

EXTREME FLIGHT ✓

RADIO CONTROL™

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

50cc Extra 300 ARF Instruction Manual



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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 buyer with a very high quality model aircraft component kit, from which you, the buyer, 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 90 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. Please inspect the model immediately upon receipt.

Extreme Flight RC in no way warrants 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. It is your responsibility to ensure the airworthiness of your model.

Congratulations on your purchase of the Extreme Flight RC 50cc Extra 300 ARF! Like our previous 50cc Yak-54 release, the Extra is among the largest aircraft currently available for 50cc gas engine power. Its light weight yet robust construction allows the Extra to perform tournament level maneuvers on an economical 50cc power plant, allowing you to experience the performance and stability of a much larger aircraft at a considerable savings. The Extreme Flight Extra 300 is loaded with unique features, including all first rate 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, aluminum landing gear, titanium pushrods and a carbon fiber tail wheel assembly, all ensuring the lightest, most high performance aircraft possible. You will notice there is a box built into the bottom of the Extra's fuselage. This is a pipe tunnel and will accommodate most canister mufflers and tuned pipes sold for the current makes of 50-60cc engines. Also included is a set of protective wing and stab bags and a canopy/hatch cover to keep your investment looking great season after season. Add to that one of our new PILOT X series helmet head figures and a very detailed scale instrument panel and dash!

The performance ability of the Extreme Flight RC Extra 300 is phenomenal! This sleek, fast and agile airframe is completely unlimited in its ability to perform the full range of full stall high alpha maneuvers and aggressive gyroscopic tumbling maneuvers. The Extra is also a topnotch precision aerobatic machine. It is capable of performing the entire FAI catalog of maneuvers and it has the kind of "big plane" presence in the air that will impress the judges. This makes the 50cc Extra a great candidate for all classes of IMAC competition.

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 50cc Extra 300!

A few tips to ensure success and airframe longevity

- 1. We are very pleased with the level of craftsmanship displayed by the builders in our factory. Through many 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, the intersection of the wing root rib and wing sheeting, anti rotation pins, etc. A few minutes spent here inspecting the joints and applying glue where needed is time well spent**
- 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. 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 the 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. A neat trick 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! These aircraft are equipped with very large control surfaces that deflect over 45 degrees. A lot of servo power is required to prevent flutter and to maintain the required deflection for maneuvers. We absolutely recommend the use of high torque METAL GEAR servos. We have had great success with the Hitec HS-5955 servos in our prototypes. We recommend this servo or the JR 8611A or new 8711 for all flight surfaces.**
- 5. Use a high quality epoxy for installing the composite control horns and hinges. We highly recommend the use of Pacer Z-Poxy 30 minute formula. We have used this glue for many years with zero failures.**

Hardware

Your new Extreme Flight 50cc Extra 300 includes all necessary hardware with the exception of main wheels, tailwheel, axles and collars and a 4" spinner. These items were omitted as I have been unable to source satisfactory versions of these items in China. I recommend Dubro 5/32" axles and collars and 3.5 inch main wheels.

You will find a complete pull-pull system, as well as high quality heavy duty ball links, titanium turnbuckle pushrods and composite control horns, and a carbon fiber tailwheel assembly. You will also find 3 white ball links. 2 of these are for use with the included 2mm pushrod for the throttle assembly (this set-up is for the DA-50-other engines may require a longer pushrod), the other is for the bottom of the rudder to retain the tailwheel tiller arm.

The bonded sealing washers are used when mounting the cowl and canopy/hatch. When the bolts used to retain the canopy/hatch and cowl are tightened against the bonded sealing washer, the rubber on the washer compresses, preventing the bolt from backing out. The rubber on the washer also protects the surface of the cowl. Tighten the bolts until the rubber compresses, but do not allow the metal part of the washer to make contact with the cowl.

For best results, remove all set screws from the tailwheel assembly and disassemble the unit. File flat spots on the tailwheel wire so that all set screws will seat properly. Place a drop of blue Loctite on all set screws and re-insert them into their holes.

Graphics

The Extra is not supplied with graphics. The "sticker" type graphics included with our smaller aircraft simply don't hold up well to gasoline. We recommend using vinyl graphics. There are several companies that specialize in model aircraft logos and can supply you with a top notch graphics package that will really dress up your Extra. Our local graphics guy Jeff Dean of Vital Signs and Graphics (770-363-2727 or www.vital-signs.biz) has packages available for the Extra like the ones pictured on our aircraft. He can modify these to suite your needs as well.

Elevator Assembly

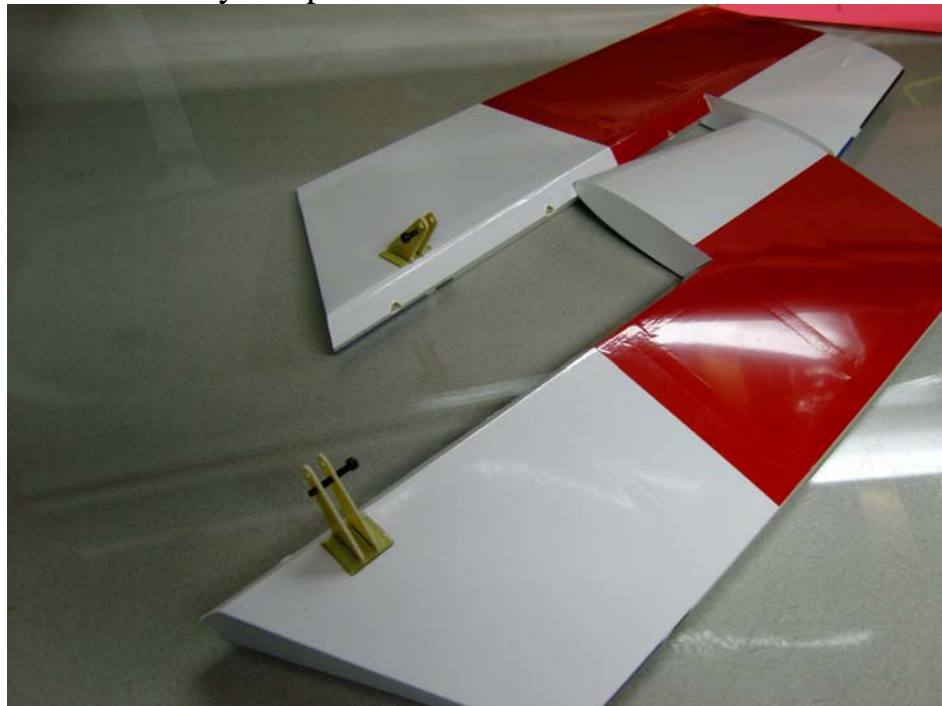
1. Locate the horizontal stabilizer/elevator assemblies as well as the composite control horns and base pieces from the elevator hardware package.



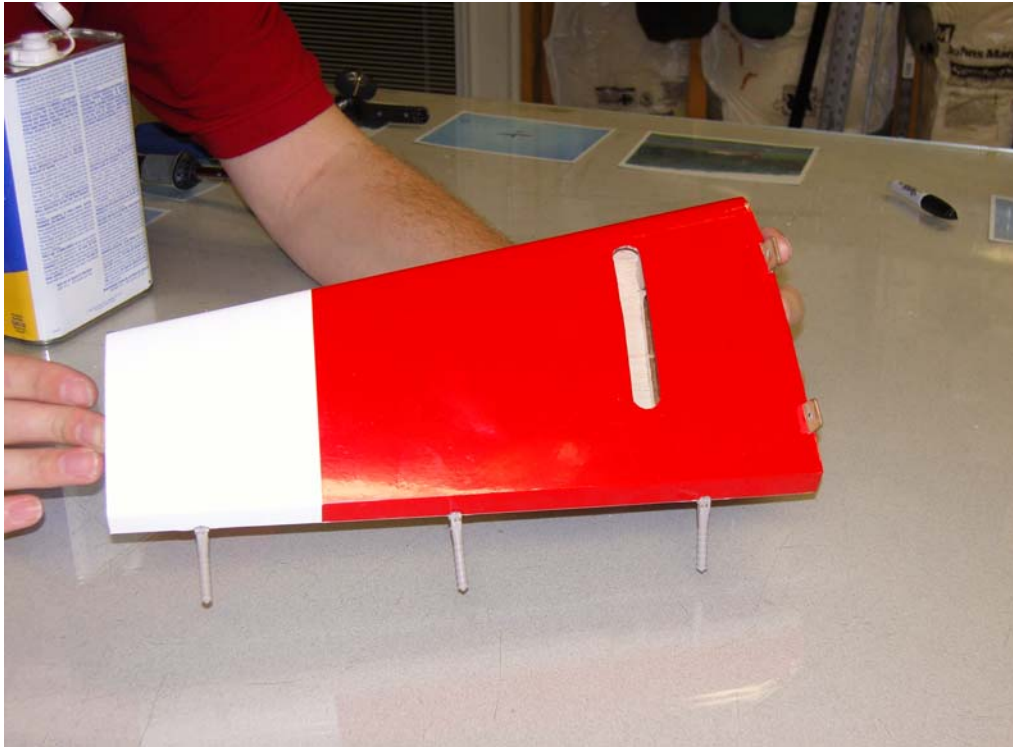
2. Use a sharp #11 blade to remove the covering over the pre-cut control horn slots near the bottom leading edge of the elevator. Cut the covering 1/16" from the ends and sides of the slots.



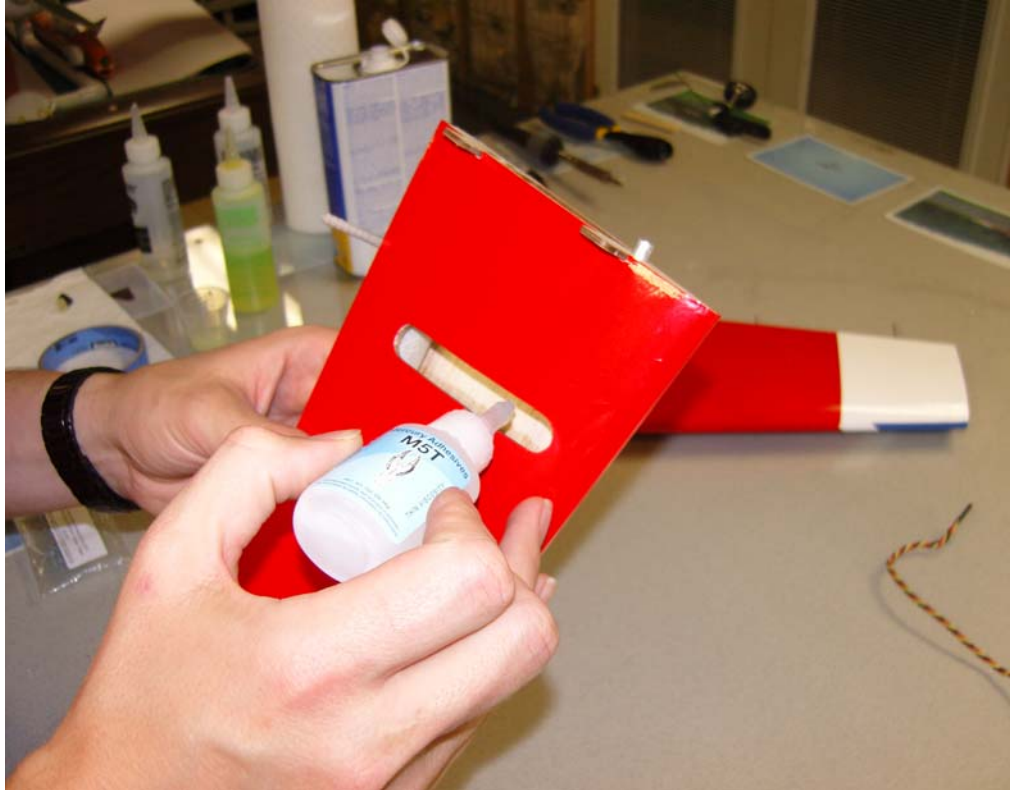
3. Insert the 2 control horns into the base plate and trial fit the horns into the slot and make sure they seat properly against the base and elevator surface. You may need to remove 1/16" from the front of the base plate to prevent it from overhanging the bevel. Remove the horn assembly and scuff the portion of the horns that will be inserted into the elevator with sandpaper. 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. Place a 3mm bolt through the horns to help insure proper alignment and set aside to dry. Repeat for the other elevator half.



4. Use a sharp #11 blade to remove the covering from the slot for the elevator servo control horn. You may have to slightly enlarge this hole to allow for maximum travel.



5. Before installing the elevator servos, I highly recommend that you take a moment and wick some thin CA (I prefer the Mercury Adhesives line of CAs) around the servo mounting rib and root rib where they attach to the sheeting as well as the anti-rotation pin where it is mounted in the stab. Temporarily install the servo arms and electronically center the servos. It will be much easier to match up the servos at this point than when they are installed. I also recommend that you thin a small amount of epoxy with a few drops of alcohol and apply a light coat to the inside of the stab and to the servo mounting rib as well as to the root rib and mounting tabs. Over time exhaust residue begins to collect here and by sealing it with epoxy you will prevent degradation of the wood.

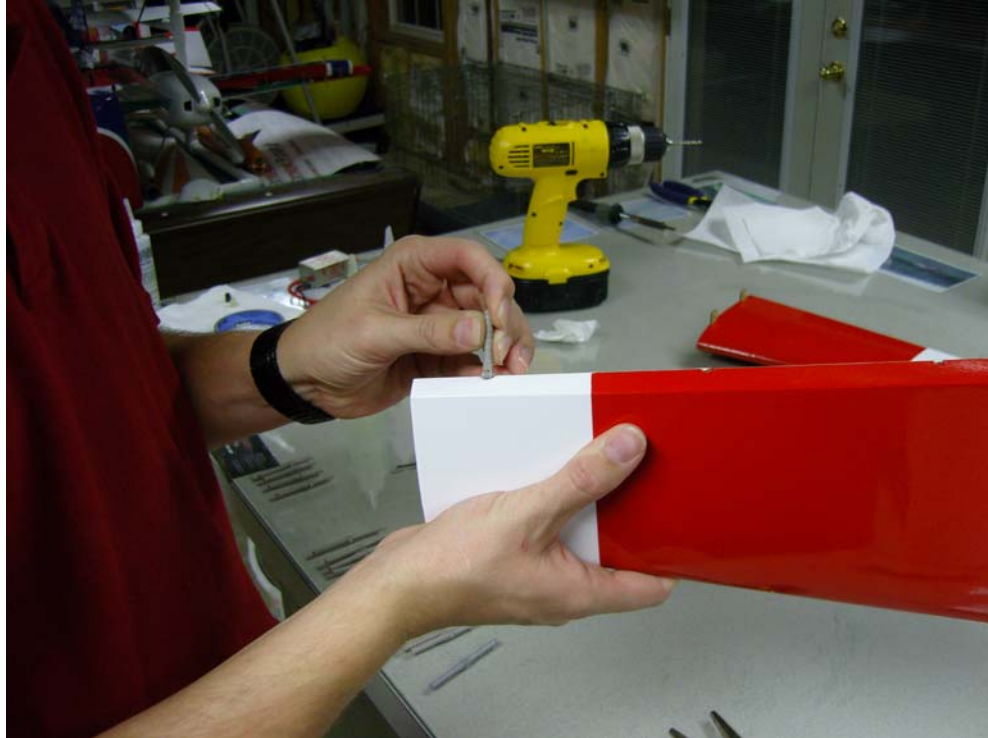


6. Use the manufacturer supplied mounting hardware and install the elevator servo with the output shaft toward the front of the stab. Feed the servo wire out of the hole in front of the servo and out of the root rib. You will need to attach a 36" servo extension to the servo lead to reach the receiver in the radio compartment. If you intend to remove your stabs for transport you will need a longer extension or additional extensions.



7. In this step I will outline the procedure we use to install the hinges. There are several ways to do this and several adhesives you can use. We will describe the way we do it, as this method has proven itself over many years of model building. If you are new to this type of hinging process then I recommend that you install a single hinge first just to acquaint yourself with this method. Before starting the process get a few items together that will aid you as you proceed. You will need the following items: 30 minute epoxy (again, we recommend Pacer Z-Poxy), a scrap piece of pushrod or 1/8" dowel, paper towels and denatured alcohol. Locate 3 hinges per elevator half. You will need to cut 1 hinge just beyond the second knuckle to clear the fiberglass tube socket in the stabilizer. Insert the carbon fiber wing tube into the socket while testing for proper hinge length to avoid damaging the fiberglass sleeve. Mix a generous batch of 30 minute epoxy. Use the pushrod or dowel to thoroughly coat and fill the hinge hole with epoxy, then coat the hinge with epoxy. Push the hinge into its hole until the joint is

about a 1/4" from its final position and use a paper towel to remove the excess epoxy that has been forced from the hole. Push the hinge the rest of the way in and make sure the hinge pin is centered in the hinge line. Use some denatured alcohol and a paper towel to remove all excess epoxy, especially on the hinge pin. When you are satisfied with the result set the surface aside to dry. Position the drying piece so that any excess epoxy will pool around the rear of the hinge.



8. When you are comfortable with this process you should be able to do one side of a surface per batch of epoxy. Glue all hinges into the stabilizer first. After the glue has set trial fit the elevator to the stab and adjust if necessary. There should be as little gap as possible between the stab and elevator. When satisfied with the fit remove the elevator and repeat the gluing process outlined above. Be sure to wipe away all excess epoxy! Set aside to dry. Repeat this process for the other stab/elevator half.
9. After the hinges have dried thoroughly, pull on them to make sure they are properly installed. The hinges will probably feel a little stiff as it is almost impossible to get all of the glue out of the joint. Use a fine tipped hypodermic needle and place one (only one!) drop of acetone on each side of the hinge pin. Move the elevator back and forth a few times and you will feel it loosen up.
Be careful to only use one drop as you don't want to weaken the glue joint! Add a drop of penetrating oil to each hinge pin and

you will ensure a smooth operating surface with no binding. Seal the bottom of the hinge gap with a strip of Ultracote or Blendern tape. Be sure to fully deflect the control surface when applying the tape or Ultracote to allow full deflection once the gap is sealed.

10. Thread 2 of the heavy duty ball links onto one of the titanium pushrods. Remember that the ends of the pushrods are reverse threaded so that they can be adjusted like a turnbuckle without removing the linkage. Insert a 3mm socket head cap screw into the ball link and into the servo arm. If using the SWB arms you will need to drill out the hole to accept the 3mm bolt. Secure with a 3mm nylon insert locknut.
11. Place the servo arm onto the servo (which you should have electronically centered in a previous step) and make sure the elevator is in the neutral position. Adjust the ball links until the linkage fits between the composite control horns and lines up with the pre-drilled top hole. Insert a 3mm socket cap screw into a washer, through one side of the composite control horn, through the ball link, and finally through the other composite control horn. Secure with a 3mm nylon insert lock nut. Use blue Loctite on all bolts! See finished set-up below.

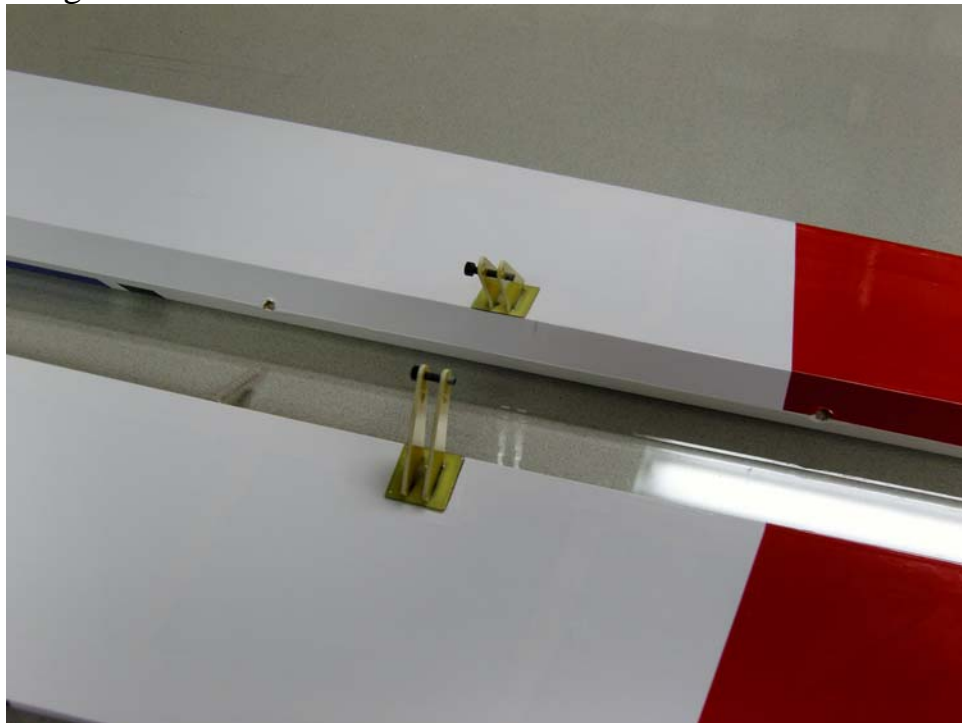


12. As mentioned previously, you may need to adjust the size of the servo arm exit slot to achieve maximum travel. A 1/4" Drum sander in a moto-tool makes quick work of this. Repeat these steps for the other stab/elevator half. Before you set aside the stabs take a

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 a soft cloth and put them away in their protective bag.

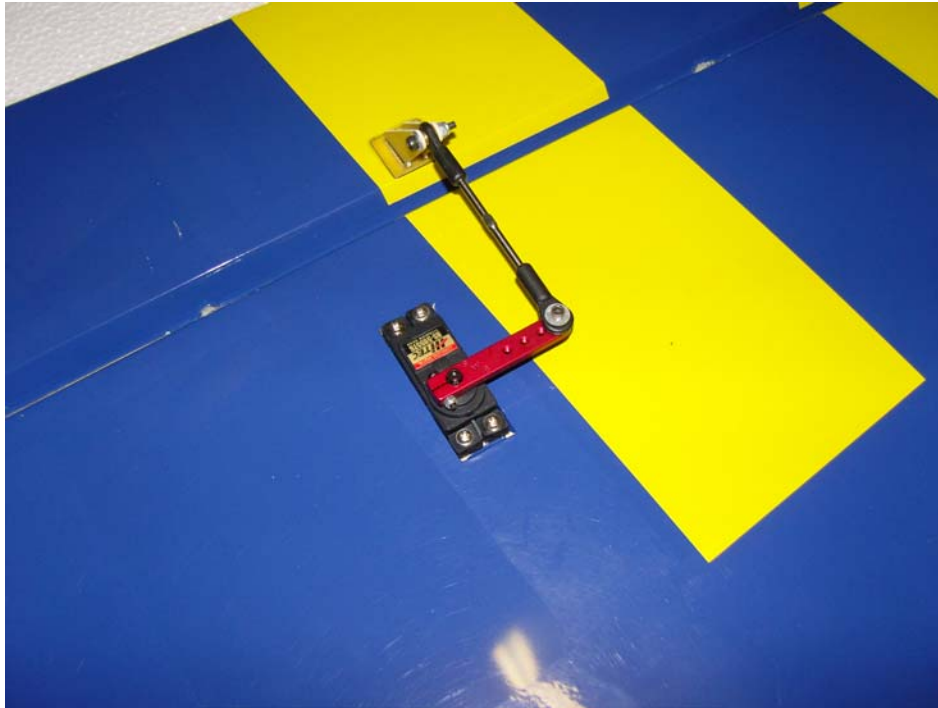
Wing Assembly

13. The assembly process for the wing is almost identical to that of the stab/elevator. For this reason we will not go into quite as much detail as in the previous procedure. Remove the aileron from the wing panel. Locate the 2 slots for the control horns and remove the covering from the slots with a sharp #11 blade. **Follow the same procedure as outlined previously to install the control horns into the control surface and hinge the wing.** You may need to trim 1/16" from the front of the composite base plate to prevent overhanging the bevel. Repeat this procedure for the other wing.



14. Locate the aileron servo mount and remove the covering from this area. Use a sealing iron to seal the edges of the covering to the sides of the servo opening. Take a few minutes to apply some CA to the joints of the servo rails and the ribs.
15. Attach a 12" servo extension to your servo and secure with thread or heat shrink tubing. Use the manufacturer supplied mounting hardware and install the servo with the output shaft toward the leading edge of the wing. Electronically center your servo. We will fabricate the linkage much in the same way as the elevator

linkage. Aileron servo arm length should be 1.50". We use and recommend the SWB double lock aluminum arms. As always, use blue Loctite on ALL bolts!



16. Before beginning the next assembly process, take a few minutes with your sealing iron on a medium heat setting and go over all seams, paying special attention to thin trim stripes and the seam at the leading edge of the wing. If there are wrinkles in the covering on the leading edge sheeting use a heat gun with a 100% cotton t-shirt to remove them and prevent digging into the wood with an iron. Use caution and avoid excessive heat as you may cause the Ultracote to shrink too much and lift at the seams. Also take the time to seal the hinge gaps with Ultracote or Blendederm tape. Clean the wings with Windex and put them away in their protective bag.

Rudder and tailwheel assembly and mounting

17. 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.



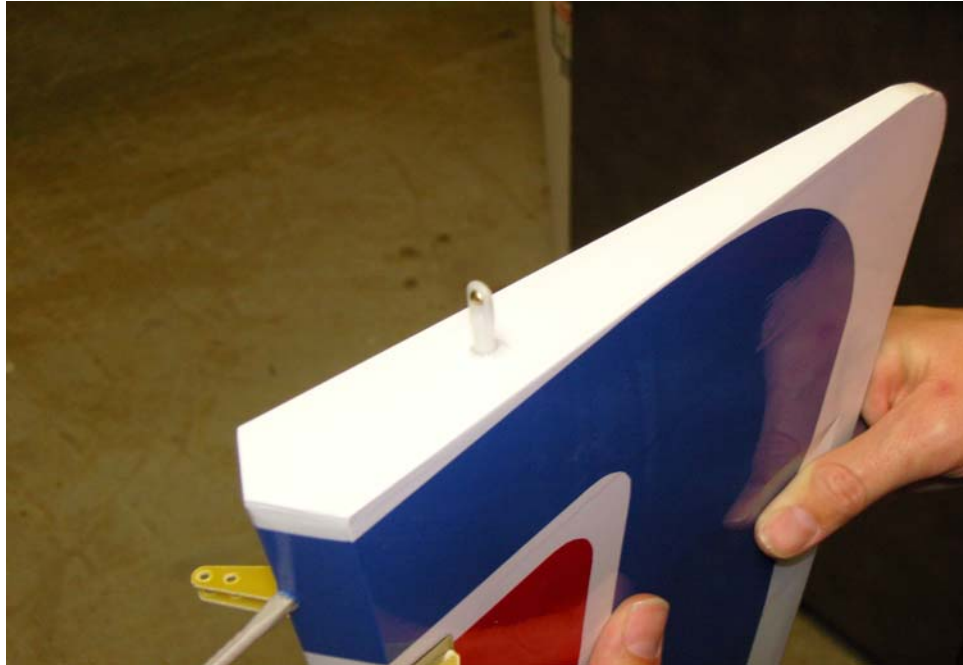
18. Trial fit the 2 servo horns through the base plate and into their proper position flush against the rudder surface. You will need to trim the front of the base plate so that it does not overhang the hinge line.
19. Mix up some 30 minute epoxy and milled fiberglass and use a small blade to fill the 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. 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. Repeat for the other side of the rudder.



24. Locate a 2mm ball link from the hardware bag. Remove the covering from the hole on the bottom of the rudder.



25. Scuff the shaft of the ball link with coarse sandpaper. Mix up a small amount of 5 minute epoxy and apply it to the ball link and the hole in the bottom of the rudder. Push the ball link into the hole as shown in the picture. Use a little excess epoxy to form a fillet around the bottom of the ball link. Make sure the hole in the brass ball is aligned front to rear to accept the tailwheel tiller arm. Go ahead and glue the hinges into the rudder at this time using the procedure outlined previously.



26. While this dries let's prepare the tailwheel assembly and get it mounted. First disassemble the tailwheel assembly as shown.



27. Use a rotary tool with a grinding bit or a small file to create a flat spot on the tailwheel wire for the set screws in the aluminum fittings to seat against. Reassemble the unit and apply Loctite to the threads on the setscrews and reinsert into the aluminum fittings and tighten snug. Slide the tailwheel of your choice onto the wire and secure with the 2 included wheel collars.



27. Position the tailwheel assembly on the rear bottom of the fuselage and be sure the tailwheel wire is aligned with the rudder hinge line. Secure the tailwheel with a couple of pieces of masking tape while you drill 2 holes with a 1/16" drill bit. Apply a few drops of thin CA to the holes and allow to dry then secure the assembly to the bottom of the fuselage as shown with the 2 provided coarse thread wood screws and 2 washers.



Fuselage Assembly

28. We'll begin by installing the landing gear. Locate the aluminum main landing gear, the landing gear slot cover 4 4mm bolts, lock nuts and washers. Insert the gear into the slot on the bottom of the fuselage and center it in the slot. Use the pre-drilled holes in the aluminum gear as guides and mark the location of the holes with a pencil. Remove the gear and drill through the plywood landing gear plate and aluminum mounting bracket.

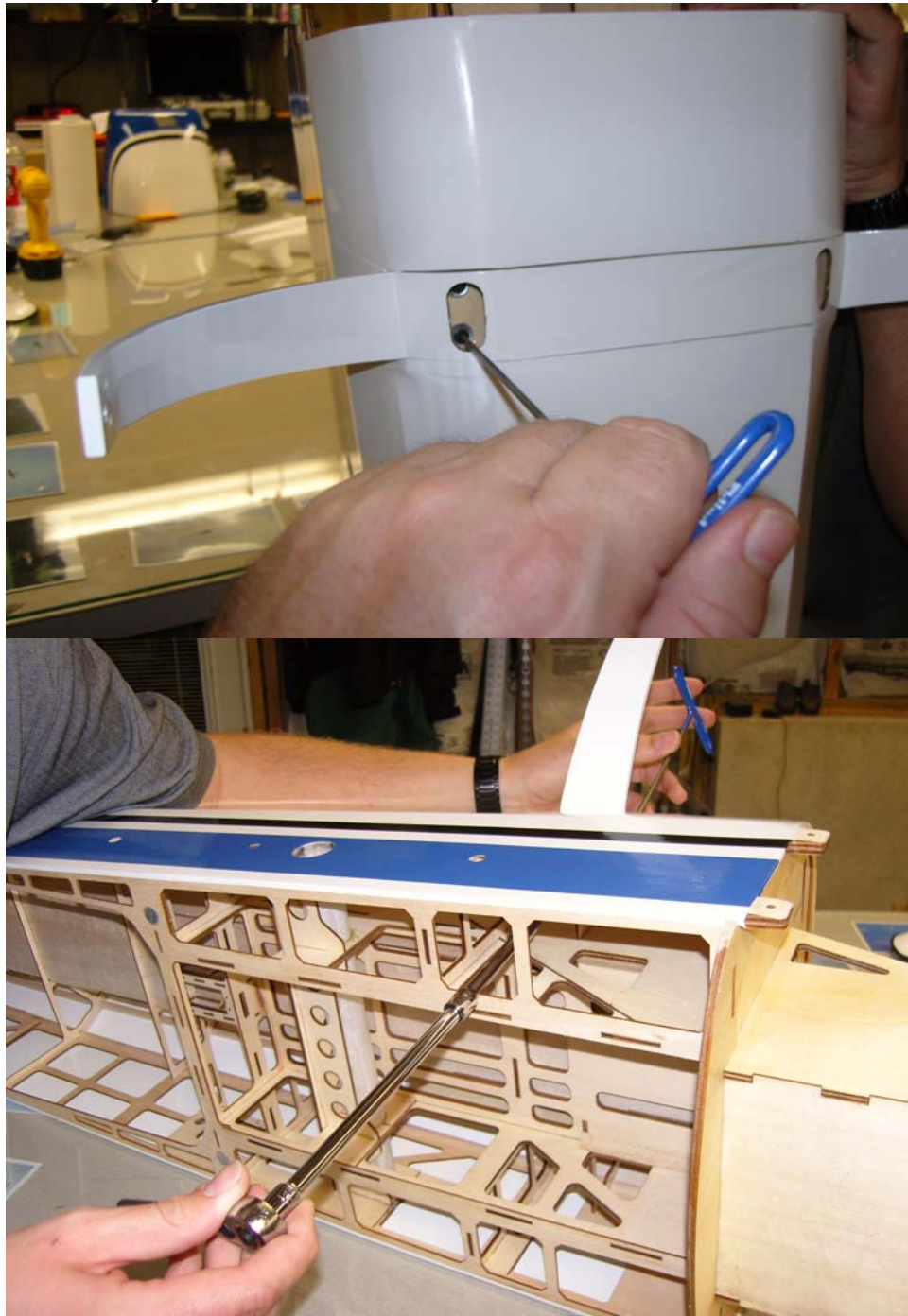


29. Locate the landing gear cover plate and remove the covering from the 2 holes on each end of the cover as shown with a sharp blade.

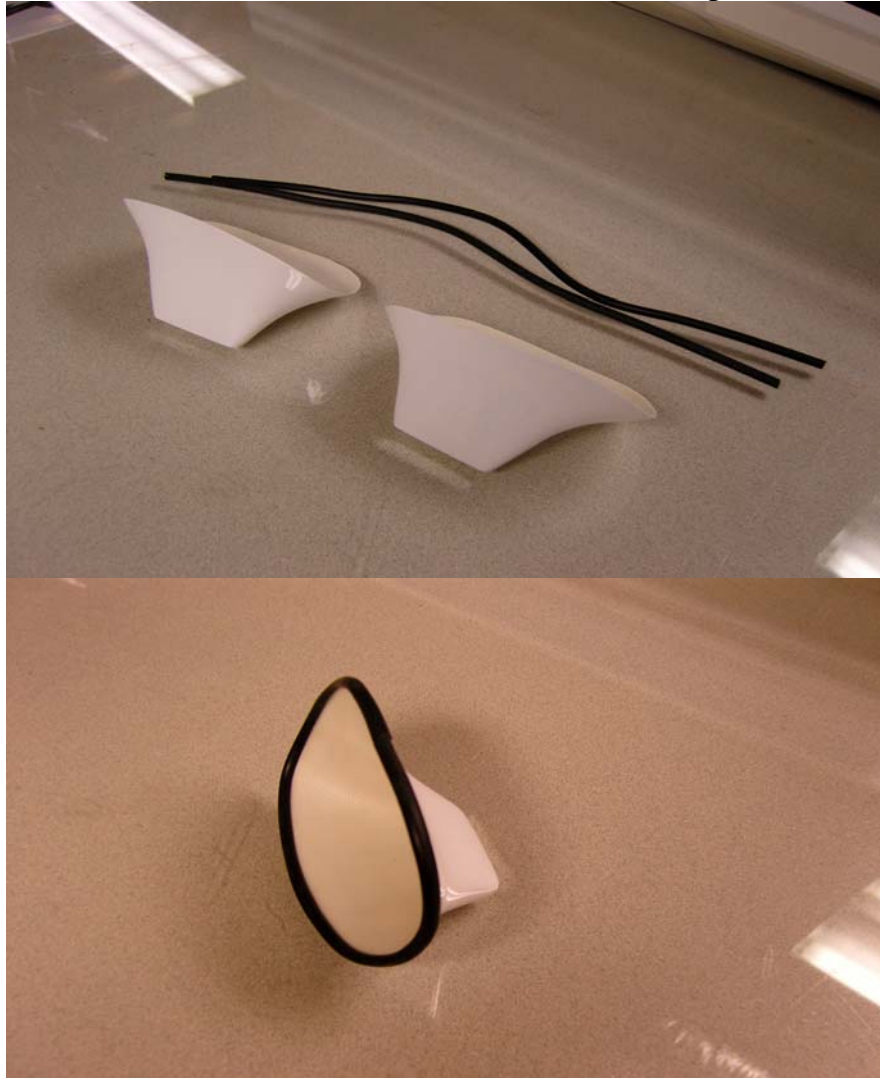


30. Secure the landing gear with 4 4mm bolts, washers and nylon insert lock nuts. Insert the bolts and washers into the landing gear slot cover and into the aluminum landing gear and through the ply

wood mounting plate and aluminum gear mount. Secure with the 4mm nylon insert lock nuts.



31. Locate the 2 fiberglass landing gear fairing and the black neoprene tubing. Use a sharp hobby blade and cut through one wall of the tubing horizontally along the length of the tubing. Press the tubing onto the edges of the fairing as shown and secure with thin CA. Make sure the seam is on the rear side of the fairing.



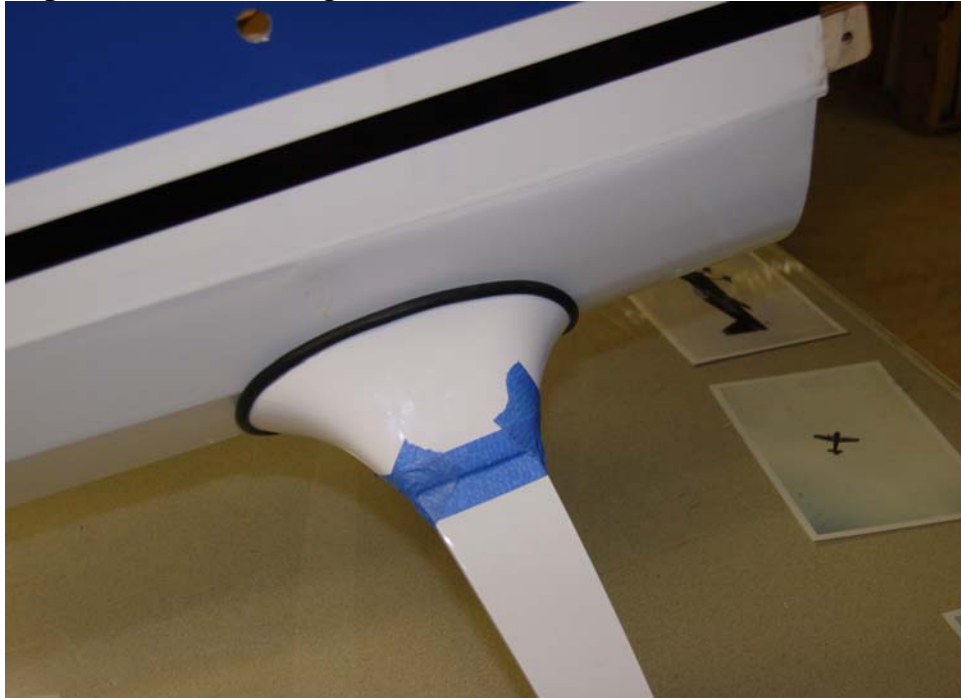
32. Slide the fairings over the landing gear and against the sides of the fuselage. You may need to open the hole in the fairing slightly with a rotary tool bit for proper fit. Use a pencil to mark the location of the bottom of the fairing on the landing gear and then remove the fairing.



33. Apply a thick bead of silicon glue just above your pencil line all the way around the gear.



34. Slide the fairing back into place and apply masking tape to keep it in position while the glue dries.



35. Locate the 2 wheel pants and 2 plywood mounting plates. Use sandpaper to scuff the inside of the pant for better glue adhesion. Glue the ply mounting plate centered in the opening of the pant as shown with 30 minute epoxy.



36. Install your choice of axles and wheels. Use a rotary tool to open a slot in the wheel pant to allow it to slide over the axles. Position as desired and mark the location for the blind nuts using the pre-drilled holes in the aluminum gear as a guide. Install the 4-40 blind nuts and secure the pant with 2 4-40 bolts. Use blue Loctite on ALL bolts.



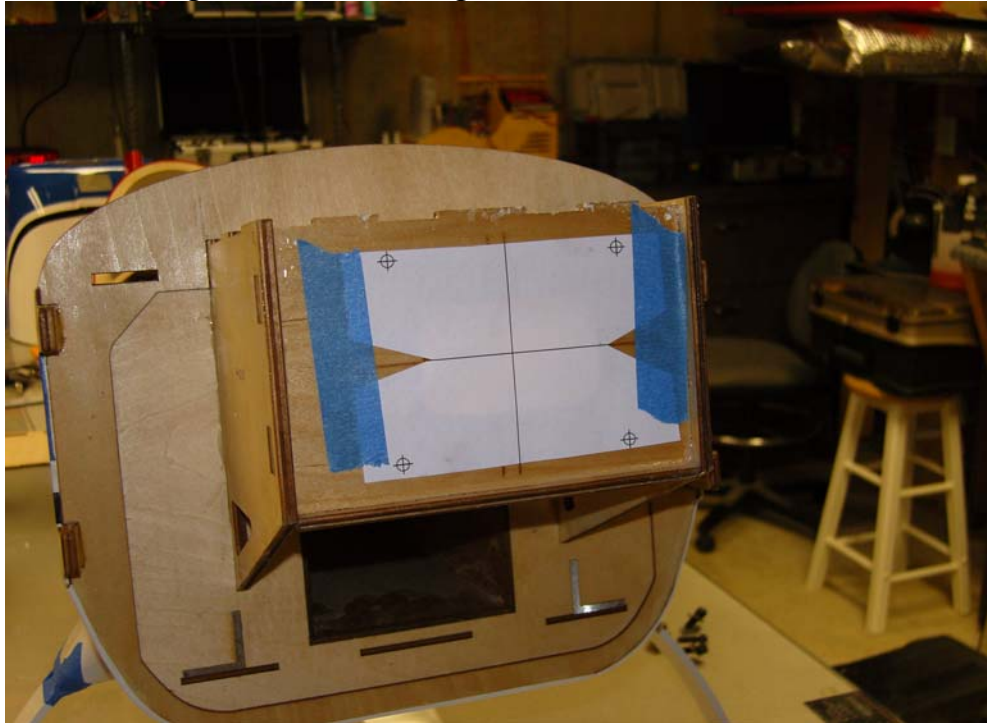




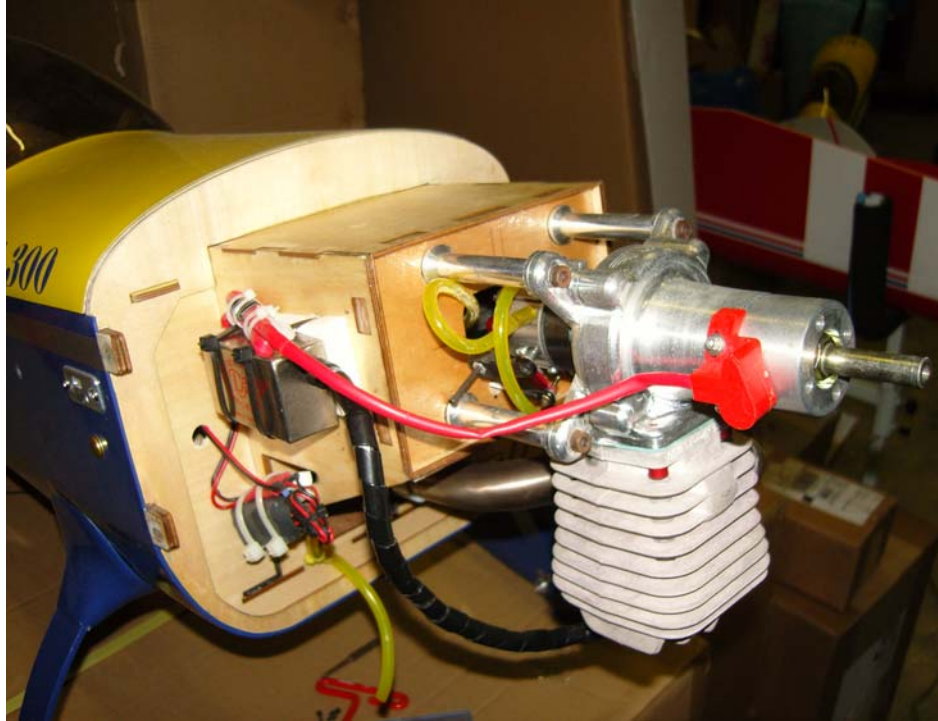
37. While the Extra is still upside down let's install the rudder and finish up the tailwheel installation. Apply 30 minute epoxy to the holes in the rudder post and to the rudder hinges. As you position the rudder onto the vertical fin, be sure the tailwheel tiller arm is inserted into the ball link. Push the rudder into position and wipe away any excess epoxy with a paper towel and denatured alcohol.



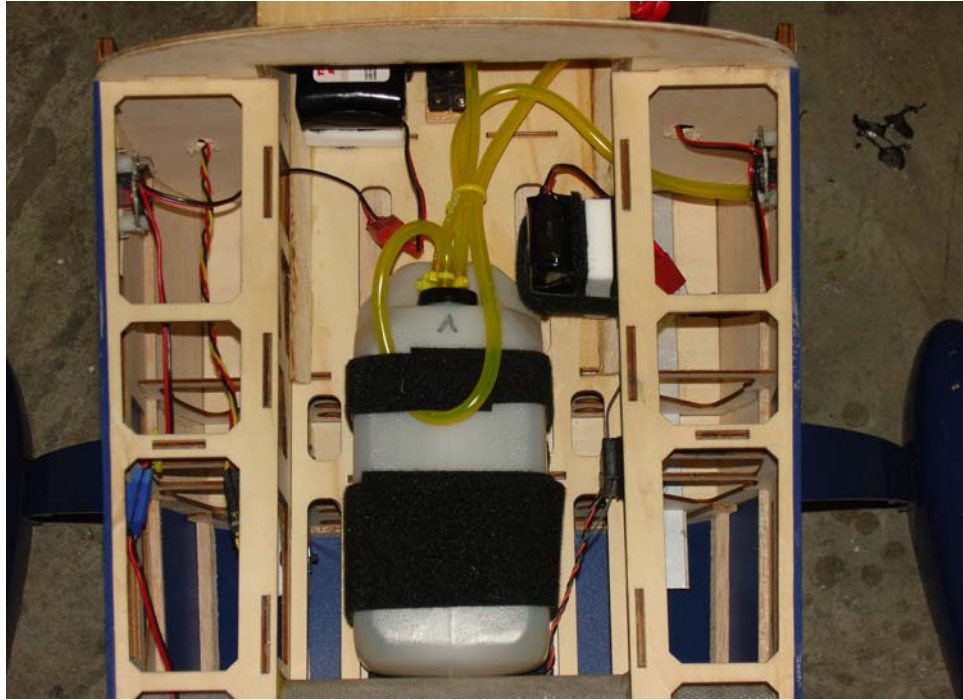
38. Next let's install the engine. We have made this process very easy. The center and offset marks have been scribed into the front of the firewall with a laser. Most manufacturers will provide a mounting template for their engines. Templates for the DA-50 and Brillelli 60 are available for download from our website. Simply tape the template to the firewall making sure the horizontal and vertical lines on the template are aligned with the lines on the firewall. Be sure to align the vertical line on the template with the thrust offset line (the line to the **RIGHT** of the center line). Drill the mounting holes at the designated location.



39. Use the recommended mounting bolts and large washers to mount the engine to the firewall. You will need to use standoffs to get the motor to 6.25" inches from the firewall to the engine thrust washer. For the DA-50 this requires the use of the standard 2.5" standoffs normally supplied with the engine. Remove the engine and brush a coat of alcohol thinned epoxy onto the exterior and interior of the motor box. Once dry permanently mount the motor. Be sure to use some large washers behind the firewall to better distribute the load. Again, use blue Loctite on all bolts. On the following page is a photo of the engine mounted and ignition unit installed.



40. Now let's set up the throttle linkage. If you are using a DA-50 this is very easy. You may need to rotate the carburetor on the DA-50 180 degrees so that the throttle arm is facing the bottom. Please contact DA for the proper procedure. It is very easy and only takes a couple of minutes. Mount the servo in the hole in the floor of the engine box and use the 2mm pushrod and white ball links to fabricate the throttle linkage. Very easy! If you plan to use a tuned pipe you will need to install 3/8" hardwood servo rails on each end of the servo hole to raise the servo so it does not touch the header/pipe.
41. Assemble the included Dubro 20 oz tank. Make sure to use the gas conversion stopper and Tygon tubing for all plumbing. Use Velcro or nylon cable ties to secure the tank to the tank tray. The tank should butt up against the partial former in front of the wing tube. If you look closely you can see the location of our ignition battery and flight pack battery in this picture. (see picture next page)



42. Here is where we installed our fuel dot and ignition switch. The radio switch is installed in the same location on the opposite side of the fuselage.

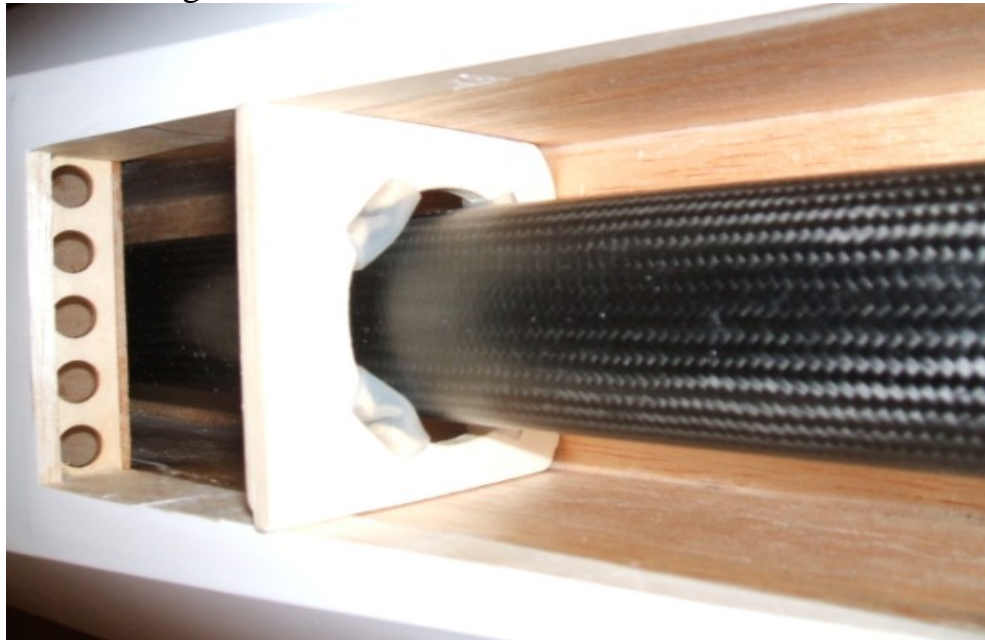


43. Once all plumbing is completed and throttle servo and linkage is installed glue the top of the motor box in place with 30 minute epoxy. This piece is NOT optional as it adds an enormous amount of strength and rigidity to the motor box.

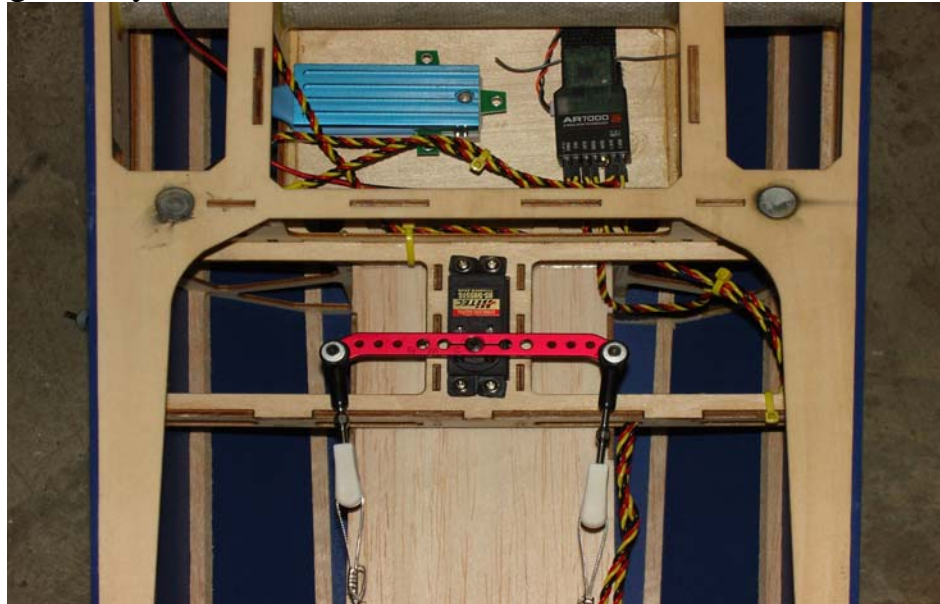
44. If you are planning to use a tuned pipe or canister now is the time to install it. You will need to remove the covering from the bottom of the fuselage as pictured. Seal the edges of the covering to the edges of the pipe tunnel and paint a thin coat of alcohol thinned epoxy to seal the wood in the tunnel.



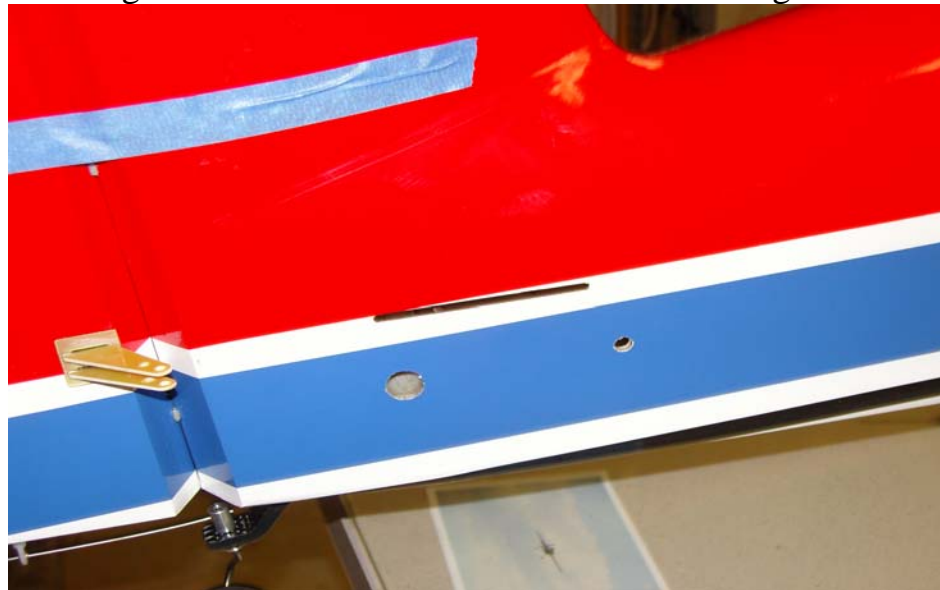
45. A simple plywood mount such as the one pictured works great. Be sure to use silicon tubing to cushion the pipe and prevent it from making contact with the mount.



46. Install your rudder servo using the supplied hardware with the output shaft toward the front of the plane. Depending on the servo used you may need to lightly sand the sides of the mount to accept your choice of servo. We recommend the use of one of the new “mega-torque” standard size servos such as the Hitec HS-5955 or the JR 8611A or 8711 for this position. You will notice in the picture we are using the SWB 4” offset rudder arm. We highly recommend the use of this quality product to ensure correct geometry.



47. Next let's install the pull-pull rudder cables. First remove the covering from the exit slots at the rear of the fuselage as shown.



48. Assemble one end of the linkage by inserting the pull-pull cable into a crimp, through the hole in the brass pull-pull fitting and back through the crimp. Loop the cable back through the crimp a second time and crimp with side cutters.



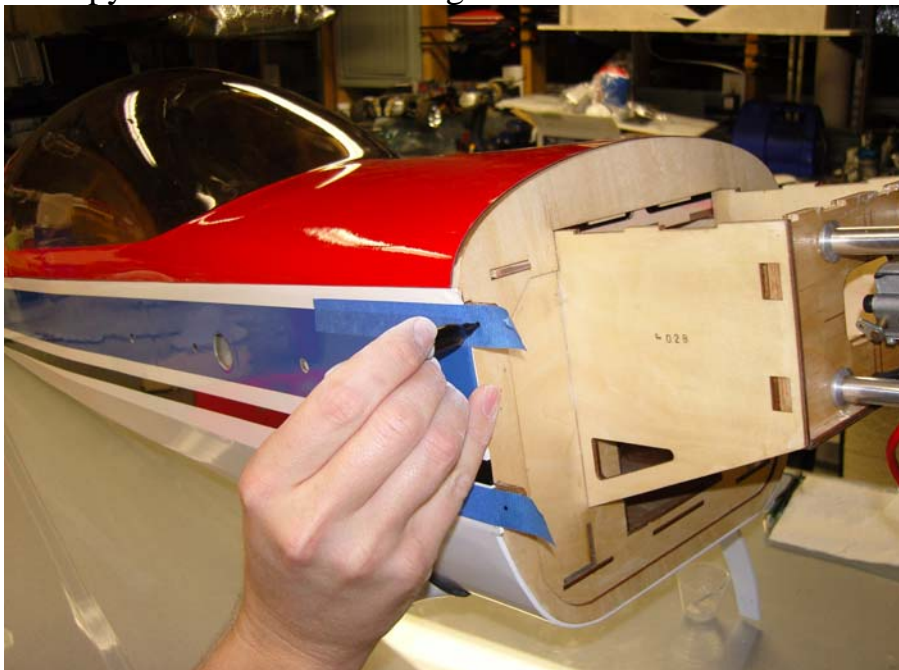
49. Insert the bare end of the cable into the slot in the rear of the fuselage and feed it forward through the hole in the former that is positioned just in front of the slot. Pull the cable forward into the canopy area and make up the same type of linkage as you did previously. Electronically center your servo. Secure the linkage at both ends with a 3mm bolt and nylon insert lock nut. Repeat for the other side. Again, you will want to use a 4 inch arm for the pull-pull system and **cross the cables**.



50. Now let's mount the cowl. It will be necessary to open the bottom of the cowl for the engine cylinder to clear. Use a rotary tool to open the bottom of the cowl. The following picture depicts the typical opening for a DA-50. This will require further work to allow clearance for the spark plug wire and muffler but should allow you to slide the cowl into position for mounting.



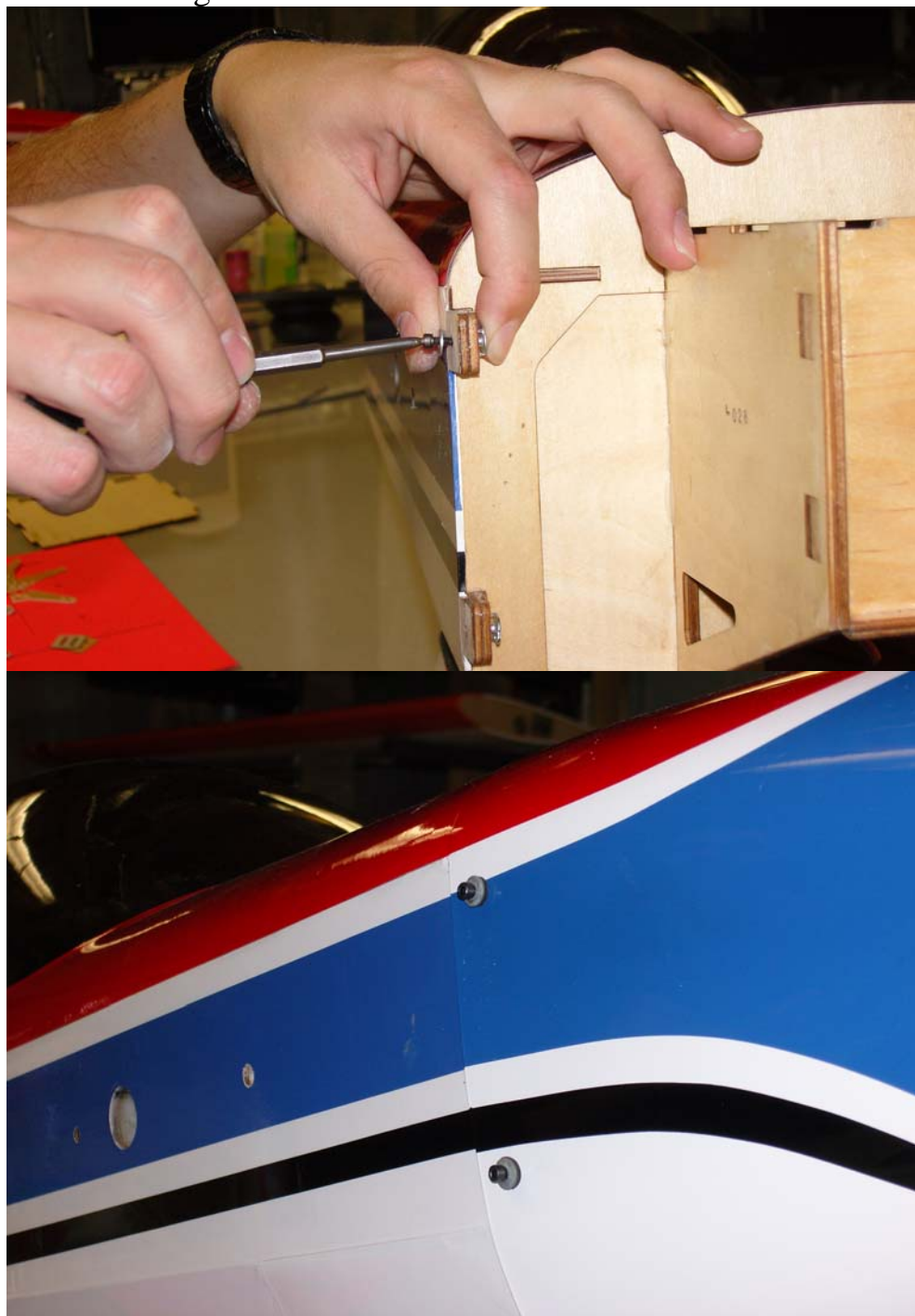
51. Before mounting the cowl place four strips of masking tape on the fuselage as shown and use a felt tipped marker to mark the location of the bolt holes in the cowl mounting tabs. Place the canopy/hatch onto the fuselage.



52. Peel the tape back just behind the F1 former and place the cowl into position, flush with the rear of the F1 former. Place your spinner (4") on the engine to aid with alignment. View the cowl from several angles to insure that it is positioned properly. When satisfied put the four tape strips back into position and drill a 1/8" hole at the location of each of the 4 ink marks.



53. Remove the cowl and soak the cowl mounting tabs with thin CA. Install the 4 4-40 blind nuts into the cowl mounting tabs. The cowl is attached using 4 4-40 socket head bolts in conjunction with 4 bonded sealing washers as shown.



54. Now let's install the stab/elevators. Open the holes in the rear side of the fuselage to expose the pre-mounted 3mm blind nuts. You will also need to open a hole for the servo leads to pass through. Slide the stab halves onto the carbon fiber stab tube and secure with a 3mm bolt and washer inserted through each mounting tab and into the pre-mounted blind nuts. Make sure to use a drop of blue Loctite on these bolts.



55. Your Extra includes one of our PILOT X helmet head figures and detailed instrument panel, as well as a Depron canopy floor. These components are light weight and add a nice finishing touch to the Extra. Assemble the instrument panel and screw the face shield onto the pilot figure. Glue the Depron insert into place with white glue or foam safe CA and use the same glue to attach the instrument panel. Either glue the pilot in position or mount with blind nuts.

55. The canopy is retained by 2 3mm bolts and bonded sealing washers. The wings are retained by inserting the 1/4x20 nylon bolts through the holes in the fuselage just behind the wing tube and into the pre-installed blind nuts in the root rib of the wing. Be careful not to cross thread the bolts and inspect them periodically to insure thread integrity.

This completes the assembly of the 50cc Extra 300. 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. 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. The wax helps to protect the covering and paint and makes clean up easy, as oil residue can simply be wiped away.

Set-up and trimming

Besides basic assembly, this is the most important part of preparing your airplane for flight. It can also be the most time consuming, but once your plane is properly dialed in you will agree it was time well spent.

The **center of gravity** range for the 50cc Extra 300 begins at 6" from the leading edge of the wing measured at the root and extends back $\frac{3}{4}$ " from this point. CG is determined with the Extra in the upright position. One of the best ways to dial in the proper CG for your aircraft is the 45 degree line test. Fly the aircraft in front of you from left to right (or right to left if you prefer) at full throttle. Pull the aircraft into a 45 degree up line and establish this line. Roll the aircraft inverted, neutralize the elevator and pay close attention to what the plane does. Ideally the plane will continue on this line for several hundred feet before it starts to slowly level off. If the airplane immediately drops the nose and dives toward the ground it is nose heavy. If it begins to climb inverted toward the gear it is tail heavy. There is no need to have the Extra excessively tail heavy to perform 3D maneuvers. At this time you will also want to balance your plane laterally. Add a small amount of weight to the wingtip to achieve proper lateral balance.

Control surface throws

I highly recommend that you purchase a throw meter that measures in degrees. There are several units available commercially. These units are a great aid in set-up and definitely beat the “that looks about right” method. For any type of precision flying, surfaces that travel equal distances are a must. The following control surface travels are what I use on my own Extra. These are a good starting point, but are by no means the only way to set up the Extra. Start here and then adjust to fit your own preferences and style of flying.

Elevator: 8-10 degrees low rate, 18-20% exponential; all you can get high rate, 60-65% exponential

Aileron: 20 degrees low rate, 30-40% exponential; all you can get high rate, 65-70% exponential

Rudder: 20 degrees low rate, 50% exponential; all you can get for high rate, 80-90% exponential.

Again, this is just a starting point. Adjust to your liking.

Thanks again for your purchase of the Extreme Flight RC 50cc Extra 300 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