



62" AJ Acuity Assembly Instructions

Congratulations

The all-new AJ Aircraft Acuity was designed to give you all of the precision flight abilities of expensive composite aircraft, in a more traditional balsa & plywood frame. Designed by our own F3A pattern champion Andrew Jesky, this 62" model will be a perfect introduction to competition pattern aerobatics. With a tall & slender fuselage, slim swept wing and T-Canaliser on the canopy, the Acuity will slip perfectly through any aerobatic maneuver. And the suggested electronics setup will work perfectly with the 5&6s 4000-5000mAh packs you likely already own.

Up Your Game! Fly AJ Aircraft

AJ Aircraft thanks you for the purchase of this airplane. Top grade materials and precision assembly have been used to make this a top quality aircraft. Following the directions closely, will assure you many hours of thrilling flight. Two years of design, development and testing has gone into this airframe. We hope you're as happy with it as we are!

WARNING!

AJ Aircraft's extensive testing ensures a high quality kit that has gone through many stages to provide you with a safe, reliable, airframe. Poor assembly will lead to an unsafe model and therefore the instructions must be followed closely. Should you have any questions, please do not hesitate to contact us. The safe operation of this model is your responsibility and yours alone. If you are a beginner or have never flown a model of this size and power you should attempt it with the help of an experienced pilot. This product should not be considered a toy, but rather a sophisticated, working model that functions much like a full-scale airplane. Because of its performance capabilities, this product, if not assembled and operated correctly, could cause injury to you or spectators and damage to property.



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. If you are not willing to accept all liability for the use of this product please return it to the place of purchase immediately.

AJ Aircraft does not accept responsibility or liability for damages resulting from use of this product.

Before starting, read through the entire set of instructions to familiarize yourself with the process.



Additional assembly information can be found in assembly videos on the [AJ-Aircraft YouTube Channel](#)

If there's ever a question, contact AJ Aircraft. 734-244-4015



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Features

Specs:

- Wing Span - 62"
- Length - 60"
- AUW (dry) - 5-6 lb
- Electric Power - 1200+ Watt Motor
- 90amp ESC
5-6s 4-5000mah LiPo
- Radio - 5 Channel
- 3 Mini High Torque Servos
- 1 Standard Size High Torque Servo

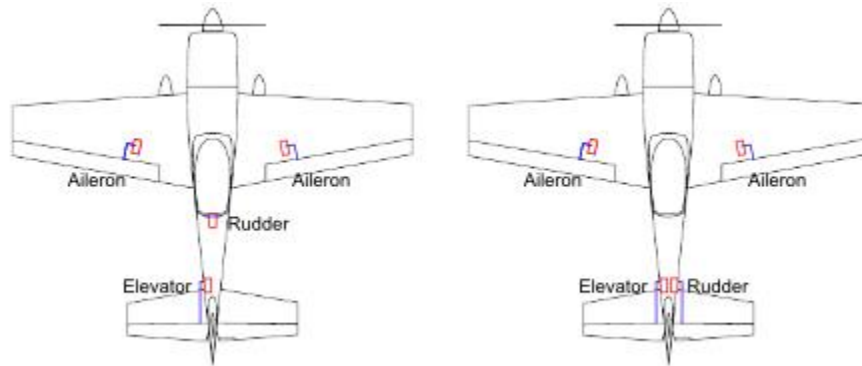
What's in the box:

- 62" Acuity Airframe
- Fiberglass Cowl & Wheel Pants
- Carbon reinforced landing gear mount
- Pre-hinged and sealed control surfaces
- Removable rudder
- Carbon main gear
- G-10 control horns
- Dual ball links for all connections
- Carbon wing tube
- Foil Wing bags
- Light weight foam wheels
- Complete hardware package
- Genuine Ultracote Covering



Optional Configurations

You have the option of using a pull-pull rudder servo or a push-pull rudder servo setup. Fasteners, control horns and servo connecting rods are provided for optional rudder setups.



Recommended Items for Completion

- Hacker A50-12s
- Falcon 16x10 prop
- Castle 90 ESC
- Thunder Power 5s 5000mah LiPo
- Futaba BLS1053/BLS551 Servos on Elevator/Rudder
- Futaba S9670SV Servos on Ailerons
- (4) x 6" Servo Extensions for the Ailerons and Rx to Wing
- (1) x 12" Servo Extension for the ESC to Receiver
- (1) x 36" Servo Extension for the Elevator
- (6) Servo Connector Safety Clips
- 2.75" or 70mm Spinner

Tools Needed

Blue Painter's Masking Tape
Thin CA Glue
30 Minute Epoxy
Denatured Alcohol
Paper Towels
Removable Thread Locker (Loctite 242, Blue)
Metric & Imperial Allen Wrenches
Hobby Knife & Fresh Blades
Covering Iron (Trim Iron)

Clamps
Small Flat File
Electric Drill w/ Assorted Small Bits (1/16", 5/64")
Small Flat Blade Screwdrivers
Small Phillips Screwdriver
Sandpaper (150-220 Grit)
Pliers
Measuring Tape & Ruler



Covering

The covering on your Laser may have developed loose areas through temperature and humidity changes between manufacturing and shipping. This may also occur during the summer heat. The covering may require retightening a few times during your first summer of flying.

Take a few minutes to go over all of the seams making sure all edges are secure. Then proceed to shrinking any area that may need tightening. (Use an iron on all seams. Use a heat gun on open areas and sheeted areas. An iron can be used in open and sheeted areas but hold the iron slightly above the surface. You don't want press the covering into the wood. Using an iron sock will reduce scratches.

- Genuine Ultracote covering.
- (White HANU870, True Red HANU866, Midnight Blue HANU885, Silver HANU881)



At 200-220°F (93-104°C) the adhesive on UltraCote® becomes active allowing the covering to be attached to the model. While 220° will fully bond the covering to the model it is well below the temperature that causes UltraCote® to shrink.

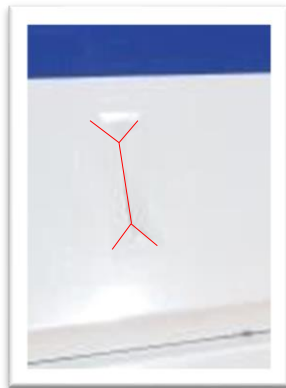
At 300°F (149°C) the initial shrinking of UltraCote® begins.

At 350°F (176°C) UltraCote® reaches its maximum shrinking point. Raising the temperature above this point will not cause further shrinkage.

Use as little heat as needed. Using too much heat may cause reshinking issues later.

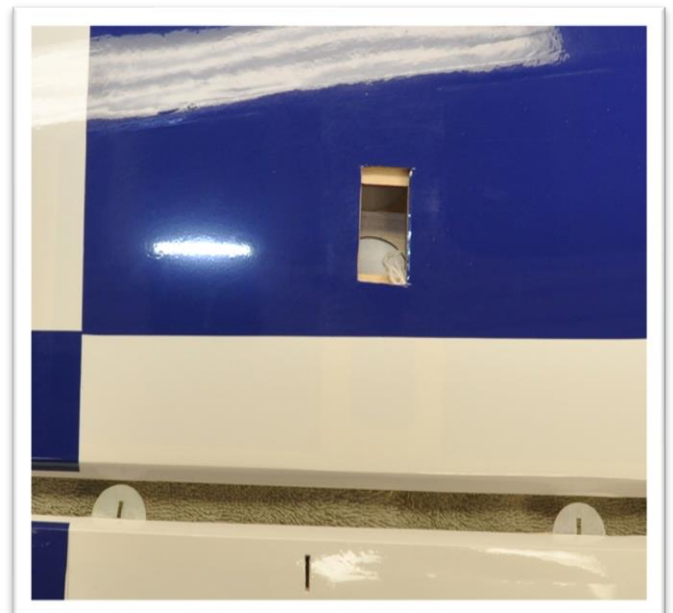
Wings

Carefully locate the aileron servo pocket. Shining a light through opposite side of the wing will help highlight the pocket location. Use a new hobby knife blade to cut through the covering. Cut from the corners of the pocket towards the center of the pocket so the covering can be folded in.



Gently snap off the servo wire installation string (if it's attached) and temporarily secure it out of the way. Do not pull it out of the wing!

Use an iron to seal around the servo pocket. Fold the cut covering under the wing sheeting and attach it to the inside edge of the pocket.



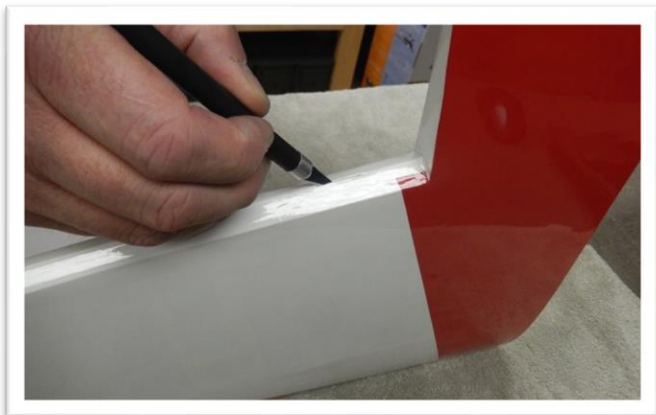
Carefully locate the aileron control horn slots. Use a covering iron to bond the covering in the area the control horn will sit. Trim the covering away to expose the slots. Be sure not to cut through to the top side covering.



The hinges should already be glued into the ailerons. Give each of them a little pull to ensure they are securely attached. It's better to find a loose hinge now rather than during a flight.



The wings are already slotted for the hinges. Use a covering iron to secure the covering along the edge of the wings and ailerons. Look at the wing hinge slots closely. Make sure the covering will not interfere when gluing the hinges. Cut away any covering that covers the hinge slot.



Slip each of the aileron hinges into the wing. Align the end of the aileron to the wing tip.



Push the aileron tight against the wing closing the gap between the two of them. Move the aileron to its maximum desired deflection. (About 15°) Notice how the hinges may pull out slightly. Experiment with the hinge position finding the best fit before gluing.



Apply a piece of tape next to each hinge. This will help you locate the hinges when you begin gluing them.



Check the aileron position at the hinges and wing tip again before gluing.

Start with the hinge near the wing tip. Flex the aileron slightly and apply a few drops of thin CA glue to one side. Flex the aileron to its maximum desired position. Then glue the opposite side.



Close the gap between the aileron and wing to the desired position at the fuselage end of the wing half. Flex the aileron slightly and apply a few drops of thin CA glue to both sides of the hinge. Again move the aileron back and forth to check its position. Once the end hinges are securely positioned you can apply a few drops of thin CA to both sides of the remaining hinges.



Use the control horns from the "Wings" part bag.



Use sand paper to roughen the lower portion of the control horns on both sides. This will help the epoxy bond to the control horn parts.



Test fit the control horn in the slot. Trim or file the slot as needed to achieve a snug fit.



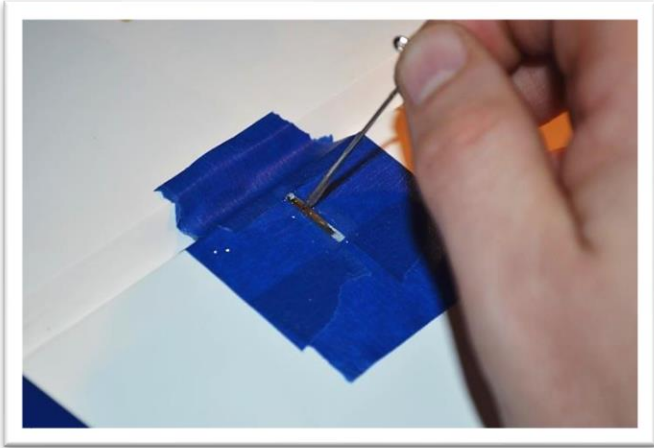
The control horn should go in all the way in until the shoulder contacts the aileron. The linkage hole in the control horn should be aligned with the hinge centerline.



With the control horn in position apply masking tape around it. This will help keep excess epoxy off the covering.



Apply epoxy to the slot in the aileron. Use a pin to help push the epoxy in.



Apply epoxy to the control horn and insert it into the slot. Wipe away excess epoxy using a paper towel and denatured alcohol.

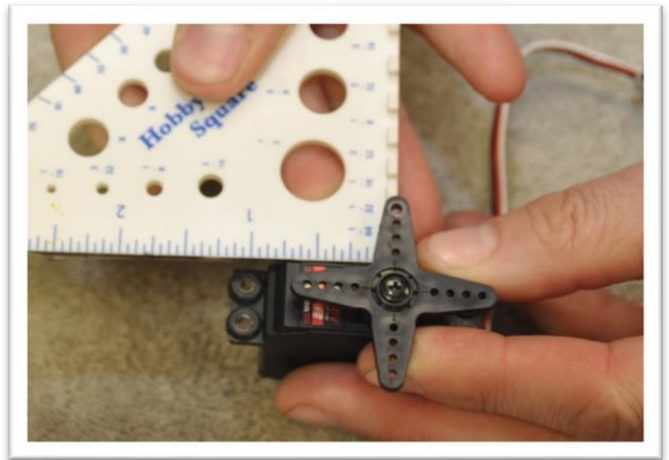


Check the alignment along the hinge line as you did when you test fit the control horn. Reposition as needed.



Allow the epoxy to partially cure. Peel away the masking tape after the epoxy is securely holding the control horn in place and still soft enough to easily remove the tape. Set the wing aside and let the epoxy fully cure.

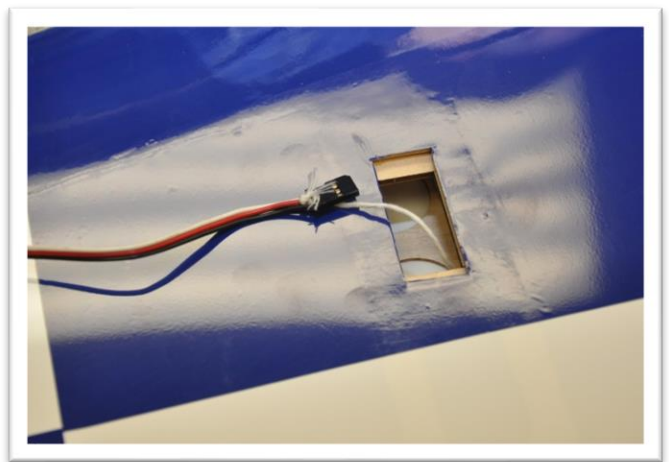
Connect the servo to a receiver and power supply. Turn on your transmitter. Set trim and sub trim to zero. Install a servo arm on the servo about perpendicular to the servo's side. Use the transmitter's sub trim to make it exactly perpendicular to the side of the servo.



Attach a servo extension and a safety clip to the servo.



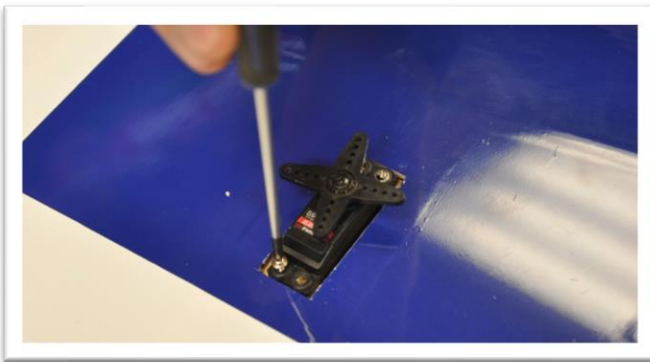
Attach the servo wire to the installation string and gently pull the wire through the wing as you insert the servo into the wing.



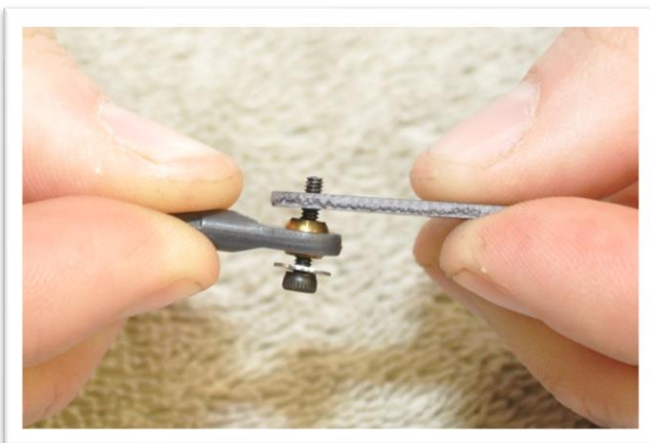
With the servo installed mark the mounting hole locations. Pre-drill for servo mounting screws using a 1/16" drill. Install the servo with the wood screws that came with your servos. Remove the screws and servo. Apply a drop of thin CA glue into each mounting screw hole. This will harden the wood around the screws and provide a more secure installation. (Allow the CA glue to dry before reinstalling the servo.)



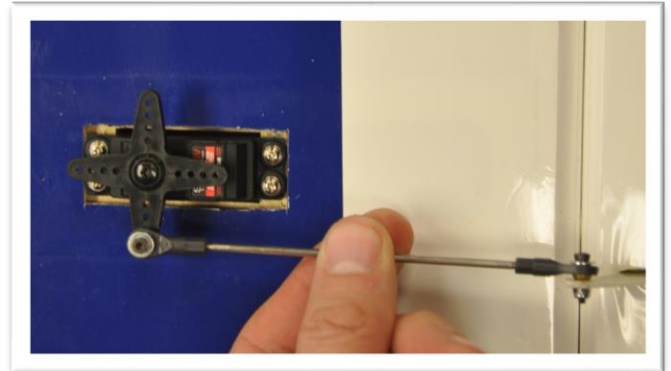
Reinstall the servo.



Assemble a ball link to each end of a connecting rod. Connect a ball link to a servo horn and the aileron control horn. Use a socket head screw, a flat washer and a nylon lock nut. (The brass ball in the link is offset. The larger reveal side should be against the control horn as shown below.)



Check the length of the assembly to the servo with the aileron level with the wing. Once the correct length of the assembly is found connect the servo arm to the servo. (Always adjust the connecting rod length with the servo powered up and centered.)

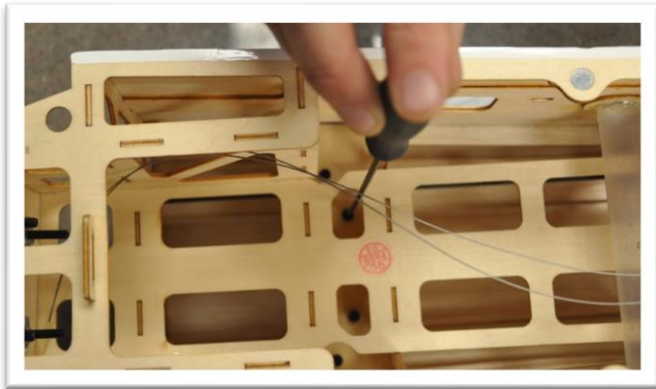


Landing Gear

Landing gear parts bag contents are shown below.



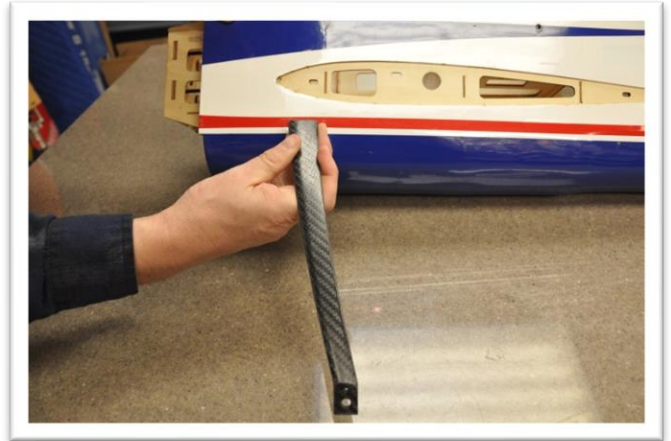
The landing gear screws are supplied installed in the fuselage. Remove these screws.



Carefully locate the landing gear slot in the side of the fuselage just below the leading edge of the wing pocket. Use a covering iron to attach the covering around the slot. Make a single cut in the center of the slot the width of the landing gear.



Slip the landing gear through the slot. Notice that there are right and left hand parts. The landing gear should be swept back.



Use 4 flat washers from the parts bag with the screws removed earlier to attach the landing gear. Add a drop of removable thread locker to the screws during assembly.



(A magnet makes installing the screw much easier.)



File a flat on the wheel axels perpendicular to the axel wrench flats.

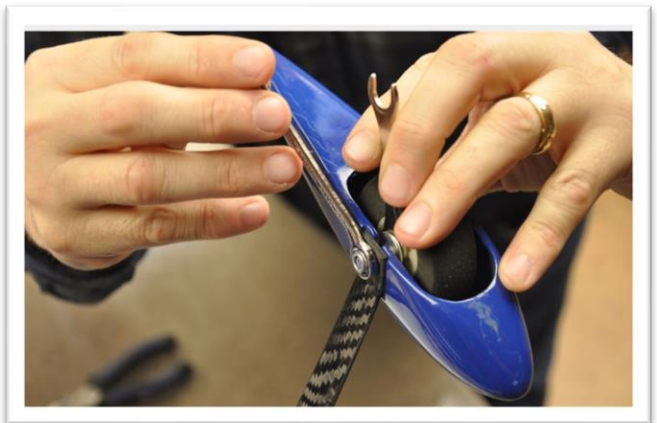


Install a wheel on the axel with a wheel collar. Position the collar set screw over the flat you filed.



(You may prefer to install the wheels and wheel pants later as a final assembly step. They may get in the way when handling the fuselage during assembly.)

Insert the wheel and axel into the wheel pant, then into landing gear. Align the wheel pant indentation with the landing gear. Add a nylon lock nut and tighten.

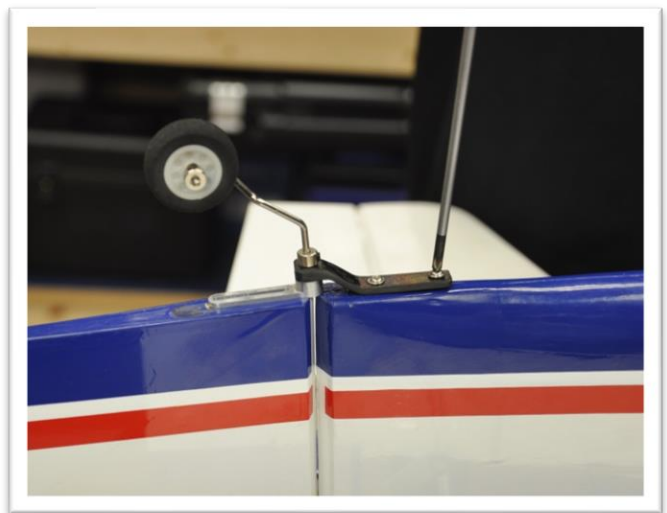


Predrill a 5/64" hole into the wheel pant then add a wood screw to secure the wheel pants.



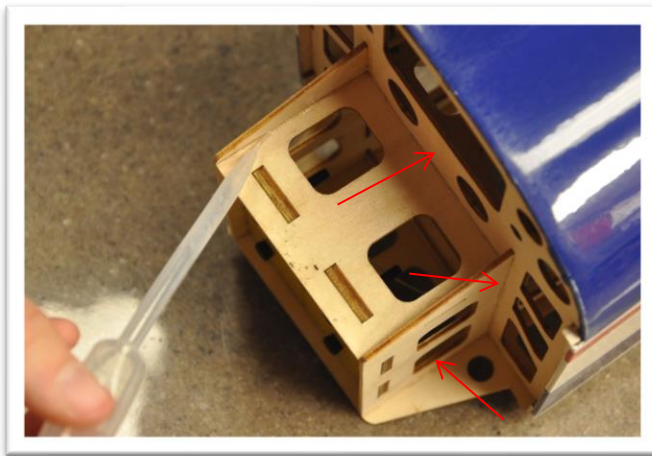
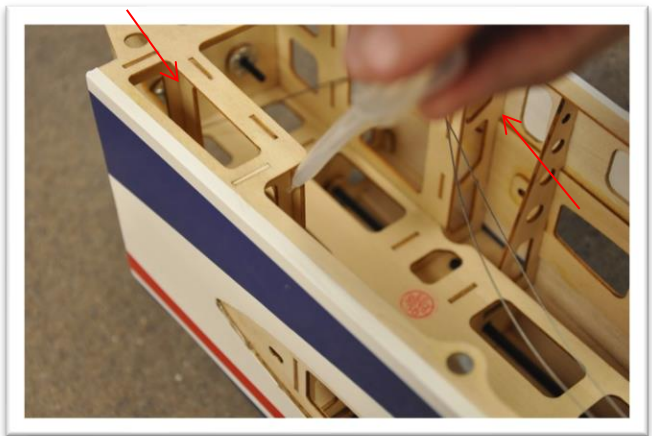
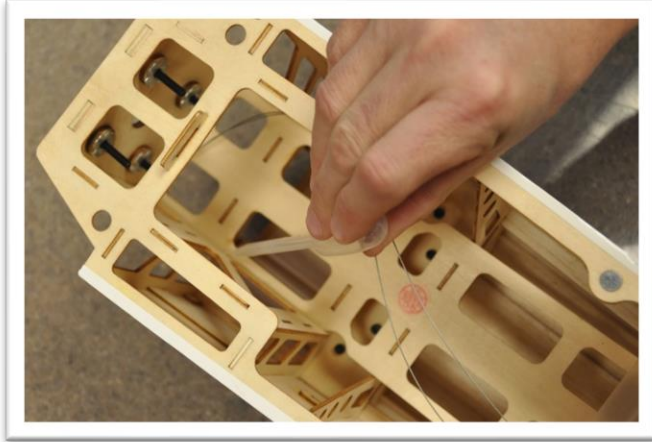
Install the tail wheel after the rudder installation.

Install the tailwheel using 3 wood screws. Position the joint of the tail wheel assembly directly over the rudder hinge line and mark the position of the screws. Turn the screws into the fuselage and rudder. Remove the screws, add a drop of thin CA glue to each hole to strengthen the wood, and reinstall the screws. (Do not fully tighten the tiller arm screw. The slot in the tiller arm allows the screw move accounting for any misalignment between the assembly & rudder.)



Fuselage

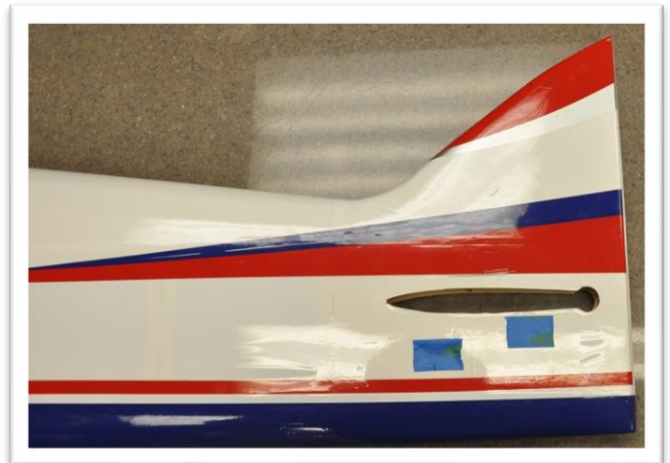
Inspect the fuselage for any interior joints that may have loosened as a result of shipping & handling. Apply thin CA glue as needed. Apply thin CA glue around the joints of the fuselage core, firewall, fuselage formers, and rudder servo tray to strengthen.



Carefully locate the horizontal stabilizer pocket. Use an iron to seal the covering around the edges of the pocket before trimming. Use a new hobby knife blade to cut through the covering.



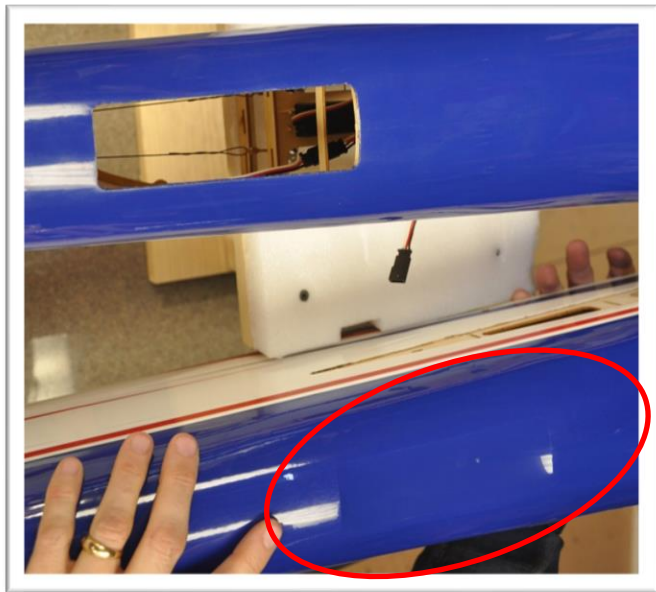
Review the servo configurations as described on page 3 before cutting the covering over the servo pockets. There are 2 servo pockets below the horizontal stabilizer slot on both sides of the fuselage (highlighted with tape). The front pocket will be used for the elevator servo. The pocket near the tail of the fuselage on the opposite side will be for a rudder servo if you decide to use the push-pull configuration.



Use an iron to seal the covering around the edges of the pocket before cutting. Cut the covering then fold it into the pocket and attach it with an iron. If you choose to use a push-pull rudder servo cut open the back pocket on the opposite side.



Use a covering iron to attach the covering around the opening in the bottom of the fuselage. Use a new hobby knife blade to cut the covering from the opening.



Elevator

The elevator hinges should already be glued in. Give each of them a little pull to ensure they are securely attached.

The jointer plate between the elevator halves are also already glued in place. *(Earlier versions of the airplane only had one elevator half glued to the jointer plate. Please check that both halves are securely glued before assembly with the horizontal stabilizer.)*

Install a control horn in the elevator using the same procedure used when assembling the ailerons. (If you cut open the servo pocket in the left of the fuselage make sure you are working with the left elevator half.)

- Use a covering iron to bond the covering in the area the control horn will sit.
- Trim the covering away to expose the slot.
- Sand the lower portion of the control horn.
- Test fit the control horn. The shoulder contacts the elevator and the linkage hole should be aligned with the hinge centerline.
- Mask around slot.
- Glue with 30 minute epoxy.
- Remove masking tape.



Slide the elevator through the fuselage.

Slide the horizontal stabilizer through the fuselage pushing it all the way forward. (Do not glue it in at this point.)



Insert all elevator hinges into the horizontal stabilizer. Align the end of the elevators to the end of the stabilizer. Push the elevator tight against the stabilizer closing the gap. Move the elevator to its maximum desired deflection (About 15°). Experiment with the hinge position finding the best fit before gluing.

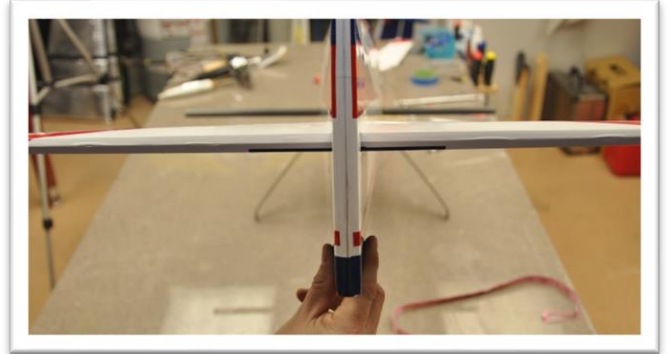
- Apply a piece of tape next to each hinge to identify its location.
- Check the elevator position at the hinges and wing tip.
- Flex the elevator slightly and apply a few drops of thin CA glue to the end hinges on both elevator halves.
- Flex the elevator and recheck its position.
- Add a few drops of CA glue to the remaining hinges.
- Add a few drops of CA glue to the opposite sides of the hinges.



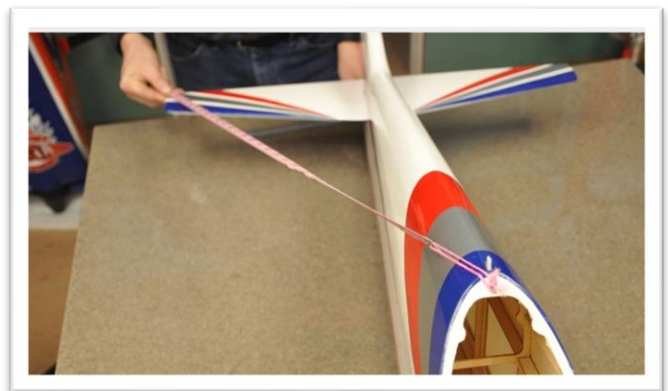
Center the stabilizer side to side using a ruler or tape measure. *(The elevator is not shown but should already be installed.)*

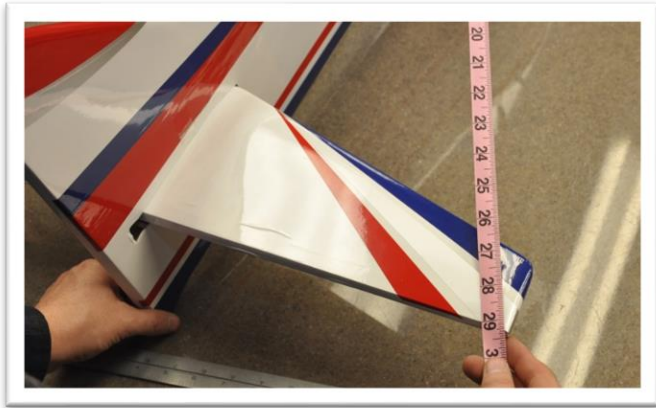


Install and center the main wing tube. Look at the plane from the back forward to make sure that the horizontal stabilizer is parallel with the wing tube. Notice that the horizontal stabilizer is tapered which may obscure the actual alignment. If the stabilizer is not aligned use shims or sand inside the pocket until it's parallel. *(The elevator is not shown but should already be installed.)*



Position the stabilizer perpendicular to the fuselage and parallel to the main wing tube. Measure the distance between the canopy latch and the corners of the horizontal stabilizer. Adjust the stabilizer until the measurements on both sides are equal. Continue checking the stabilizer to ensure it is still centered side to side as previously described. Extra time spent here will go a long way to improve the flight characteristics of your airplane. *(The elevator is not shown but should already be installed.)*





Once the horizontal stabilizer is positioned glue it in place with thin CA glue. Wick glue in on left and right sides, top and bottom. The use of an applicator tip is suggested to control the flow of thin CA glue and get it exactly where you want it. *(The elevator is not shown but should already be installed.)*



Install the elevator servo using the same procedure used when assembling the ailerons.

Connect the servo to a receiver and power supply. Turn on your transmitter. Set trim and sub trim to zero. Install a servo arm on the servo about perpendicular to the servo's side. Use the transmitter's sub trim to make it exactly perpendicular to the side of the servo.



Attach a servo extension onto the elevator servo lead and use a safety clip to secure the connection.



Install the servo into the fuselage and pre-drill for servo mounting screws using a 1/16" drill. Install the servo with the wood screws that came with your servos. Remove the screws and servo. Apply a drop of thin CA glue into each mounting screw hole. This will harden the wood around the screws and provide a more secure installation. *(Allow the CA glue to dry before reinstalling the servo.)*

Assemble a ball link to each end of a connecting rod. Connect a ball link to a servo horn and the elevator control horn. Use a socket head screw, a flat washer and a nylon lock nut. Check the length of the assembly to the servo arm with the elevator level with the stabilizer. Once the correct length of the assembly is found connect it to the servo arm using the provided machine screws washer and lock nut. *(Turn on the transmitter, receiver and servo while making adjusting to the connecting rod. This will keep the servo in its correct position.)*

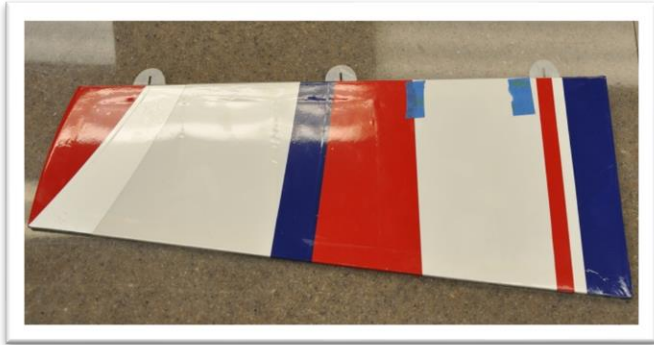


Rudder

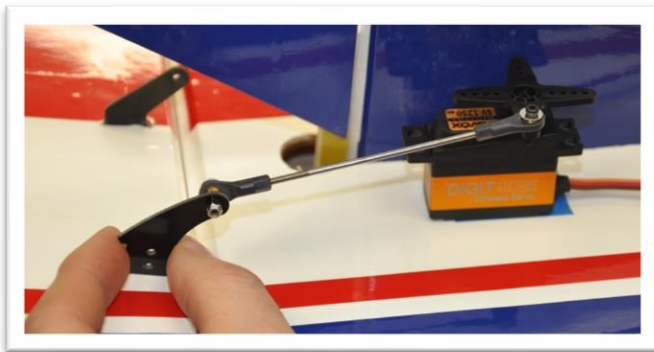
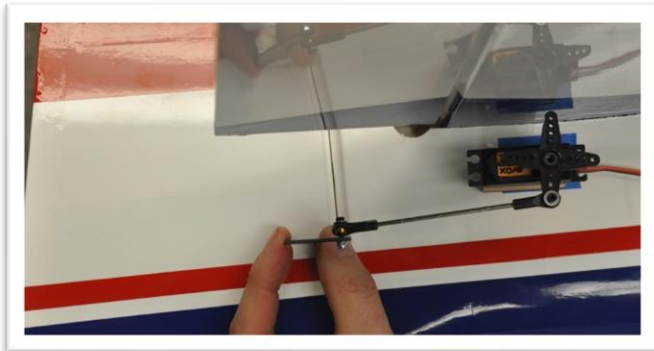
The rudder control can be configured as a push-pull system or as a pull-pull cable system. See the configuration options listed on page 3.

Push-Pull Rudder Control

The rudder is built with control horn slots for the push-pull control system and the pull-pull control system. The blue masking tape indicates the control horn locations. The push-pull control horn slots are located near the bottom of the rudder.



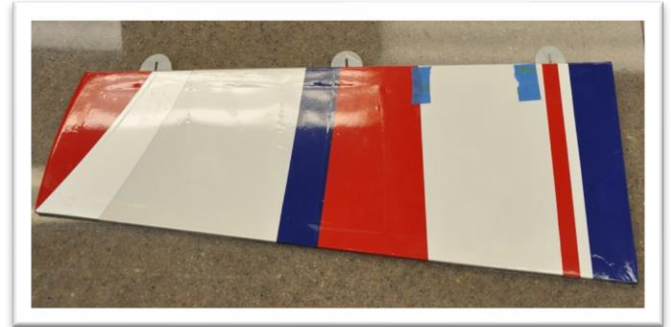
The pictures below show a mockup of the rudder push-pull system. The installation process of the servo and control horn is the same as the ailerons and the elevator.



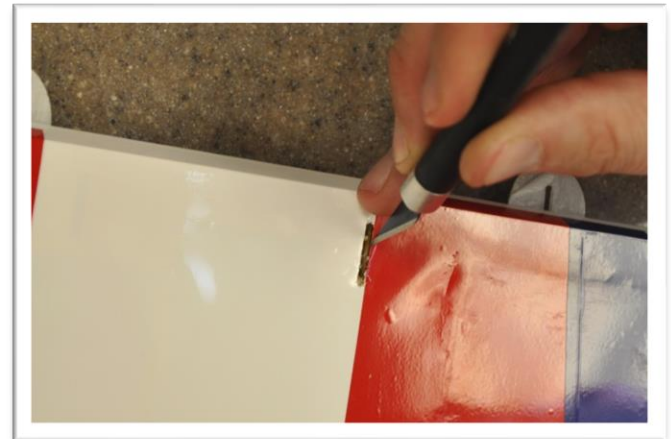
The pull-pull cables can be removed and the covering will need to be patched with covering.

Pull-Pull Rudder Control

The rudder is built with control horn slots for the push-pull control system and the pull-pull control system. The blue masking tape indicates the control horn locations. The pull-pull control horn slots are located higher up on the rudder.



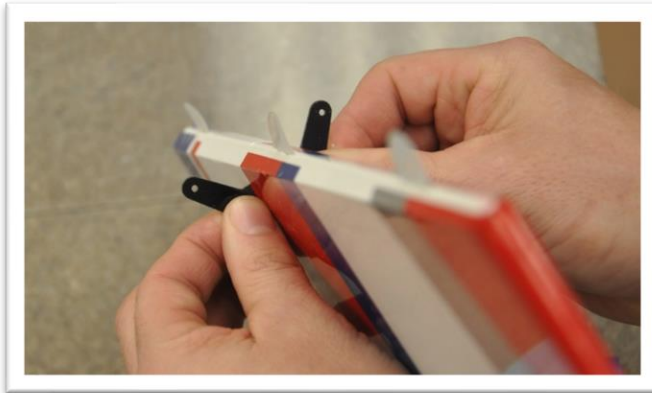
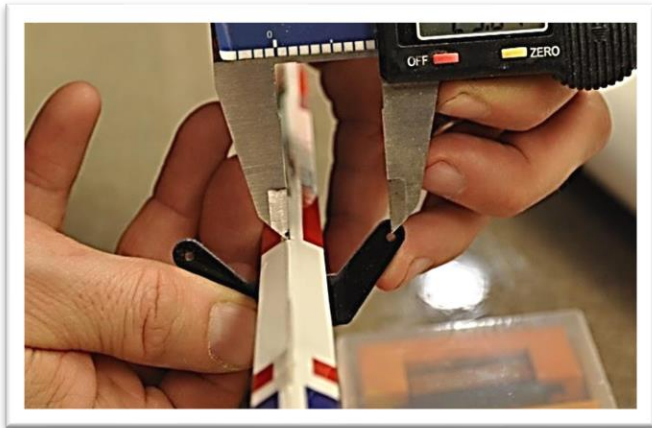
Cut the rudder covering to expose the control horn slots on both sides of the rudder.



Use sand paper to roughen up the center of the control horn so the epoxy will adhere better.



Tests fit the control horn to the slot. Use a file to modify the slot as needed. Center it side to side and align the holes with the hinge line. The control horn should be symmetrical about the hinge line.



Apply masking tape around the control horn slot on both sides of the rudder.

Use 30 minute epoxy to glue the control horns in place. Check the alignment, peel the masking tape away, and clean up with alcohol.

Check the alignment again and set aside for the epoxy to cure. (When setting aside to dry position the rudder and control horn so gravity does not reposition the control horn for you.)

The hinges should already be glued into the rudder. Give each of them a little pull to ensure they are securely attached.

The vertical stabilizer is already slotted for the hinges. Use a covering iron to secure the covering along the edge of the rudder and stabilizer. Look at the vertical stabilizer hinge slots closely. Make sure the covering will not interfere when gluing the hinges. Cut away any covering that covers the hinge slot.



Slip each rudder hinges into a slot. Align the end of the rudder with the top of the vertical stabilizer.

Push the rudder tight against the stabilizer closing the gap between the two of them. Move the rudder to its maximum desired deflection. (About 15°) Notice how the hinges may pull out slightly. Experiment with the hinge position finding the best fit before gluing.



Apply a piece of tape next to each hinge. This will help you locate the hinges when you begin gluing them.

Start with the top hinge. Flex the rudder slightly and apply a few drops of thin CA glue to one side. Flex the rudder to its maximum desired position. Then glue the opposite side.

Close the gap to the desired position. Flex the rudder slightly and apply a few drops of thin CA glue the bottom hinge. Again move the rudder back and forth to check its position. Once the end hinges are securely positioned you can apply a few drops of thin CA glue to both sides of the center hinge.



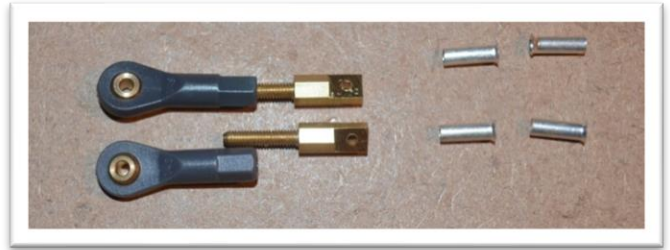
Connect the servo to a receiver and power supply. Turn on your transmitter. Set trim and sub trim to zero. Install a servo arm on the servo about perpendicular to the servo's side. Use the transmitter's sub trim to make it exactly perpendicular to the side of the servo.



Install the rudder servo into the fuselage and pre-drill for servo mounting screws using a 1/16" drill. Install the servo with the wood screws that came with your servos. Remove the screws and servo. Apply a drop of thin CA glue into each mounting screw hole. This will harden the wood around the screws and provide a more secure installation. (Allow the CA glue to dry before reinstalling the servo.)



Tread the brass cable eyes about half way into the ball links.



Start the cable assembly at the servo end inside the fuselage. Thread on 2 crush sleeves and the brass cable eye.



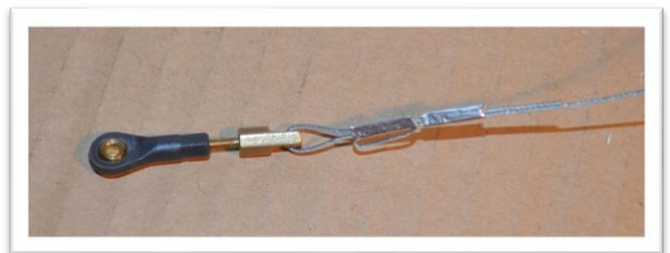
Loop around the cable eye and go back through a crush sleeve.



Loop around the crush sleeve and back through the sleeve again. Slide the second sleeve over the tail.



Adjust the loops and crimp the sleeves with the non-serrated surface of standard pliers.



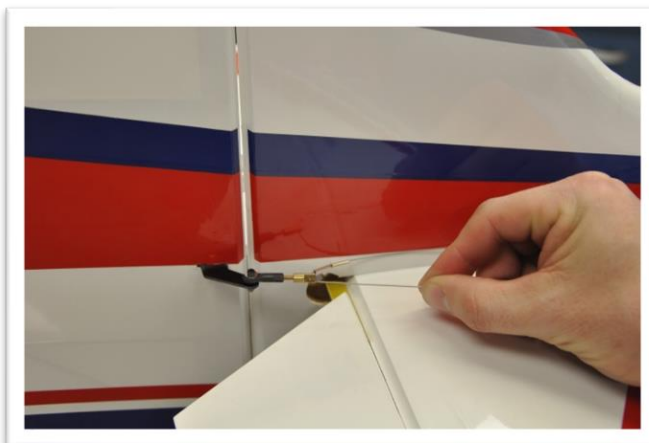
Pull the slack out of the cables and make sure the cables cross once inside the fuselage. Connect the ball links to the rudder control horn at 1.77" (45mm) between holes.



(A 45mm hole spacing matches the rudder control horn.)



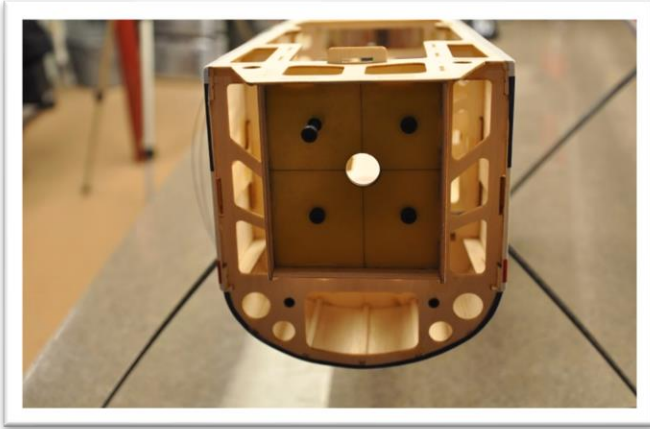
Center the rudder in position aligned to the vertical stabilizer. Clamp a couple of balsa sticks across the rudder hinge to keep it centered. Repeat the cable eye installation process on the rudder end of the cables with the servo powered up and centered. Pull the cable snug. You don't need to make the cable guitar string tight.



Remove the clamps and adjust the cable lengths to center the rudder by turning the cable eyes into the ball links.

Electric Motor

The firewall is pre-assembled with thread inserts installed on a 58mm diameter bolt circle (41mm X 41mm sq).



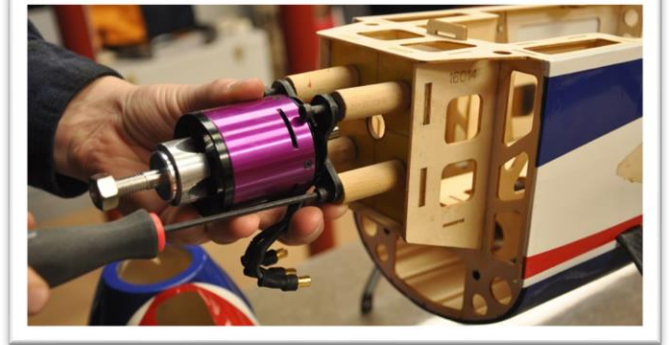
The cowl length is 4 5/16" (109.5mm) from the firewall.



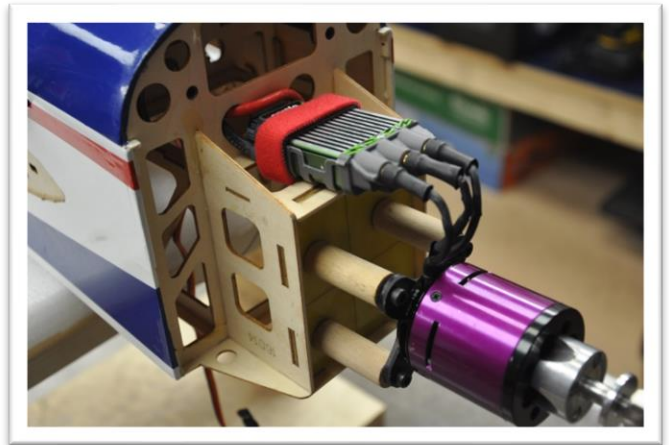
Use the supplied motor standoffs to mount your motor's prop backer plate at least 4.375" (111mm) away from the firewall. (If you need to shorten the supplied standoffs make sure they all end up the same length so you do not introduce changes to the motor thrust angle.)



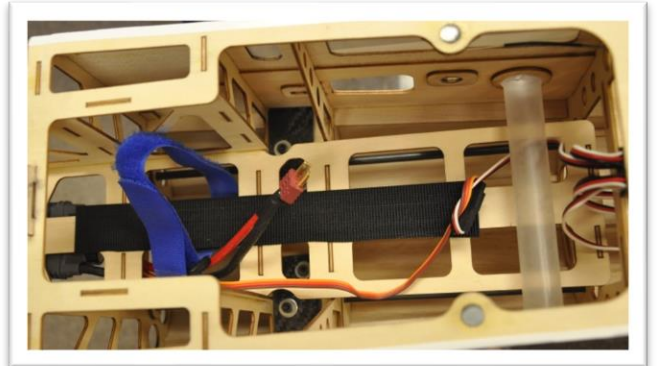
Use removable thread locker when installing the motor bolts.



Use nylon zip ties or a hook & loop strap to secure the ESC to the bottom of the motor box. We recommend putting a small piece of foam between the ESC and motor box to dampen vibrations.



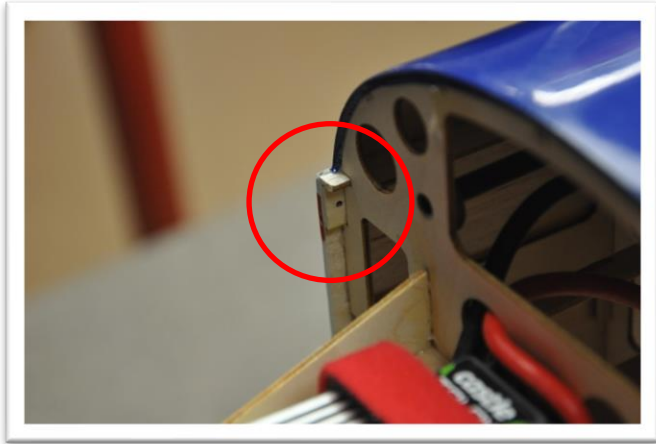
Place hook & loop tape to the battery tray and the battery. Loop hook & loop straps around the battery.



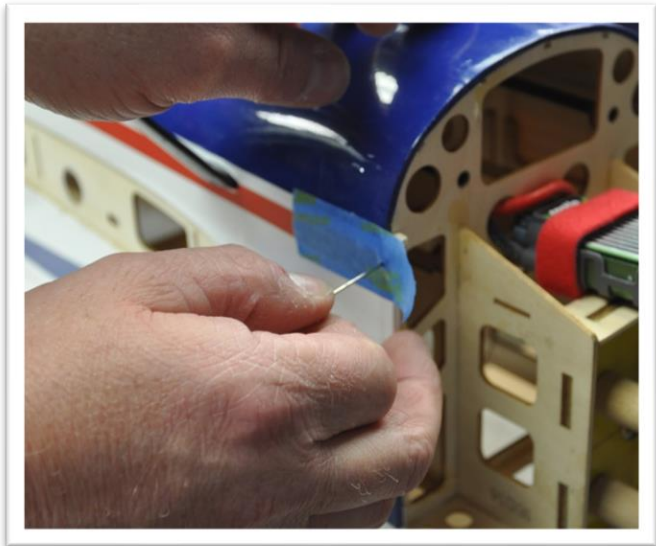
Cowl & Canopy

Install the canopy on to the fuselage.

The cowl will be mounted using 4 wood screws through 4 holes in the side of the fuselage just in front of the firewall.



Place tape over the holes and past the front of the firewall. Use a pin to poke through the tape and covering locating the mounting hole. Peel the tape back away from each hole but leave it attached to the fuselage.



Position the cowl onto the fuselage.



Align the motor shaft with the center of the cowl. (Use the spinner's back plate to help you center the cowl.)

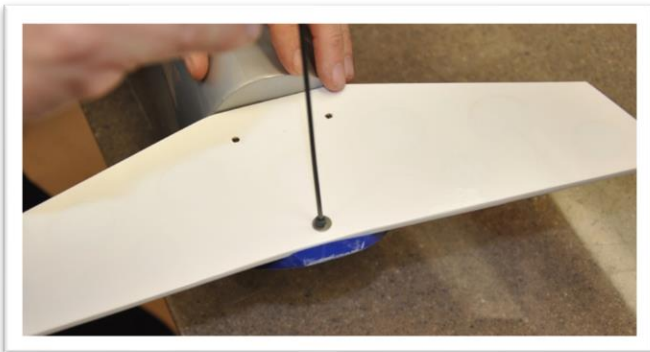


Tape the cowl on in its final position. Transfer the hole in the tape to the cowl with a pin. Use a 1/16" drill bit to enlarge the hole in the cowl. Use 4 wood screws through these holes to mount the cowl.





Assemble the T-Canaliser to the canopy using a machine screw and washer in the back hole.



Finish the assembly by installing the T-Canaliser cover with 2 more machine screws.



You may eliminate the T-Canaliser by installing the supplied filler plate instead.



Radio Installation & Setup

Take the time to properly balance and trim your aircraft.

Use the suggested throws below as your starting point then fine tune to your flying preferences after your first few flights.

Your receiver can be mounted anywhere in the airframe. In front of the wing tube works well on this fuselage. A piece of foam rubber should be used between the fuselage and the receiver to dampen any vibration.

Control Throws		
Elevator	10° Up	13° Down
Aileron	12° Up	12° Down
Rudder	15° Left	15° Right

The center of gravity is located 7/16" (11mm) to 7/8" (22mm) behind the wing tube.



You can adjust your CG depending on your flying style.

If you enjoy sport & precision aerobatics you'll want a slightly nose heavy CG.

To test the CG fly left or right at about 3/4 to full throttle and pull to a 45 degree up-line. Roll inverted and let go of the elevator stick. A correct nose heavy CG will slowly arc to the level. A neutral CG should nearly hold the up-line. And a tail heavy CG will steepen the up-line.

While the final setup is of personal preference, these are some general guidelines to make your first flight a success.

Enjoy your new plane!

We at AJ Aircraft sincerely hope you enjoy flying the 62" AJ Acuity.

Feel free to create a support ticket at aj-aircraft.com if you have any problems, questions, or suggestions. Once you get a few flights in, we would greatly appreciate your review submitted to our web site! See you at the field!

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