Assembly Manual / Airframe – 89” Slick

Thank you for purchasing this 3DHobbyShop by Extreme Flight ARF RC aircraft. If you have any issues, questions, concerns or problems during assembly, please contact our tech department at: *Info@extremeflightrc.com* or 770-887-1794 10am-5pm Eastern Monday thru Friday.

SAFETY in Assembly

During assembly of this aircraft, you will be asked to use sharp knives and hobby adhesives. Please follow all safety procedures recommended by the manufacturers of the products you use, and always follow these important guidelines:
ALWAYS protect your eyes when working with adhesives, knives, or tools, especially power tools. Safety glasses are the best way to protect your eyes.
ALWAYS protect your body, especially your hands and fingers when using adhesives, knives, or tools, especially power tools. Do not cut toward exposed skin with hobby knives. Do not place hobby knives on tables or benches where they can roll off or be knocked off.
ALWAYS have a first-aid kit handy when working with adhesives, knives, or tools, especially power tools. ALWAYS keep hobby equipment and supplies out of the reach of children.

SAFETY in Flying

This is NOT a toy! It is a very high-performance RC airplane capable of high speeds and extreme maneuvers. It should only be operated by a competent pilot in a safe area with proper supervision.

- ONLY fly your aircraft in a safe, open area, away from spectators and vehicles and where it is legal to fly. NEVER fly over an unsafe area, such as a road or street.
- NEVER fly near overhead power or utility lines. If your airplane ever becomes stuck in a line or a tree DO NOT attempt to retrieve it yourself. Contact the authorities for assistance in retrieving your aircraft. Power lines are DANGEROUS and falls from ladders and trees CAN KILL!
- Never fly too close to yourself or spectators.
- Spinning propellers are DANGEROUS!
  Never run your motor inside a house or building with the propeller attached Remove the prop for safety. Always fly within your control.
- Always follow manufacturers instructions for your radio system.
- Always preform a pre-flight check of your aircraft to be certain of the aircraft's airworthiness.
- Always obtain proper insurance before flying. Always fly model aircraft in accordance with the Academy of Model Aeronautics (AMA) Safety Code. Visit the AMA's website at **www.modelaircraft.org** for more information.

Limits of Responsibility

Extreme Flight provides high-quality aircraft and components to it's customers and end users. These aircraft and components are assembled by the end user to produce a flying model. It is beyond Extreme Flight's control to monitor the end user's completed aircraft. Therefore, Extreme Flight in no way accepts or assumes responsibility or liability for damages resulting from the end user assembled product. The end user assumes all responsibility and liability in use of Extreme Flight aircraft and components and agreeing to hold harmless Extreme Flight, it's distributors and dealers.

Required Items

Hobby Knife
Small Phillips Screwdriver
Set Metric Allen Wrenches
Scissors
Small Pliers
Wire Cutters
Adjustable wrench
Masking tape
Drill and drill bits
Threadlocker (Blue Loctite)

Optional:
Heat gun and covering iron
Dremel tool

Assembly Instructions – Read completely before starting assembly!

UNPACK :

Unpack your airplane and examine the components. Check for damage of any kind. If you have damage, please contact Extreme Flight to discuss. Contact info listed above.

WRINKLES :

Your airplane was packed in plastic at the factory without any wrinkles in the covering. You may notice some wrinkles now; more likely, you will notice a few in a day or two or the first time you take the plane out to the flying field. These wrinkles are the result of wood shrinkage and/or expansion. Balsa wood changes size and shape slightly as it is exposed to varying humidity in the air. This is a

natural property of balsa wood. As your airplane adjusts to the weather in your part of the world, wrinkles may appear and disappear. Wrinkles may be removed with the gentle application of heat to the covering material on your airplane. The best tools to use are a heat gun and covering iron. Apply the heat gently: the covering material will shrink as you apply the heat, and this will remove the wrinkles. BE CAREFUL! Too much heat applied too quickly can damage the covering, either by causing it to pull away from the wood at seams and corners or even by melting it. The covering will shrink at low temperature with patient application of heat. Wrinkles in the covering DO NOT affect flight performance. If you must shrink on a color-seam, use the iron and go slowly and carefully to avoid any pulling or lifting at the seam.

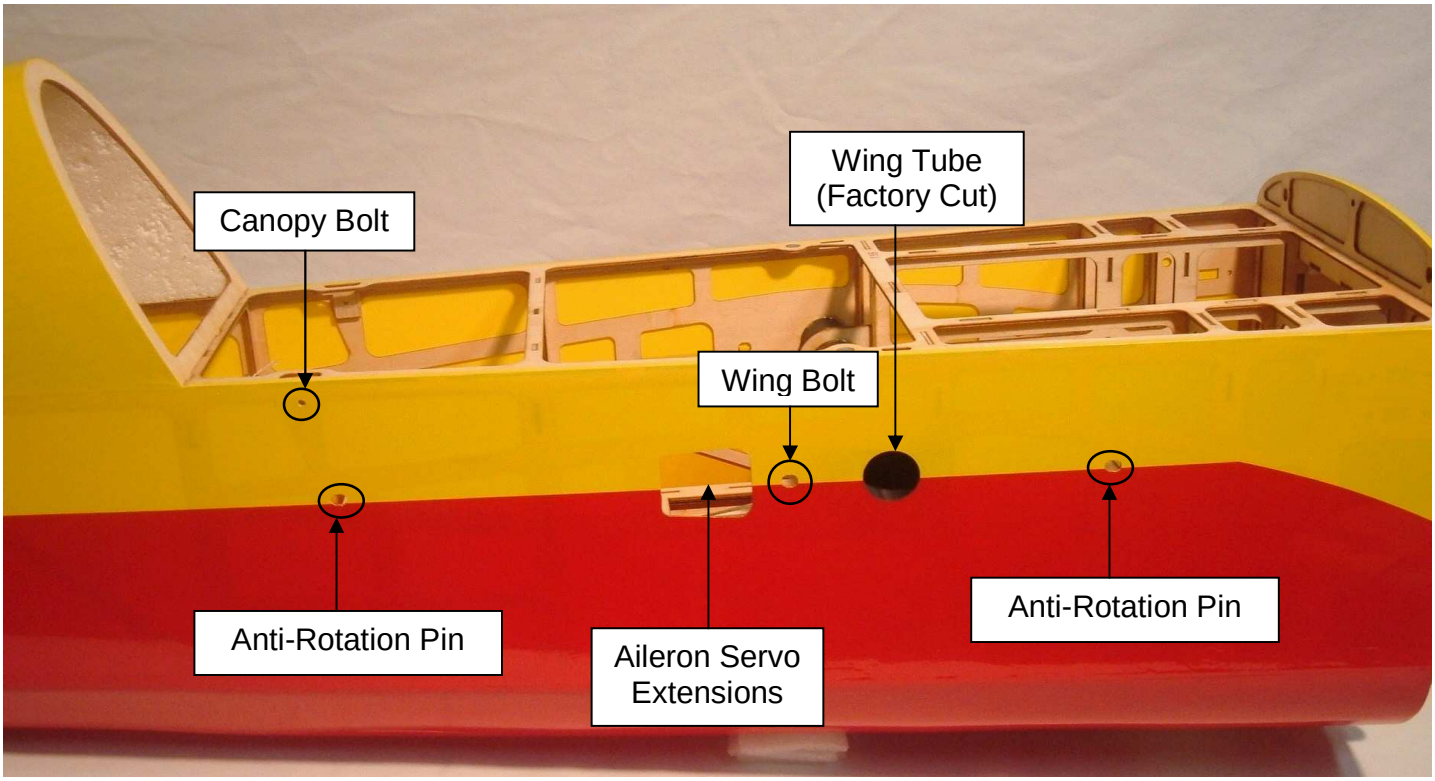
Remove the canopy before attempting to use heat on your covering! The canopy is made of thermo-activated plastic and WILL deform with the application of heat. Do not apply heat to the canopy.

PAINT:

If you need to clean your airplane, we recommend using a damp towel. The paint used on the canopy and cowl is not safe for all cleaners. In particular, DO NOT use alcohol on these parts, it will remove the paint.

Let's get started!

Covering Removal (Fuselage)

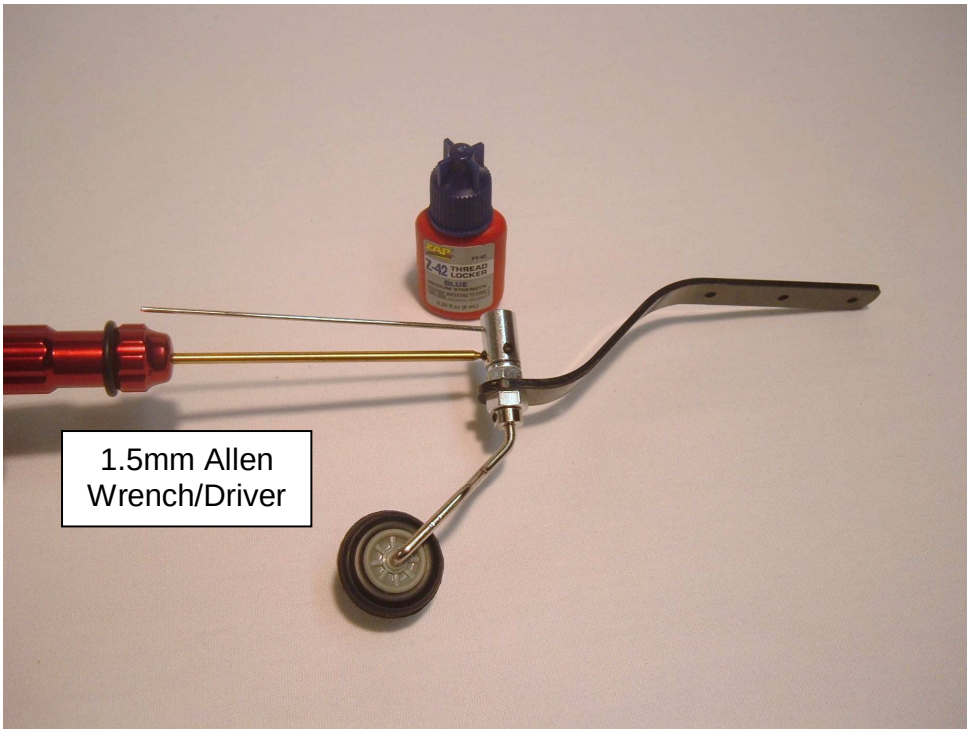


Using a soldering iron or hobby knife, remove covering from forward fuselage areas.
(Pictured above)

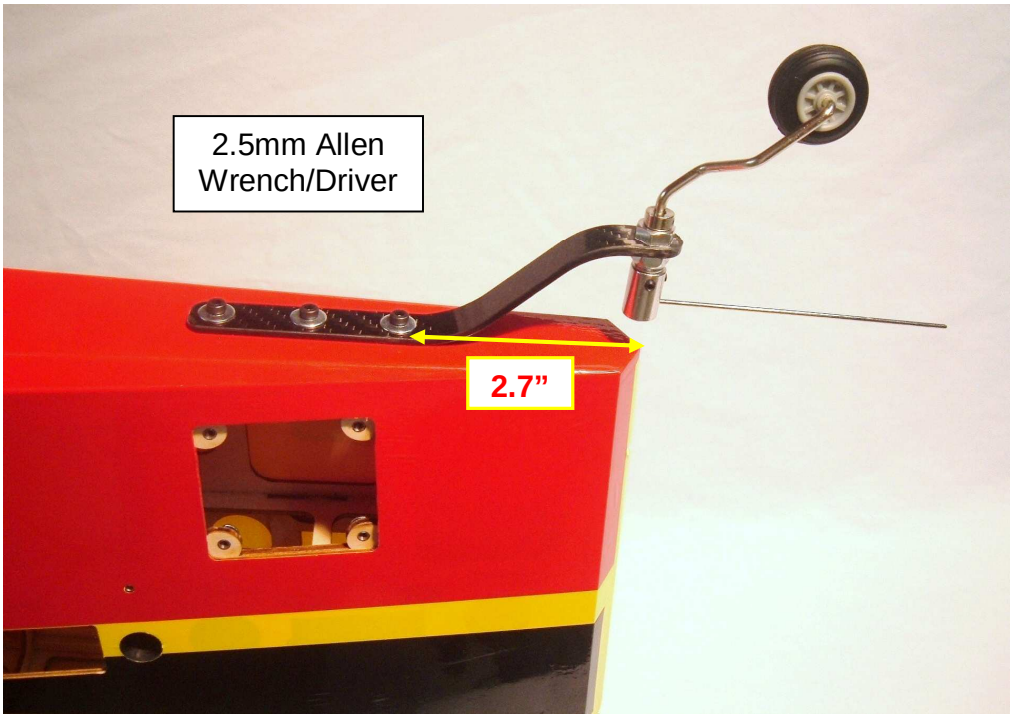
Next remove covering for the horizontal stabilizer bolts, anti-rotation pin and servo wires.
(Left fuselage side pictured above)

Also remove covering over the rear access port as shown. This port can be used to access the guide-string for the elevator servo extensions, and can also be used for maintenance and repairs to the tail-wheel mount. (Tail weight may also be secured here if desired).

Tail Wheel



Remove tail wheel assembly set screws one at a time and re-torque using blue loctite.
(Total of 5 set screws, including wheel retaining collar)



Install tail wheel assembly using 3x-3mm bolts and washers.
Use blue loctite when securing the bolts.

Rudder Hinging

The 89” AJ Slick comes with factory pre-hinged Elevators and Ailerons to save time during your build. The builder is only required to hinge the rudder to the vertical stabilizer. The instructions below detail the use of polyurethane (PU) glue to hinge the rudder. 30 minute epoxy is also acceptable. If you are using a type of specific RC-hinge glue, follow the direction on the hinge glue bottle.

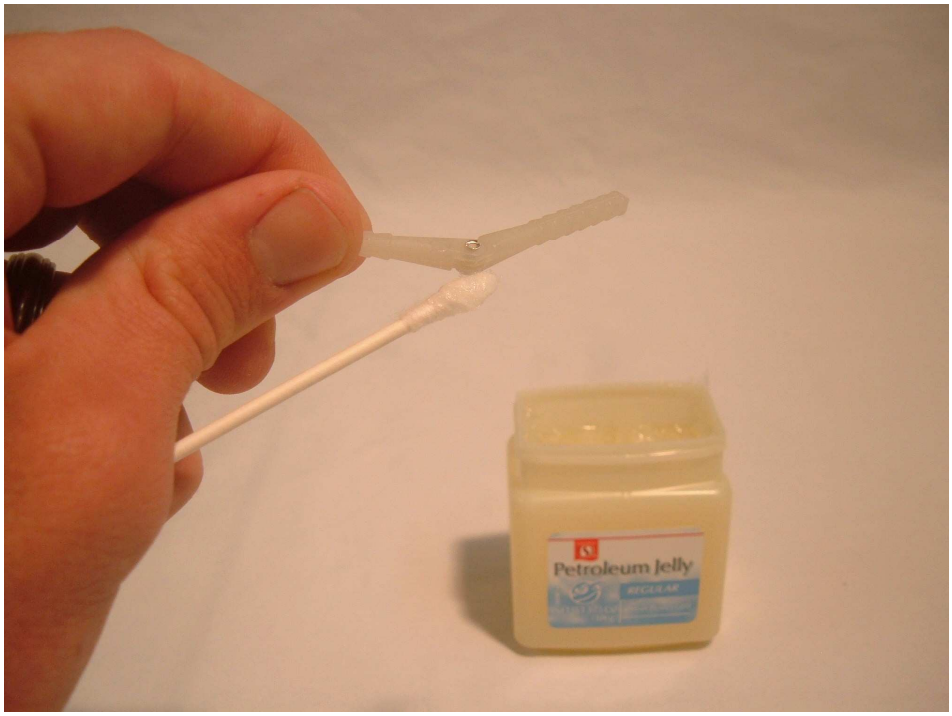
Quick overview for using PU (Polyurethane) glue for hinging:

1) Apply Petroleum Jelly to center hinge joint using cotton swab.
2) Lightly dampen all surfaces to be glued with water.
3) Squeeze a small amount of PU glue into all of the hinge holes.
4) Install hinges.
5) Wipe away excess glue as it expands and foams using rubbing or denatured alcohol. (Glue can expand and foam for the first 5-60 minutes after being set in place)
6) Allow to fully cure for 12hrs or more.

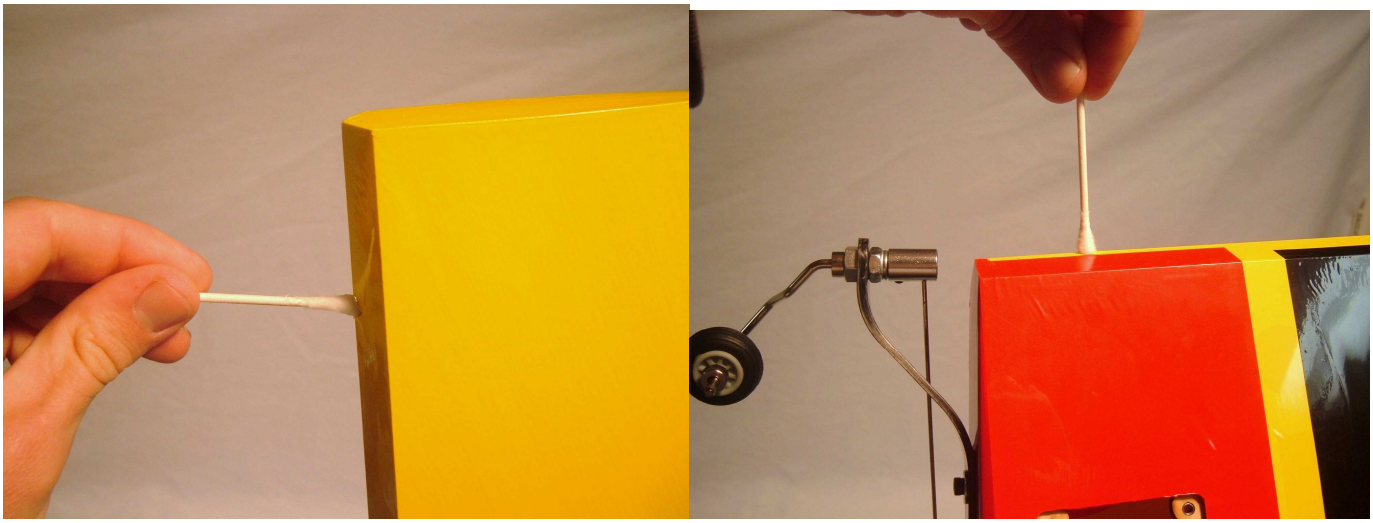
Items required for PU-glue hinge installation:

1) Rubbing/Denatured Alcohol
2) Petroleum Jelly
3) Cotton Swabs
4) Polyurethane Glue. (Gorilla and Sumo work well)
5) Water
6) Paper Towels for cleanup.

Test fit the rudder before starting the gluing process.
Make sure hinge gap is correct and rudder will swing a minimum of 45º both directions.

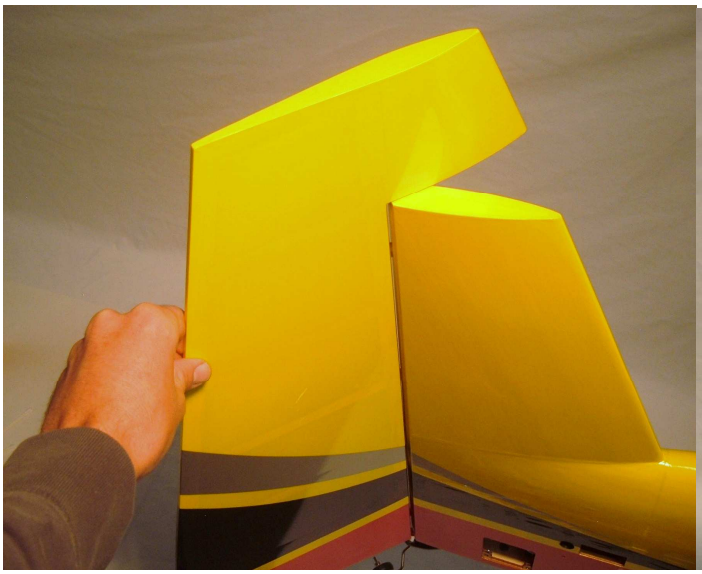


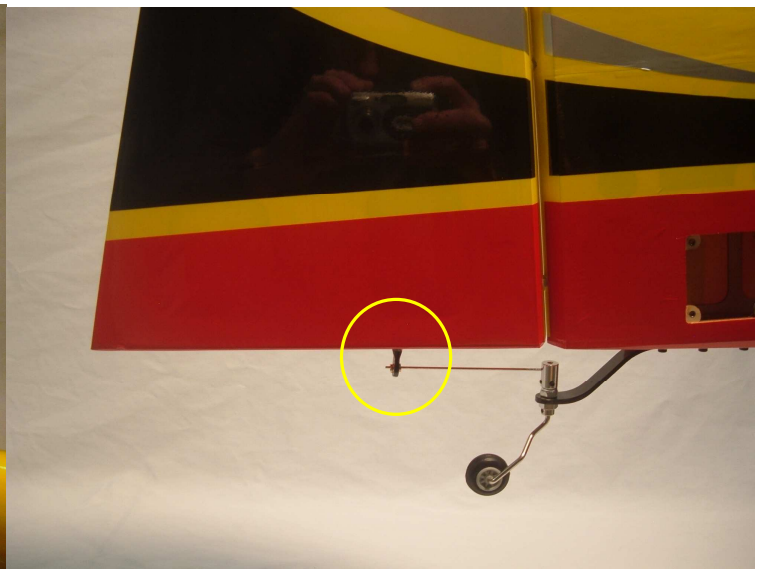
Apply Petroleum Jelly to the center of all hinges.
We prefer Petroleum Jelly to thinner oils as it will not run onto gluing surfaces resulting in a weak bond.



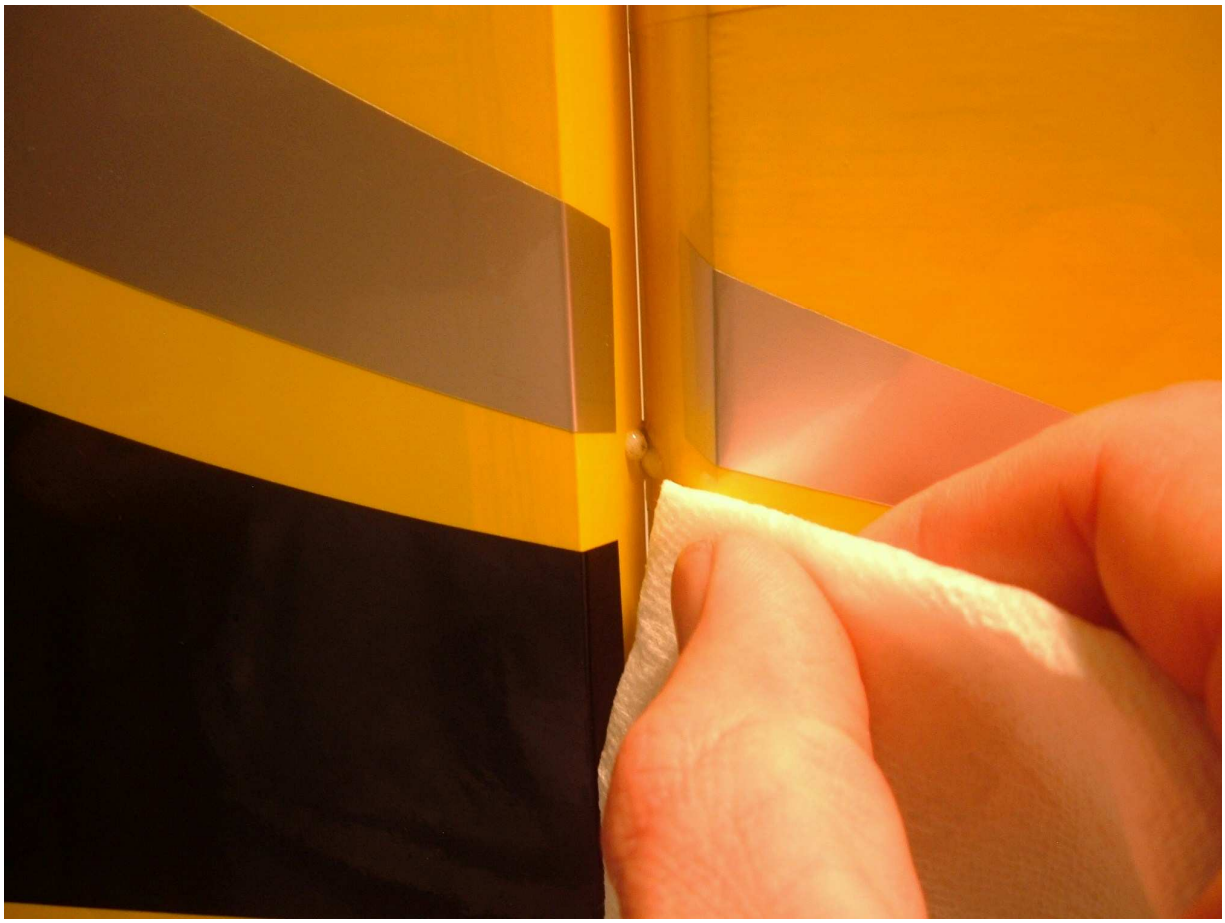
Using a cotton swap apply a small amount of water to all hinge holes.

Apply polyurethane glue to all hinge holes in the rudder and vertical stabilizer.
(Excessive amounts of glue are not required)



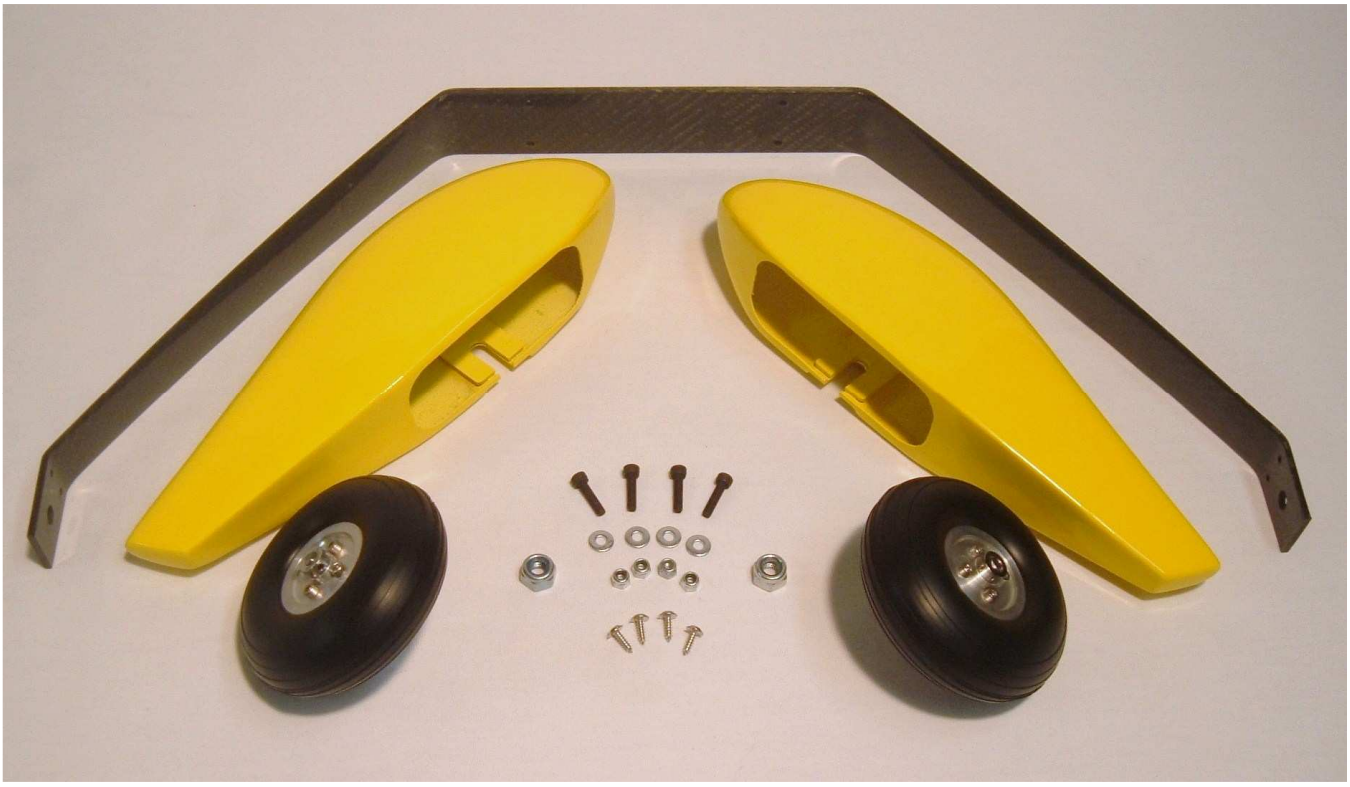


Install rudder as shown. Immediately after installing, flex the rudder a minimum of 45º in each direction to ensure the hinges are properly aligned and to set the correct hinge gap.
Don't forget to install tail wheel tiller wire!



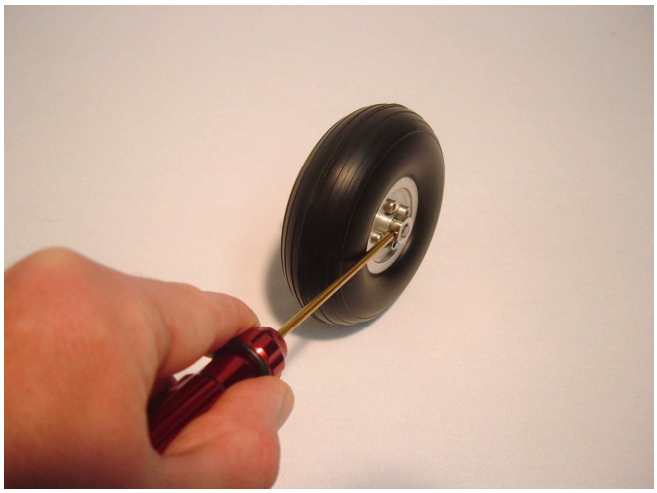
Be prepared to clean foaming PU-Glue from the hinge joints for the first 5-60 minutes
This can be done with rubbing or denatured alcohol and a clean rag or paper towel.

Main Landing Gear

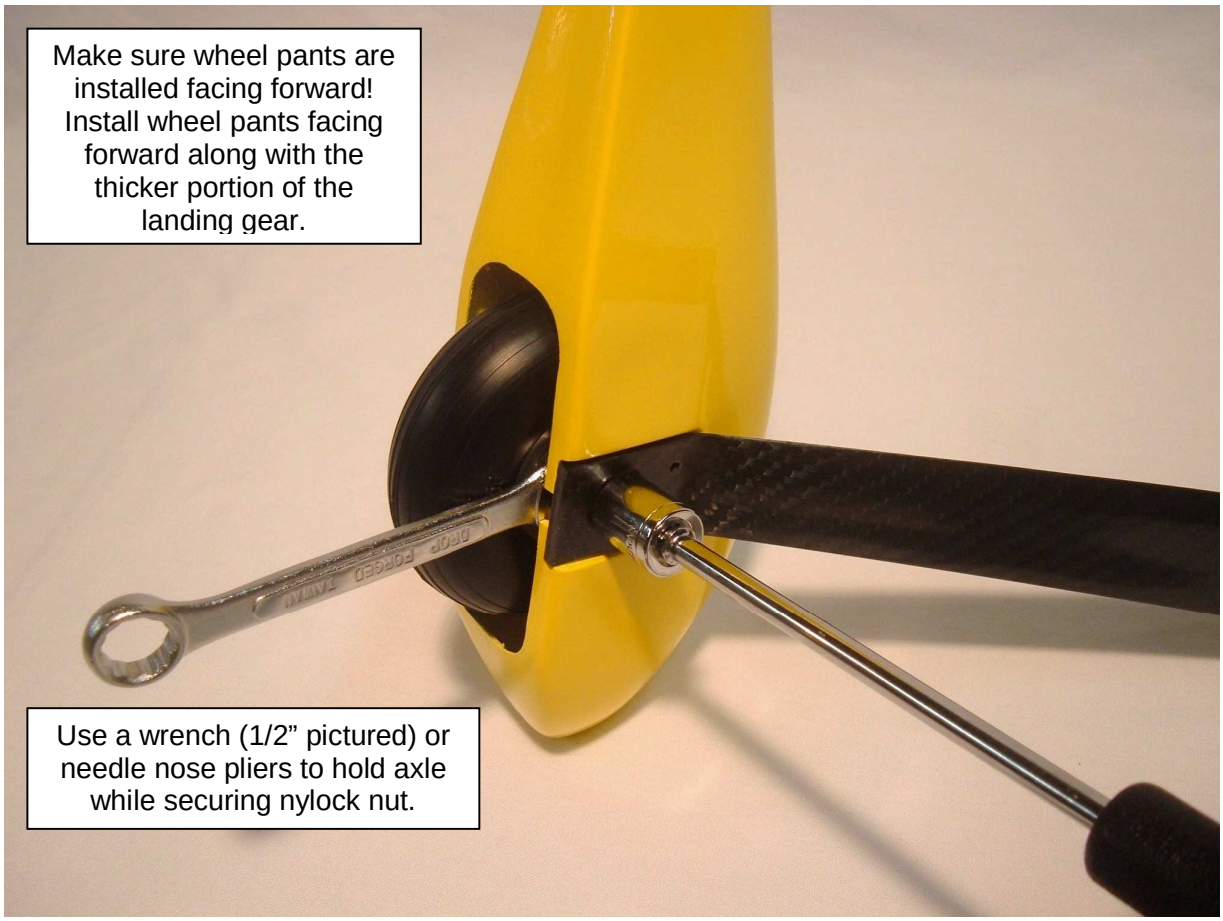


Locate all landing gear parts and hardware.

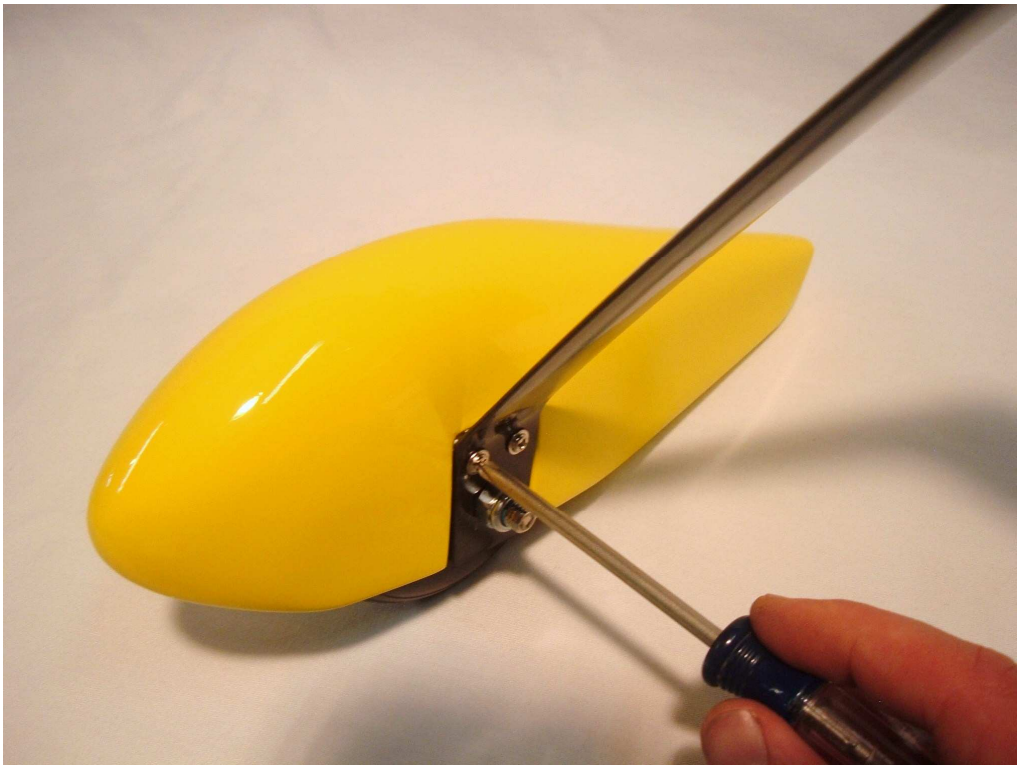
Each axle assembly incorporates two wheel collars. The first is used to prevent the wheel from rubbing on the inner side of the wheel pant, and the second outer collar to secure wheel.



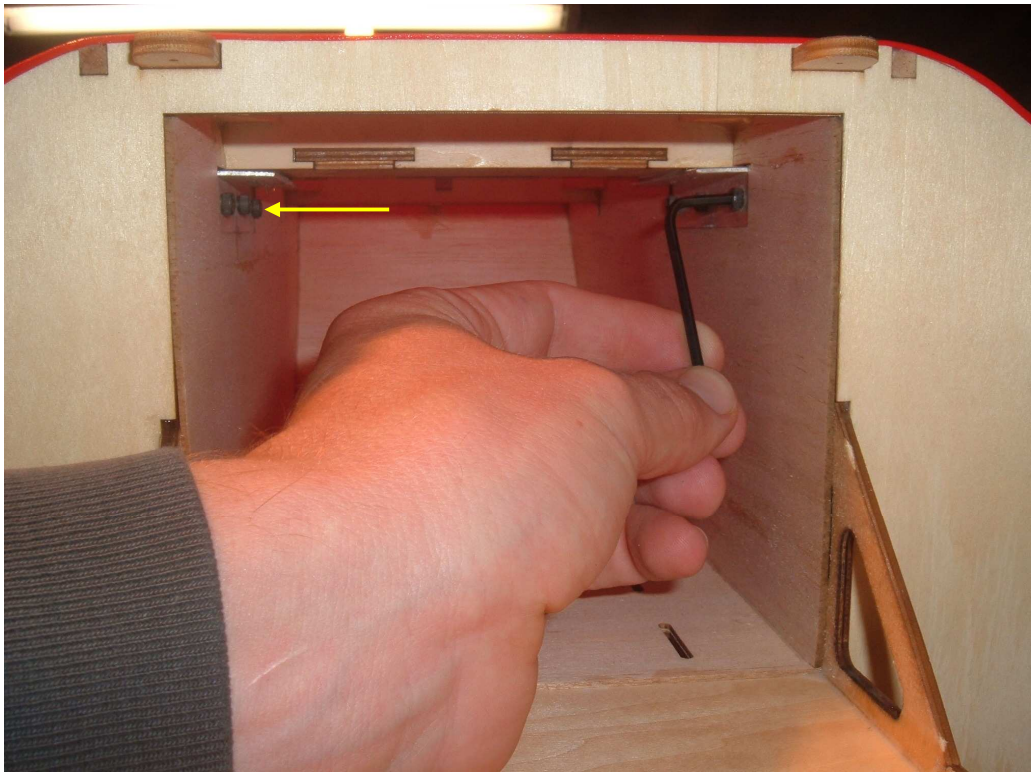
Secure collars on either side of the wheel using a 1.5mm Allen Wrench/Driver. Make sure the collars are just far enough apart that the wheel spins freely.



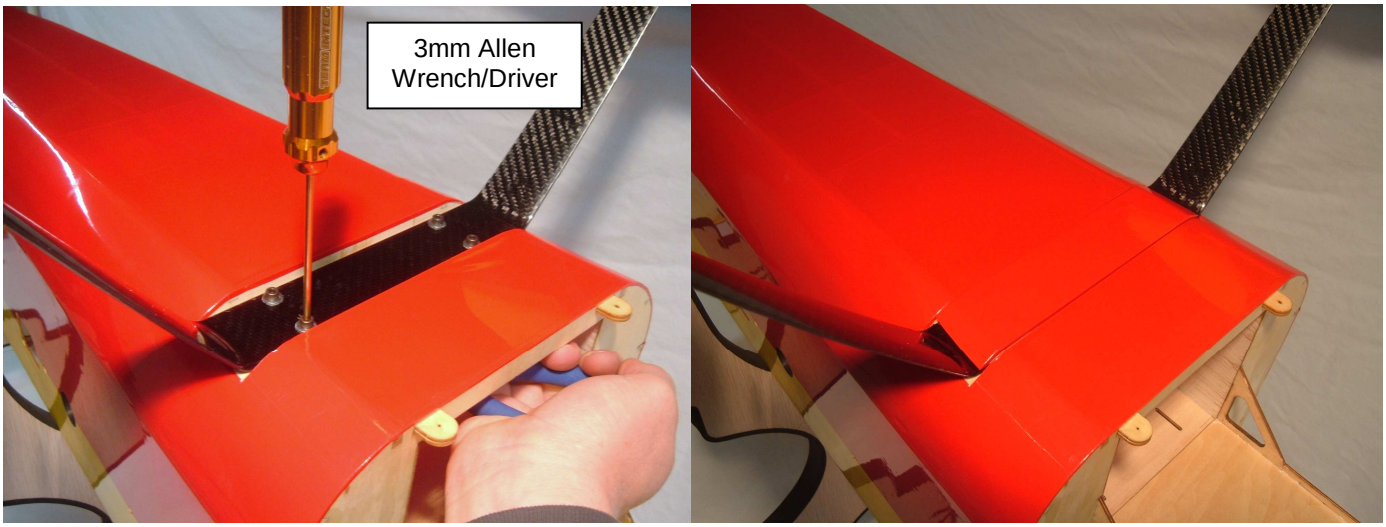
Insert the wheels and axles into the wheel pants and attach to the main landing gear with the nylock nuts. (13mm nylock nuts)



Install 2x Phillips head wood screws as shown.
Note: Drilling 1/16” pilot holes will ease screw installation.



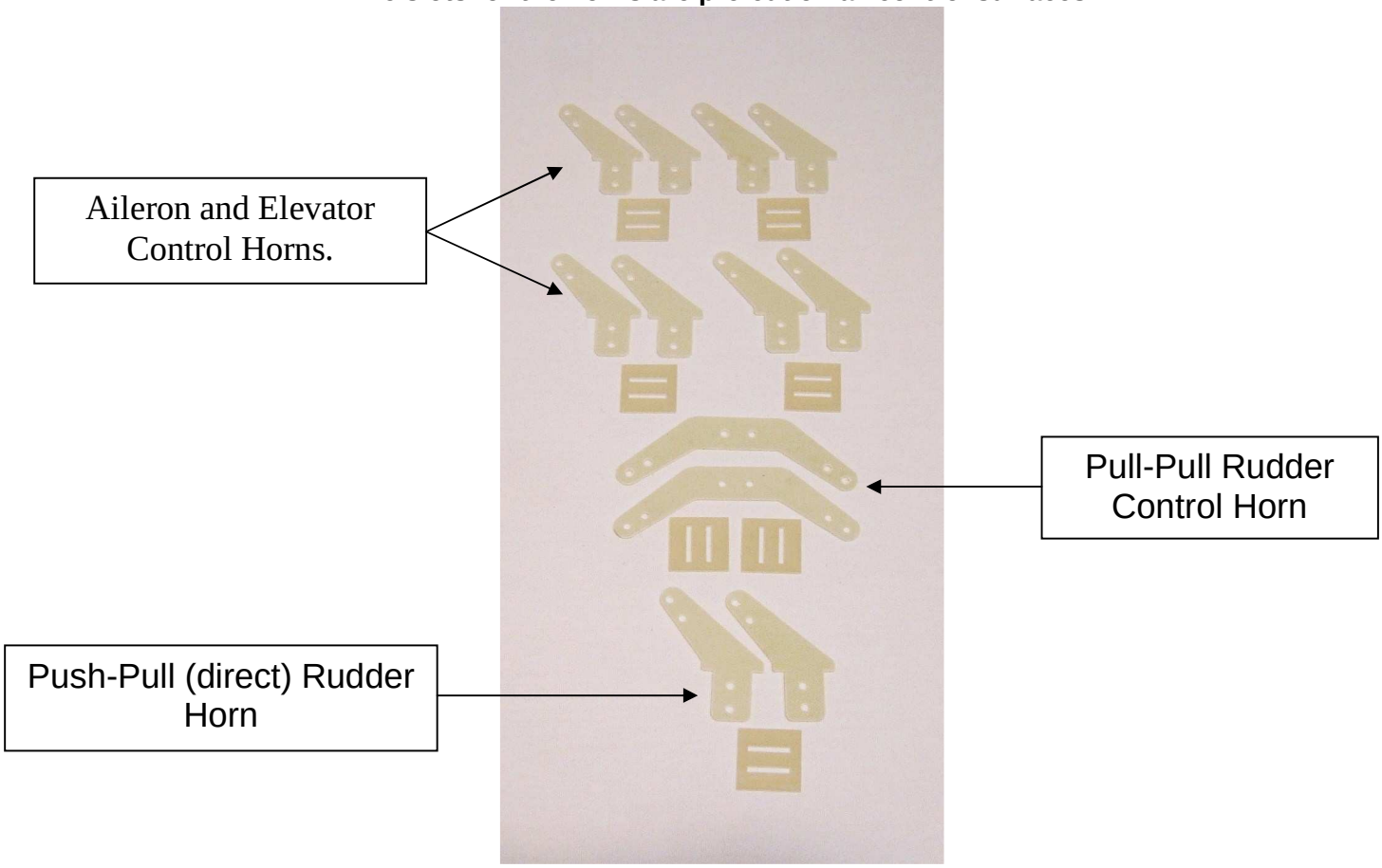
Using a 2.5mm allen wrench check and tighten all landing gear aluminum angle bracket bolts.

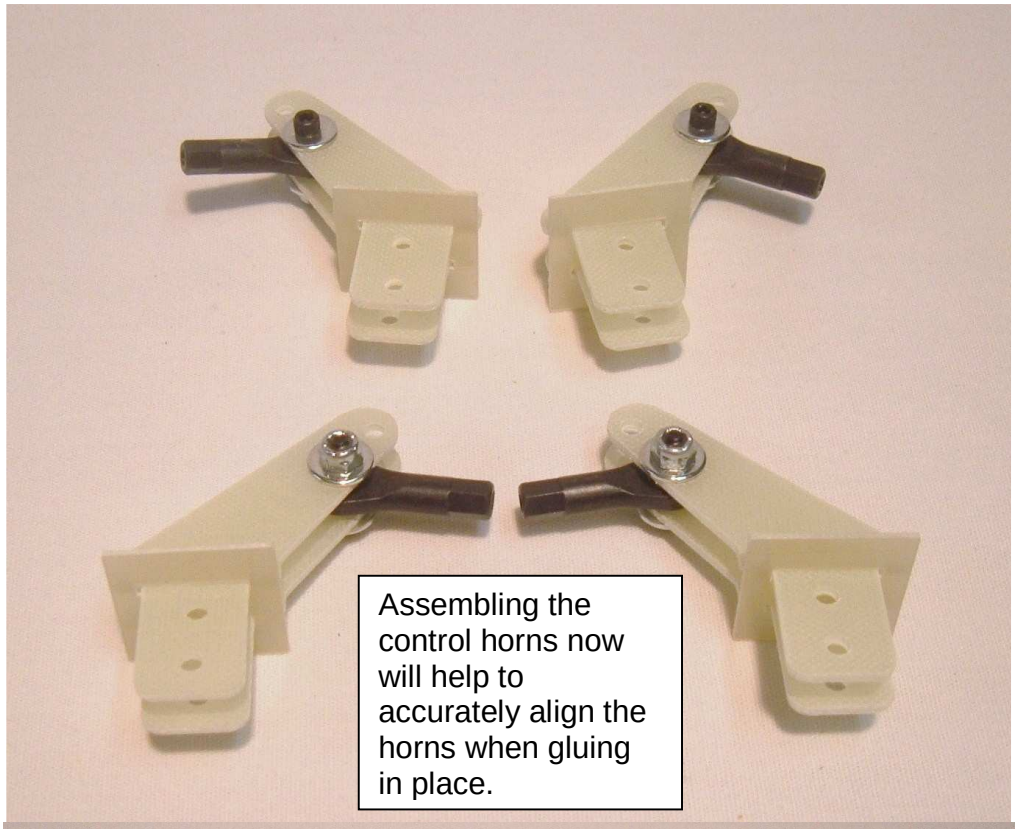


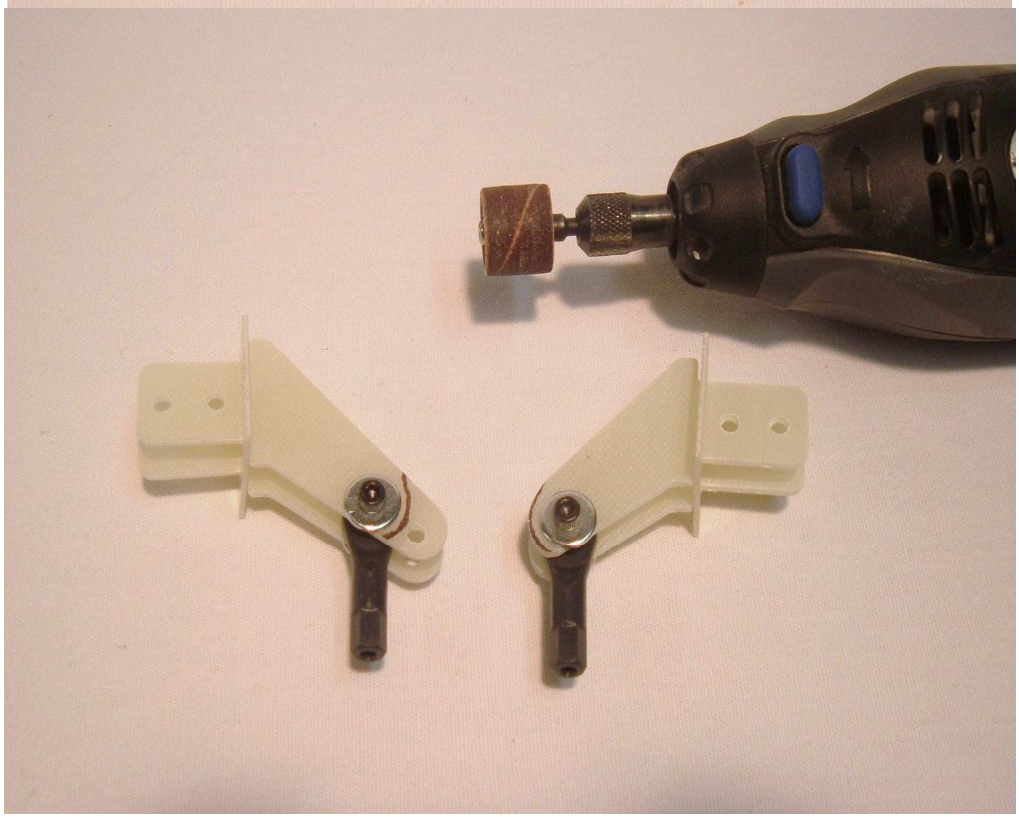
Install the main gear to the fuselage using 4 x 4mm screws, washers, and locknuts.
Then secure landing gear cover plate using epoxy.

Elevator and Aileron Control Horns

Your Slick features phenolic control horns.
The slots for the horns are pre-cut on all control surfaces.

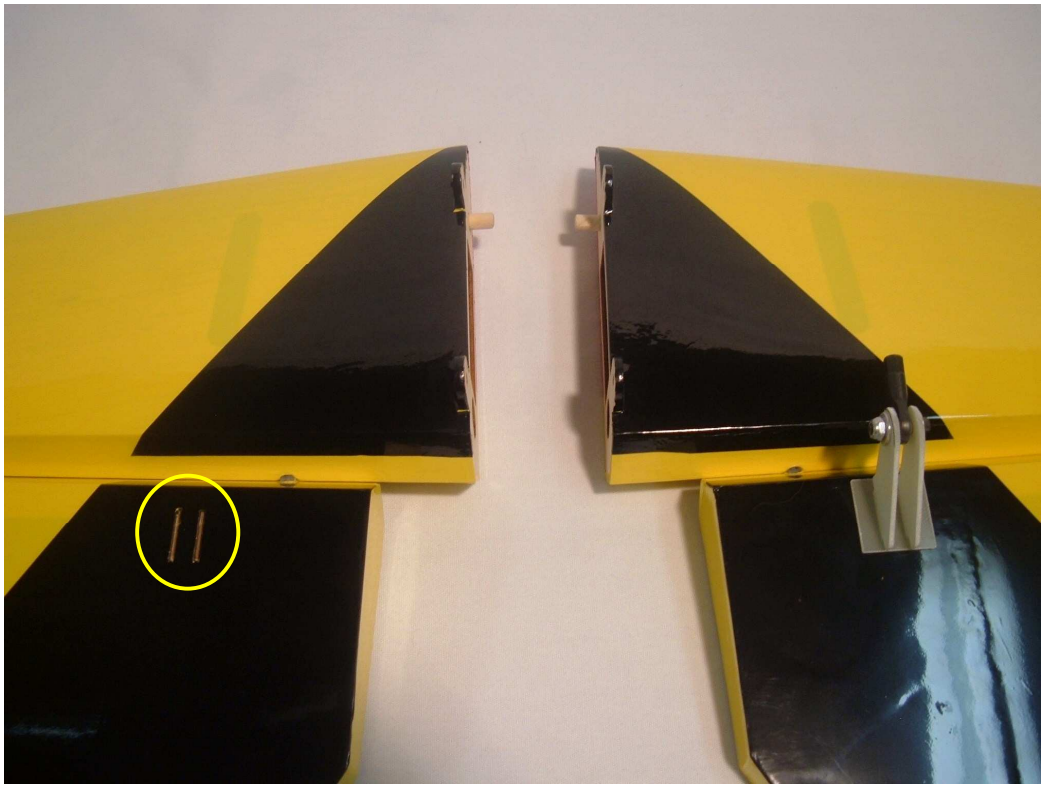




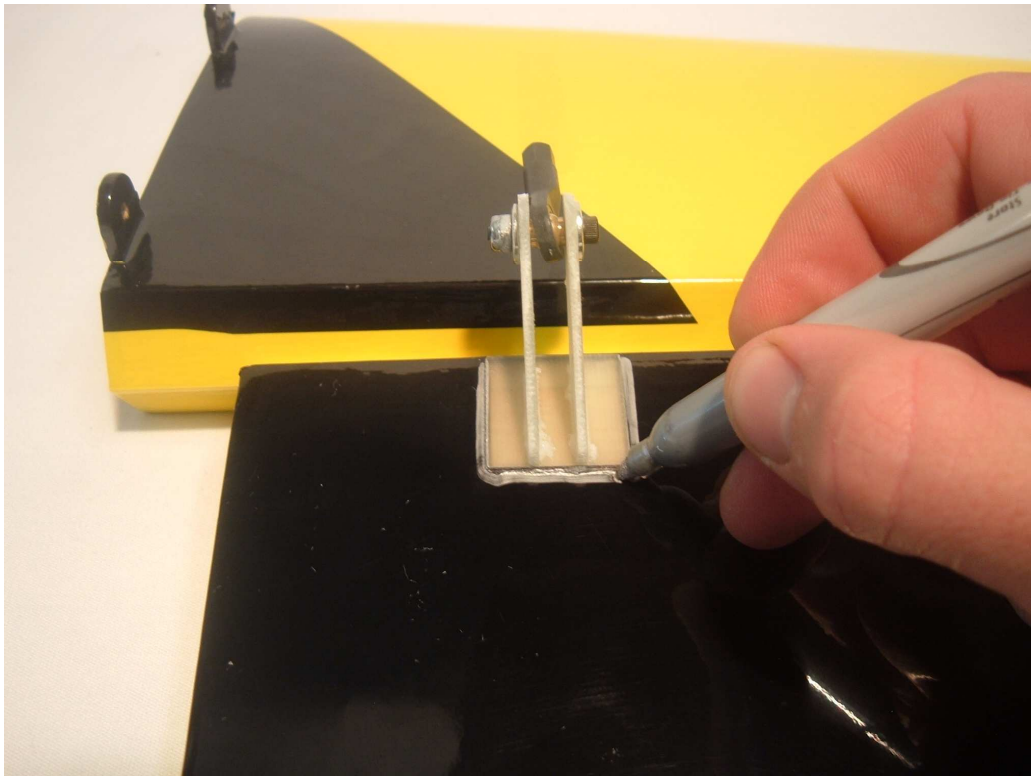


Assemble the aileron and elevator control horns as pictured above. If you choose to use the inner holes on the control horns for more throw, the horns will need to be trimmed as shown. Use a dremel tool with a sanding drum attachment. Do this work in a well-ventilated area and use eye protection!

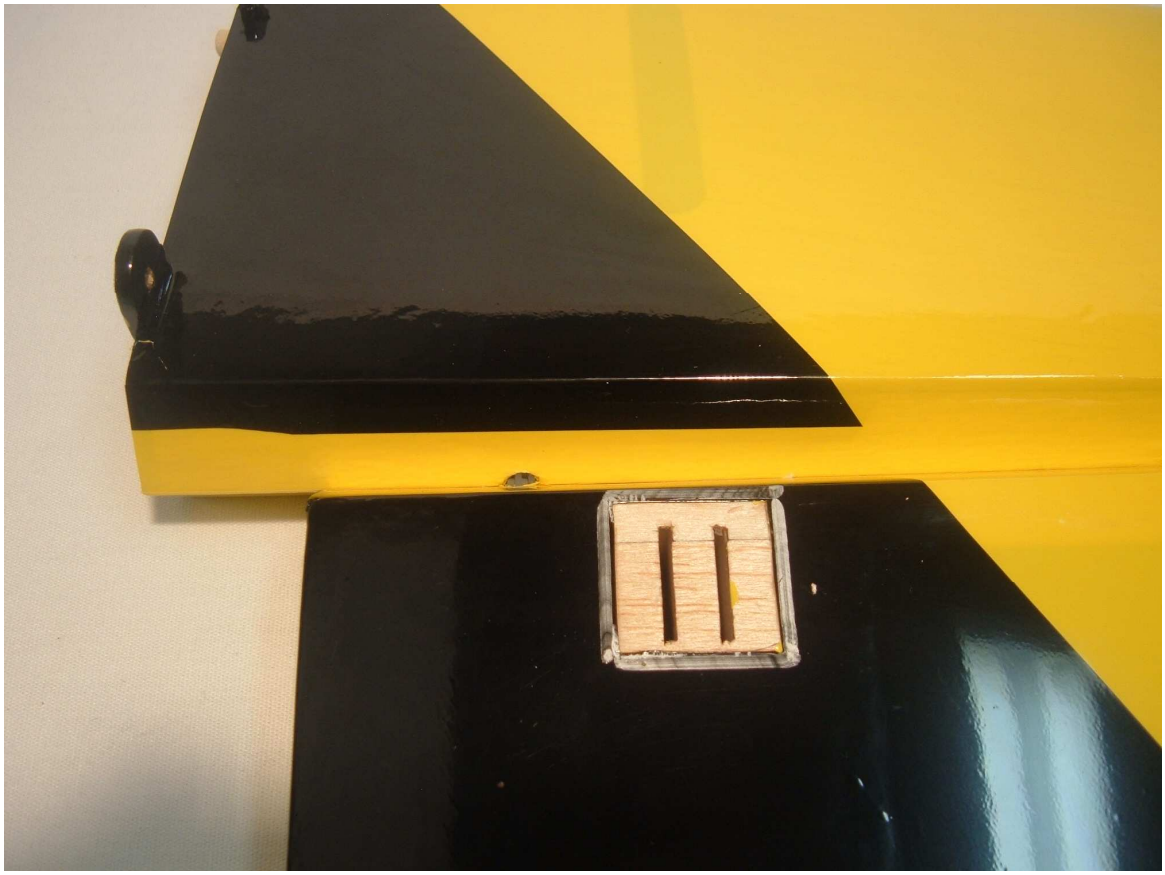
Note:
Control horns can be installed using Polyurethane glue OR 30-minute epoxy.
The instructions will detail the use of PU-Glue.



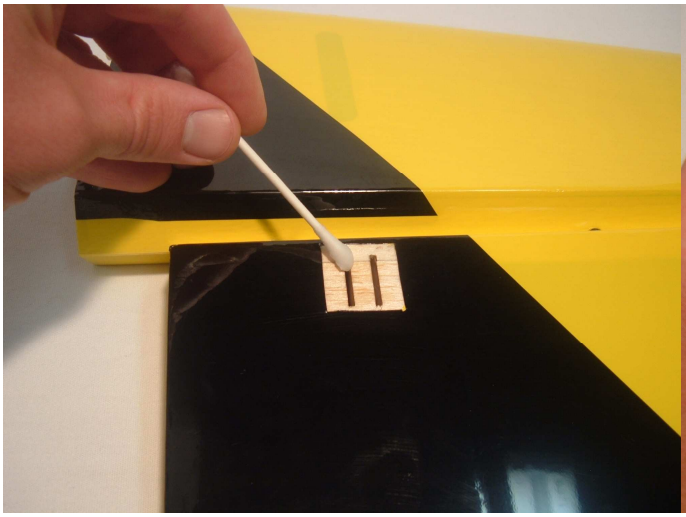
Locate the control horn location for each control surface and remove the covering from the double slots on each surface. Trial fit each control horn before gluing!



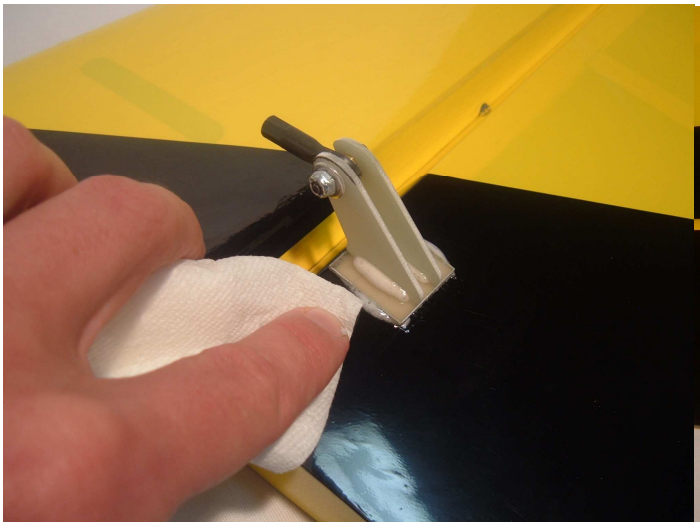
Insert control horn into slots, (do not glue) and trace around the perimeter of the horn with a Sharpie.



Using a soldering iron or sharp xacto knife, remove covering inside of your marking
The Sharpie line can be easily removed using rubbing or denatured alcohol.



Slightly dampen the gluing surface with water.
Apply glue in both slots and on the balsa mounting surface.



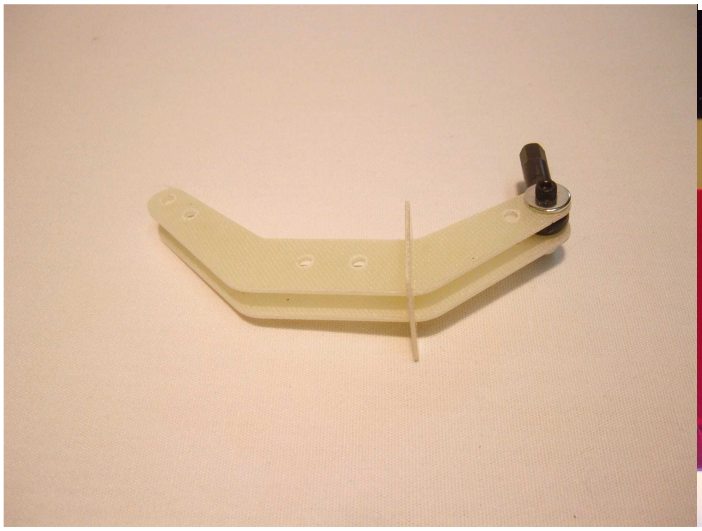
Insert horn. Be prepared to wipe away foaming PU glue for the first 10-60 minutes using rubbing/denatured alcohol. Repeat the process and install the aileron control horns.

Rudder Control Horn Installation

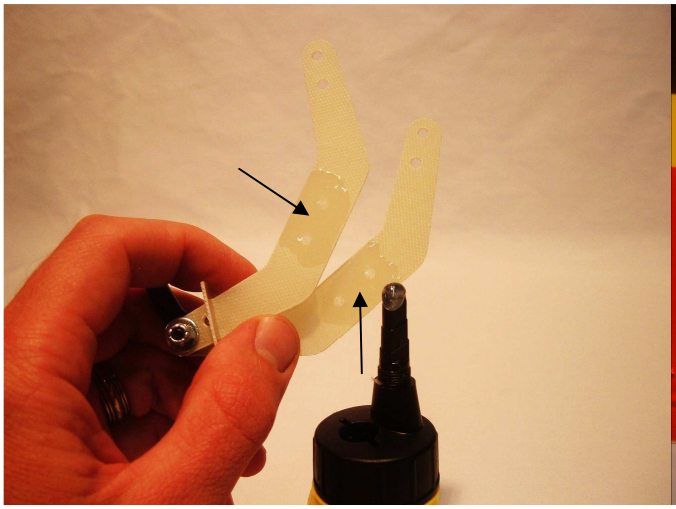
Your Slick is equipped with two rudder servo locations.
If you use a lightweight engine such as most 50-60CC single-cylinder engines, use the forward rudder servo location in the fuselage and the pull-pull cables.

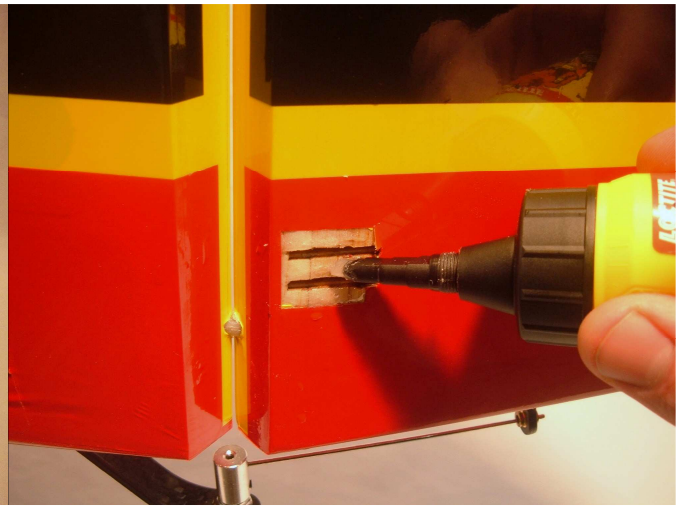
If you are using a larger engine such as 70CC or above you can use the rear servo location and pushrod to obtain the proper CG. Both positions are illustrated below:

Pull-Pull Style Rudder Horn:

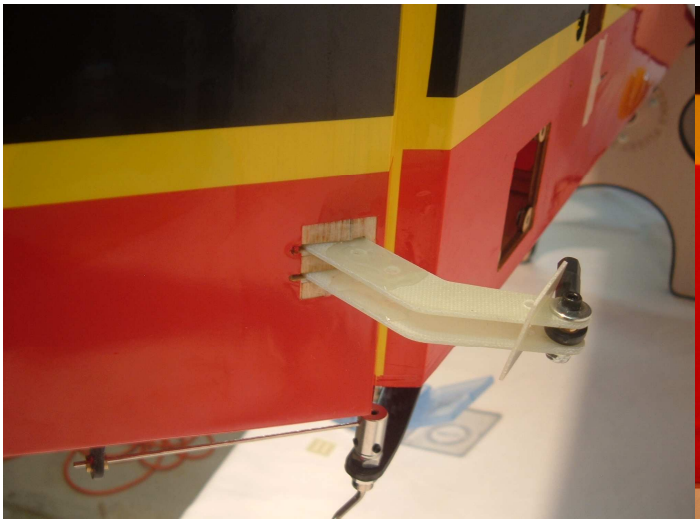


Start by assembling double horn with one ball link as pictured above. Temporarily install horn, mark and remove covering from BOTH sides of rudder.

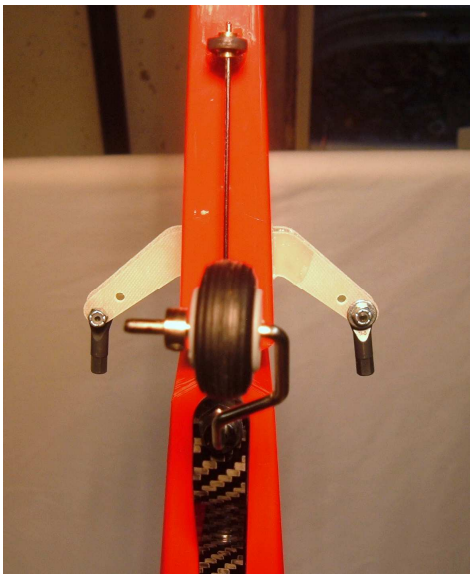




Apply glue to the center of the two horn pieces as well as both sides of the rudder.
You <u>do not</u> need to squeeze glue into the control horn slots in the rudder.



Slide control horns into position and install second ball link to ensure proper alignment as glue cures.



Carefully check and center control horns while removing the foaming PU glue. Allow glue to fully cure.

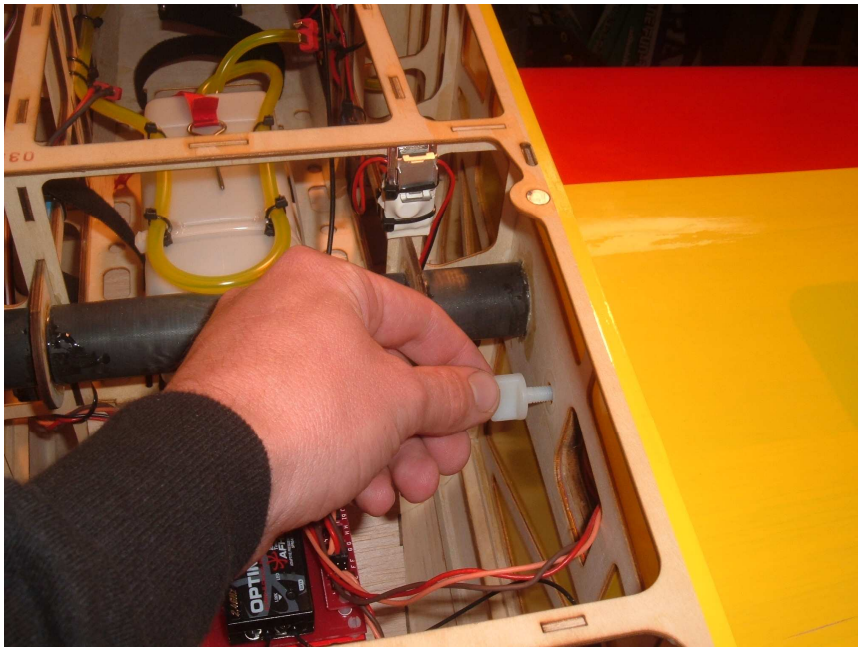
Rear Mount Servo Horn:

The rear rudder servo location uses the same rudder horn location, but install the single-sided rudder horn instead of the double-sided. This can be done using the same method as the elevator and aileron control horns.

Horizontal Stabilizer Installation

Install the horizontal stabilizers onto the fuselage using the carbon-fiber spar tube.
The horizontal stabs are retained by two 3mm screws on each side as shown.
Please use threadlockeron these screws, and inspect frequently, as vibrations may loosen them over time.

Wing Attachment

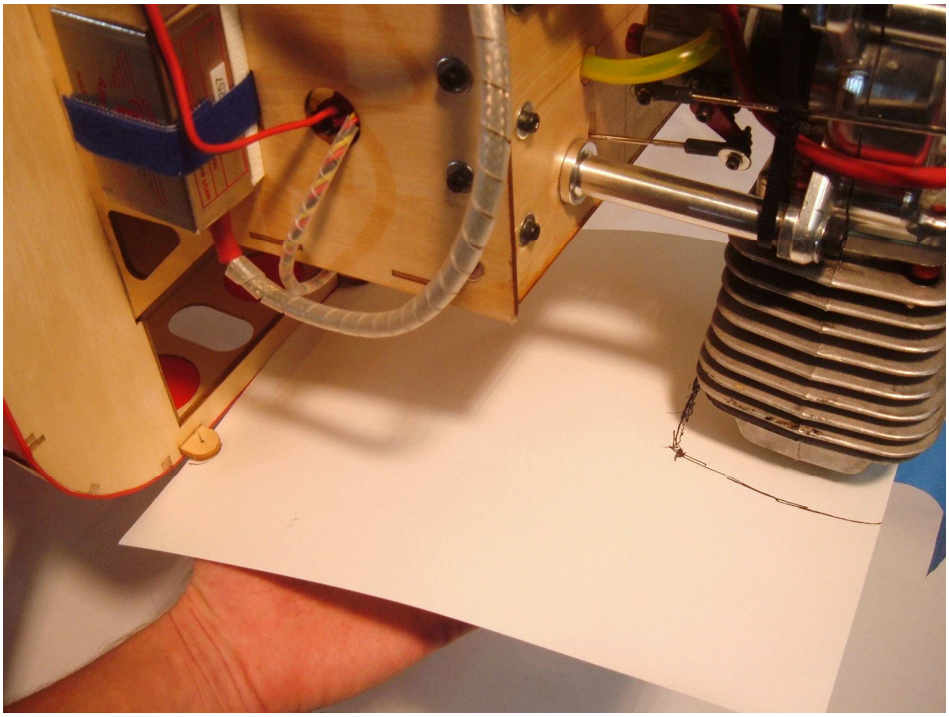


The wing attaches to the fuselage with one nylon thumb-screw per side. Your carbon-fiber wing tube is a snug fit into the wings and fuselage. This provides additional strength and fatigue resistance. As a result, you may need to periodically lubricate your wing tube. Were recommend non-stick cooking spray or silicone spray-lube for this job. Your wings will be an especially snug fit onto the tube the first several times you install them. Install the wing tube slowly and patiently to prevent damage.

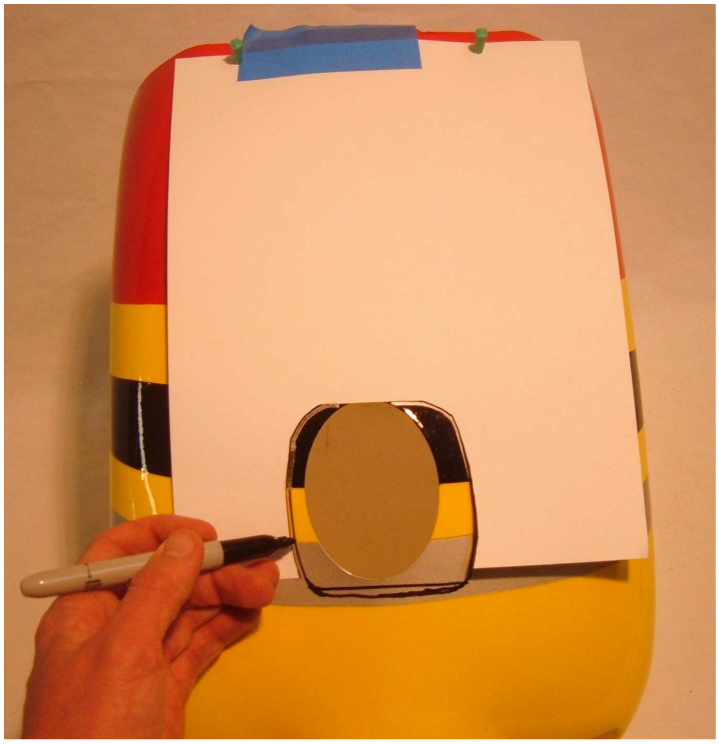
Canopy

The canopy hatch is supplied with the floor pre-installed. The rear of the hatch is left open so you can easily install a pilot head and cockpit control panel. When you have completed any work inside the cockpit, use a small amount of CA glue to install the balsa rear plate onto the canopy hatch. The canopy hatch is held onto the fuselage with 3mm nylon thumbscrews. These thumbscrews require no tools to install or remove.
Please inspect these screws frequently for wear and fatigue – we have included replacement spares in your kit.

Engine Cowl Cutting/Gas Engines



Using a piece of cardstock or thick paper, mark out the area to be removed for the cylinder head. Cut this outlined area out of the cardstock to transfer the outline onto the cowling.



Transfer this cutout onto the cowling using a Sharpie.
(Silver or black sharpie works well because it removes easily with rubbing alcohol)

Using a dremel tool, cut and remove the outlined area.
Slide the cowling in position and make further adjustments as required.
Continue making adjustments until no part of the engine or exhaust system are rubbing on the cowl.

If using either Pitts or Stock Muffler system, you may be required to remove more cowling material.
The same cardstock method works well to locate exhaust cut-outs.

Cowling Attachment

The cowling fastens to the airframe using 3x internal 3mm screws and washers as seen in the top picture.

2x silver external wood screws on the bottom of the cowling.

If you have mounted your engine properly, you should have a 1/8th to 3/16th inch gap between the cowling and the back of the spinner plate. Adjust your motor as necessary to achieve this.

Electric Power Installation

(For gas engine installation, refer to DA-50 installation manual)

The Slick flies very well as an electric powered airframe.

Recommended motors include:
Hacker A60-18L and A80-8

A plywood piece is supplied to block off the exhaust canister tunnel if needed for electric applications.

To mount your electric motor, create a mounting template for your particular motor mount on paper. Match up the center of your template with the thrust-line center on the firewall, and mark your hole locations. Be sure to use blue Loctite on all of your fasteners. When assembling your motor mount, the correct distance from the firewall to the back of your spinner is 6 ¾ inches.

You will need additional cooling air over your batteries. Leave the access plate on the top of the engine mounting box open.
You will need an air exit, as well. You can make this by removing some of the covering on the bottom of the fuselage behind the canister tunnel. We recommend opening up two of the holes in the bottom of the fuselage. This should be approximately 3 times the amount of area as the air-inlets on the front of the cowling for optimal cooling.

Note: For detailed information on the installation of servos and other electronics, refer to the 89" Slick Electronics Installation Guide

Throws High Rate

Ailerons – 45 degrees
Elevator – 50-55 degrees
Rudder – Maximum throw available without interference
High rate controls typically use 50-75% exponential

Throws Mid Rate (if used)

Ailerons - 30 degrees
Elevators - 35 degrees
Rudder - Maximum throw

Throws Low Rate

Ailerons – 20 degrees
Elevator – 20 degrees
Ruder – 30 degrees

Center of Gravity

Measure at WINGTIP. 4.5 inches back from leading edge is preferred.
Allowable range is 4.0” to 5.0”

The above picture shows the relative angle the Slick will hang from the wing tube when the CG is positioned slightly forward of neutral. A slightly forward of neutral CG is often used for mixed 3D and precision aerobatic flying.

3D Hobby Shop wishes you the very best with your new 89” AJ SLICK!

FLY LOW!