# *Assembly Manual for*

# Decathlon 107”-180”


## www.pilot-rc.com

# *INTRODUCTION*



***Thank you for purchasing our Decathlon plane. At Pilot we strive to build the best performing Quick Build ARF aircraft available today.***

***The Decathlon is manufactured using advanced building techniques for maximum strength and lightest weight. The kit features many premium light weight carbon fiber components, hardware, genuine Oracover(Ultracote) covering, laser cut wood, and the best adhesives. The Decathlon's light weight allows optimum flight performance from exciting aerobatics or just relaxing.***

***At Pilot we make every effort to provide the highest quality products and customer service. Our goal is a happy customer having a wonderful time assembling and flying Pilot model aircraft.***

**More information on website**

www.pilot-rc.com

# ***WARRANTY***

■ All Pilot-RC products are guaranteed against defects for 30 days of receiving your airplane. This warranty is limited to construction or production defects in both material and workmanship , it does not cover any component parts damaged through use or modification .

■ The manufacture cannot supervise the assembly, operation or maintenance, and is not responsible for radio malfunctions. Please ensure your radio system is in good condition. **We are not responsible for any accident or damage while using this product.** It is impossible to determine for certain whether crash damage was the result of improper installation of our products, a radio system failure, or pilot error. Model airplane owners use our products at their own risk.

■ Pilot-RC will not be liable for any costs, unless agreed and proved beyond doubt the failure was due to faulty materials or fabrication. Any agreed cost will not exceed the cost of the airframe and not include engine, radio equipment or third party claims.

■ Should you wish to return a product or receive replacement parts, all shipping cost must be paid by the customer.

# ***ATTENTION***

- **Do not regard this plane as a toy!**
- To ensure safety, please read the instruction manual thoroughly before assembly.
- Building and operating an RC Plane of this nature requires previous experience and competence to an experienced level. This plane is not for a beginner!
- If you are in doubt have an experienced pilot at hand. Diligent practicing and correct guidance is essential, accidents can cause bodily harm and property damage.
- Seek assistance from an experienced person or airplane model clubs in assembly, operation and maintenance to ensure successful training.
- **Fly only in a registered RC model club airfield** that is approved by your local Academy of Model Aeronautics (AMA).

**Pilot-RC has the right to revise the plane, the instructions and the limited warranty without notice. If you have any problems and questions please contact Pilot –RC at:**

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Cellphone:+86 760 88781293
FAX: +86 760 88780293
Address: No.34, Chengnan Er Road , Zhongshan city, 528400, Guangdong Province, China

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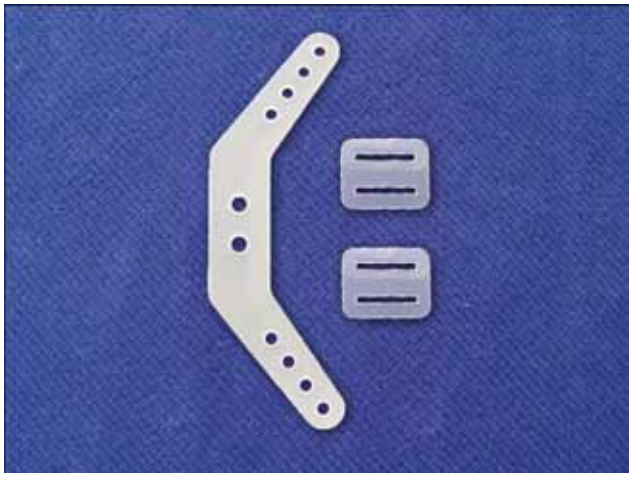
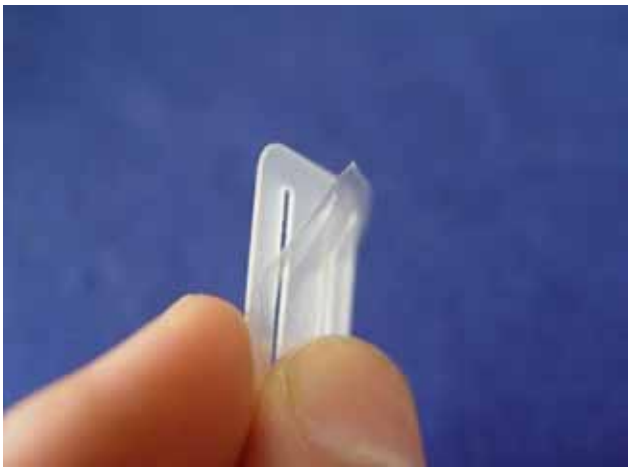
# *Fuselage*

## *Rudder Assembly*

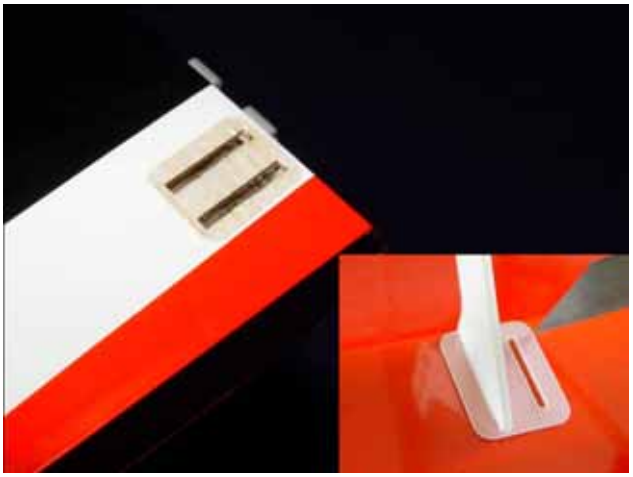
### Rudder Control Horn



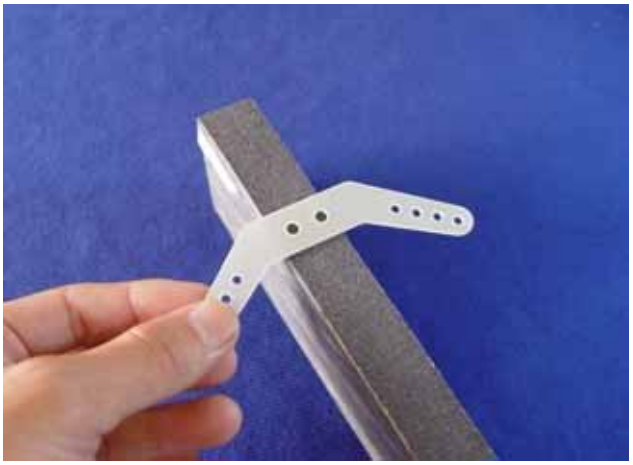
1. Tear off the cover on the horns and locking plates.



2. Slice covering over factory installed slots. Press control horn into position. Trace around the locking plate with a knife and remove the covering.



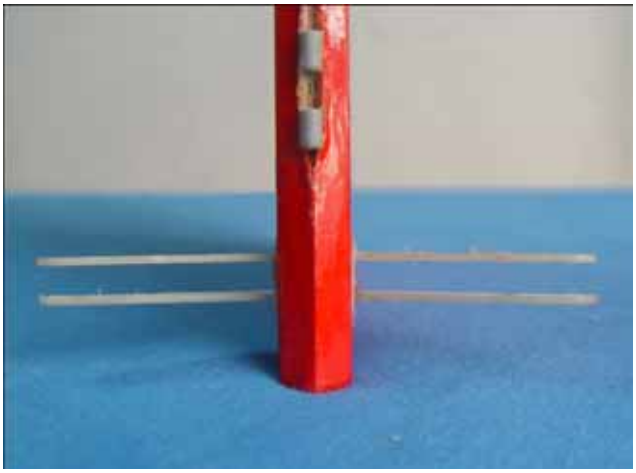
3. Scuff the middle of horns with a piece of sand paper for good glue bond. Wipe off sanding dust prior to gluing.



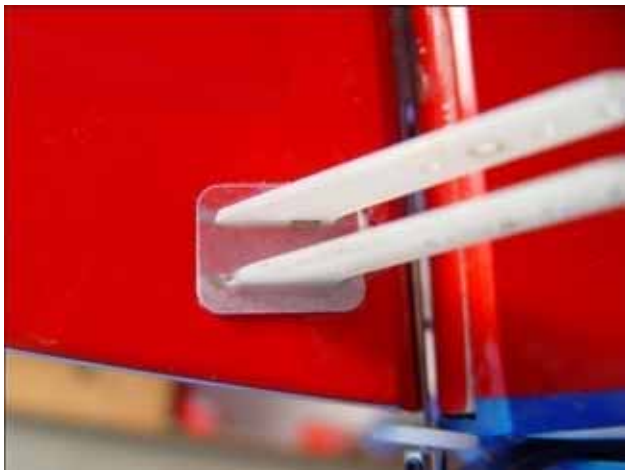
# *Rudder Assembly*

4. Apply the 30 minutes epoxy inside the pre-cut slot, and coat the horn with epoxy as shown.

Make sure the horn is perpendicular to the rudder.

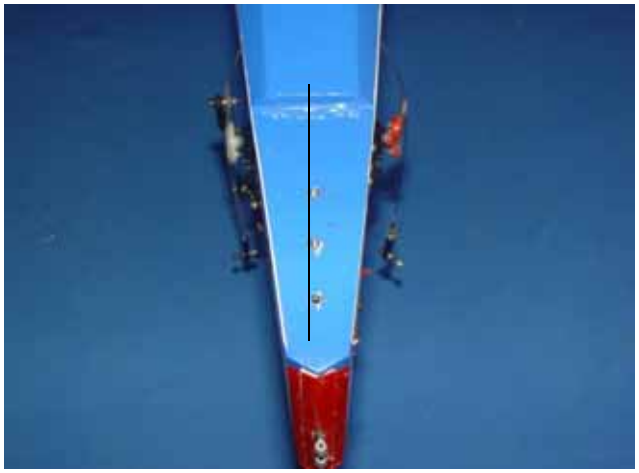


5. Slide the horn into slots with locking mount plates. Wipe away excess glue with rubbing alcohol.



# Tail Wheel Installation

1. Draw a center line with a fine line marker as shown.

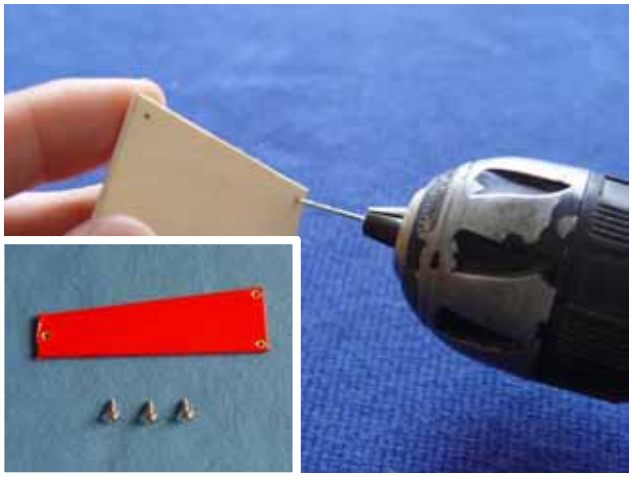


2. Locate and drill holes in the tail wheel mounting block as shown.

3. Install the blind nuts through the opening in the rear of the fuselage. Mount the tail wheel assembly using blue Loctite on the threads screws.

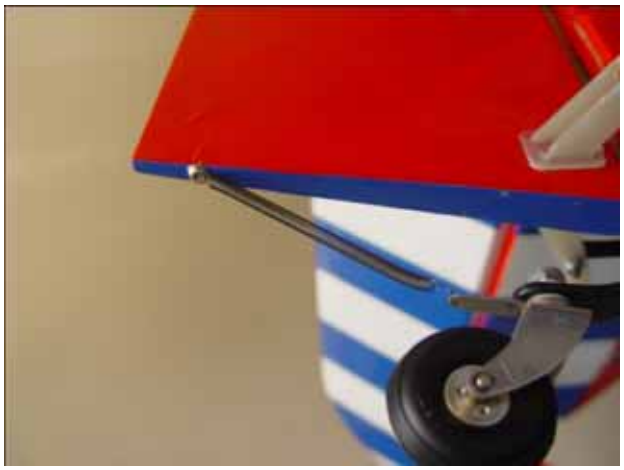
# *Tail wheel*

4. Install the hatch over the opening in the rear of fuse with 3 screws in accordance with the pre-drilled holes

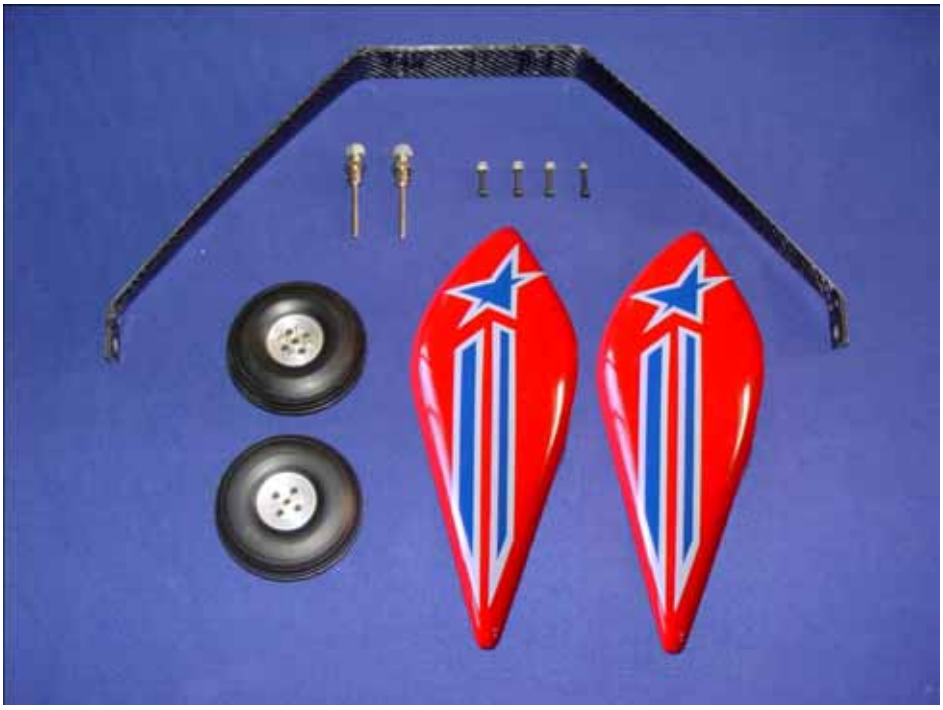


Ensure the spring is under slight tension.

5. Drill a 1mm hole in the bottom of the rudder and mount steering spring with a wood screw as shown. Cut off excess wire from the spring.



## *Main Landing Gear Installation*



NOTE: The main landing mounting direction.

# *Landing Gear Assembly*

1. Install the landing gear with the bolts and locking nuts. Do not over tighten the hardware.


3. Tighten the lock nut against the landing gear strut making sure the flat sides of the axle bolt vertical with ground.

2. Install the landing gear axles with lock nut.

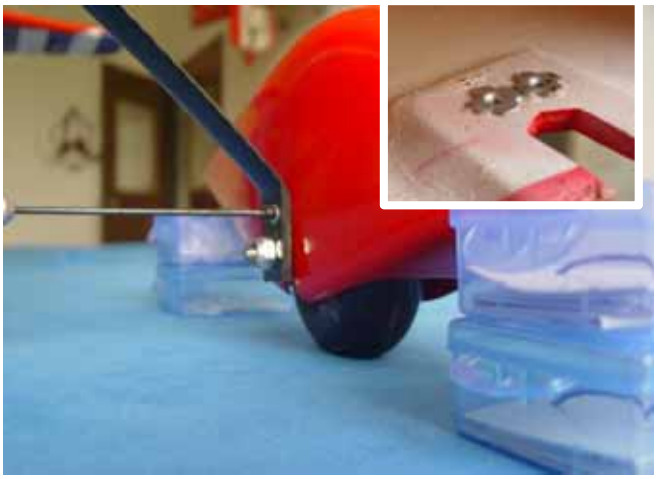
4. Install wheels and wheel collars using **Blue Loctite** on the set screws.

# *Landing Gear Assembly*

## Wheel pant installation

1. Level the fuselage and place the wheel pants over the wheels. The cut out in the wheel pant is cut to fit the hex nut on the axle. Check for proper clearance over the wheels and that wheel pants are level with the fuselage.


2. Drill the holes for the mounting bolts and install the blind nuts.

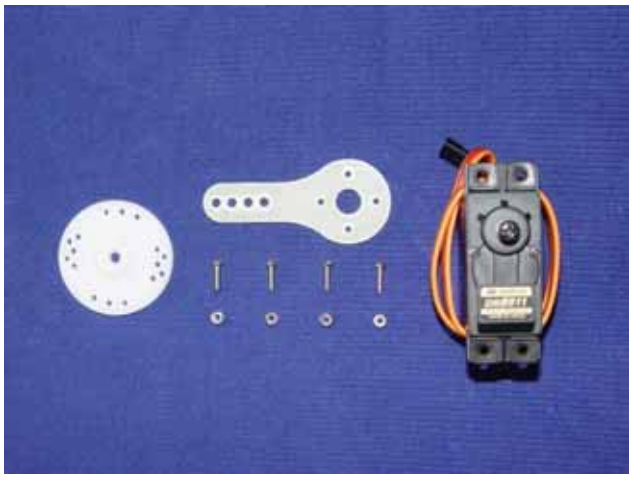


3. Finish the wheel pant mounting with the bolts and use Blue Loctite on the threads.

# *Wing Servo Assembly*

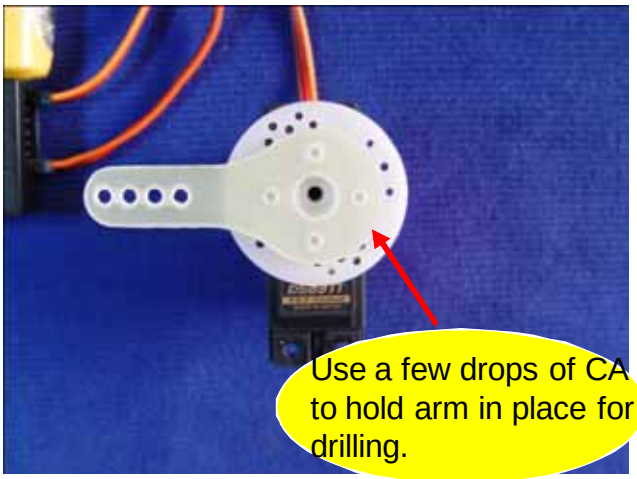
## Servo Arm Installation

Minimum servo specs:
180 in. oz / Metal Gear / Digital

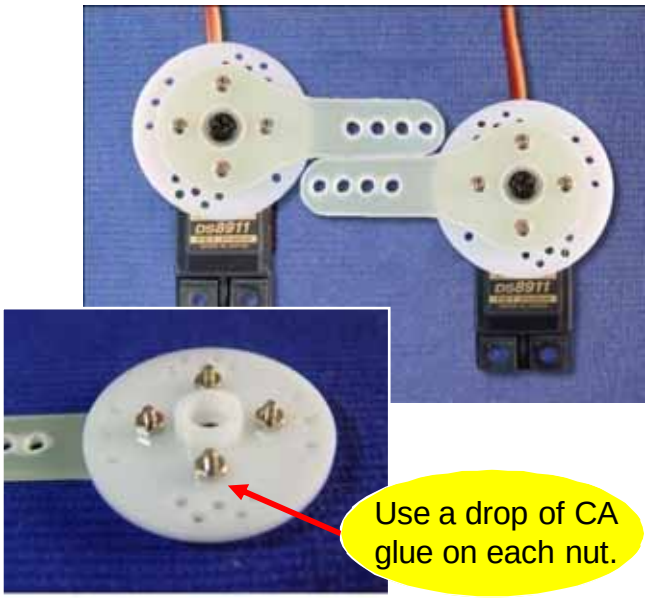


1. Turn on your transmitter and make sure servos are centered before putting on servo arms.

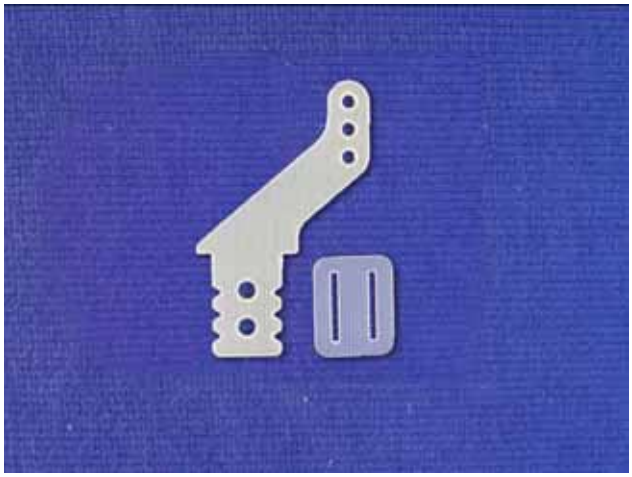

2. Locate and drill 2mm holes into nylon servo arm to attach the included fiberglass servo arms.




3. Mount the screws and nuts.



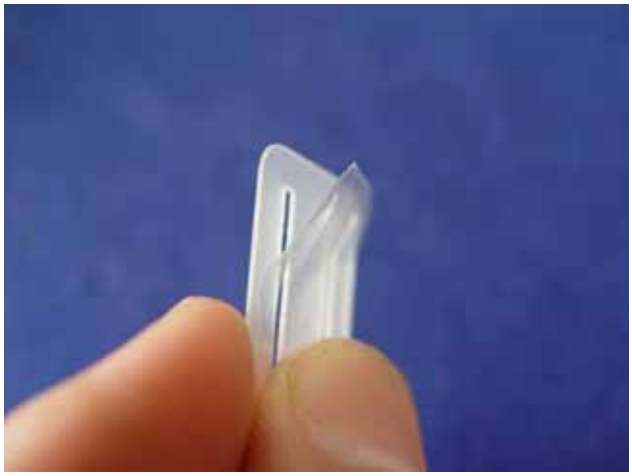
## Aileron Control Horns

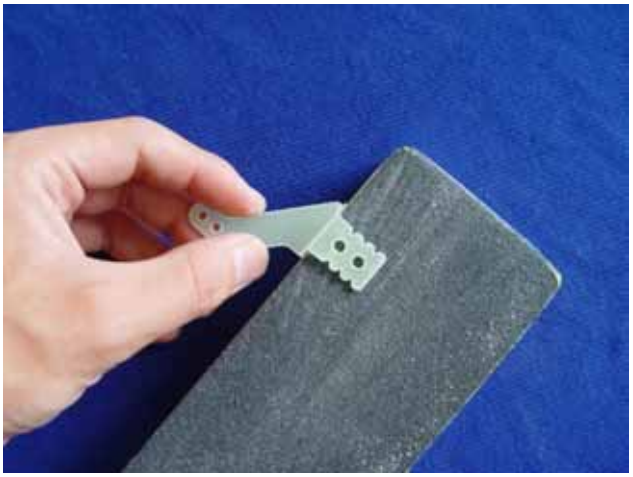


1. Tear off the cover on the horns and locking plates

2. Slice covering over factory installed slots. Press control horn into position. Trace around the locking plate with a knife and remove the covering.

3. Scuff the horns with a piece of sand paper for good glue bond. Wipe off sanding dust prior to gluing.



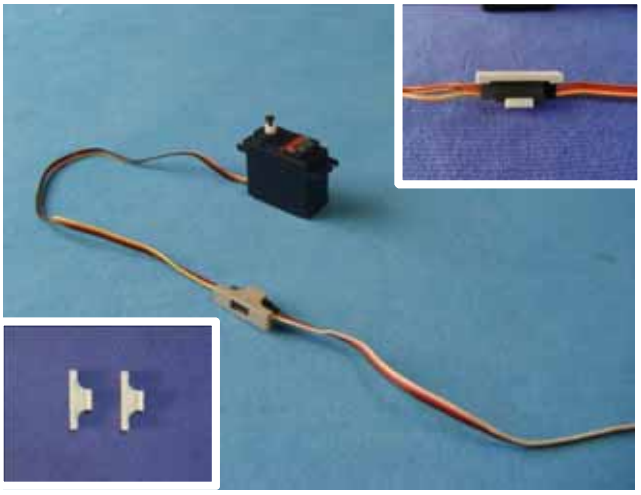


## Servo Installation

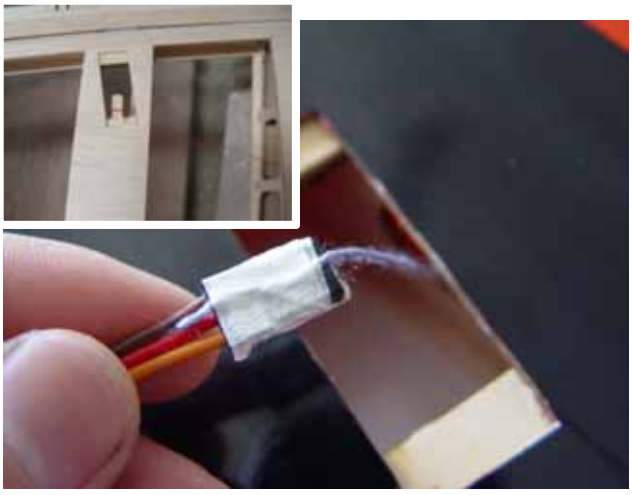
4. Apply the 30 minute epoxy inside the pre-cut slot for horn and coat the horn with epoxy as shown.

5. Slide the horn with locking plate into place. Wipe away excess epoxy with rubbing alcohol. Note: Some trimming of the horn might be required for the horn to fit flush.

2. Add a servo extension to each aileron servo. Install connector safety clip to as shown to connection.

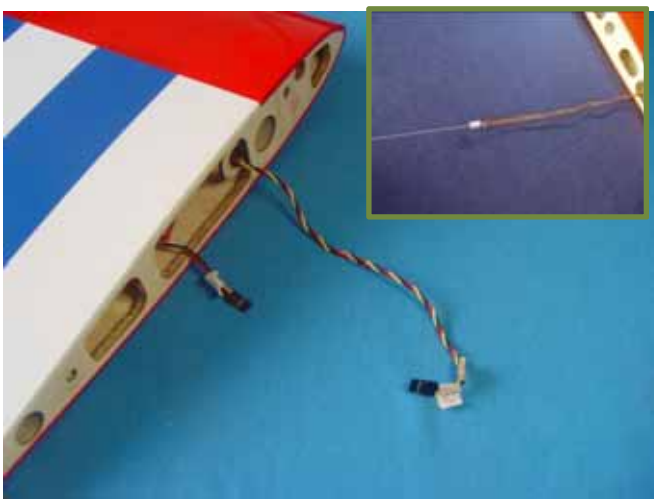


3. Locate servo cut outs and remove the covering with a knife. Tape the servo lead securely to the pull-string.

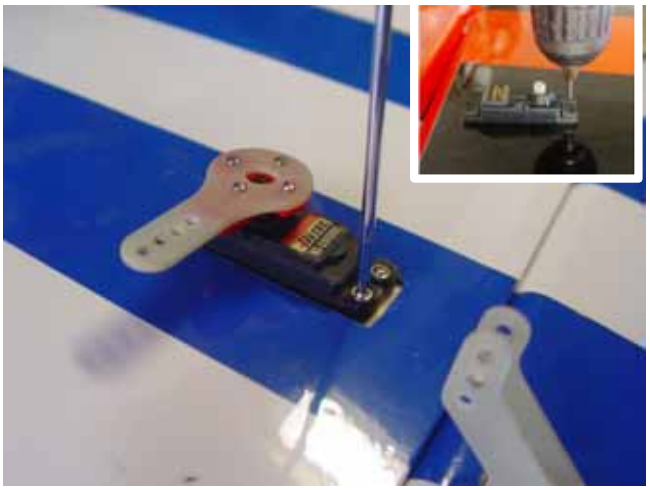


# *Wing servos*

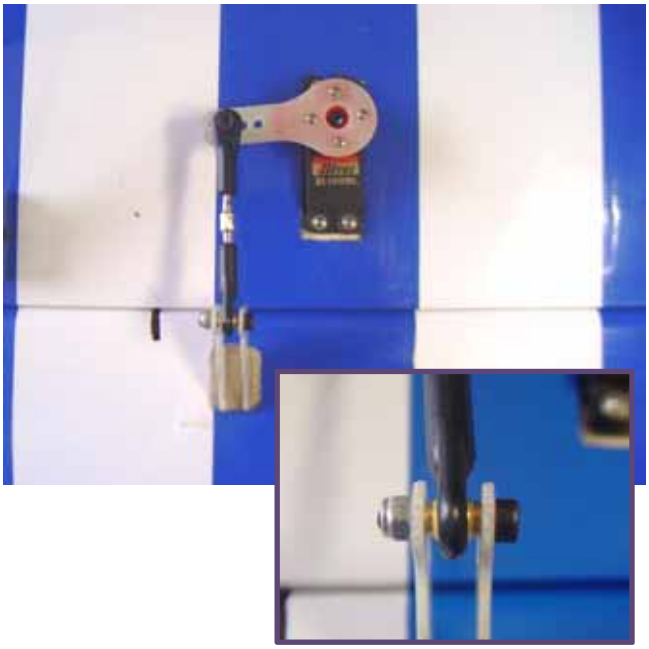
4. Pull the extension lead through to the root of the wing.



5. Use a 1mm drill bit to drill for the servo mounting screws. Install servo with output shaft toward the leading edge of the wing.



6. Install the servo arm facing outboard toward the wing tip. Adjust pushrod length so the servo arm is at 90 degrees and aileron panel in neutral position.

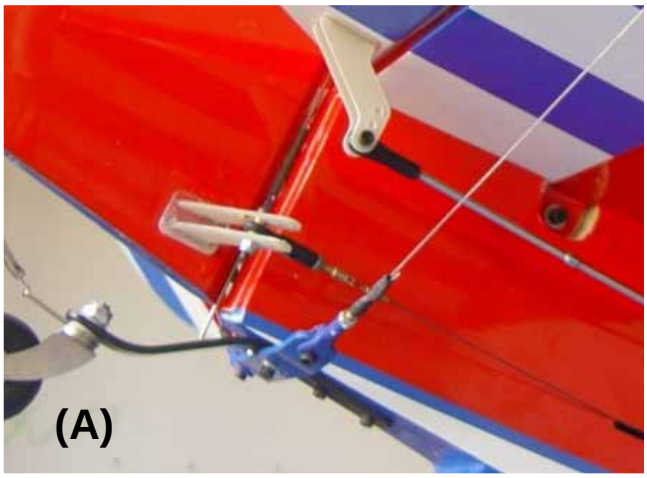


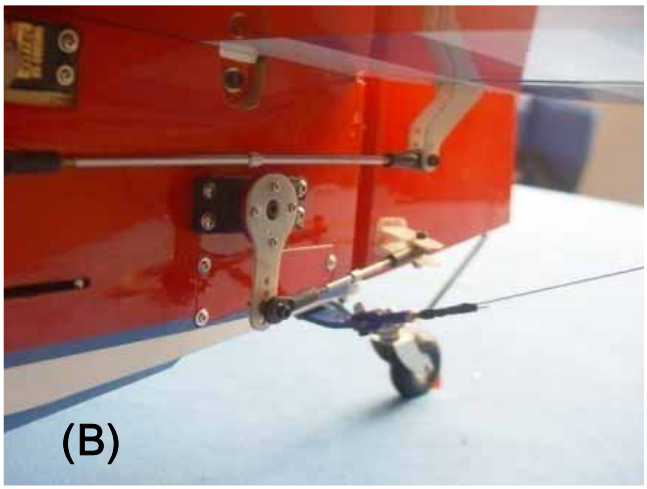
# *Rudder servo Assembly*

7. Repeat steps for the other aileron and flaps.

## Rudder servo installation

The rudder servo can be mounted forward in the cabin using cables or mounted in the tail using a push rod.

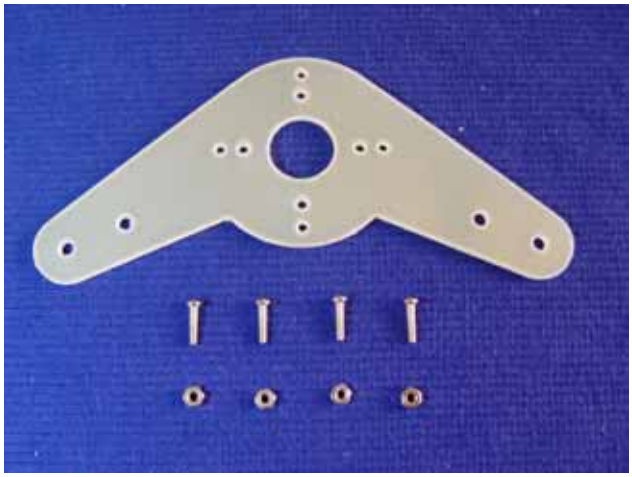



Pick the rudder servo mounting location based on CG needs.

# *Rudder Servo Assembly*

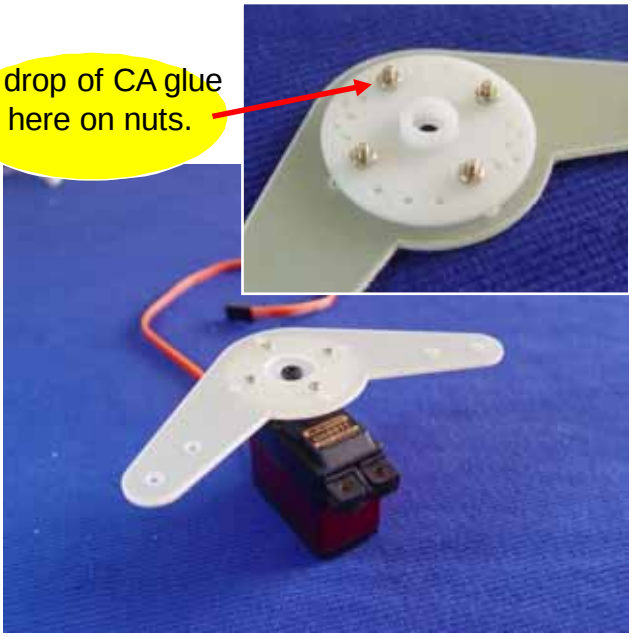
Minimum servo specs:
180 in. oz. / Metal Gear / Digital

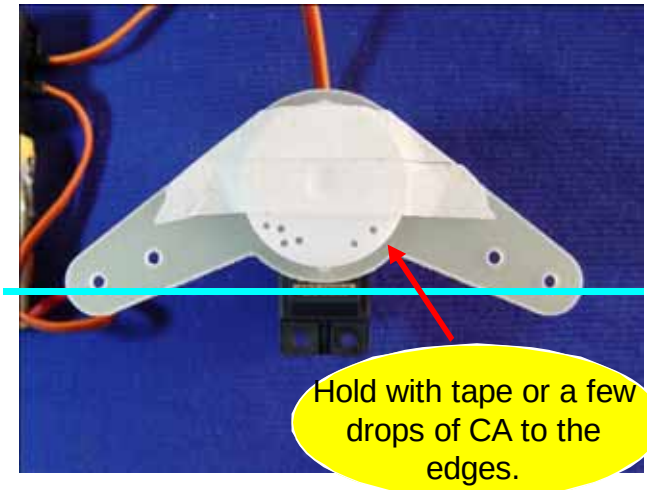


1. Turn on your transmitter and make sure servos are centered before installing the rudder servo arm.

2. Drill holes with a 2mm bit for hardware.

3. Mount the screws and nuts.



# *Rudder Servo Assembly*

## Rudder Servo (A)

The rudder cables and couplers come factory installed as shown.

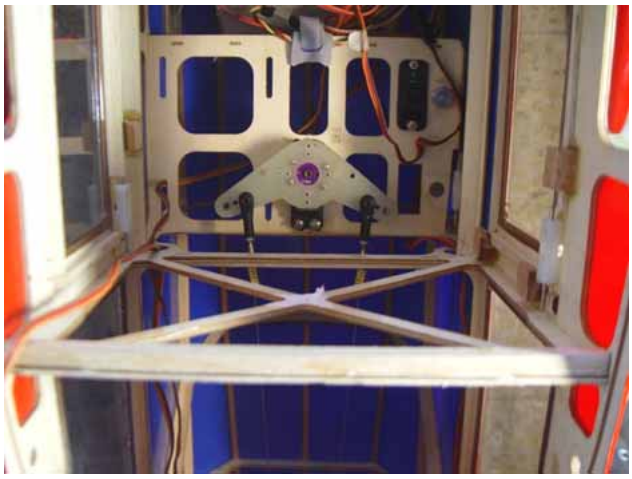
1. Drill 1mm holes and mount the rudder servo with the output shaft facing forward.

2. Install the rudder servo arm with cable attach points aft.

3. Tape the rudder to the vertical fin in the neutral position to help with the rigging.

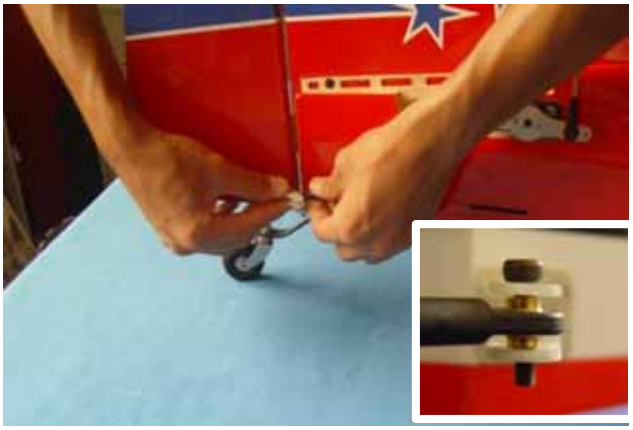
# *Rudder Servo Assembly*

4. Mount the cables with the pre-installed ball link cable ends to the rudder servo arm. Cut the covering in the tail to expose cable exit slots. Run the cables out the slots. Make sure the cables cross in the middle.

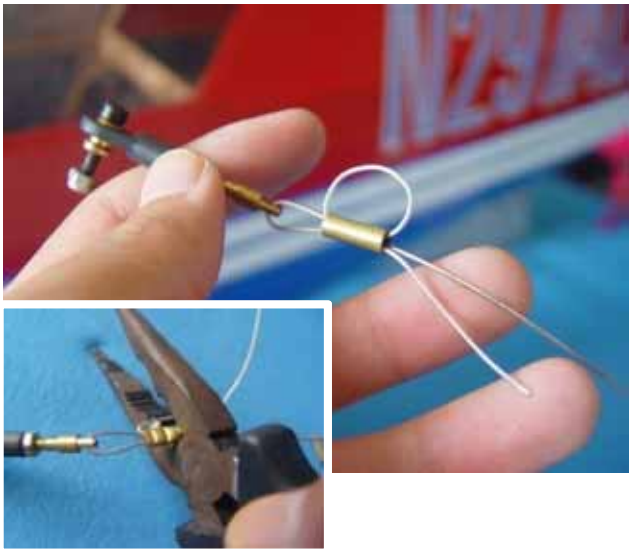


5. The flat surface of the ball link gets screwed against the servo arm.

5. Install ball link to rudder control horn temporarily.



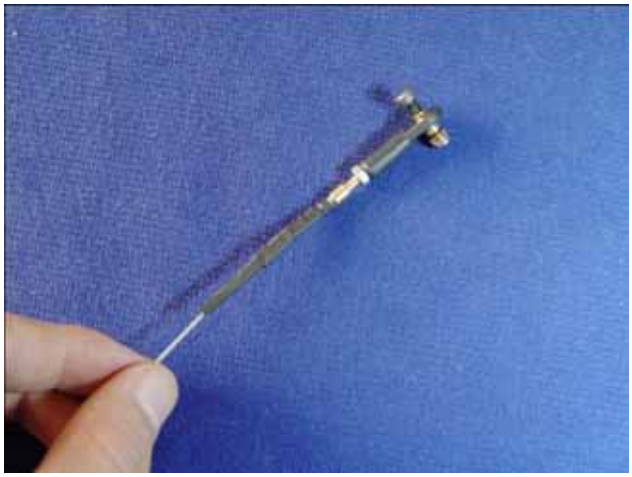
6. Prior to connecting rudder cable to the ball link, slide a section of heat shrink tubing and copper tubing. Run cable as shown looping around tubing. Remove excess slack from cable and crimp with diagonal pliers.



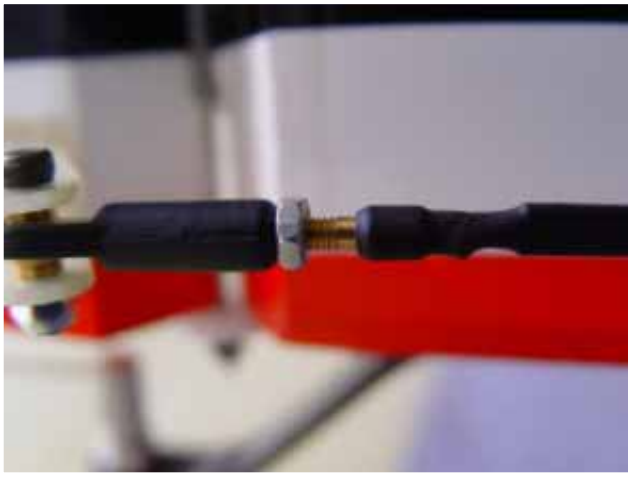
# *Rudder Servo Assembly*

7. This is what a completed cable should look like. Cut off excess cable after crimping. Repeat process for opposite rudder cable.

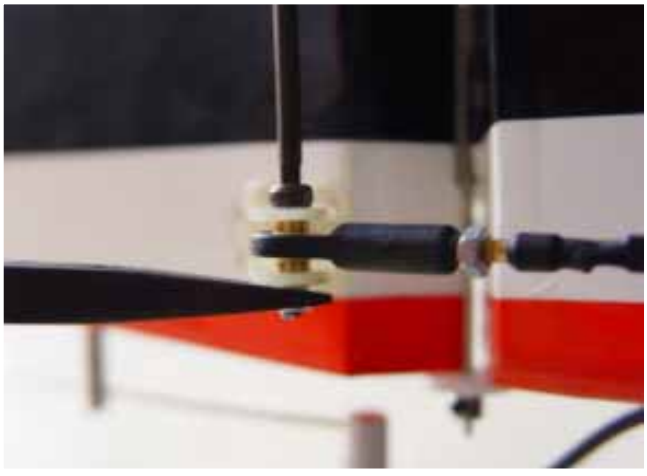
8. Shrink the heat shrinking tube over the crimp for a clean appearance.



9. Adjust the rudder cable threaded fair leads to obtain appropriate cable tensions. Remove tape that was holding rudder straight.



10. Tighten jam nut to lock ball link in position and permanently install ball link to rudder horn.



# *Rudder Servo Assembly*

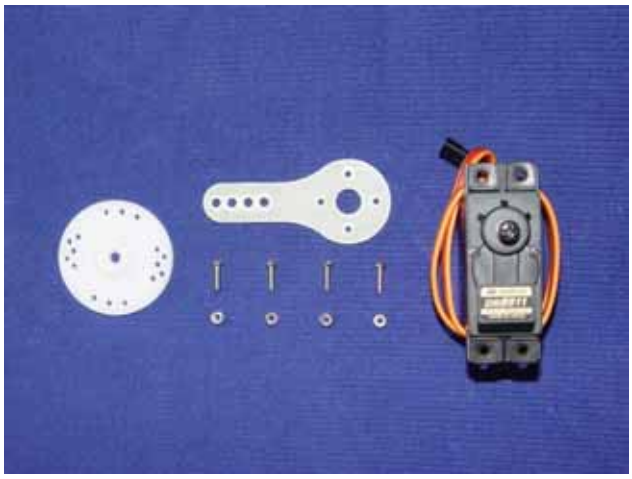
## ***Rudder Servo Plan B***

1. The process for the rudder servo installation is the same process as for the ailerons.

# *Elevator Servo Assembly*

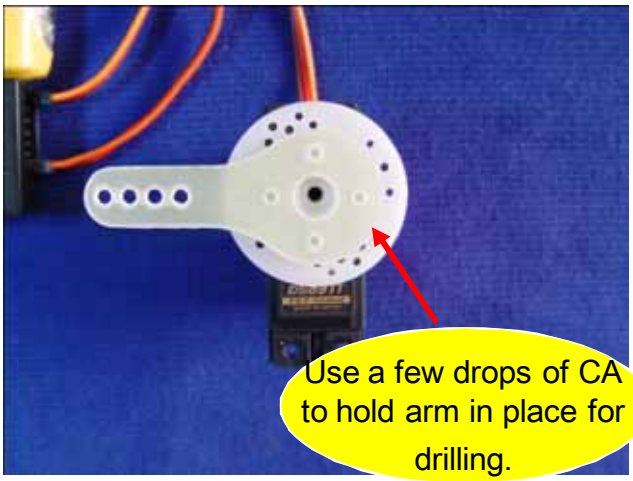
## Servo Arm Installation

Minimum servo specs:
180 in. oz / Metal Gear / Digital

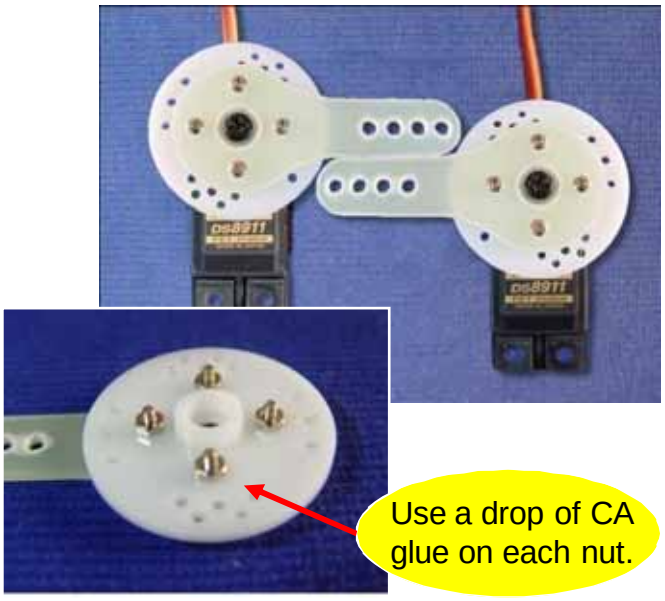


1. Turn on your transmitter and make sure servos are centered before putting on servo arms.


2. Ensure the servo arm is 90 degrees with servo as shown. Then mark and drill holes with 2mm bit.

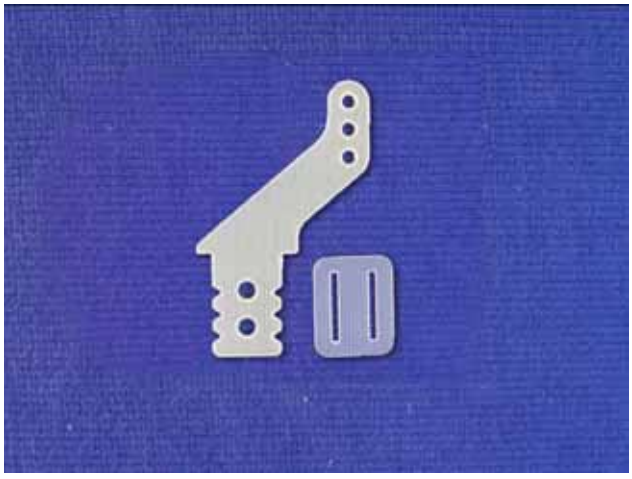



3. Mount the screws and nuts.

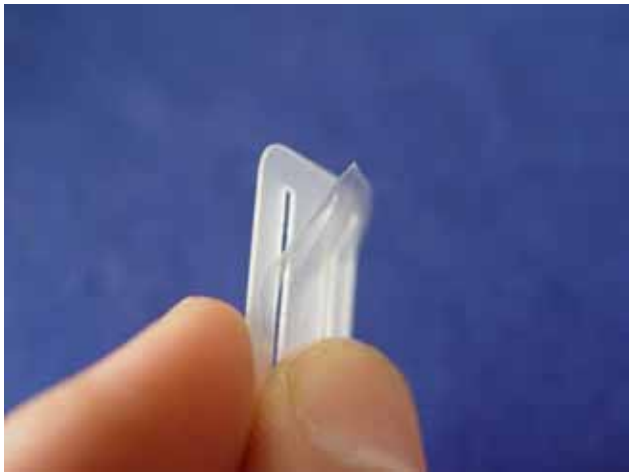


# *Elevator Servo Assembly*

## Elevator Control Horns

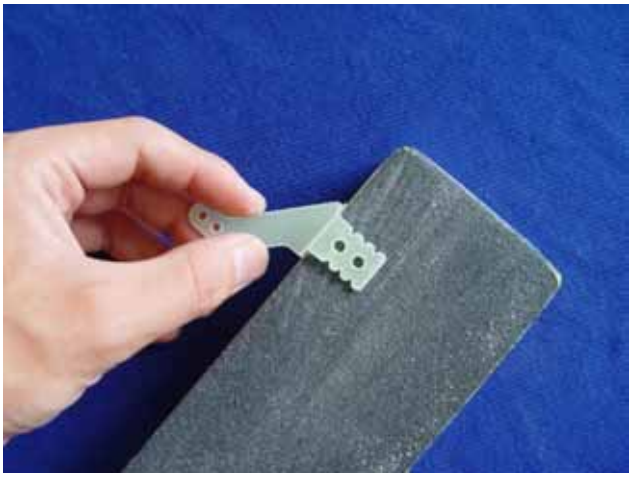


1. Tear off the cover on the horns and locking plates



2. Slice covering over factory installed slots. Press control horn into position. Trace around the locking plate with a knife and remove the covering.

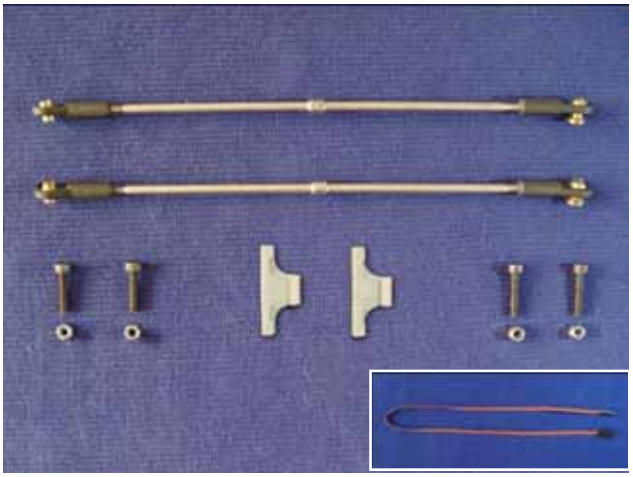
3. Scuff the horns with a piece of sand paper for good glue bond. Wipe off sanding dust prior to gluing.



# *Elevator Servo Assembly*

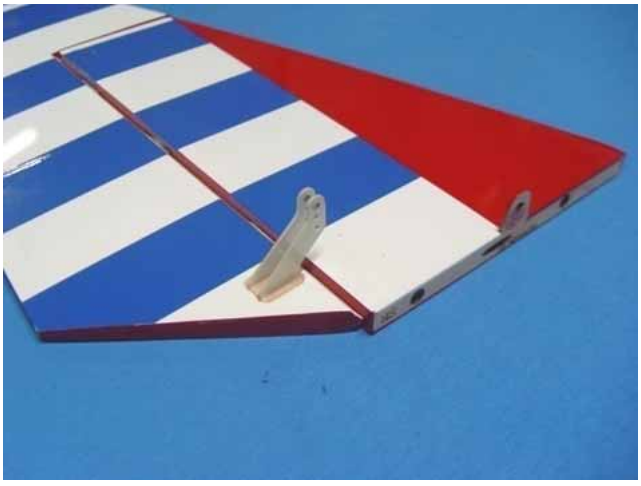
## Servo Installation

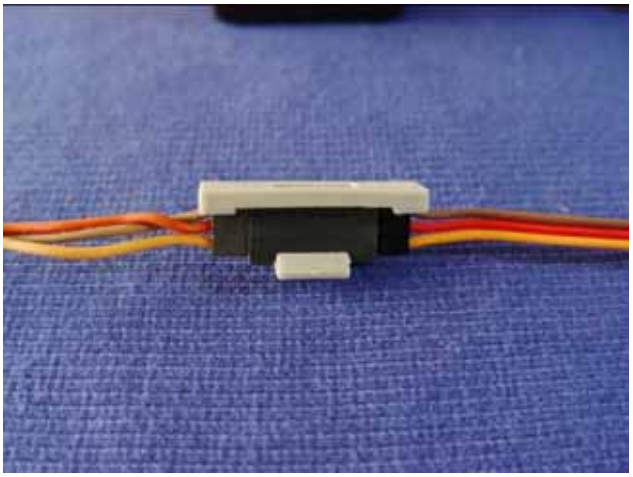
4. Apply 30 minutes epoxy inside the pre-cut slot for horn, and coat the horn with epoxy as shown.



5. Slide the horn with locking plate into place. Wipe away excess epoxy with rubbing alcohol.

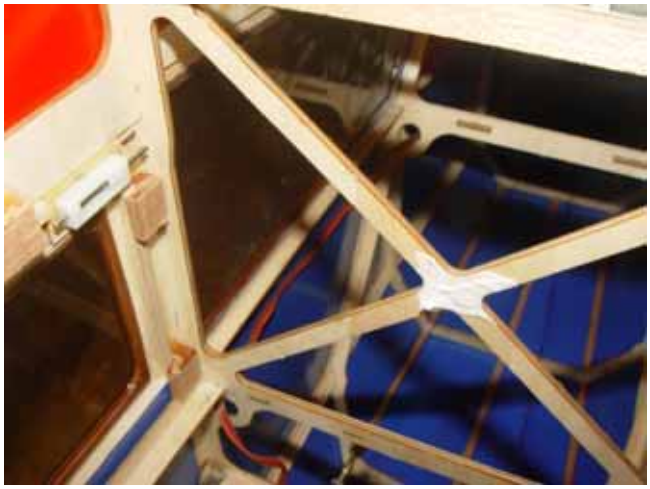
1. Connect the servo extension to the servo and install safety clip.





# *Elevator Servo Assembly*

2. Snake the elevator servo leads into the fuselage using the factory installed pull string. (same process as ailerons)



3. Use 1mm bit to drill the mounting holes. Install the servos with the out put shaft facing forward.

4. Cut the covering on the pre-drilled hole for stab mounting. Insert carbon spars and slide horizontal stab into position.

5. Install the stab with mounting bolts and washers. Apply Loctite to threads before installation.

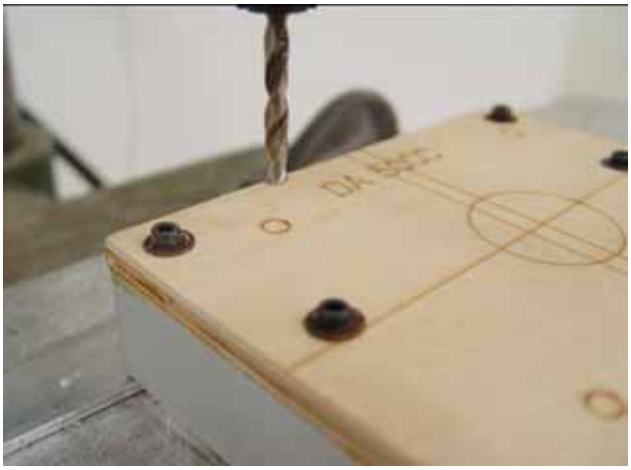
# *Elevator Servo Assembly*

6. Install the servo arm facing down. Adjust pushrod length so the elevator is neutral and the servo horn is at 90 degrees.

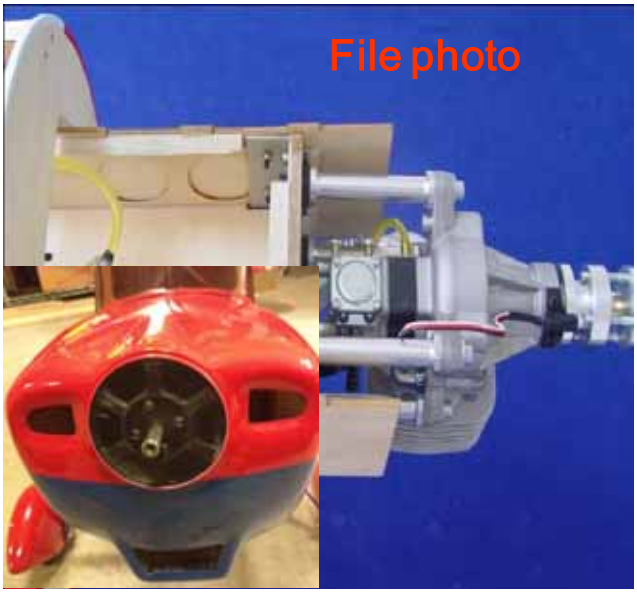
7. Repeat steps for the other elevator servo.

# *Engine installation*

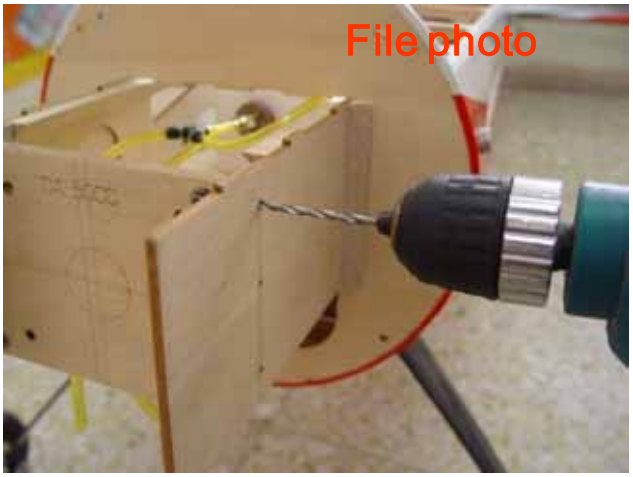
1. Using a template, locate, drill, and install the engine centered to the firewall.



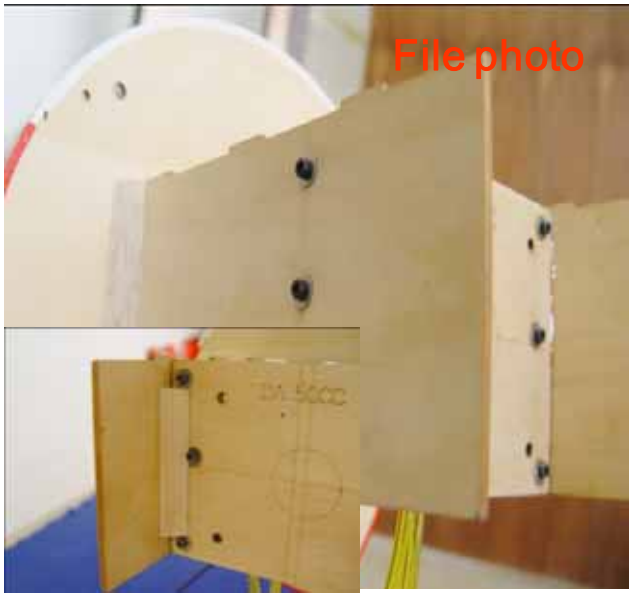
2. Fit the firewall with the attached engine into the motor box (without glue). Install the engine cowl over the engine. Install the spinner bulkhead onto the engine and center the spinner bulkhead with the cowl.



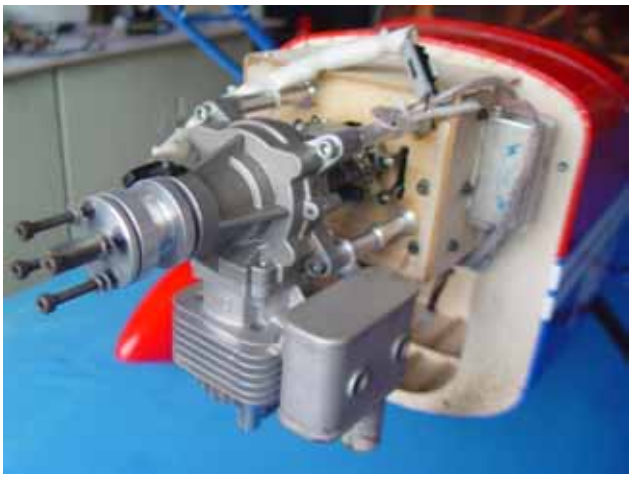

3. Remove cowl and mount fire wall at present location. Drill 3mm mounting holes for hardware through the motor box into aluminum angle brackets.



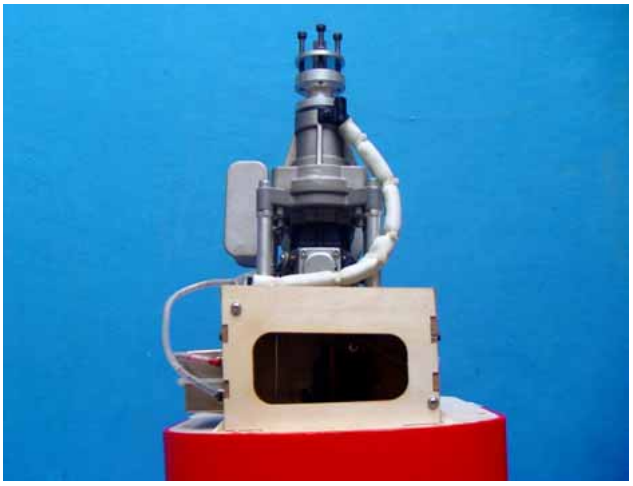

4. Glue the firewall at that location with 30 minute epoxy. Triangle stock is included to reinforce firewall.



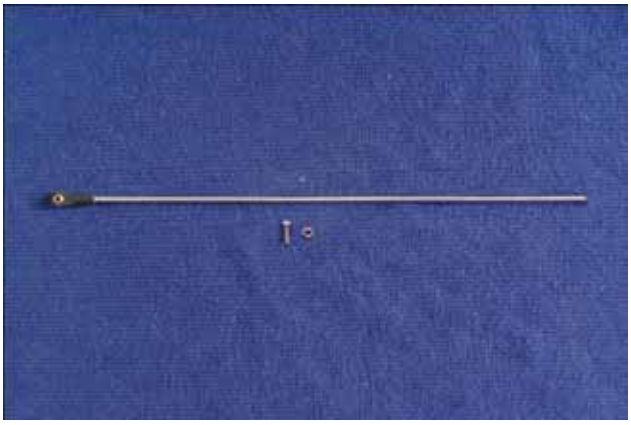
## Engine Installation



Note: Use Blue Loctite on final installation of engine mounting screws.

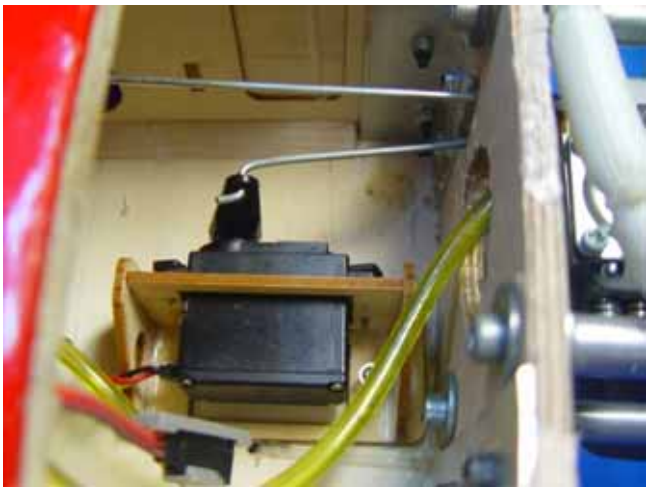


## Throttle Servo Installation

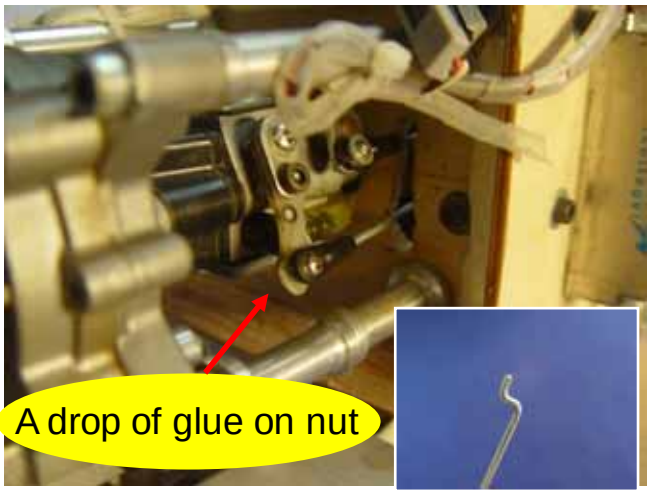


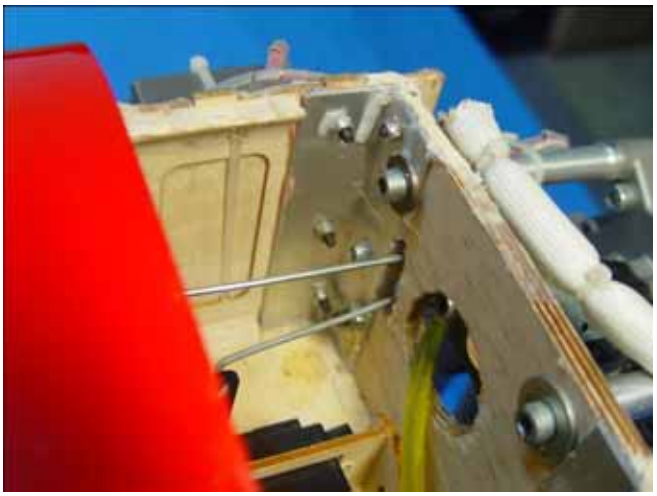
1. Install the throttle servo in the included mounting tray. Mount the tray in the engine box behind the fire wall. Make pushrod path is in a straight line for a precise throttle linkage connection. Epoxy and screw the tray in place.

2. Make a hole for push rod path with a Dremel tool. Measure and bend to a sharp “Z” bend as shown. Cut off extra length wire. Mount the throttle pushrod ball end to the throttle arm and “Z” bend to the servo arm.

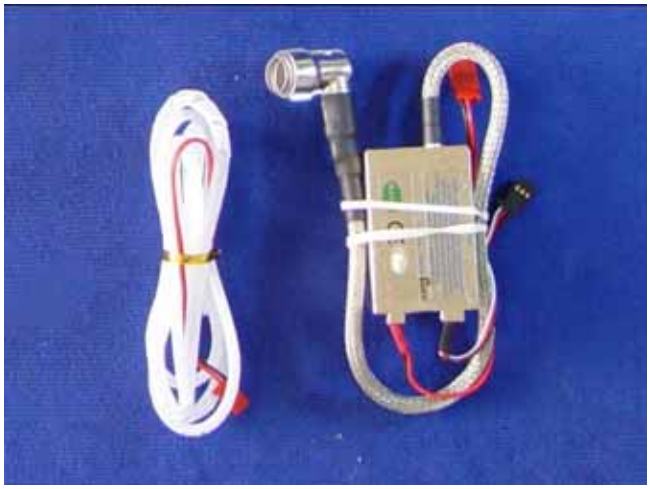


5. Finish the servo installation with two additional mounting screws.

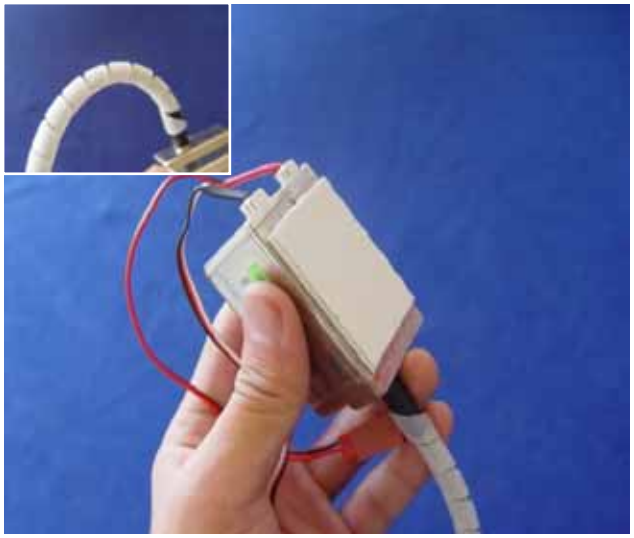


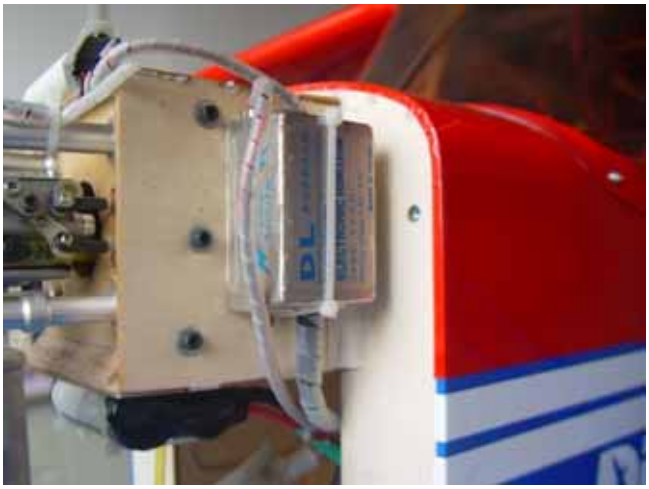
## Ignition Module



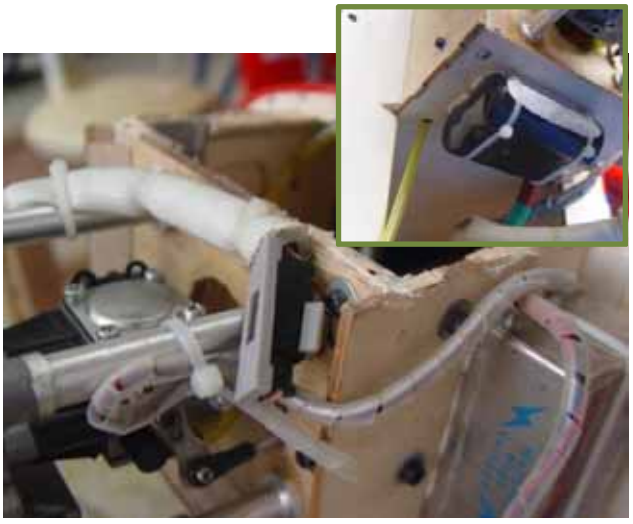
1. Attach foam rubber to the bottom of ignition with double sided tape and install spiral wrap cover to ignition lead as shown.



2. Stick the ignition to the outside of the engine box with double sided tape. Allow room for spark plug leads and wire connections. Drill holes in motor box for zip ties and secure module with ties.

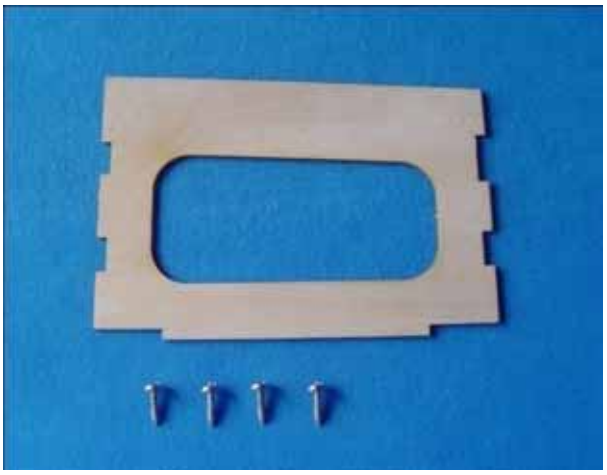


3. The ignition battery installs the same manor except under the engine box. Lock the connectors with the provided safety clip to prevent vibration from loosening connections.

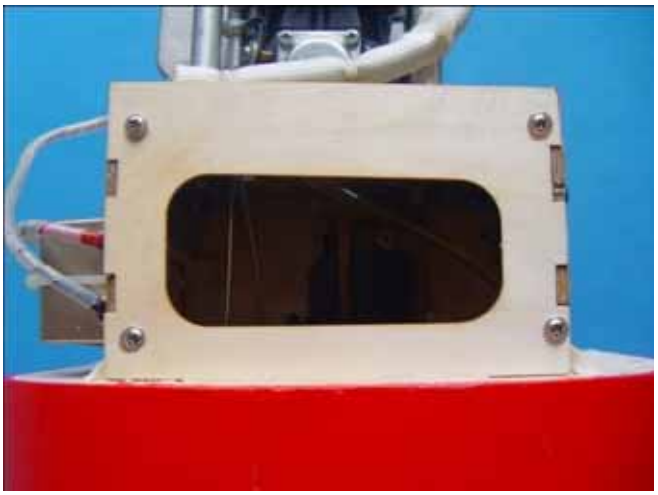


# *Hatch and fuel tank*

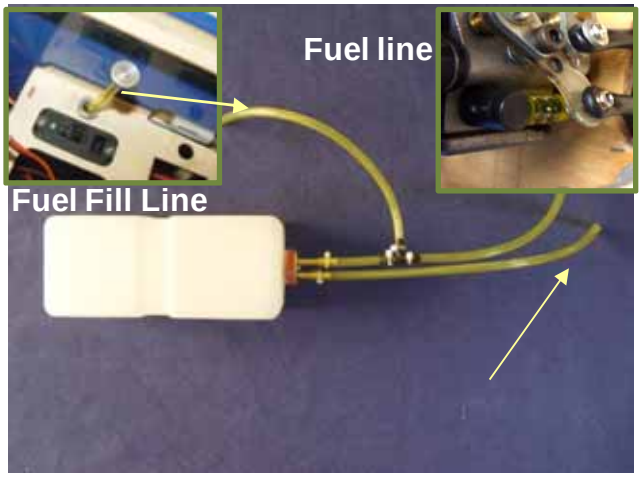
## Engine Box Hatch



Epoxy the hatch in place and install self-tapping screws.



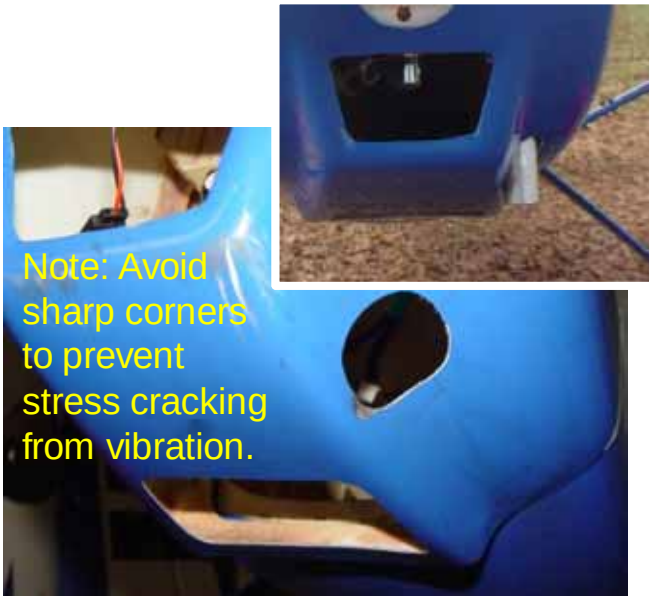
## Fuel Tank And Dot




Mount the fuel tank with Velcro straps. There is a factory laser cut hole for the fueling dot aft of the engine cowl on the left hand side of the fuselage. Secure all fuel lines connections with zip ties.

## Cowl Assembly

1. Use a Dremel cutting tool to rough cut the cowl for clearance for the exhaust system and for additional cooling. The air exit hole must be larger in diameter then the air inlet for sufficient cooling. Remove any rough edges with sandpaper.



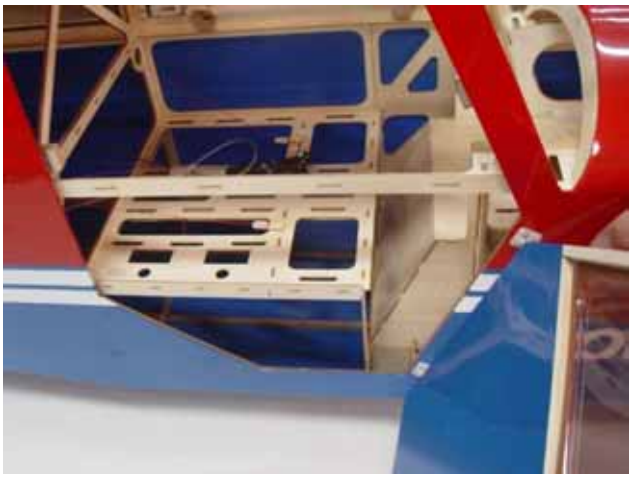

2. Install the plastic cooling air deflector(only offer for 107-122" decathlon) to the inside of the cowl. Secure with thick CA or silicone. Some trimming might be necessary for clearance with the engine.

Note: An extended Allen wrench is needed to reach the hardware to remove and install the cowl.

Extend a ball driver tool by cutting standard ball driver in half and adding a section of copper tubing a small heat shrink tubing.

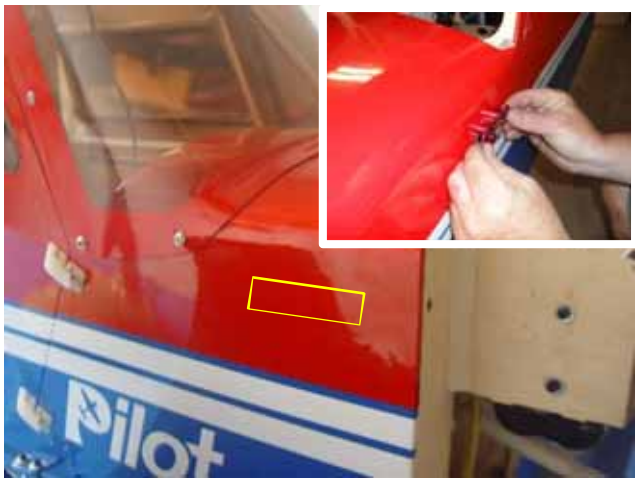
## Switch Assembly

1. Opening the cabin door exposes two additional pre cut switch locations in the servo mounting plate.



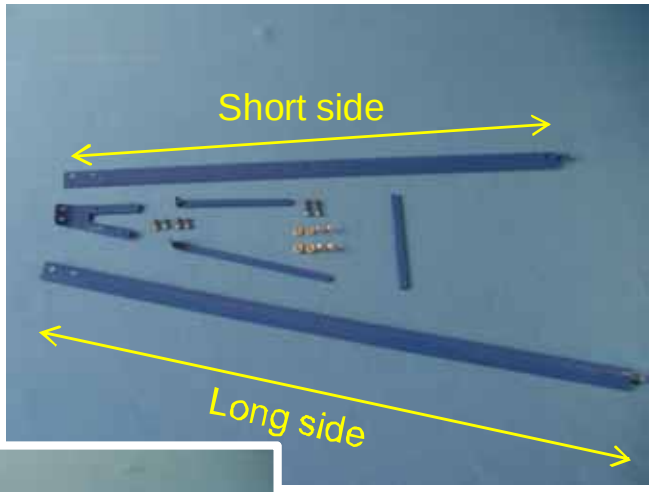
Note: Factory installed laser cut switch mounting holes are located under the covering on either side of the fuselage for your convenience.

2. Finish the mounting the switch with screws and nuts.

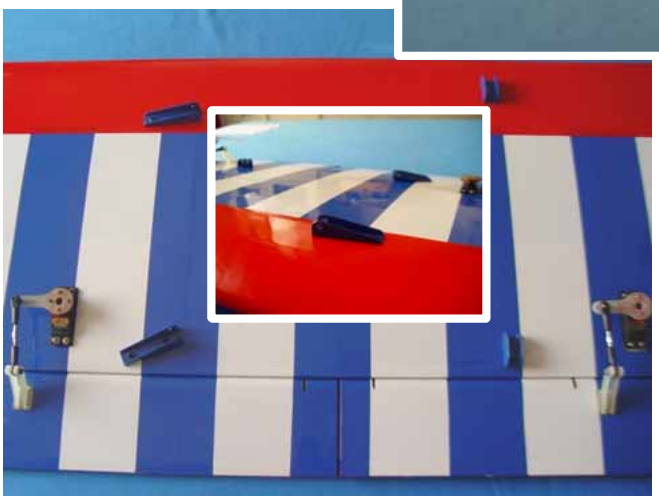



## *Wing Assembly*

2. Layout, identify, and assemble lift strut components. Do not fully tighten hardware at this time.

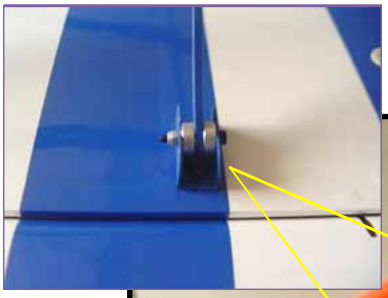



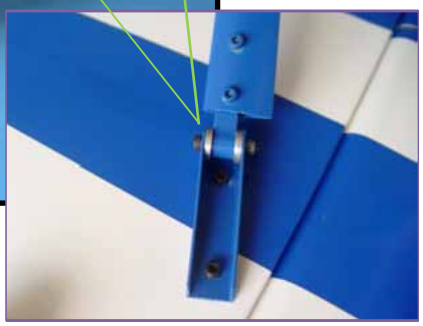

1. Install the brackets at mounting locations under side of wing. Use Loctite on threads.



# *Wing Assembly*

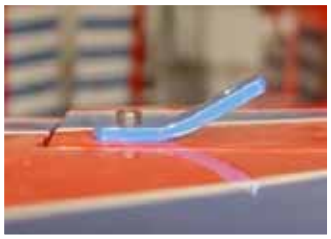
Use the included spacers and mount the lift struts to the wing. Thin spacers are for the out board brackets and thick spacers for the inboard brackets. Leave hardware lose. Install wings on fuselage and make sure every thing is aligned. Tighten all hardware.

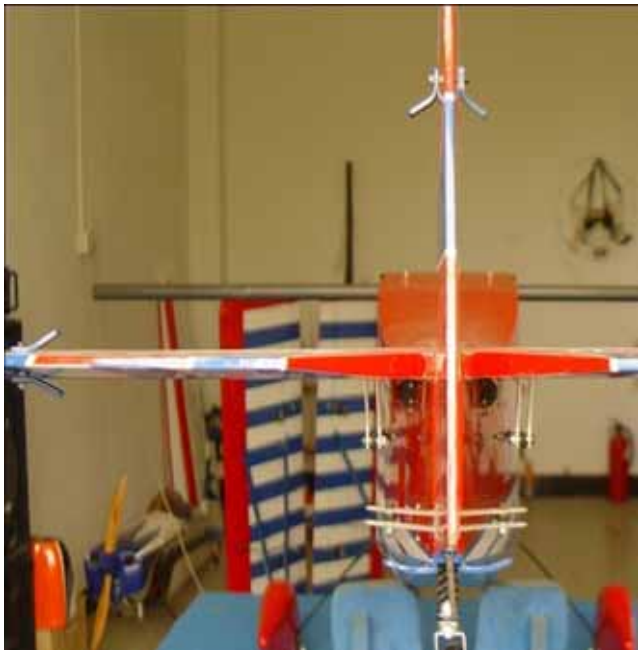


## *Elevator Assembly*

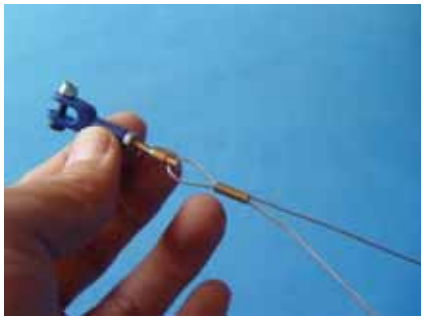
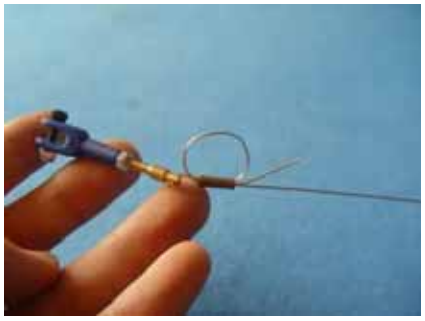
1. Install the aluminum brackets onto the tail for the wire bracing. There are a total of seven brackets for the tail assembly. There are four identical brackets that are for the horizontal stabilizer, two with steeper bands that are for the vertical stabilizer, and a double sided bracket that mounts on the aft screw of the tail wheel bracket under the fuselage.

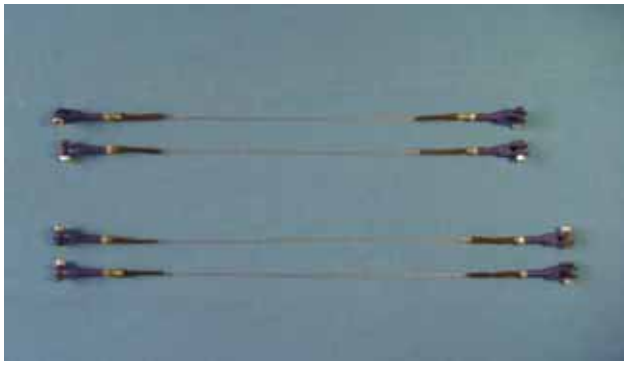




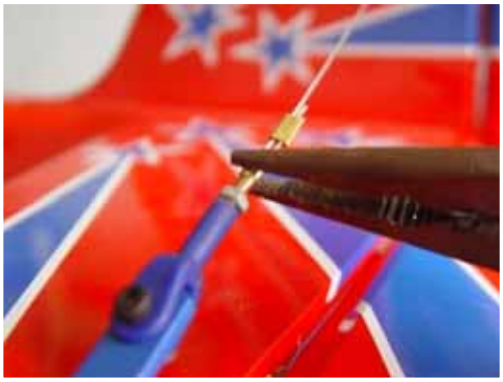
2. Attach the nylon clevises and threaded cable ends to the metal tail brackets. Install the included cables and crimp into position. Balance cable tensions.

# *Elevator Assembly*

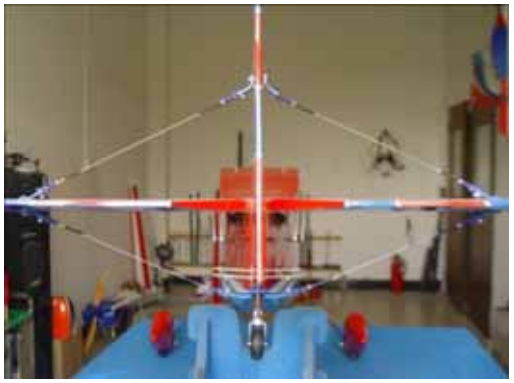







Note: make sure cable tensions are balanced to prevent warping.



# *CG And Control Throws*

## Center Of Gravity

The center of gravity is near to the wing tube .For more plane please refer to the CG list

Avoid adding weight to your Decathlon for CG purposes. Position the batteries where required in order to correctly balance your model. Mount batteries on a bed of foam and secure with Nylon ties or Velcro straps.

## The First Flight set up

Throttle: Adjust idle –full

Elevator: 40 Degrees on High rate

12 Degrees on Low rate

Aileron: 30 Degrees on High rate

12 Degrees on Low rate

Rudder: 45 Degrees on High rate

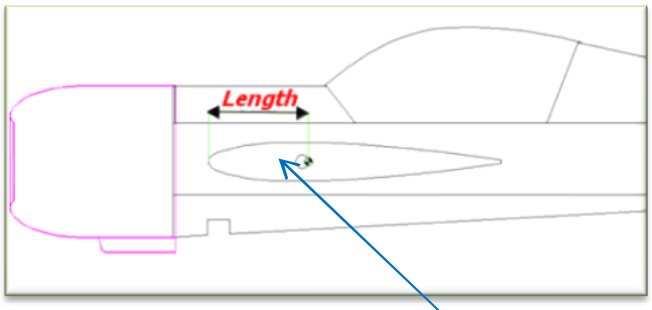
40 Degrees on Low rate

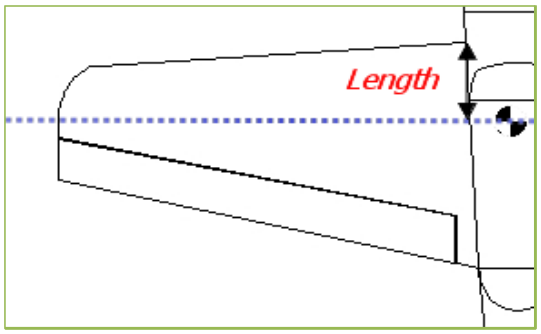
■ After you have a few flights under you belt you can change control deflections based on personal preference as well as adjust the CG back in 1/4" intervals.

■ Set exponential up to approximately 40% on your elevator to make great landings on low rates and 70% exponential on High Rate.

# Center of gravity

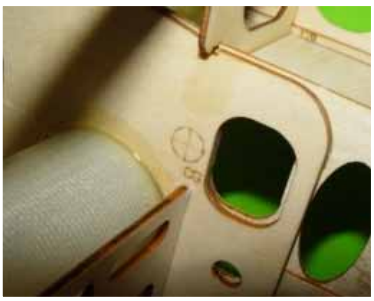
*The CG list of Pilot-RC products*




This recommendation balance point is for your first flight.The CG can be moved around to fit your personal taste.

| PLANE | CG location |
|---|---|
| DECATHLON 107” | 133mm/5.2inch |
| DECATHLON 122’’ | 145 mm/5.7inch |
| DECATHLON 150’’ | 182 mm/7.2inch |
| DECATHLON 180’’ | 217 mm/8.5inch |
| YAKM55 73” | 165mm/6.5inch |
| YAKM55 88’’ | 216 mm/8.5inch |
| YAKM55 107’’ | 267 mm/10.5inch |
| YAKM55 122’’ | 287mm/11.3inch |
| YAK-54 53’’ | 126mm/5.0 inch |
| YAK-54 73’’ | 156 mm/6.1inch |
| YAK-54 87’’ | 183 mm/7.2inch |
| YAK-54 107’’ | 225 mm/8.9inch |
| YAK-54 121’’ | 266 mm/10.5inch |
| YAK-54 129’’ | 273 mm/10.7inch |
| YAK-54 148’’ | 314 mm/12.4inch |
| YAK-54 180’’ | 401 mm/15.8inch |
| EXTRA-300/330 73” | 154mm/6.06inch |
| EXTRA-300/330 88” | 170mm/6.7inch |
| EXTRA-300/330 107” | 211mm/8.3inch |
| EXTRA-300/330 122” | 236mm/9.3inch |
| Sbach 342 53’’ | 132mm/5.2inch |
| Sbach 342 73’’ | 145mm/5.7inch |
| Sbach 342 87’’ | 173mm/6.8inch |
| Sbach 342 107’’ | 234mm/9.2inch |
| Sbach 342 122’’ | 269mm/10.6inch |
| Sbach 342 148’’ | 305mm/12 inch |
| Columbia 400 128’’ | 136mm/5.35inch |
| Columbia 400 150’’ | 141mm/5.6inch |
| Edge-540 73’’ | 116mm/4.5inch |
| Edge-540 87’’ | 136mm/5.35inch |
| Edge-540 107’’ | 141mm/5.6inch |
| Edge-540 122’’ | 166mm/6.5inch |
| EXTRA-260 73’’ | 140mm/5.51 inch |
| EXTRA-260 87’’ | 170mm/6.7inch |
| EXTRA-260 106’’ | 202mm/7.95inch |
| EXTRA-260 122’’ | 248mm/9.8inch |



The location of CG has been marked inside plane as show. Usually it is near the wing tube.

# *Flight Preparation*

■ Make sure you have the right model programmed into your transmitter.
■ Check the direction of each control surface before flight.
■ Remember something wrong on the ground, never improves in the air.
■ Do a range check of the radio system with the engine running and check with.
■ Monitor battery voltage after each flight in case one servo is draining your battery.
■ Recheck all screws, horns and linkages for slop after your maiden fight and always check for damage in the event of a rough landing.
■ Have an experienced pilot perform the maiden flight if you have any doubts in your skills.
■ Take a break after you first flight and let the adrenaline burn off by bragging to your fellow members how good it flies.
■ Fly conservatively your first few flights.
■ Listen to your engine run and have an observer with you to remember what you talked about during the flight and encase you get into trouble.
■ Always balance your props, vibration is a killer.
■ Remember nose heavy airplanes fly all the time, tail heavy airplanes fly only once. Be on the CG!
■ Fly 3D two mistakes high in the beginning and not close to people, other planes, or the run way.
■ Being a center of the runway hog does not endear you to fellow modelers.

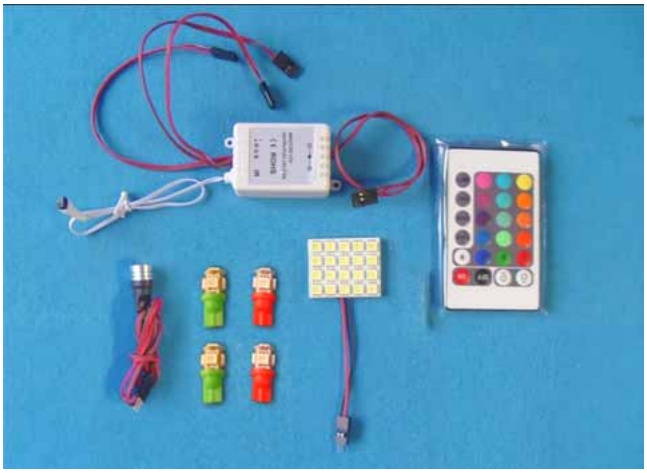
■ Check with the engine manufacturer’s for recommended running temperature and make sure that it is not exceeded.

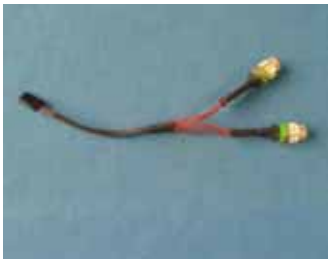
■ Pilot-RC doesn't accept responsibility for any damage from improper engine cooling.

# *LED Assembly option*

## *LED Assembly*

Pilot-RC Optional LED lighting kit.





Some soldering is required.