



**Assembly Manual For**  
**50cc aerobatic plane**



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## **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.

**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:**

Email: [pilot-rc@139.com](mailto:pilot-rc@139.com) , [info@pilot-rc.com](mailto:info@pilot-rc.com)

Phone: +86 760 88781293

FAX: +86 760 88780293

Address: No.34, Chengnan Er Road , Zhongshan city, 528400, Guangdong Province, China



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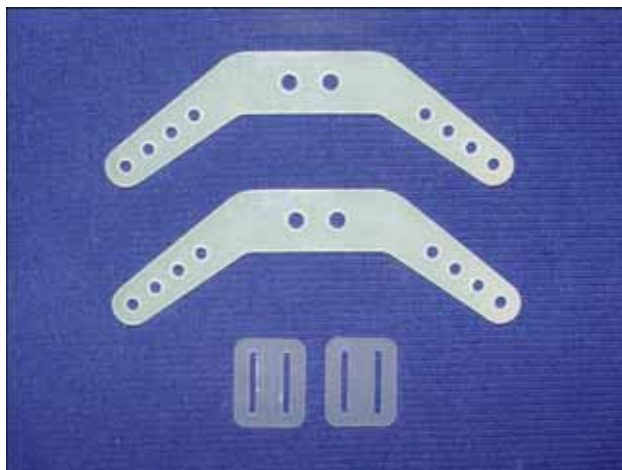
## **Engine Unit**

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## ***Rudder Assembly***

### Rudder Control Horn



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



2. Trace around the locking plate with knife and cut off the cover (see below). Then the pre-cut slots appear





3. Scuff the middle of horns with a piece of sand paper for good glue bond. Then clean up the surface



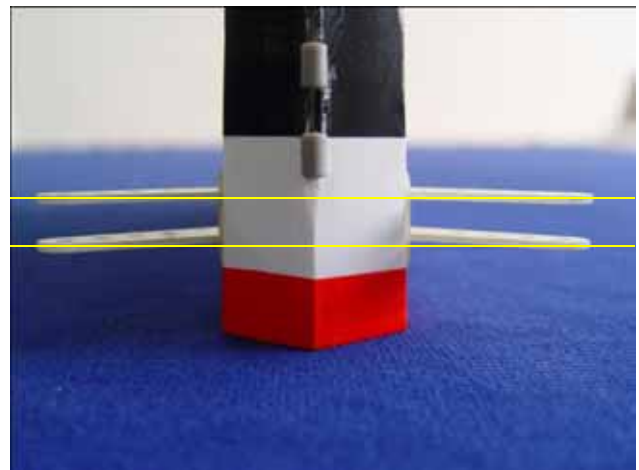
4. Apply the 30 minutes epoxy inside the pre-cut slot, and coat the horn with epoxy as shown



5. Slid the horns into slots slightly, mount the locking plates in place. Wipe away excess glue with rubbing alcohol



6. Make sure the horns line up (by installing the steer bolts )and align the both side before epoxy has cured



### Tail Wheel Installation



1. Draw a center line with a pencil as shown



2. Drill holes on the tail wheel mounting block accordingly with the tail wheel strut taped in place or mounted with one bolt as shown

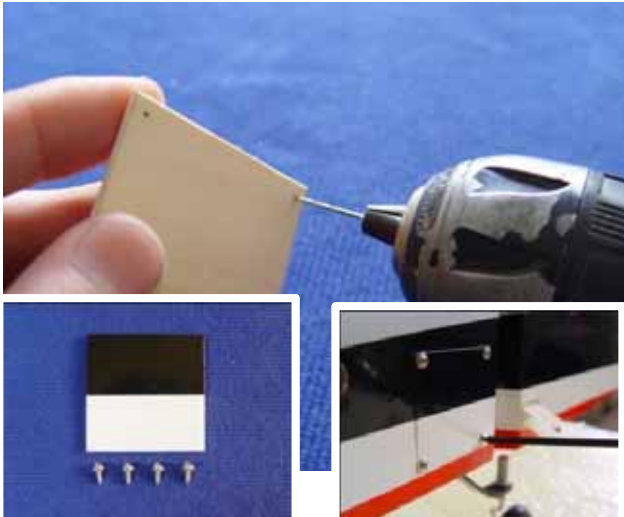


3. Install the blind nuts through the opening in the rear of the fuselage and fit screws for the tail wheel using Blue Loctite on the thread





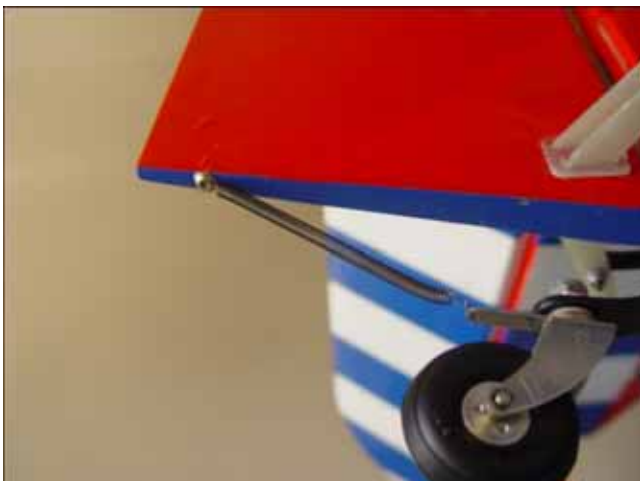
4. Install the hatch over the opening in the rear of fuselage with the 4 screws in line with the pre-drilled holes



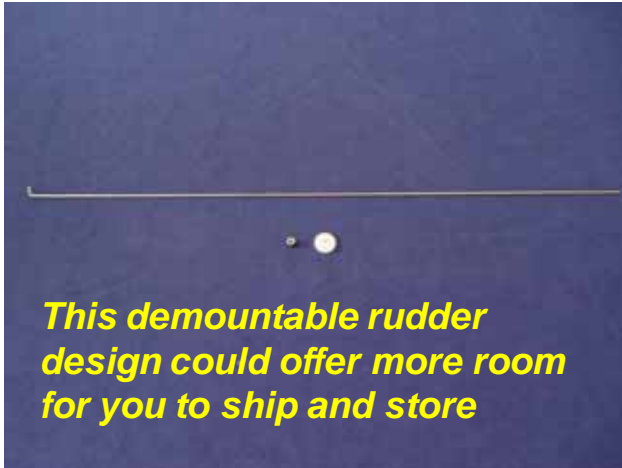
Ensure the spring has been fitted tightly for correct operation of tail wheel when rudder operates



5. Drill a 1mm hole and mount spring on the bottom of rudder with self-tapping screw as shown. Cut away excess wire



### Rudder Axis Installation



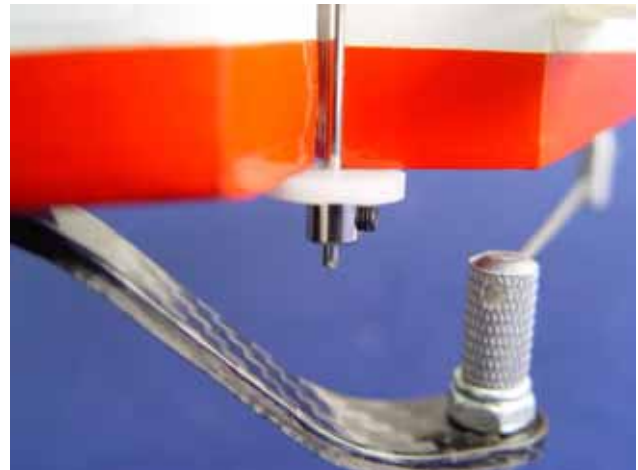
1. Using the rudder pin pierce the cover through the pre-installed brass tube by trial fitting through hinges in reverse direction



2. Align the rudder in place inserting the steering arm through the steering tube in top of rudder ensure pin bent end sits flush on top of rudder



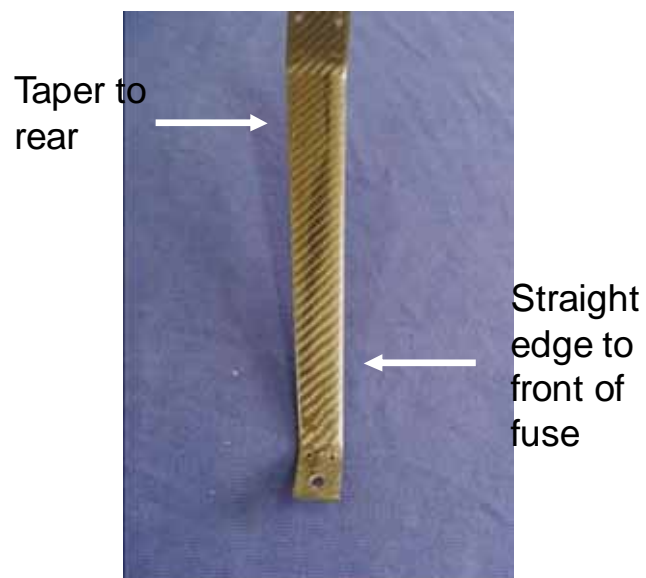
3. Tighten the collar set screw with 1.5mm Hex Wrench as shown



## ***Main Landing Gear Installation***



**NOTE:** the correct edge in mounting



1. Install the landing gear with supplied bolts and locking nuts  
Note: Don't over tighten and crack the carbon fiber



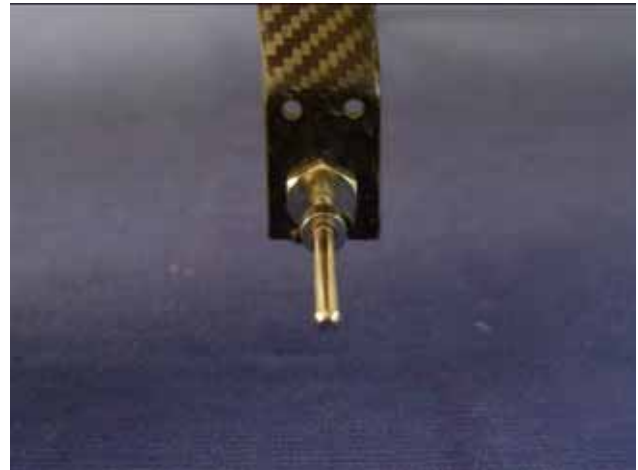
2. Install the landing gear axles with lock nut, but do not tighten yet



3. Lift the rear of fuse to line it up with ground as shown



4. Make the flat sides of the axle bolt vertical with ground. **Then tighten the lock nut against the landing gear strut**



5. Install the collars and wheels in correct order, use **a drop of Blue Loctite** on the collar set screw. Ensure the wheel freely rotates.

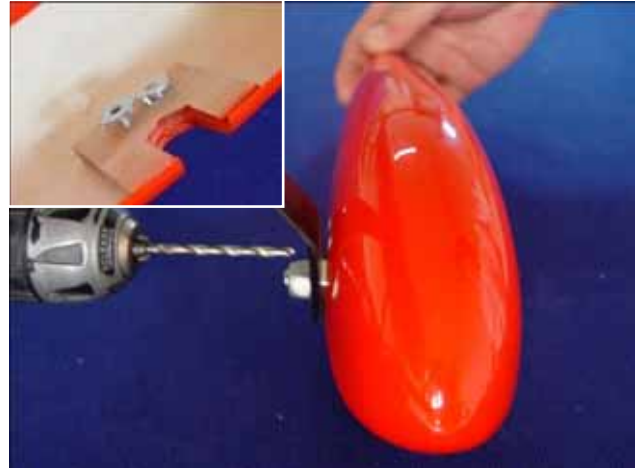


### Pants Installation

1. Lift the rear of fuselage and line the wheel pant horizontal with ground by slipping them over the axles and supporting them from the rear for the proper clearance



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



3. Finish the wheel pants mounting by fitting the bolts, use Blue Loctite on the threads

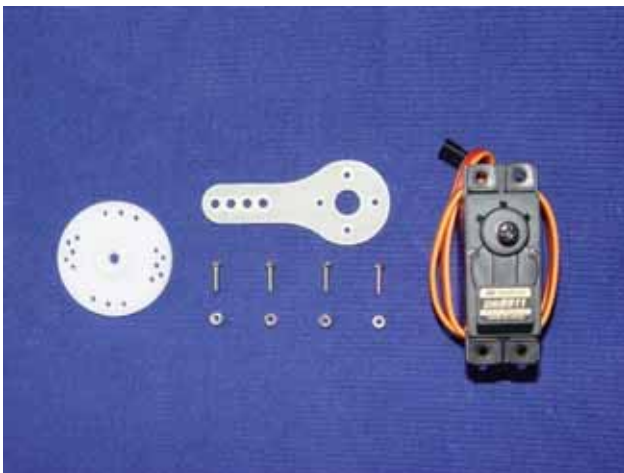




## Wing Servo Assembly

### Servo Arm Installation

Minimum Request Servo:  
180 in.zo / Metal Gear / Digital



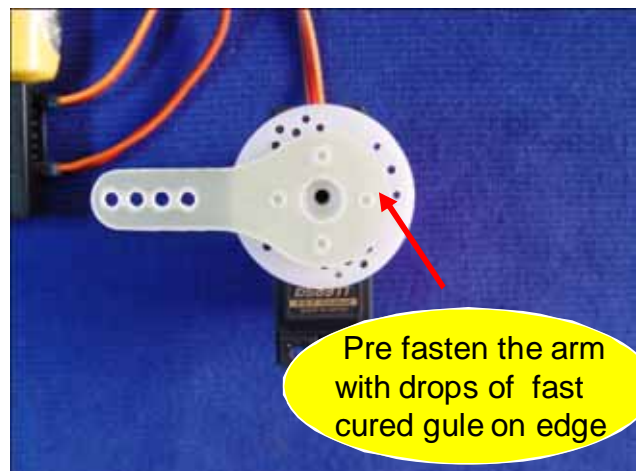
1. Turn on transmitter, plug servo into aileron slot on receiver. Ensure all channel trims set to neutral.

Note: Refer to your radios manual for setting up dual aileron servos

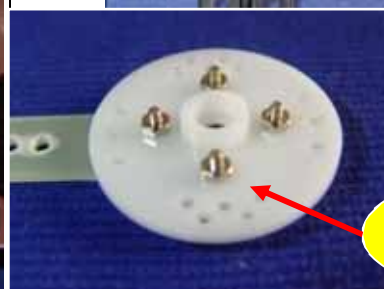
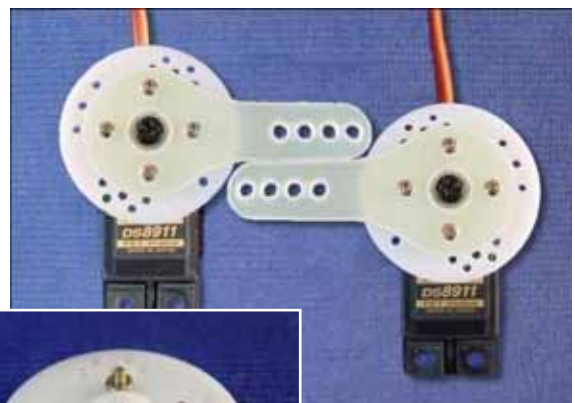


2. Ensure the servo arm is 90 degrees to servo as shown. Then mark and drill holes with 2mm bit.

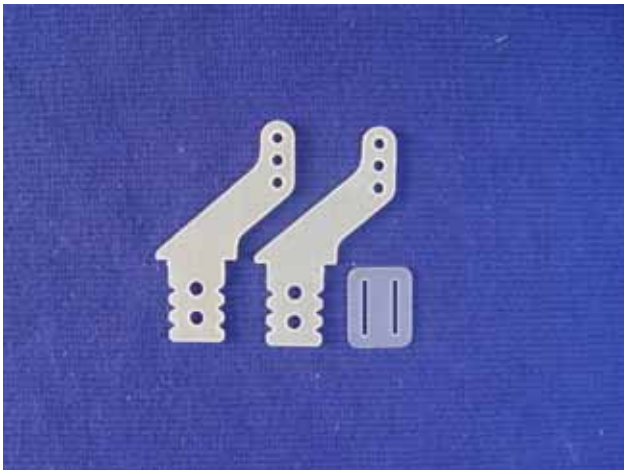
Note: Refer to your radio manual, set sub-trims and end points to obtain equal throws on both wing servos in all directions.



3. Mounting screws and nuts



### Aileron Control Horns



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



2. Trace around the locking plate with knife and cut off the cover below. Then the pre-cut slots appear



3. Scuff the horns with a piece of sand paper for good glue bond. Then clean up the surface



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



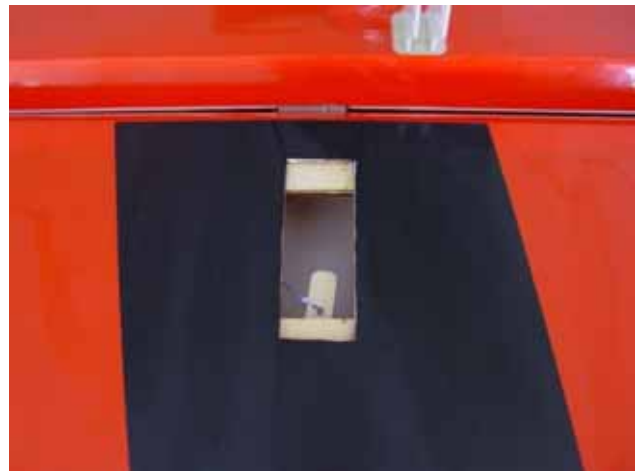
5. Slide the horns into slot slightly and Mount the locking plate in place. **Align the right and left sides** before epoxy has cured. Wipe away excess epoxy with rubbing alcohol



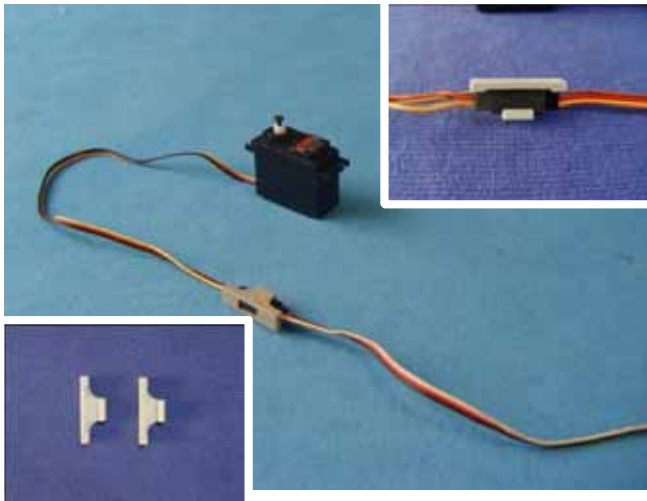
### Servo Installation



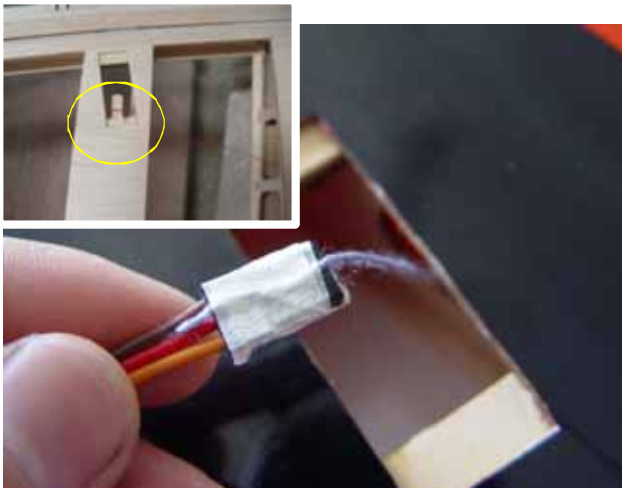
1. Cut out the cover for servo location carefully as shown



2. Lock the connector with the provided safety clip to prevent disconnection during use.



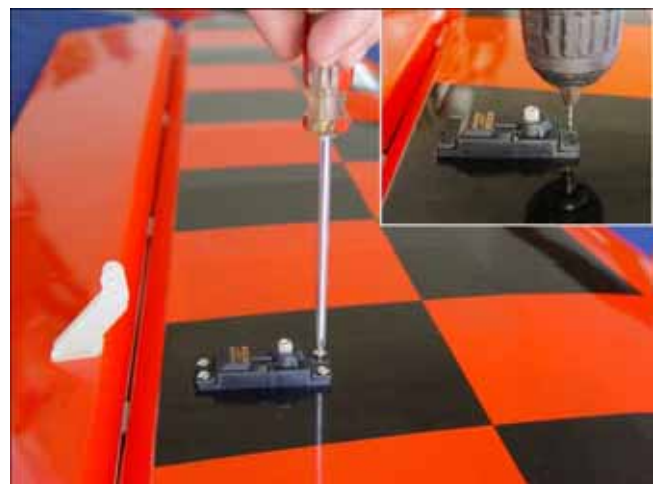
3. Tape the lead to pull-string tightly. In order to ensure the servo wire can be pulled out without hanging up inside wing



4. Then put the extension lead through the root of wing



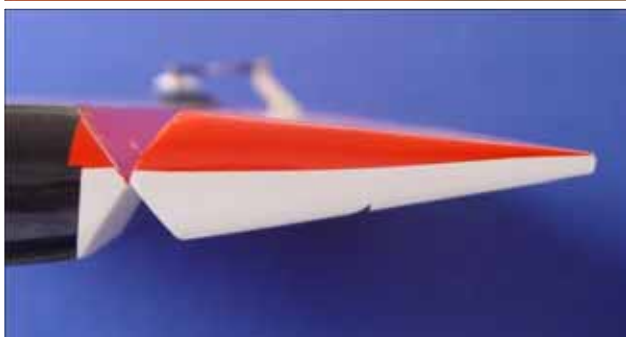
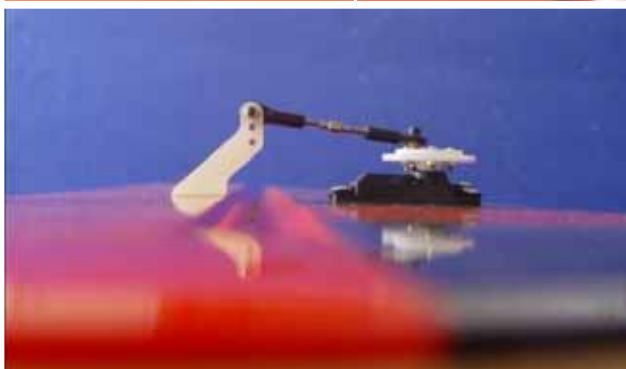
5. Install servo with mounting screws. Face the brand toward the trailing edge of the wing. Drill 1mm hole for mounting screws, fix servo





6. Install the servo arms facing toward the wing tip and adjust pushrod to correct length to keep the aileron in the neutral position.

(Connect servo, turn on radio to centre servo reset pushrod as required)



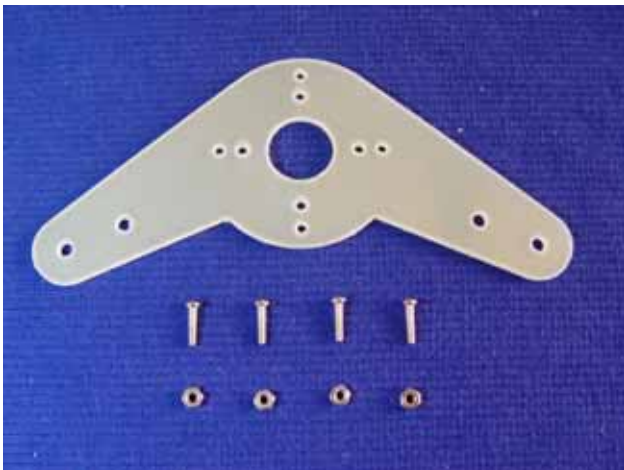
7. Repeat all steps above for the other wing

The carbon tube and wing bolts are used to mount wings to fuselage in the final assembly.



## Servo Tray Installation

Minimum Request Servo:  
180 in.zo / Metal Gear / Digital

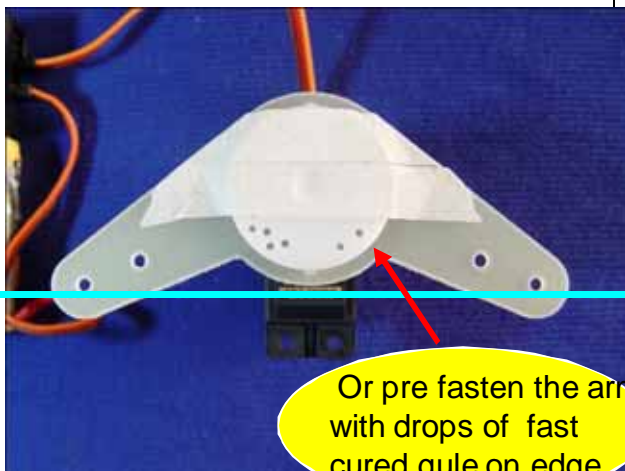


1. Turn on transmitter, plug servo into rudder slot on receiver. Ensure trim set to neutral. Align rudder arm and tape or glue in place ready to drill holes.

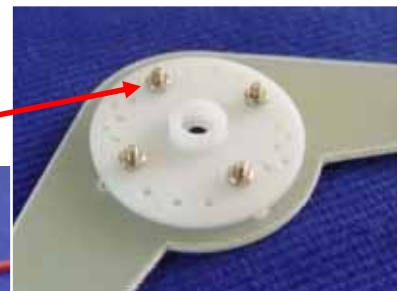
2. Drill 2mm holes for screws



3. Mounting screws and nuts

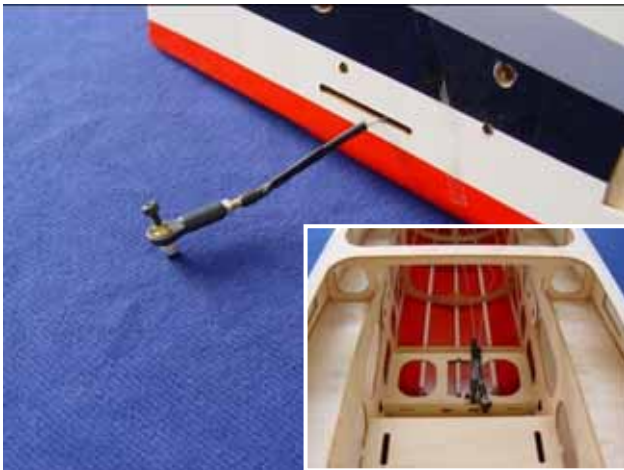


A drop of fast  
cured gule here



### Servo Installation

The rudder cables and couplers have been installed as shown



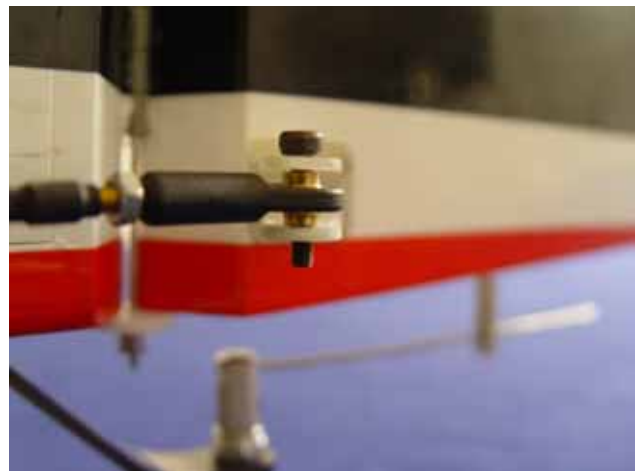
1. Mount servo with mounting screws and face the brand label toward the rudder. Drill 1mm holes and fit screws.



2. Tape the rudder panel to top of the vertical fin in the neutral position to make it straight



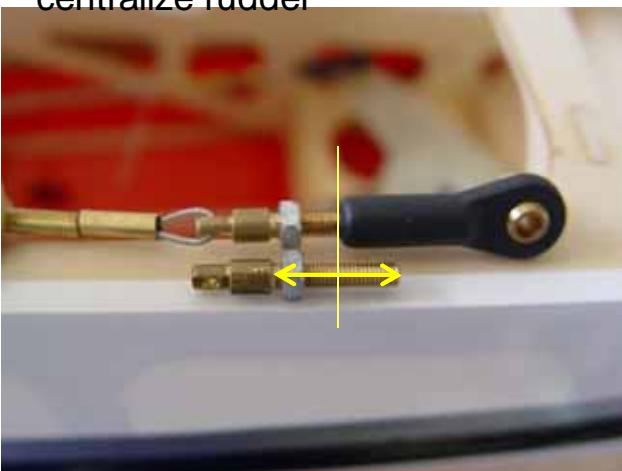
3. **Turn on radio to centre the servo.** Attach the pre-installed ball link to the rudder horns without locking nut as shown



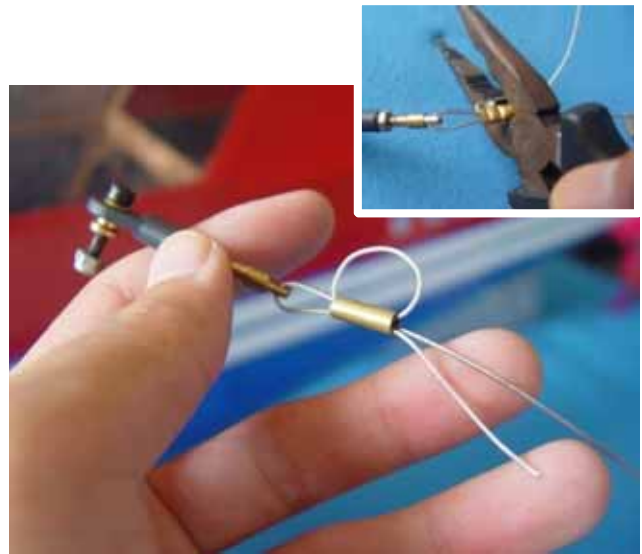
4. Mount the pre-installed ball link to the rudder servo arm without locking nut. Put two brass tubes on the cable and thread through the coupler hole. Ensure the cables are straight



NOTICE: The coupler thread is fitted half way into ball link for further adjustment if needed to centralize rudder



5. Crimp the brass tubes with crimping pliers once satisfied alignment is correct

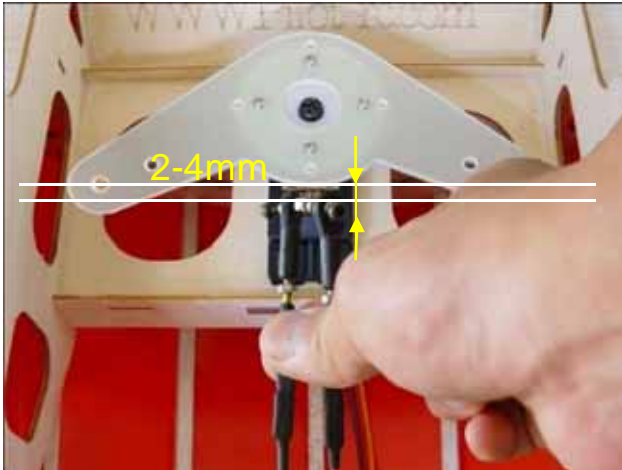


6. Cut away excess cable





7. Thread the coupler in 2 – 4 mm.  
Ensure the same length of cables and tension



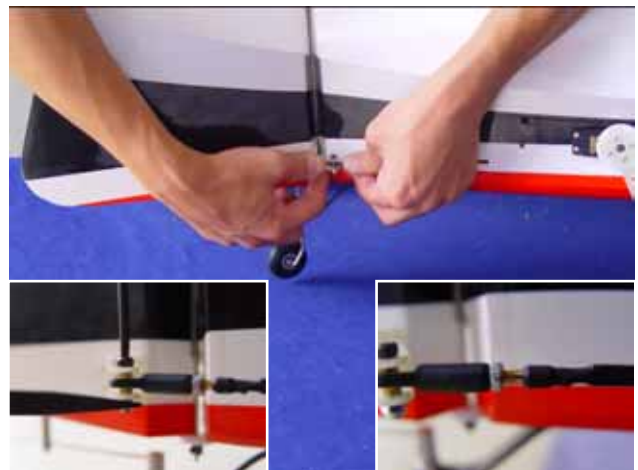
8. Shrink the heat shrinking tube on the brass tube and just overlap to base of thread to prevent twisting



9. Remove the ball links from rudder horn and install the servo arm ball links with bolts and nuts

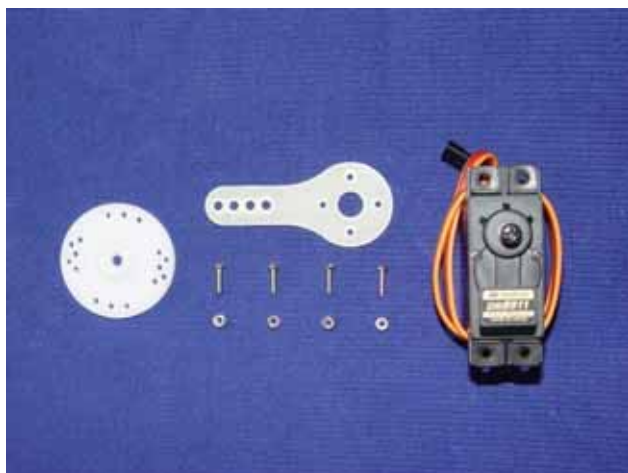


10. **Turn off radio now.** Reinstall the ball link, do not over tension as you may damage rudder. If tight then re-adjust ball link on rudder servo arms. Cables to be tensioned enough to hold rudder firm at neutral point.



### Servo Arm Installation

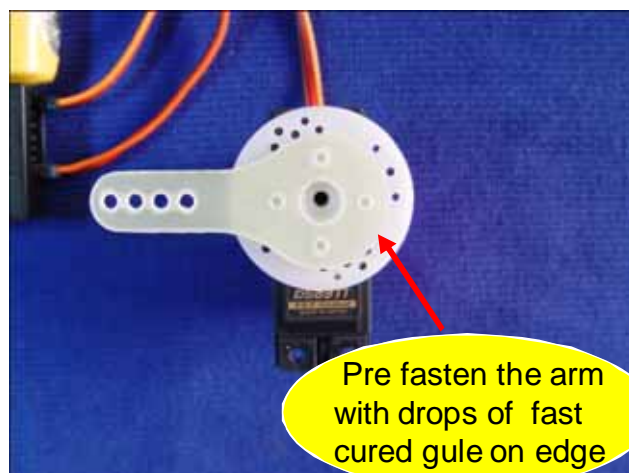
Minimum Request Servo:  
180 in. zo / Metal Gear / Digital



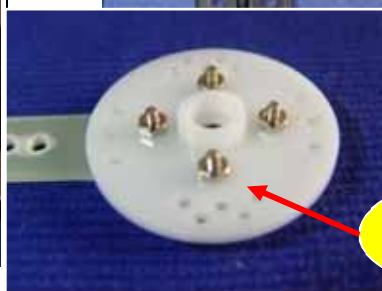
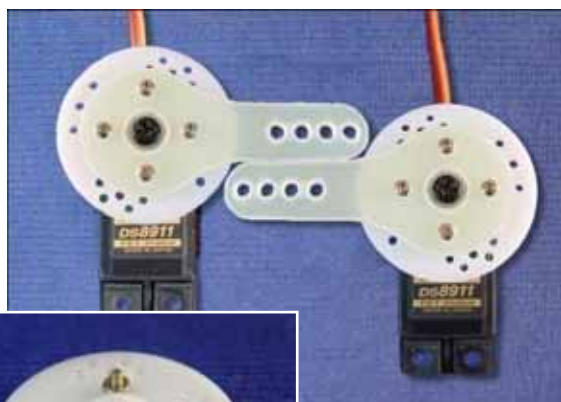
1. Turn on your transmitter and plug the servo into receiver. Ensure every channel is neutral by adjusting sub-trim



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

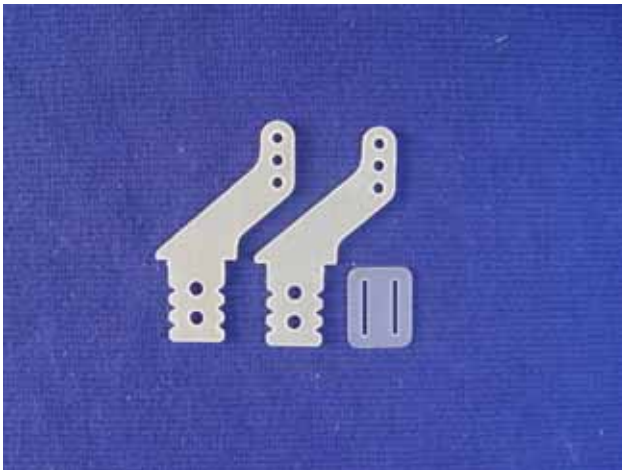


3. Mounting screws and nuts





### Elevator Control Horns



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



2. Trace around the locking plate with knife and cut off the cover below. Then the pre-cut slots appear



3. Scuff the horns with a piece of sand paper for good glue bond. Then clean up the surface



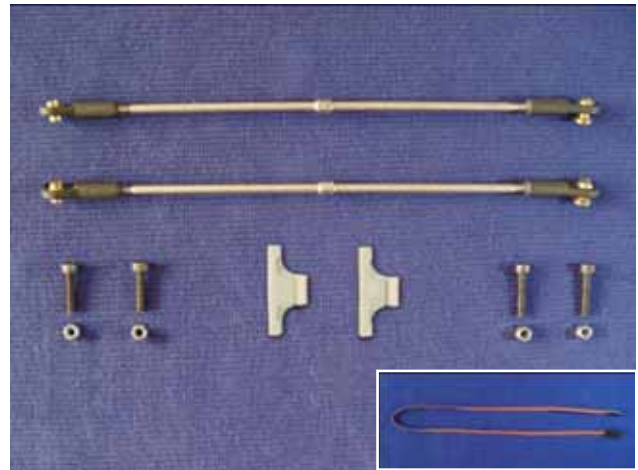
4. Apply the 30 minutes epoxy inside the pre-cut slot for horn, and coat the horn with epoxy as shown



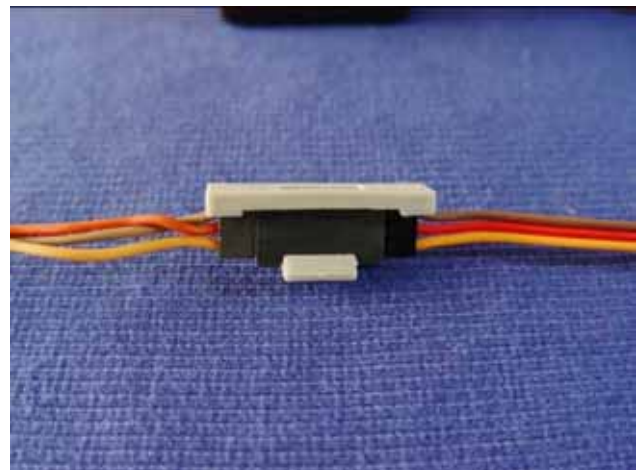
5. Slide the horns into slots slightly and Mount the locking plate in place. **Align the right and left sides** before epoxy has cured. Wipe away excess epoxy with rubbing alcohol



### Servo Installation



1. Lock the connector with the provided safety clip against vibration and loosened tension as shown



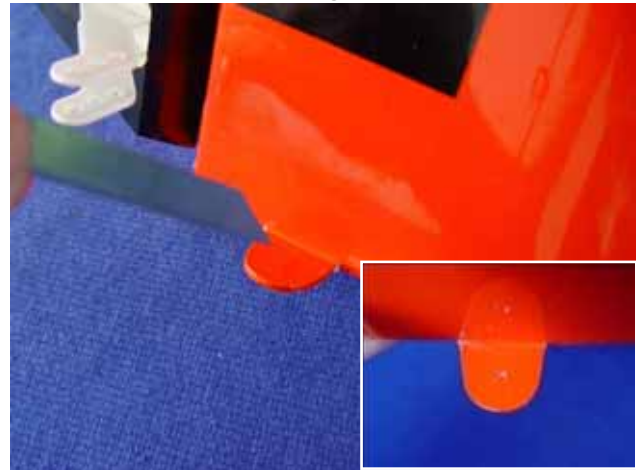
2. Thread the extension lead through fuselage



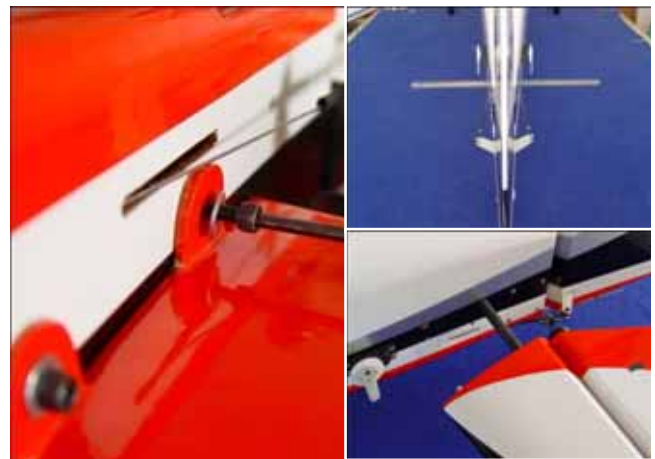
3. Install servos with mounting screws. Face the brand name toward the rear of fuselage. Drill a 1mm hole for servo screws and fix in place.



4. Cut the cover to expose the pre-drilled hole for mounting horizontal stabilizer to fuselage



5. Install the stabilizer with mounting bolts & washers provided.



6. Install the servo arms facing toward the ground, adjust pushrod to correct length so elevator panel is in the neutral position.



7. Repeat all the step above for the other stabilizer





### Switch Installation



**Note:** The switch mounting holes have been pre-cut for standard size switch. If required adjust hole size by using 1.7mm plywood glued on inside and cut hole to match your preferred switch. (ply not supplied)



1. cut off the cover film flush with a sharp knife

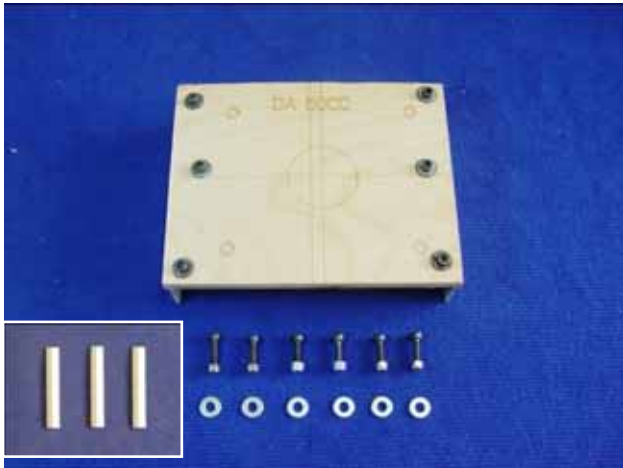


2. Fit supplied switch nuts and bolts.

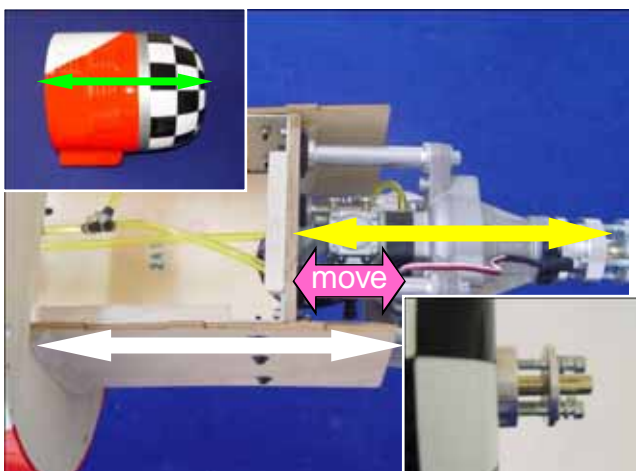




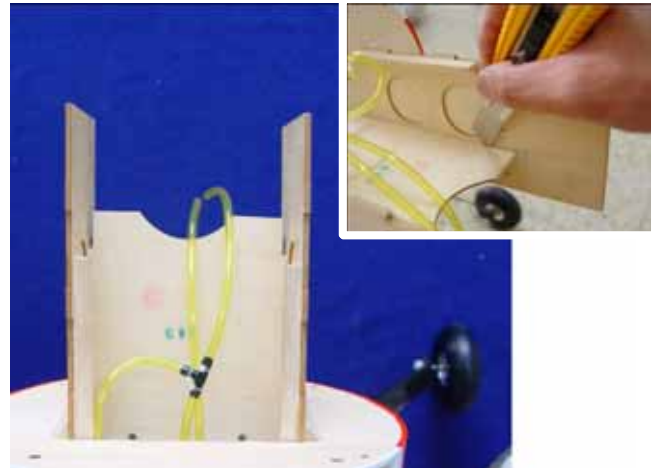
## Firewall Assembly



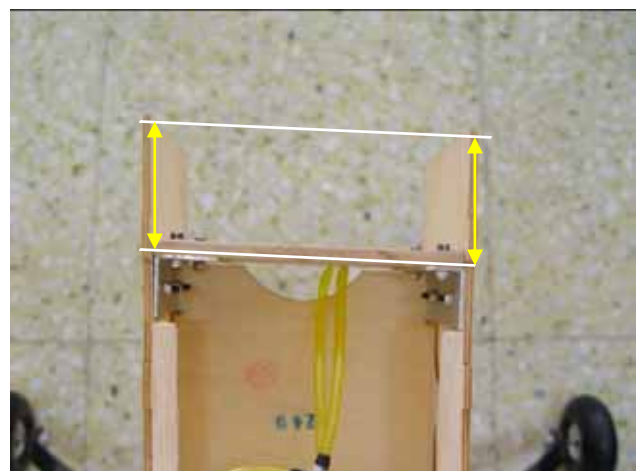
1. Measure the length of the engine (from the firewall to the prop thrust washer), the cowl and the engine box for the proper distance allowing 1/4" to 1/2" from the edge of the cowl. Then mark the location



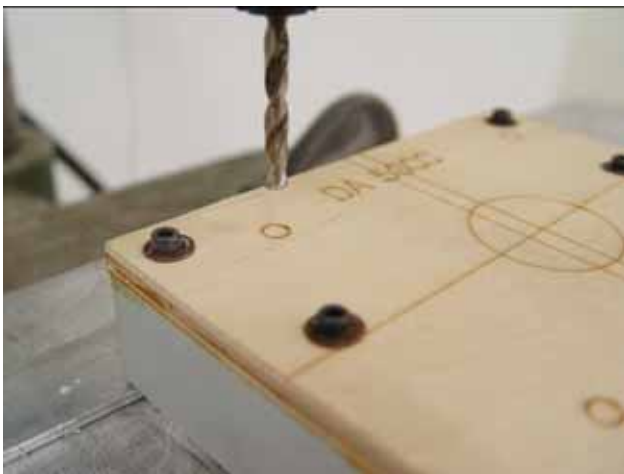
Move if necessary



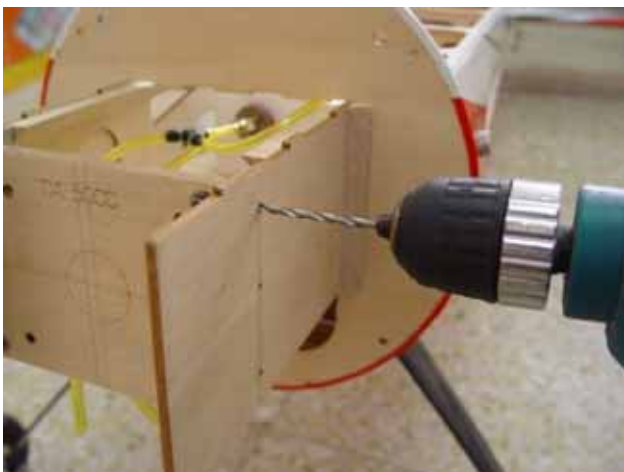
**Note:** The 2 degree right thrust is built in at time of fixing firewall, ensure you align the firewall the same distance from each fuselage edge as shown below.



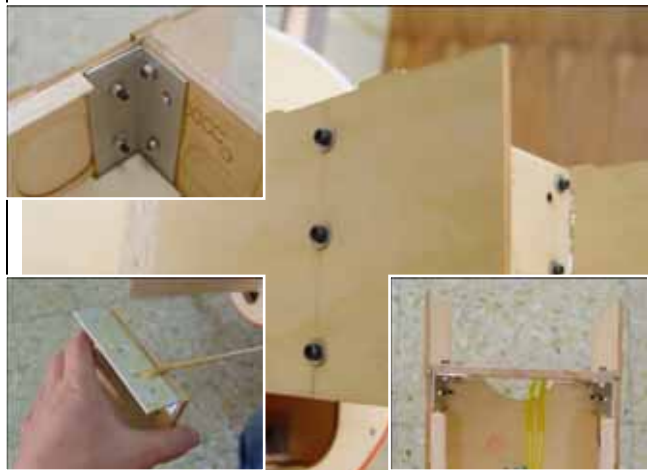
2. Drill the firewall according to the pre-marked laser holes for DA 50.3W 50, or to suit the engine you use, note the offset of the holes to allow for side thrust & centre prop in cowl. Install the firewall after drilling.



3. Drill the side screw mounting holes aligning the line you have drawn both side as shown with the firewall taped or glued slightly in place using a 3mm drill.



4. Epoxy the firewall with 30 minutes epoxy and use the mounting screws and lock nut to fasten it immediately as shown



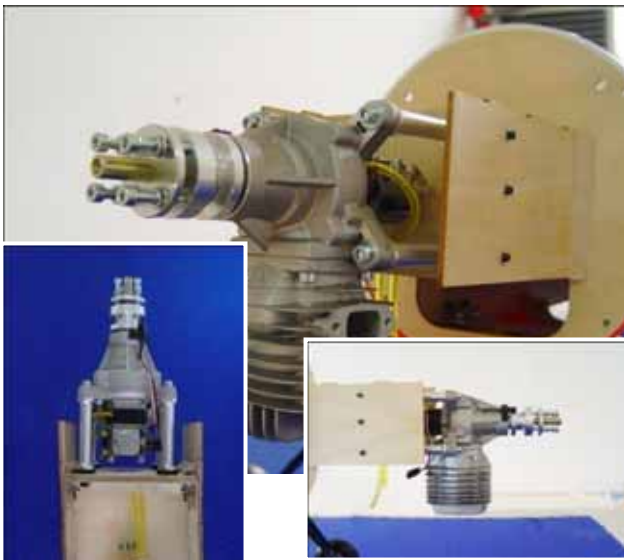
**Note:** Epoxy the triangular hardwood supports to reinforce.



## Engine Installation



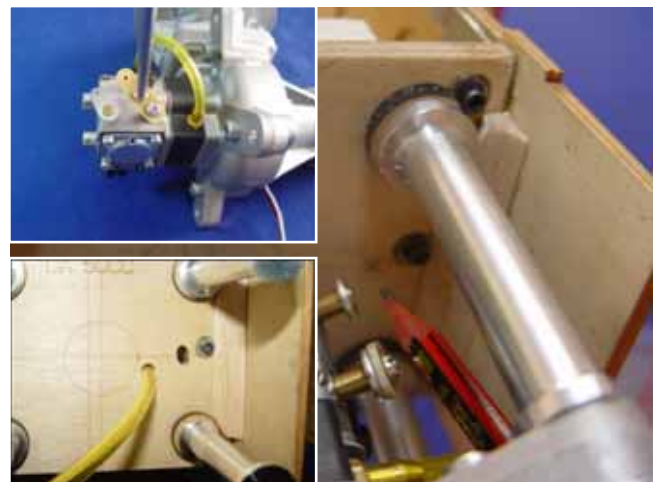
**Remember:** Only use Blue Loctite on all engine mounting screws once you have installed the throttle servo and drilled the fuel line hole in firewall, pre-fit and try throttle before final fixing of engine.



## Throttle Servo Installation

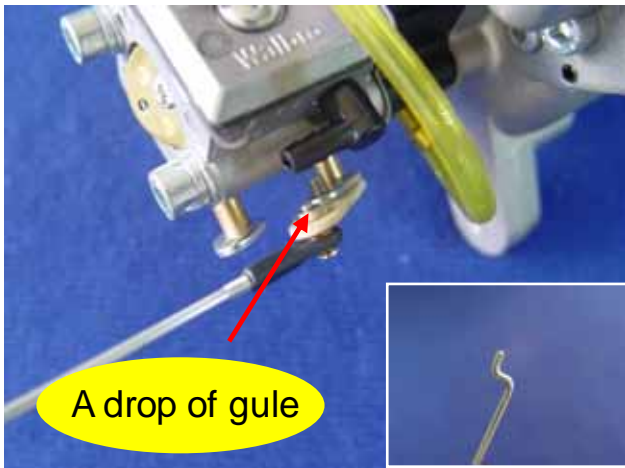


1. Install the engine throttle arm with a little Blue Loctite and mark the throttle pushrod hole and fuel line location, then drill as shown





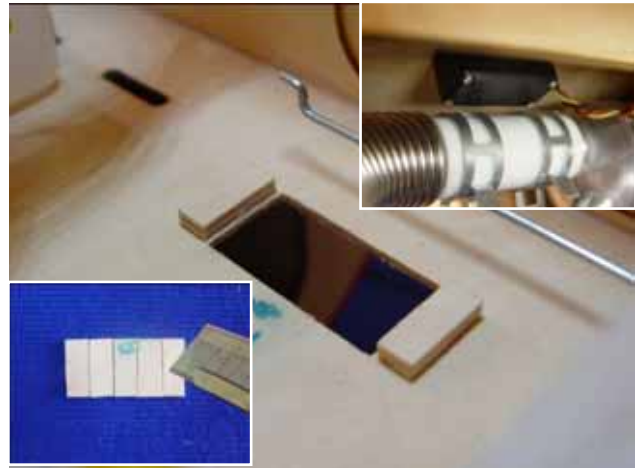
2. Measure and cut off throttle pushrod extra wire and bend to a sharp "z" to fit servo arm. Mount the throttle pushrod to engine. Test fit to ensure the hole is suitable.



3. Determine where the throttle servo is going to be mounted on the engine box to get the straight and precise throttle linkage connection then make a mark



4. Cut away the marked location as shown. Make supports with the cut off plywood in 2 layers and epoxy into place to keep the servo a distance from muffler.

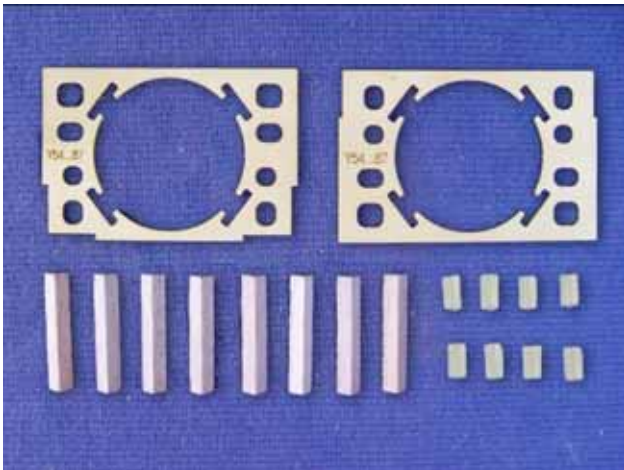


5. Finish the servo installation with mounting screws

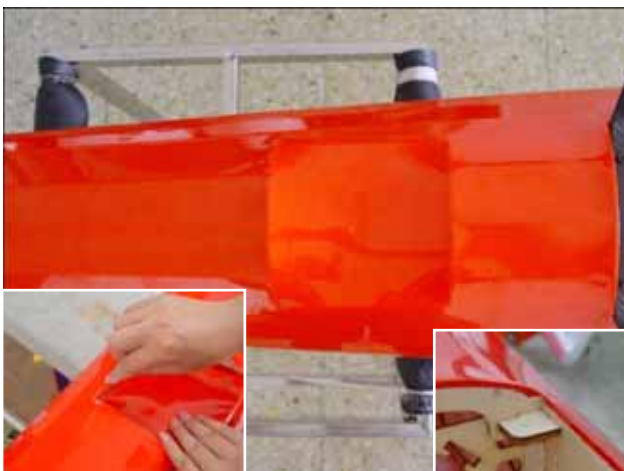




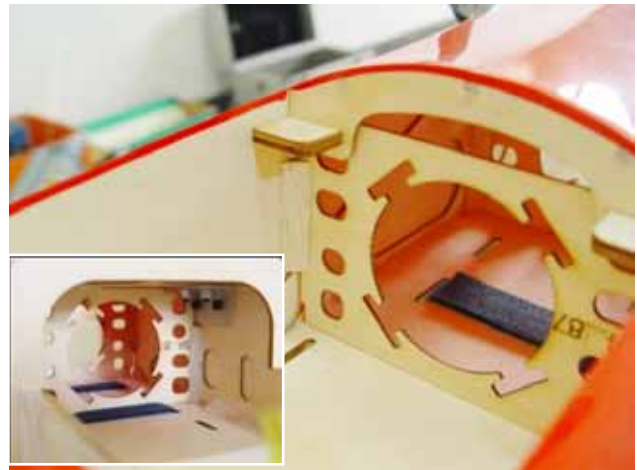
### Canister Bracket Installation



1. Use a sharp knife to remove the cover from the canister pre-cut air exit opening and ensure the edge has been sealed with a heat cover iron



2. Epoxy the bracket in place supported by triangular hardwood supports



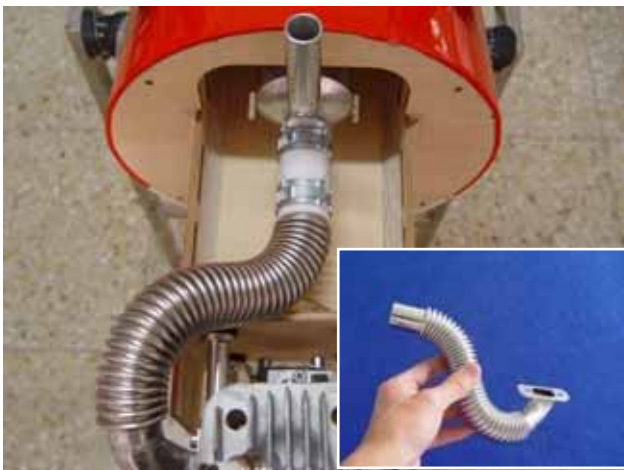
3. Mount the silicon vibration insulators. Use soldering iron remove the fuselage hatch covers and finish mounting with self-tapping screws.



### Muffler And Canister



1. Bend the pipe and trial fit till align the canister. Then cut the excess pipe to correct length



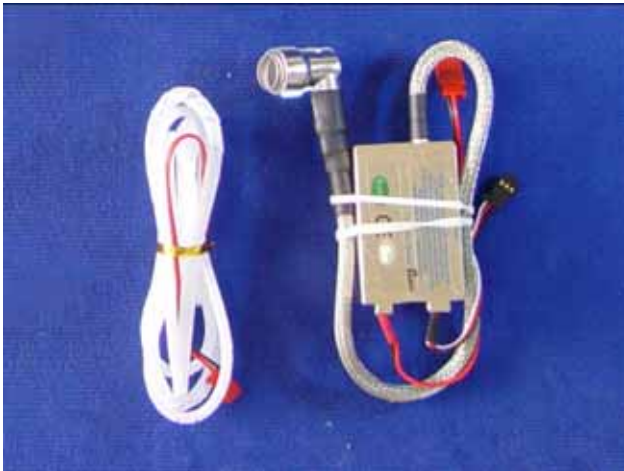
2. Tighten the muffler mounting bolts with Blue Loctite



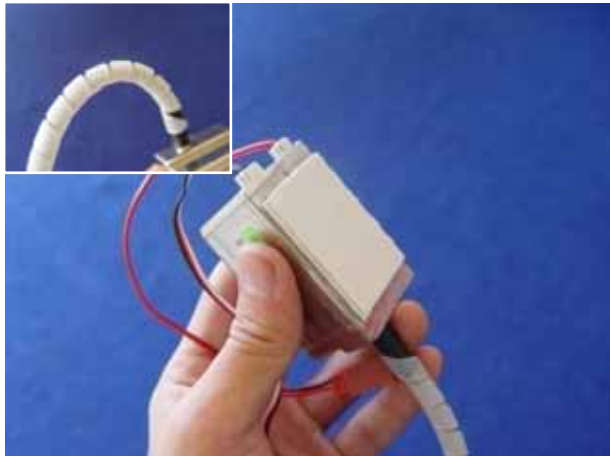
3. Use silicone coupler on exhaust joint securing with clamps as shown



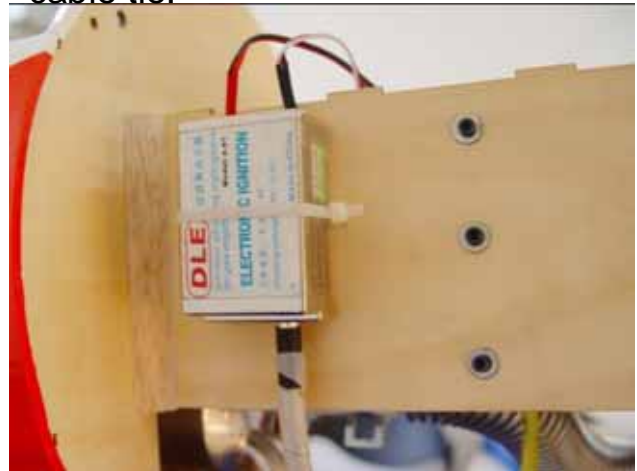
### Ignition Module



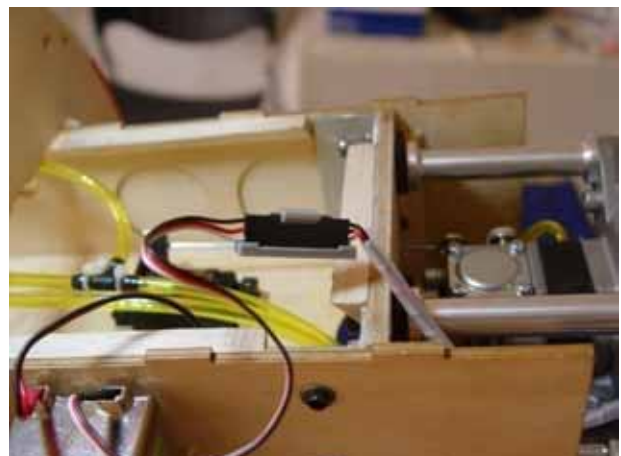
1. Use single sided self adhesive foam rubber on bottom of ignition unit and attach to plywood side as shown



2. Position the ignition outside the engine box to allow the spark plug leads to connect the engine without excess tension, drill hole for nylon cable tie.

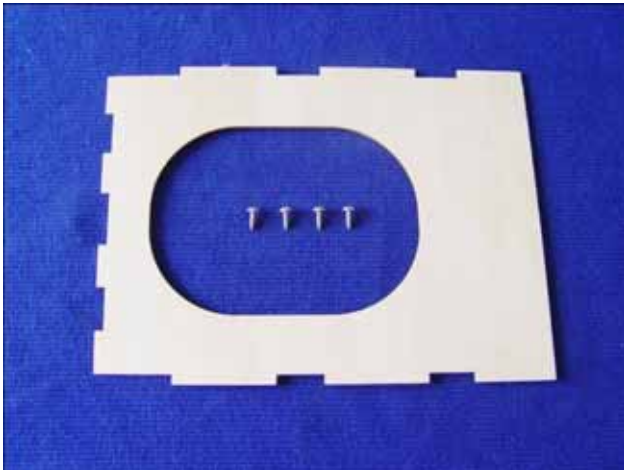


3. Lock the connectors with the provided safety clip to prevent loosening with vibration.

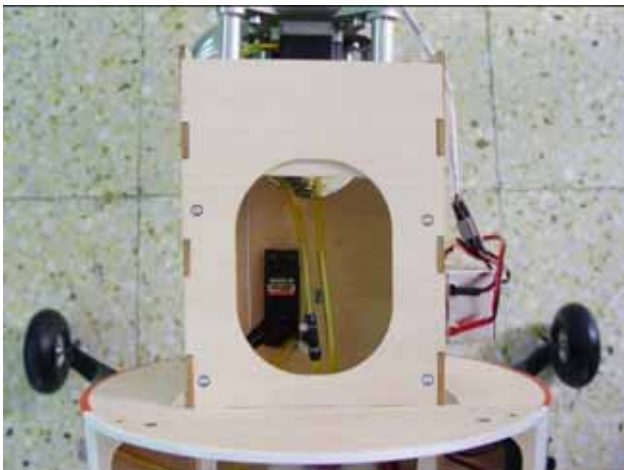




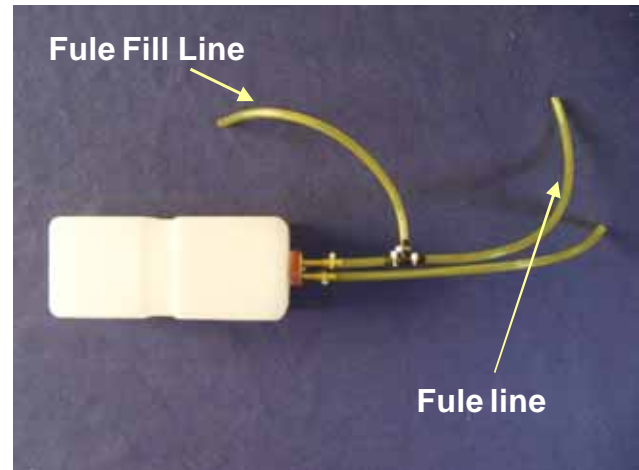
### Engine Box Hatch



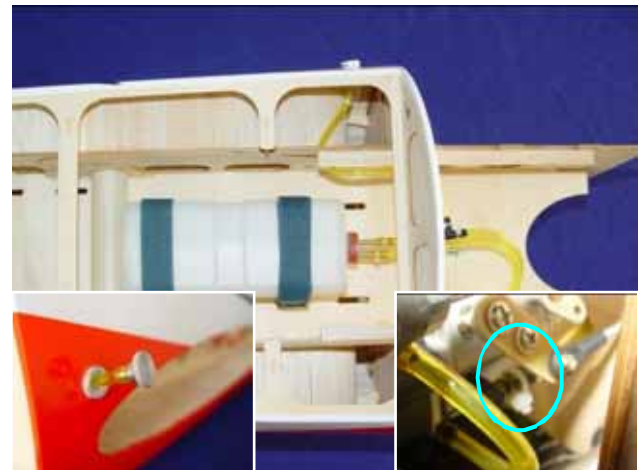
Epoxy the hatch in place and secure with self-tapping screws



### Fule Tank And Dot



Fuel tank and fuel dot has been installed. Tighten the Velcro ties when finally positioned.





### Cowl Assembly



1. Measure the center of the spark plug and make a pattern of the engine head on a paper template and follow required cut out shape. Trial fit to make sure there is a minimum of 3/8" clearance around the engine for cooling.



2. Use a fiber cutting tool to rough cut the cowl and finish with a round sander



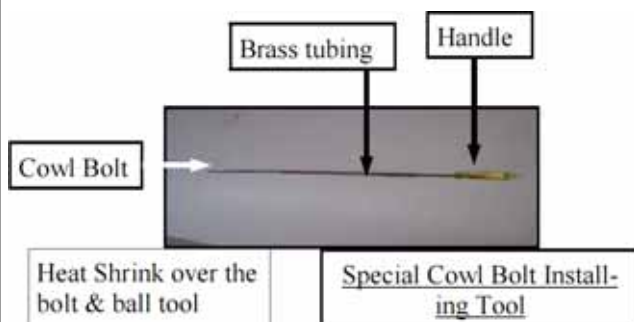
3. Cut out hole for the exhaust pipes and muffler you use, with clearance for cooling, engine or muffler should not come into contact with cowl.



4. Ensure all corners are rounded and not a sharp 90 degree corner to minimize any splitting under vibration. Trial fit and adjust hole until the cowl fits correctly



5. Make an extension tool with a proper size hex driver and handle by cutting standard hex driver to suit. Use small heat shrink tubing attached to hex driver to hold in place. You have to reattach the cowl in the future by this method



6. Install into position using the bolts. There are two that mount from the rear of the firewall on the top of the cowl and two that mount from the front of the cowl opening



### NOTICE:

Possibly more exit air cooling will be needed to ensure your engines recommended running temperature

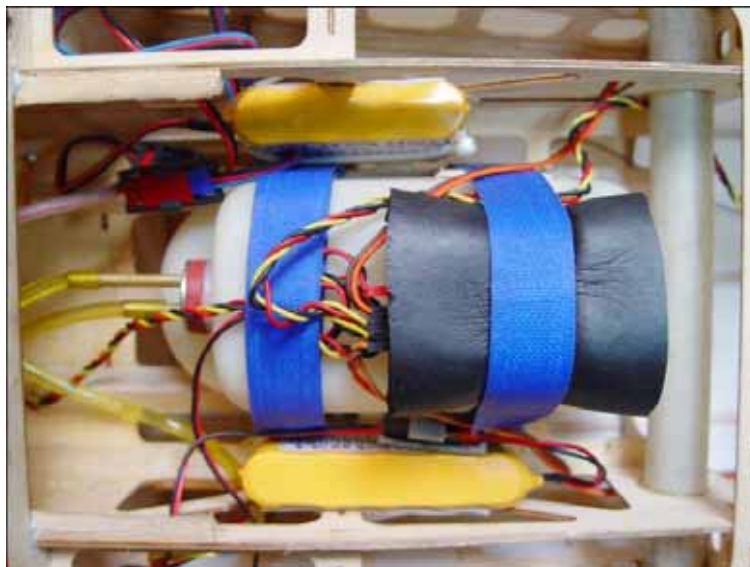
Always check your engine as Pilot-rc will not accept any responsibility for damage due to improper installation and cooling.

### Center Of Gravity

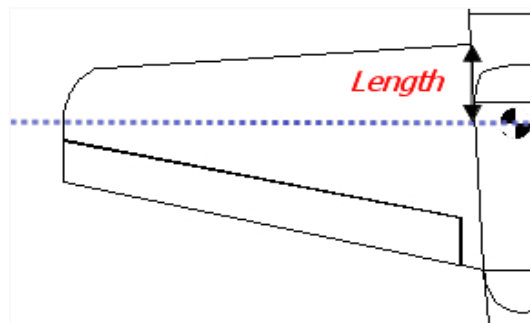
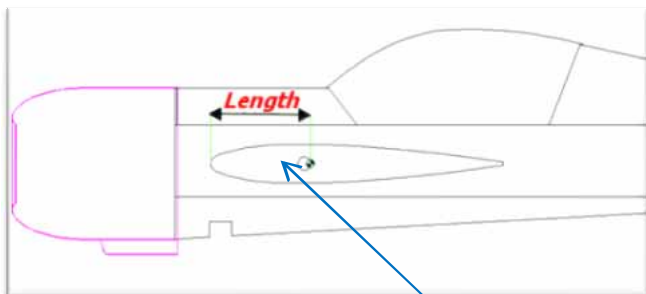
The center of gravity is on the rear of the wing tube. For other planes refer to the CG list below



Your balance at the correct CG can be determined by positioning batteries in correct location. Mount batteries and secure with nylon ties



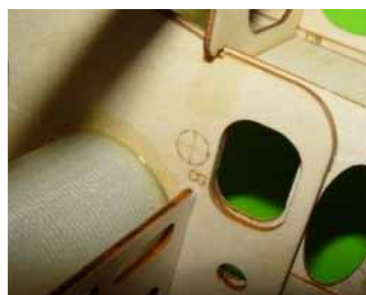
## The CG list of Pilot-RC products



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.





## Control Throws

### 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 set the given control throws and have a few flights under your belt, you can change the throws as well as moving the CG back at 1/4" intervals to suit your requirements and skill level.

Learn to use exponential of about 40 percent on your elevator to make smooth landings and prevent over control on this highly aerobatic airplane. Use 70 percent exponential on High Rate!



## Flight Preperation

Make sure you have the right model programmed into your transmitter

Check the direction of each control surface for correct operation before you take off .

Remember nothing wrong on the ground ever improves in the air

Check the air plane with the engine running and do a range check with as per your radio manufactures instructions your body should be between you and the plane at 150 feet.

Check your battery voltage after each flight in case one servo is draining your battery

Recheck all screws, horns and linkages for slop after your maiden flight and check for damage if you made a bad landing your first time

Have an experienced pilot fly it for the first time if you have any doubts in your mind about the maiden flight

Take a break after you first flight and let the adrenaline burn off by bragging to your fellow members how good it flies

Fly low and at a medium speed on your first few flights

Listen to your engine run and have an observer with you to remember what you talked about during the flight or if 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 sure about the CG!

Fly 3D maneuvers high in the beginning and not close to people, planes or runways. Being a center of the runway hog does not endear you to other modelers.