

Pilot

Assembly Manual For

50cc Plane



www.pilot-rc.com



Thank you for purchasing our new 50 cc model. We strive to bring you the most complete and easy to build ARF kits in the market today.

Assembly is quick with most of the major work already completed at our factory.

Our products are designed with performance in mind. We use only the highest quality wood, glue, covering and hardware in all of our products.

The model is strong but light weight making it an ideal aircraft for 3D and freestyle flying as well as aerobatics.

We hope you enjoy flying your model as much as we enjoyed designing and building it.

More information on website

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- All Pilot-RC products are guaranteed against defects within 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 components or parts damaged by misuse or modification.
- The manufacturer can not control the assembly, operation and maintenance of this product therefore, **Pilot-RC are not responsible for any damage that occurs as a result of the use or misuse of this radio controlled model.**
- In no circumstance will Pilot-RC accept liability exceeding the original cost of the airframe. (not including engine and radio system).
- Shipping costs for ALL returns (regardless of the reason for return) will be paid by the customer. Shipping costs for replacement parts will be paid by the customer.

- **You should not regard this plane as toy!**
- To ensure safety, please read the instruction manual thoroughly before assembly.
- Building and operating a model plane requires diligent practice and correct guidance. An inexperienced flyer can cause serious injury and property damage.
- Seek the assistance of an experienced RC pilot or model airplane club for help with assembly, operation and maintenance to ensure your flying experience is both enjoyable and safe.
- **Fly only in AMA (Academy of Model Aeronautics) approved areas.**

Pilot-RC reserves the right to make changes and amendments to construction manuals, terms and conditions without notice. If you have any problems and questions please contact Pilot –RC

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Introduction	1
Warranty	2
Attention	3

Landing Gear And Rudder Unit

<i>Rudder Assembly</i>		
Rudder Control Horns	.....	5
Tail Wheel Installation	.....	7
Rudder Axis Installation	.....	9
<i>Landing Gear Assembly</i>		
Main Landing Gear Installation	.....	10
Pants Installation	.....	12

Servo Unit

<i>Wing Servo Assembly</i>		
Servo Arm Installation	.....	13
Aileron Control Horns	.....	14
Servo Installation	.....	15
<i>Rudder Servo Assembly</i>		
Servo Tray Installation	.....	18
Servo Installation	.....	19
<i>Elevator Servo Assembly</i>		
Servo Arm Installation	.....	22
Elevator Control Horns	.....	23
Servo Installation	.....	24
Switch Assembly	.....	27

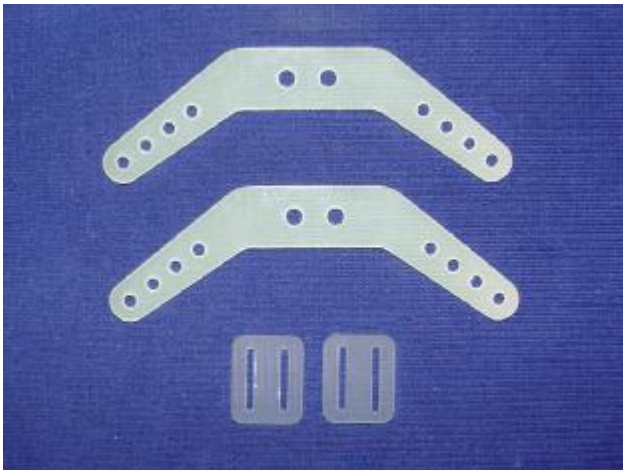
Engine Unit

<i>Firewall Assembly</i>	.....	28
<i>Engine Assembly</i>	.....	30
<i>Throttle Servo Assembly</i>	.....	30
<i>Muffler Assembly</i>		
Canister Bracket Installation	.....	32
Muffler and Canister	.....	33
<i>Ignition Module</i>	.....	34
<i>Hatch And Fuel Tank</i>	.....	35
<i>Cowl Assembly</i>	.....	36

CG And Control Throws	.....	38
Flight Preparation	.....	39

Rudder Assembly

Rudder Control Horn



Please refer to the **HARDWARE LIST** (download with instructions) to get the exact information about every step. A printed list is recommended for easy checking.

1. Remove the protective covering from the horns and locking plates.



2. Trace around the locking plate with a knife and remove the covering below to expose the pre-cut slots.



Example:

On the step of Rudder Control Horn installation

Rudder ← You can search

no.	Item	Material	Qty.	Note
1	Rudder Servo Arm	fiberglass	2	Screw And Locking Nut
2	Rudder Control Horn	fiberglass	2	Locking Plate

3. Scuff the middle of horns with sand paper to ensure a good glue bond.



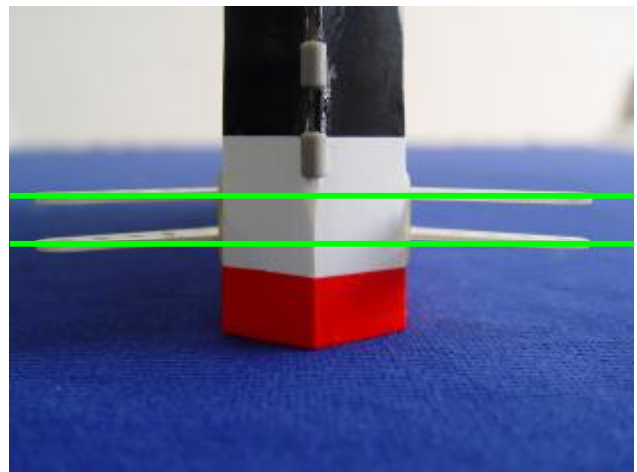
4. Apply 30 minute epoxy inside the pre-cut slots and coat the horn with epoxy as shown



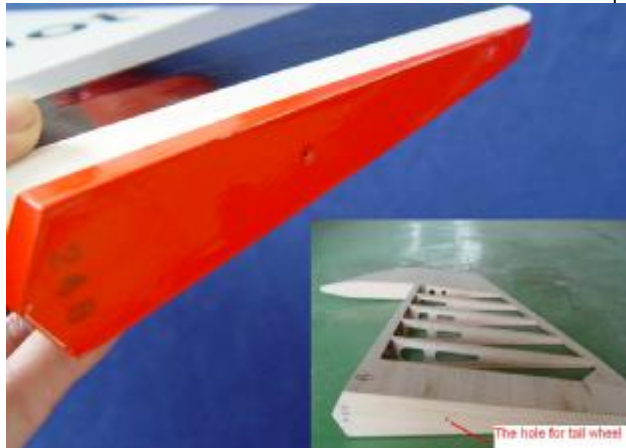
5. Fit the horns into the locking plate and then insert them into the pre-cut slots. Wipe away excess glue with rubbing alcohol.



6. Make sure the horns are correctly aligned (by installing the linkage bolt) before the epoxy has cured.



7. Locate the position of the tail wheel steering tube under the covering.



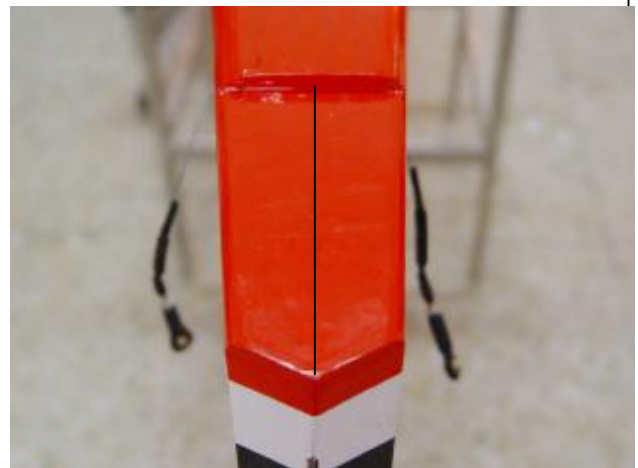
8. Drill a 6mm hole and dry fit the steering tube. Do not glue it into position until the tail wheel installation step is completed.



Tail Wheel Installation



1. Draw a center line with a pencil as shown



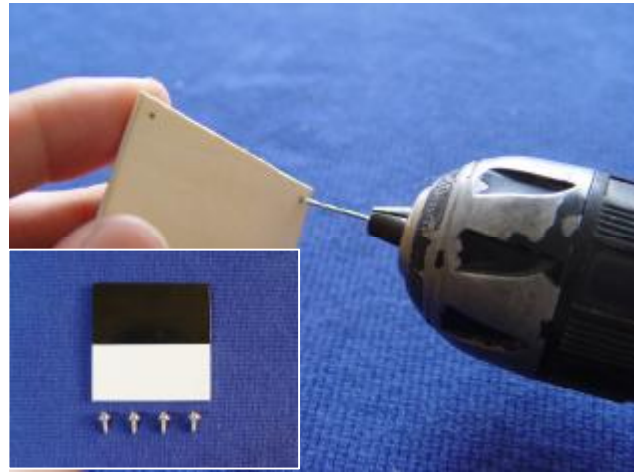
2. Use the tail wheel bracket as a template and drill holes for the mounting bolts.



3. Install the blind nuts through the opening in the rear of the fuselage. Attach the tail wheel bracket and secure the bolts with Blue Loctite.



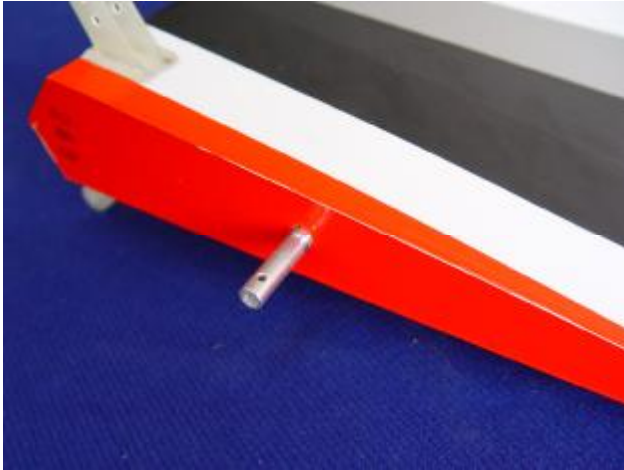
4. Install the hatch with 4 screws using the pre marked screw holes.



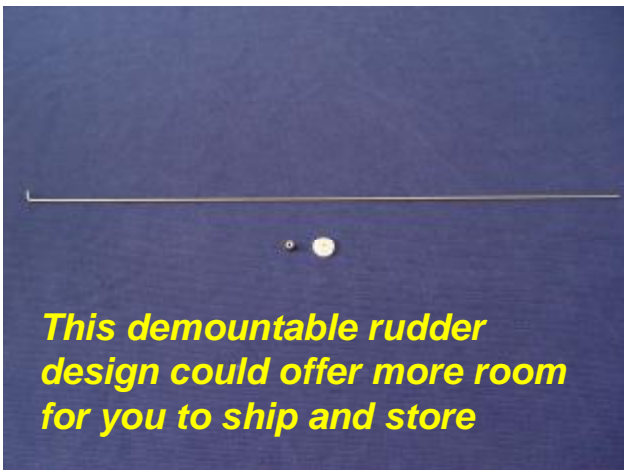
5. Insert the steering arm into the rudder steering tube and position the tube ready for gluing. Tighten the set nut



6. Epoxy the steering tube in place as shown.



Rudder Hinge Installation



1. Insert the hinge pin into the hinges from the bottom of the rudder and push it right through to the top to locate the entry hole.



2. Fit the rudder by aligning the hinges and inserting the hinge pin from the top of the rudder.

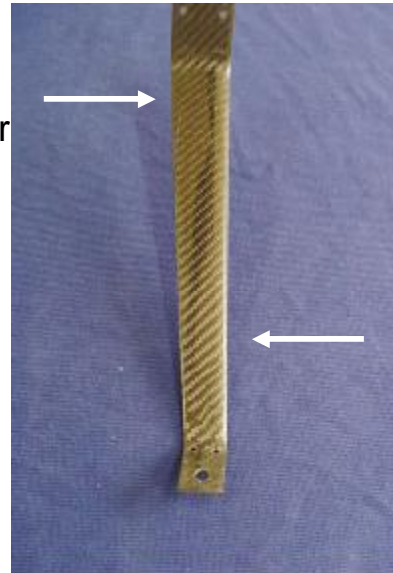


3. Fit the Teflon washer and tighten the collar set screw with a 1.5mm hex wrench as shown.



NOTE: the correct edge in mounting

Taper to rear



Straight edge to front of fuse

Main Landing Gear Installation



1. Install the landing gear in the pre drilled holes with the supplied bolts and locking nuts.

Note: Don't over tighten and crack the carbon fiber.



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



3. Lift the rear of fuselage parallel to the ground as shown.



4. Position the flat sides of the axle bolt vertically to the ground **then tighten the lock nut against the landing gear strut.**



5. Install the wheel and tighten the collar set screw using a drop of Blue Loctite. Make sure the wheel rotates freely.

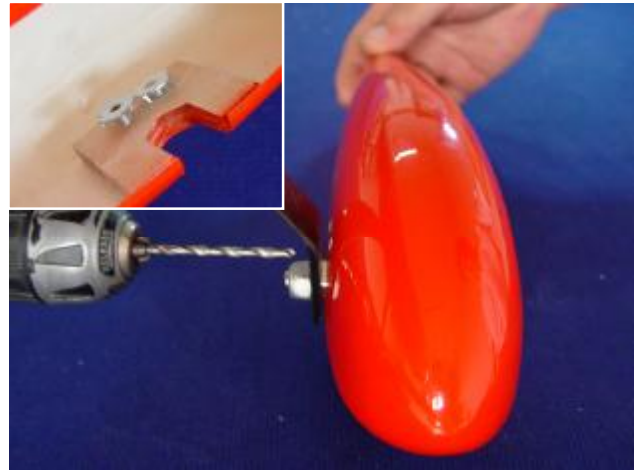


Pants Installation

1. Lift the rear of fuselage and line the wheel pant up with the ground by slipping them over the axles as shown. Mark the location for the two attachment bolts.



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



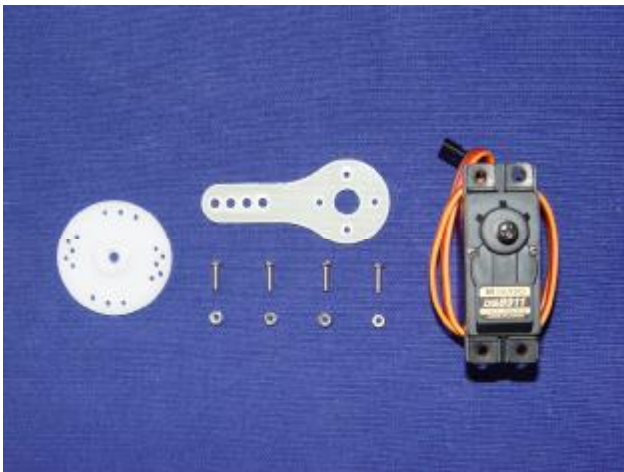
3. Mount the wheel pants and secure the bolts with a drop of Blue Loctite.



Wing Servo Assembly

Servo Arm Installation

Minimum Required Servo:
180 in.oz / Metal Gear / Digital



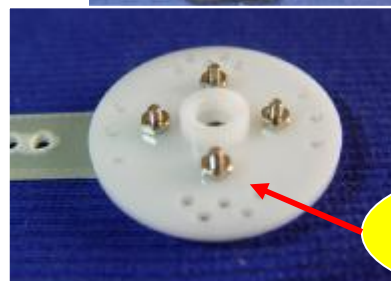
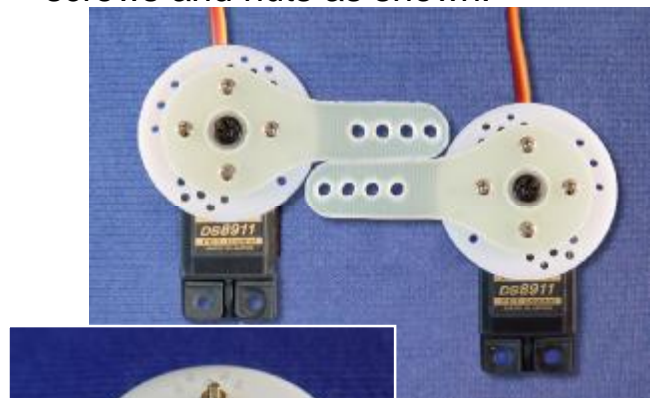
1. Turn on the transmitter and plug the servo into receiver. Ensure every channel is neutral.



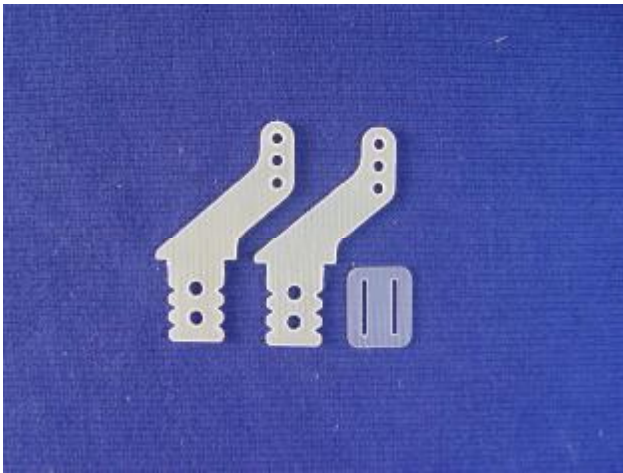
2. Position the servo arm 90 degrees to the servo as shown. Then mark and drill 2mm holes.



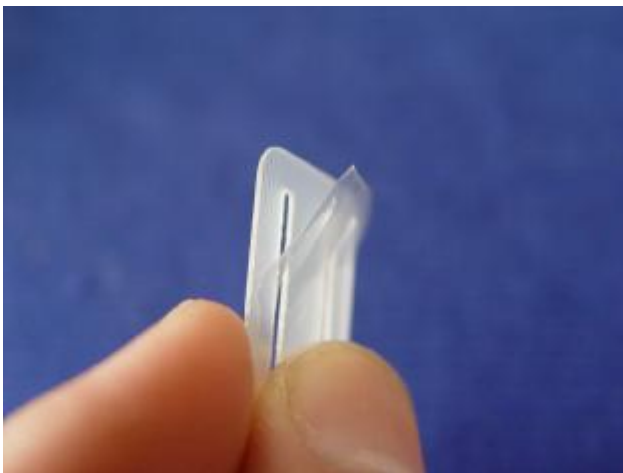
3. Mount the servo arm with screws and nuts as shown.



Aileron Control Horns



1. Remove the protective covering from the horns and locking plates.



2. Trace around the locking plate with a knife and remove the covering below to expose the pre-cut slots.



3. Scuff the horns with a piece of sand paper for a good glue bond.



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



5. Fit the horns into the locking plate and then insert them into the pre-cut slots. **Align the right and left sides** before the epoxy cures. Wipe away excess epoxy with rubbing alcohol



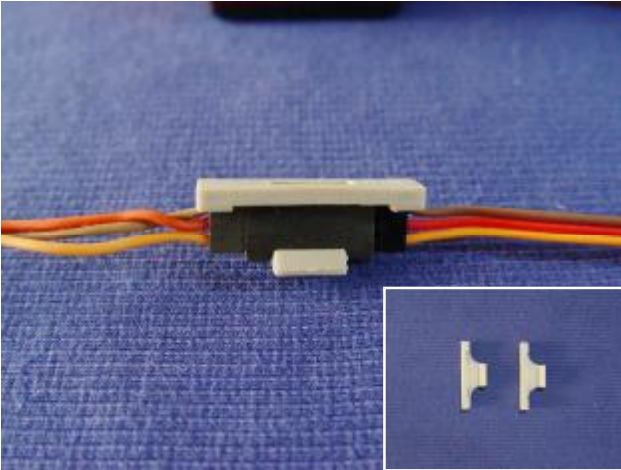
Servo Installation



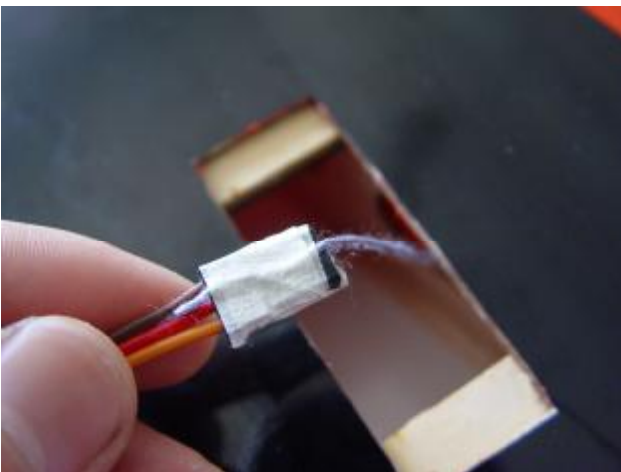
1. Carefully remove the covering from the servo location as shown.



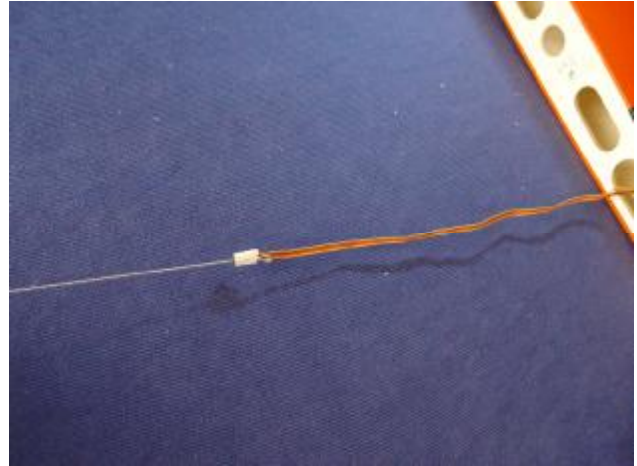
2. Use the provided safety clips to secure the servo and servo extension leads.



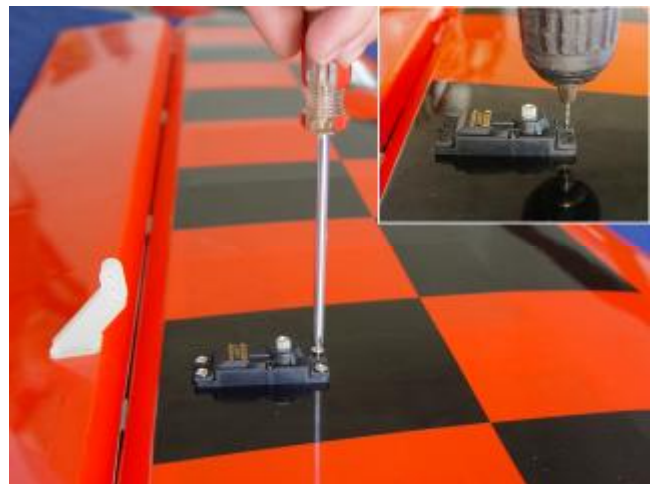
3. Tape the end of the servo extension lead to the pre installed pull string.



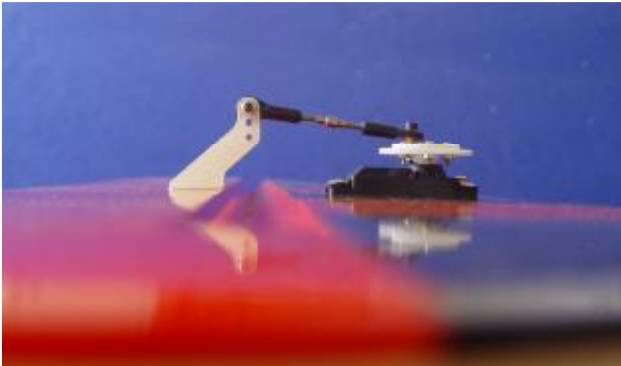
4. Pull the extension lead through to the root of the wing.



5. Drill 1mm holes for the servo mounting screws. Position the servo with the servo label closest to the wing trailing edge.



6. Install the servo arm facing toward the wing tip and adjust the pushrod length to ensure the aileron and servo are in the neutral position.

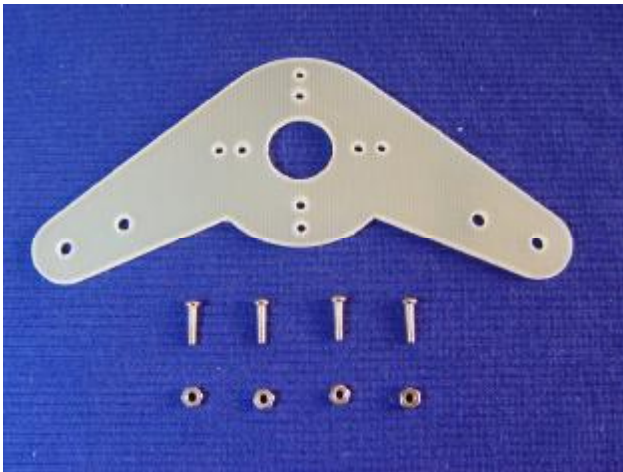


7. Repeat all the previous steps for the other wing

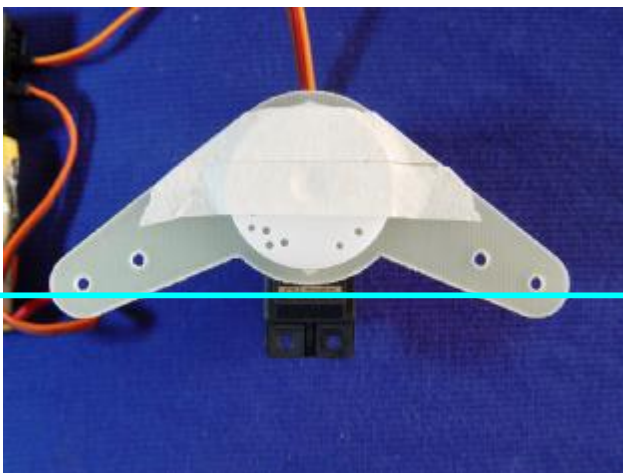
The wing tube and wing bolts will be mounted in the final assembly.

Servo Arm Installation

Minimum Required Servo:
180 in.oz / Metal Gear / Digital



1. Turn on the transmitter (refer to wing servo installation) Align the servo arm with the servo and temporarily tape in place.

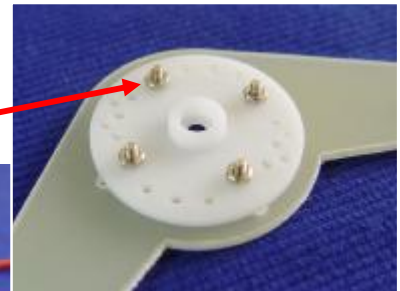


2. Drill 2mm holes.



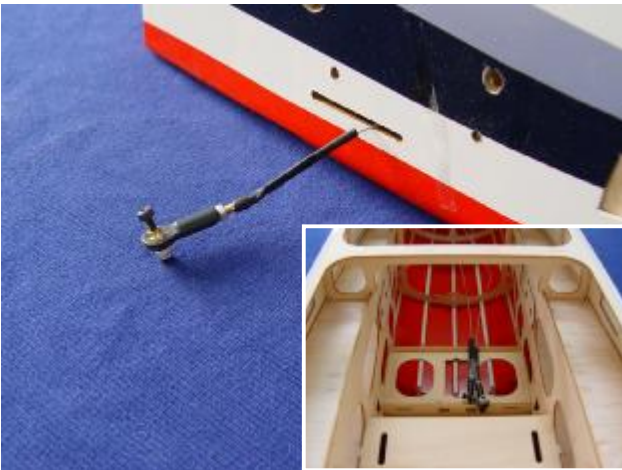
3. Attach the servo arm with mounting screws and nuts as shown.

A drop of fast cured glue here

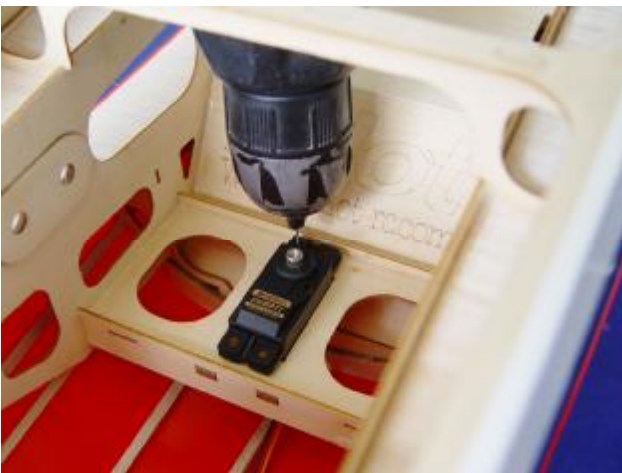


Servo Installation

The rudder cables and couplers have been pre installed as shown



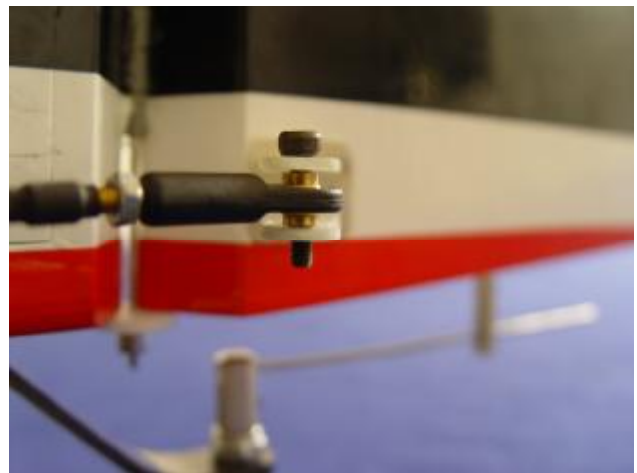
1. Drill 1mm holes for the mounting screws. Fit the servos as shown with the servo label facing the rudder.



2. Tape the rudder panel to the top of the vertical fin to ensure it remains in the neutral position.



3. Attach the pre-installed bolt link to the rudder horns without locking nut as shown.



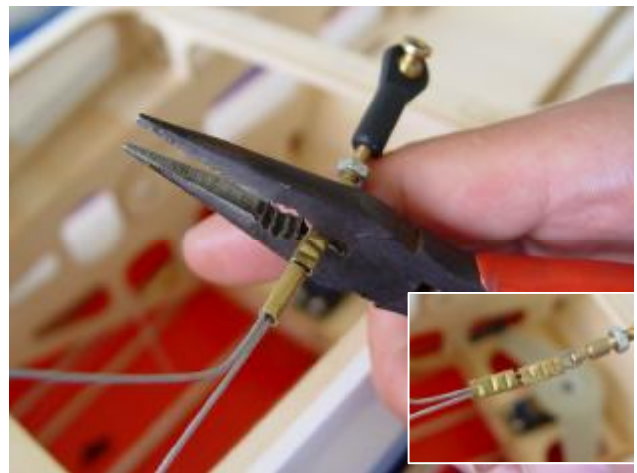
4. Turn on the transmitter. Make sure the servo is in the neutral position. Mount the pre-installed bolt link to the servo arm without the locking nut. Use two brass crimps on each cable and thread the cable through the end of the pull-pull connector.



NOTE: The pull-pull connector is only threaded half way into the ball link to allow for final adjustment.



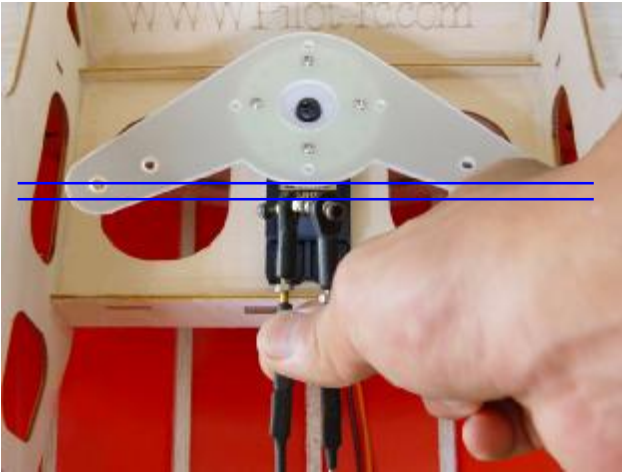
5. Remove any slack in the cables and crimp to secure as shown.



6. Cut away the excess cable.



7. Thread the connector in 2 – 4 mm. Ensure the tension is the same for both cables.



8. Shrink the heat shrink tube over the bras crimps.



9. Remove the ball links from the rudder horn and secure the servo arm ball links with locking nuts.

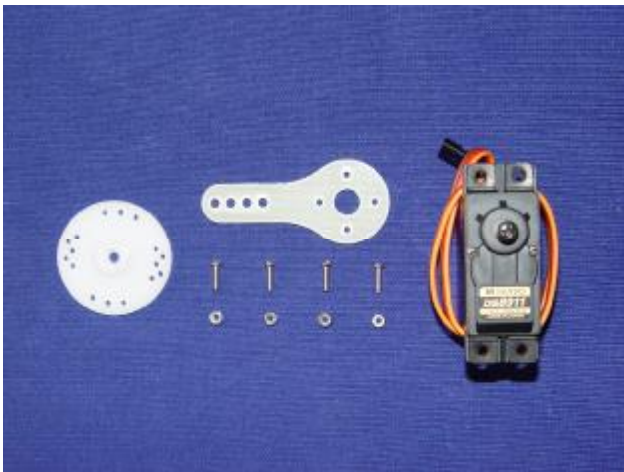


10. Turn off the transmitter. Reinstall the rudder ball links with bolts and locking nuts. Check the pull-pull cables. Rudder and the rudder servo should both be in the neutral position. Adjust by loosening or tightening the cable connectors.



Servo Arm Installation

Minimum Required Servo:
180 in.oz / Metal Gear / Digital



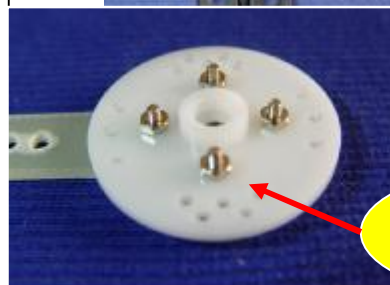
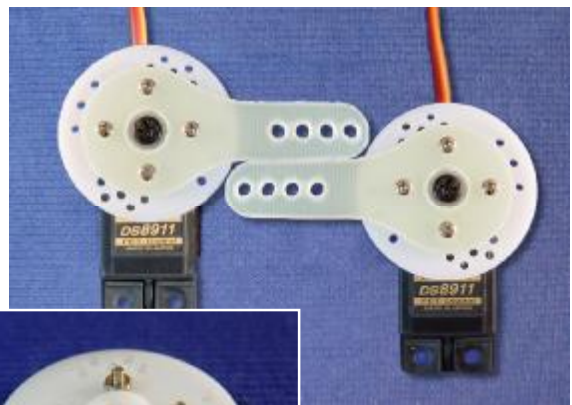
1. Turn on the transmitter and plug the servo into the receiver. Ensure every channel is neutral.



2. Ensure the servo arm is 90 degrees to the servo as shown. Mark and drill 2mm holes.

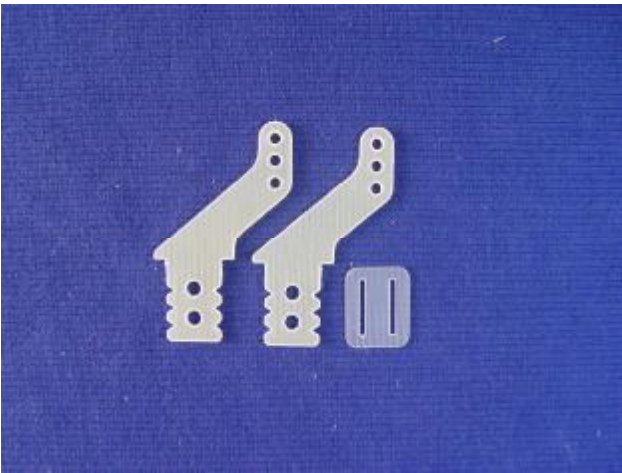


3. Attach mounting screws and nuts as shown.



A drop of fast dry gule here

Elevator Control Horns



1. Remove the protective covering from the horns and locking plates.



2. Trace around the locking plate with a knife and remove the covering below to expose the pre-cut slots.



3. Scuff the horns with a piece of sand paper for a good glue bond.



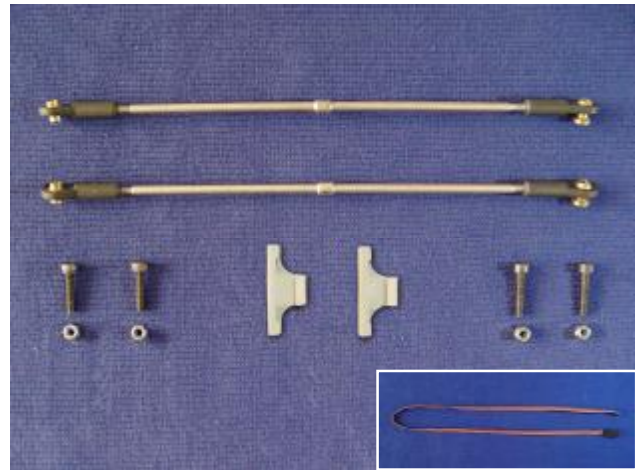
4. Apply the 30 minute epoxy inside the pre-cut slots and coat the horn with epoxy as shown.



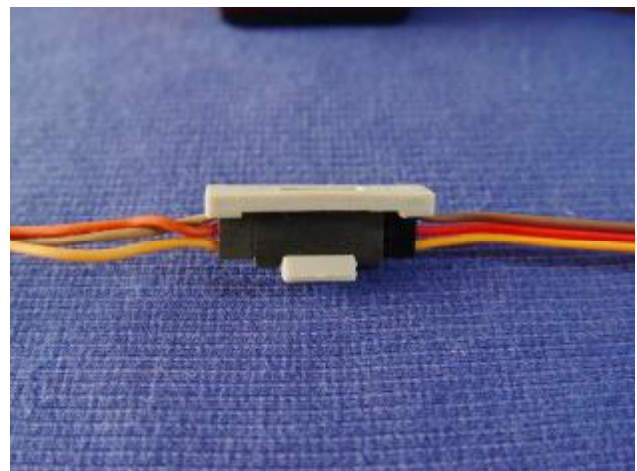
5. Fit the horns into the locking plate and then insert them into the pre cut slots. **Align the right and left sides** before the epoxy has cured. Wipe away excess epoxy with rubbing alcohol.



Servo Installation



1. Use the provided safety clips to secure the servo and servo extension lead.



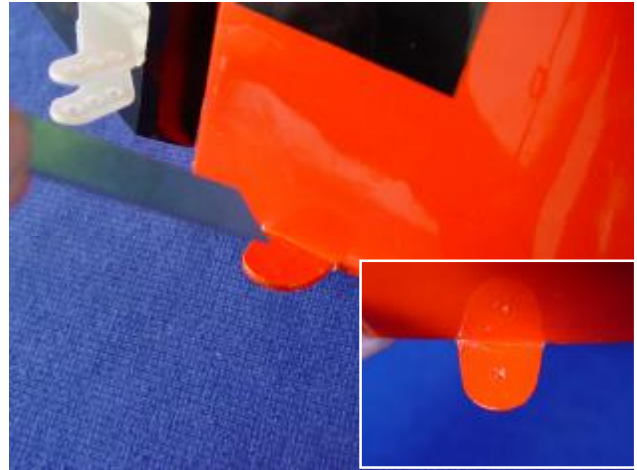
2. Run the extension lead through the fuselage to the receiver.



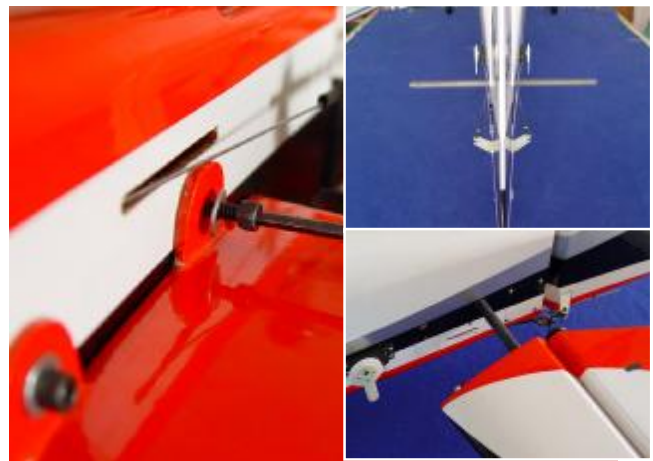
3. Install servos as shown with the servo label facing the rear of the fuselage.



4. Remove the covering from the pre drilled mounting holes.



5. Install the stab with mounting bolts and washers.



6. Install the servo arm in the vertical position as shown. Adjust the pushrod length so that the servo and elevator are both in the neutral position.



7. Repeat the previous steps for the remaining stabilizer.



Switch Installation



Note: The switch mounting holes have been pre-cut for standard size switches.

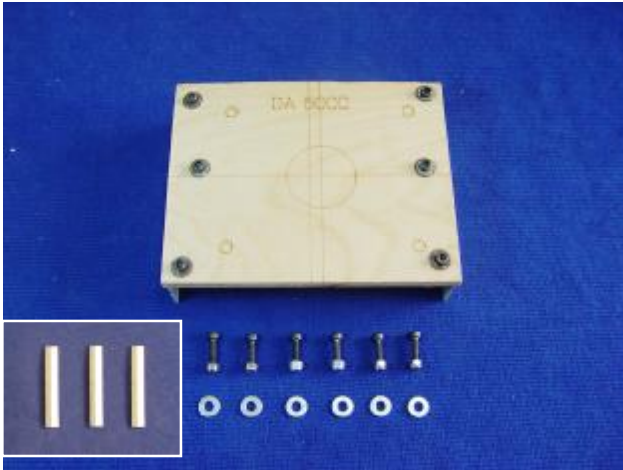
1. Carefully remove the covering over the switch cut out.



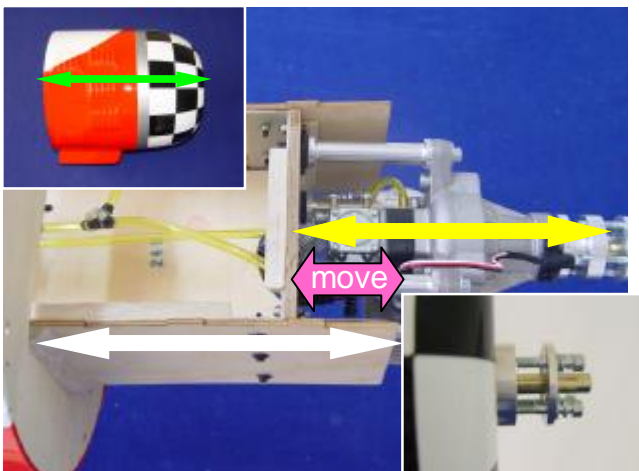
2. Mount the switch with the screws and nuts provided with the switch.



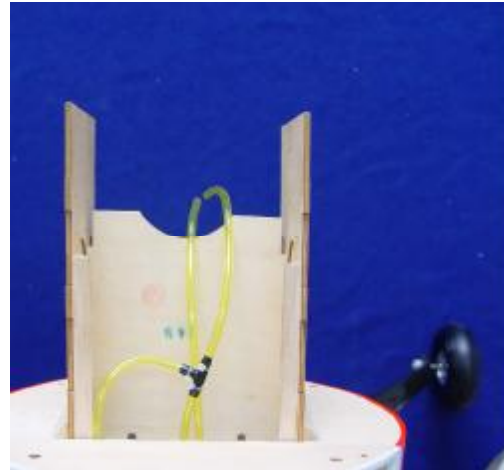
Firewall Assembly



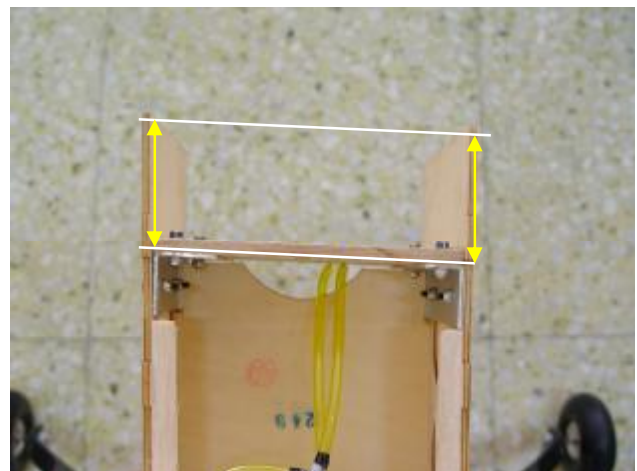
1. Measure the length of the engine from the firewall to the prop thrust washer. Measure the distance required for the prop thrust washer to clear the front of the cowl by $\frac{1}{4}$ " to $\frac{1}{2}$ " then mark the firewall position on the engine mount.



Move if necessary



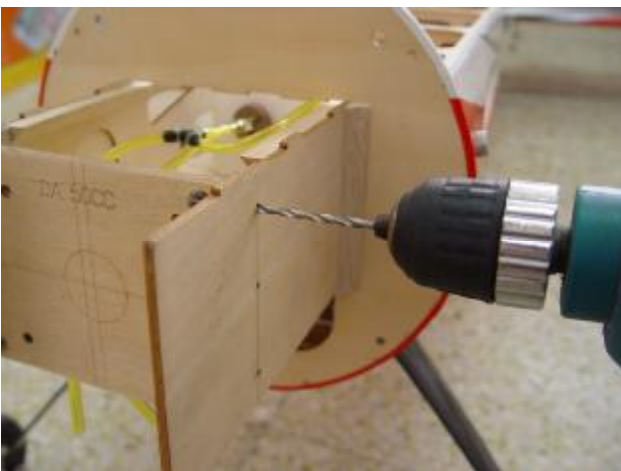
Note: The 2 degree right thrust has already been built in. Measure the same distance from the front of the engine mount when installing the firewall.



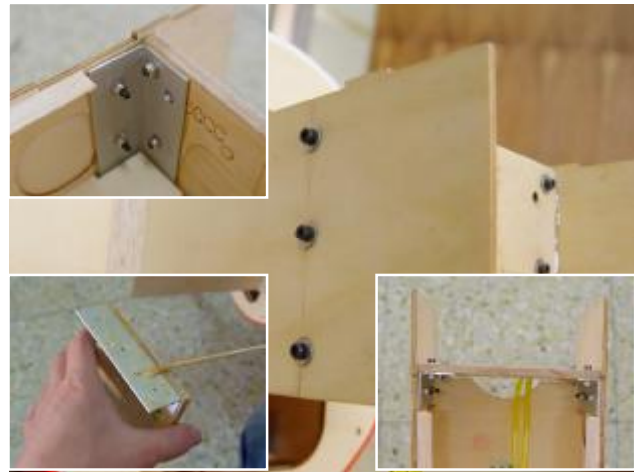
2. Drill the firewall according to the pre-set laser holes for DA or DLE engine installations. Otherwise measure your engine's firewall mounting location.



3. After marking the firewall position clamp or temporarily attach the firewall and drill 3mm mounting bolt holes as shown.



4. Epoxy the firewall with 30 minute epoxy and use the mounting bolts and lock nuts to fasten it immediately as shown.



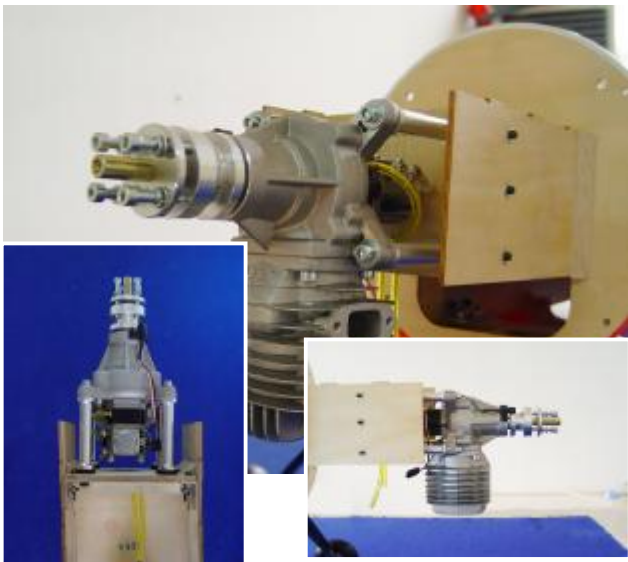
Note: Epoxy the triangular hardwood supports for reinforcement.



Engine Installation



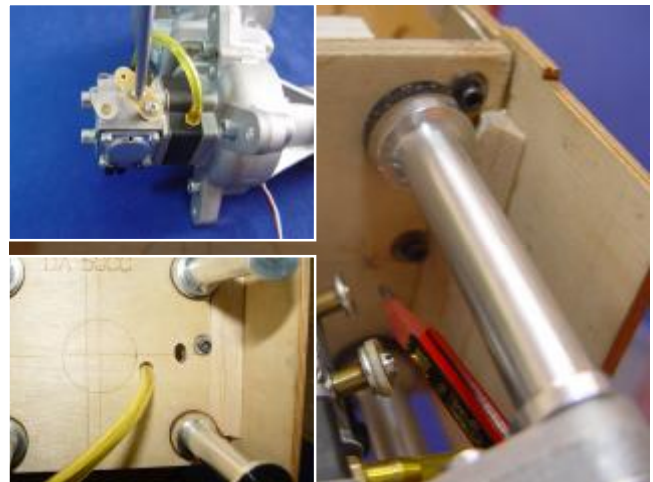
Remember: Do not use Blue Loctite on engine mounting screws until final assembly. The engine will need to be removed to fit the throttle push rod and fuel line.



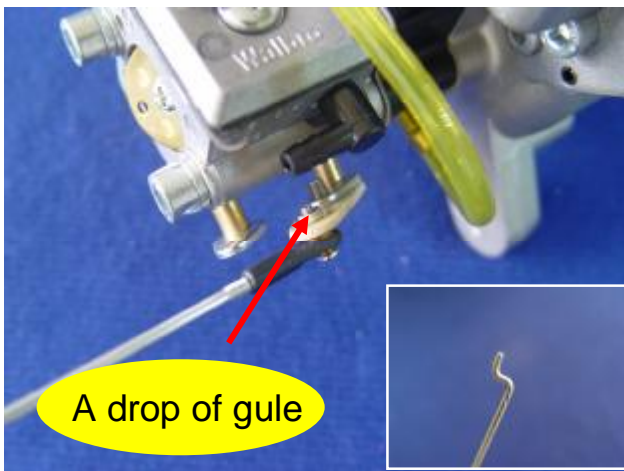
Throttle Servo Installation



1. Install the engine throttle arm and secure the screws with Blue Loctite.



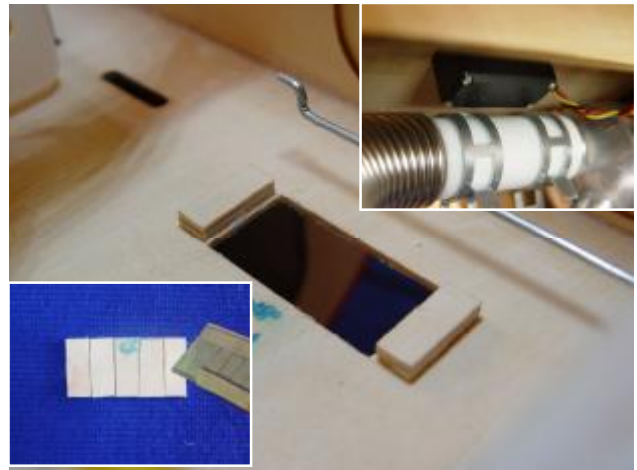
2. Install the engine throttle arm and pushrod. Use a Z bend to connect the push rod to the servo arm.



3. Determine where on the engine box the throttle servo tray is to be mounted. The throttle push rod requires a straight and direct connection to the throttle so be careful with the mounting position.



4. Alternatively, mount the throttle servo as shown but add plywood off cuts to keep the servo clear of the hot exhaust canister (if installed)

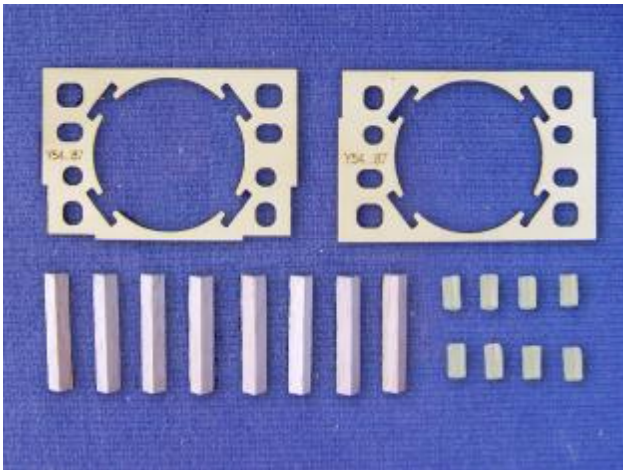


5. Mount the throttle servo and push rod as shown.



Canister Bracket Installation

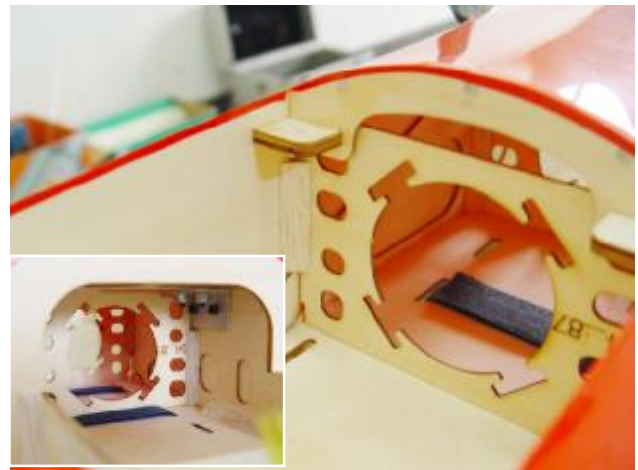
Canister bracket and wood block are Not Include



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



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



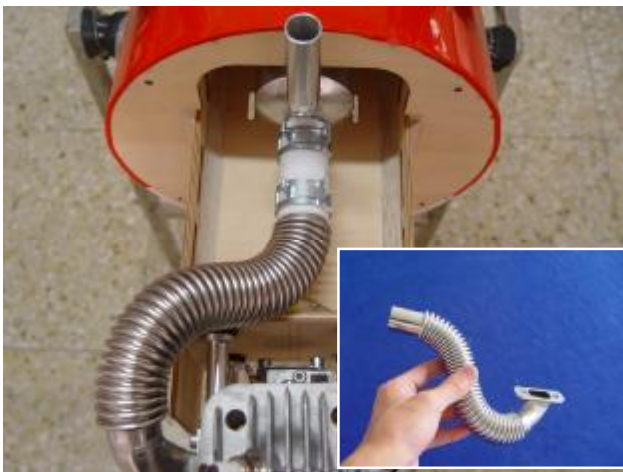
3. Mount the silicon insulators as shown. Use a hot soldering iron to remove the covering from the air cover and secure the cover with self tapping screws.



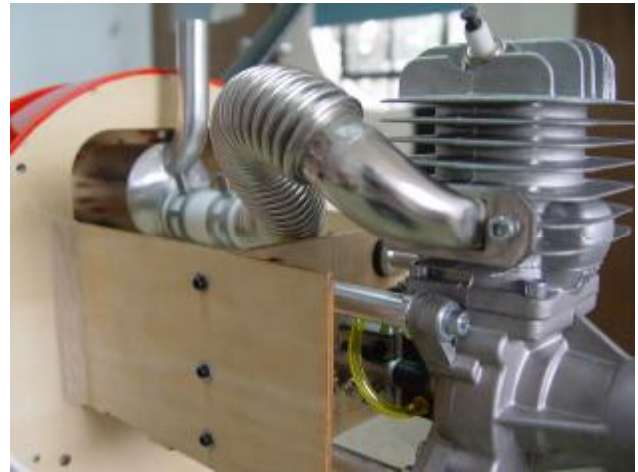
Muffler And Canister



1. Carefully bend the flexible manifold to connect to the canister muffler. Trim the excess pipe to fit.



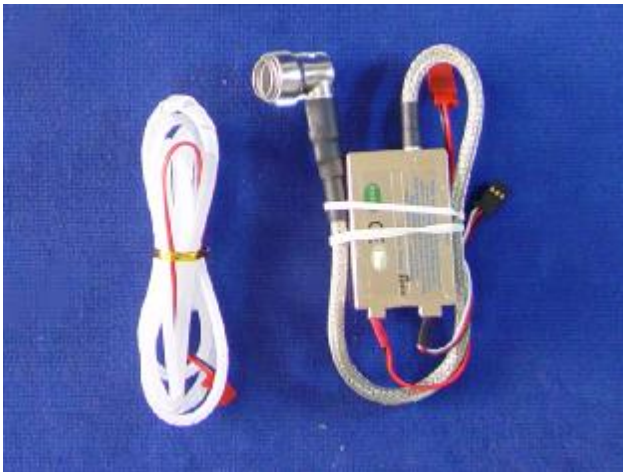
2. Tighten the manifold bolts and secure with Blue Loctite.



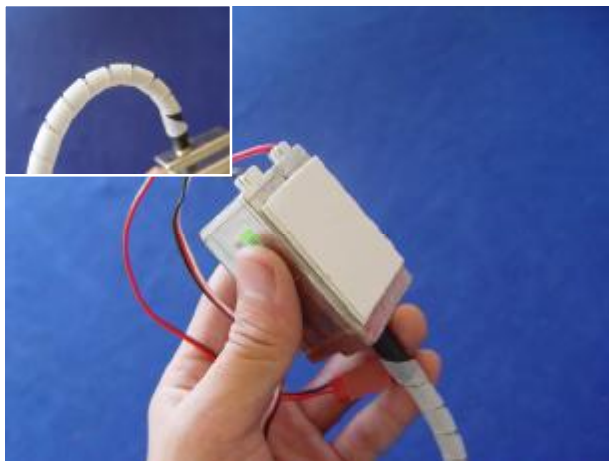
3. Use the silicone coupler and clamps to join the manifold and the canister muffler as shown.



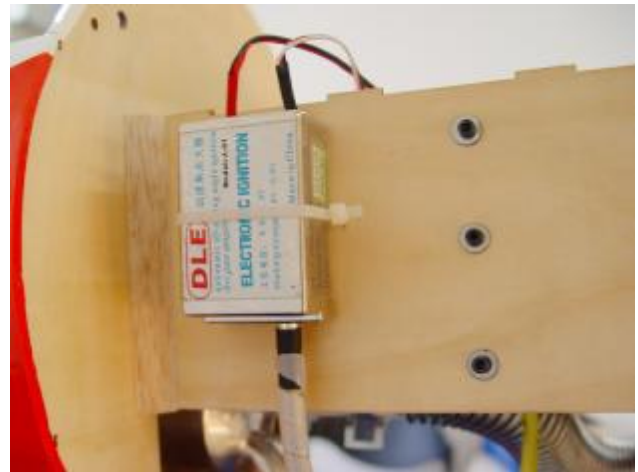
Ignition Module



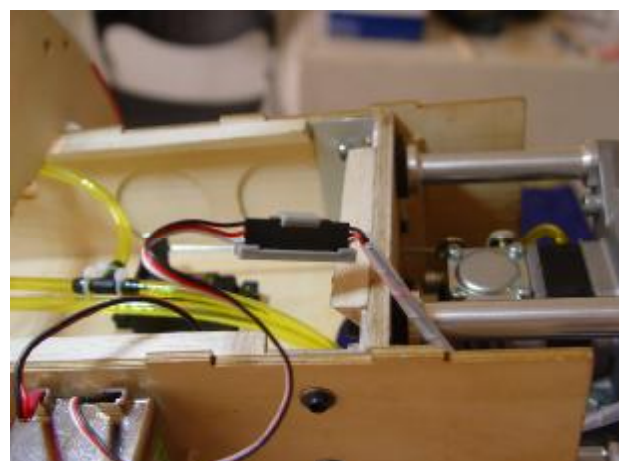
1. Tape foam rubber to the bottom of the ignition safety cover as shown.



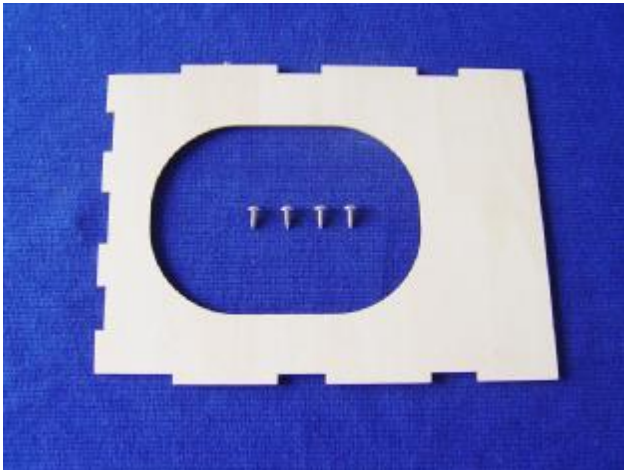
2. Position the ignition outside the engine box to allow the spark plug leads to connect to the engine without excess tension. Secure with Nylon zip ties.



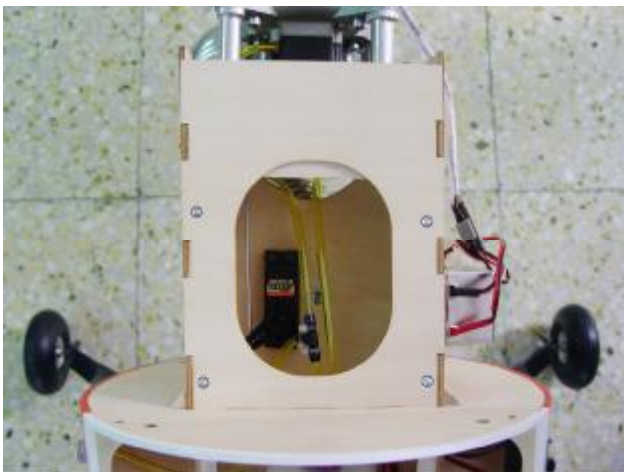
3. Lock the connector leads with the provided safety clip to ensure the leads do not vibrate loose.



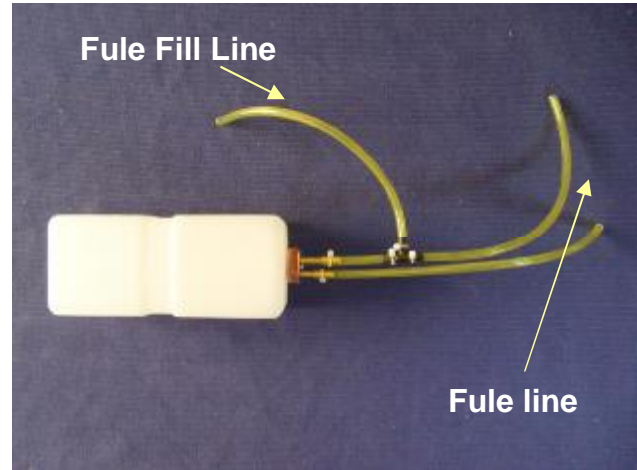
Engine Box Hatch



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



Fuel Tank And Dot



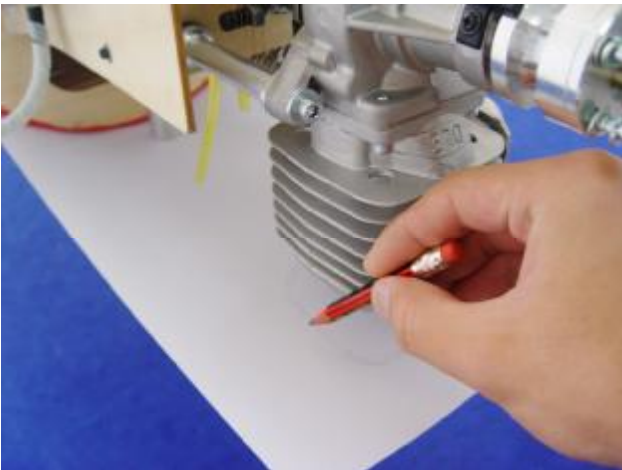
The fuel tank and fuel dot have been pre installed. Just tighten the Velcro ties that secure the fuel tank.



Cowl Assembly



1. Use a paper template to measure where the cowl will need to be cut for the exhaust and spark plug. Trial fit to make sure there is a minimum of 3/8" of clear space around the engine for cooling.



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



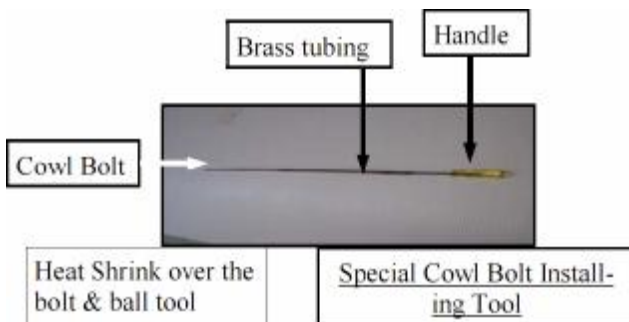
3. Use templates to cut out other openings in the cowl for manifolds if fitted.



4. Ensure all corners in any cowl cutouts are rounded. Sharp 90 degree corners will split and fracture with the engine vibration.



5. **NOTE:** The YAK-54 needs an extension tool to be fabricated to fit the lower cowl attachment bolts which are inside the cowling.



6. For the Yak 54 - Install the cowl into position using the bolts provided. 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. **For other models the lower bolts are on the outside of the cowl.**



NOTICE:

Always check the engine temperature against the manufacturers recommendation. More cut outs may be required in the cowl if engine temperatures are too high.

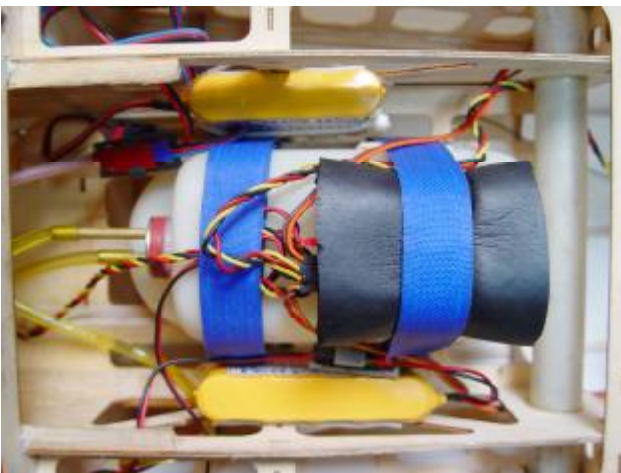
Pilot-RC does not accept responsibility for any damage from improper engine cooling.

Center Of Gravity

The center of gravity is on the rear of the wing tube as shown



Your balance at the CG will determine the final mounting location for batteries. Mount batteries and secure with Nylon zip ties



The First Flight set up

Throttle: Adjust idle –full

Elevator: 40 Degrees on High rate
15 Degrees on Low rate

Aileron: 30 Degrees on High rate
15 Degrees on Low rate

Rudder: 45 Degrees on High rate
40 Degrees on Low rate

- After you set the recommended control throws and have a few flights under you belt, you can change the throws and experiment with moving the CG back at 1/4" intervals

- Learn to use exponential of about 40 percent on your elevator to make great landings and so as not to over control a highly aerobatic airplane. Use 70 percent exponential on High Rates!

- Make sure you have the right model programmed into your transmitter
- Check the direction of each control surface during flight prep and also right 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 your body 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” first landing.
- Have an experienced pilot fly the “first flight” 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 careful with the CG!
- Fly 3D two mistakes 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.