

SPITFIRE MK IX

MS:183

ASSEMBLY MANUAL

“Graphics and specifications may change without notice”.



Specifications:

Wing span ----- 59.9in (203cm).
Wing area ----- 1165.6sq.in (75.2sq.dm).
Weight ----- 5.1-13.2lbs (5.0-6.0kg).
Length ----- 64.5in (163.8cm).
Engine ----- 22-40cc -----2-stroke.
40-50cc -----4-stroke.
Radio ----- 6 channels with 10 servos.
Electric conversion: optional

INTRODUCTION.

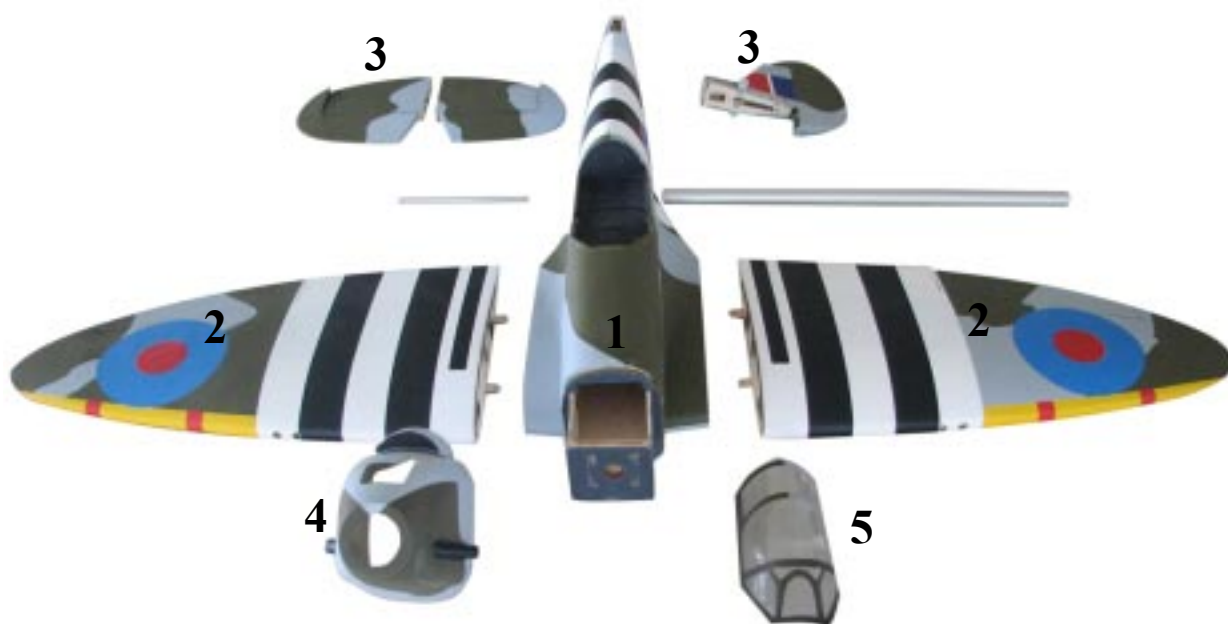
Thank you for choosing the SPITFIRE 2030 mmARTF by SG MODELS . The **SPITFIRE** was designed with the intermediate/advanced sport flyer in mind. It is a semi scaleairplane which is easy to fly and quick to assemble. The airframe is conventionally built using balsa,plywood to make it stronger than the average ARTF , yet the design allows the aeroplane to be keptlight. You will find that most of the work has been done for you already.The motor mount has beenfitted and the hinges are pre-installed . Flying the **SPITFIRE** is simply a joy.

This instruction manual is designed to help you build a great flying aeroplane. Please read this manual thoroughly before starting assembly of your **SPITFIRE** . Use the parts listing below to identify all parts.

WARNING.

Please be aware that this aeroplane is not a toy and if assembled or used incorrectly it is capable of causing injury to people or property. WHEN YOU FLY THIS AEROPLANE YOU ASSUME ALL RISK & RESPONSIBILITY.

If you are inexperienced with basic R/C flight we strongly recommend you contact your R/C supplier and join your local R/C Model Flying Club. R/C Model Flying Clubs offer a variety of training procedures designed to help the new pilot on his way to successful R/C flight. They will also be able to advise on any insurance and safety regulations that may apply.

KIT CONTENTS

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SEA18301	Fuselage
SEA18302	Wing Set
SEA18303	Tail Set
SEA18304	Cowling
SEA18305	Canopy
SEA18306	Linkage Set
SEA18307	Landing Gear
SEA18308	Wing Tube
SEA18309	Decal Set
SEA18310	Hardware Pack

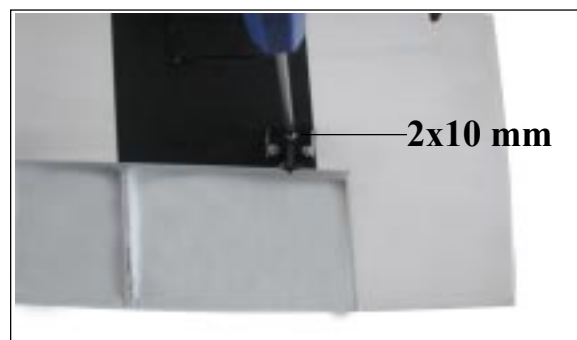
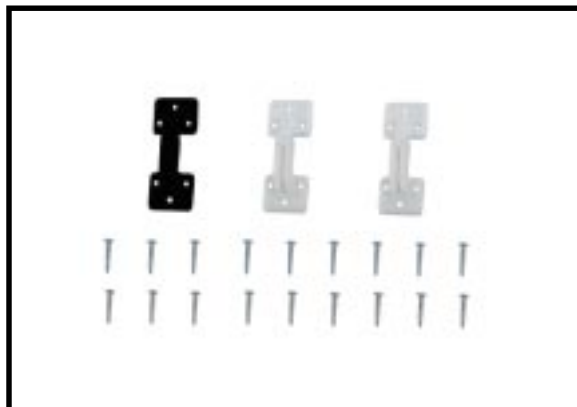
ADDITIONAL ITEMS REQUIRED.

- ☐ 22-40cc 2-stroke.
- ☐ 40-50cc 4-stroke.
- ☐ Computer radio with 10 servos.
- ☐ Glow plug to suit engine.
- ☐ Propeller to suit engine.
- ☐ Protective foam rubber for radio system.

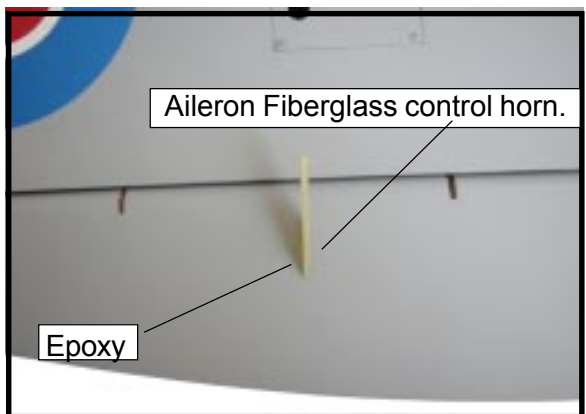
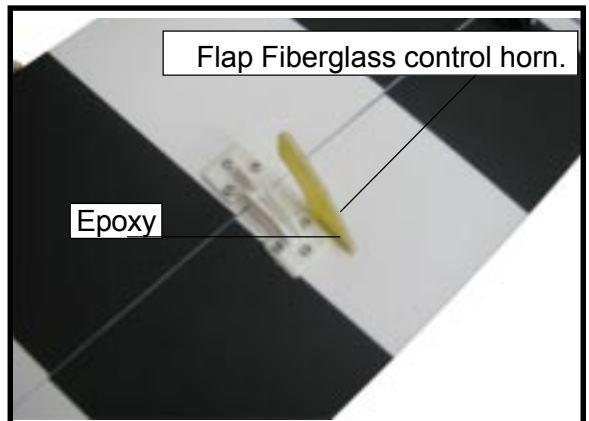
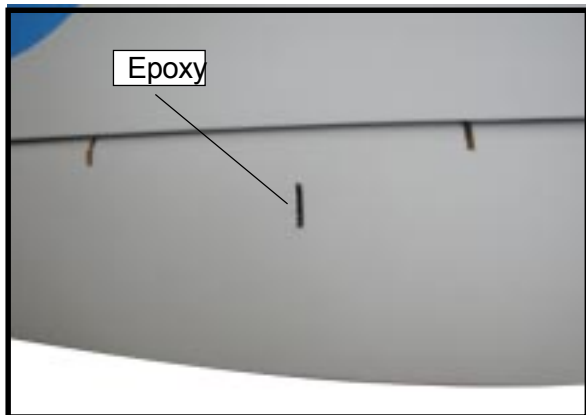
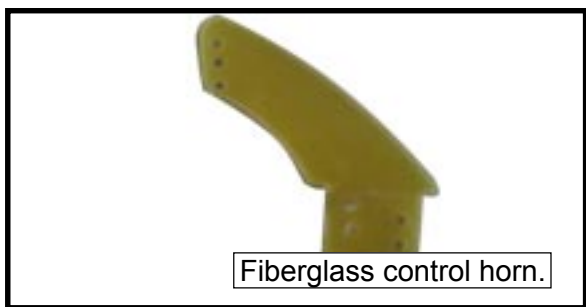
TOOLS & SUPPLIES NEEDED.

- ☐ Thick cyanoacrylate glue.
- ☐ 30 minute epoxy.
- ☐ 5 minute epoxy.
- ☐ Hand or electric drill.
- ☐ Assorted drill bits.
- ☐ Modelling knife.
- ☐ Straight edge ruler.
- ☐ 2mm ball driver.
- ☐ Phillips head screwdriver.
- ☐ 220 grit sandpaper.
- ☐ 90° square or builder's triangle.
- ☐ Wire cutters.
- ☐ Masking tape & T-pins.
- ☐ Thread-lock.
- ☐ Paper towels.

HINGING THE FLAP .



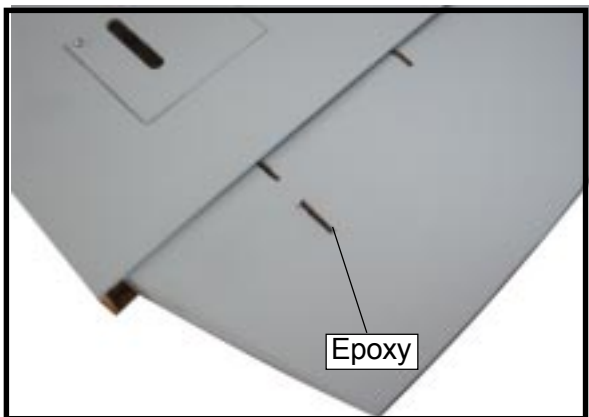
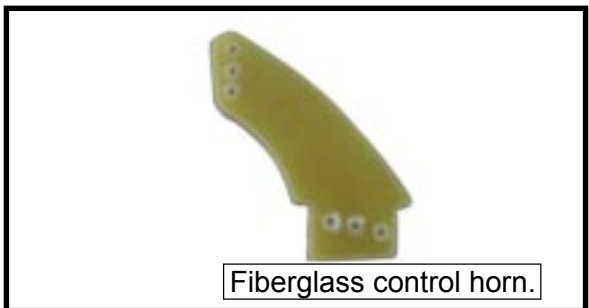
INSTALL THE AILERONS CONTROL HORN.

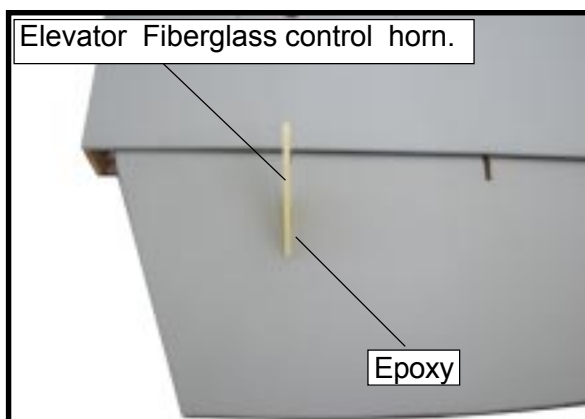


INSTALL ELEVATOR CONTROL HORN.

INSTALL FLAP CONTROL HORN.

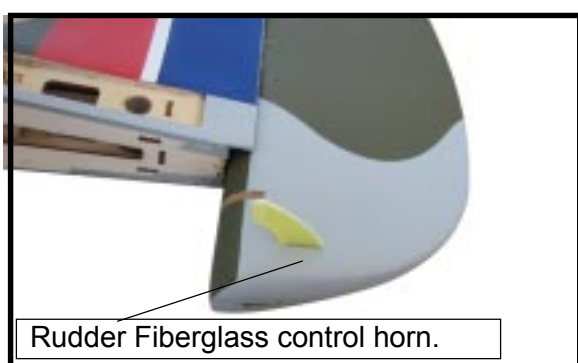
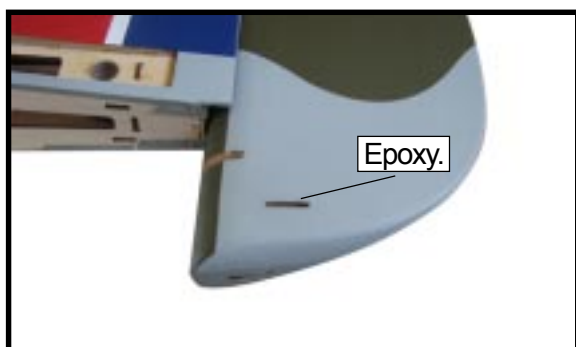
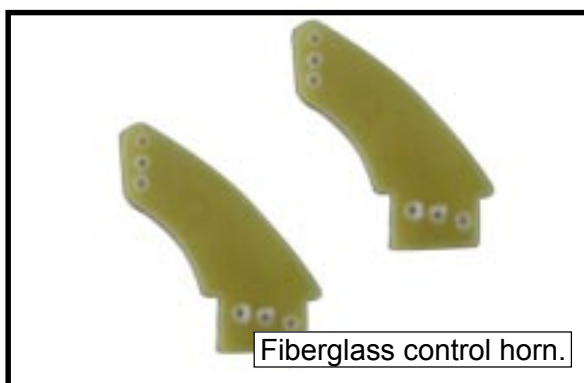
Install the flap control horn using the same method as same as the aileron control horns.





INSTALL RUDDER CONTROL HORN.

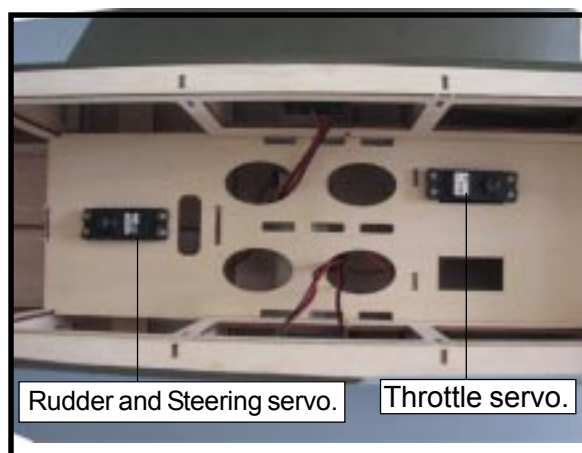
Repeat steps to install the rudder control horn as same as steps done for ailerons.



INSTALLING THE FUSELAGE SERVOS.

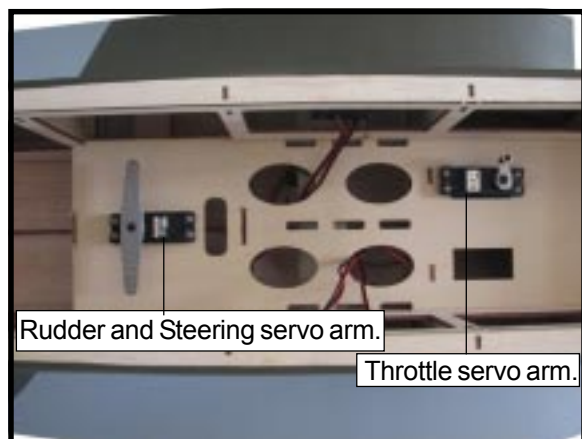
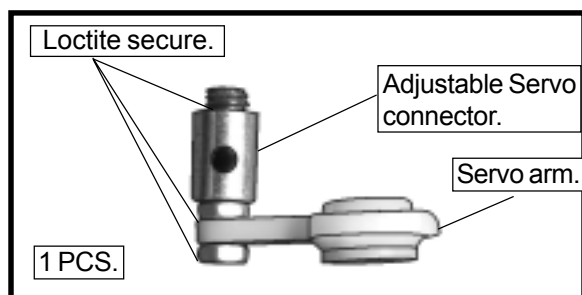
 *Because the size of servos differ, you may need to adjust the size of the precut opening in the mount. The notch in the sides of the mount allow the servo lead to pass through.*

- ☐ 1) Install the rubber grommets and brass collets onto the throttle servo. Test fit the servo into the aileron servo mount.
- ☐ 2) Secure the servos with the screws provided with your radio system.



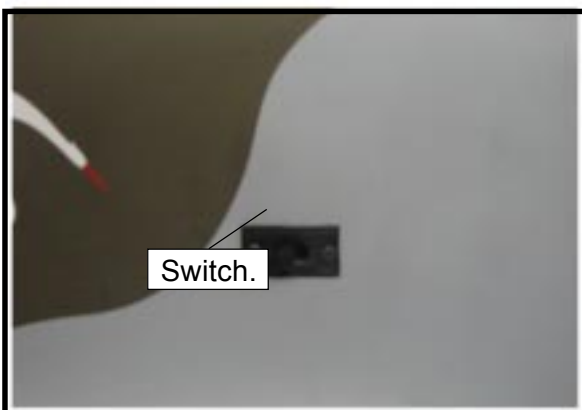
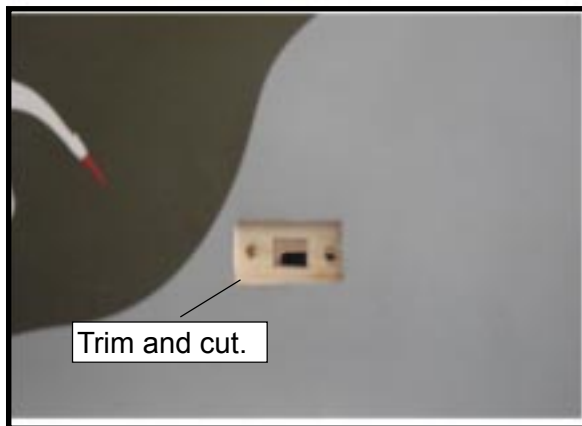
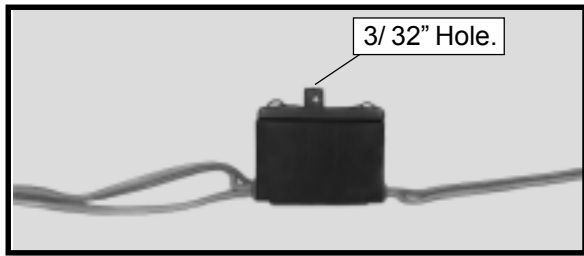
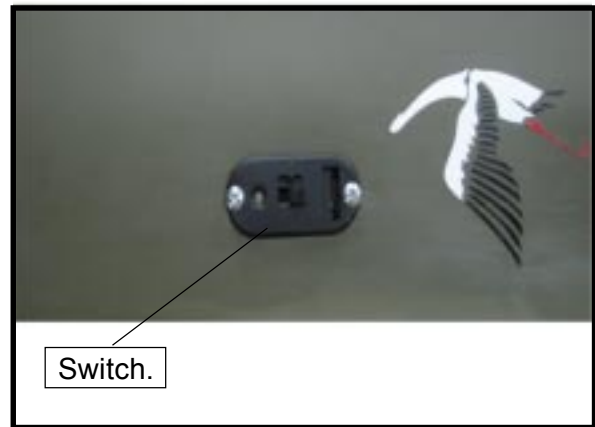
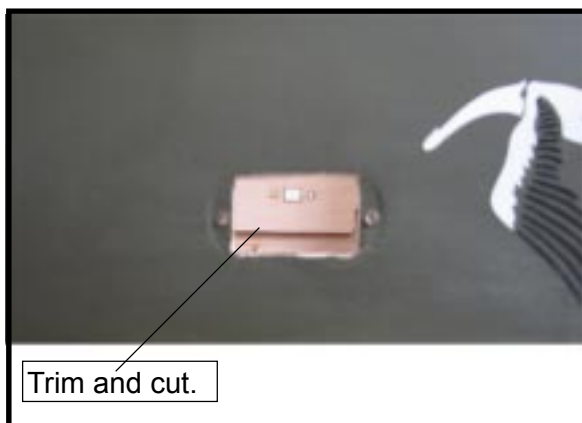
THROTTLE SERVO ARM INSTALLATION.

Install adjustable servo connector in the servo arm as same as picture below:

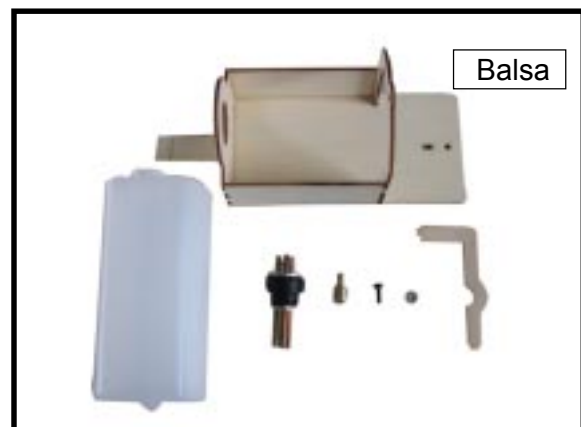
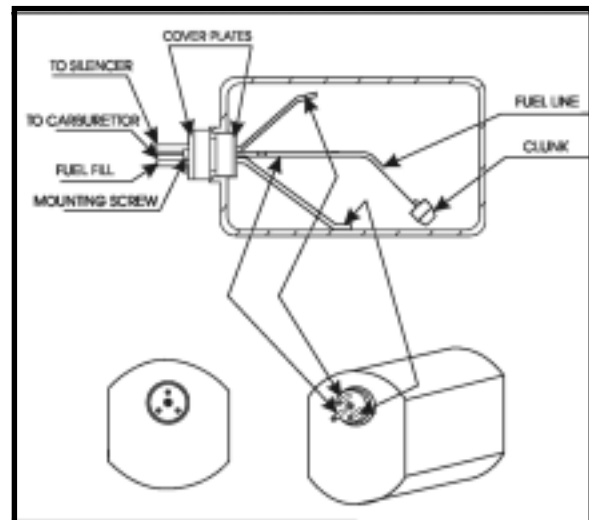


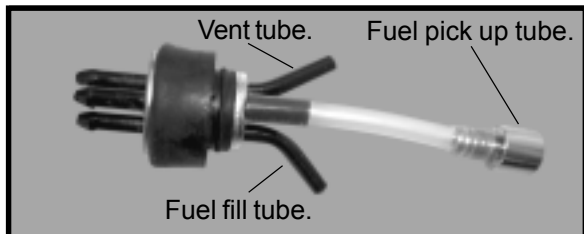
INSTALLING THE SWITCH RECEIVER

Install the switch into the precut hole in the side, in the fuselage.

**INSTALLING THE SWITCH ENGINE****INSTALLING THE STOPPER ASSEMBLY.**

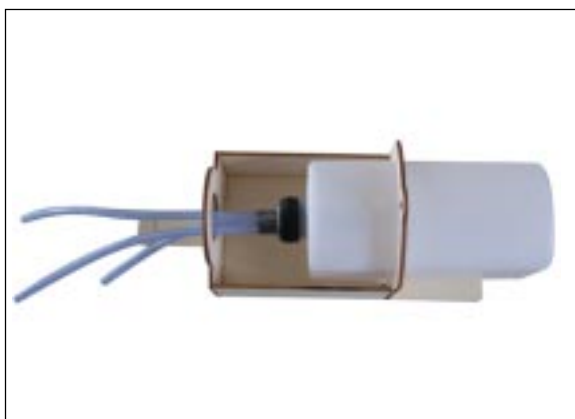
- ☐ 1) Using a modeling knife, carefully cut off the rear portion of one of the 3 nylon tubes leaving 1/2" protruding from the rear of the stopper. This will be the fuel pick up tube.
- ☐ 2) Using a modeling knife, cut one length of silicon fuel line. Connect one end of the line to the weighted fuel pick up and the other end to the nylon pick up tube.





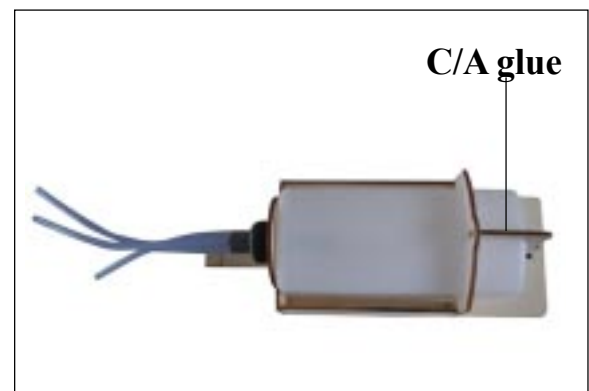
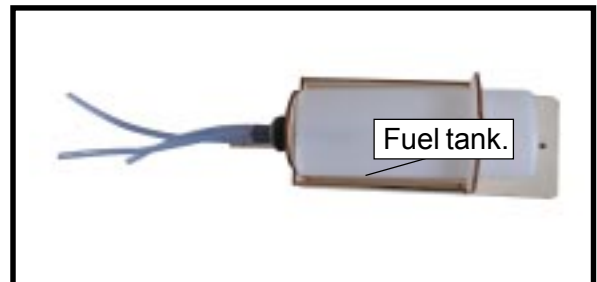
- ☐ 3) Carefully bend the second nylon tube up at a 45° angle. This tube is the vent tube.
- ☐ 4) Test fit the stopper assembly into the tank. It may be necessary to remove some of the flashing around the tank opening using a modeling knife. If flashing is present, make sure none falls into the tank.
- ☐ 5) With the stopper assembly in place, the weighted pick-up should rest away from the rear of the tank and move freely inside the tank. The top of the vent tube should rest just below the top of the tank. It should not touch the top of the tank.
- ☐ 6) When satisfied with the alignment of the stopper assembly tighten the 3 x 20mm machine screw until the rubber stopper expands and seals the tank opening. Do not overtighten the assembly as this could cause the tank to split.

FUEL TANK INSTALLATION.

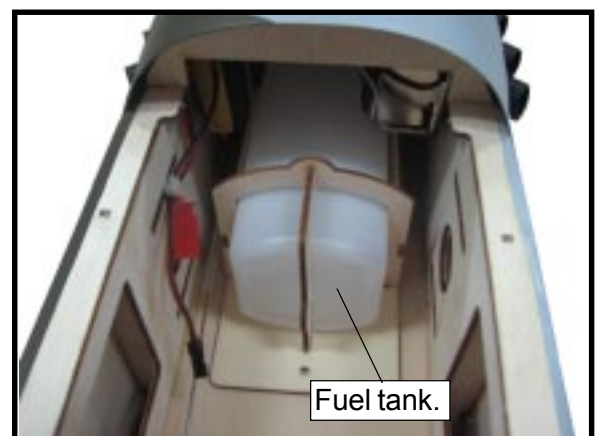


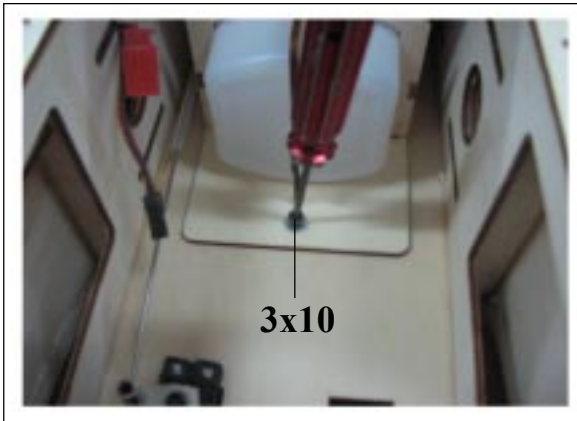
 You should mark which tube is the vent and which is the fuel pickup when you attach fuel tubing to the tubes in the stopper. Once the tank is installed inside the fuselage, it may be difficult to determine which is which.

- 7) Slide the fuel tank into the fuselage. Guide the lines from the tank through the hole in the firewall .



- ☐ 8) Use plywood template to hold in place the fuel tank with C/A glue to secure the fuel tank inside the fuselage.





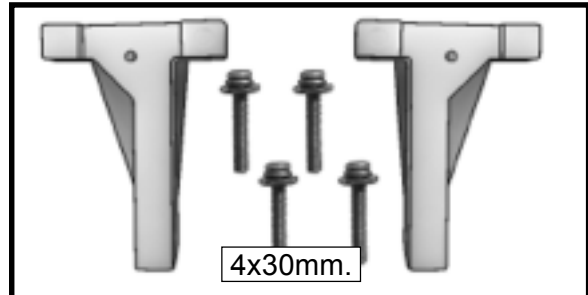
9) Connect the lines from the tank to the engine and muffler. The vent line will connect to the muffler and the line from the clunk to the carburetor.



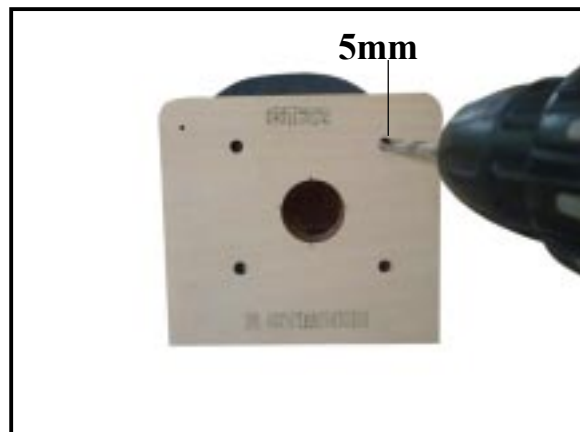
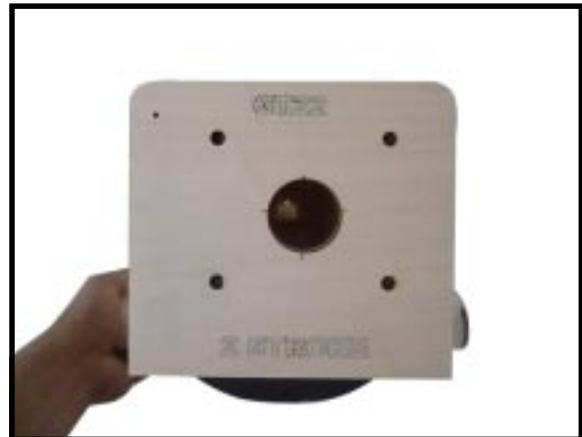
 **Blow through one of the lines to ensure the fuel lines have not become kinked inside the fuel tank compartment. Air should flow through easily.**

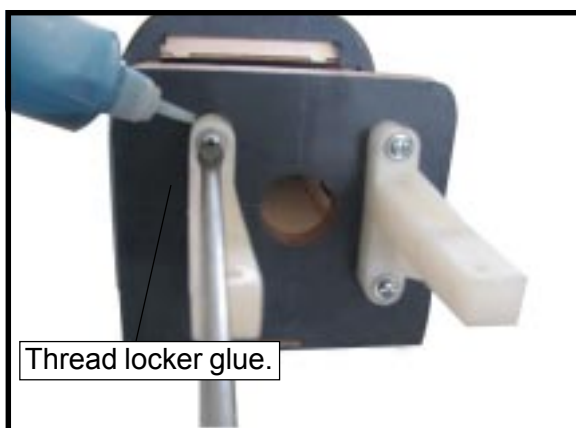
ENGINE MOUNT INSTALLATION.

1) Locate the items necessary to install the engine mount included with your model. .



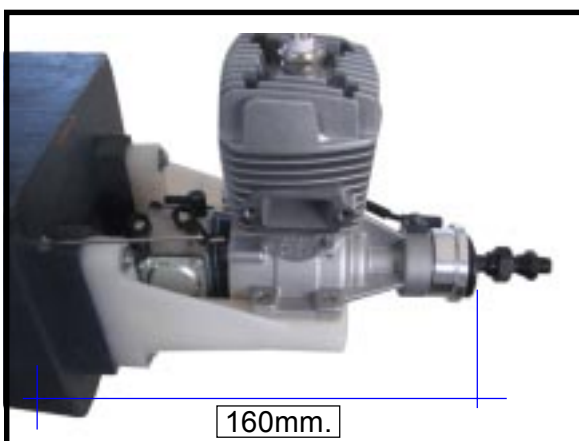
2) Use low-tack tape to secure the plywood engine template to the firewall, making sure it is centered. Use a drill and 1/16 inch (1.5mm) drill bit to drill the four pilot holes for the wood box mounting screws.



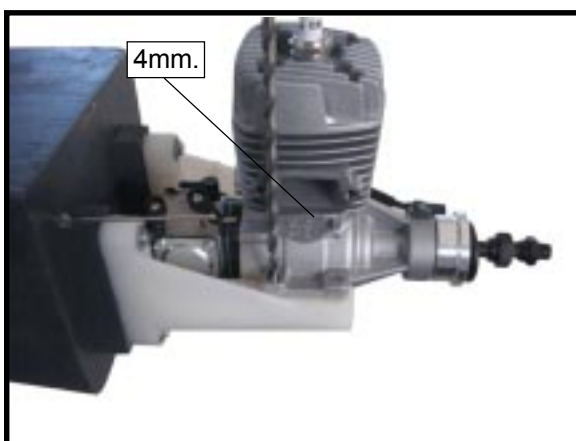


MOUNTING THE ENGINE.

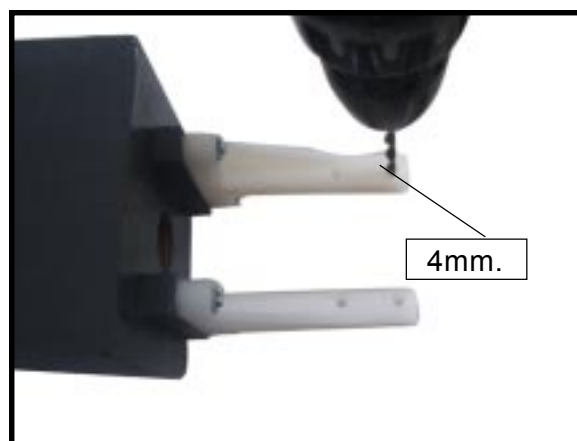
- 1) Position the engine with the drive washer (160mm) forward of the firewall as shown.



- 2) Use a pin drill and 4mm drill bit to drill a small indentation in the mount for the engine mounting screw.



- 3) Use a drill to drill the four holes in the engine mount rails.

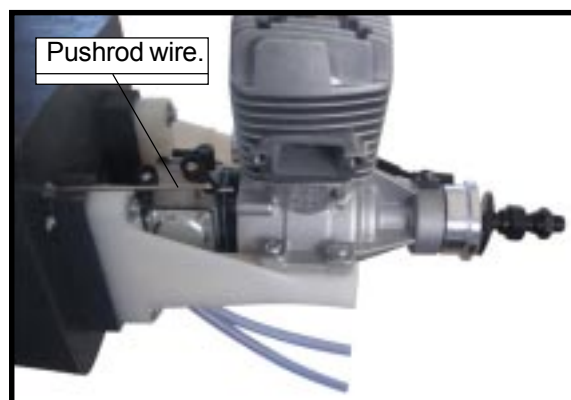
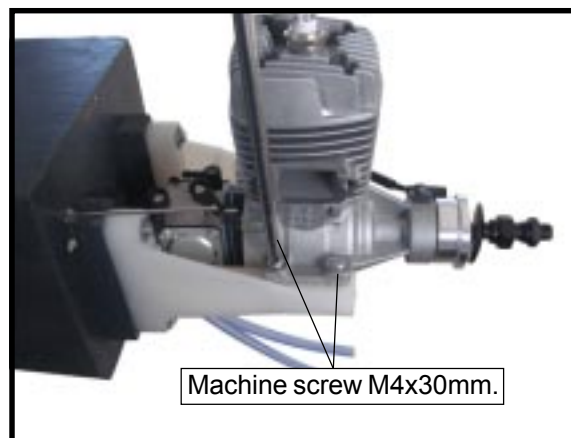


- 4) On the fire wall has the location for the throttle pushrod tube (pre-drill).

- 5) Slide the pushrod tube in the firewall and guide it through the fuel tank mount. Use medium C/A to glue the tube to the firewall and the fuel tank mount.

- 6) Connect the Z-bend in the 600mm throttle pushrod to the outer hole of the carburetor arm.

- 7) Slide the throttle pushrod wire into the tube. Position the engine between the mounts. Use four M4x30mm machine screws to secure the engine to the mount as shown.

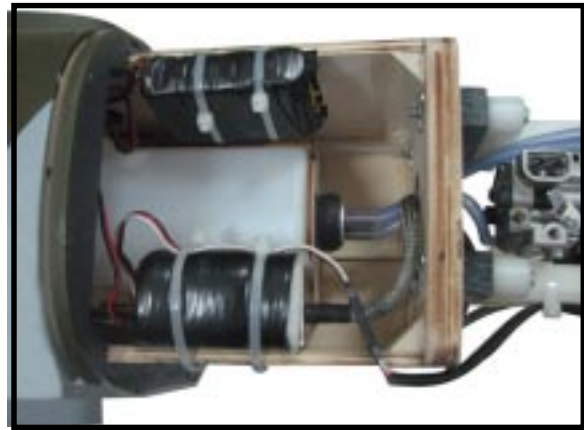
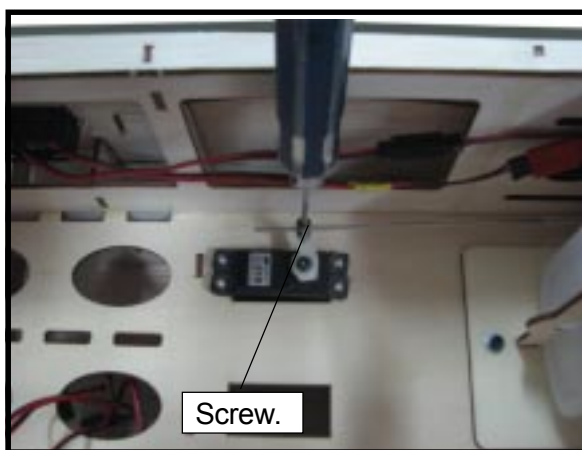




8) Reinstall the servo horn by sliding the connector over the pushrod wire. Center the throttle stick and trim and install the servo horn perpendicular to the servo center line.



9) Move the throttle stick to the closed position and move the carburetor to closed. Use a 2.5mm hex wrench to tighten the screw that secures the throttle pushrod wire. Make sure to use threadlock on the screw so it does not vibrate loose.

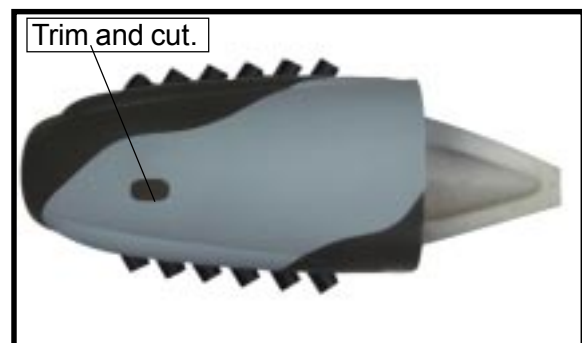
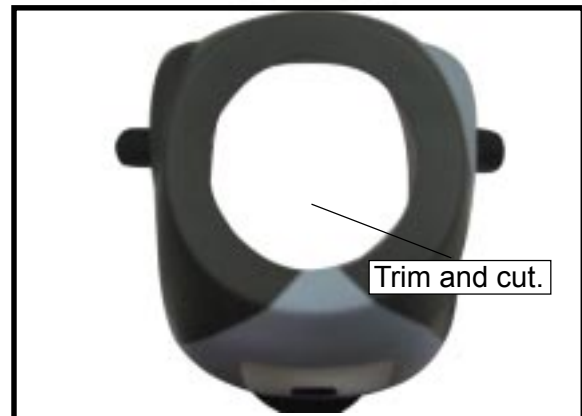


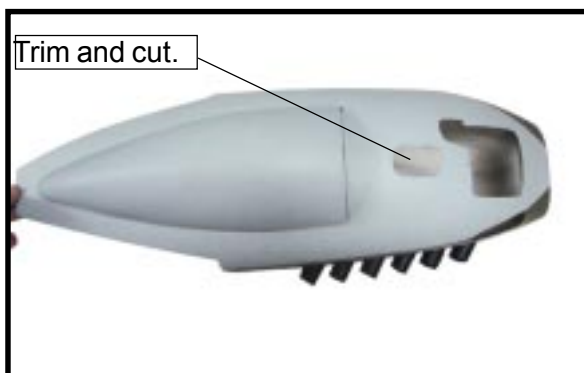
□ Secure the ignition module in the fuselage using hood and loop tape. Route the wires as necessary, making sure to connect the lead from the ignition switch and the sensor from the engine. The lead for the plug is routed through the opening in the firewall.

□ Pass the lead for the ignition through the rectangular hole in the firewall. Connect to the corresponding lead from the ignition module.

COWLING.

□ 1) Slide the fiberglass cowl over the engine and line up the back edge of the cowl with the marks you made on the fuselage then trim and cut as shown.



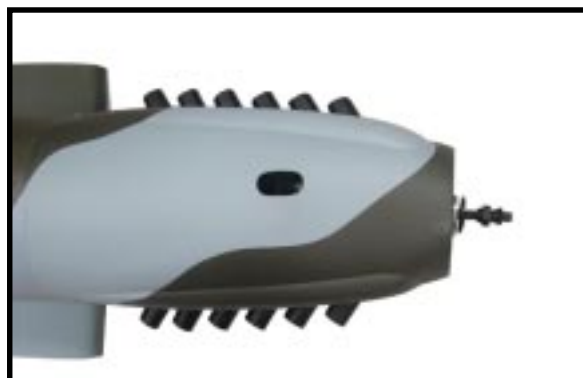


Because of the size of the cowl, it may be necessary to use a needle valve extension for the high speed needle valve. Make this out of sufficient length 1.5mm wire and install it into the end of the needle valve. Secure the wire in place by tightening the set screw in the side of the needle valve.

- 2) While keeping the back edge of the cowl flush with the marks, align the front of the cowl with the crankshaft of the engine. The front of the cowl should be positioned so the crankshaft is in **nearly** the middle of the cowl opening. Use the spinner backplate as a guide. Hold the cowl firmly in place using pieces of masking tape.



- 3) Install the muffler and muffler extension onto the engine and make the cutout in the cowl for muffler clearance. Connect the fuel and pressure lines to the carburetor, muffler and fuel filler valve. Secure the cowl to fuselage using the 3x10mm screws to tighten the screws.



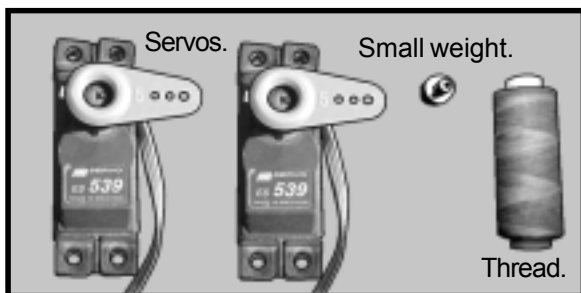
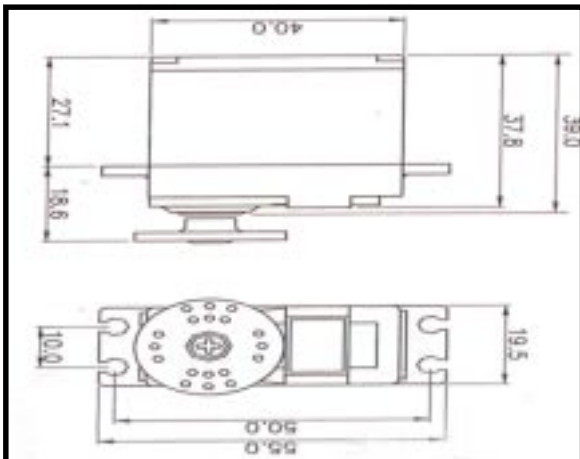
INSTALLING THE SPINNER.

Install the spinner backplate, propeller and spinner cone.



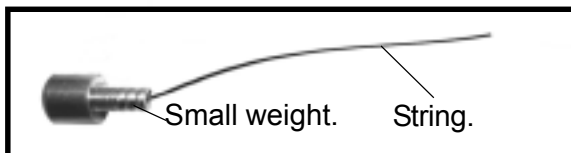
 *The propeller should not touch any part of the spinner cone. If it does, use a sharp modeling knife and carefully trim away the spinner cone where the propeller comes*



INSTALLING THE AILERON SERVOS.

⚠ *Because the size of servos differ, you may need to adjust the size of the precut opening in the mount. The notch in the sides of the mount allow the servo lead to pass through.*

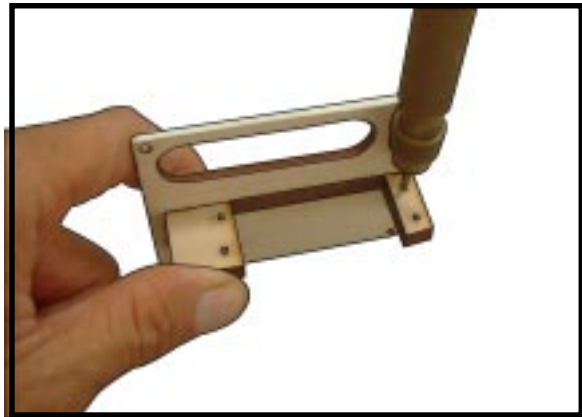
1) Using a small weight (Weighted fuel pick-up works well) and string, feed the string through the wing as indicated.



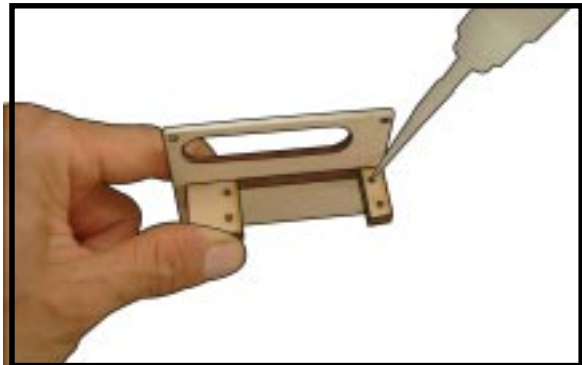
2) Place the servo between the mounting blocks and space it from the hatch. Use a pencil to mark the mounting hole locations on the blocks.



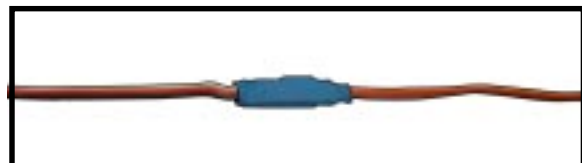
3) Use drill bit in a pin vise to drill the mounting holes in the blocks.



4) Apply 2-3 drops of thin C/A to each of the mounting holes. Allow the C/A to cure without using accelerator.



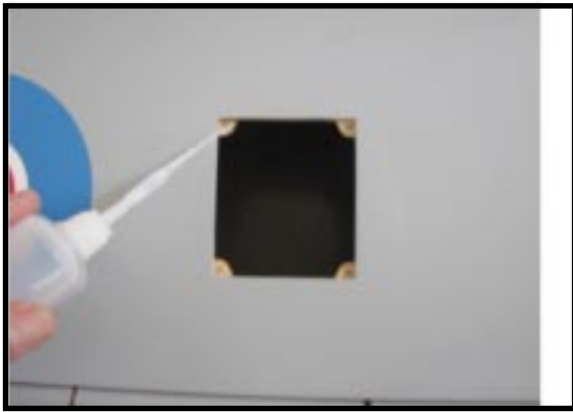
5) Use dental floss to secure the connection so they cannot become unplugged.



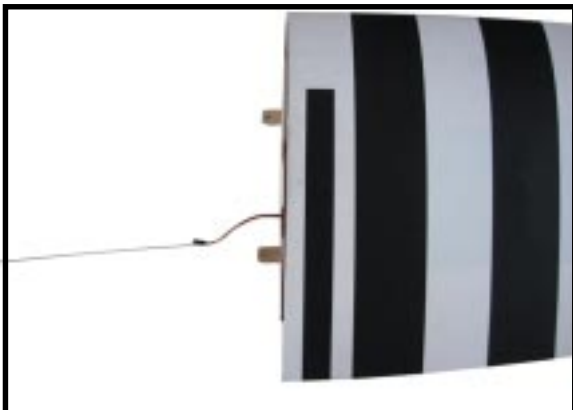
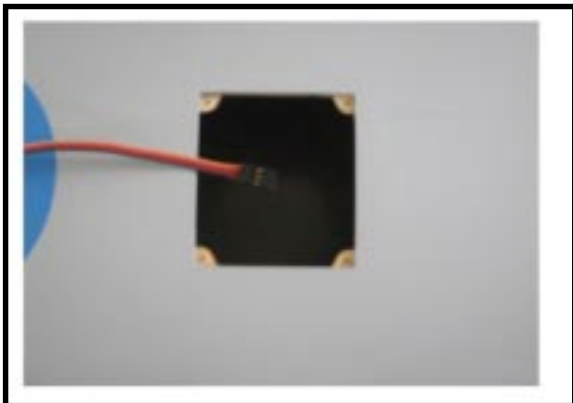
6) Secure the servo to the aileron hatch using Phillips screwdriver and the screws provided with the servo.



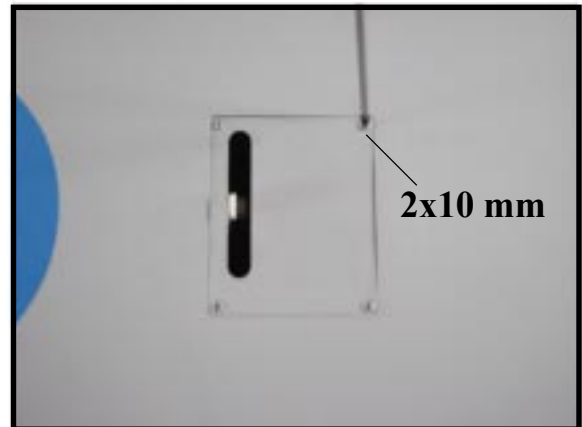
7) Apply 1-2 drops of thin C/A to each of the mounting tabs. Allow the C/A to cure without using accelerator.



8) A string has been provided in the wing to pull the aileron lead through to the wing root. Remove the string from the wing at the servo location and use the tape to attach it to the servo extension lead. Pull the lead through the wing and remove the string.



9) Set the aileron hatch in place and use a Phillips screw driver to install it with four wood screws.



INSTALLING THE FLAP SERVOS

Repeat the procedure for the aileron servo.



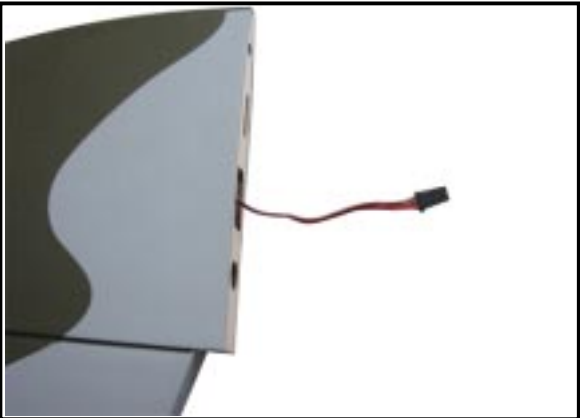
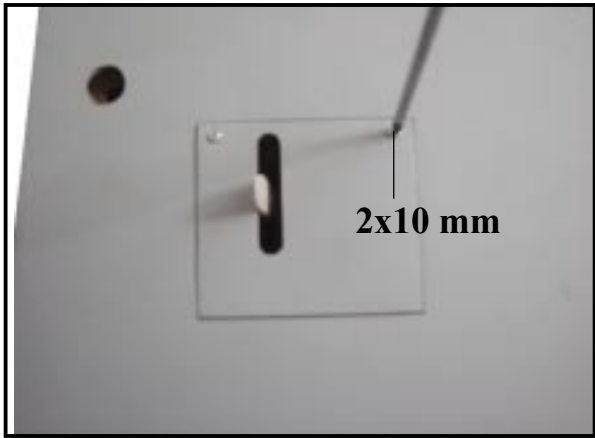
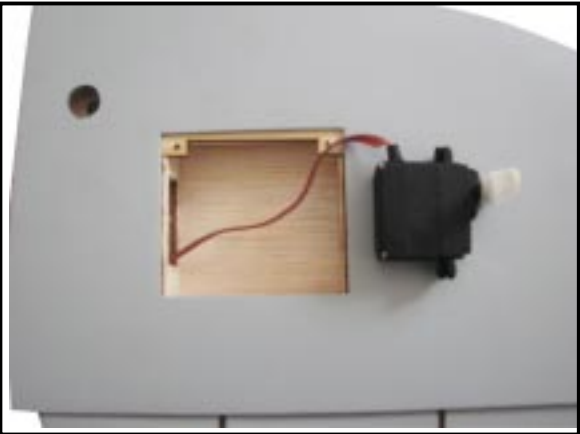
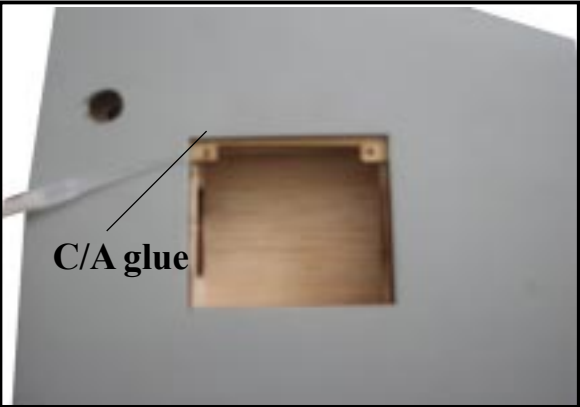
INSTALLING SERVOS RETRACT

Repeat the procedure for the aileron servo.

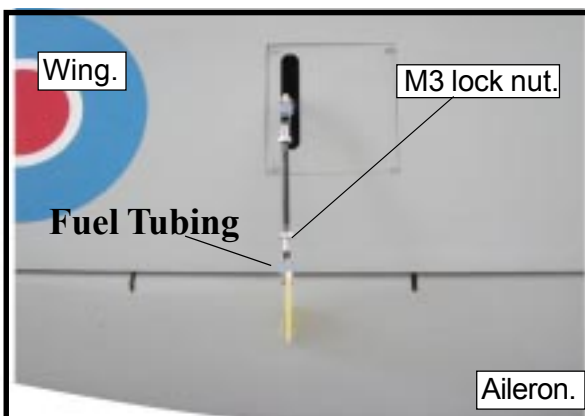
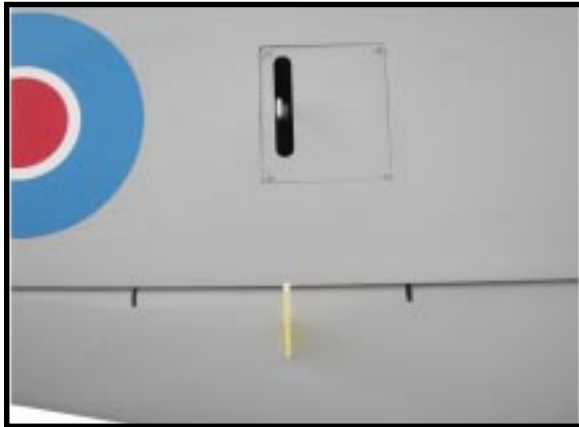
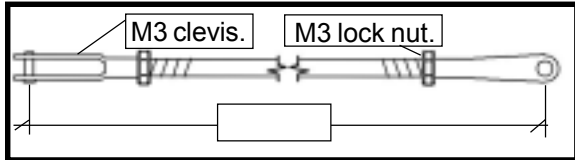
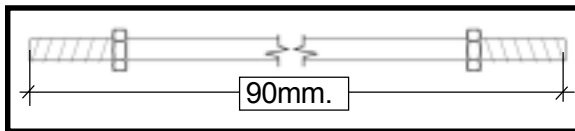


INSTALLING ELEVATOR SERVO

The elevator servo assembly follow these below pictures

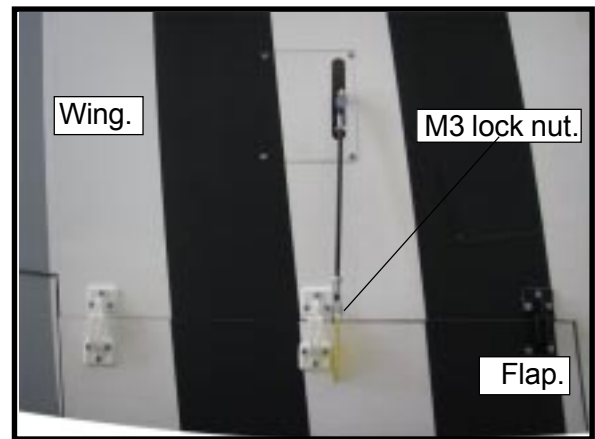
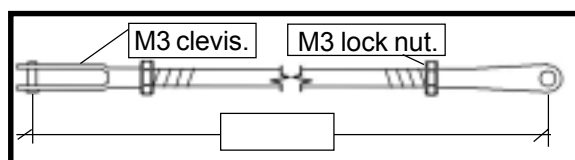
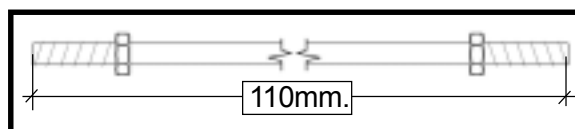


AILERON PUSHROD HORN INSTALLATION

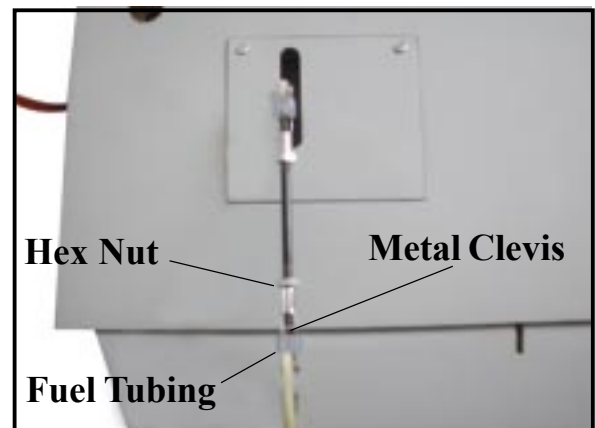
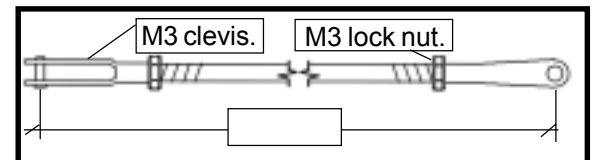
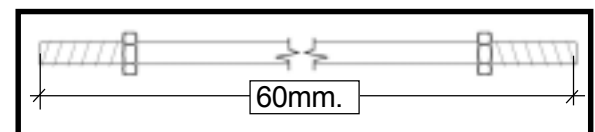


INSTALLING THE FLAP PUSHROD

Repeat the procedure for the aileron servo.



INSTALLING THE PUSHROD ELEVATOR

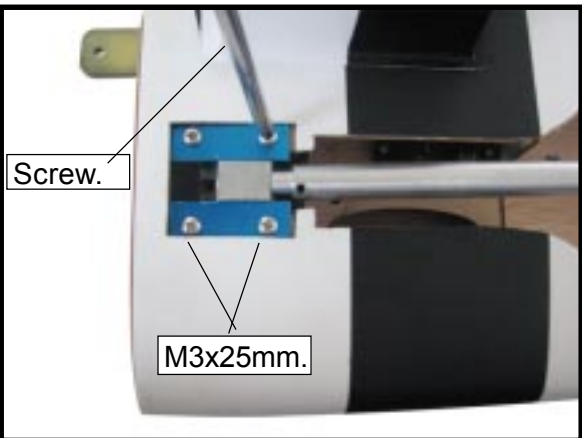
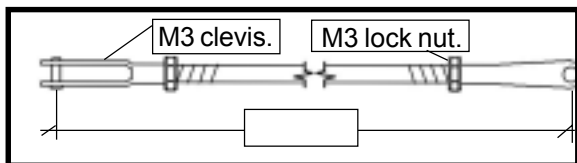
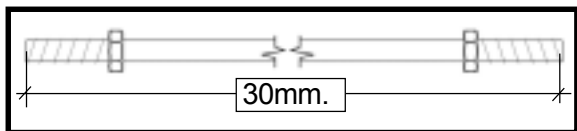
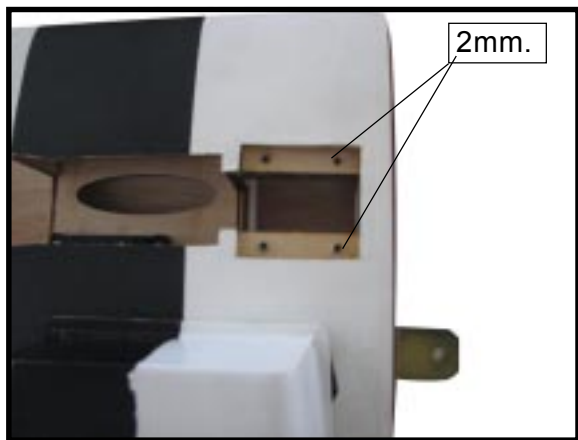
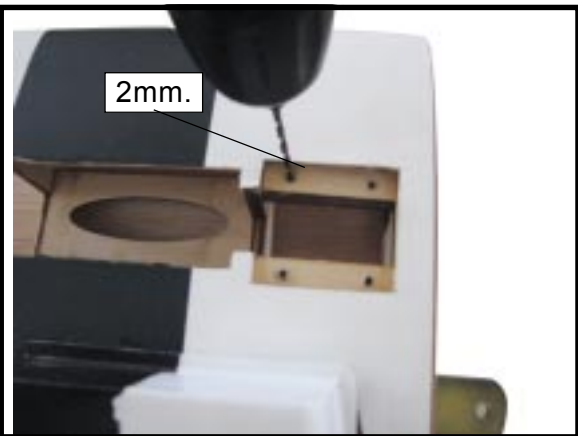
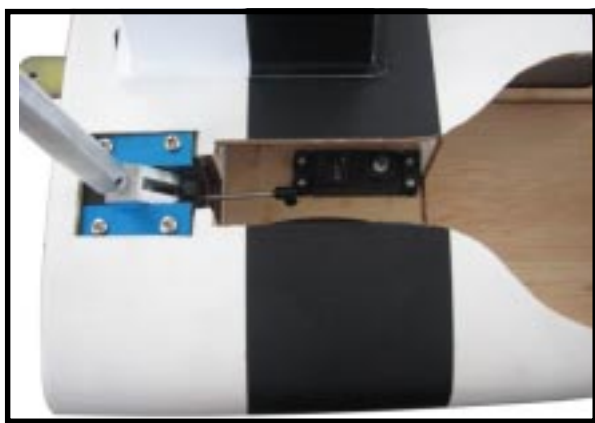
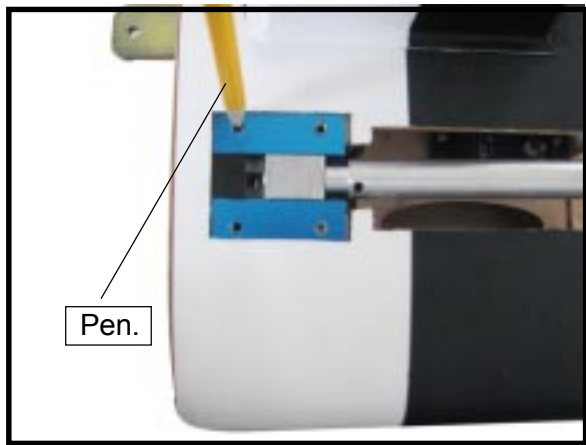


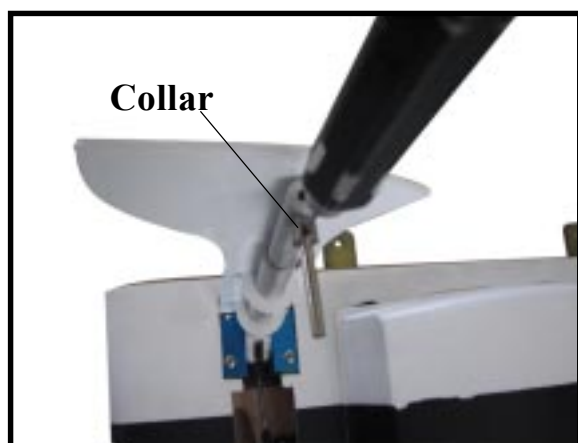
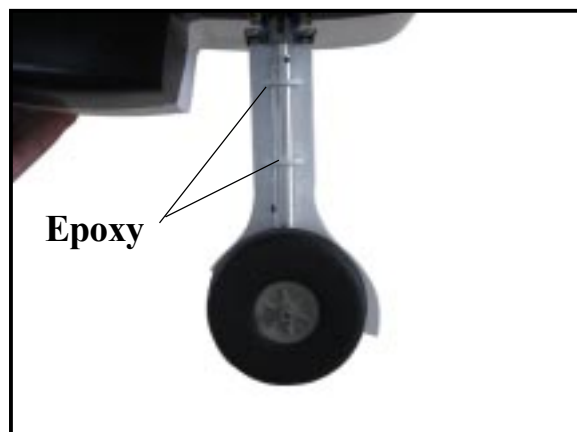
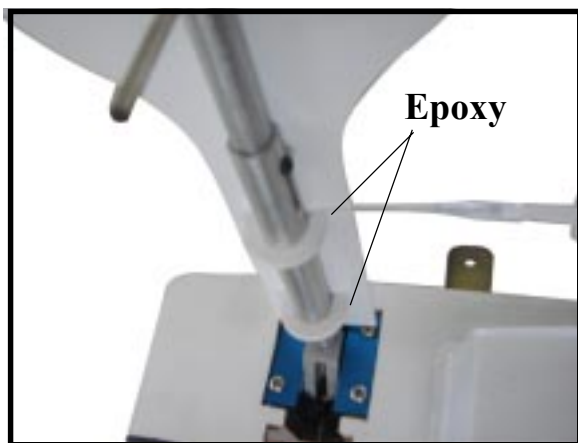
INSTALLING RETRACTABLE LANDING GEAR.

1) Locate the items necessary to install the retractable landing gear as shown.

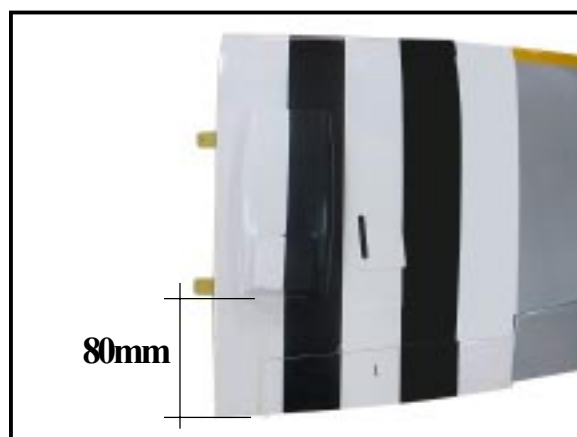
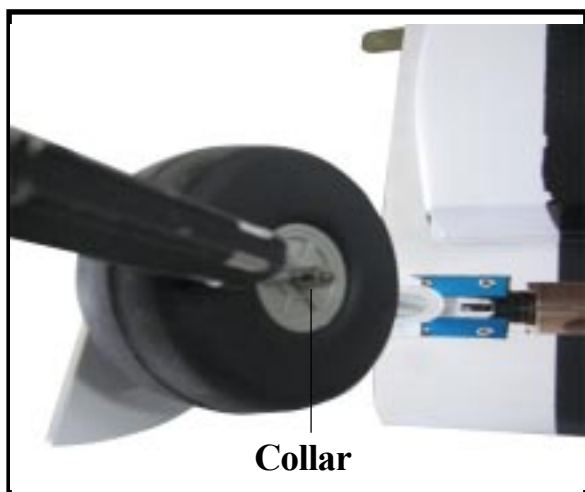


2) Install Retractable landing gear at the Wing.





3) Install Wheel.



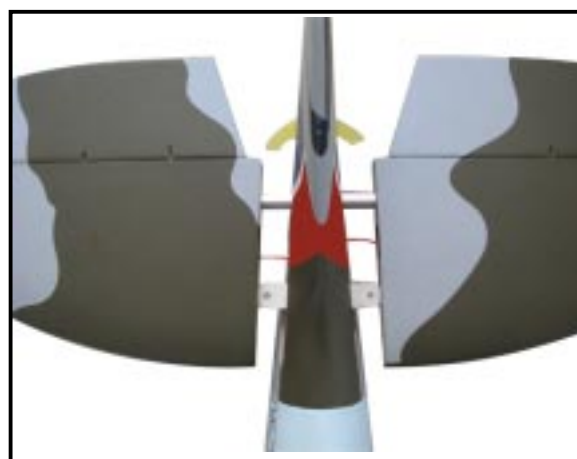


INSTALLING RUDDER HINGE

- ☐ The rudder hinge assembly follow picture below



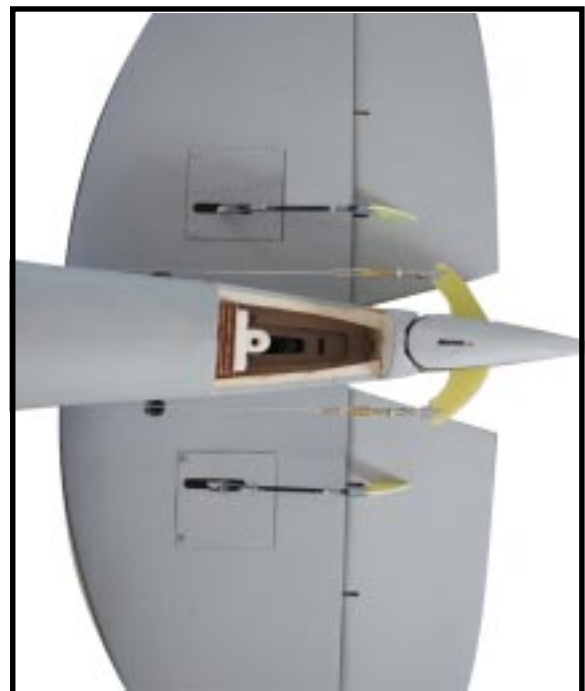
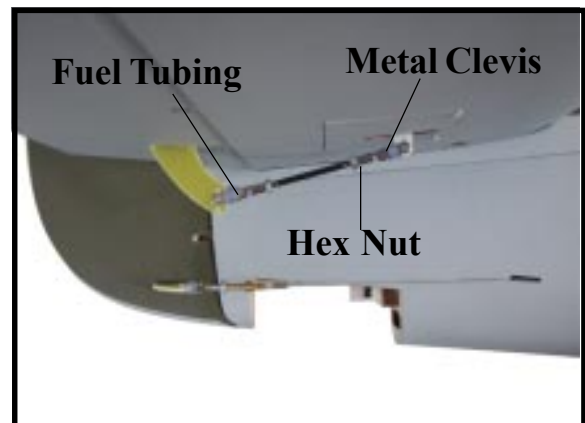
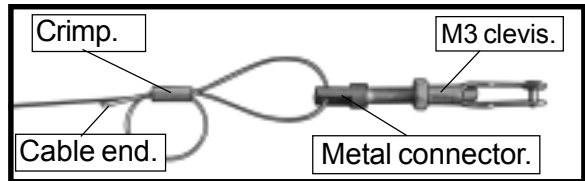
INSTALLING THE HORIZONTAL STABILIZER.





RUDDER PUSHROD HORN INSTALLATION.

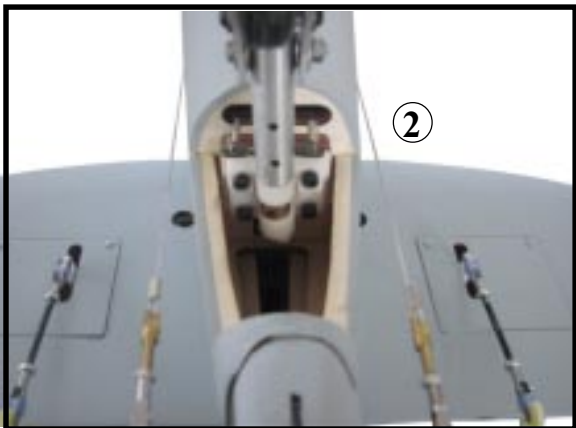
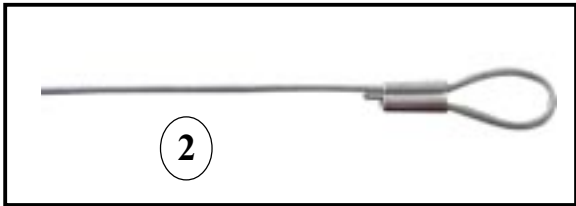
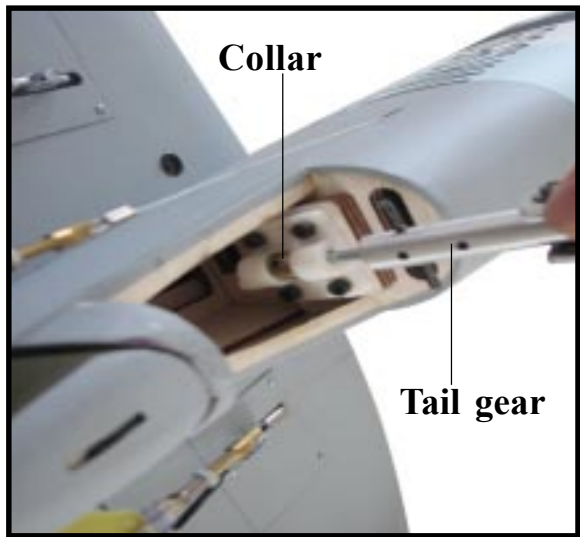
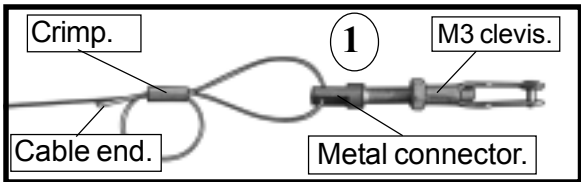
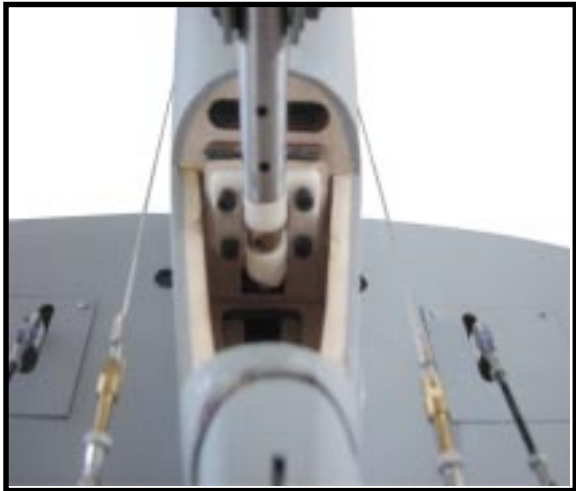
1) Locate items necessary to install rudder pushrod.

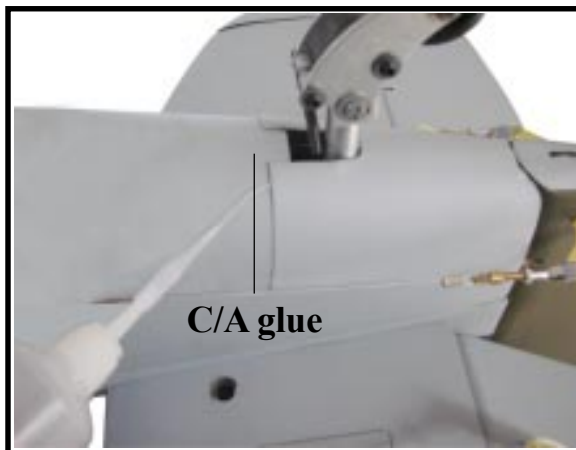
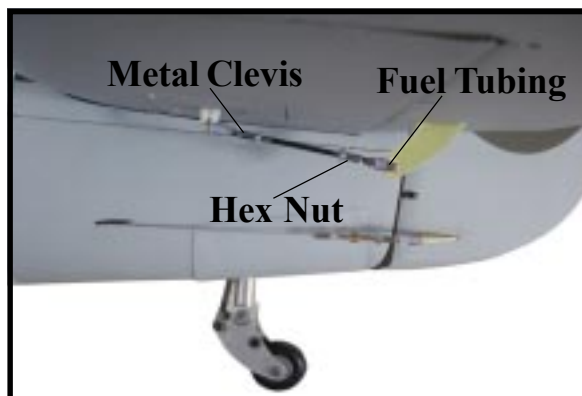
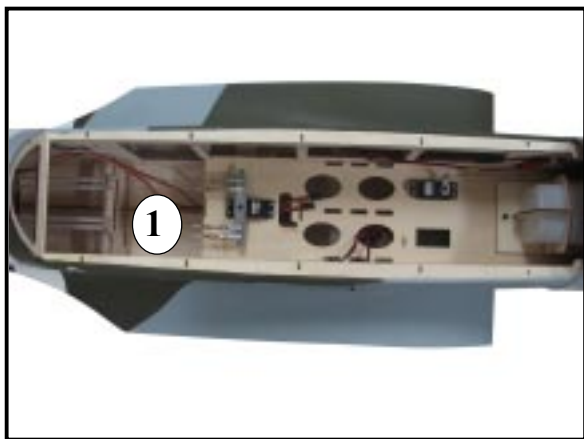




MOUNTING THE TAIL WHEEL

1) Locate items necessary to install tail gear.





INSTALLATION PILOT AND CANOPY.

1) Locate items necessary to install pilot and canopy.

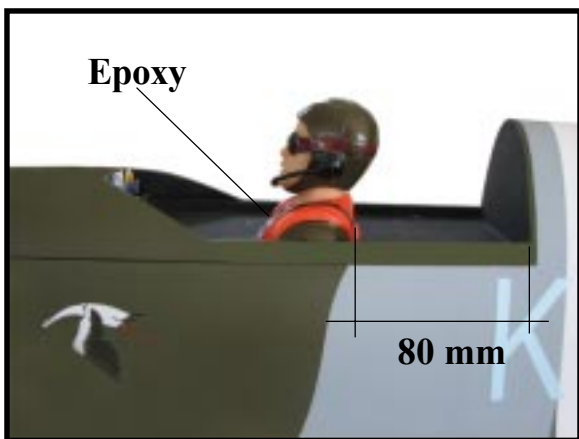


2) A scale pilot is included with this ARF. The Seagull Pilot included fitting well to the cockpit. (or you can order others scale pilot figures made by SG Models. They are available at SG Models distributors.)

If you are going to install a pilot figure, please use a sanding bar to sand the base of the figure so that it is flat.



3) Position the pilot figure on the canopy floor as show. Locate the oval shaped on the canopy floor and remove the covering. Use epoxy to glue this into the base of the pilot figure and glue the cockpit panel in place with C/A glue, please see pictures as shown.



4) Position the canopy onto the fuselage. Trace around the canopy and onto the fuselage using a felt-tipped pen.



APPLY THE DECALS.

1) If all the decals are precut and ready to stick. Please be certain the model is clean and free from oily fingerprints and dust. Position decal on the model where desired, using the photos on the box and aid in their location.

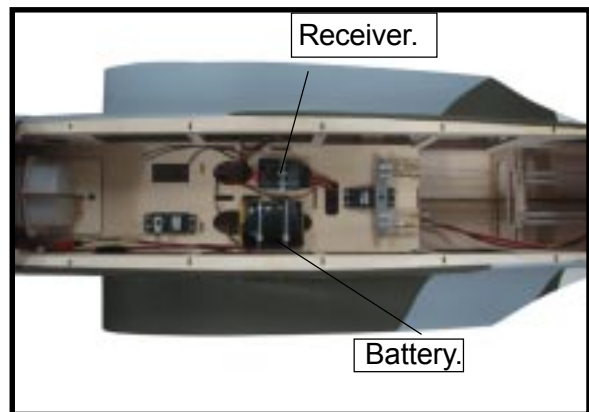
2) If all the decals are not precut, please use scissors or a sharp hobby knife to cut the decals from the sheet. Please be certain the model is clean and free from oily fingerprints and dust. Position decal on the model where desired, using the photos on the box and aid in their location.

INSTALLING THE BATTERY-RECEIVER.

☐ 1) Plug the servos leads and the switch lead into the receiver. Plug the battery pack lead into the switch also.

☐ 2) Wrap the receiver and battery pack in the protective foam rubber to protect them from vibration.

☐ 3) Route the antenna in the antenna tube inside the fuselage and secure it to the bottom of fuselage using a plastic tape.

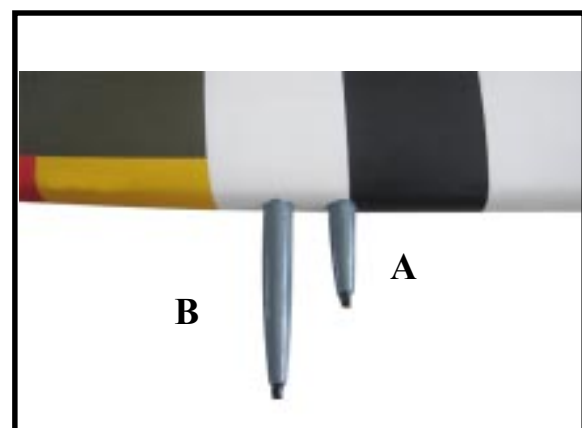
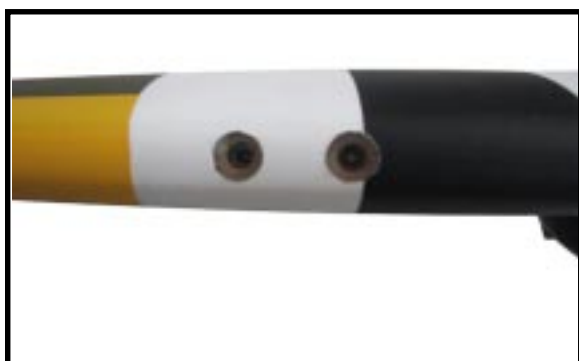
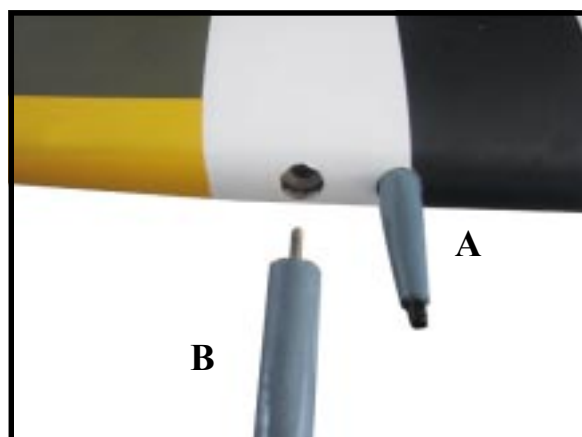
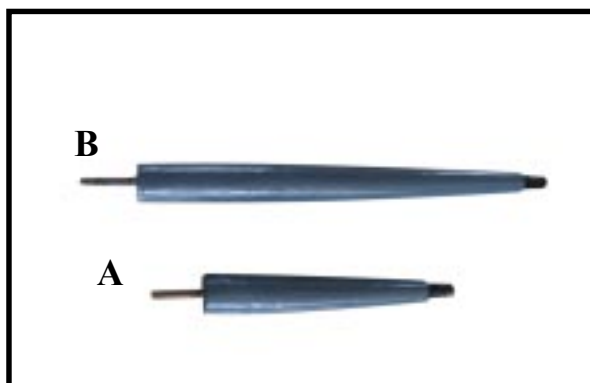
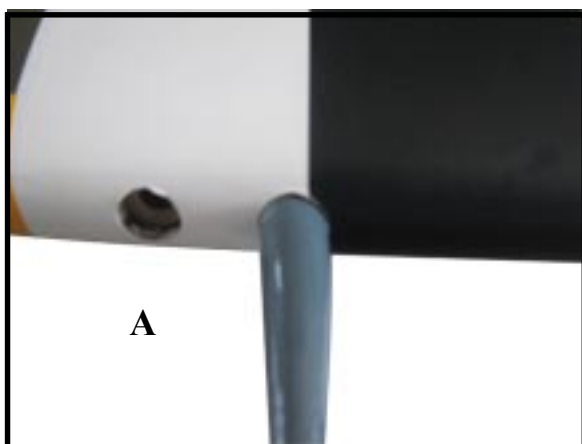
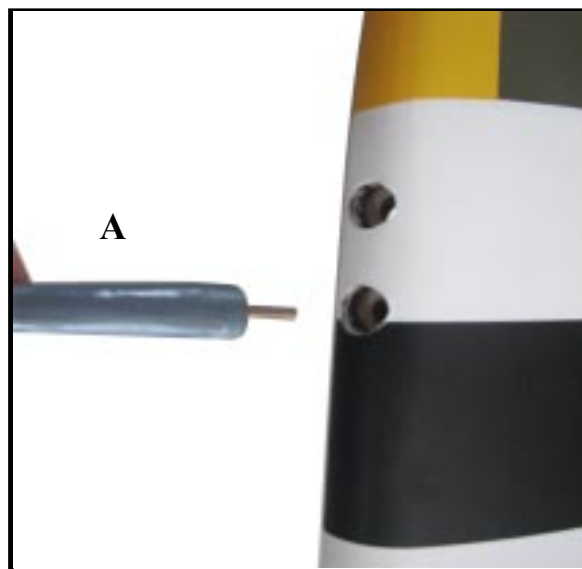
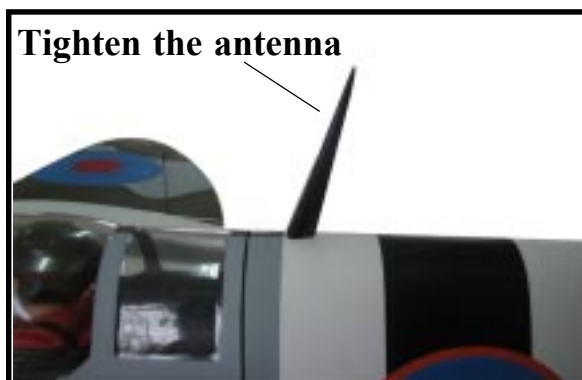


☐ 4) The last detail is to install the antenna onto the fuselage. Use a hobby knife to cut a slot in the top of the fuselage for the antenna.



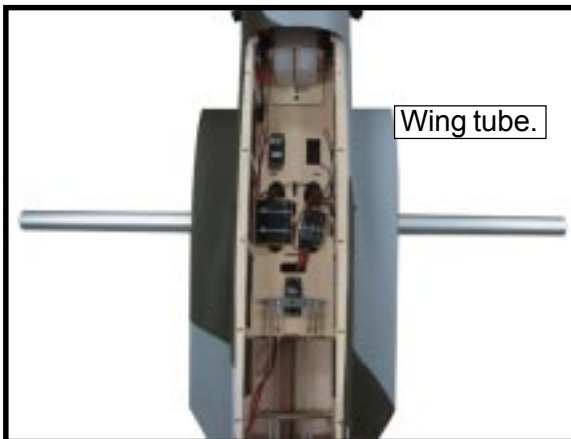


- 5) Tighten the antenna to the fuselage.
The antenna is removeable so you can install it at the flying field to prevent damage in transporting.

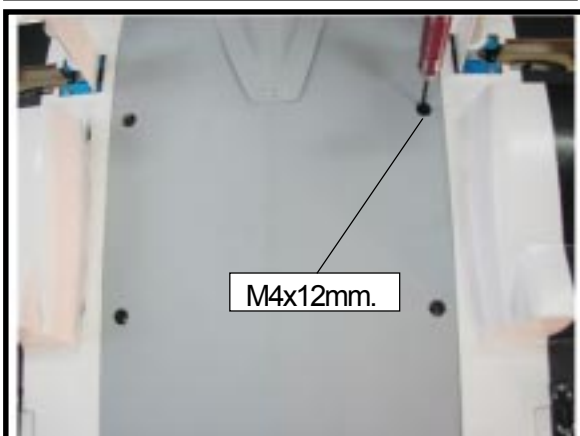


ATTACHMENT WING-FUSELAGE.

1) Attach the aluminium tube into fuselage.



Insert two wing panels as pictures below.

**BALANCING.**

❑ 1) It is critical that your airplane be balanced correctly. Improper balance will cause your plane to lose control and crash. THE CENTER OF GRAVITY IS LOCATED **114 MM** BACK FROM THE LEADING EDGE OF THE WING AT THE WING ROOT.

❑ 2) Mount the wing to the fuselage. Using a couple of pieces of masking tape, place them on the top side of the wing **114 mm** back from the leading edge of the wing at the wing root.

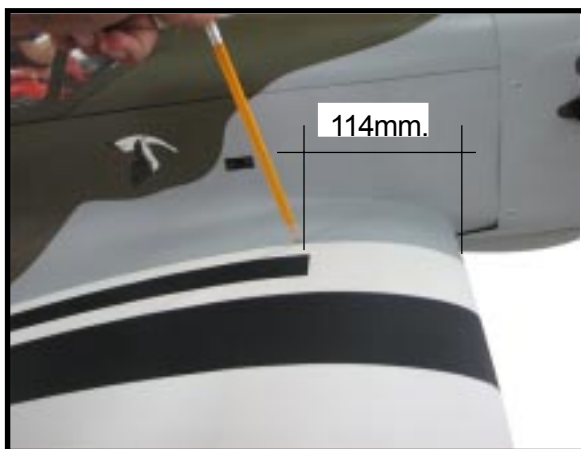
❑ 3) Turn the airplane upside down. Place your fingers on the masking tape and carefully lift the plane .

Accurately mark the balance point on the top of the wing on both sides of the fuselage. The balance point is located **114 mm** back from the leading edge of the wing at the wing root. This is the balance point at which your model should balance for your first flights. Later, you may wish to experiment by shifting the balance up to 10mm forward or back to change the flying characteristics. Moving the balance forward may improve the smoothness and arrow- like tracking, but it may then require more speed for take off and make it more difficult to slow down for landing. Moving the balance aft makes the model more agile with a lighter and snappier "feel". In any case, please start at the location we recommend .

With the wing attached to the fuselage, all parts of the model installed (ready to fly), and empty fuel tanks, hold the model at the marked balance point with the stabilizer level.

Lift the model. If the tail drops when you lift, the model is “tail heavy” and you must add weight* to the nose. If the nose drops, it is “nose heavy” and you must add weight* to the tail to balance.

*If possible, first attempt to balance the model by changing the position of the receiver battery and receiver. If you are unable to obtain good balance by doing so, then it will be necessary to add weight to the nose or tail to achieve the proper balance point.



CONTROL THROWS.

Ailerons:

High Rate :

Up : 18 mm

Down : 18 mm

Low Rate :

Up : 13 mm

Down : 13 mm

Elevator:

High Rate :

Up : 20 mm

Down : 20 mm

Low Rate :

Up : 15 mm

Down : 15 mm

Rudder:

High Rate :

Right : 30 mm

Left : 30 mm

Low Rate :

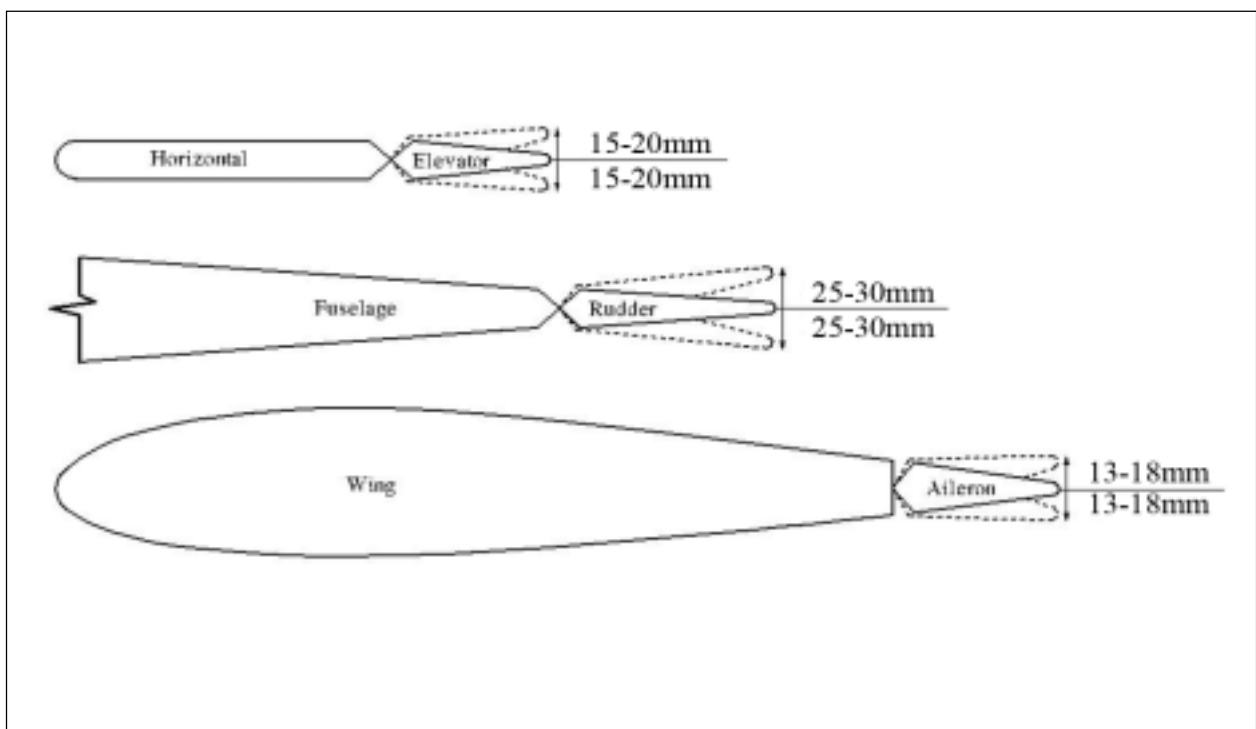
Right : 25 mm

Left : 25 mm

Flap:

Mid : 25 mm

Landing : 35 mm



FLIGHT PREPARATION.

Check the operation and direction of the elevator, rudder, ailerons and throttle.

☐ A) Plug in your radio system per the manufacturer's instructions and turn everything on.

☐ B) Check the elevator first. Pull back on the elevator stick. The elevator halves should move up. If it they do not, flip the servo reversing switch on your transmitter to change the direction.

☐ C) Check the rudder. Looking from behind the airplane, move the rudder stick to the right. The rudder should move to the right. If it does not, flip the servo reversing switch on your transmitter to change the direction.

☐ D) Check the throttle. Moving the throttle stick forward should open the carburetor barrel. If it does not, flip the servo reversing switch on your transmitter to change the direction.

☐ E) From behind the airplane, look at the aileron on the right wing half. Move the aileron stick to the right. The right aileron should move up and the other aileron should move down. If it does not, flip the servo reversing switch on your transmitter to change the direction.

PREFLIGHT CHECK.

☐ 1) Completely charge your transmitter and receiver batteries before your first day of flying.

☐ 2) Check every bolt and every glue joint in the **SPITFIRE** to ensure that everything is tight and well bonded.

☐ 3) Double check the balance of the airplane. Do this with the fuel tank empty.

☐ 4) Check the control surfaces. All should move in the correct direction and not bind in any way.

☐ 5) If your radio transmitter is equipped with dual rate switches double check that they are on the low rate setting for your first few flights.

☐ 6) Check to ensure the control surfaces are moving the proper amount for both low and high rate settings.

☐ 7) Check the receiver antenna. It should be fully extended and not coiled up inside the fuselage.

☐ 8) Properly balance the propeller. An out of balance propeller will cause excessive vibration which could lead to engine and/or airframe failure.

We wish you many safe and enjoyable flights with your SPITFIRE - 2030mm