

Feibao BAe Hawk

Developed and written by Luke Cullen



The following instructions are developed based on using a Kingtech K 180 G. This kit includes engine mounts, bypass and thrust tube for 16 -18 kilo turbine and tanks with the capacity for 4 litres of fuel. The build for the Hawk will give you the general idea for your specific engine you use. Think of the build as working from the back to the front, this makes it seem easier. Every step focuses on easy maintenance when the need arises.

DISCLAIMER:

THIS IS NOT A TOY; it's a high performance model capable of high speeds and damage to persons and or property if not used responsibly. The manufacturer and its distributors cannot control how you assemble this model, what type of equipment you use, or how you fly it. FB can assume no liability whatsoever for any damages that may occur when you fly your aircraft. By assembling this model, you are agreeing to indemnify and hold blameless the manufacturer and/or his agents from any and all torts and liability associated with the use of this product. Please inspect all parts before beginning assembly. If any parts appear to be missing or suspect, contact your dealer or the manufacturer for repair or replacement BEFORE you begin. Once you have assembled the aircraft, you are the pilot in command and assume any and all responsibility for the use of the model and any damages that might occur by flying or attempting to fly this aircraft. R/C model jets require a high level of skill in both their assembly and their flying. If you do not feel confident in either your building or flying skills, PLEASE seek assistance from more experienced modellers. It is advisable no matter what level of skills you have to have a second experienced modeller go over your installation after assembly. This is advisable during the build to use the inspector who will do the final turbine inspection. A second set of eyes may spot a problem you have missed. If you have not flown a model like this before, it is HIGHLY recommended that you get an experienced turbine pilot to do your maiden flight. Very often, the first few seconds of a maiden flight are critical until the aircraft is trimmed out, and having an experienced pilot at the controls can make the difference between a wrecked aircraft and once that enjoys many hundreds of flights. Be sure to select a suitable open field for flying...take the time to find a large paved runway if at all possible, especially for test flights, until you feel comfortable getting the aircraft in and out of smaller grass fields.

BEFORE YOU BEGIN:

Keep this in mind as you proceed:

Look at EVERY assembly step you finish, double check what's done and make sure it's correct. Even the smallest component is important and can cause the loss of your airplane, so take the time to do things accurately. Correct problems if they are wrong. Careful work will result in a long-lasting plane that gives you years of pleasure, one loose component could result in the complete loss of the aircraft and all the components inside it, and someone can even get hurt. Use quality digital servos and alloy servo arms to increase strength and durability. Also this decreases the chances of slop in surfaces which is important to avoid flutter with such a fast model.

The FB Hawk as it comes from the factory includes the following parts:

Accessories included:

- 1 x Stainless steel double walled thrust tube
- 1 x wooden engine mount spacers for Jet cat engines
- 1 x large 4 litre fuel tank with plumbing hardware
- 3 x coils of coloured plastic airline
- 1 x brake valve
- 1 x retract valve
- 1 x bag of air Y connectors
- 1 x bag of 4 way air connectors
- 1 x bag of fuel Y connectors
- 1 x bag of fuel plugs
- 6 x servo linkages including ball links
- 2 x small air tanks
- 2 x large air tanks
- 1 x bag of servo mounts and hardware
- 1 bag of steering cable parts including wire and crimps
- Multiple named bags with socket headed mounting bolts

Airframe parts included

- Fuselage rear section
- Fuselage nose section
- 1 x detailed double cockpit including dress up trim
- 1 x rudder
- 1 x elevator
- 2 wing panels
- 1 carbon wing tube
- Plywood formers and trays
- Large drop tank for under the fuselage
- Control horns

Servos used in this build

- Ailerons x 2 JR 8411
- Flaps x 2 Futaba S9074
- Rudder JR 8911
- Elevators x 2 Futaba S9075
- Steering x 1 JR 8411

I have used SWB alloy arms for all of the flying surfaces to increase the integrity of all the controls. They are 25mm arms which is ample for the amount of movement you need.

I have tried to arrange a construction sequence that will allow you to keep moving forward, rather than standing around waiting for glue to dry before you can proceed to the next steps

Introduction:

You have chosen a model that represents the pinnacle of ARF technology. While there is not a lot of building to do, there is enough to keep you busy for a many hours. Even if you have assembled other ARF jets, we highly recommend following our assembly sequence and procedures anyway. Chances are it will save you a lot of time, prevent you from running down dead ends, and perhaps remind you of a few small things that might end up saving your aircraft.

Just because the model is almost completely built does not mean you can rush through the assembly. You need to employ fine craftsmanship every step of the way, turbine models need critical care and attention.

Keep this in mind with everything you do, every part you install...look at the work you just did, evaluate it critically, and ask yourself "is this going to potentially crash my airplane?" If there is any doubt about the work you have done, back up, and re-do it properly.

Adhesives: The correct adhesive to use for all procedures is Loctite Hysol 9462. This is a very strong white epoxy that is thixotropic. "Thixotropic" means it does not run at all, but stays only where you put it. It is infinitely superior to regular epoxy, even slow-setting epoxy, for our purposes, because of this characteristic. Regular epoxy will run downhill with gravity as it dries, taking it away from where it is intended to be.

A good example is in the hinges...using regular epoxy, a good portion of the glue will migrate down away from the hinge into the inside of the wing as it dries, and you won't even know it is happening. Hysol stays where you put it. The downside of Hysol is it takes overnight to dry properly, but I have tried to arrange things to keep you busy while waiting for glue to dry. I also highly recommend that you only use a proper Hysol dispensing gun with the long-type mixing nozzles.

The short nozzles do not mix this glue enough and only a thin nozzle and gun will let you fill the hinge and control horn holes properly with glue, you can't do it mixing your Hysol on a flat surface and trying to get the glue in the proper place by a brush or stick.

You can buy a complete Hysol setup including a mixing gun, nozzles and cartridges of glue from your local hobby supplier. Consider it a great investment, the glue is the best you will use. Two cartridges will be plenty to assemble your Hawk

AIR SYSTEMS:

The Hawk uses pneumatic brakes and retracts so follow the steps and you should have very reliable leak-free operation. Neatness counts so all airlines should be secured to the airframe to keep them from flopping around or getting kinked. I used plastic clips to keep all the wiring and airlines both neat and away from heat. The other very important thing is to cut off the end of each airline dead square before installing it on the nipple. This is VITAL. You can either purchase a professional tubing cutter from your dealer Intairco or similar, or you can make up a jig to hold the airline and keep a sharp, new razor blade perfectly upright as you cut. Either one works, just ensure that all ends of all airlines are cut off dead square. Make sure all airlines are pushed ALL THE WAY onto their nipples. They should not need to be secured otherwise, but you can add fine wire safety wraps if you like. Make sure all left and right matching airlines are the same length, particularly the brake lines, or you will get uneven retraction or braking action. It's worth taking the time to get everything pneumatic right the first time, as having your landing gear fail to retract is not that bad, however having it fail to deploy can really ruin your day and the paint on the bottom of your model.

FUEL SYSTEM:

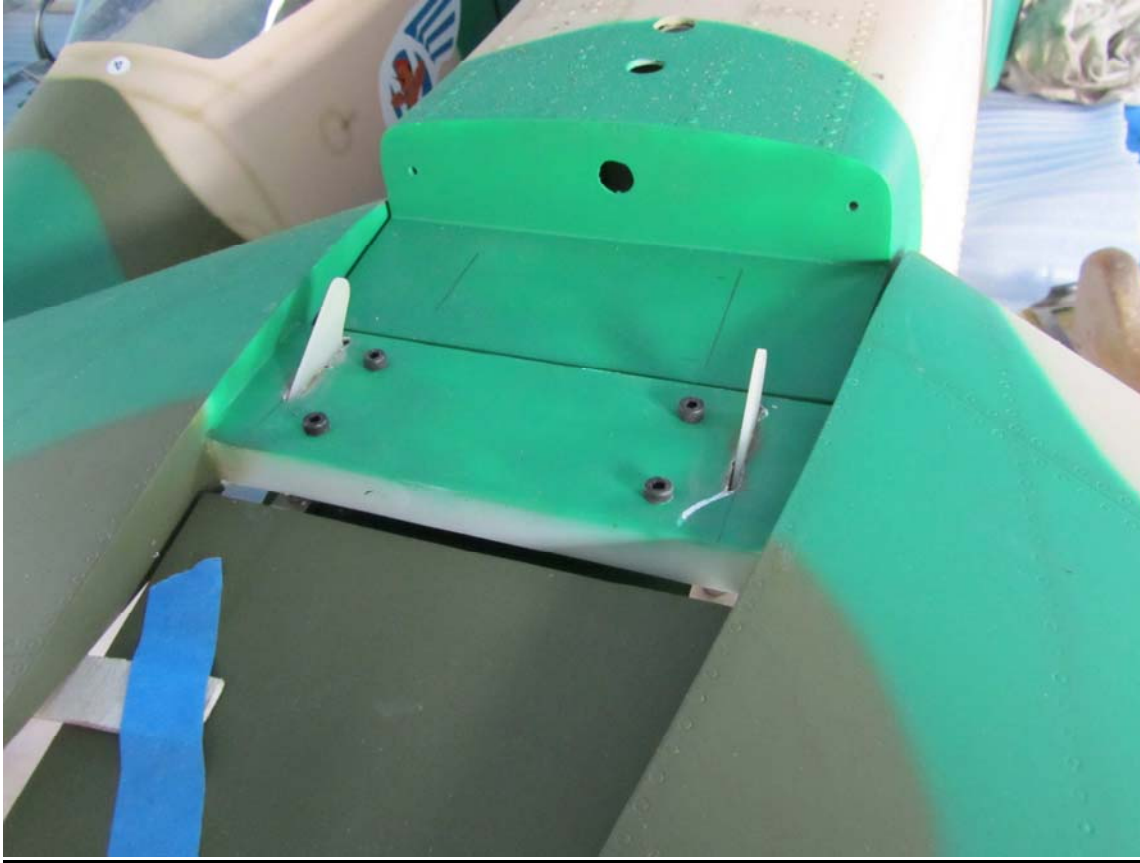
The Hawk has a very simple fuel system, 1 main 4 litre tank in front of the ducting area and I used a 1 litre Dubro tank that fits above the main ducting. There is heaps of room for a UAT or similar header tank. There is not much to go wrong, but like the pneumatic system it does need to be done right the first time, with some careful craftsmanship. As with the airlines, all fuel lines must be cut off square. I have used all Festo fittings for all fuel lines or tie wire where Festo fittings are not available. The UAT's I have used are from INTAIRCO and provide all Festo fittings. Everything needs to be dead clean including the inside of all the fuel tanks.

Accessories packs:

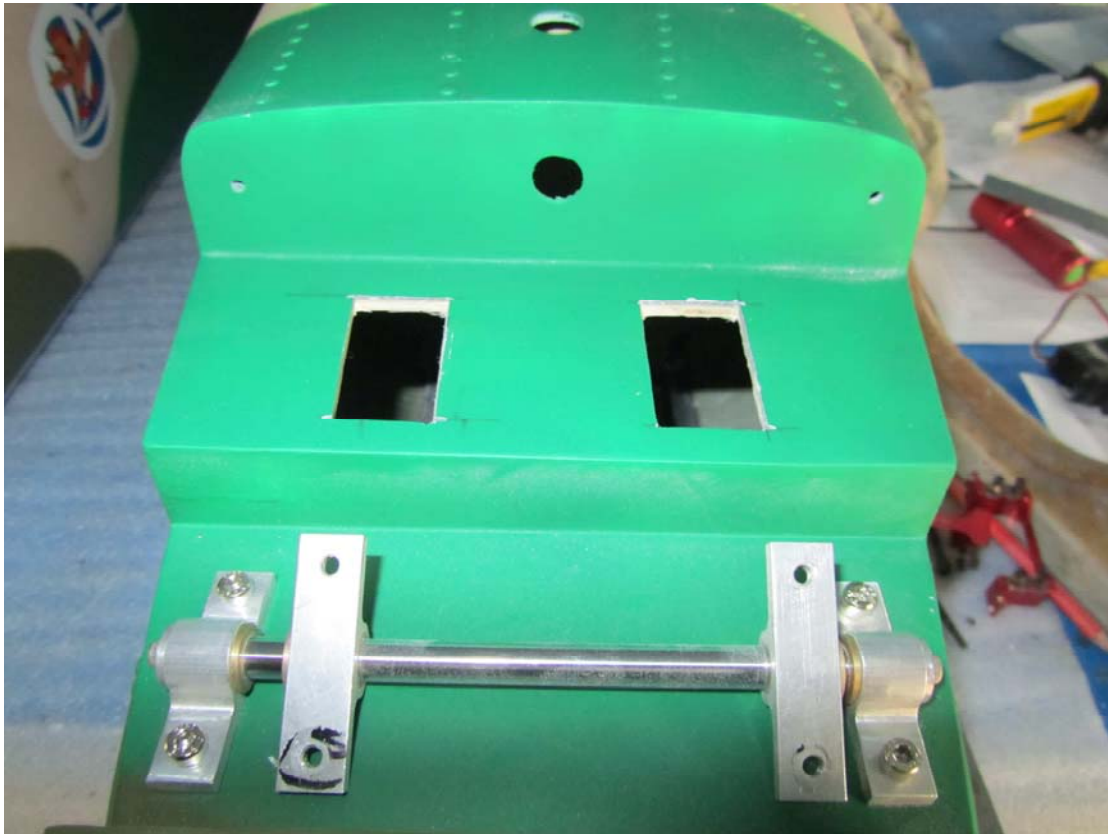
Included with the FB Hawk is a comprehensive amount of control horns, airlines and bolts to complete the model.



Elevator:



1. Temporarily mount the elevator on the alloy mount. You can then measure the position of the servos for clearance for the tail cover.
2. Cut the slots for the fibreglass horns making sure they are both in the identical positions from the leading edge.
3. Glue the horns in with Hysol with the long tips roughing up the horns before you glue them.
4. The elevator is one piece with a pre-installed alloy pivot. The servos are mounted in the area in front of the elevator.
5. Cut holes and mount your elevator servos in front of the elevator. Be careful where you place the servos in relation to where the tailpipe fits.
6. I put a piece of balsa wood under the servos to make sure they don't get warm. I also used heatproof aluminium tape on the balsa wood cover.
7. Check the position of the alloy arm to provide clear movement of the servo and linkage



8. Loctite the 3mm screws to mount the tailplane, I used larger washers to spread the load on the tailplane.

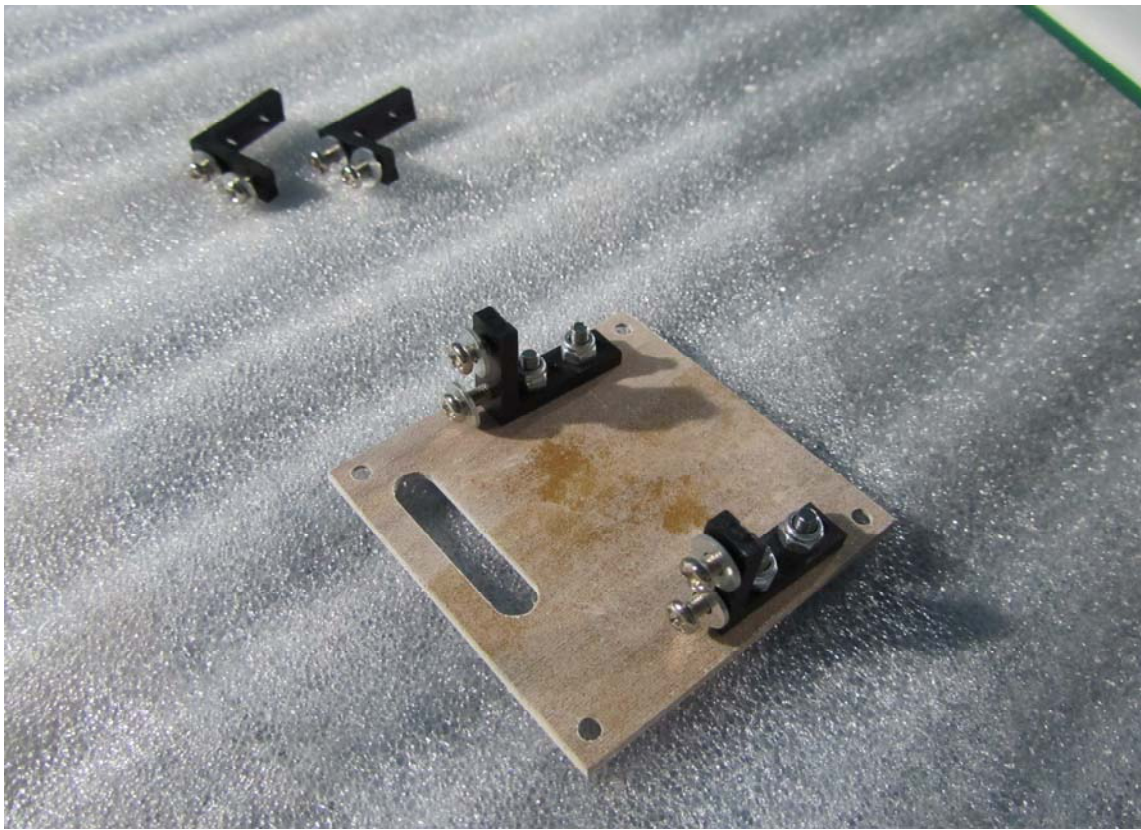
9. You need to finish the adjustment of the elevator servos now so you can fit the factory cover for the elevator area.

10. Use the fibreglass pieces provided to cover the holes left in the elevator/fuselage join.



Rudder:

1. Remove the screws holding the servo covers from the rudder servo bay. Keep the orientation of the servo cover correct, do not flip or rotate the servo covers, as there may be slight variations in the screw holes and they may not fit perfectly if you rotate the covers.
2. Mount the plastic brackets as indicated then mount the servos to the brackets.



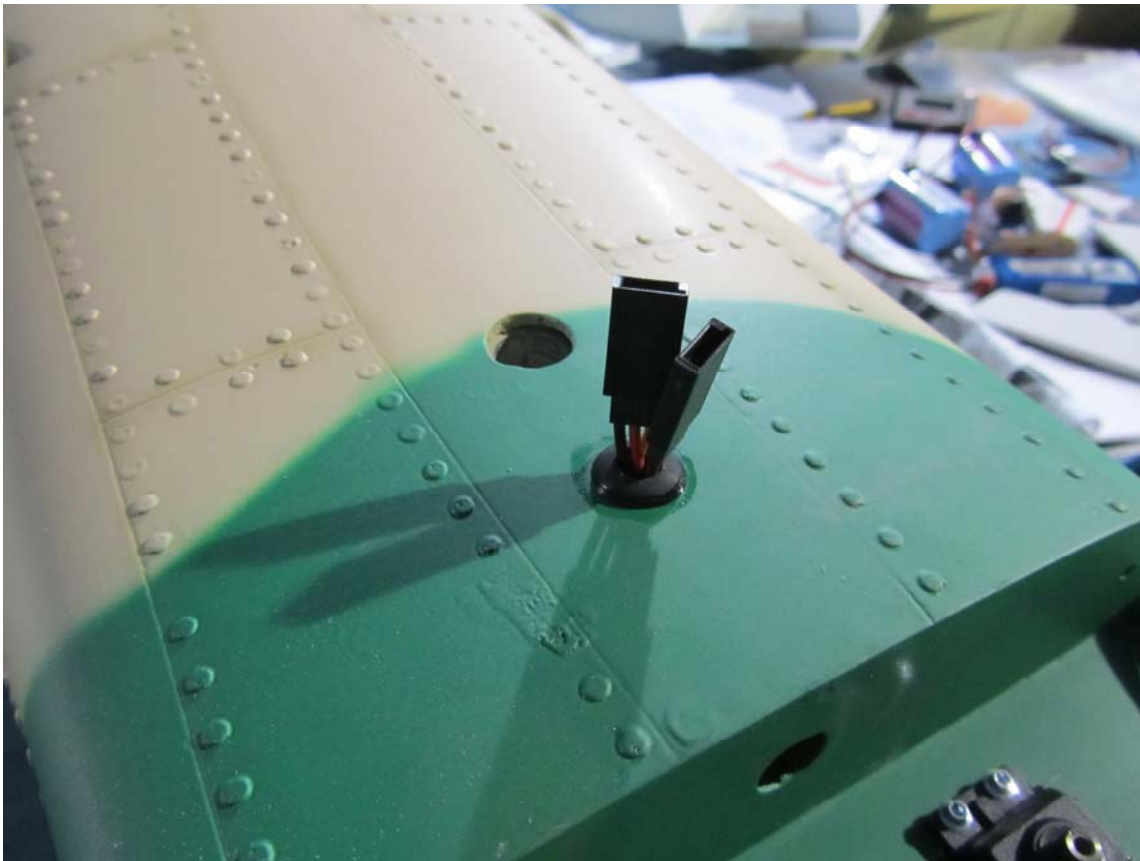
3. Glue the control horn in the rudder making sure it fits right down in the slot. I used a 3mm drill carefully to make the slot deeper. Roughen up the bottom of the control horn so the glue bonds properly.



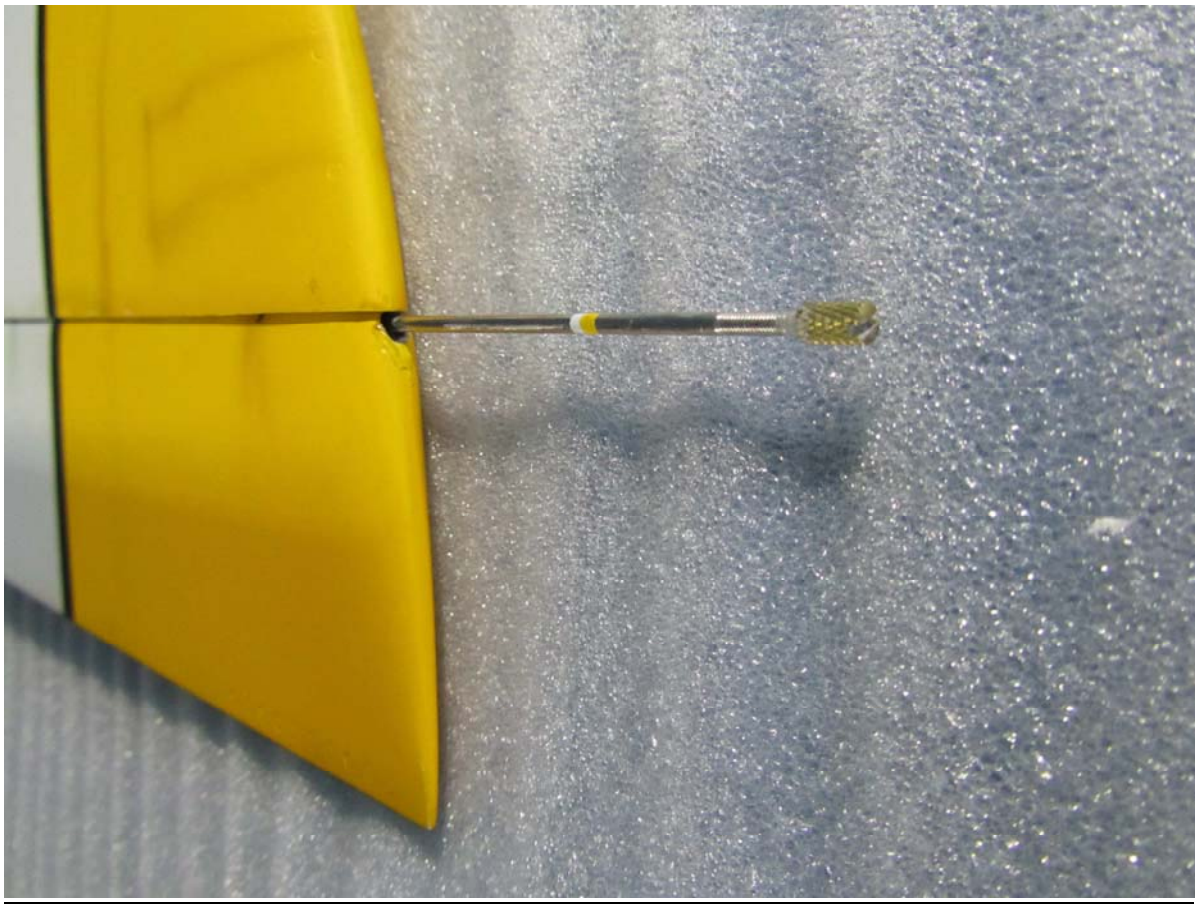
4. I used a titanium link for the rudder control rod, when using the factory ball links I put a washer over the bolt as a safety measure.



5. Put a rubber grommet where the wires go through the fibreglass. This avoids and damage to the wires over time from vibration.



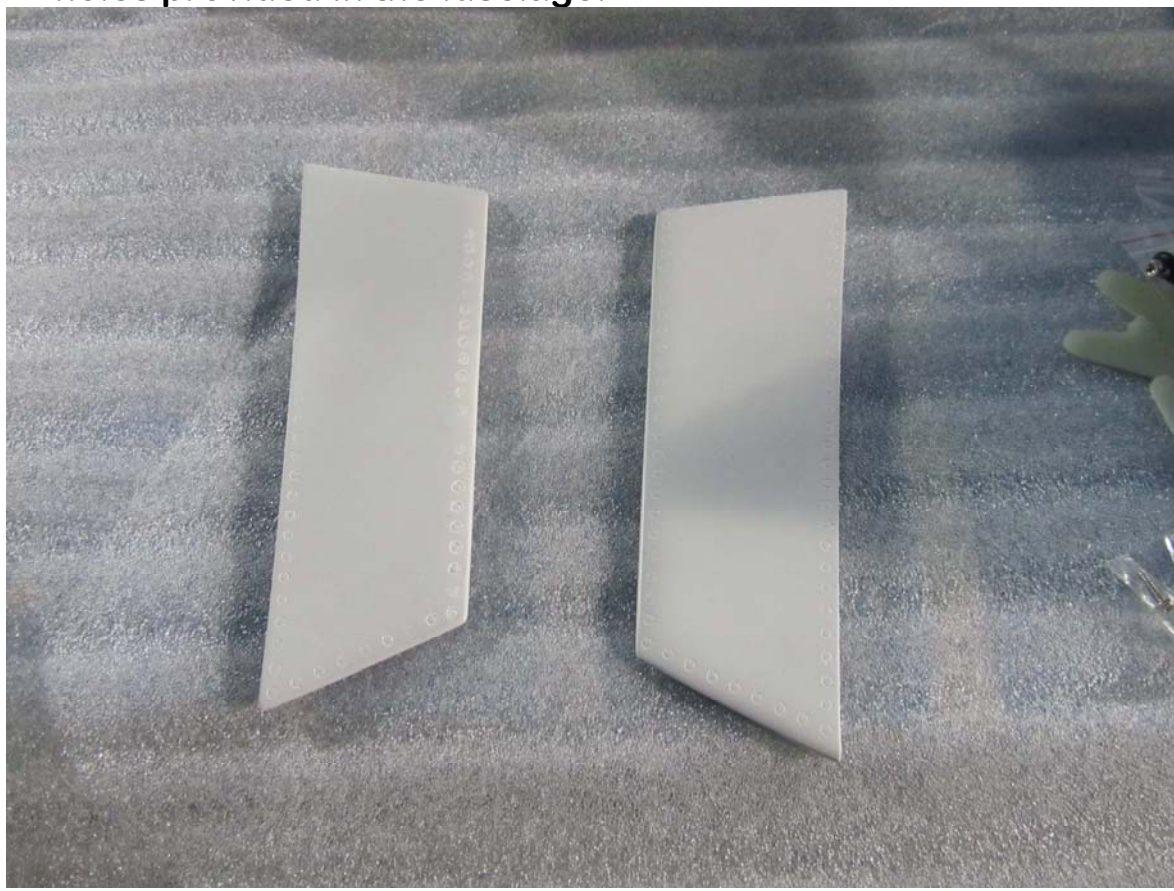
6. Do not over tighten and strip the screws. Do not use any grommets or other servo hardware. Vibration isn't a problem for jets, that is why you don't need to use the rubber grommets. Secure the screws with Loctite
7. Check the depth of the servo mount with the servo. Relieve if needed with a sharp exacto knife.
8. Feed the wires for the servo to the hole provided that goes through the fuselage.
9. Rough up the rudder horn and check the depth where they sit on the rudder. Check the positioning as the hole in the horn should be directly over the hinge point.
10. Hysol the control horn to the rudder use the tips available to get into the bottom of the holes.
11. Mount the rudder on the fuselage with the screws already fitted inside the model.
12. Tighten both rudder screws on both the clamp and 3mm bolt.
13. Use Loctite when fitting the steel pivot rods for all the control surfaces.

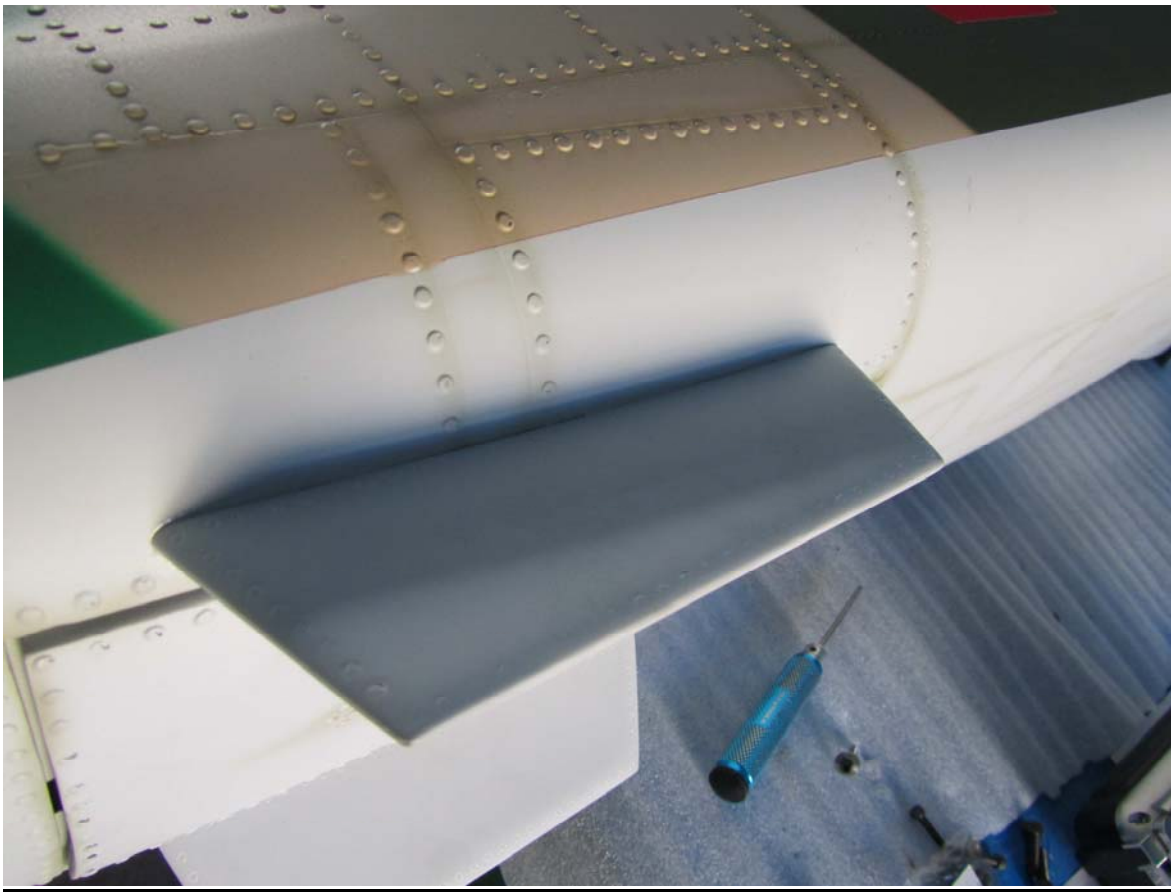


Speed brake:



1. Run the air hoses provided for the air brake to the front of the model. Keep them away from the thrust tube to avoid damage from the heat.
2. Mount the chines provided to the fuselage with Hysol. Position them with the holes provided in the fuselage.





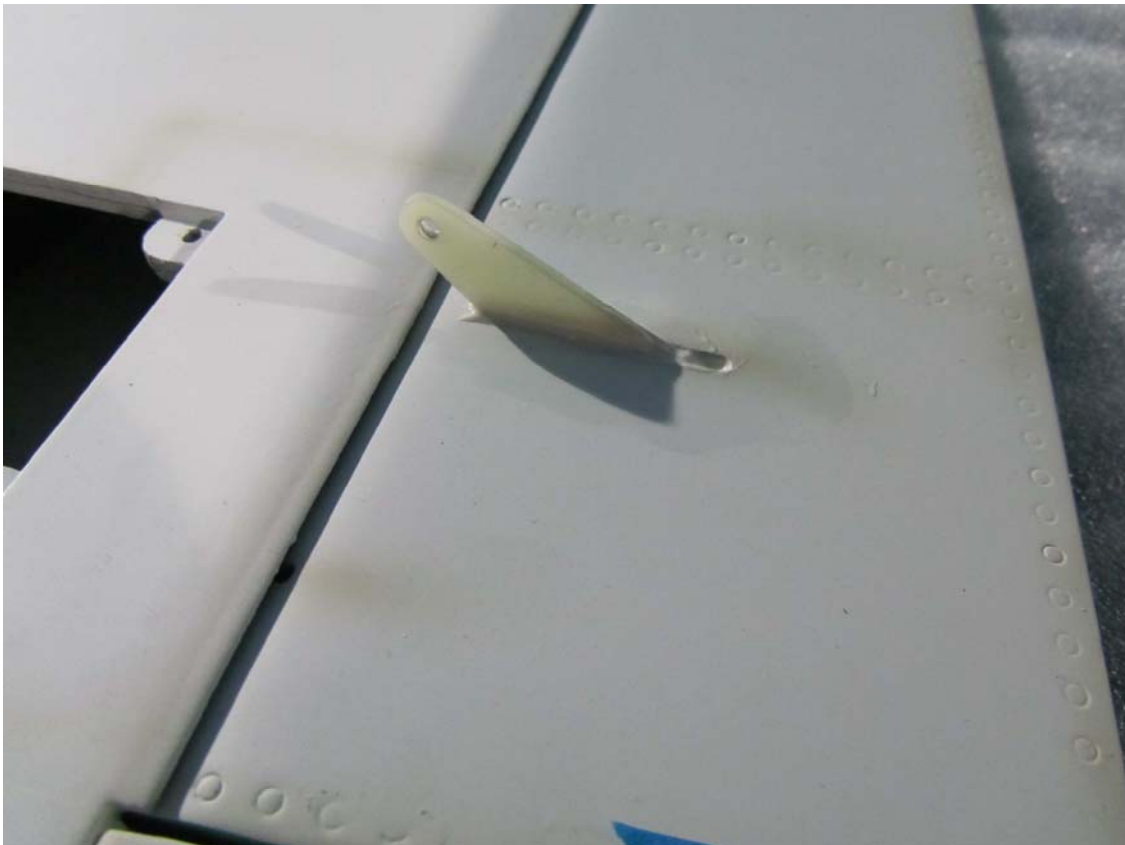
Wings:

1. The same methods are adopted for the servos and linkages for the ailerons and flaps. Keep in mind the position of the control horns; they have to be directly over the hinge line. Make up extension leads for the aileron and flap servos as they need to be longer. Note the hole on the underside where the bolt attaches to the carbon tube.

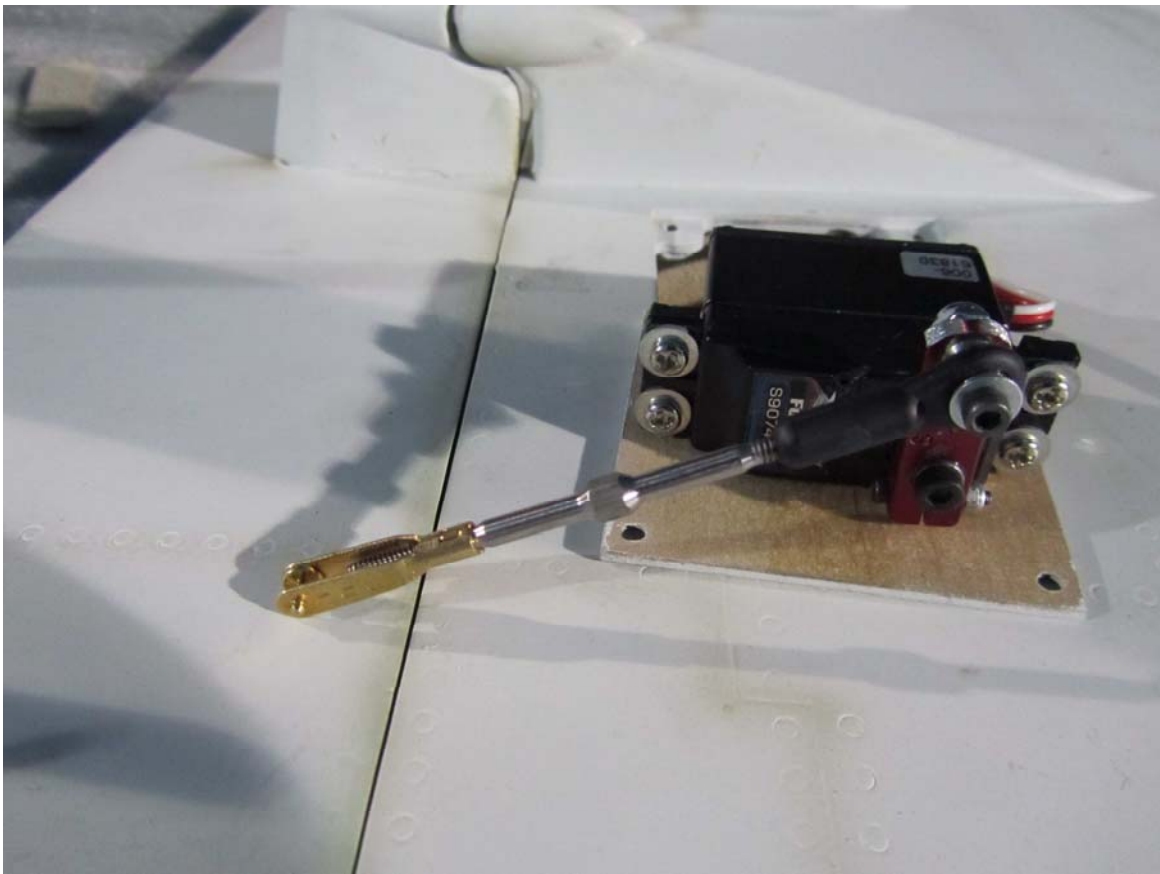


2. The slots are provided for the aileron horns. Hysol the horns in, you may need to clearance the hole to get it deep enough. Roughen up the fibreglass horns before gluing them.
3. FB provides light covers for the wings and nose, I used Braincube lights which are custom made for the Hawk.





4. Horns for the flaps need to be glued in behind the opening for the servo. This keeps the linkage hidden



5. This is what the flap should end up looking like. The horn only needs to be short to get adequate movement for the flap.



6. Use grommets where the wires and air hoses come through the wing.



Rear fuselage:

1. The following photos are mounting the thrust tube and bypass.



2. Clip all wires and airlines away neatly to avoid areas where heat may affect them. I put my smoke pump in front of the turbine mount.



1. Where wires and airlines are close to heat affected areas cover with a heat resistant tape.



2. For ease of maintenance I mounted the pipe on a plywood bracket that could be removed. This made mounting the turbine much easier.

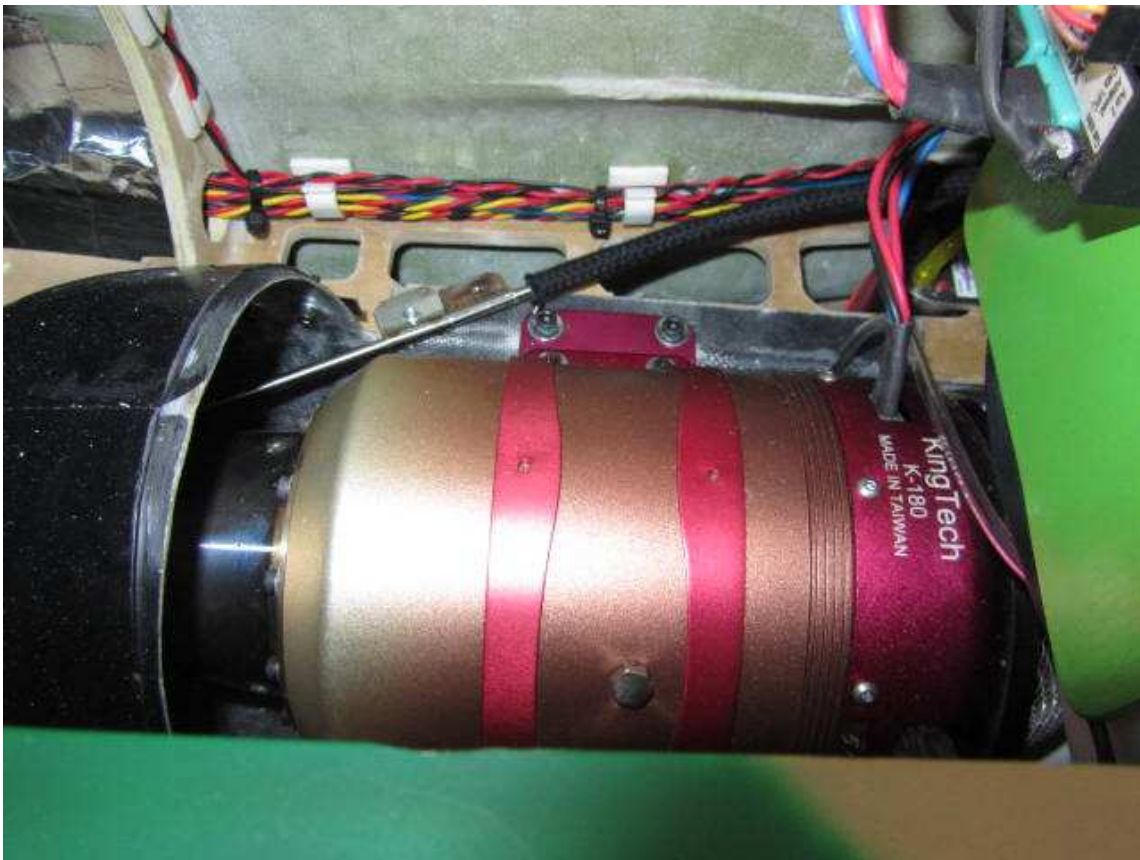


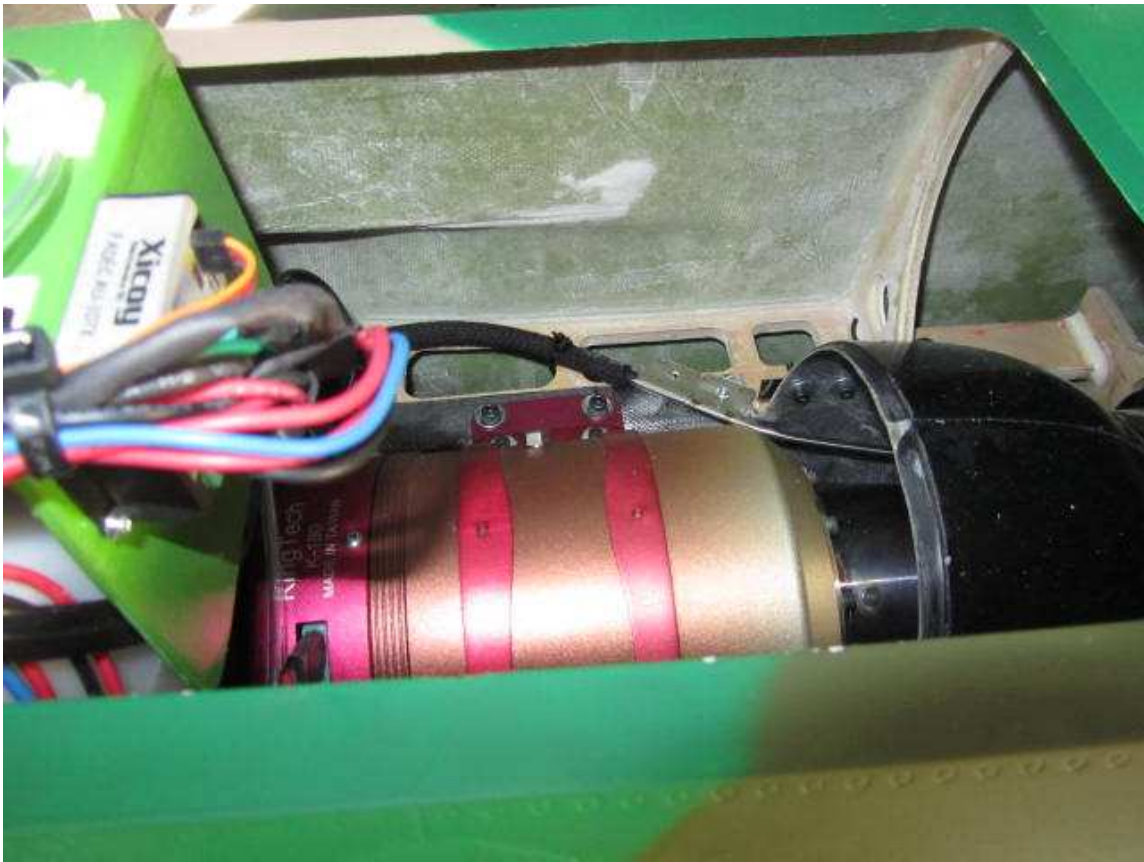
3. Mount the pipe to the bypass so the pipe is unable to move at all. I had to modify the bypass at the front to clear the former.



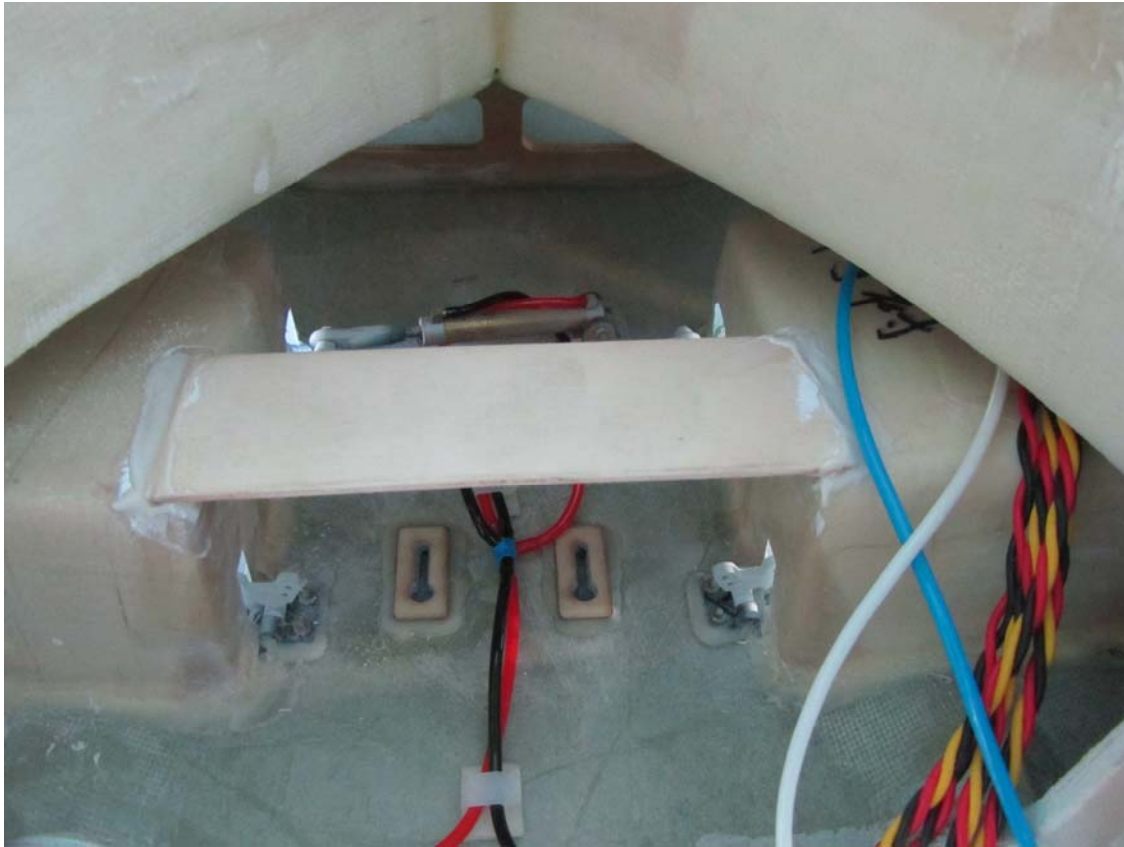


4. Mount the turbine on the bypass leaving a gap around 25mm-30mm between the tailpipe and the thrust tube.





5. I glued a piece of plywood between the inner wheel housings to stabilise the main fuel tank. You need to run all the airlines for the doors and wheels to the front of the model now.



Front Fuselage:

1. Bolt the front fuselage on to the main fuselage with the 4mm bolts provided, use Loctite on these bolts too.
2. Remove the nose leg so you can mount the servo for the steering. Once mounted you can replace the leg in the fuselage. Now is a good time to run the airlines for the front nose doors.



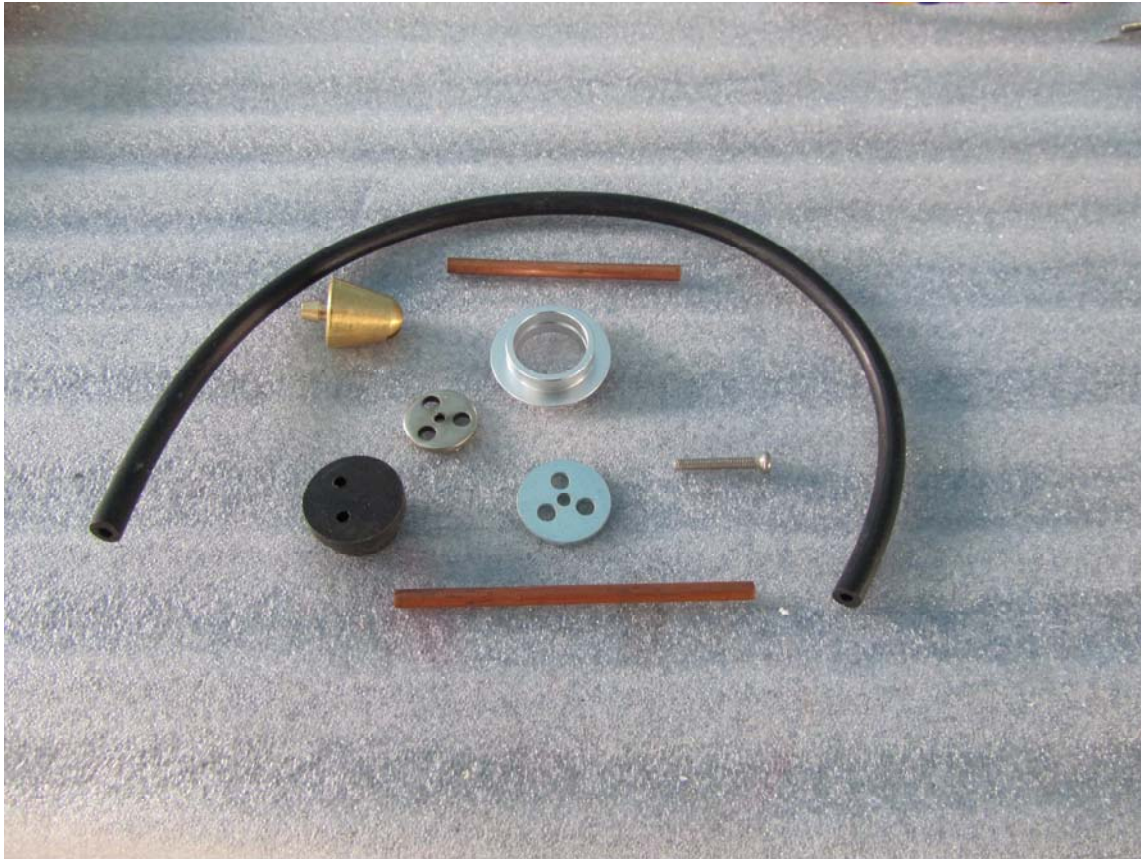
3. Run the cables for the steering now with the hardware provided.



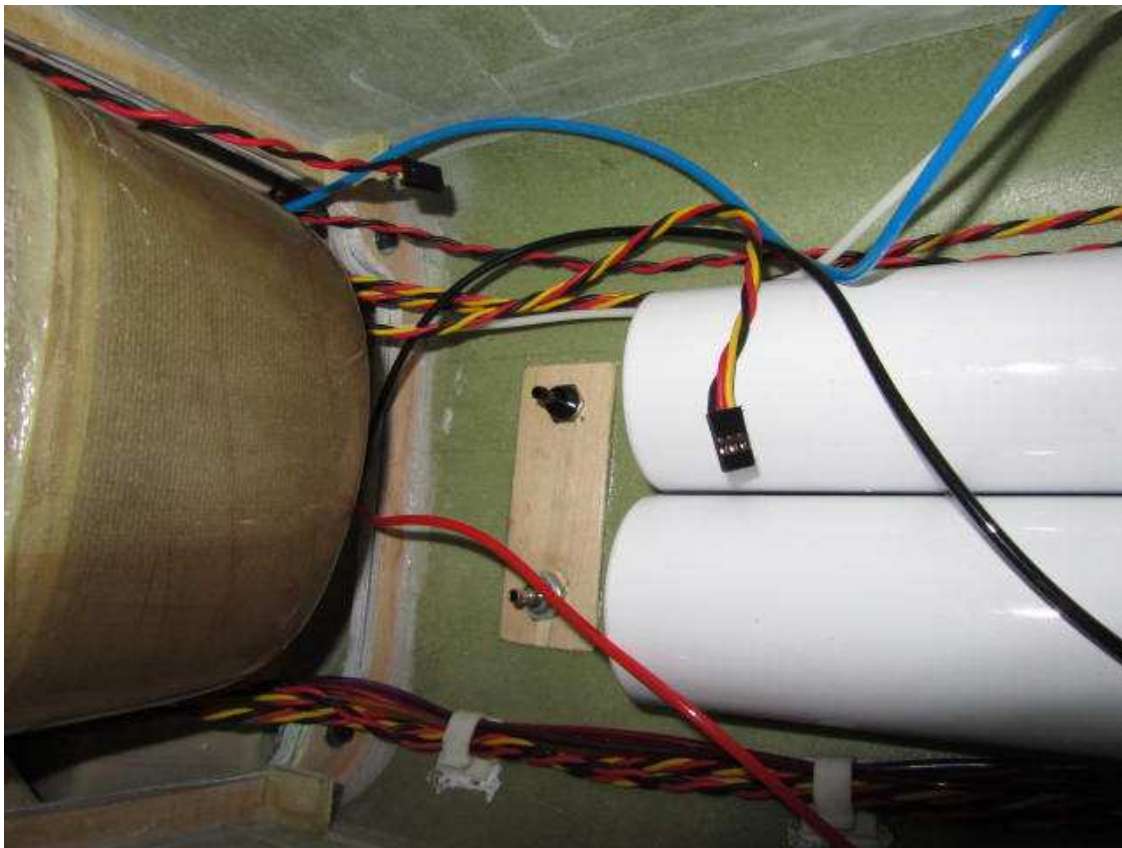
4. Mount the 2 large air tanks in the rear section of the nose.



5. Using the hardware for the fuel tank provided make a clunk and vent line, make sure that the clunk can move freely within the tank before mounting the tank.



6. Mount the vent lines on a plywood plate behind the air tanks.



7. FB provides plywood trays for the front section of the fuselage. I mounted the bubble trap and the fuel pump in this area.



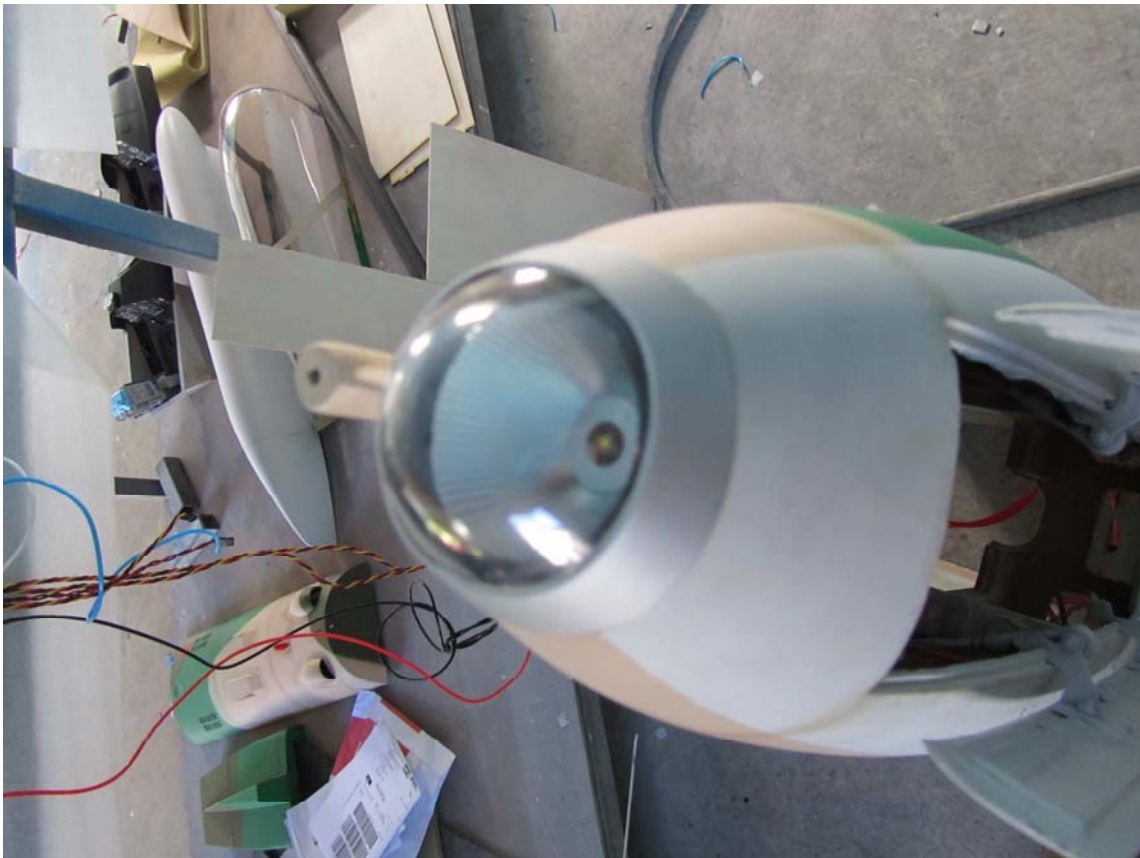
8. If you are using lights cut out the front section as indicated.



9. I used the Braincube lights that fit this section perfectly.



10. Once the light is mounted you can glue the clear lens and fibreglass surround on.



11. You can fit more tanks above the ducting so I put a smoke tank and another fuel tank below the plywood tray I made. I mounted all the starting and charging gear to make starting and maintenance simple.



12. You will have to trim some of the fibreglass to slide the cockpit in smoothly.



13. The forward canopy goes on last using the spring loaded clip on the rear hatch.



14. I placed all my electronics in the front tray provided and required no nose weight. All the batteries are in the front section too as seen in the photo.



This completes the build of the FB Bae Hawk, go over the entire model before running the engine. Try taxi testing to adjust the sensitivity of the steering before attempting to fly the model. Utilise your turbine inspector as a second set of eyes checking the build. Be careful when you first assemble the model as it will not sit on all 3 wheels until it has the cockpit, canopy and fuel it.

FB BAe Hawk control throws and C/G

Ailerons 18mm up and down, 20% expo

Elevator 40mm up and down, 25% expo

Rudder 25mm left and right, 20% expo

Nose wheel servo, 10-15 degrees movement with 50-60% expo

Take off flap 12 degrees

Landing flap 40 degrees

Programme 3mm of proportional up elevator with the flaps as the Hawk will drop the nose when the flaps come down.

C/G 180 - 195mm from leading edge at the root with the UAT's full of fuel.

Good luck and now enjoy another amazing model jet from Feibao.