

BAE Hawk MK 66



Instruction Manual



Thank you very much for purchasing the CARF Models Bae Hawk Mk 66. Before you get started building and setting-up your new aircraft, please make sure you have read this instruction manual, and understood it. If you have any questions, please don't hesitate to contact your Rep, or CARF-Models directly. Below are the contact details:

Email: techsupport@carf-models.com

Or call your CARF Rep by phone!!! He will be there for you. Please write down his phone number somewhere on this manual, you'll find it, after you're logged in on our website, on the top right corner of every page.

Liability Exclusion and Damages

You have acquired a kit, which can be assembled into a fully working R/C model when fitted out with suitable accessories, as described in the instruction manual with the kit.

However, as manufacturers, we at CARF-Models are not in a position to influence the way you build and operate your model, and we have no control over the methods you use to install, operate and maintain the radio control system components. For this reason we are obliged to deny all liability for loss, damage or costs which are incurred due to the incompetent or incorrect application and operation of our products, or which are connected with such operation in any way. Unless otherwise prescribed by binding law, the obligation of the CARF-Models company to pay compensation is excluded, regardless of the legal argument employed.

This applies to personal injury, death, damage to buildings, loss of turnover and business, interruption of business or other direct and indirect consequent damages. In all circumstances our total liability is limited to the amount which you actually paid for this model.

BY OPERATING THIS MODEL YOU ASSUME FULL RESPONSIBILITY FOR YOUR ACTIONS.

It is important to understand that CARF-Models Ltd, is unable to monitor whether you follow the instructions contained in this instruction manual regarding the construction, operation and maintenance of the aircraft, nor whether you install and use the radio control system correctly. For this reason we at CARF are unable to guarantee, or provide, a contractual agreement with any individual or company that the model you have made will function correctly and safely. You, as operator of the model, must rely upon your own expertise and judgement in acquiring and operating this model.



Servo Choice:

We strongly advise that you use the recommended high-torque digital metalgeared servos on all the main flight controls, and the milled plywood mounts are specifically designed for these.

There are plenty of alternative servos available from many manufacturers. However, it is important that you measure the "height" of the servo from the mounting flanges to the control arm. This dimension is important to know BEFORE you glue any mounting frames in the stab or wing.

Servo Screws:

Fix the *all* the servos into the milled plywood servo mounts using the 2.9 Ø x13mm or 16mm sheet metal screws provided in the kit, *not* the standard screws normally supplied with servos by the servo manufacturer. This is because all the holes in our milled servo mounts are 2mm diameter, due to our CNC manufacturing process, and this is too big for the normal screws.

Building Sequence:

The actual building sequence is your choice, but it is definitely most efficient to follow the sequence of this manual.

Take Care:

Composite sandwich parts are extremely strong, but fragile at the same time. Always keep in mind that these composite airplanes are designed for minimum weight and maximum strength in flight. Please take care of it, especially during transport, to make sure that none of the critical parts and linkages are damaged. Always handle your airplane with great care, especially on the ground and during transport, so you will have many hours of pleasure with it.

To protect the finished surface on the outside of the model from scratches and dents during building, cover your work table with a piece of soft carpet, cloth or bubble-plastic. The best way to stop small spots of glue getting stuck to the outside painted surfaces is to give the whole model 2 good coats of clear car wax first, *but* of course you must be sure to remove this 100% properly before adding any additional paint, markings or trim.



Adhesives and Solvents:

Not all types of glues are suited to working with composite parts. Here is a selection of what we normally use, and what we can truly recommend. Please don't use inferior quality glues - you will end up with an inferior quality plane, that is not so strong or safe.

Composite models require good gluing techniques, due to the higher flying speeds, and hence higher loads on many of the joints.

1. CA glue 'Thin' and 'Thick' types. We recommend ZAP, as this is very high quality.
 2. ZAP-O or Plasti-ZAP, or ZAP canopy glue 560 (for clear canopy)
 3. 30 minute epoxy (stressed joints must be glued with at least 30 min & NOT 5 min epoxy).
 4. Loctite Hysol 9462 or equivalent (optional, but highly recommended)
 5. Epoxy laminating resin (12 - 24 hr cure) with hardener.
 6. Milled glass fibre, for adding to slow epoxy for stronger joints.
 7. Micro-balloons, for adding to slow epoxy for lightweight filling.
 8. Thread-locking compound (Loctite 243, ZAP Z-42, or equivalent)
- We take great care during production at the factory to ensure that all joints are properly glued, but of course it is wise to check these yourself and re-glue any that might just have been missed.



When sanding areas on the inside of the composite sandwich parts to prepare the surface for gluing something onto it, do NOT sand through the layer of lightweight glass cloth on the inside foam sandwich. It is only necessary to rough up the surface, with 80/120 grit, and wipe off any dust with acetone or denatured alcohol (or similar) before gluing to make a perfect joint. Of course, you should always prepare both parts to be joined before gluing for the highest quality joints. Don't use Acetone for cleaning external, painted, surfaces as you will damage the paint.

Tip: For cleaning small (uncured) glue spots or marks off the painted surfaces you can use old-fashioned liquid cigarette-lighter fuel, like 'Ronsonol' or equivalent. This does not damage the paint, as Acetone and many other solvents will, and this is what we use at the factory.

At CARF-Models we try our best to offer you a high quality kit, with outstanding value-for-money, and as complete as possible. However, if you feel that some additional or different hardware should be included, please feel free to let us know. Email us: feedback@carf-models.com. We know that even good things can be made better !

Did you read the hints and warnings above and the instructions carefully?

Did you understand everything in this manual completely? Then, and only then, let's start assembling your CARF-Models Bae Hawk Mk 66 If not, please read it again before you continue.

Accessories

This list will help you chose the main additional items needed to finish your BAE Hawk Mk 66

1. Servos: 8 high quality Servos all the main control surfaces require a minimum of 20 kg torque such as JR8711
2. Aluminum servo arms
3. A receiver power supply such as a Powerbox Evolution or Cockpit
4. Turbine with a thrust of 180 – 200 N
5. Scale retract Landing Gear Item No. 130500
6. Gear door pneumatic set Item No. 130600
7. Speed break pneumatic set Item No. 130650
8. Tank Set Item No. 130108
9. Trust Tube Item No. 130700
10. Scale Cockpit Item NO. 130400
11. Speed brake kit Item NO. 131650

Hardware List

Material Name	Piece	For What
Fin -Ruder Bag		
ALL THREAD M3 x 100 mm	1	Ruder
Plastic ball link M3	1	Ruder
Plastic ball link M3 Smal	1	Ruder
Button head screw M3 x 15mm	1	Ruder
SHEET METAL SCREW 2.9*13	4	Ruder
ALLEN SCREW M3 x15	3	Ruder
Stop nut M 3	2	Ruder
Rubber Grommet 6 mm	1	Ruder
Elevator Bag		
SHEET METAL SCREW 2.9*13	8	Elevator
ALL THREAD M3 x 65 mm	2	Elevator
Stop Nut M 3	3	Elevator
WASHER M3	4	Elevator
Plastic ball link M3	4	Elevator
ALLEN SCREW M 3 x 10	4	Elevator
ALLEN SCREW M 3 x 15	2	Elevator
ALLEN SCREW M 3 x 25	1	Elevator
ALLEN SCREW M 4 x 35mm	4	Elevator
WASHER M4	4	Elevator
Brass tube inside 3mm x 100	2	Elevator
Aileron - Flap Bag		
Sheet metal screws 2.9 x 13 mm	16	Servo Aileron and Flap
Sheet metal screws 2.9 x 9 mm	8	Servo Hatch
Aluminium Ball link M3	2	Servo - Flap
Screw M2 x 10mm	2	Flap
Nut M 2	2	Flap
Clevis Alu M 3	2	Servo - Aileron
Plastic Ball link M3	4	2 x Ail / 2x Flap
All thread M3 x 95 mm	2	Aileron
All thread M3 x 150 mm	2	Flap
Brass tube inside 3mm x 150	2	Flap Linkage
Brass tube inside 3mm x 95	2	Aileron linkage
Nut M 3	4	Counter Flap and Aileron Clevis
Allen screws M3 x 16 mm	4	Ballink - Horn
Stop nut M3	4	Ballink - Horn
Washer M6	2	Wing fuselge conection
Allen screws M6 x 40 mm	2	Wing fuselge conection
Trusttube and Turbine Mounting		
Lock Nut M 3	4	trust tube -ducting mount
Swasher M 3	8	trust tube -ducting mount
ALLEN SCREW M 3 x 10mm	4	trust tube -ducting mount
ALLEN SCREW M 4 x 20mm	4	Turbine Mount
Swasher M 4	4	Turbine Mount
T Nut M 4	4	Turbine Mount
ALLEN SCREW M 4 x 25mm	4	Ducting mount to bearers
Swasher M 4	8	Ducting mount to bearers
Lock Nut M 4	4	Ducting mount to bearers
Sheet metal screws 2.9 x 10 mm	2	Trust tube down holder mounting

Hardware List

Retract Mount Bag		
Sheet metal screw 3.4 x 21	12	Landinggear mount
Nose wheel stering		
Plastic ball link M3	1	Nose wheel stering
Clevis Steel M 3	1	Nose wheel stering
Allen Screw M3 x 16 mm	2	Nose wheel stering
ALL THREAD M3 x 30 mm	1	Nose wheel stering
Nut M 3	1	Nose wheel stering
Stop nut M 3	2	Nose wheel stering
Fuselage Joining		
ALLEN SCREW M 4 x 30mm	4	Fuselage front rear Joining
ALLEN SCREW M 4 x 40mm	2	Fuselage front rear Joining
Intake		
Sheet metal screws 2.9 x 13 mm	2	Joining Intake-Fuselage
Main Gear Door and Zylinder mounting		
Allen Screw M4 x 20 mm	2	Main Door
T Nut M 4	2	Main Door
Aluminum Ball link M3	2	Main Door
Bottom head screw M2 x 10	2	Main Door
Nut M2	2	Main Door
wheel collar 4mm	2	Main door
Aluminium Tube 4 mm x 20 incl silikon tube	4(8)	Main door hinge
Ball link M2 Plastic	4	Small main door
Screw M2 x 20mm	2	Small main door
Allen screw M2 x 10	4	Small main door
Nut M2	4	Small main door
Phenolic horns	2	Small main door
Front Gear Door and Zylinder mounting		
Allen Screw M3 x 25 mm	2	Zylinder mounting
Swasher M 3	2	Zylinder mounting
Stop nut M 3	2	Zylinder mounting
Aluminium Ball link M3	2	Zylinder - Door linkage
Bottom head screw M2 x 10	2	Zylinder - Door linkage
Nut M2	2	Zylinder - Door linkage
Wood parts		
Distance holder stabmounting	1	Fiberglass
Batterie Support	1	3 mm Plywood
Elektronic support	1	3 mm Plywood
Turbine Electronic support	1	3 mm Plywood
Hoppertank support	1	3 mm Plywood
Battery Support	1	3 mm Plywood
Turbine spacer wood	2	3 mm Plywood 16 x 300 mm
Powerbox swich support	1	3 mm Plywood
CG Jig	2	3mm Plywood

Hardware List



Canopy Latch



Fin Ruder



Elevator



Retract



Fuselage joining



Wing



Front Gear Door



Nose retract/Steering



Turbine mount



Intake



Main Gear Door

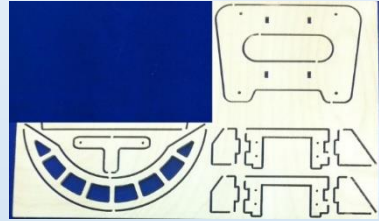


Main Gear Door

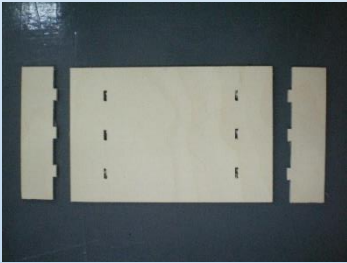
Milled and Scale parts included in the kit



Milled parts for Turbine - Ducting mounting



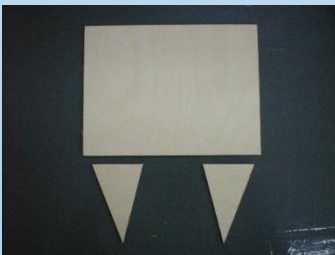
Milled parts for elevator servo and trust tube support



Milled parts for turbine equipment



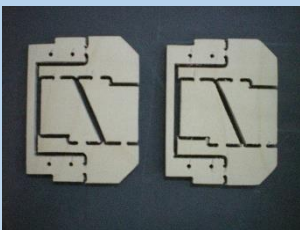
Milled part for Battery support



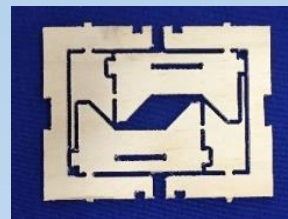
Milled parts for Rc equipment



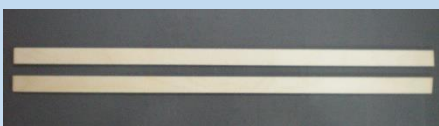
Milled part for Powerbox switch



Milled parts for Aileron Servo mounting



Milled parts for hopper mounting



Turbine - ducting spacer



CG Jig 2 Pc.

Milled and Scale parts included in the kit



Fin - Rudder

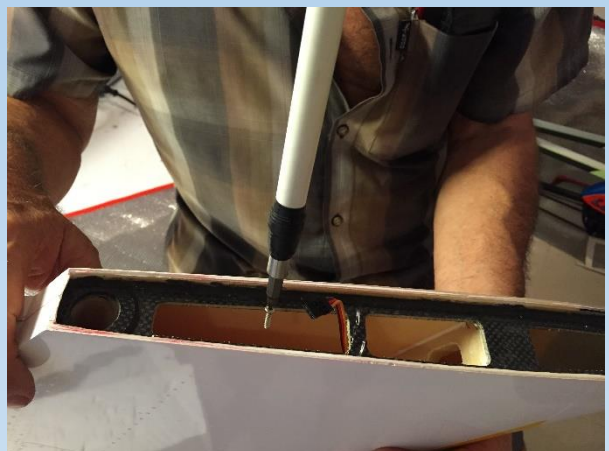
The servoplate is integral to the fin structure and the mounting holes are pre drilled for you.

Before installing the servo arm, a 10 – 11 mm arm is the maximum size that will fit in the area. This length of arm will give you plenty of rudder thro.

Before installing the servo in the fin attach

The plastic ball link supplied with the M 3 x 15 and the locknut.

Now you are ready for install the servo in the fin with the 2.9 x 13 sheet metal screws.



Fin - Rudder

Taking the 100 mm M3 threaded rod for the ruder pushrod, screw on the small M3 ball link supplied to one end. For the next step you might find it easier to remove the rudder. This is done by simply pulling out the piano wire hinge from the bottom side of the rudder. This will give you access to the end of the pushrod through the rear of the fin and into the ball link attached to the servo arm. Take note from the pictures that the ruder pushrod is operated on a diagonal plane to give the best throws without any binding.



Re-attach the rudder ensuring the piano wire has not missed any of the hinge points and affix the rudder ball link with the M3 x15 round head screw and locknut.



The fin assembly is secured to the fuselage using the supplied aluminum spar which you find is predrilled and fitted with a M3 captive nut for securing inside the rear of the fuselage. For the securing use the supplied M3 x 15



Notice :

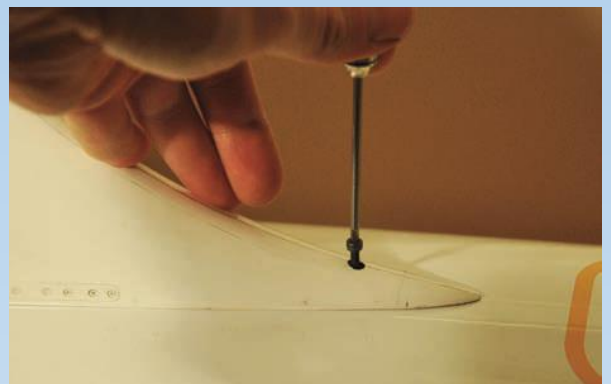
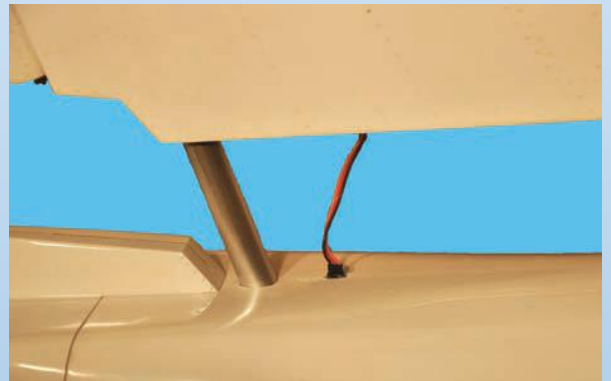
You will find in the Ruder bag 2 different Ball links, the thinner one will fit on the ruderhorn.

Fin - Rudder

The fin assembly is secured to the fuselage using the supplied aluminum spar which you find is predrilled and fitted with a M3 captive nut for securing inside the rear of the fuselage. For the securing use the supplied M3 x 15



Using a dremel tool or similar cut an opening for the servo extension lead to exit the top of the fuselage near the fin post. The fin fits over the aluminium fin post at the rear and locates with the carbon peg at the front, finally securing with an M3 x 15 allen bolt at the very front.



Elevator

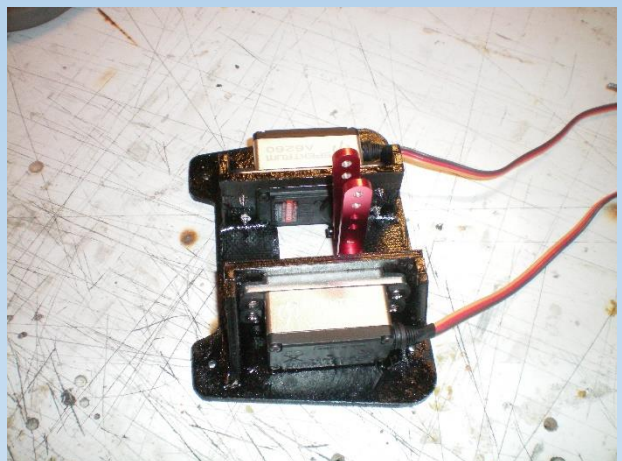
Bonding the mounts onto the CNC milled plate.



Reinforce the bonding area with the supplied fiberglass band. Use epoxy resin only. Follow the steps 22 – 24. Once the resin is completely cured cut the excess fiberglass band.

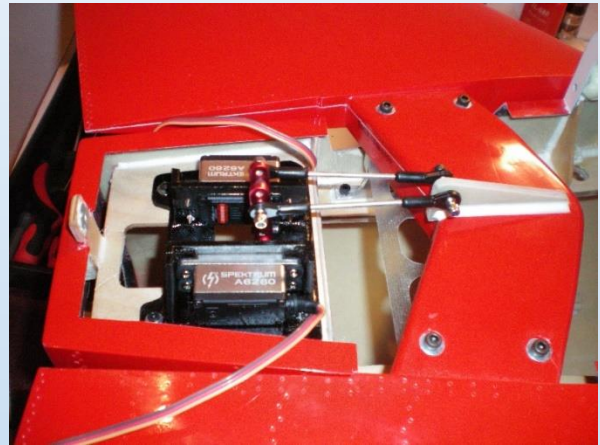


Use the supplied 2.9 x 13mm sheet metal screws to mount the servos not screws supplied by the servo manufacturer!!!

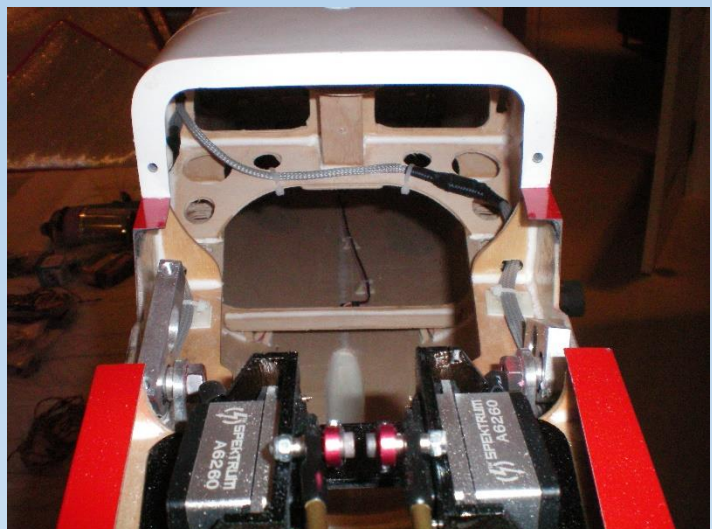
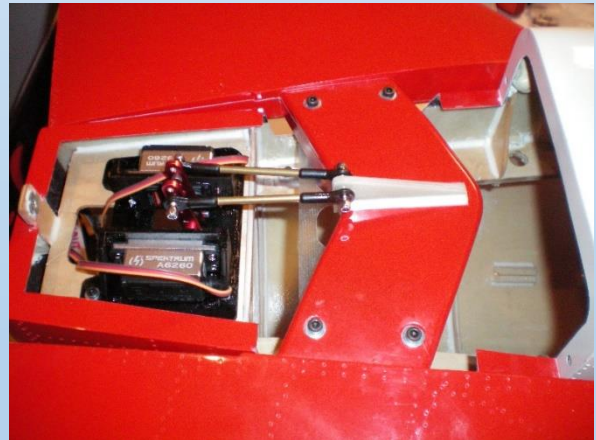


Elevator

It is important that the two servos do not fight each other as the servo current draw is increased massively in this situation and will lead to early servo failure.

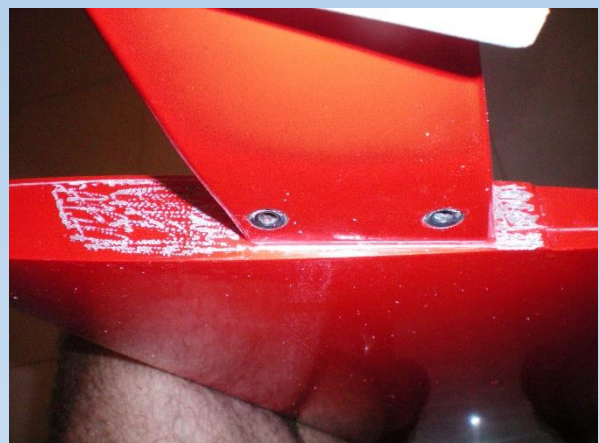
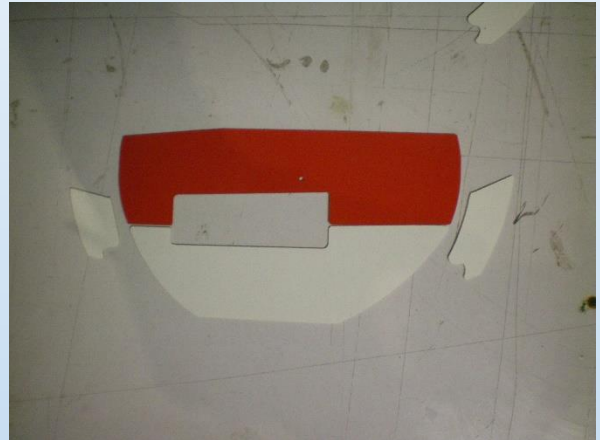


After you adjust the linkage, cut the brass tube in the right length. Remove the ball link once more and slide the brass tube over the Linkage.



Elevator

It is advisable at this point to fit the "bacon slicers" to the tail. These are not functional in any way on the model but are a scale feature and enhance the looks of the aircraft. Assemble the parts provided by gluing the 2 smaller side pieces for each unit to the top half. For a good bonding sand the areas which later are get glued to the stab like shown in the picture.



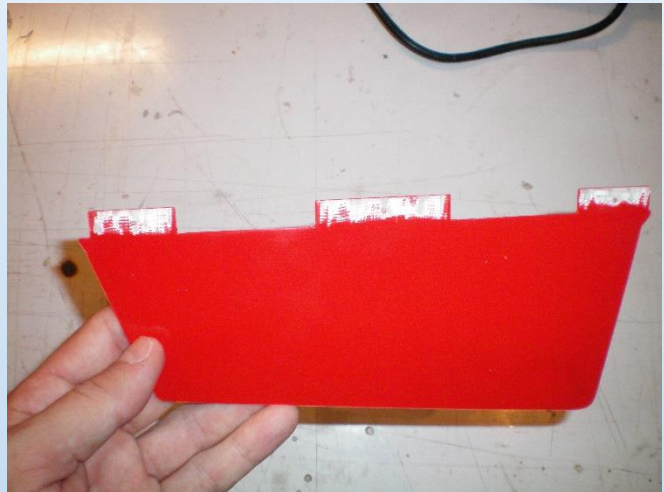
Elevator

Temporarily fix the tail in place on the aircraft and then tack the top and bottom half of the “bacon slicers” to the central tail block with cyano ensuring that there is no binding against the fuselage. Install the top hatch and again check there is no binding in this area. When you are happy with the position fix in place permanently with hysol or similar.



Ventralfins

Install the ventral fins in the rear of the model before final fit of the turbine and thrust tube assembly. The three tabs on each fin should be scuffed with a sheet of sandpaper before inserting on the pre cut slots in the bottom of the fuselage note the larger end of the fin is towards the front of the fuselage. From the inside of the fuselage apply enough thick cyano at each of the three mounting tabs to ensure a secure bond to the pads. After you can use 30 min Epoxy for make that Gluing area more strong if required.

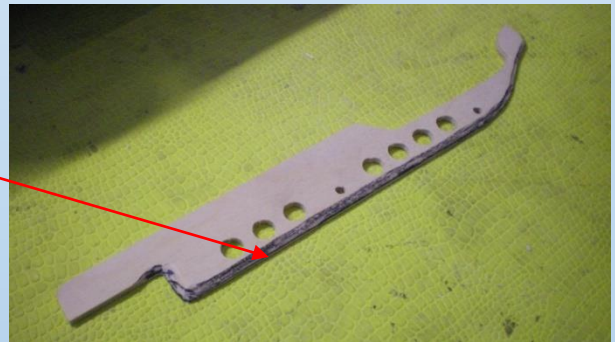


Turbine and Trust Tube

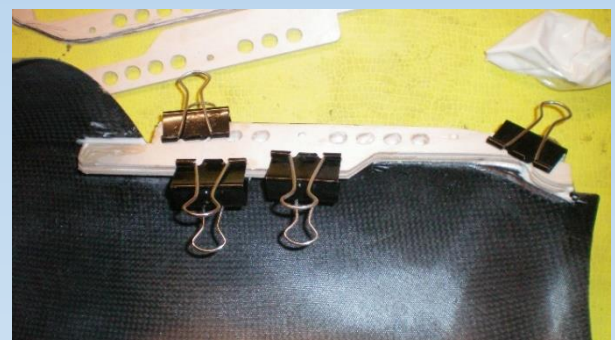
Start by locating the 4 3mm milled plywood pieces.



The two lower ones, which later contact the duct surface, need to be rounded as you see here. Trial fit until they sit flat on the duct mount surface.



Roughen the gluing area and glue the wood parts with 30 min epoxy on the carbon ducting. Make sure they sit flush and are aligned to each other.



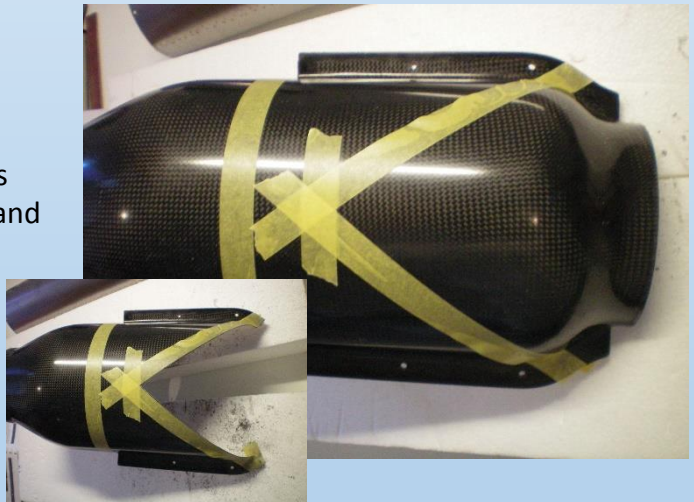


Turbine and Trust Tube

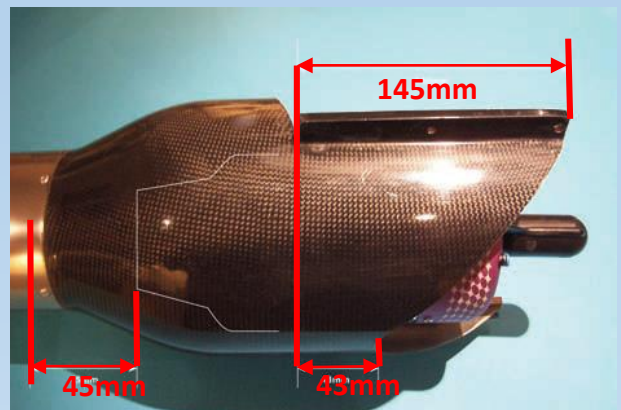
After the resin is cured the duct looks like shown on the photo.



At this point the bypass can be measured for trimming. See how to mark and measure the area to be cut. Trim outside of the cut lines with a dremel or suitable rotary tool and tidy with files as appropriate.



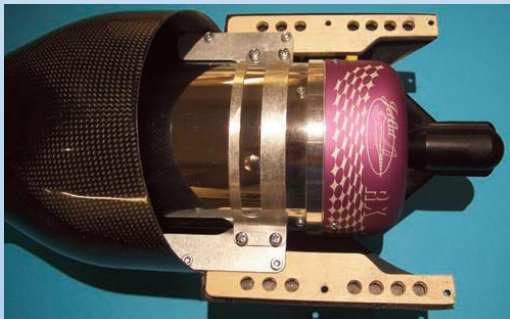
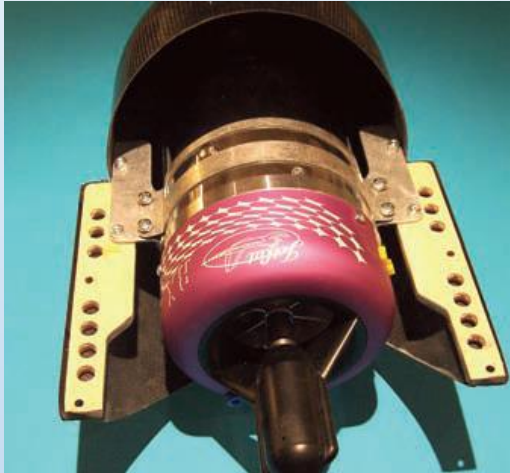
We then move on to fitting the turbine. It is easiest to do this whilst the assembly is outside the model as the thrust pipe / bypass / turbine is effectively a self contained unit. This manual describes fitment of the JetCat P180RX turbine however the bypass and mounting rails will accommodate a larger case turbine such as the JetCat P200SX without modification.



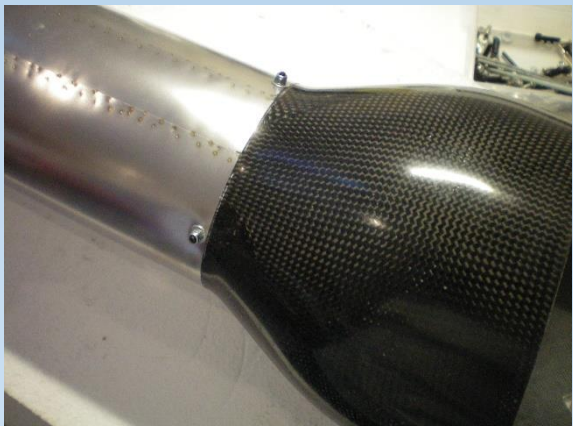


Turbine and Trust Tube

The rear of the tail cone of the turbine should be set at 45mm from the rear edge of the bypass. Ensure this measurement is carried out carefully. Once you have this position set, ensure the turbine is central within the pipe by observing through the rear end of the pipe. Adjust as necessary and drill the 4 mounting holes $\varnothing 4.0\text{mm}$ and mount the turbine with M4 x 20 and M4 T-nuts.

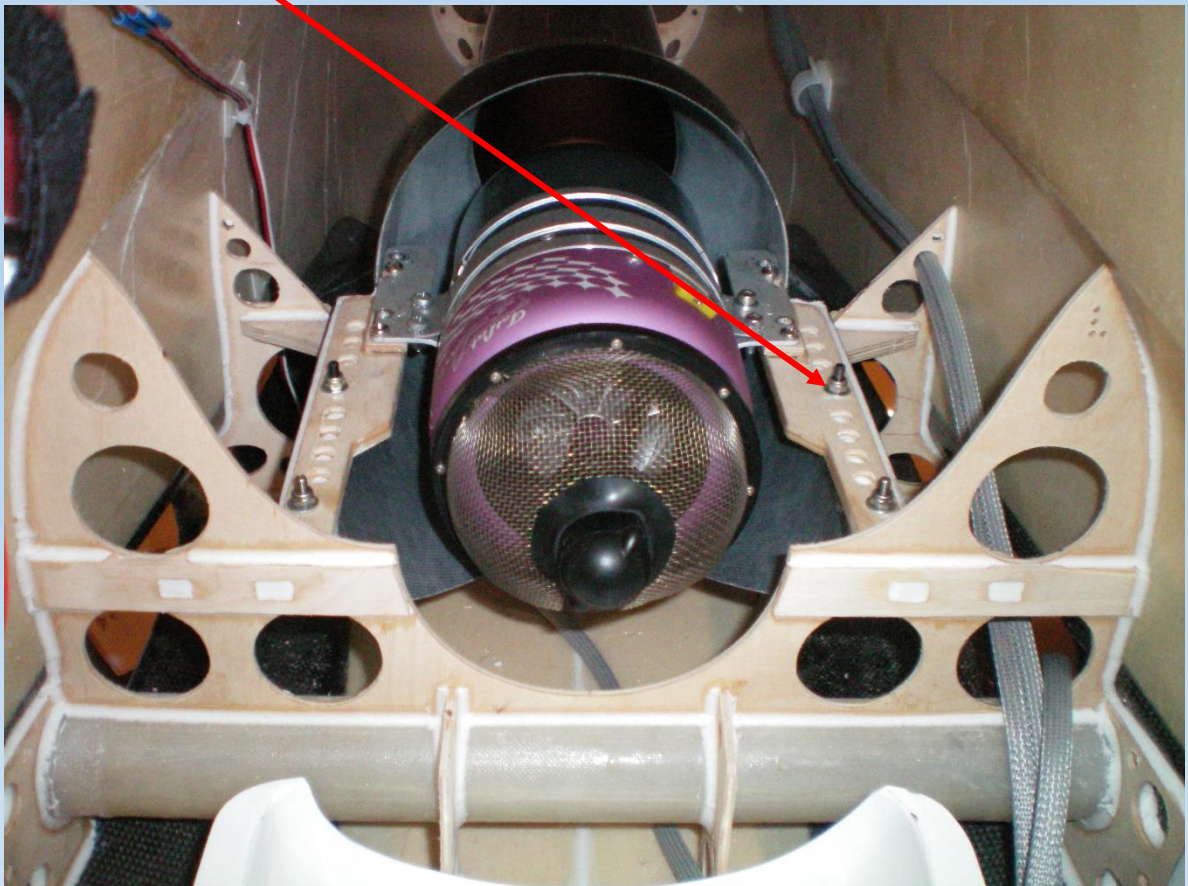


The setup has been designed to position the seam of the pipe at the very top. Once you have fitted the pipe you must check that it is square before permanently attaching the two pieces. Then mark and drill the pipe through the bypass $\varnothing 3\text{mm}$, at 4 points equally spaced around the pipe. Secure with 4 x M3x15 lock nut and washer.



Turbine and Trust Tube

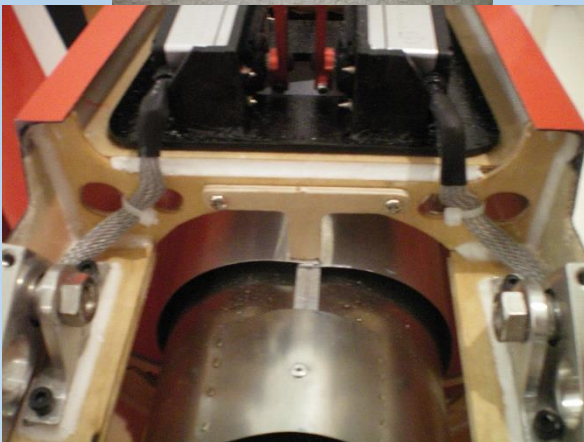
The turbine assembly can now be installed in the fuselage as a complete unit. Feed the pipe through the rear half of the fuselage and position so the bypass is centered on the bearers and at the rear the outer flange piece running at 45 degrees to the tailpipe is just within the rear of the fuselage. You will notice there are 4 pre drilled holes in the ply pieces fitted to the bypass. These holes can be used to drill through to secure the turbine assembly to the bearers. We recommend using a 90 degree drill attachment to achieve this easily. Drill now 4 mm holes and use the M4 x 25 with washer and locknut as shown on the picture.



Turbine and Thrust Tube



The rear of the thrust tube must be supported in some way to stop it from moving up / down or left / right. For the supporting use the supplied milled wood parts and glue – screw with 2.9 x 10mm on those formers in place. For the location use the picture .



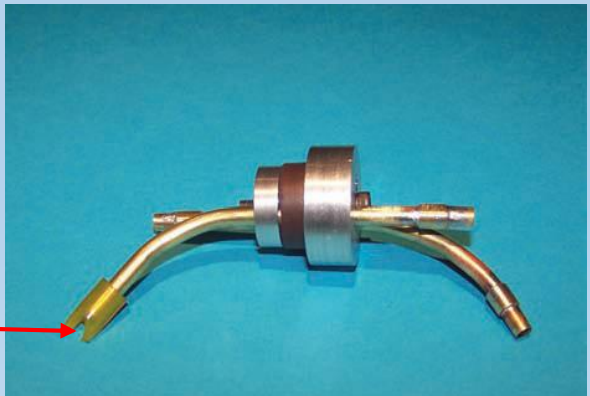
Main and Hopper Tank

CARF Models offer an optional molded Fiberglas or Kevlar fuel tank of 5.2 ltr capacity, which is installed in the fuselage on the CG . The tank is molded with a deeper rear trough to retain fuel towards the end of the tank and a blister in the front forward section for the vent to go up to allowing maximum fill capacity.

Before starting assembly of the molded tank it is important that any manufacturing debris left over in the tank is washed out. Washing the tank with warm water and some washing detergent works well. Ensure the tank is completely dry before you assemble it.



Use Tygon tube for the clunk line, where the clunk line passes through the baffle insert a section of brass tube as the glass fiber edge can easily cut through the tygon tube. The supplied soft clunk will become heavier when charged with fuel and easily reach all areas of the fuel tank. Affix a small piece of tygon to the top pf the breather pipe cut at an angle on sides. so there is less chance of the breather being obstructed. The breather should be fashioned to so the top protrudes into the blister at the top of the tank made for this purpose.



Main and Hopper Tank

The tank is very easily installed in the airframe on to the pre-formed tray in the rear fuselage and secured with the Velcro straps provided. At this point you may wish to consider where you will want to place your turbine and radio ancillaries. Unlike many jet models the Skygate Hawk does not need all equipment to be as far forward as possible. We have placed the turbine ancillaries on top of the fuel tank. This is ideal, not only by allowing for short lines between tank, fuel pump and turbine but also allows for the rear section to be more self contained should you wish to remove the front fuselage section for transport.

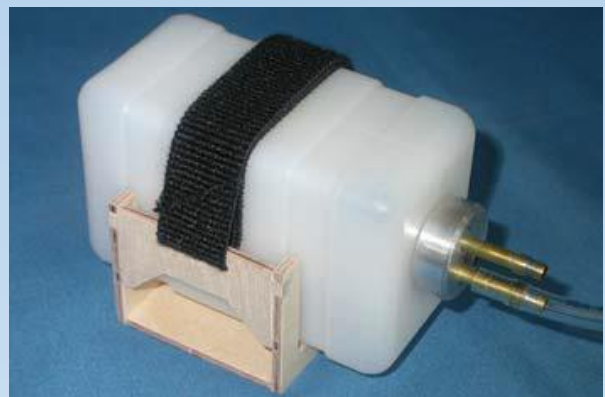


Hopper tank assembly

Use a very short 6mm festo tube for the clunk line. The clunk is placed in the cubic center of the hopper, it is not designed to move at all.

For the breather tube (connection to the main fuel tank) use a piece of tygon and cut a "V" shape to the end, that makes sure you get as much as possible air out during refill .

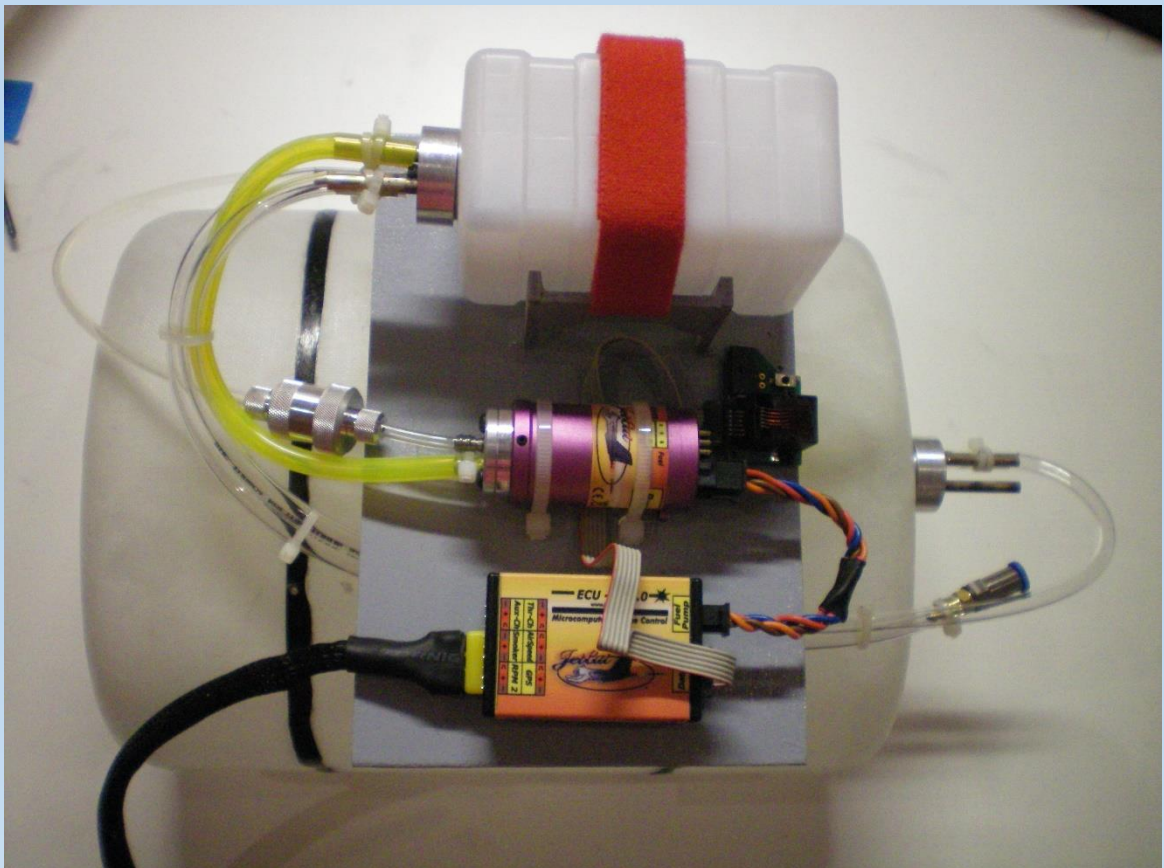
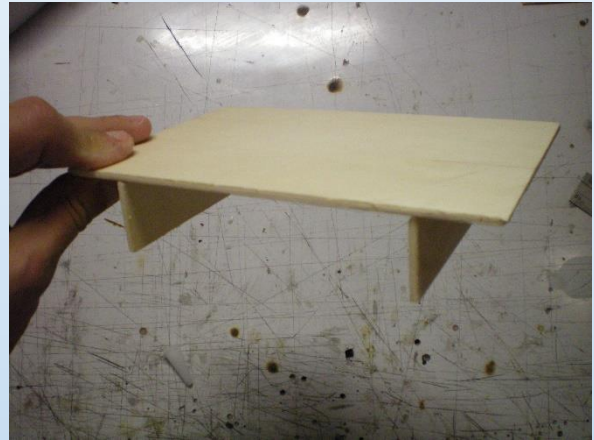
The wood parts of the hopper tank mount are self explaining. Glue them together with thick CA glue and mount the hopper with a strip of Velcro.



Turbine electronic support

the Skygate Hawk does not need all equipment to be as far forward as possible. We provide a wooden support for glue it on the main tank. Glue the wood parts together as shown in the picture.

And place the turbine ancillaries on top of the fuel tank. This is ideal, not only by allowing for short lines between tank, fuel pump and turbine but also allows for the rear section to be more self contained should you wish to remove the front fuselage section for transport.

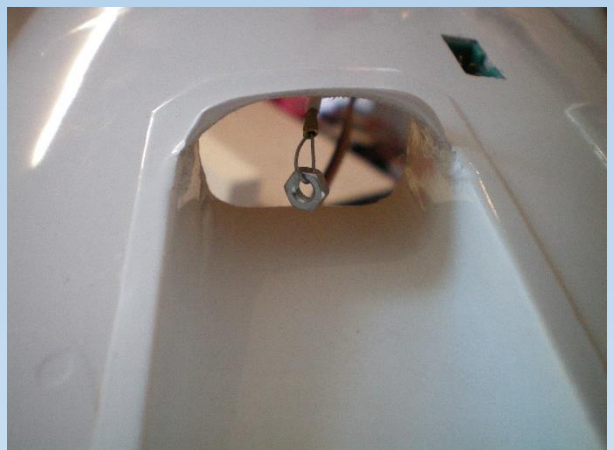
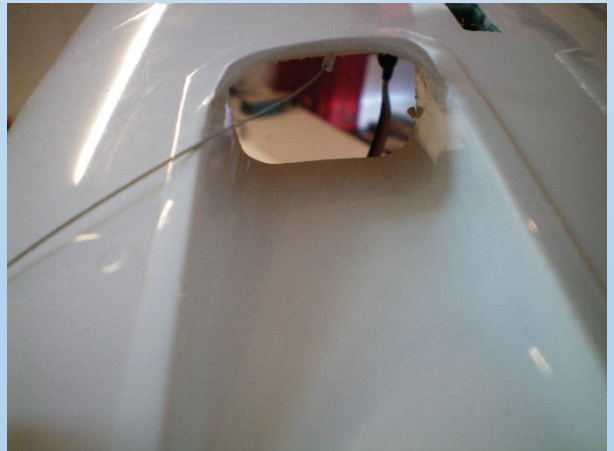


Canopy and Canopy Latch

Slide the spring 1 cm over the brass tube. Make sure that the pin protrudes the fuselage surface and securely locks into the hole in the canopy frame.

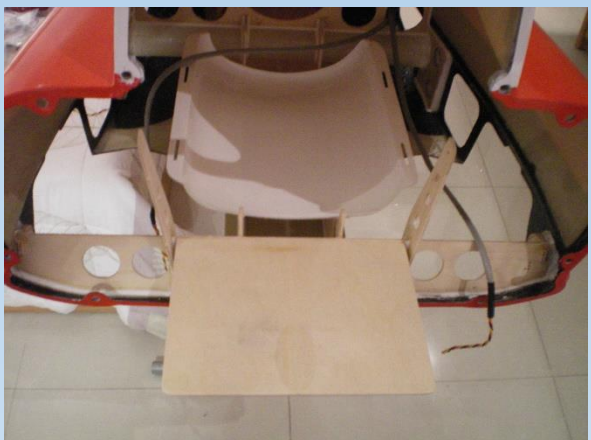
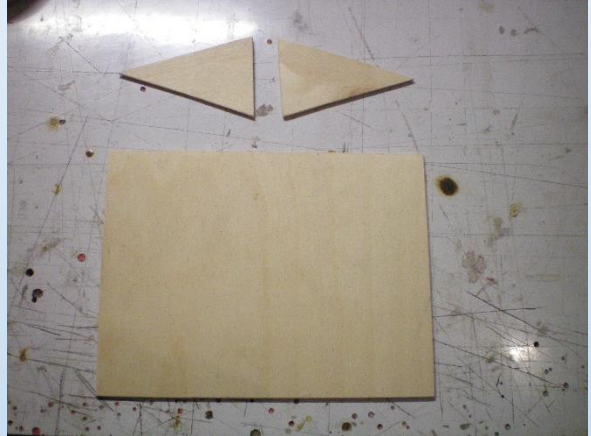


Use the white plastic sleeve to guide the steel wire. Cut the white tube approx. 3 cm shorter than the steel wire, make a loop into the steel wire, (add an M3 nut in the loop) and place the end in an accessible place inside the fuselage. Then glue the guide tube with 30 min epoxy on to the inner surface of the fuselage.



Electronic support plate

You are free to locate components for the support equipment wherever best meets your needs. We found on this model that fitting the Powerbox unit and air control systems in the rear fuselage just near the front and rear fuselage joint gave us the best solution. Engine ancillaries were mounted above the tank. If required the front fuselage section can be removed for transport relatively easily for transport and the aircraft balanced at the correct CG (with cockpit set installed) without the need for any additional weight. A picture is included for your reference.

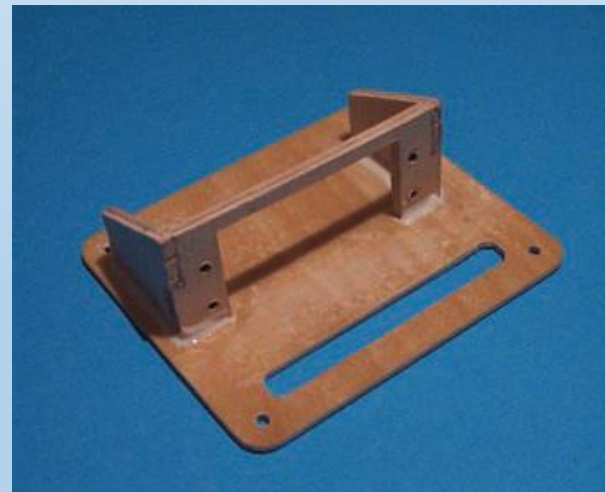
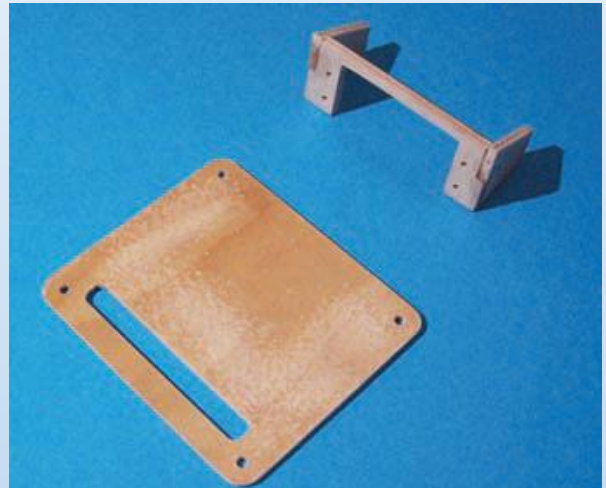


Electronic support plate



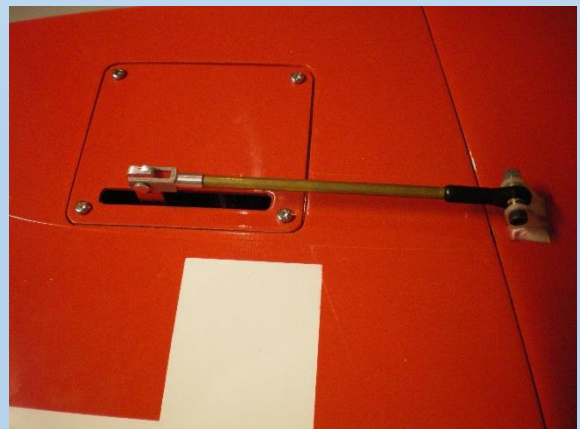
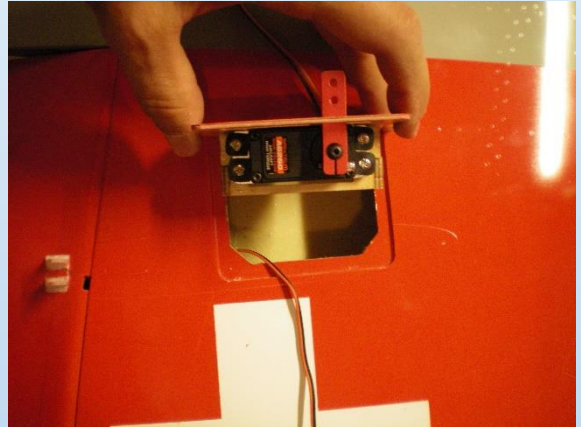
Aileron and Flap

In the small wood pack you will find ply pieces to make up the aileron servo mounts. Clean the pieces with sandpaper and assemble with cyano making sure all joints are secure. For aileron actuation CARF Models recommend 25kg torque . Use a suitable aluminium servo arm. The distance from the hole where the clevis go through are 19mm from center. Screw the aileron servo with arm installed to the poly servo mount using 2.9 x 13mm sheet metal screws supplied and cyano in position on the aileron servo hatch which you have rubbed with sandpaper around the gluing area. Take care not to glue the servo itself to the hatch. Once the cyano has cured, remove the servo and apply a bead of hysol or similar around the mounting area. You **MUST** also add a small piece of fiberglass all around the mount and soak with epoxy to ensure the parts are securely bonded. Once cured, re-install the servo.



Aileron and Flap

The aileron servo linkage is made up using the M3 x 95mm threaded rod with 3mm ball link at one end and M3 aluminium clevis with 3mm pin at the servo end. Add a length of brass tube to the outside of the pushrod for extra strength if desired. Attach the ball link end to the aileron horns with the M3 x 15 allen screw and nylock nut supplied. Once you are happy with aileron throws and movement you can affix the supplied plastic fairings to cover the mechanism. The servo hatch / mount is fixed to the wing with 2.9 x 10mm sheet metal screws.

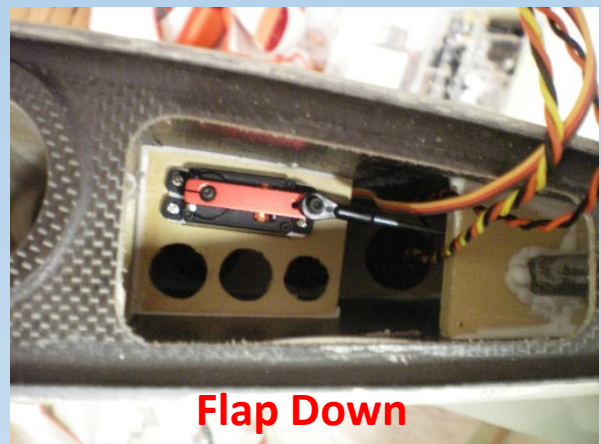


Aileron and Flap

The flap surfaces are installed for you at the factory with beautiful scale hinging. What remains is for you to install the servo and linkage. CARF Models recommend a 25kg torque digital for the flap surfaces.

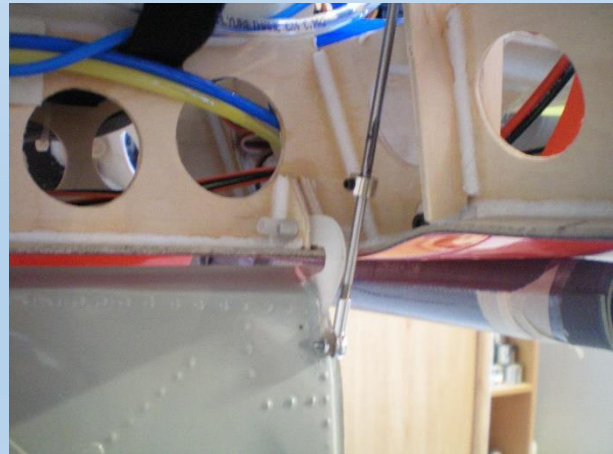
We have used a aluminium arm at 38mm between centers for the flap. Drill the servo arm at 38mm \varnothing 3mm and install the M3 Ballink with M3 x15 and locknut supplied. Install the servo arm on the servo and install the servo in the wing using 2.9 x 13mm sheet metal screws.

Using the M3 x 150 mm threaded rod and then screw on the supplied M3 Aluminum Ball ink and the M2 screw with nut . Install the pushrod open end through the back of the wing and screw in to the M3 Ballink on the servo arm. Once happy with the flap throws tighten the nut on the end of the pushrod.



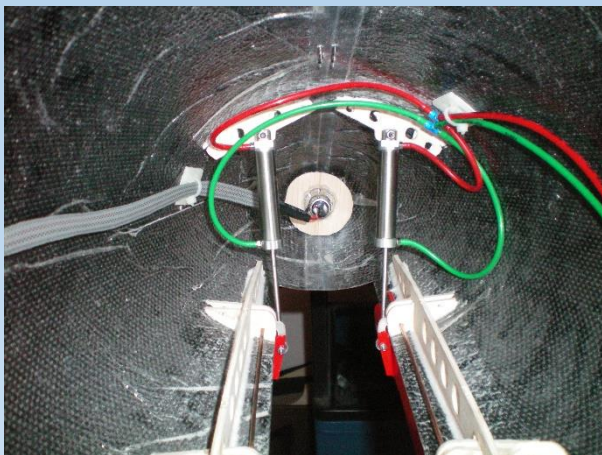
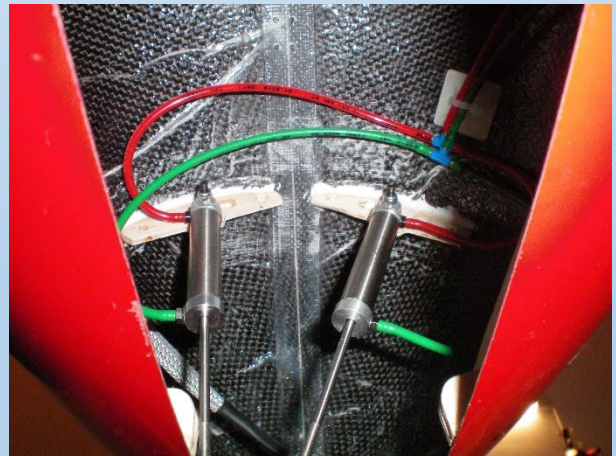
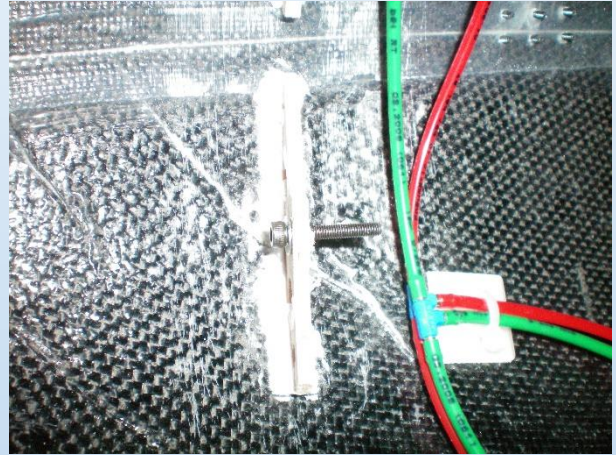
Front and Main Gear Doors

The undercarriage set available for the BAE Hawk is specifically designed for this model and fits straight on to the mounting rails fitted in the wings and fuselage. The legs are supplied in plain aluminium finish for you to fit as is or paint according to the color scheme of your model. The main gear legs are supplied with a set of fiberglass covers. These are not necessary for operation but greatly enhance the scale looks of the model. The front gear doors are fully fitted for you at the factory and the main gear doors simply attach to the pre fitted and drilled mounting points inside the fuselage. Fitting the main gear door rams simply requires you to **drill the gear door ram mounting posts Ø4mm and attach the door rams with the supplied M4 x 20mm allen bolts and spike nuts**. Fit the stop collar to the ram shaft and secure loosely in place ready for final adjustment later. Before fitting the M3 Aluminium Balllink to the gear door ram. Screw the clevis on to the ram as far as it will go and attach to the pre drilled hole on the gear door hinge.



Front and Main Gear Doors

The mounts for the nose gear door rams are installed for you at the factory. Bolt the 2 rams to the mounts with M3 x 25 allen bolts with lock nuts. You might find the mounting holes in the rams are slightly large. If this is the case you can sleeve the bolt with a piece of scrap fuel tubing to take up the slack. Fit the supplied plastic ball links to each ram and attach to the pre drilled holes in the gear door hinges with M2 x 10mm screws and nuts. Apply a little Loctite to secure the nuts. The limits of closing the gear doors can be adjusted simply by screwing / unscrewing the ball link to achieve the optimum fit.

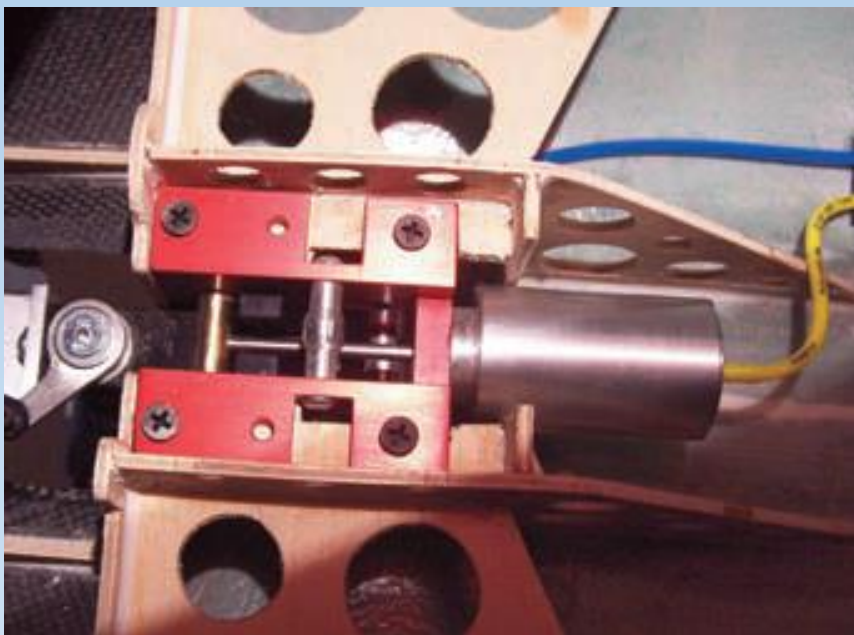
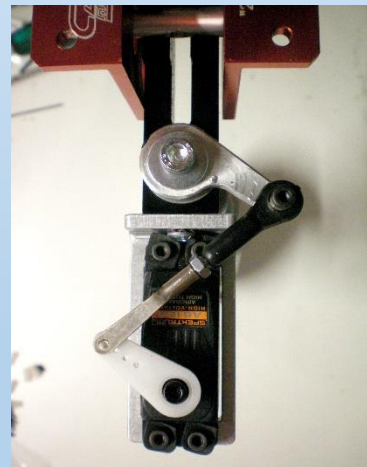
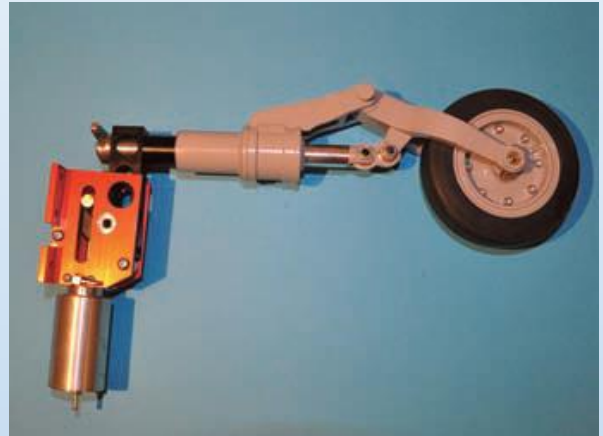


Front and Main retract

The nose gear unit comes pre-assembled. In case you did not dis-assemble it for painting, ensure that all parts are secure and tight before installation.

Attach the steering servo frame to the nose unit with the M3 dome head screw supplied and fit the servo using the M3 x 10 allen bolts supplied.

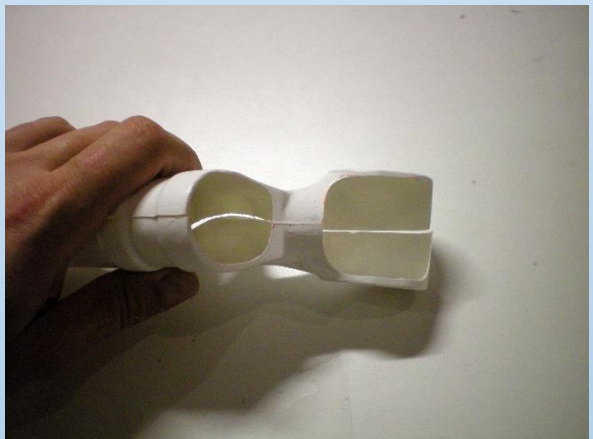
Using the 30mm M3 threaded rod supplied make up the steering pushrod with M3 ball link and M3 clevis as shown. Install the linkage on a diagonal plane as shown in order to achieve good throws and no issues with retracting / extending the gear. Fit the 4mm air lines supplied to the nose gear unit and install in the fuselage using the large self tapping screws supplied.



Front and Main retract

You will find in your kit a pair of fiberglass strut covers for the main gear legs each in 2 halves. These covers are handed so make sure the cover set you select is correct for the gear leg you are working on. If you decide to paint your undercarriage please do this before fitting the strut covers.

Each strut cover half must be fitted and left to cure before the second half is added in order to achieve the best result. You will need to trim the top off each strut cover so the area where the leg mounts into the retract unit is kept clear. To start the joining process apply a liberal amount of resin with micro balloon only to the area where it will come into contact with the main leg to the inside of the half you are working on. It is not necessary to put any form of glue or silicone around the knuckle joint for the trailing leg or the supporting arm for this area. Fit the cover to the leg on a flat surface and prop up where necessary with spacers to ensure the fit is central. Offer up the second half to see that it



Front and Main retract

will fit well and then remove it again. Leave the first half to cure.

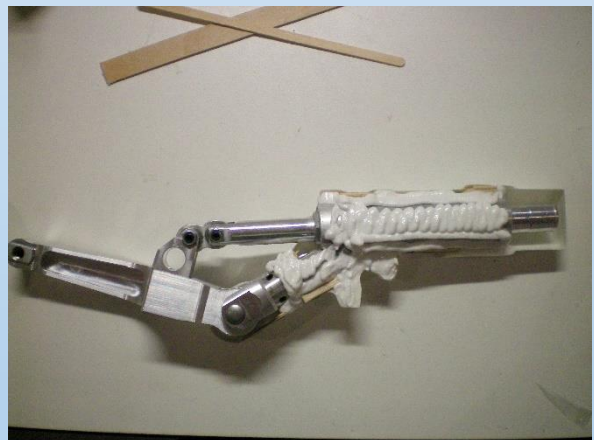
Once the first half is securely bonded you can now add some balsa blocks to the inside of the first half.

Shape the balsa blocks so they are in contact with both the leg and cover then glue in place with cyano.

Again offer up the second half to see that it fits and adjust if necessary. When you are happy apply a generous amount of resin mixed up with micro balloon to the inside of the cover where it will come into contact with the main part of

the strut. Apply cyano to the exposed cyano blocks and bond in place. Do not worry if there are any small gaps.

Once this has fully cured, mix up a slurry of epoxy with micro balloons and push it into all areas of the joint. Once set, sand away the excess and prepare for painting.



Front and Main retract

The main gear units fit on the rails installed in the wing.

This is a crucial part of the build and some sanding of the rails may be necessary to get the required fit. It is also necessary to check that the retract mechanism does not foul the operation of the outer gear door.

Some adjustment here may be required to get a good fit. Once happy with the basic fit, connect a length of 4mm air line supplied to each of the nipples on the retract unit and slide the unit into place in the wing making sure not to obstruct or kink the air lines in the process.

Slide the retract unit into the trunnion and check the movement is smooth and without obstruction.

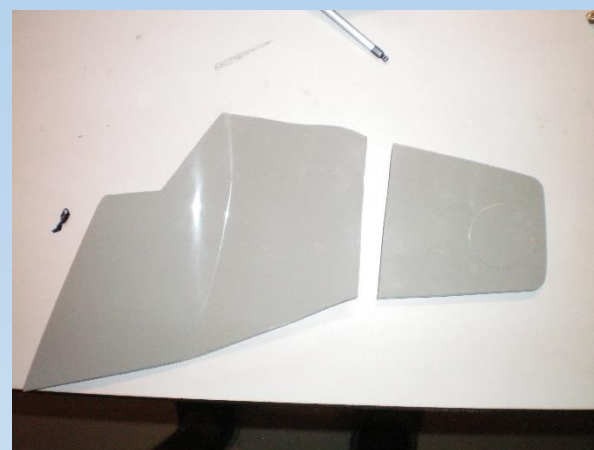
Remove the leg leaving the retract units in place, drill the 4 mounting points and secure the retract unit with 4 x large self tappers supplied.

When both wings are completed to this stage the wings should be fitted to the aircraft to position the legs for accurate tracking. Check the retracting motion again at this time to make sure the assembly retracts nicely into place and the fuselage gear doors can close without obstruction. You may have to do this a number of times to achieve the result you are happy with. Once you are happy with this mark the position of the legs relative to the retract trunnion with a marker pen on both the leg and the trunnion.



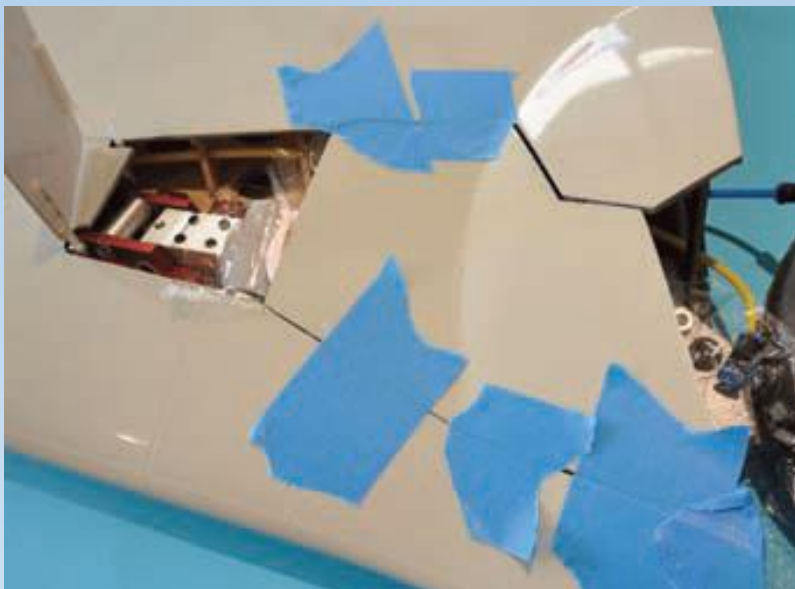
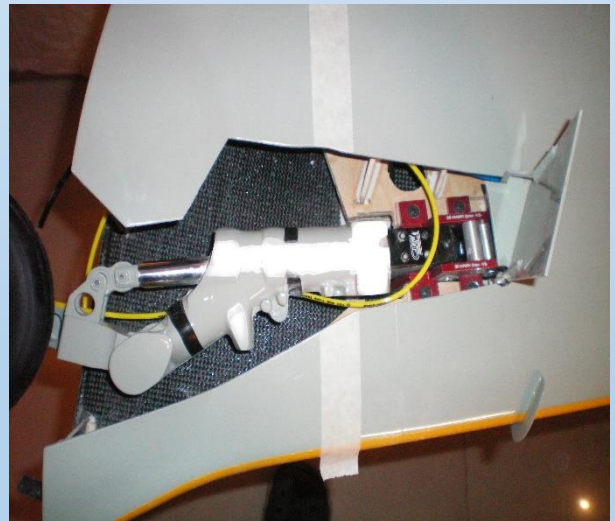
Front and Main retract

Fitting of the strut door and smaller outer wing door but some patience and time spent in this area will reward you with a well functioning nice looking system. The strut door is a double skinned part with scale detail on the inner skin. The first job to do here is to trim the top part of the door off where the smaller door hinged on the wing will fall. and with the small door closed mark on the wing skin where it ends. Then open the door and offer up the strut door taping in place and extending the marks to the strut door giving you a line to cut to. Make sure there is a few mm space left between the doors. Trim the top portion off the strut door and check the fit. You will notice that the strut door when resting on the strut is proud of the wing surface. Begin by sanding through the inner door skin with a rotary tool at the points where the skin rests against the leg. Do this in small increments so you do not remove more material than is necessary. Allow some extra space around all the touching areas for the next step. With the use of car body filler you can now create a fillet between the strut door and the strut that is shaped exactly to each. Place a layer of cling film over the strut and a separate piece over the door. Ensure that your leg is secured in its final position with the grub screws tightened so it cannot move. Mix up a generous amount of car body filler and apply carefully to the cling film on the strut. Do not worry about applying a little too much as it will be squeezed out and can be trimmed later. Fit the strut cover over the body filler and squash down so the door is neatly positioned within its opening and level with the wing



Front and Main retract

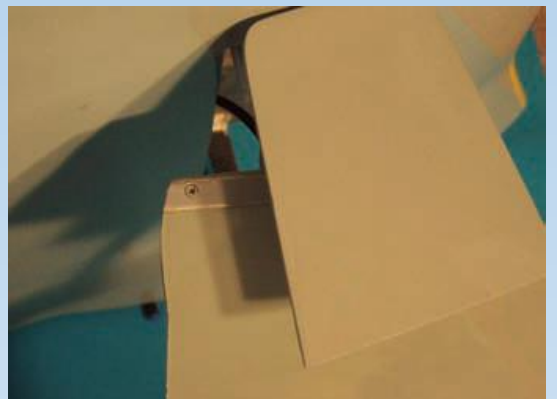
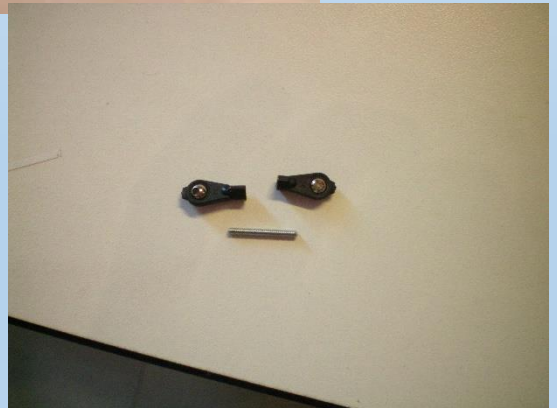
You will notice that the strut door when resting on the strut is proud of the wing surface. Begin by sanding through the inner door skin with a rotary tool at the points where the skin rests against the leg. Do this in small increments so you do not remove more material than is necessary. Allow some extra space around all the touching areas for the next step. With the use of Epoxy mixed up with microballon you can now glue the strut door against the Strut and let it cure .



Front and Main retract



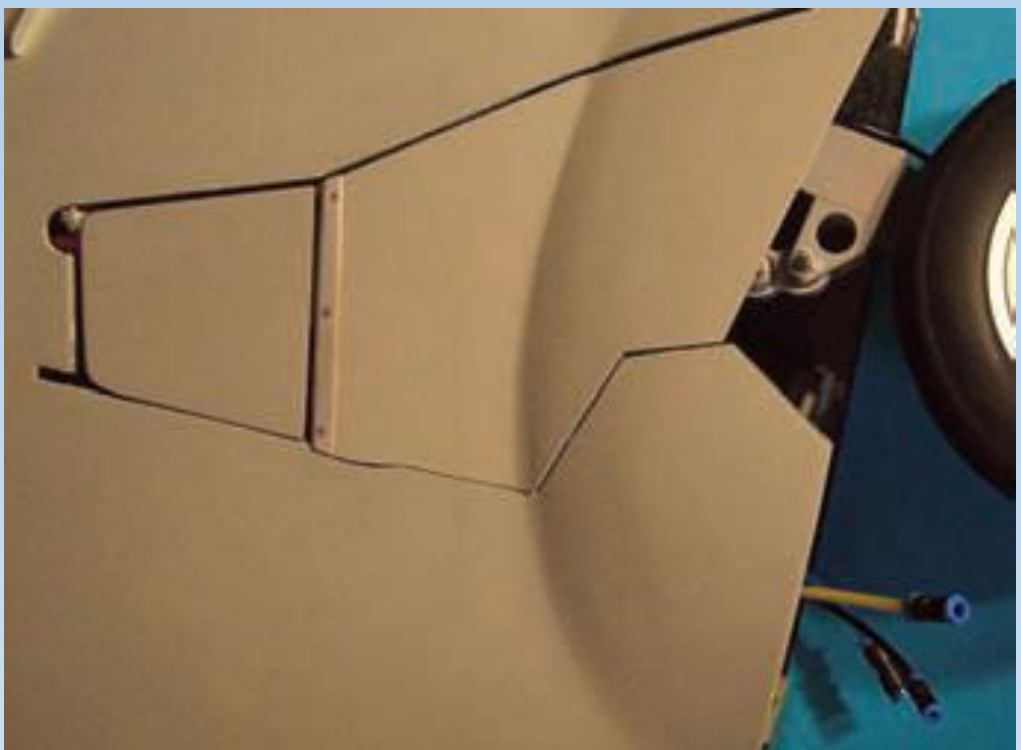
The small gear door has been fitted for you at the factory. However you must make up a linkage between this door and the strut. Begin by drilling and tapping a hole to M2 in the center of the front face of the retract trunnion. This will be your first mounting point. Using 2 x M2 ball links and a M2 x20 please cut the head of for make the linkage, the distance between centers on this example is 27mm. You may need to trim the ends of the ball links to achieve the correct length. We provide 2 small phenolic parts which are have to glued on the small door for provide the fixing point there, just cut the part which are the second hole located. Attach this lug to the linkage with an M2 screw and nut and screw the other end of the linkage to the hole you made in the trunnion. The linkage needs to be set off the trunnion by approx. 6mm to provide clearance for movement



Front and Main retract

You can now locate the best place for fixing the mounting lug on the gear door by tacking it in place in the closed position and checking that it opens freely without fouling the strut door. Once you are happy with the location of the lug, secure in place with hysol or similar.

For this example we found that extra smooth movement between the gear doors was achieved by adding a small aluminium plate to the top of the strut door bent downwards so that the doors did not foul each other on opening. You can choose to do this as well or leave a larger gap between the 2 doors.



Canopy and inlay

The canopy frame has all work done. It comes completely finished with all locks, tabs and slides. It fits perfectly on the fuselage. You just have to cut out the clear canopy and glue it into the frame.

Roughly cut the front and rear of the canopy as molded, so that you can put it over the fuselage.

Fix it with small pieces of tape and mark around the three canopy cutouts . Allow 4 mm excess material so you can glue it later from the inside in to the frame.

Cut now the front part around your mark . Use a pair of short, curved scissors or a diamond disk with a dremel. Make sure the room is warm, or warm up the material before you cut, to prevent splitting or cracking

Gluing in the canopy pieces is a tricky job. There are many ways to do a great job.

Start on the front canopy, use a proper tape for this work with a good tack.

After everything is taped make sure the canopy all around sit as tight as possible against the frame.

Then use thin CA glue to fix it in a few spots. Apply very little amounts with the tip of a knife and do not use accelerator.

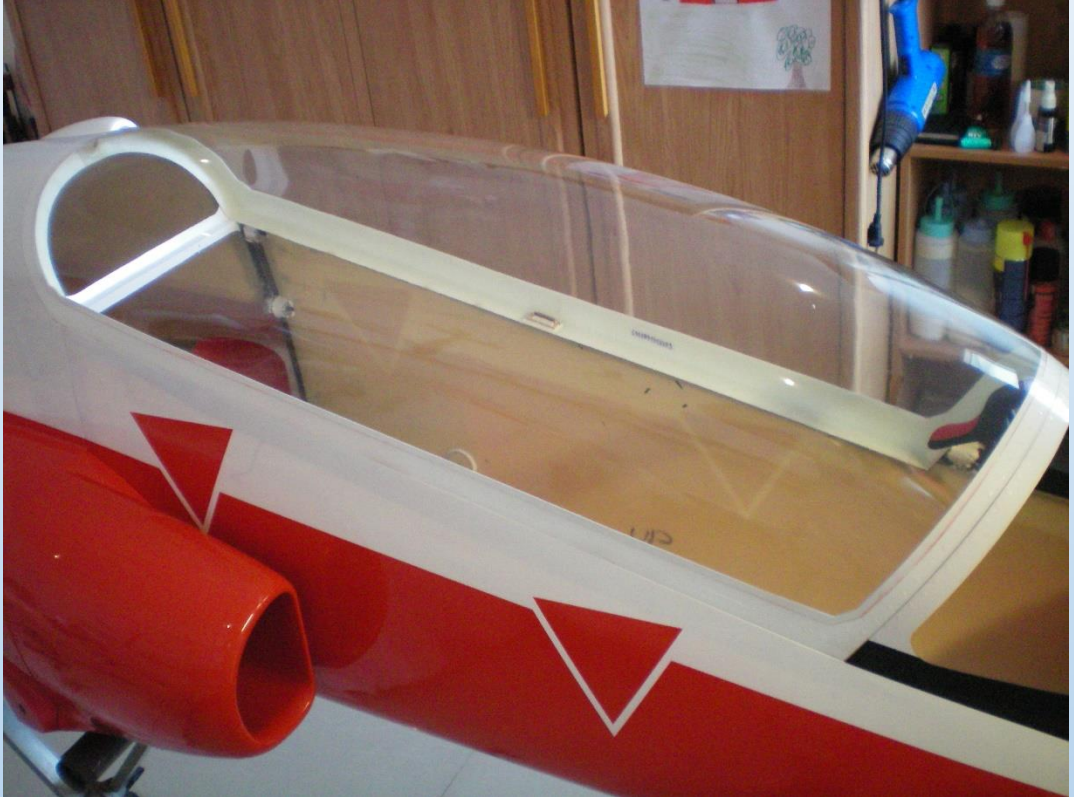
When the screen is fixed well, apply 30 min epoxy from the inside and let it cure. The resin will creep into the gap slowly and create a good joint.

Work backwards one by one screen. Allow ample time to do this job, as it is critical for the professional looks of your cockpit.

Canopy and inlay



Canopy and inlay



Canopy and inlay



Canopy and inlay



Canopy and inlay

We provide in our kit a scale frame inlay. It will be very difficult to get it inside the canopy frame in one piece. So, simply cut it in two pieces and glue it in as shown on the photo.

Finally, you can use grey or black silicone to create a nice filled between the canopy glass and frame. Mask the glass, cut the masking tape parallel to the frame with a very sharp knife, in a distance of 2-3 mm. Remove the tape close to the frame, apply the silicone with a very thin nozzle.

Use your finger and form a nice round fillet. Then pull the tape off, make sure you have a sharp line on the wind screen and let the silicone cure overnight.

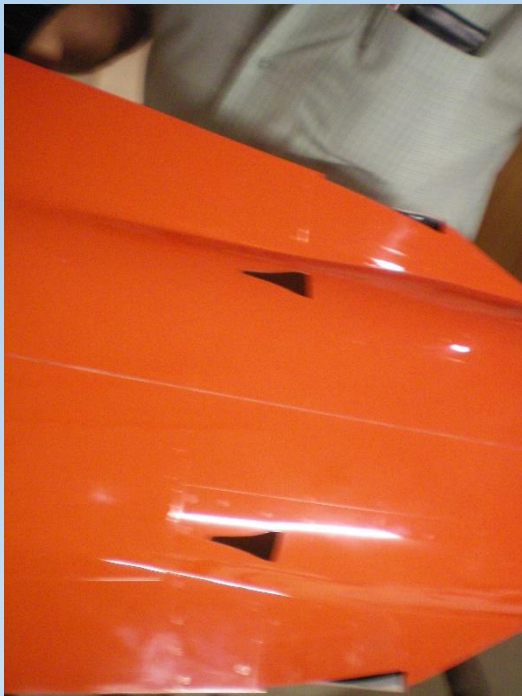
Lastly, next day, you simply can rub off any excess silicone from the fiberglass canopy frame.



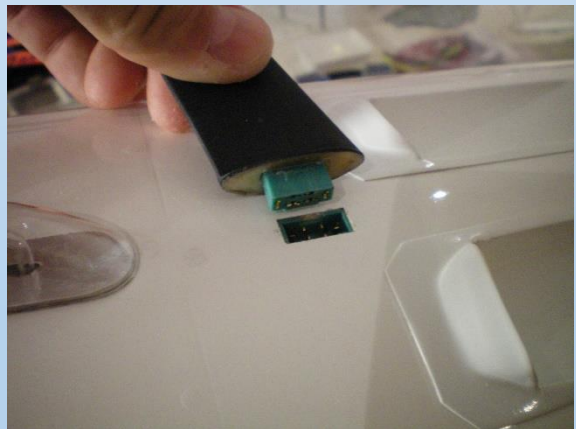
Scale accessories and lights

All those Naca inlets are clearly marked on the surface of the fuselage. Cut them out carefully and glue in the pre painted intakes which come with your kit. Cut them to fit and glue them from inside.

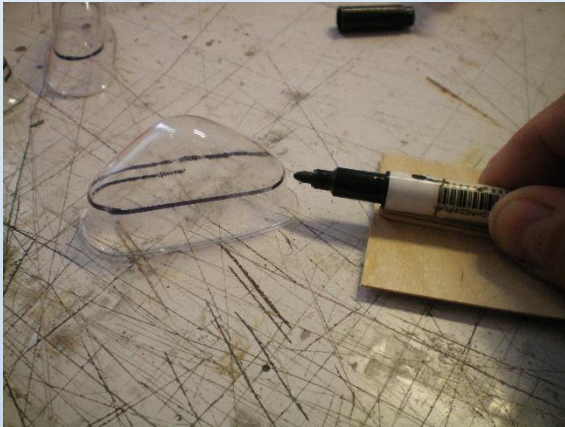
Take out carefully the Foam sandwich out in the gluing area.



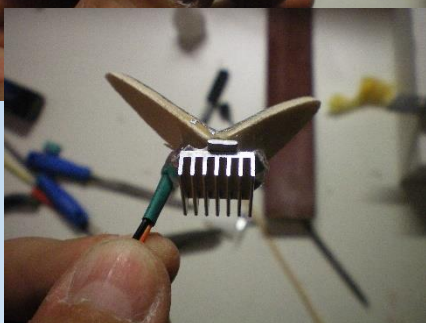
Tips and Hints about the Scale accessories and lights



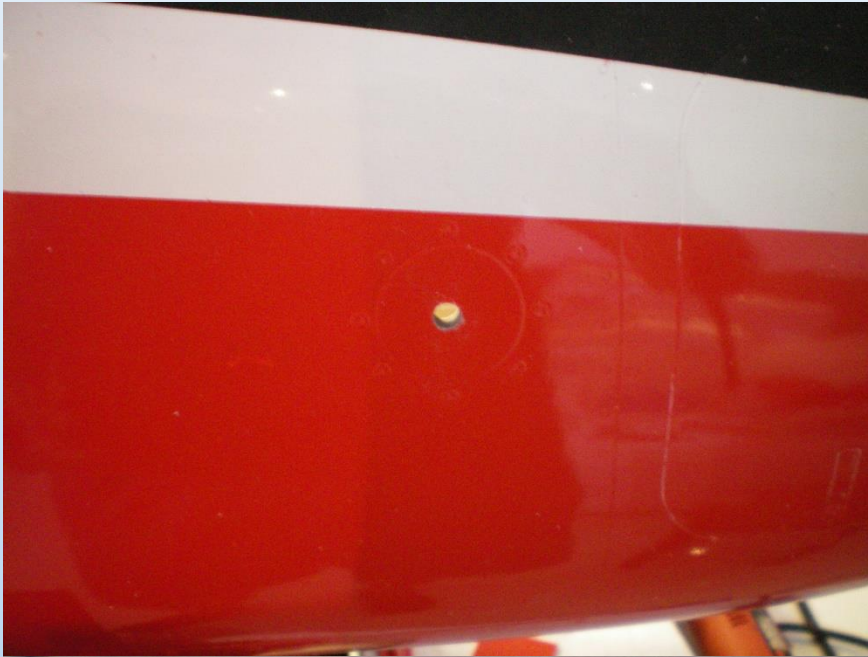
Tips and Hints about the Scale accessories and lights



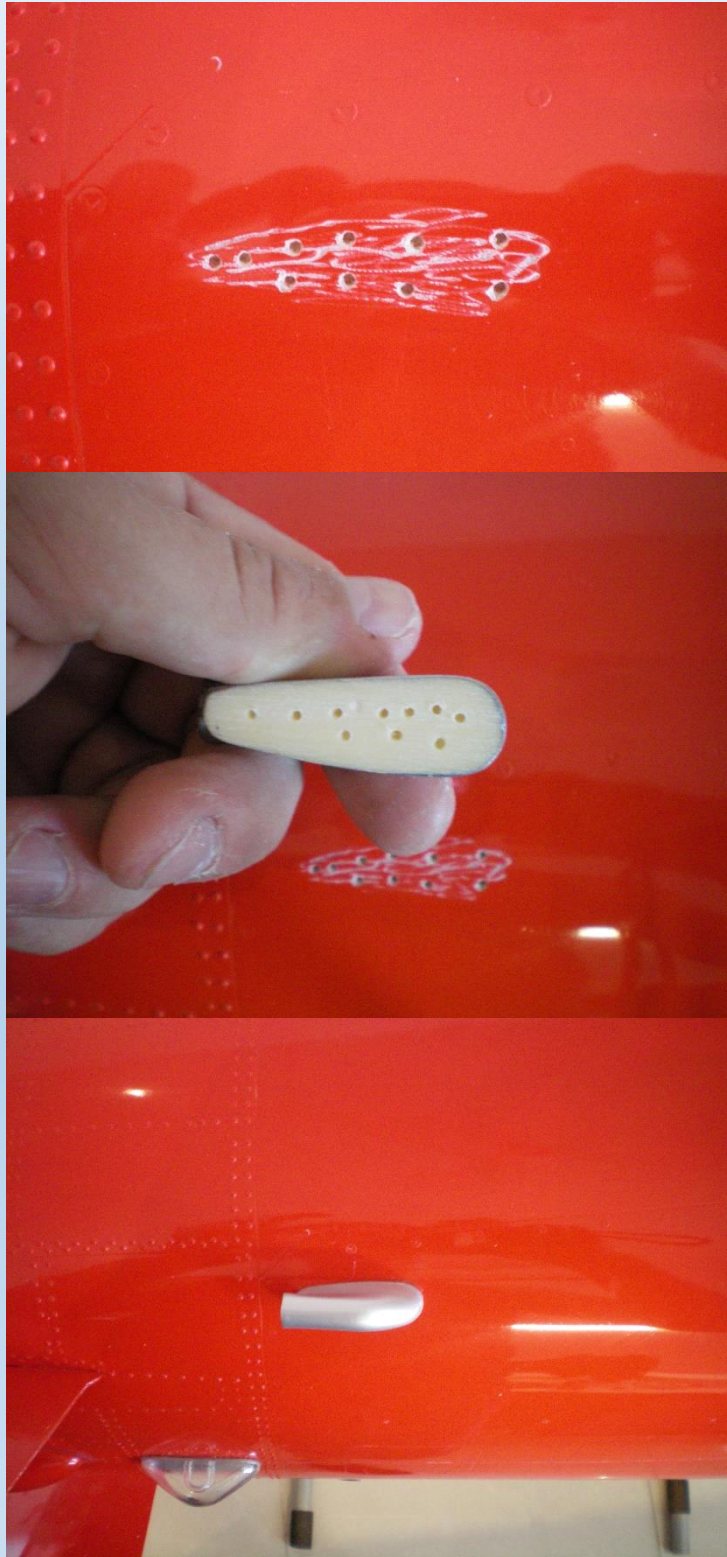
Tips and Hints about the Scale accessories and lights



Tips and Hints about the Scale accessories and lights



Tips and Hints about the Scale accessories and lights



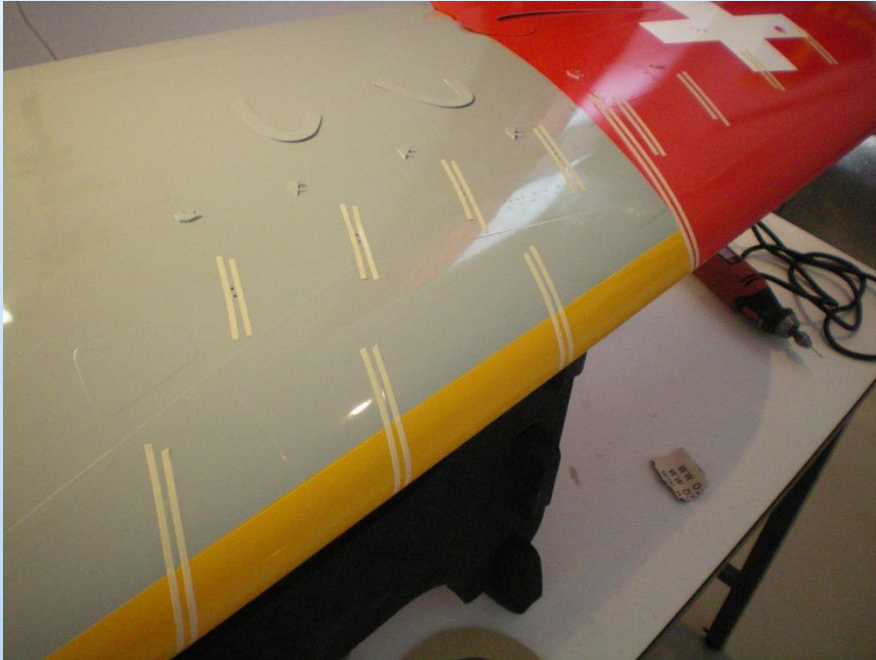
Tips and Hints about the Scale accessories and lights



Tips and Hints about the Scale accessories and lights

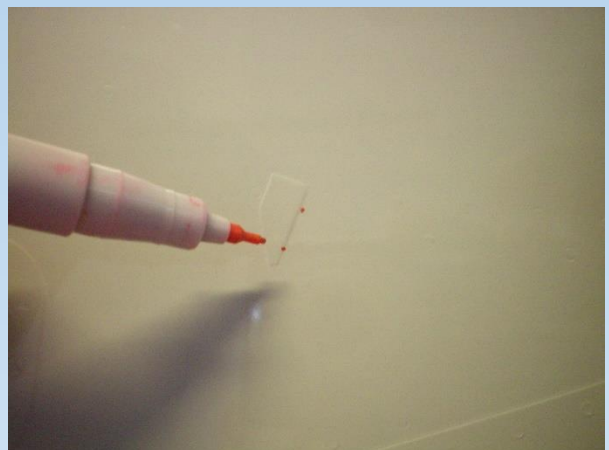


Wing Fences and Vortex generators



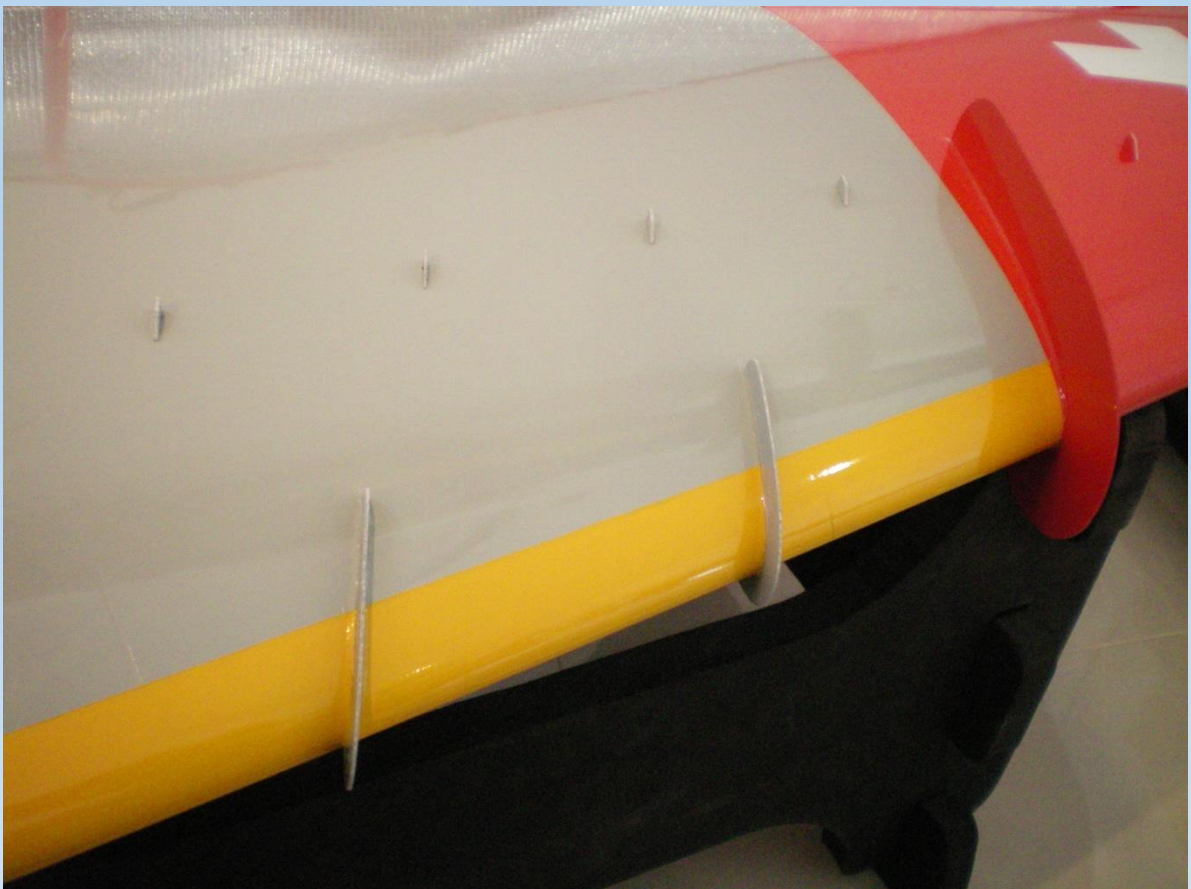
Each wing also has a number of small vortex generators. You will see the relevant positions for the vortex generators on the wings.

If you use a small pen for mark the position for the pins will make the task of drilling the holes easier. Drill a pair of holes for each piece 1.5mm and put a drop of cyano in each hole before fixing the vortex generator in place.



Wing Fences and Vortex generators

A set of wing fences and vortex generators is supplied in your kit and fitment is relatively easy. On each wing there is one large wing fence (see here in red) for the outboard of the wing, and 3 smaller fences (seen here in grey) to go further inboard. You will see impressions on the wings where the fences are positioned. Pay particular attention to the angles they should be set at. For the inboard fences each has a slightly different inner profile depending on its position along the leading edge. Before gluing, identify which one goes in which position. Tack each in place with cyano and then apply a bead of hysol / epoxy on each side to secure in place. The joints can then be painted to finish.



Wing Fences and Vortex generators



Balancing

The final weight of your Bae Hawk MK 66 will vary depending on your equipment/turbine choice and the amount of scale detail you might choose to add. We guarantee that the plane can be build below 20 kg dry weight with our production cockpit, which can be ordered as an accessory.

However, if you are not careful, you can easily end up being 1-2 kg too heavy. Don't give up if you need to keep the weight limit, you will find areas where you can save weight, if you end up a bit too heavy.

The center of gravity is located 305mm from the leading edge of the wing at the wing root. Measure the

CG with main tank empty and hopper tank full with gear down. The CARF Skygate Hawk is a large model and care should be taken when balancing

The center of gravity is quiet easy to check , just use the jig which we provide in our kit.





Control movements

We have listed below the movements we used to fly the aircraft built for this manual.

Different pilots

sometimes prefer a different feel to the aircraft but you will find that using these movements as a starting point will give you safe and smooth operation. You can then adjust to suit your flying style.

Aileron - 20 - 20mm each way (make neutral position of aileron in line with flap so a little bit "down")

25 to 35% Expo (positive for JR / negative for Futaba)

Elevator - 45mm up and 40mm down - neutral position is trailing edge in line with rear hatch joining with fuselage 25 to 35% Expo (positive for JR / negative for Futaba)

Rudder - 40mm each way 25 to 35% Expo (positive for JR / negative for Futaba)

Flaps - 20 degrees take off - 60 degrees landing. A little up elevator required with flap 3% for take off and 7% on landing

All measurements are given at the root trailing edge of each surface.