

Building a Vailly Aviation Hawker Hurricane...Instalment 6



Fitting stabiliser to fuselage:

Correctly fitting a stabiliser to a fuselage is vital to the end performance of the aircraft, the stabiliser must be parallel to the wings, have the correct angle of incidence, be at right angles from the centre line and have an equal span both sides of the fuselage.

I start with a known flat and level bench top and put the fuselage into a foam fruit case supported

over a piece of pipe that is in contact with the fuselage wing root formers. With the use of a spirit level I will make minor adjustments to the edge of the packing case until I have the plane in a level position span wise.

From the alongside picture you can see I have clamped a piece of wood across the back of the box to support the fuselage and to allow me to adjust the rear of the plane up or down to obtain a lengthwise level. To obtain this is as easy as measuring from the top of the building crutch to the bench top on the firewall former and the tail most former.

I now pin the stabiliser onto the stabiliser mount and measure the trailing edge both sides of the fuselage. With minor repositioning I establish the centre position and draw lines on the stab sheeting from the fuselage sides for later reference.





I then measure from the top of the trailing edge to the bench top to get the stab level span wise.



I refer to the marks on the stab sheeting to ensure the stab is still centered and then I hook a piece of fishing trace to a pin inserted on the centreline of the firewall former and pull out the trace to the trailing edge of the stab tip and hold at that point. I repeat the process to the other stab tip and



adjust the stab until both sides are equal. Lastly with the stab firmly pinned and weighted to the stab mounts measure the incidence and remove or add balsa to the mounts until it is correct.

I will repeat the whole process from start to finish to make sure all is well before epoxying the stab to the mounts.



Because I wanted to completely hide the elevator horn and pushrod within the fuselage I was forced to do a few mods to the standard fit out. I cut out the rear of the fuselage former as per the upper right picture and manufactured a cranked pushrod as per upper left. The elevators were joined with a bit of 3/16" dia. steel wire with a brass horn silver soldered in the middle. The whole assembly was then fitted from the rear into the fuselage and held in place with the epoxied **Robart** pin hinges.



The rudder fin is the next surface to be fitted.

This is pretty well self aligning vertically as the fin has a large rudder post attached to its trailing edge. I pinned the rudder post to the tail frame and, using the string method described in fixing the stab, made sure we had equal distance from fin tip to stab tips on both sides, then I glued the rudder post to the former. The fin has a little offset from centre built in to minimise torque effects, this was measured from the plan and the fin then glued to the fuselage.



The fin and stabiliser need a fairing as per the full size, I used a mixture of **micro balloons** and **ZAP Finishing Resin** to create an easy sanding bog that I have spread around the joins and sanded to shape, once again, make sure you have masked the panels shape before applying bog. Later on I will build up over-lapping panels on the basic shape.

Be aware that there are micro balloons that are as hard as a rock and there are micro balloons that are easy to sand. I get mine from:

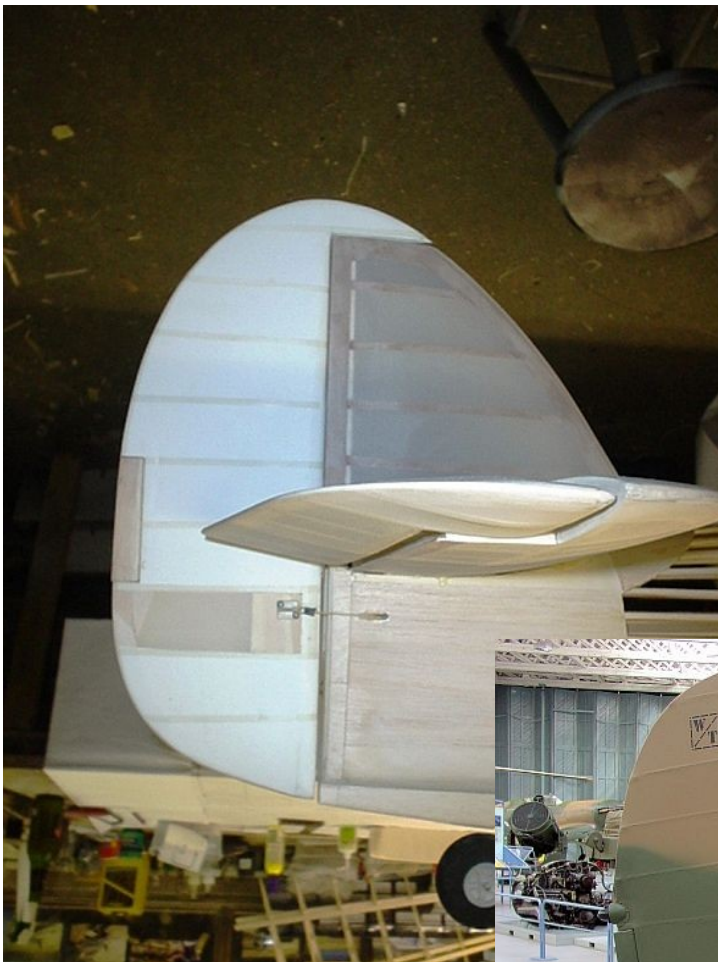
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The rudder was fitted next, once again, using **Robart** pin hinges. The trim tab was glued in place and a pull-pull system to actuate the rudder from a centrally mounted servo was connected up. The tail wheel steering servo and the rudder servo are connected with a reversing "Y" lead



The pull-pull rudder system doesn't have to be massive as this model won't be doing any 3D manoeuvres. I've gone for as scale a look as possible.



Full size rudder horns.





Wing Mounting and Wing Fairings:

After completing the tail group, next is to mount the wings with the same parameters as the stabiliser i.e. alignment and angle of attack. First I start with sanding the fuselage sheeting to the same profile as the fuselage internal ply wing formers, then apply glue to the formers and the fuselage sheeting and place two strips of 1mm ply over each side.



The wing is fitted in place with a layer of greaseproof paper between the wing and the ply strips. Weight down the wing and remove when the glue is dry.



The ply strips are cut to shape and formers for planking are added.

The fairing is planked with balsa to the front former placed about half chord. The balsa needs to be softened by spraying with ammonia to conform with the required curves.



From the front of where the planking ends the fairing is made from a bog of micro balloons and finishing resin.



The wing will be mounted on the fuselage with a 1/2" hardwood dowel epoxied in the leading edge of the wing to match up with a hole drilled in the wing former and two 1/4"-20 bolts through the reinforcing at the back of the wing into a ply plate aft in the fuselage.

The correct angle of incidence is set during this process. To do this I insert a pointed piece of dowel into the hole drilled in the leading edge of the wing. I apply paint onto the tip of the dowel and make minor adjustments to the placement of the wing until I get the desired incidence I then push the dowel against the wing former.



The wet paint on the dowel leaves a centre point on the wing former for me to drill out. The pointed loose dowel is replaced with the correct hardwood version and all should be good...



Finishing the wing fairing is done in two steps, first bog up the section on the upper front of the fairing and sand to shape then turn the plane over, fit the wing and bog and sand to shape the front underside and front of wing fairing. I mask the surrounding balsa to avoid any unwanted hollows caused by over-enthusiastic sanding.





After a lot of sanding we end up with a shape at the front of the root as below.

Air bubble holes and minor dings can be filled with duco putty.



The wing is then cut off the fuselage by cutting through the fairing with a razor saw and then tidied up with a sanding block.

This process may look a bit harder than it really is but if the correct mix of **ZAP Finishing Resin** and the correct micro balloons are used it is quite easy to achieve. I use various shaped foam sanding blocks and 80 grit paper. The bog sets into a chalky like texture which will be later reinforced when covered with fibreglass cloth.

That's it for the wings and fuselage.

Next instalment will be about exhaust pipes, plumbing and wing detail.

Cheers

Stan

