

Building a Vailly Aviation Hawker Hurricane....Instalment 5

Continuing to build the wing:



Flaps: The flaps are made from the cutaway sections done in instalment 4, as you can see from the photo they have been strengthened with a large spar down the leading edge, this spar will also carry the hinges. More ribs will be added to match the full size

look above. The flaps will be fibreglassed with 2 oz cloth inside and out to strengthen.



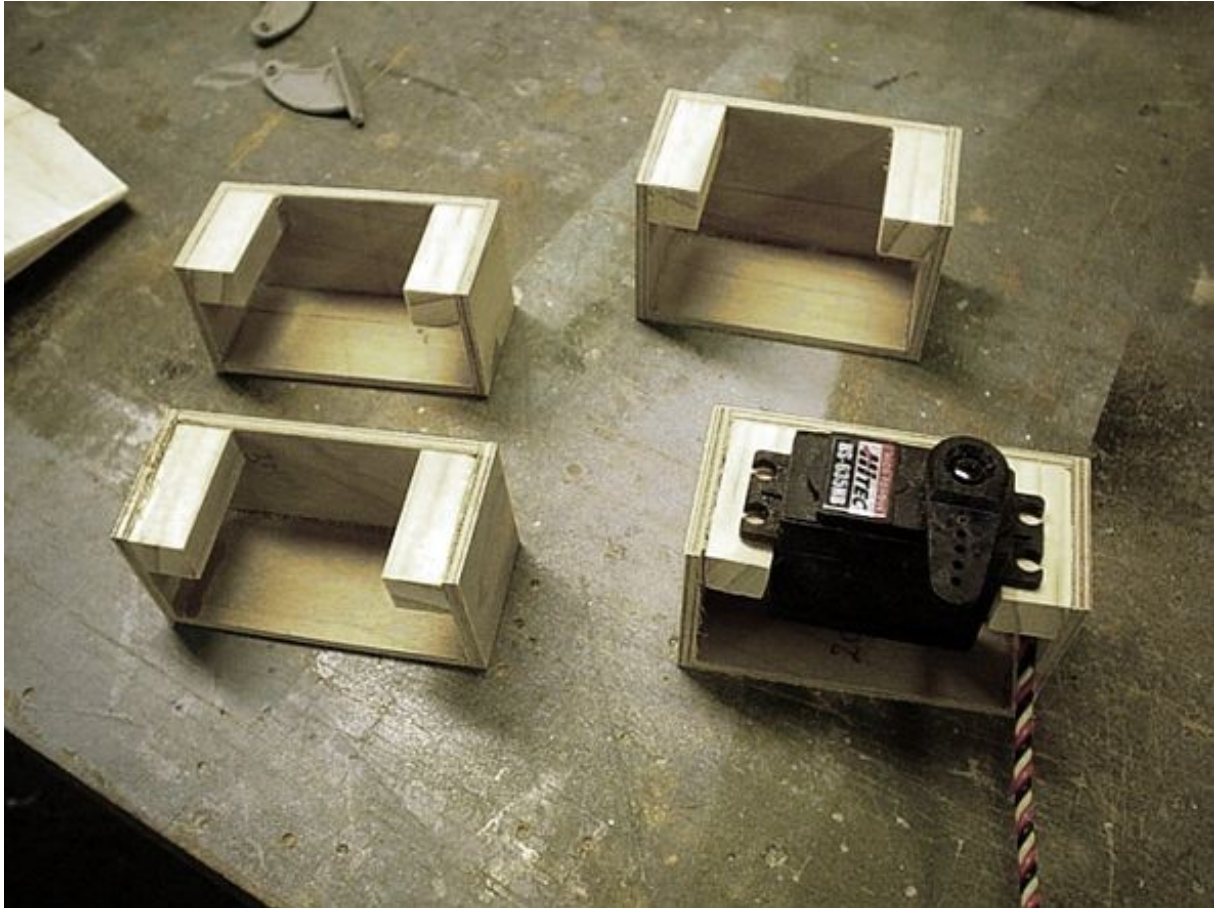
with 2 oz cloth inside and out to strengthen.

The servos that actuate the flaps are going to be buried in the wing and will be

epoxied to the rear spars and wing upper sheeting. The servos will push the flaps down and pull them closed.

The flaps require strengthening with aircraft ply to attach the actuating **Robart** horns.



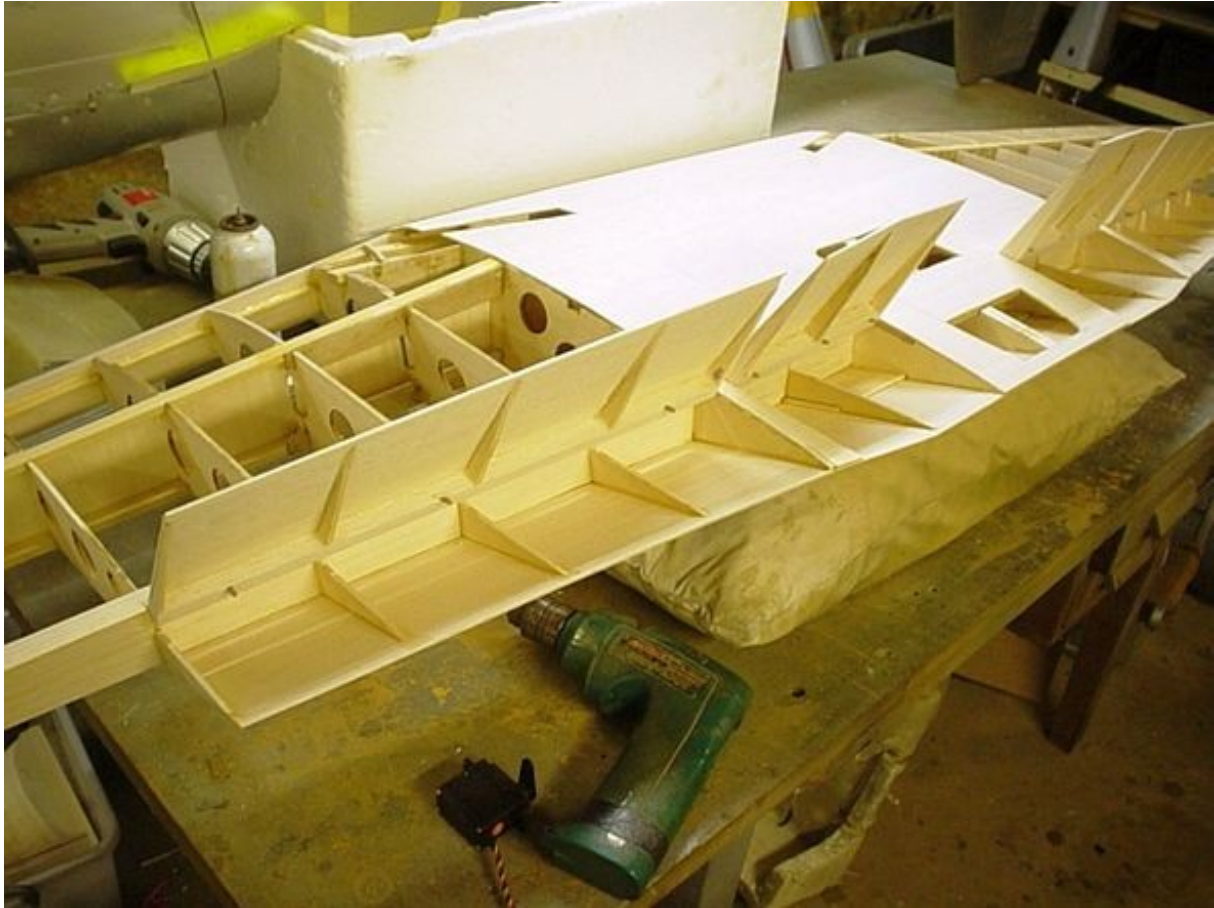


The above picture is of the four servo mounting blocks, these blocks are epoxied to the rear set of spars, adjacent wing rib and to the wing sheeting. If the servos need servicing I will have to cut a hatch in the wing skin. The upside to burying the servos inside the wing is that no control horns or pushrods will be visible externally.



The four flap servos and two ailerons servos are all **HITEC HS645MG**

The ailerons are made the same as the flaps but as the Hurricane had fabric covered ailerons I have left the top surface open and will cover with **Solartex**



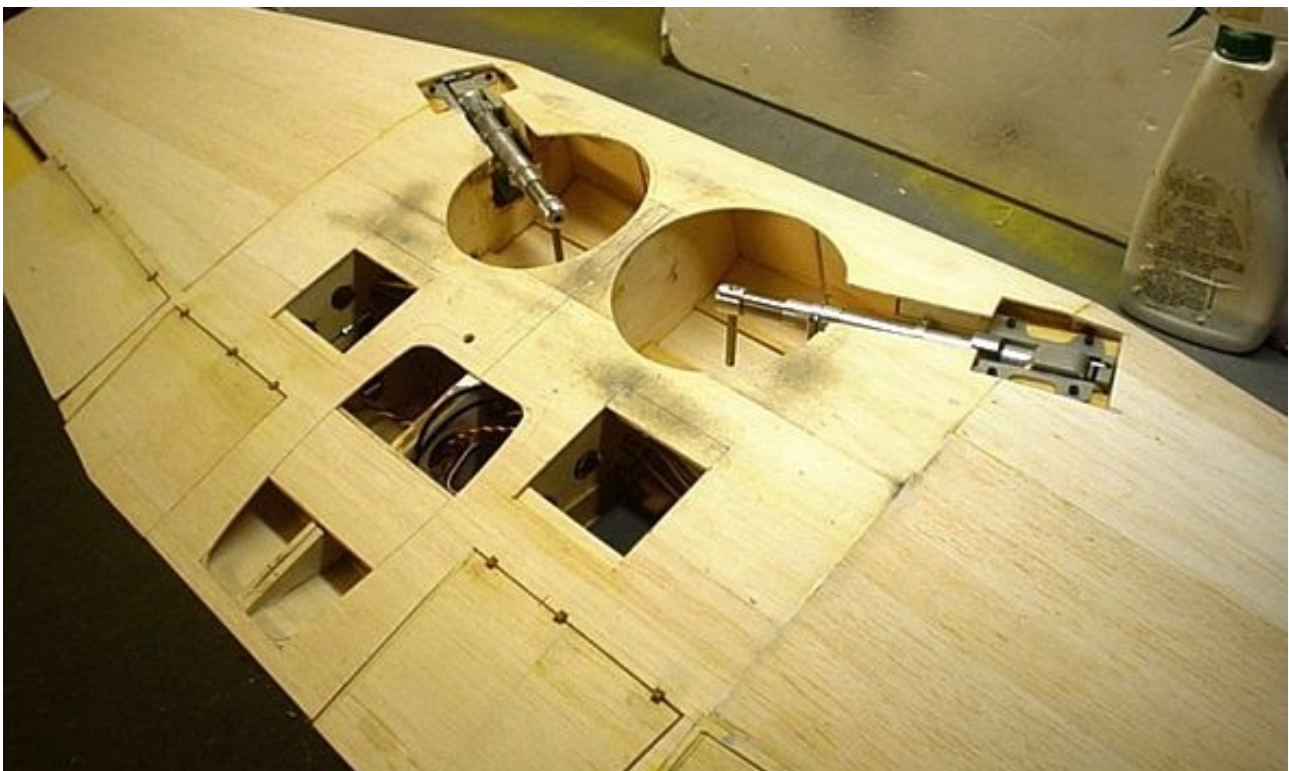
Robart pin hinges are fitted to the leading edges of the flaps, they are inserted in holes drilled at 45 degrees in the back of the rear spars sheeting and the leading edge of the flaps, this allows the hinge line to be level with the surface. The ailerons were similarly fitted but their hinge line is flush with the upper surface of the wing. In the photo below you can see the embedded servos for stbd outer flap and aileron.



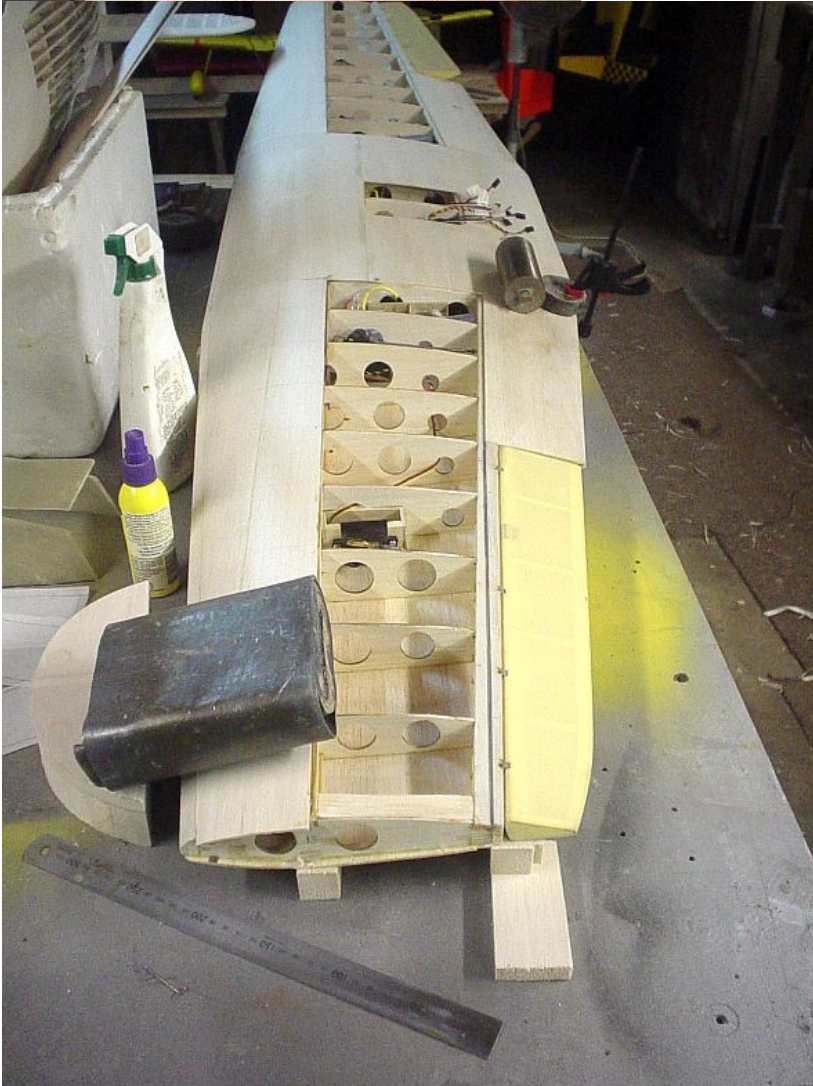
Both wings have **Robart** air bottles fitted in the inner bay and they are connected with plastic tubing and a 'T' piece to the servo actuated **Robart** U/C retract valve in the port wing and the inlet valve mounted in the side of the radiator under the wing.



The photo above shows one of the main undercarriage air tanks, the U/C retract UP-DOWN valve and actuating mini servo attached to one of the wing root ribs. There are two air tanks connected in parallel. The other servo in the picture is one of the outer flap servos and is attached to the ply re-enforced rib No.2



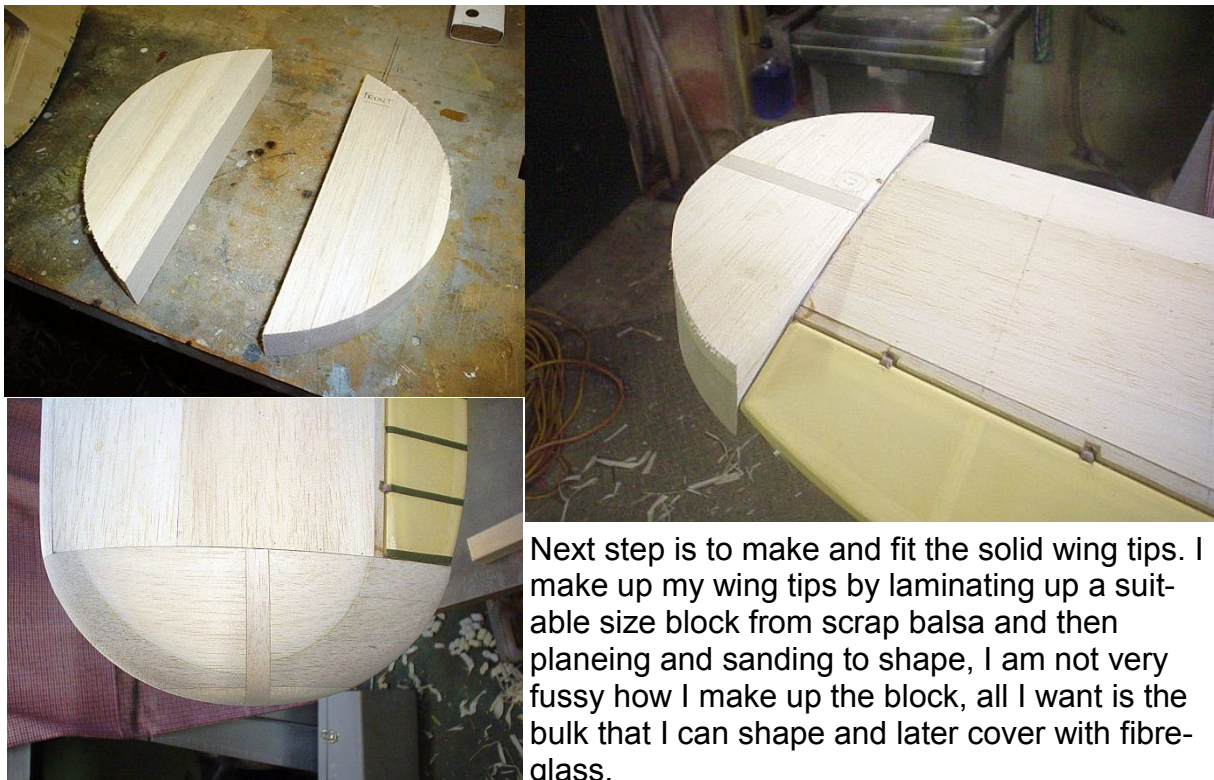
The rest of the underside of the wing is now sheeted and the wheel well cut-outs made. Note the hatches for the inner flap servos and the centre cut out which will have the oil cooler radiator fitted over. The sheeted bit inside the radiator cut-out is 3mm balsa over 6mm aircraft ply and will be drilled for 2 x 1/4"-20 cap head bolts to bolt the wing to the airframe.



Before the final sheets are fitted to the upper surfaces the wash-out must be set. The wing must have a lower angle of attack at the tips than at the root to minimise tip stalling. This is done by weighting or clamping the centre section down to the bench and twisting the wing the desired amount. The wing will twist quite readily if the sheeting already fitted to the wing is sprayed with hot water and ammonia. A block which has been cut to the size of the required washout is placed under the trailing edge of the wing at the tip and the leading edge is weighted down to the bench. I allow about 5mm of over size washout in a wing this size and that will reduce to the correct amount when the top sheeting is complete and the glue is dry and the weights are removed. The fit of the upper sheeting must be precise and therefore I use a good PVA glue to give me a bit of working time.



You can see from the above photo that the wing is weighted and clamped to the bench to give the correct twist. It is important to have good glue joins on the skin to the ribs and spars hence the extensive pinning of the sheet to the ribs and spars.



Next step is to make and fit the solid wing tips. I make up my wing tips by laminating up a suitable size block from scrap balsa and then planing and sanding to shape, I am not very fussy how I make up the block, all I want is the bulk that I can shape and later cover with fibre-glass.

At last the bloody thing is finished and ready for glassing, I didn't realise that it would be such a big build...



This photo demonstrates how fine the trailing edge would need to be to be in scale. I doubt that this fine edge is sustainable making a wing from balsa. Might be a bit of a compromise here.....





Glassing is easy, I always do the underside first and then overlap the topside. I glassed the centre section with two layers of two ounce cloth and then the complete wing with one layer of 3/4 oz. I use **ZAP Epoxy Finishing Resin** and an old credit card to squeegee it out over the surface.

It is nice to apply the resin on a hot day or night as it will wet out the cloth more readily but as I was doing this in the middle of winter I had to add a little methylated spirits to the mixed resin to aid the wetting out process. The downside of adding metho is that there is an increased likelihood of the resin being too thin in places where the balsa is soft and has absorbed it unevenly. Add as little as possible.





Flaps are glassed with 2 oz cloth inside and out.



All done finally and weighing in at 3Kgs which is not bad for a 92" wing fitted with 7 HD servos, two air tanks, an undercarriage retract valve and all wiring and plumbing.

The next instalment will be about fitting the stabiliser and the wing to the fuselage and creating their respective fairings..

Cheers
Stan