

Building a Mick Reeves 1/4.5 scale Hurricane— Instalment 8

Wings, Flaps and Ailerons



Flaps: The Hurricane has inner flaps and outer flaps, I'm going to drive each flap with an individual Hitec HS645MG servo. Synchronising the four servos is the job of the Smart-fly 3D Equaliser gizmo. I've used these before and have found them to be excellent as you can adjust the centre and end point and reverse each individual servo connected to them.

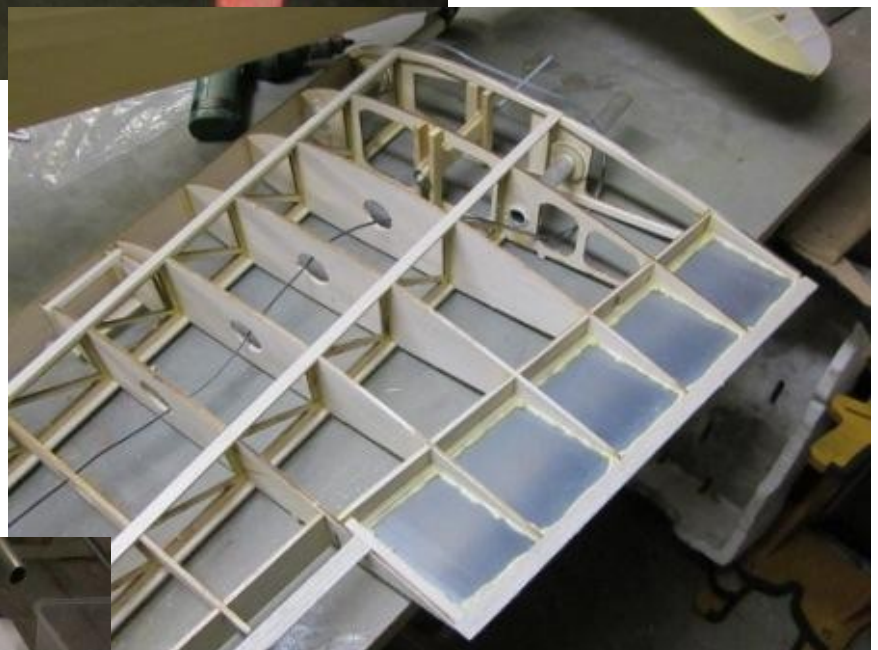


This picture is of the area and the framework in the wing for the outer flap



A sheet of Proskin is glued to the framework using Probond with straight edges and plenty of clamps.

One of the really nice features of using Proskin is that very fine, straight trailing edge can be achieved that are also strong enough to resist "hanger rash".

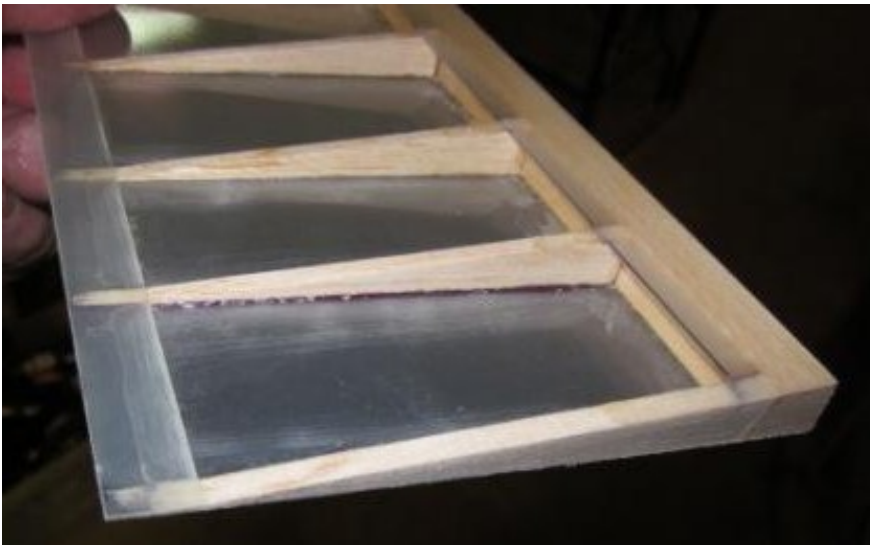


Now that I have the flap recesses done I will build up the flaps over them to minimise any gaps. The flaps are a simple sheet of Proskin with a balsa leading edge reinforced with balsa ribs and Proskin strips front and rear to make them stiff.

I started the flaps by cutting a bit of Proskin to roughly fit the flap recess and then glued a bit of 1/2" balsa to the front edge



I then trimmed the Proskin to give me a 2mm overhang of the recess on all edges and fitted the flap into the recess to mark out the flap rib positions. The triangular ribs were glued to the flap with CA and the whole flap was sanded to fit using a linisher sanding belt.



A 12.5mm strip of Proskin was glued to the trailing edge and a 20mm wide strip to the leading edge, both were glued with CA.

The end result is a flat, stiff and strong flap.

Next step is to hinge them and work out a way to actuate them.





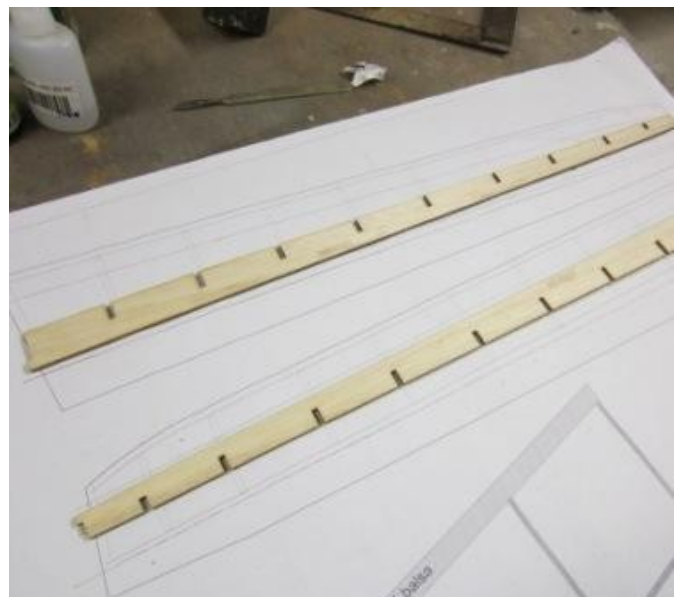
The top left picture is of the angled servo box glued to a rib and the rear spar. The back of the balsa rib will be reinforced with a spruce bearer. The top right picture is of the keyhole in the floor of the flap recess and of the simple commercial horn attached to the leading edge of the flap. The bottom picture is of the build up on the front of the flap recess to take the five strip hinges.

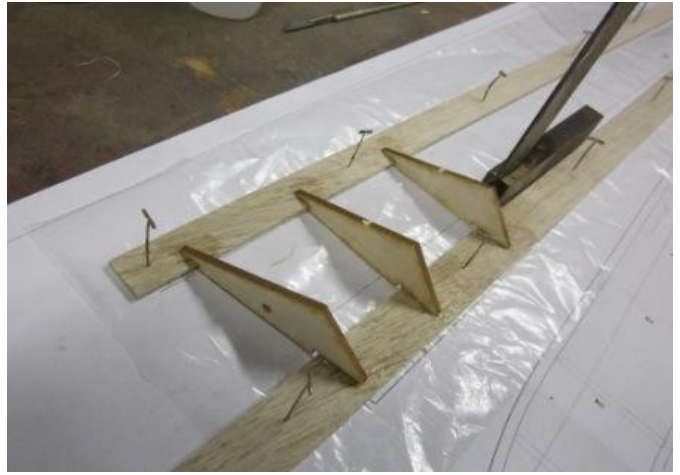
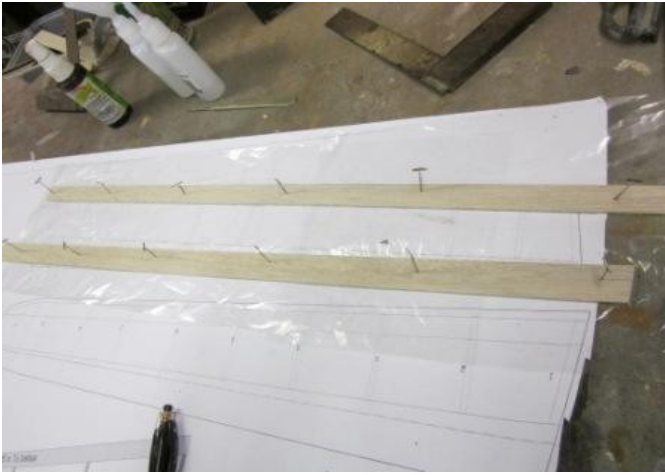


This is a picture of the starboard flaps in the full down position, the fine adjustment to the four flaps was done with the Smart-fly 3D Equaliser.

Ailerons: The ailerons started out as a bit of a mystery as I had laser cut parts that weren't on the plan. I don't know what the bits below were designed to do as they were marked "aileron" but didn't fit any which way, later on in an RC Scale-Builder blog Mick advises to discard these parts.

I made the ailerons by pinning strips of hard 1/8" x 1" over the plans and adding the laser cut ribs. I glued a piece of 1/4" on the leading edge..





I covered the bottom of the ailerons with Proskin sheet and used a linisher belt sander to shape the final profile as per Mick's plans. I'll reinforce the area for the horns with

8mm ply glued to the leading edge, a rib and the Proskin. I'll cover the top surface with Solartex after final fitting.





The ailerons were then clamped into position and mounting holes were drilled through the ply wing rib into the aileron ribs to take the tubing hinge.

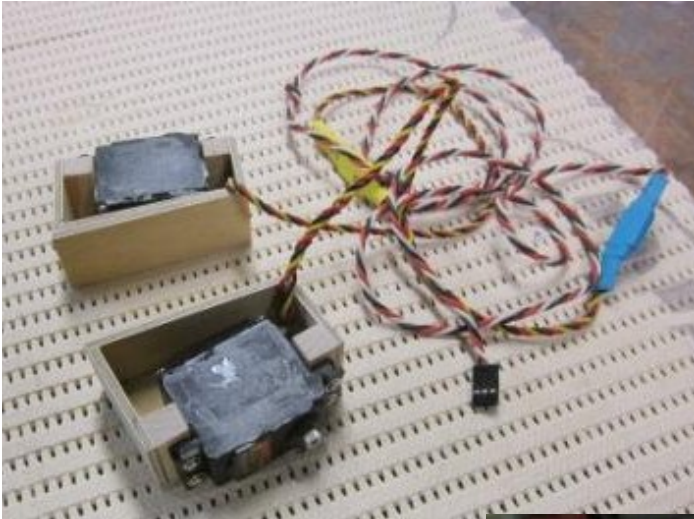
When the tubing was fitted and the aileron moved freely I tacked the tubing into position with CA prior to reinforcing with balsa blocks and Hysol.

Wires with the same diameter as the inner diameter of the tubing were inserted through the ply wing ribs into the aileron tubing and glued into place on the wing to create the hinge

All pretty simple, hope it doesn't flutter!



Next step is to make two servo mount boxes that position the servo at 90 degrees to the hinge line



I usually make these from good quality 4mm ply.

The picture is of the two mounts with well used Hitec HS 5645MG servos fitted.

I've now got to position the servo box on a rib that will give me a straight push-pull with the smallest possible

aperture for the link to the aileron horn and without having to cut into any spars. The rib will have to be suitably strengthened to ensure there is no movement of the structure supporting the servo boxes.

Below is a picture of the servo mounted in an angled box attached to the rear spar and an adjacent rib.





This picture shows the straight 4-40 push rod attached to the servo with a ball link and a simple cut down commercial horn on the leading edge of the aileron.

Covering the Wings:

It's bite the bullet time as this is my first experience with Proskin and the wings must be covered with the stuff.

To confuse me the sheets I've received with the kit appear to be different. Two sheets of the four have a shiny texture with no protective covering whereas the other two have protective covering and have a matt finish. These are the ones I'm

using for the wings as I figure the matt finish will give me a better glue bond.



By the way I've given Mick Reeves Probond glue away, it comes in a great big plastic bottle that was just too awkward to handle when I was trying to get glue under the skin on the ribs after I had previously glued the skin to the centre of the wing.

All the gluing from now on will be a Sika product called SikaBond, it's the same sort of glue and its available at Bunnings.



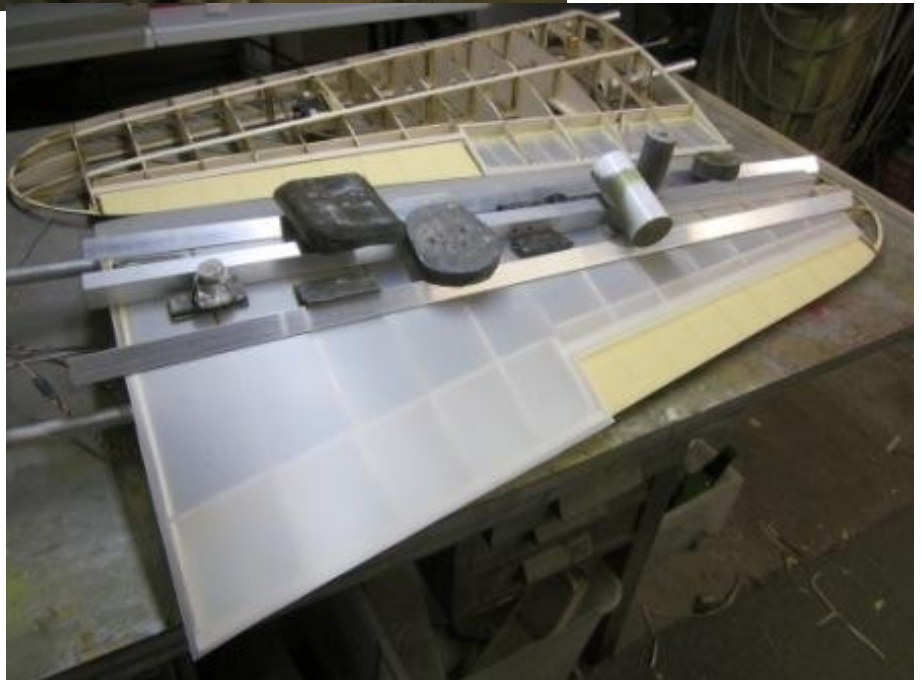


First Step: Mark out carefully, this stuff is expensive, and then cut oversize.

I'm going to cover the top-side first as the ribs have legs on them on the under-side to set the correct washout when the wing is set up on a flat sur-

face.

Because the Proskin stuff is very stiff and springy I am going to glue it down in four stages. First the centre section between the spars then the area from the rear spar to the trailing edges then the area from the front spar to the leading edge and lastly attack the compound curves at the tip.



I have used the straight aluminium extrusions and weights to hold the stuff down in the centre section and a thousand clamps for the trailing edge



So far so good.

Now for the underside.. The wings are now pretty stiff with the top skin glued in place but as I've got to use weights to hold the skin in place until the glue dries I have to be very careful that I don't muck up the inbuilt wash out when doing the underside.

I will glue the skin on in three stages. The first stage will be down the centre as it was for the top skin but to do the underside I am going to support the wing in a foam bed made up from the top piece of a foam set of P40 wings I have. I am hoping that when the centre section is dry the washout will be locked in and I will be able to do the front and rear of the wing freehand using CA .





All went to plan and when I glued the skin to the centre section the wing was very stiff so washout was locked in. I used the usual straight edges and extrusions with weights to do the front and back of the wing and at last the wings are skinned, stiff and very strong.

To complete the wings I have to fit a leading edge of 5/8" balsa and the vac formed wing tips.



IMO skinning the wings with Proskin was time consuming, tedious and messy, not much fun. Being an old fashioned builder I missed working with clean, creamy 3/32" balsa sheeting. The upside of using Proskin is the strength, I think if I hit a tree with these wings it will cut the bloody tree down.

Next instalment will be retracts, gear doors, radiator and finishing the wing centre section.

Cheers
Stan