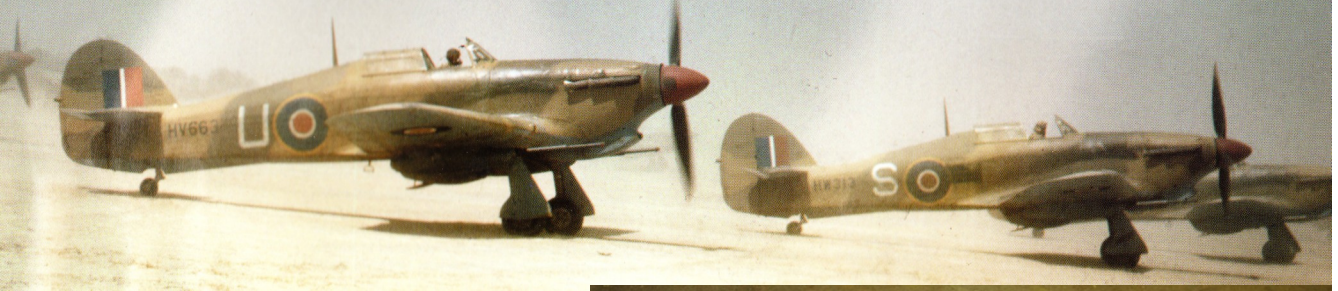


Building a Vailly Aviation Hawker Hurricane....Instalment 4



Building Flying Surfaces

Tail Group: Rudder first then the fin then moving on to the horizontal stabiliser followed by the elevators. The rudder is easy. Cut out the usual kit of parts from the plan and make it over a protective layer of old fashioned greaseproof paper over the plans.



To transfer the various shapes of ribs, formers etc from the plan I trace them onto tracing paper and then contact glue the traced item onto the balsa or ply sheet for cutting out. From the photo you can see I have added a bit of balsa on the trailing edge of the rudder to enable me to cut out and make a trim tab. You can see at the same time I have cut out the parts to make the basic fin and tail post.

Because of the thickness of the fin it can't be assembled over the plans. The position of the ribs is notched on the leading edge and marked on the trailing edge then the ribs are inserted vertically between these marks and notches. A set square is essential here to ensure accurate alignment. Definitely a job for cyano.. To finish the set the fin is capped with 0.6mm ply over the ribs, leading and trailing edges. The trailing edge capping protrudes 3mm or so and the rudder will hinge inside the trench so formed to hide the hinge gap.

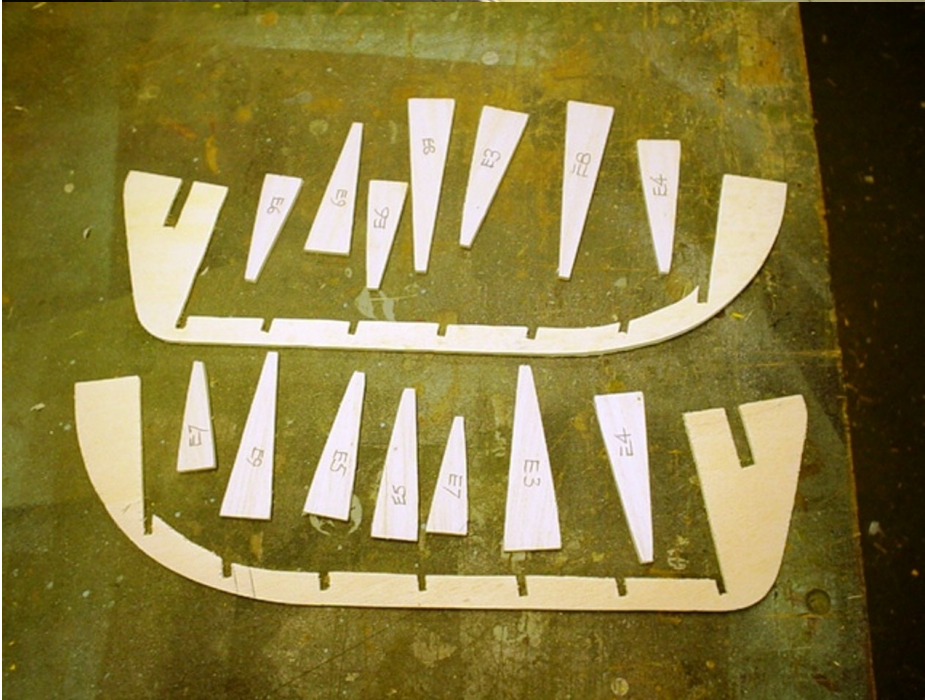




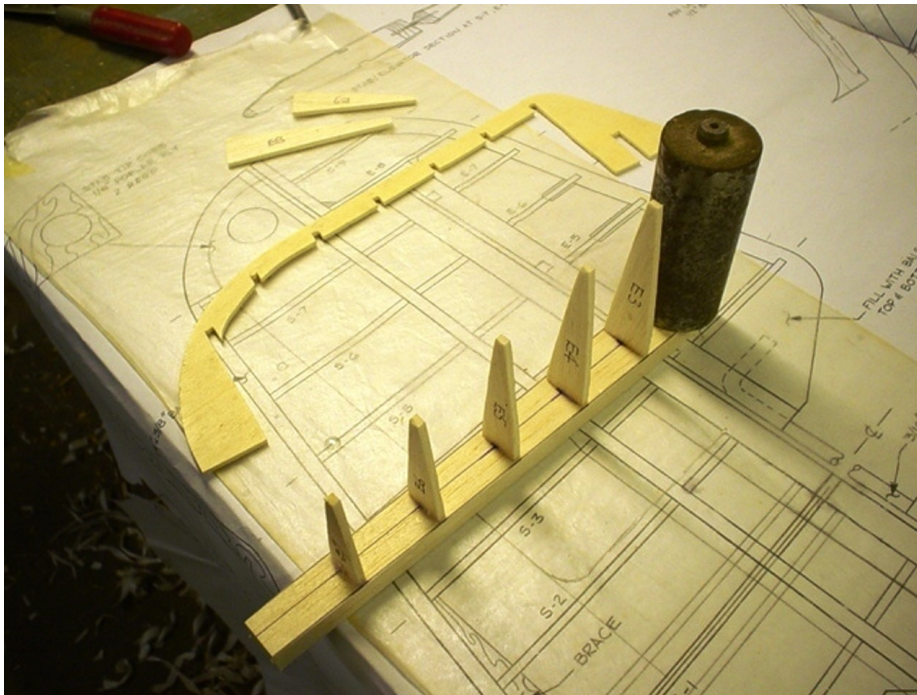
The ribs and stabiliser tips are shaped as per plan and then the stabiliser is made over the plan, once again cyano is the only way to go here.



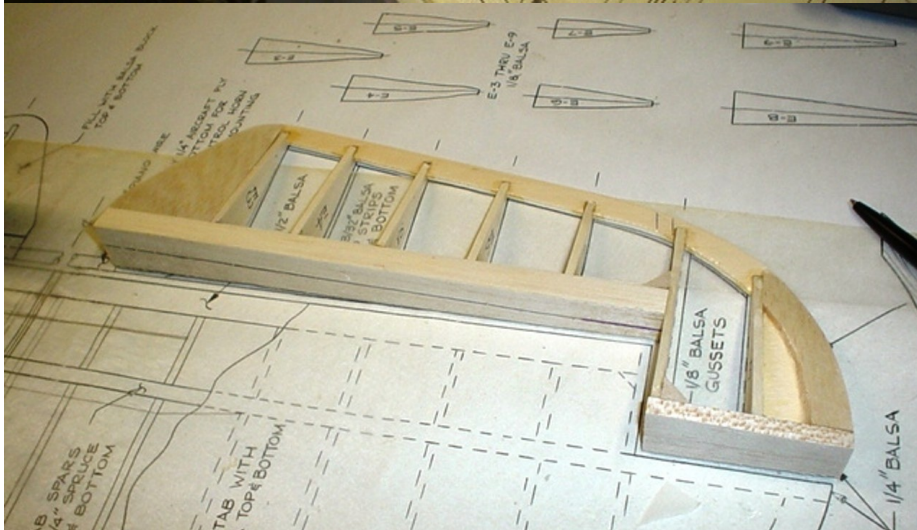
The stab tips are fitted and the stab is now ready to be sanded to shape.



The parts for the two elevators are cut out and the elevators are assembled as per the fin. The trailing edge shapes are 1/8" light ply.



Making the fin and elevators vertically from the largest spar is easier than it looks but it is essential that the ribs are cut accurately so that they align vertically.



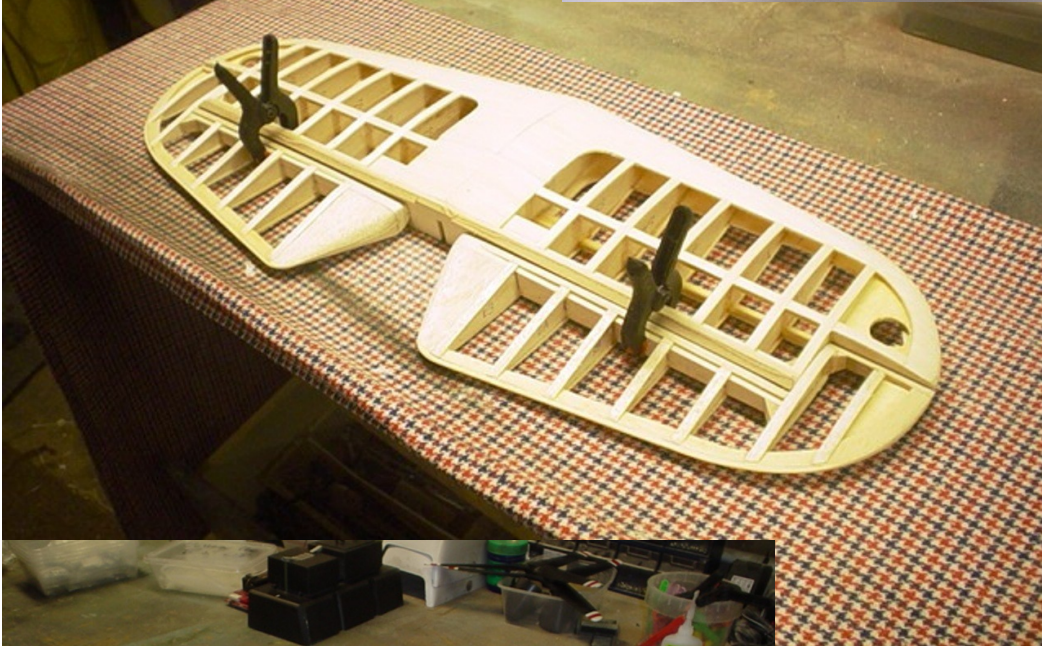
The tips, end blocks and gussets are added.



The elevators and stab are clamped together and sanded on a linisher to get the final shape before rib capping, elevators and sheeting and capping the stabiliser.



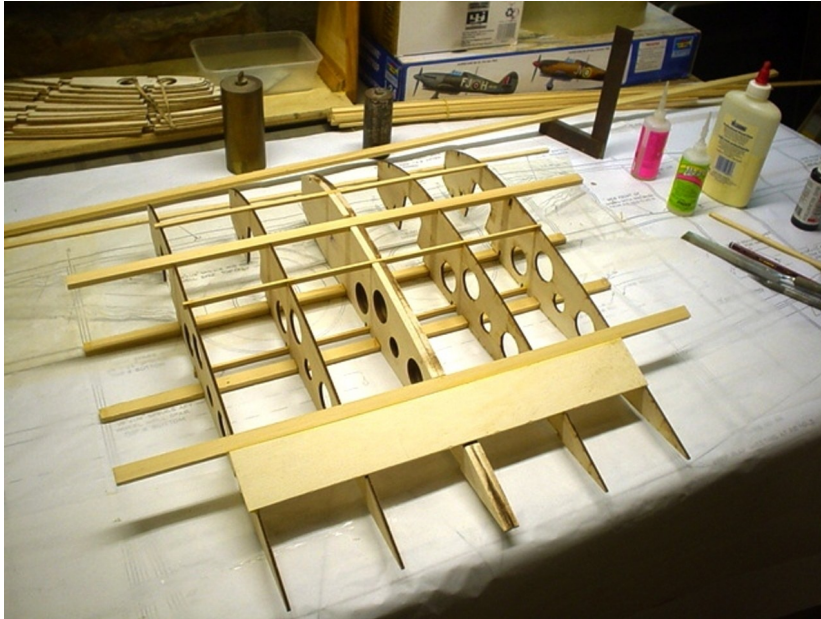
The elevator cap strips are glued to all the ribs and the leading edge and the elevators are sanded to their final shape.



Similarly cap strips and sheeting are added to the stabiliser and all are sanded smooth prior to covering.



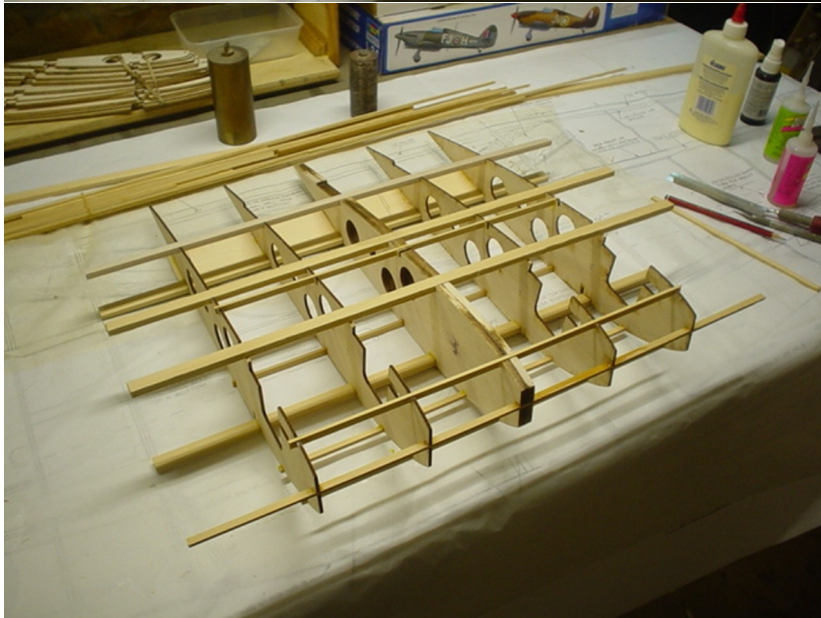
The rudder, rudder trim tab, elevators and horizontal stabiliser can now be covered. I use **Solartex** when I need a fabric covering, it is easy to use as it has the same properties as nearly all of the iron on coverings in that it has its own adhesive and shrinks with heat. Its not so easy to source now but **Modelflight** and **Kelletts** stock it. It costs about \$35 for a roll 78" x 26" in the old UOM.



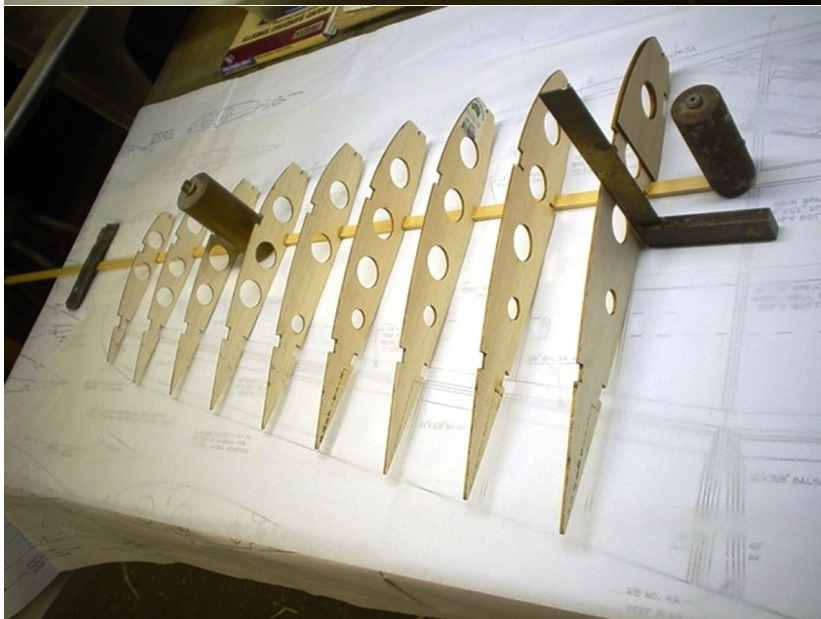
Making the Wing

The wing is made in three pieces before being joined, the centre piece is strengthened for attachment to the airframe and has to accommodate the wheel wells. It is built first and is a straight forward build over the protective grease proof paper over the plans.

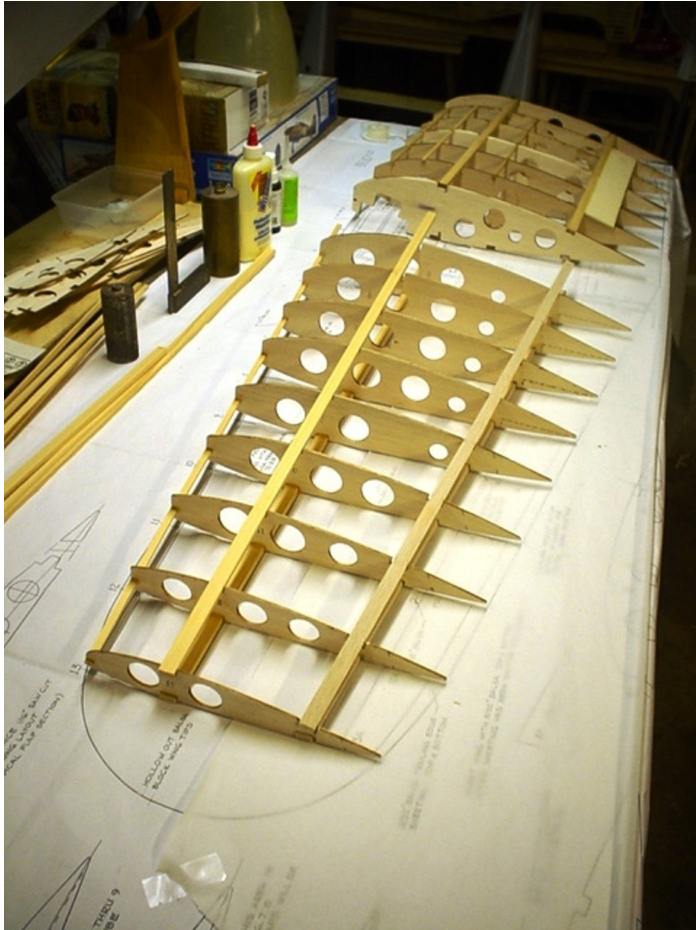
Spaces are left for the later fitting of dihedral braces at the main and auxiliary spars.



The wheel wells are not cut out at this stage and wont be until the port and starboard wings are fitted to the centre section.



The port and starboard wings are a straight forward build over the bottom main spar over the plans.



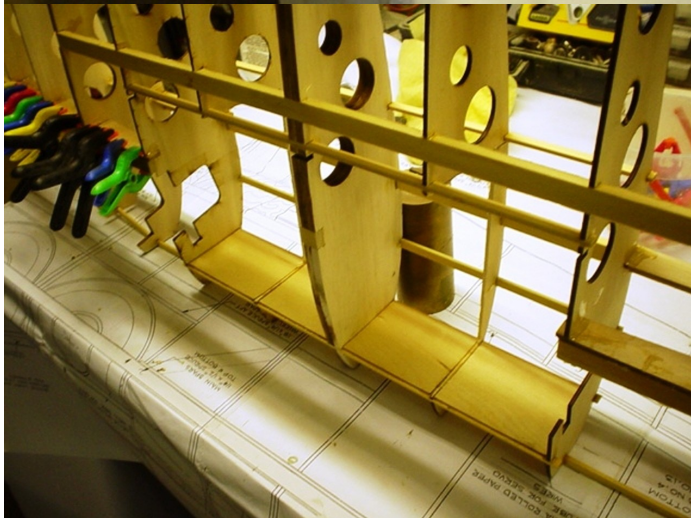
Framed up port wing and centre wing.



Joining the pieces.
The centre section is held down on the bench with weights and then the wing tips are raised for the required amount of dihedral. Plywood dihedral braces are inserted, top and bottom, alongside main and auxiliary spars and epoxied and clamped in place.



This is the completely framed and joined one piece wing, all 92" of it...



The next step is to cut away the ribs and spars that are where the wheel wells must go. Reinforcing must be added around this area to avoid a weak point in the wing. After the wing is sheeted I will lay up 2 x 2oz and 1 x 3/4oz fibreglass cloth over the complete area to further strengthen it.



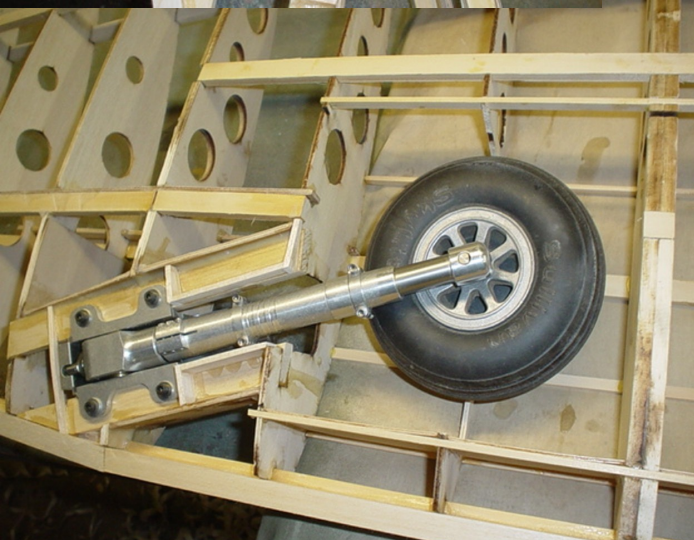
This is a photo of the completed wheel wells, note the aircraft ply both front and rear and the heavy offset spar terminated with diagonal bracing to the main spar.

Retract mounting rails are now fitted and the 1/2" thick leading edges are glued to the front of the ribs and the 1/8" x 1/4" hoop pine LE spar.



Retracts are temporarily fitted to ensure correct alignment.

A wheel is then fitted to retract to ensure clearance from wing sheeting and fore and aft alignment in the wells.



Full size looking from back of leg.



Full size in profile.



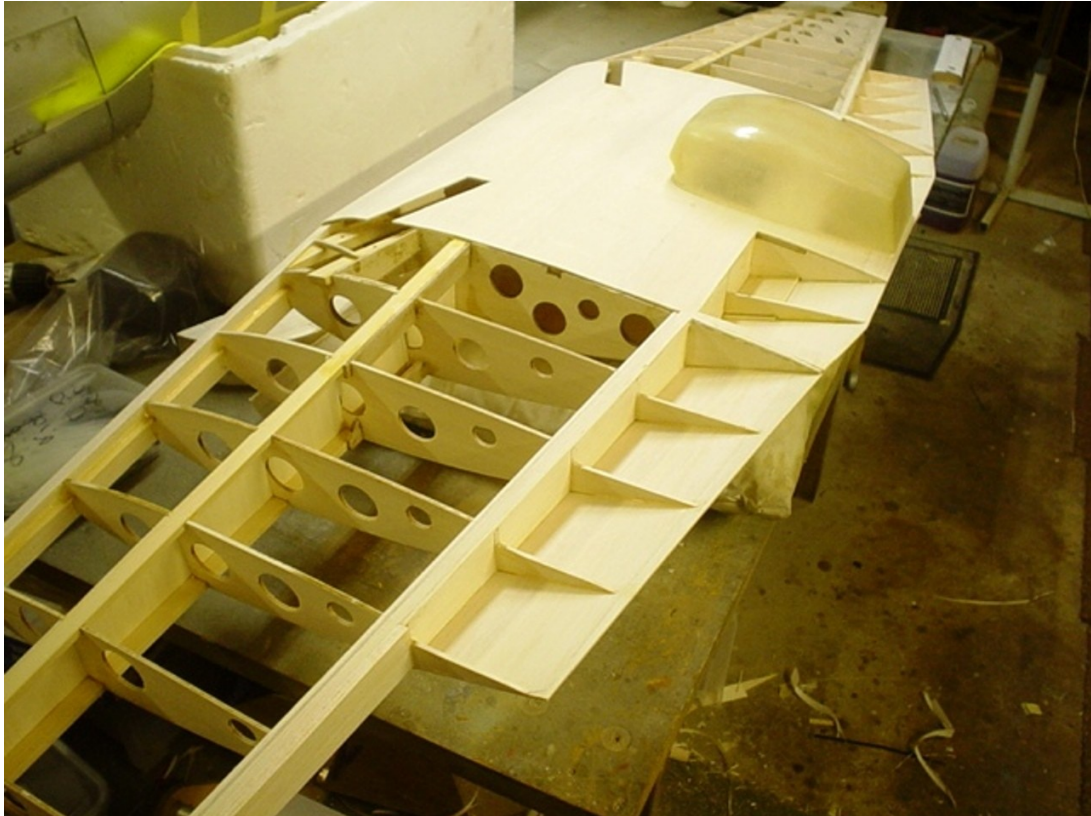
The next step is to sheet the top centre section of the wing.



Then sheet up to the rear spar on the underside of the port and starboard wings. This sheet and attached ribs will be cut away later to form outer flaps and ailerons.



The tail end of the ribs are cut off flush with the two rear spars. I use a blade from a razor saw with the stiffening back removed to do this. The flaps on the Hurricane are the split type i.e. The trailing edge splits to form the flap. To make these I have to divide all the ribs that form the flap down the middle and cut from the underside to the centre line to produce half a piece of wing from rear spar to TE.



The centre section underside is now sheathed as is the upper section over the flaps. Behind the two trailing edge spars is also sheathed in. Shearing webs have been glued between all the ribs and main spars.

From the above photo you can see the half section of the inner and outer flaps. The inner and outer flaps are hinged on different angles and required a flexible joint to operate on the full size. I am going to dodge that and use four servos, one for each

Features:

- Small size 1.65" x .865" x .375"
- Adjusts 3 servos, drives 4 servos
- Auxiliary power inputs
- Wide 4.0V to 7.25V operating range
- Less than 3.5mA current consumption
- Low weight 0.3 oz
- Universal connector with 10" pigtail
- Intuitive user interface
- Compatible with all radios, PCM & FM
- 1/4 microsecond sampling resolution
- 1/2 microsecond adjustment resolution
- 16-bit ultra-low power RISC processor

Uses:

- Servo matching on surfaces with multiple servo drive
- Split elevators
- Ailerons
- Separate rudder and steering servo drive



flap. It is important that all of these flaps come down at the same rate and finish at the same angle, to achieve this I will use the flap channel on my transmitter set to servo slow, 30secs, going to a clever little device called a Smart Fly Equaliser 3D. This little gadget drives four servos and allows you to adjust the centering and throws of three of the four, they are available from Desert Aircraft Australia shop.desertaircraft.com.au or Smart Fly USA www.smart-fly.com they cost about \$100 and are worth every cent, without this gadget I would have had to use four channels, three of which would be mixed to the master channel. I've only got nine channels on my transmitter.

That's about it for this instalment, we will continue building the wing in the next instalment.

Cheers Stan