

# Building and Flying a Vailly Aviation Hawker Hurricane....

## Instalment 13



### Flying:

The pictures below are typical of the delightful bits of history that come to the surface when you research and make scale aeroplanes. The two scanned images are the front and the back of a WWII Aircraft Recognition card. The writing on the back of this card reads "I have flown these & are wonderful to fly" written by **George Simpson**. **George Simpson** is the father of our club President **Col Simpson**.

I hope old George is right when it comes to flying one 1/5th the size of the one he flew 68 years ago!

"THE PROFICIENCY TEST" SERIES (THIRD CLASS). No.—17  
**THE HAWKER HURRICANE IIc.**  
**BRITISH FIGHTER.**

One 1,280 h.p. Rolls Royce Merlin XX motor. Fitted with four 20 m.m. Hispano Oerlikon cannon, the Hurricane IIc fires 2,400 rounds per minute. (600 lb. of explosive shell per min.) Hurricane IIb, fitted with 12-303 in. Browning machine guns (14,400 rounds per min.). Modified versions of the Hurricane I are being used as catapult fighters off merchant ships, and as fleet fighters off aircraft carriers. Variants of the Hurricane II include fighter bombers and night fighters. The world's most versatile fighter: there are over 100 different versions.

**Dimensions.**—Span, 40 ft.; length, 31 ft. 5 in.; height, 13 ft. 1 in.; wing area, 257.5 sq. ft.; aspect ratio, 6.21.

**Weight.**—Loaded, 7,550 lb.

**Performance.**—Max. speed, 334 m.p.h. at 21,000 ft.; range, 750 miles at 212 m.p.h.

*I have flown these & are wonderful to fly*

THESE DRAWINGS, REPRODUCED FROM "AIRCRAFT IDENTIFICATION," ARE THE COPYRIGHT OF "THE AEROPLANE."

**RECOGNITION POINTS.**—Straight tapered wings with rounded tips and rectangular centre section. Four projecting cannon. Humped fuselage. Rounded fin and rudder.

"AIRCRAFT RECOGNITION" CARDS. The Third-Class Proficiency Test Series. (Copyright.)  
Revised Edition VALENTINE & SONS LTD., DUNDEE AND LONDON. Printed in Gr. Britain.

After all the testing carried out in Instalment 12 I had a few snags to fix up before committing to flight. Nothing dramatic but back to the workshop to fix :-

1. Heat in exhaust pipe tunnel was softening the **Robart** retract tubing to the point that the pressure would blow it off the nipples or connectors.
2. Heat in wing area over radiator was affecting the **Smart Fly** equaliser and the travel of the flaps
3. Mechanical stop on the **Walbro** carby was set too high for idle revs.
4. Oleo leg covers were too long and were hitting the grass when the oleo legs were fully compressed going over bumps in the field.
5. Tail wheel steering was too sensitive.
6. Fuel was being sucked out of fill tube by venturi effect.

Snags 1 and 2 were fixed by fitting heat shielding panels and a box for the Smart Fly. All were covered with shiny aluminium ducting tape. Snag 3 was easy, 4 required cutting down the aluminium covers, 5 was fixed with a smaller servo arm and a simple plug stopped the fuel leak in snag 6..

A final balance check was done with dry tanks and retracts down and now I truly have run out of excuses.

I am on weather watch now.

I have asked a mate of mine to do the initial test flights. **Bob Flint** is one of the most capable and natural pilots I know and if he cant fly it I'm bloody sure I couldn't. Bob is a **QANTAS** Captain in his spare time so he's the man....

After talking to Bob we are looking for dead calm or a very light westerly, we want to take off down the slope to the sea and land up the slope to the hill, this will enable us to have a less steep approach angle than we could achieve if we were to fly in the normal sea breeze and land down the hill, shouldn't be too hard to get at this time of the year.

Before flying the Hurricane I have made up a check list and a test flight profile that I hope we will stick to amidst all the excitement. The idea is to provide a logical sequence of actions that will test the aircrafts stability and systems with the least possible risk before and during the flight.

#### Pre-flight Check List:

- Transmitter battery fully charged.
- Three onboard batteries fully charged.
- Retracts tanks at 120psi, no leaks.
- Fuel tank full with correct petrol mineral oil mix.
- Retracts cycle OK.
- Range check—Motor OFF.
- Range Check—Motor ON.
- Run up Motor—check peak RPM approx 6500 with current prop.
- Check all control surfaces for free and correct movement.
- Check Flaps, deployment and equal angles.

### Test Flight Profile:

- Taxi to end of runway—start transmitter timer.
- Take off—shallow climb—retract undercarriage.
- Two mistakes high over field and trim for hands off.
- Check pitch, roll and yaw sensitivity.
- Deploy flaps to first position.
- Check pitch coupling with flaps down.
- Check for coupled roll tendency (note direction of roll for flap angle adjustment)
- Deploy flaps to full down
- Check pitch coupling with flaps full down.
- Check for coupled roll tendency (note direction of roll for flap angle adjustment)
- Retract flaps.
- Two mistakes high—crack flaps to first switch position downwind—lower wheels—lower full flaps on final—simulate landing approach and flare—check for tip stall—speed and sink.
- Retract wheels and flaps.
- Overhead figure eights, low passes for camera and upward climbing roll .
- Land. Stop T/X timer.
- Check engine temp
- Check any sign of exhaust pipe burning fuselage internals, retract tubing or wiring.
- Check all fasteners for tightness.
- Check remaining air pressure in retract tanks.
- Check remaining fuel in tank. Estimate max flight duration and set Transmitter timer down counter..
- **Cheers and beers.....**



This is a full size Hurricane doing its thing in Seattle US.



## Test Flying Sunday 9th May 2010

Our last chance to fly the Hurricane before the Autumn Scale Day competition was Sunday 9th May. We wanted to check out the Hurricane's handling characteristics before the event and we also needed heavy model certification.



We were lucky and scored a near perfect day for test flying, bright sunshine with little to no wind.



All checks were done, air and fuel tanks were filled and it was time to fly. Bob taxied to the end of the field and accelerated down the hill for a beautiful take off towards the sea, a gentle turn gaining height demonstrated that this was a heavy model with not a helluva lot of reserve power as it was difficult to back off full throttle at all.



Trim was pretty good with only a couple of clicks of up elevator required. We then carried out our test flight profile successfully and I started to breathe again.



I took a turn of the transmitter when we were two mistakes high and did a couple of lazy horizontal figures of eight over the field, the model felt heavy in the climb but was rock solid in pitch and fairly sensitive in roll. I handed the transmitter back to Bob to prepare for landing. Bob had a couple of practice passes before cracking the flaps to the first position and lowering the wheels to bring her in. We intended to carry out a wheelie landing into the little wind we had and up the slope with a bit of throttle to keep the speed up. Bob set her up with a nice approach but when following the uphill profile of the field she slowed down and fell out of the sky, bounced twice and rolled on her back. Bit of a surprise but no big deal, a bit of Zap for the radio mast and she was ready for flight number 2.

The second flight was pretty much a repeat of the first but as we gained confidence in the handling of the Hurricane and the performance of the motor it was ShowTime, Bob did some magic low passes for the camera and finished off with a beautiful upward climbing roll. I was stoked..This is what scale modelling is all about, the more you risk the more you are rewarded.

To land this time we decided to have a go at down the slope, once again only using half flaps, we felt that full flaps was pitching her nose down too far and required too much elevator to compensate. We decided to use a bit more throttle to keep her flat which was going to make the landing a bit hot to put it mildly. Bob brought her around the end of the field in a beautiful curved approach and touched down opposite the pilot area in a perfect wheelie landing. She ran on a bit until her tail came down and stopped just before the long grass at the end of the field, fantastic!! Up flaps and taxi back to the pits, shut the motor down. We all had big silly grins on our faces, bloody beauty....





Post mortem was that we had a big, heavy aeroplane that flew nicely but needed a lot of concentration to land. The over-weight meant that she picked up a lot of speed if the nose was lowered so a shallow approach was the way to go. This is a bit difficult over the trees at the western end of the field but we considered it to be the better option rather than risking a stall when landing uphill from the eastern end.

### Sunday 16th May 2010

Autumn Scale Day dawned with another beautiful day with a light westerly blowing down the field and about 50 very nice model aircraft in the pits. The forecast was variable depending on who you listened to but increasing winds from the south was the consensus. I prepared the plane and we decided to fly earlier rather than later. The westerly was blowing just enough to mean that we had to land up the hill into the breeze which wasn't our preferred option but the wind strength was not hard enough to stop us taking off downwind down the hill.



Bob taxied her out to the very end of the new part of the field and slowly advanced the throttle for a lovely scale takeoff, wheels were retracted and show time again, lovely banked low passes

with zoom climbs, split esses, a roll or two and finish up with another upward climbing roll, all magic to watch with appropriate noises from the onlookers.





We only had to nail the landing for maximum scores. We had decided to touch down on the flattest part of the field to the left of the pilot area and let her run out of steam on the roll out up the hill. Bob set her up with another great approach, touched down and all looked good until she hit a bump, jumped up and flopped back down again with her tail in the air and no elevator deflection left to get the tail back down again, over she went on her back breaking the top of the fin and rudder so no more flying for us today....bugger!!! but if you have to be a spectator, Scale Day on a lovely Autumn day at WRCS isn't too hard to take.



The wash up of the day was that we were awarded third place in the Military Model over 7kg classification despite our very un-scale like somersault landing and we were voted joint winners of The Model of the Meeting. We might have scored a few sympathy votes there I reckon?

Another post mortem: The plane is nice to fly and looks sensational when buzzing the field with full speed low passes, the motor hasn't missed a beat and seems to be getting stronger with each run so its a keeper with a few mods. I have to get some weight out of the thing and now having to remove and fix the rudder and fin makes it easy to attack the tail end of the plane. The ratio of levers around the centre of gravity of the Hurricane is about 4: 1, that is the tail is about four times the length of the nose so if I can get 1lb out of the tail I can remove 4lbs from the lead ballast in the nose for a net weight loss of 5lbs, very desirable, watch this space for the ongoing saga.

Famous scale modeller Dave Platt once said "You never finish a scale model you just stop working on them" seems true enough....



## Hindsight is 20 20 vision:

Its always easy to be critical of a plane like this after completion. I like to look at the overall and pick out things I could have done better and will do better on the next project.

There are four major things that get up my nose with this Hurricane, one mechanical and three visual.

- Mechanical

Is the excessive weight in the rear of the aircraft causing the addition of lead ballast to get the required C of G. If I was to build this plane again I would substitute balsa for most of the pine stringers, lighten all of the ply formers aft of the C of G and make a lighter stabiliser, rudder and fin. I would replace the steel elevator joiner and substantial pine elevator pushrod with carbon tubing and have the lightest possible tail wheel assembly. My advice to anyone building a Vailly Hurricane is to have a set of digital scales next to your workbench, weigh everything and make an assessment on if you can lighten them somehow, keep a score of the weight you have saved..

- Visual

The wing to fuselage fit. No excuse for the lousy wing / fuselage fit, when I laid it up I had the incorrect wing incidence. When I fitted the wing correctly all the lumps and hollows were in a different position causing the gaps.

The incorrect shape of the wing fillets. The rear of the wing fillets are the wrong shape, The ones on the plan are more like P40 or Spitfire fillets rather than Hurricane fillets. I should have picked that up when I was making them, this exacerbated the lousy wing / fuze fit and caused the wing walkways to be smaller than they should be.

The beefy wing tips. If I had shaped the balsa wing tips to achieve the sharp edges of the full size it would have resulted in too sudden a taper at the end of the wing. This is caused by the depth of the wing tip ribs, still, I could have compromised better than I did.

A less important issue was with the decorating, I found out after I had painted the wheel wells to simulate zinc chromate that the wells weren't painted at all on the full size and I should have simulated natural aluminium.

Any way the thing was built for fun and was never meant to be a “**count the rivets**” type scale. I am happy to have made a nice model representative of the type even if it is a bit of a lead sled.

Big thanks to Bob for test flying and thanks Robert, Andrew and Peter for the pictures and thanks to you for staying with us for the last fifteen months. I hope the result of all of this is that somebody out there will now feel that scale modelling is rewarding, not a black art and will **have a bloody go!!!**

Cheers and beers

Stan