

Spartan returns to the air

New Zealand has a new oldest registration. **Bob McGarry** describes the rebuild of his 1929 Simmonds Spartan, one of the world's rarest airworthy biplanes.

The build time of 8,492 hours was spread over 8½ years, which didn't include the jigs and assembly fixtures. I had it firmly fixed in my mind that the project would take around 3,500 hours. Repairs of similarly constructed aeroplanes (Moth Minor, Fox Moth, Dominie) gave me the impression that the time was achievable. How wrong I was!

The construction was straightforward. The Spartan is of a simple stressed-skin plywood system with upright members to keep the ply from buckling. A new longeron was fitted under the doors and that side stressed and found to be +5, -3.5G at maximum all-up weight. The fuselage is built in a box, using 1/8in 6-ply on the forward fuselage and 2mm 3-ply on the aft section, with the turtle decking placed on top.

Working with wood gives rise to a continuous vacuuming of sawdust, and all of that dust is gold, with spruce being valued at around \$11,000 per cubic metre at the time.

The fabric work was very satisfying although a bit stressful, owing to the time of around 100 hours per wing. The tapes are of the faired variety which had to be hand cut and frayed. Settling the frayed edges down on the fabric tries the patience to the extreme. The attachment system was the Blue River (now Stewart Systems) water-based cement and filler coat with butyrate finish.

Painting the finished components was looking to be a problem due to humidity and temperature, being mid-winter. A portable plastic automotive shelter was assembled inside the warehouse and fitted with a dehumidifier, a heating system and exhaust fans. This idea worked perfectly.

All items were given around 12 coats of butyrate dope. There was a need to keep the fabric weave visible to make the machine look as original as possible, so no attempt was made to gloss the finish coats.

The most unforgiving and frustrating job was making the engine cowlings. In the end I made contact with Bruce Fraser and Glen Bernie for some expert help. It is a revelation to watch craftsmen metal bashers at work. I would have never treated aluminium so roughly, yet the results speak for themselves.

Mind you, the polishing was a bit of a chore. Ever gas welded alloys? Blue lenses do the trick.

The Civil Aviation Authority inspectors David Gill and Jeremy Cook did a brilliant job and also were able to locate the original files for the machine.

The test flying was carried out by John Goddard, an ex-TAIC accidents inspector. He knew just how the machine should perform

and just what could cause problems.

The day of the first flight dawned with flyable weather. The machine was prepared for flight (valve guides lubricated and rocker shafts greased as the rocker/valve gear is open to the elements you see) and refuelling carried out. Weight and balance checks and John strapped in. The engine caught first swing and ran up nicely.

The previous day had been taxi tests and a run down the runway to lift the tail. John mentioned that if taxi tests on the second day went OK, he may do a circuit or two.

And so it was. After being erected at Wigram in 1929 and now flyable 79 years later, she lifted off in about 75 yards and climbed away to do three circuits and then a greaser landing.

"She's not too bad really," was John's comment. Many photos were taken and the machine was put to bed in Wigram's number four hangar.

Test flying revealed heavy vibration running through the machine, which sensitive altimeters don't endure. The engine is bolted directly to the airframe and the instrument panel is a structural part, so there is no isolation of the instruments from the inherent vibrations. The old non-sensitive altimeter seems to be strong enough to take the punishment, although 20,000ft with 270deg rotation of the needle leaves a bit to be desired for accuracy in the circuit.

Test flying continued for 12 hours or so, averaging about 45 minutes per flight.

No major problems occurred, although there was the frustration of the engine having a rough running point at about 1950rpm. This was eventually traced to the auto carburettor heat system, and fitting a manually operated carb heat solved the problem.

The rigging had to be adjusted, and tightening the left-hand front wires half a turn and



Photographs: John King

right-hand loosened half a turn solved the tendency to fly port wing down a bit. A piece of rope on the rudder to trim out the rudder bar in cruise and some shifting about of the elevator trim springs had her in hands-off flight.

Being awarded the Smith's Tech Air Classic Cup at the Sport Aviation Association fly-in at Ashburton last month was a great occasion and a very welcome gesture.

My wife revealed to me after seeing the machine with the wings attached for the first time that up until then she had not been able to visualise the finished product but saw only a multitude of unidentifiable parts, and as time went on there just seemed to be more and more of them.

I do feel that I am lucky to be able to handle the hours of time spent and to look upon the achievements of any particular day as another rung up the ladder. An essential attribute for such a project.

It's been a very satisfying project. Would I do it again? That raises the question: Is my wife in earshot?!

Bob McGarry rebuilt the Spartan to fund his retirement, and it will be auctioned on 6 April. Much interest has been shown overseas, but he would like it to stay in New Zealand and hopes a local group can make a successful bid.

John Goddard shows off the lines of the Spartan over the Rakaia River mouth.



Left: Bob McGarry tops up the oil, a wet sump system on the upright Gipsy engine.

Above: Russell Brodie provides a comparison of the Spartan with its near-contemporary, the more familiar Tiger Moth.

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