

Test Flying Part 2 - Putting it in to Practice

In the last issue of *KiwiFlyer*, regular contributor Frank Parker wrote a general item on test flying, focusing on maintenance requirements. In this article he tells of recent experiences with a specific aircraft, the *Flug Werk FW 190* reproduction.



Gavin Conroy

The FW 190 is presented in the livery of Erich Rudorffer during operations in Finland in 1944. Rudorffer was one of the Luftwaffe's high scoring aces with 222 kills. See the June 2011 edition of *KiwiFlyer* for more information.

IN 2010 I was contacted with reference to my possible interest of test flying a Flugwerk FW 190 reproduction which was destined for Omaka, the aim of course to have the aircraft ready for the then upcoming Classic Fighters Airshow.

For me personally this was close to winning Lotto. I've had an affinity with these aircraft from schoolboy balsa model days. Prior to involvement with Kittyhawk CAG I had seriously considered constructing a replica from 'Jurca' plans - I figured a P&W 1830 from a DC-3 would do the trick! Alas, common sense prevailed.

I had followed the Flugwerk project over 10 or more years and was familiar as to how a number of these reproduction aircraft had been produced, faithful to the original design specifications, and how a number had flown in Europe and the USA. To have the privilege and opportunity to fly one myself was edging on fantasy.

From the outset this was a different project. The aircraft was not a rebuild of a known quantity such as a P-40 which rolls out of the shop exactly as they did in their thousands sixty years ago. It was an airframe built to the specifications of

60 years ago fitted with an engine (of about the same weight and power of the original) and fitted with a propeller (about the same as the original). There had been some problems with other flying examples, including one forced ditching because of a problem with the propeller pitch mechanism.

There was no one with recent experience to discuss the basics of this aircraft with, let alone any finer points. The closest advice I got was from a UK based friend who suggested I needed to wear a pointy hat! I think he had confused it with a helmet from the Kaiser's War.

The Omaka folk associated with the aircraft were most helpful in providing some Pilots Notes which had been through a translation program. This was interesting reading and although useful background information, many technical terms had

not translated correctly and so lost their context and meaning. A German speaking work colleague was able to assist and 'engine at the operating with only one magnet do not shake' became 'nil vibrations with single magneto'.

Meanwhile a test flying program was developed to submit to CAA. I based this on past Warbird flight testing (P-40 and Yak 3) that I had been associated with, the main goals being to prove the airframe/engine/propeller combination and then establish handling characteristics.

The aircraft was held up in transit so it became a challenge to ready it for the intended airshow. Nonetheless Jay McIntyre and co worked their magic and had RFR ready for flight a few days out.

My first impression of the aircraft was one of awe. While

not 'big' as in a P-47 Thunderbolt, it has an aggressive stance, not unlike the Corsair. The aircraft lacks the visual pedigree of the Spitfire or Mustang, but the big Russian Asch 82 engine exudes power and the aircraft has a real sense of purpose.

The cockpit is snug, apparently built around the average Luftwaffe pilot of 5 feet 10 inches. The seating is almost supine with legs at hip level to help overcome G effects. Systems wise, this aircraft is a departure from the American and British norms of hydraulics and pneumatics. It is all electric, a reflection on designer Kurt Tanks background as an electrical engineer.

After a thorough inspection and briefing with engineer Jay McIntyre it is time for taxi trials. Starting the engine is straight forward with an inertial starter, a hearty cough and plenty of exhaust smoke before it settles to a rumbling idle. After start checks are

Don't miss...

The first major display for this aircraft is planned for the Classic Fighters Omaka Airshow over Easter Weekend, 29 -31 March 2013.

The aircraft owner, Chariots of Fire Fighter Collection, is also producing a DVD with an in-depth review of the background, assembly and test flying of the aircraft.



to cycle the flaps, then engine checks and off for a taxi about the airfield. It is soon apparent that the brakes are on the weak side but sufficient for positive control and the long undercarriage is harsh, finding every airfield ripple.

After a couple of familiarisation taxi runs and simulated take-off runs up to 40 knots or so it's time to fly. There were a couple of unknowns, firstly the trim positions. The aircraft has a trimable horizontal stabiliser and fixed tabs on the rudder and aileron. With no better knowledge we decided to set these to neutral !! It also has a wide chord propeller and reasonably small rudder, so there was some thought on take off yaw.

With these in mind it's time to roll. I eased on the power smoothly, so far so good, bit more power, tail up, whoa we're off to the left with full right rudder. Time for some brake and ease off on the power. With the harsh undercarriage it all feels like a rally car on a dirt track and I won't forget that take off in a hurry!

After take-off, I select gear up, ease back on the power, establish a climb, and gather my thoughts. The first obvious problem is the trims - a bootfull of right rudder, a handful of left aileron and plenty of forward elevator force are required to maintain wings level. At least the elevator can be trimmed. There's no option but to put up with the other!

After the takeoff it was a relief to settle into a cruise over the airfield at 1500 feet and gather the senses. Instantly this aircraft was different to any other I had flown. The big Asch while the same as the Lavochkin seemed harsher and the control trim



An aggressive stance helps to create a very visual sense of purpose to the design.



The 14 cylinder Russian Shvetsov ASH-82 engine provides the Flug Werk FW 190 with 1850hp.



The cockpit still carries German language signage, so a good deal of study was required before flight.

being well out of whack was a challenge, as was my unfamiliarity with the cockpit. Well that's what I volunteered for, best get on with it. Overhead the airfield I set some basic power configurations to check controllability, then made an approach to the stall to gauge a reasonable approach configuration.

For the initial landing I headed to Woodbourne and its generous area of grass. Lined up for Grass 06, the first landing was acceptable if not pretty, the long undercarriage proving harsh but ground control positive. Time to gather one's thoughts and taxi back for a further circuit and landing, again successful. Now let's go and challenge Omaka.

The next surprise, after two reasonably non eventful circuits at Woodbourne was when overhead Omaka and the right main undercarriage hangs up. Now this is a bad look. After a little trouble-shooting, I get the gear down and make a reasonable landing. The problem was traced (in German – Irish – English translation) to a 'wiggly wire' in the undercarriage up lock.

The next two flights in the aircraft were generally confirmation of procedures and attention to the obvious 'snags' such as trims. Also evident was my nemesis, communications. The VHF radio had a squelch disable problem so it was full static full time which along with the ambient noise of the aircraft made any R/T communication with anyone a challenge.

On the fourth flight, I was just beginning to get a feel for the aircraft when during some manoeuvre checks an engine vibration developed. To an old helicopter pilot it was a definite medium frequency,

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about engine RPM. As I was in the early stages of test flying, Omaka was only a few minutes away for a precautionary landing. After technical evaluation it was found that the propeller needed to be removed and returned to the manufacturer in Germany for repair, so suffice to say we missed the airshow.

Subsequently we have completed 18 hours of flying on this aircraft. The only minor recurring problems are cracked exhaust stacks (the P-40 has a similar problem after 60 years).

The test flight program was concentrated on establishing stable operating parameters, temperatures, pressures, fuel consumption, expanding the flight envelope by increasing the airspeed five knots at a time, checking climb and glide performance and exploring the stalling regime - firstly 1 G straight and level, approach configuration, then onto 'manoeuvre' stalls, in steep turns under 2+ G. The aircraft has negligible pre-stall buffet and when it stalls it is quite sharp with a positive wing drop which is something to remember for aerobatics - it will bite! The next task is to expand the manoeuvre envelope, firstly easing up the airspeed, looking for any signs of control flutter then chandelles, and high wingovers, moving onto aileron rolls, loops, barrel rolls and half cubans.

The Focke Wulf is a different aircraft. It does not possess the classical handling of the P-40 or Spitfire nor the nimbleness of the Yak 3. Strangely I liken it to a helicopter with a neutral feel, i.e. once trimmed, that's it. From 180 – 550 k/hr (100 to 300 knots) there is no need for elevator trim and only a touch of rudder. The stick gets heavy with high speed but you don't have to fight it as the trim changes, indeed you use elevator trim once cleaned up after takeoff and use it again as the gear and flap goes down for landing. Nonetheless its performance is impressive and as you develop a feel for it those classic aerobatics are delightful.

This project has been a two year adventure with a few hiccups along the way. It has been an interesting experience getting to grips with this unique aircraft and discovering its character. While I have been the 'lucky' guy who gets to fly, the project has been a team effort. My thanks firstly to the owner who entrusted his aircraft to me, the support team from Classic Wings who facilitated the project and of course the engineering team, Jay McIntyre and his staff who have made it all happen.

Cheers, Frankly@xtra.co.nz

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