

Foxy Lady

Packing a powerful punch, this lightweight taildragger threatens to topple the Super Cub as short-field supremo and the glider tug of choice

Words *Dave Unwin* Photos *Keith Wilson*





As the rope goes taut I push the throttle open and the EuroFOX begins to move. When the throttle hits the stop there's the tiniest pause – then the turbocharger cuts in and the combination surges forward. Suddenly there's fifteen per cent more power than there was a second ago. There's an urgent shove in the back and (believe it or not) the sensation reminds me of the moment when a jet engine's afterburner lights, albeit scaled down considerably. The airspeed is building rapidly, and a glance in the mirror shows the glider is already airborne. This really is a tasty tow plane!

Over the years a surprisingly wide range of aircraft have been used as tugs, from Tiger Moths and Super Cubs to DC-3s and Stirling bombers, the incredible twin fuselage, five-engine He 111-Z1 and even a C-141 Starlifter! However, the most popular tow aircraft for many years have been Morane/Socata Rallyes, Robins, Piper Super Cubs and Pawnees – although a 'double whammy' of increasing fuel costs and spiralling maintenance bills (most of these airframes are at least thirty years old) has seen many gliding clubs examining the feasibility of using instead modern lightweight tugs powered by efficient, liquid-cooled engines.

Buckminster GC has been considering replacing its Robin DR400 Remorquer with an Aeropro EuroFOX for some time now, and as the club's Tug Master I have enjoyed evaluating several different variants over the past eighteen months, powered by carburetted Rotax 912ULS, injected 912iS and turbocharged 914UL engines, and in both nosewheel and tailwheel versions. The emphasis of this flight test is on the latest – and most powerful – iteration, the 914-powered taildragger, which is proving to be quite a little hot-rod.

The EuroFOX can actually trace its lineage as far back as 1983, when the Avid Flyer was first introduced. This morphed into the very successful Kitfox, which despite initially earning a somewhat unsatisfactory reputation (due to a combination of relaxed stability and considerable adverse yaw produced by excessive aileron drag) eventually became a very successful kitplane. The basic type has continued to evolve, and the EuroFOX, which is manufactured in kit form by Aeropro in Slovakia, is a much more sophisticated machine than its American ancestors, and is very different. In fact, EuroFOX UK's Roger Cornwell said that, "it's like comparing a 1980s Mini to this year's model. Everything but the wing fold ➔



914 TURBO



Oposite page, clockwise from top: while ZTUG's panel features mechanical flight instruments, builders can opt for a custom fit; the test aircraft came with toe brakes on the left, pilot in command position only – dual brakes are a £350 option; strangely-shaped Duc propeller and 'tundra' tyres are standard items; discs look like mountain bike items but are assuredly up to the job for the 308kg airframe; and well-shaped, fixed-position seats (any adjustment has to be made by varying the thickness of the squabs)

Right: Dave was also able to sample the EuroFOX in tricycle undercarriage form. Finished in red and powered by a 100hp Rotax 912iS, G-TTUG is fitted with the optional retractable tow cable system (listed at £3,500). From top to bottom: just the Tost rings are visible with the cable retracted; flaperons (combined flaps and ailerons) are operated by rods, visible bottom right in photo; drum for the optional retractable tow cable sits behind the seats; standard on all models, the wings can be folded once a section of the rear fuselage decking and the forward spar pins are removed; and, with wings folded, full advantage can be taken of limited hangar space, or the aircraft stored in a purpose-built trailer/hangar priced at £8,500



is different.” He and Adrian Lloyd had also brought an iS-powered nosedragger across to Saltby to complement the turbocharged taildragger, and having flown a few tows in this very nicely equipped aircraft I finally got my hands on G-ZTUG, which is (as Jeremy Clarkson would intonate) the only 914-powered EuroFOX... *in the World*.

I immediately like the look of 'Uniform Golf'. The tailwheel undercarriage really suits it, and the retro look is enhanced by the bright yellow paint scheme, which is strongly reminiscent of Piper's classic Cub. However, although it may have a vintage vibe, Uniform Golf is the very model of a modern machine. The turbocharged engine's horses are turned into thrust by a three-blade ground-adjustable Duc propeller, and its composite blades feature intriguing spoon-shaped tips. I don't fully comprehend the physics, as propellers are extremely complex devices, but it is my understanding that the unusually shaped tips reduce induced drag.

The engine is tightly cowled but the fibreglass cowlings can be removed quickly, making a full inspection of the engine and its ancillaries easy. Powerful LED landing and taxi lights are located in the lower cowling, just below the radiator





Above: Uniform Golf trails its tow rope as it turns away from the camera ship

air intake. The main undercarriage uses a cantilever GRP bow, and is fitted with fat 'Tundra' tyres and slotted disc brakes. The fuselage and tail feathers are made of TIG-welded steel tube, while the wings use all aluminium spars and ribs, although the Junkers-type flaperons (combined flaps and ailerons) are attached to a composite steel/aluminium tube.

The wings can be folded quickly and easily – a very useful feature when the club hangar is particularly cramped. Struts brace the wings and tailplane, and the whole structure is very nicely covered with Stits PolyFiber. Uniform Golf is fitted with a traditional Tost hook, although an electric cable retraction winch is an option. The pneumatic tailwheel is steered by the rudder pedals up to about 30° each way: beyond that it breaks out and free-casters. The port elevator carries a large trim tab.

Access to the cockpit is good. The top-hinged doors open wide and are supported by gas struts, but it is at this juncture that pilots converting to a EuroFOX from a Pawnee or Super Cub just need to remind themselves that the design philosophies between a 21st century 'lightweight' and a utility aircraft built in the 1950s are very different. Basically, the prototype Pawnee was almost certainly built first and then weighed, while the

components of modern lightweight machines are weighed first and *then* the aircraft is built. You do not, for example, slam the door and then use the rudder pedals to shove yourself back in the seat. If you do, things will soon start to break. This isn't meant as a criticism of the EuroFOX – it's just the way it is. If the rudder pedals, doors, etc weighed as much as a Pawnee's then it simply wouldn't work. The doors can be opened in flight at speeds up to 70kt, making DV panels superfluous. They are locked shut by a neat rotary catch at the bottom of the door which also actuates a cable operated latch pin at the rear. This would be better if it was at the front where the air loads are.

Wider cockpit than a C172's

With a maximum width of 1.21m, the cockpit is actually wider than a Cessna 172s, and the extensive glazing gives it a very airy feel. The baggage bay behind the seats can take up to 20kg. The seats and pedals don't adjust, so different sizes of pilot are catered for by changing the seat squabs. There are toe brakes for the left-seated PIC (a dual brake option is available, priced at £350) while levers for the flaps and trim are carried on a longitudinally mounted tube just forward

of, and between the seats. The knobs for flap and trim are different shapes, but strictly speaking the trim should be colour-coded green. The throttle is mounted centrally, adjacent to the very nicely located (but incorrectly coloured) cable release. There's another T-handle for the choke, mounted quite close to the cable release: it would be better if this were to be a different shape – or at least a lot smaller than the cable release. Below the two T-handles is the knob for the oil cooler flap. This is a great idea, as many Rotax installations are rather over-cooled and can take ages to warm up. Surprisingly, although thermostatic control is an option, in standard form operation is purely manual. Even the seventy-year-old P-51 Mustang has an *auto* setting for its cooling system (see 'Mustang Conversion', p.22 – Ed).

The fuel system consists of two aluminium wing tanks – important if you're planning on using mogas, which can attack composite materials these days – that feed into a six-litre polyethylene header tank. There's a fuel cock for each tank and a master shut-off under the left side of the panel. Personally, I'd leave both tanks *on* all the time, as they seem to cross-feed quite naturally. Quantity remaining is shown by sight-tubes in the wing roots, which are difficult to read at a glance. There should be clear scales behind the sight-tubes, and also

some sort of float within them. Excess fuel is returned to the left tank, and as soon as the header tank starts to empty, the 'Bingo' (low fuel) light illuminates. Although it may not sound like much when you're told there's only five litres of fuel left (the last litre is considered unusable), you could probably eke this out to as much as thirty minutes at the 'max conserve' power setting. Interestingly, our Remorquer also has a Bingo light – but it comes on at fifteen litres remaining!

The flight and engine instruments are all analogue, the ASI, VSI and altimeter being positioned directly in front of the pilot, along with the tachometer, manifold pressure and CHT gauges. There are also several

status indicator lights on the left side of the panel for the main and back-up fuel pumps, 'low fuel', 'charge control', and warnings from the TCU (turbo control unit). The GPS, transceiver and transponder are mounted in the centre of the panel, while the oil pressure and temperature, fuel pressure and voltmeter are on the right, along with the circuit breakers, most of the electrical switches and a very useful glove box.

Overall, it's quite nicely laid out, although my preference would be for all the annunciators to be in a single block and for the tachometer and MP gauge to be adjacent to each other. But, of course, the EuroFOX is a kitplane, and the customer can choose exactly the panel layout and instruments that they want. The panel also contains twin, guarded mag

switches and a key-operated rotary unit for the starter. Some people say that this is because you're supposed to crank the engine and *then* turn on the mags, but I would much rather have my other hand on the throttle. However, this arrangement does allow you to crank the engine prior to starting, which is probably helpful for sloshing the oil around a bit.

The 914 starts easily and runs smoothly, but I am soon reminded of what has to be the worst feature of any nine-series Rotax:

Initial acceleration and ground roll seem to be essentially the same as they would be in the 180hp Remorquer

those ridiculously powerful throttle bias springs. These are arranged to give full power should the throttle cable break, so unless you have the throttle friction wound tight, then the second you let go of the throttle that's what happens. Of course, like most of us I generally keep my hand on the throttle when I'm on the ground, but even briefly setting the flaps, adjusting the trim, or any other task, can have the engine accelerating alarmingly quickly. And when the friction is wound right down, you have no finesse. I absolutely detest it, don't understand Rotax's logic in making the springs so strong and was glad to hear that Aeropro offers both significantly softer springs and a Vernier throttle as options.

Anyway, as soon as the Ts & Ps are good I conclude the simple takeoff checks

and taxi into position in front of the waiting sailplane. The field of view over and each side of the nose is good, while the tailwheel steering and differential braking combine to allow precise directional control. The rear-view mirror is excellent. It provides a fine field of view and appears impervious to vibration – unlike some tugs I've flown! At the 'up slack' signal I roll slowly forward and turn on the backup fuel pump, then wait for the rope to go taut and the 'all-out' before

opening up to full power. Ambient conditions are an OAT of +4°C, which gives a density altitude of just below sea level, with a gentle crosswind from port. When taking off, Roger recommends setting half-flap and then

putting the flaps to zero as soon as the tug is airborne, but I'm not convinced. Although this may be a good tactic when taking off from grass (to reduce rolling resistance) we are operating from concrete so resistance isn't a factor. Indeed, there may be something to be said for the tug being on the ground a little bit longer, as with the heavier gliders the tug actually takes off first, which isn't ideal. I'm also doubtful about the virtues of re-configuring so close to the ground. Talking of heavy gliders, the EuroFOX is currently cleared to tow sailplanes up to 750kg (800kg approval is being sought for the 914UL) on a 300kg weak link.

The first glider is an ASK-21 and it is two-up, yet the initial acceleration and ground roll seem to me to be essentially the same as they would be if I were in the





Top: with such low mass and the power available, the EuroFOX tug gets airborne after a very short run...

above: ...and is soon climbing away, weathercocking into the crosswind, indicated by the sock in the background

Right: towing two-seaters is not a great problem – the aircraft is presently cleared for gliders up to 750kg

180hp Remorquer. The 914's extra power is really noticeable in the EuroFOX, and clubs based on short grass strips would do well to consider the Turbo model. Pulling away at 65kt gives broadly comparable climb performance and although the EuroFOX's field of view isn't quite as good as the Remorquer's, because the high-wing configuration inevitably creates a bit of a blind spot, all you have to do is raise the wing on the side you want to turn, before rolling into the

turn. Once established in the turn you can see into it, courtesy of the clear roof panel. Operating the engine is very simple, but not as easy as the injected iS version, as you do need to monitor the manifold pressure gauge and take care not to exceed the five-minute full power limit. Once the K-21 releases, I turn off the back-up fuel pump, smoothly but firmly close the throttle, trim forward and dive towards the

You do need to monitor the manifold pressure gauge and take care not to exceed the five-minute full power limit

airfield with the ASI's needle at 'the top of the green'. This is where the Rotax really scores as, being liquid-cooled, the cylinder-heads are in no danger of either being cooked in the climb or shocked in the

descent. Consequently the total time for the tow (from 'all-out' to touchdown) is broadly the same, although of course the EuroFOX not only burned less than half the fuel than the Remorquer would've consumed, but the fuel that it burned is almost fifty per cent cheaper. And it's not just about the money (although the costs of both maintenance and consumables are an order of magnitude lower too) it's also

about noise, and here there is almost no comparison – the EuroFOX is that quiet! It's also an easy machine to handle in the circuit, so long as pilots converting onto it from a Robin, Rallye or Piper remember

that it has considerably less inertia than these older, and heavier, machines. The Vfe is usefully high at 81kt, but full flap should be avoided unless you're trying to get into a really short field on a nil-wind



AVAILABLE ONLY AS A KIT

To avoid the 'costly and onerous' EASA permit system, the EuroFOX is sold in the UK only as a kit. The Light Aircraft Association requires builders to complete no less than 51 per cent of an aircraft, and under its 'Advanced' kit construction scheme, the EuroFOX builder visits the factory with the UK agents and, under supervision, covers the wings and fuselage. At the same time, the builder is able to observe how the AeroPro workers complete the ready to fly EuroFOX aircraft (useful for the builder when the Advanced kit arrives in the UK). The factory applies the paint to ensure the UK fleet has the same quality finish (a requirement of AeroPro, if reducing their product to kit form) and the kit is then shipped to the builder's home for finishing. It's a unique system, a consistent factory finish but in a kit.

Throughout the rest of the world, the EuroFOX is available factory built – only the UK requires a kit.

As well as being a neat little tug, the EuroFOX is also a capable tourer. Although cruise speeds in excess of 110kt are possible, around 95 seems to be a comfortable compromise, giving a claimed fuel burn of 14 lit/hr on the 914 engine and 11.2 lit/hr on the 912iS. →

day, because as soon as you close the throttle and flare, the speed bleeds away at (quite literally) a rate of knots! Conversely, when landing in a crosswind of any strength I think that 'flaps up' is the way to go, as this improves aileron authority. Fifty-five knots on final seems about right.

Having towed some heavy gliders, I try a lightweight machine. The K-8 likes a slow tow, but on some tugs the combination of high power and slow speed can create excessive engine temperatures. However, the liquid-cooled cylinder-heads and efficient oil cooler ensure that everything stays comfortably within limits.

Taildragger handles best

While descending from the various tows I try some steep turns and other manoeuvres in order to reacquaint myself with the general handling. As I've been flying the iS-powered 'nosedragger' this morning, this also gives me the chance to

compare the two types – with particular emphasis on the stability and control. As expected, the taildragger's directional stability is stronger, as there is less keel area in front of the centre of pressure. Interestingly, although the stall speeds are essentially the same, the nosedragger's elevator seems to have less authority at very slow speeds, possibly because the C of G is further forward. Both aircraft reluctantly stall at an IAS of about 38kt, and with no tendency to drop a wing. As mentioned earlier, the early-model Avid's and Kitfox's Achilles heel was excessive adverse yaw when the flaps were lowered, but the EuroFOX has a taller fin, longer fuselage (and consequently greater moment arm) and although the adverse yaw is still there – particularly when the flaps are lowered – correct use of the rudder is all that is required to keep the slip ball centred. Control around all three axes is very good, with the roll rate being particularly noteworthy.



SPECIFICATION

AEROPRO EUROFOX 914UL TURBO
 £51,450 (ADVANCED KIT)

■ DIMENSIONS

Length	5.66m
Height	2.25m
Wingspan	9.12/2.16m (folded)
Wing area	11.41sqm

■ WEIGHTS AND LOADINGS

Empty weight	308kg
Max AUW	560kg
Useful load	252kg
Wing loading	39.47kg/sq m
Power loading	6.53kg/kW
Fuel capacity	86 lit
Baggage capacity	20kg

■ PERFORMANCE

Vne	124kt
Economy cruise	95kt
Stall clean	42kt
Stall, landing flap	37kt
Climb	1,800fpm
Take off distance (over 50ft)	100m
Landing distance (over 50ft)	200m
Range	570nm

■ ENGINE AND PROPELLER

Rotax 914UL turbocharged liquid-cooled flat-four, producing 115hp (85.75kW) at 5,800rpm and driving a Duc three-blade ground-adjustable propeller

■ MANUFACTURER

Aeropro s.r.o
 Nitra-Janíkovce
 Slovakia

■ UK AGENT

EuroFOX Aviation Ltd:
 Tel: 07923 441269
 Email: eurofoxuk@btinternet.com
 Web: www.eurofoxuk.co.uk

The latter offers a range of over 700nm and the comfy seats, spacious cockpit and generous baggage bay make the EuroFOX a perfectly practical 'going places' machine. The typical useful load is 270kg, large enough to allow full 20kg baggage to be carried even two-up with full fuel. Finally, the sparkling STOL performance

GC's executive committee that we buy the iS-powered nosedragger.

Basically, as we have about 900 metres of tarmac runway and clear, unobstructed approaches at Saltby we simply don't need the extra power offered by the 914, while as we do often operate in a crosswind the inherent directional stability provided by

Sparkling STOL performance ensures that not only will you be able to get in, but you'll also be able to get back out!

ensures that whatever your destination, not only will you be able to get in, you'll also be able to get back out!

So, which one to choose?

Having reviewed the data and collated the pilot's impressions of the various gliders I towed, plus the experience of being towed in a Duo Discus (140kg heavier than the EuroFOX tug, but no problem for even the 100hp version), it was time to draw some conclusions. The data confirmed what I already knew: the Turbo logged the fastest tows, the iS and the Remorquer being about the same. While I enjoyed flying the Turbo taildragger (and it really is a hoot) you may be surprised to learn that I have actually recommended to the Buckminster

the nosewheel configuration means it's much easier to land. It will obviously struggle a bit with very heavy gliders – as does the Remorquer – while the faster speed required when towing these water-ballasted behemoths is also considerably greater than the EuroFOX's Vy. However, on most days, and for most gliders, the performance will be perfectly adequate. (At the same time, the extra power would certainly make the Turbo more attractive to clubs that operate from grass.)

The quiet engine—912 or 914 are equally good in this respect—will keep our neighbours happy and the greatly reduced towing costs should improve the members' collective demeanour! **■**