

NEW KID ON

The EuroFOX kit aircraft is either a microlight or SEP/SSEA aircraft with a max all-up weight of 560kg. John Marriott flew it as a glider tug at Bicester to see how it compares with 'conventional' tugs, while Phil King got the glider pilot's perspective during trials at Shobdon



T WAS a fine, calm morning at Bicester, but showers were forecast for that afternoon. EuroFOX Aviation's Roger Cornwell and Adrian Lloyd kindly flew the aircraft in for us to have a go. At first glance I wasn't convinced it would be up to glider towing in a club environment, but I think it's fair to say we were all later quite impressed by it and, after closer inspection, the machine actually looks quite rugged and certainly well finished.

After a brief and quick flight, I was sent solo. The aircraft was very easy to fly and quite docile with really great ground-handling qualities. Nosewheel steering works well and can be supplemented with differential braking to turn on a sixpence. The flying controls are extremely light. No ailerons, but flaperons are fitted – just like a Vulcan bomber! The climbing attitude is quite high so I lowered the flaperons using a simple, easy-to-operate centrally positioned control lever. This gave me a much better view ahead. This is not normally necessary when

glider towing as the nose attitude is much lower. Flaperons result in small trim changes, which are easily trimmed-out with another centrally located control lever. The all important general view out is good, but there is a small blindspot created by the high wing. This is similar to the Super Cub and necessitates a clearing wing raise before a turn. You can see into the turn when established in it by looking through the clear roof, also like some Super Cubs.

A very good rear view mirror is fitted – I'm pleased to report that it didn't suffer from any vibration problems, blurring the view of the glider. I liked the two big entrance doors on gas struts and the catches that hold them open and keep them closed.

The LAA magazine *Light Aviation* published a very good and comprehensive article on the EuroFOX in its November 2011 edition, so can I suggest that if you want loads of good info on general handling qualities you obtain a copy from our friends at the LAA? It's available on

THE BLOCK



Phil King in Shobdon's Twin Astir behind the EuroFOX (Ed Hicks)

the EuroFOX website as a download, so I'll keep this article aimed more at aerotowing gliders.

We had prepared a K-13, so dragged it out to the launchpoint. The wind had now picked up to about 12kts and the temperature was about 7°C. Dave Watt and passenger had the first go at being towed, promptly followed by Dave Bullock and passenger. Later, Derren Francis appeared from an airspace meeting at Oxford. He had a go at towing and took Dave Watt for a whizz around. I also took John Delafield and Dave Hook for a quick go.

Light wing loading makes the EuroFOX bounce around a bit. The glider pilots said it was more difficult to remain in station behind it, but it was a bumpy day. The EuroFOX itself was perfectly manageable. The benefit of the low wing loading resulted in tight turns to take advantage of thermals.

The EuroFOX stalled at below 40mph with two on board. The pilot's

notes quote 43mph at MUAW (max all-up weight). The EuroFOX minimum towing speed is about 53mph, making it extremely suitable for vintage type glider towing. Tow times to 2,000ft were similar to a Robin DR 400. The glider pilots went well out of position a number of times and induced a few bows in the rope with subsequent snatch. All resulted in no control problems for the EuroFOX. It descended better than I expected, in fact I had to apply some power approaching the circuit. The water-cooled engine is obviously a great advantage with respect to preventing the shock cooling associated with air-cooled engines. If you need to throw some height away, the machine side-slips easily. The landing was easy and the roll-out very short. From the ground, the aircraft appears less noisy than a "conventional" tug and from the cockpit it's certainly no noisier than other tug types.

Now this machine is not your answer to all glider towing requirements. Take-off and initial climb performance could be



BASIC INFORMATION ON KIT FOR AEROTOWING GLIDERS:

■ 560kg MAUW for SEP/SSEA version

■ 472.5kg MAUW microlight

■ 450kg MAUW microlight

■ Advanced kit equipped for towing operations ranges from about £40,000 plus VAT.

■ Kit contains everything to finish the aircraft to a flying condition and contains airframe, engine, basic instruments and paint.

■ A number of options are available, including strobe lights, back-up electric fuel pump, parachute recovery system, extra large tyres (could be useful on some fields) and more. Some of these extras would be very desirable on a glider tug for safety reasons.

■ The flying numbers vary depending on the variant so I will list the 560kg, 100hp version, which would be appropriate to glider towing:

Empty weight: 285-299kg

Fuel capacity: 86 ltrs

Stall speed: 43mph

Cruise speed: 110mph

VNE: 143mph

ROC at MUAW: 900fpm

Baggage weight: 20kg

Max wind: 28mph (Ground handling care required here as the machine is so light)

Crosswind limit: 17mph

Max flap extension: 93mph

Glide ratio: 9:1

Range: over 600 miles (statute)

Wingspan: 29ft 10in

Cockpit width: 44.1 in

Max width, wings folded: 7ft 10.5in

Length: 21ft

Main gear width: 7ft 2in



The EuroFOX can be equipped with a ballistic recovery system (Rosie Homer)

✂ a problem in certain circumstances, especially with Open Class ballasted gliders. The flight manual says the aircraft is certified to tow up to 750kg with a 300kg weak link fitted. However, in certain weight, altitude, temperature, slope wind and grass conditions, you would have to be very cautious. Your particular site could also have a bearing on these performance issues with slope, long grass and climb-out obstacles, etc. Having said that, I think it is capable of towing Standard Class types and typical club two-seaters in most conditions.

As I mentioned earlier, we towed a K-13 two-up from Bicester's grass strip with no problem at all. The grass was short, the temperature range was between 7-10°C and we had about 12kts headwind. If you want to tow a heavy ballasted glider, off grass, in calm conditions on a hot day, you might need to consider something more powerful.

For general touring, the EuroFOX can be well loaded. Full fuel, two pilots and some baggage appear to be within loading limits.

The EuroFOX is produced by Aeropro at a Slovakian factory a 45-minute drive from Bratislava. The design was first built in 1990 and based on the popular American "Avid", but is totally re-engineered. More than 350 have been produced, with more than 150,000 flying hours. There have been no reported fatalities or in-flight failures during this time.

The kit build is defined as "possible for the novice". There are standard and advanced build kit options. In the LAA advanced kit build assist programme, the builder spends a week at the factory covering the wings and fuselage under supervision. All covered surfaces are then factory-painted to a quality finish and the kit is then finished back in UK. The first builder reports a build time of 250 hours. Any club member can participate in the build under LAA rules. Factory spares are readily available. It is "Stitts Poly Fibre" fabric covered, so club repairs should be very easy.

There is a factory warranty of two years or 200 hours.

Engine

The engine is a Rotax 912 (80hp) or 912S (100hp) engine. Only the latter is suitable for glider towing, with a special glider towing cooling duct fitted.

Engine start was easy, carried out by key rotation after selecting two electronic magnetos on.

The engine "kicks in" after an eight-second built-in magneto check – I think this is

known as "soft start". Carburettor heat didn't appear to do anything, which is typical for Rotax-style carb heat, but I'm assured the Rotax engine isn't susceptible to carburettor icing anyway. Apparently some Rotax engines are fitted with a water jacket automatic carb heat, which would mean there's one fewer control to bother with and my understanding is this arrangement doesn't affect performance. The Rotax has been a proven light sport engine over the past 20 years or so, and is the choice for many aircraft manufacturers. As mentioned, it has the benefit of water-cooling, which is very useful in tugging and eliminates shock loading during the descent. There is a 115hp Rotax engine available, but there are questions about its reliability and servicing regime. I predict that higher power reliable Rotax engines won't be far away.

Propeller

The propeller is three-bladed, ground-adjustable "spoon-ended". The prop we used was towing-optimised, as suggested by the manufacturer. I saw an Apache helicopter recently that also had "spoon-ended" rotors. Apparently this makes the prop (or rotor blades) more efficient, reducing induced drag.

Robustness

The local gliding club on the EuroFOX base's airstrip has an aircraft that has been towing many types of gliders for more than seven years, achieving 2,000 hours and over 6,000 tows and its condition was described as "very good". However, I guess it was to their advantage to look after it! The EuroFOX has also been the regular tug for the Pribina Cup and European gliding championships for the past five years.

Furnishings

The seats are not adjustable so the aircraft can have two sets of seat cushions fitted – a thick set and, of course, a thin set. The two can, apparently, be used together. I'm 6ft 1in and found it quite comfortable.

The entrance doors open on a cute gas strut and I'm told the aircraft can be flown with them open up to 75mph. This could be good for aerial photography. Great on a hot day, but watch out for the swirling airflow relieving you of your map! I don't know if having the door or doors open for flight affects the performance much. They say having your windows open in your car increases fuel consumption.

Instrumentation

Instrumentation is basic and conventional, but that's all we want really. The ASI was in mph, but it is also available in knots. The limits published were also in mph (they can easily be converted to knots so we can comply with the limitations). We towed the K-13 at 73mph, which appeared to give the glider pilot a little over 60kts indicated. (You can fit a glass cockpit if you like, but I personally struggle to even turn this stuff on – and I fly glass cockpit for a living!)

Fuel

There are two wing fuel tanks feeding a header tank with a total capacity of 86lts. Useable fuel is 85lts. I found the fuel level in the sight tubes a little difficult to read, but this could be improved with a little modification of a marked card behind the tubes or something similar. Each tank has an on/off tap. It's probably best to leave both on for towing, as the fuel appears to cross balance – similar to a Cessna 150. There's a separate "master" fuel cock under the left side of the instrument panel. The additional and optional electric fuel pump is probably also best left on for towing to act as a "belt and braces" positive fuel pressure and reduce risk of vapour lock often associated with mogas use on hot days. I understand that Rotax engines are fitted with a bleed back from the fuel system back into the tank to help prevent vapour lock. The aircraft was fitted with a 4lt low fuel warning light as standard. Fuel tankering could, of course, easily be accomplished out of jerry cans. Rotax engines can equally be run on Avgas from the bowser if required, but with a slightly modified maintenance regime.

Taxiing

This was easy. No park brake, but that's something else less to go wrong. If you want a parking brake, it is available as an option. The tow brakes on pilot's side only were held on manually for engine start. Turning was excellent. Tundra tyres are available for those needing rough terrain (or airfield) capabilities. Good nose-wheel steering, with differential braking means the machine can be turned on a sixpence. The main and nose gear appeared simple and rugged. A tail wheel version is available, but the nose gear version we flew coped well. As the machine is very light, a tail gear version might be prone to tipping on its nose during ground operations in windy conditions.

The wings can be folded in 10 minutes,



leaving the aircraft little over the size of half an average trailer – great if you are pushed for hangar space, or want to trailer the machine.

Cost

The basic, fast-build kit is £37,450 plus VAT for the Rotax 100 HP version (nose or tail wheel), including basic instruments; everything you need to get airborne. I would guess you should add the inevitable few grand to see it completed and for sensible extras. It burns around 15lts of mogas an hour cruising at about 90kts. We worked out it was using between 2.5-3lts a tow to 2,000ft.

Conclusion

To summarise, the EuroFOX could considerably reduce club aerotowing costs, whilst offering a proven simple design. However, if you want to launch the Open Class, it might not be for you. I would certainly consider owning a EuroFOX, personally, or as a syndicate, as there is a lot of aircraft for your buck.

The real advantage in my view is its efficiency and the fact it can double-up as a tug and as a very efficient little tourer.

There are other similar types becoming available that can tow gliders. The BGA is reviewing much of this new equipment and hopes to have a report available in the spring. The EuroFOX certainly appears to be up there with the best of the best when it comes to modern relatively high efficiency and low-cost aircraft, ticking numerous benefit boxes.

■ Turn to p42 to read about the EuroFOX from a glider pilot's point of view.

The BGA is working with the LAA and the CAA for LAA permit to fly tugs to be approved for general club glider towing. The EuroFOX has full type approval, with the glider towing option. Banbury GC has placed an order and the factory demonstrator has been purchased by Highland GC www.eurofoxuk.co.uk (Photos by Rosie Homer)



John Marriott, 55, is BGA Chief Tuggie. He has 18,000 hours as a professional pilot, 3,000 hours in light aircraft and 1,000 hours in light aircraft and 1,000 hours gliding. An EASA light aircraft and motorglider instructor, John has an MSc in Air Safety Management. John is also the author of *Aerotowing Gliders*, available at £12.50 from www.bgashop.co.uk Proceeds go The Air League to encourage youngsters in gliding



Phil King, 63, started gliding at 16. In 2010, he and his wife Diana moved to live near Shobdon so that they could exploit the all-year-round soaring conditions found there. Phil instructs at Herefordshire GC and enjoys exploring the wave in the lee of the Welsh mountains and thermal soaring



Tests at Shobdon were carried out in an LS8 and Twin Astir (Ed Hicks)

ON EVERY LAUNCH, EVERY ASPECT (TAKE UP SLACK, GROUND RUN, TAKE-OFF, CLIMB, AND RELEASE) WAS COMPLETELY NORMAL WITHOUT ANY UNTOWARD INCIDENTS

VIEW FROM BEHIND THE EUROFOX

I'VE had aerotows behind most of the common types of tugs, as well as a few which are not so common now such as a Tiger Moth, *writes Phil King*. So I said yes at once when Adrian Lloyd asked whether I would be happy to take part in some aerotowing trials with a EuroFOX as the tug.

Adrian told me that the EuroFOX has been used for aerotowing abroad for several years and all I would be doing was to validate its capabilities for use in the UK. I'm not a tug pilot and don't have a PPL so Adrian would fly the tug and I would fly the glider. We did the trials at Shobdon, where we are both members of the gliding club.

The tug was already fitted with a Tost release hook in the tail and a rear view mirror. For these tests, Adrian fitted the EuroFOX with a fine pitch propeller, which should improve

the take off and climb performance at the expense of a lower cruising speed. We did all the tows off our normal grass runway. The surface was dry and the grass had been recently mown.

We used two gliders for the tests. The first was our own LS8-18, flown in 18m mode without any water ballast. The second was the club two-seater Twin Astir, flown solo and dual. Between tests the weather changed considerably. The first launches were with high ambient temperatures, calm conditions, and a light crosswind. Later launches were with a strong crosswind and strong turbulence.

On every launch, every aspect (take up slack, ground run, take-off, climb, and release) was completely normal without any untoward incidents. The performance (eg length of ground run and rate of climb)

appeared subjectively to be broadly similar to the performance of our club-owned Rallye 180T. The average rate of climb of the LS8 as measured by SeeYou analysis of the logger trace from "all out" to 2,000ft was 5.1kts with an elapsed time of 3 minutes 51 seconds. On one launch with the Twin Astir I performed two "boxing the slipstream" manoeuvres. This was completely normal.

On the later launches, when there was strong turbulence I had the subjective impression that the EuroFOX was thrown around by the turbulence more than a heavier aircraft would be. This was not a problem from the perspective of the glider pilot.

After the tests, I suggested the following modifications should be made to the EuroFOX:

- The release handle is coloured red. Glider pilots expect release handles to be coloured yellow. I'm not sure whether there is a standard colour for release handles in tugs; however there would be a significant human factors advantage in using the same colour code in tugs as in gliders.
- The almost pure black three-bladed fine pitch propeller on the EuroFOX was difficult to see when the engine was running. The Rotax engine makes less noise than a conventional aero engine and the noise was likened by bystanders to a sewing machine. One suggestion for improved safety would be to paint the propeller with a spiral pattern to make it more visible when it is rotating.

My feeling at the end of the tests is that the EuroFOX performs extremely well and, from the perspective of the glider pilot, presents no problems.

The EuroFOX will not be suitable for launching heavily ballasted Open Class gliders from short airfields; however, it appears to be an excellent option for less demanding aerotowing duties.