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PUSH TO TALK **TODAY'S PILOT**

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 Key Publishing Ltd,
 PO Box 100, Stamford,
 Lincolnshire, PE9 1XQ, UK.

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PO Box 100, Stamford, Lincs, PE9 1XQ, UK
 UK Tel: 01780 756131 Fax: 01780 757261
 Overseas Tel: +44 1780 756131
 Fax: +44 1780 757261
 E-Mail: todayspilot@keypublishing.com

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At this time of year opportunities to fly can be few and far between - so I always advocate grabbing every chance you can. Despite the somewhat inclement weather that has been prevailing of late, on the occasional good day I've managed to get in a little flying. I'm a firm

believer in making sure I stay current, and over the last few weeks I've managed a very small amount of glider towing with a Rallye, some upper air work in a Robin, a circuit session in a Super Cub and a very pleasant 'sleigh ride' in a K-21. I've always enjoyed variety in my flying - even before I became editor of *Today's Pilot* - as one of the great attractions of aviation is that you never stop learning. And a great way to learn, stay current and stretch yourself is to fly something you haven't flown before. Now, before some of you write in to complain about the cost, that different type doesn't have to be an expensive or exotic aircraft. One of the cheapest powered aircraft you can train on is the Slingsby T-61/Scheibe Motor Falke - and a session of 'circuits and bumps' with a sharp instructor will educate (and also possibly humiliate) even an experienced 'nosedragger' pilot. Motorgliders are also great for proving that an aircraft doesn't simply 'fall out of the sky' if the engine stops! Or why not get some tailwheel experience? Even getting checked out on a different type of nosedragger can be educational, particularly if it has a castoring nosewheel and is steered by differential braking. Don't let yourself get stale, or 'type bound' - instead, not only try various types of aeroplane, but also different types of aircraft. For example, I really enjoyed my autogyro adventures a few months ago. Experiencing new forms of aviation will not only sharpen your flying skills, but you'll also gain a better appreciation of other aviator's needs. Finally, it will also increase your technical knowledge - and this is very important.

During a recent conference on crew management held in London, delegates were told that "many airline pilots do not possess the technical knowledge base that their employers assume they have." Unfortunately the same lack of knowledge is also true of far too many GA pilots. Indeed, even the briefest trawl through a few general aviation internet forums soon reveals a level of ignorance that is positively scary. The reasons for these 'knowledge gaps' are probably numerous, but I can't help but think that too much emphasis on 'learning how to pass the exam' as opposed to 'understanding the question' may well be contributing.

I also think that over-regulation is just as detrimental to flight safety as a lack of technical knowledge. The reason I say this is that it seems to me that over-regulation has reduced activity within the GA sector, despite the fact there is no identifiable relationship between regulation and safety. Safety stems from knowledge and skill, not regulations.

Talking about regulations, I was gratified to note that the government has 'watered down' the requirements for people who work with children to register with a new agency and have a criminal record check (see November 2009's PTT). The Schools Secretary Ed Balls has accepted the recommendations of a review he ordered into the vetting and barring scheme, and the checks will now only apply to those working with the same children once a week. This is good news for air sports, as this ill-advised legislation could have had a very detrimental effect on model flying groups, gliding clubs and flying schools. Some observers have tried to make some political capital out of this, by claiming that the government has done a 'U-turn' but I would beg to differ. Every aviator knows that a well-timed 180 can be a crucial manoeuvre, while it was Confucius who observed that "the man who makes a mistake and doesn't rectify it is making another mistake". At least Ed didn't 'balls it up!' And on that cheerful note, I wish you all the very best for some great flying in 2010. Let's just hope the weather this year is better than the last!

Dave Unwin
 Editor



PUSH TO TALK

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High-wing Speedster



Jochen Ewald gets an early look at a promising ultralight and 'Euro-Light Sport Aircraft' built in Poland and assembled in Germany.

When I asked him for a date to fly his new aircraft, Juergen Ostermeier replied, "Well, it's still a bit early for a flight test, but you can come and try it if you want!" Juergen is CEO of new microlight manufacturer B.O.T Aircraft located at Oerlinghausen airfield in Germany. Since its maiden flight, the prototype Speed Cruiser had clocked up only 35 hours, and ground resonance tests had yet to be completed - so speed was still limited to 97kts instead of the design limit of 140 and, of course, some features were still in the process of being optimised. Nevertheless, I was keen to garner a first impression of

this interesting microlight, an elegant carbon fibre composite design with a cantilever high wing.

It was obvious that the prototype, D-MLIP was still in the final phase of fine-tuning. The lower half of the radiator was protruding from the cowling - its position had been optimised during previous flights, but moulding had not yet been modified to suit. Otherwise, the aircraft appeared to be constructed to a professional standard.

The Speed Cruiser has an interesting history; Juergen started out with the intention of being the German dealer for the SC07 Sky Cruiser,

manufactured by Bilsam in Poland. When the relationship with this supplier did not work out, Juergen and his colleagues, Thibaud Berimont, Erwin Bogger and Reiner Tauern decided to take things into their own hands. They founded their own enterprise, B.O.T, and purchased the rights for the SC07 design and proceeded to modify it to fulfil their - and the certifying authorities' - requirements. The idea was to find a reliable partner to build the aircraft, but this proved impossible and B.O.T ended up founding its own manufacturing plant in Poland to produce the main components. Final assembly, finish and fitting of any

Above Work in progress - Jochen test flew the aircraft before things like the cowl design were finalised.




optional/additional equipment is done B.O.T.'s workshop at Oerlinghausen. This hybrid manufacturing arrangement appears to work well; the prototype SC07 Speed Cruiser was displayed at Aero 2009 in Friedrichshafen this spring, and its maiden flight was made shortly afterwards.

While there are several similar high-wing ultralights on the market, the Speed Cruiser is very much at the top end of the range, being constructed mainly from carbon fibre composites and having a number of interesting design features that distinguish it from the opposition. The removable wings have a parallel-chord inner section and tapered outer panels. Their spar

"The Speed Cruiser is very much at the top end of the range"

extensions locate in boxes moulded in the fuselage, and two bolts secure each wing. The spars do not overlap, which makes rigging very straightforward, as the aircraft will stand safely with one wing in position.

The fuselage is of the 'widebody' type, with two large, upward-opening doors that reach down to seat level. This makes it simple to get in and out, and suitable for disabled people. The stick's neutral position is tilted a bit forwards, making entry even easier. However, 



Right Frise ailerons reduce adverse yaw, and the rudder and elevator are properly balanced.



there are a couple of things I disliked. To check the engine properly, a lot of small screws had to be undone before the cowling could be removed - I would prefer Camloc fasteners, even if there is a lid in the cowling to check oil and cooling water between flights. I also found there was no way to verify the fuel level in the fuselage tank against the electric instrument indication in the cockpit - a simple transparent hose besides the tank would fix this shortcoming. (I understand these

issues are likely to be addressed for serial production.)

Although the labels were missing, I liked the layout of the cockpit, its 1.23m width and the ergonomic placement of controls and switches. The design of the fuel cock is particularly clever: when it is in the closed position, the lever covers the starter button, making it impossible to start the engine with the fuel turned off. The panel offers a lot of space for 'luxury' instrumentation (as far as this is possible given the

limited payload of ultralights). Behind the seats, there is a large baggage compartment, partly occupied by the Junkers Lightspeed ballistic recovery system. The area of cabin roof above the BRS pack is made from a material specially developed for this purpose; foam, covered with a resin-paper laminate. This panel is stiff enough to keep its shape in flight, but breaks into small pieces without sharp corners when the BRS rocket hits it - so neither the parachute nor its lines will

Below The absence of lift struts makes for very smooth lines.





be damaged when they are dragged out of the pack.

Gerd Dahmann, the pilot who is carrying out the certification test flying for B.O.T., was my companion for the flight. It is easy to get settled in the cockpit; the seat shells can be rotated into the most comfortable position around their front end by adjusting the belts underneath, and, after undoing a bolt, each of the rudder pedals can be separately adjusted. Almost anybody would be able to find a suitable seating position, there is room enough even for very large people and everything is placed sensibly and within reach.

While starting the engine, I appreciated the combined throttle/wheelbrake lever, which originates from the MT-03 autogyro and makes both functions available with one hand. The brake can also be set for parking,

Taxying towards the runway, I found the nosewheel responded nicely to my rudder inputs and the aircraft could be swung in a tight radius. The Beringer wheelbrakes held securely, even against full power.

When it was weighed for certification, including BRS and basic instruments,

"The Speed Cruiser is 'designed for the future'"

the aircraft scaled 292.5kg. With the additional gear installed for flight testing and the newly fitted, but not yet activated Junkers hydraulically adjustable propeller (set up temporarily as per the standard, fixed-pitch prop), its empty weight had risen to 315kg,

With Gerd and me aboard we hit the maximum permitted take-off weight in the ultralight category with only 20 litres of fuel aboard, and suffered a slightly nose-heavy C of G position. Full use of the 87-litre fuselage tank would, as it is with most of today's European ultralights and British microlights, only be possible when flying solo. However, the Speed Cruiser is 'designed for the future' - stressed for the maximum take-off weight of 600kg allowed by the upcoming E-LSA category. It would offer excellent payload when certified under E-LSA.


For take-off, I set the electrically driven slotted flaps to 20°. To do this, I had to refer to a scale fixed to the flaps - the planned LED indication in the cockpit not yet being installed. It might seem that 20° is a lot of flap for take-off, but Gerd assures me

Above Those small windows behind the doors offer a very useful over-the-shoulder view, when you are in the circuit.



Left Access to the prototype's engine is not as easy as our tester, Jochen would like. However, he rated the nosewheel steering and brakes highly.



 The neat and relatively large panel - and clever touches like a selector that blocks off the ignition when the fuel is off.

that the shortest ground run and best initial climb angle are to be had at flap settings between 20 and 30°. With the stick held back, I pushed the throttle forwards, to be rewarded with excellent acceleration. The nosewheel was soon off the ground, a light rudder

deflection to the right being required to compensate for the torque of the Rotax 912S. The ground run is very short, and after take-off, I accelerated to 60kts and retracted the flaps in stages, first to 10° and then to 0° at 65kts. In both positions, I measured a climb rate of

1,080ft/min - excellent for a 472.5kg aircraft with what is effectively a fixed-pitch propeller.

In flight, I found the spring trim to be ineffective: even with it fully back, I had to maintain a back pressure on the stick at all speeds up to our temporary maximum, and looking back through the rear window I could see the elevator was deflected upwards. (B.O.T tells me this has since been fixed by increasing the difference between the angle of incidence of the wing and the tailplane, and the aircraft is now said to be trimmable throughout its speed range.)

For a high-wing aircraft, visibility from the cockpit is very good, the Perspex roof and large windows in the doors giving a wide field of view. Although the elegant windscreen is raked back at a very flat angle, the grey-painted panel cover does not cause disturbing reflections. The windows either side of the baggage compartment are very helpful in the circuit, allowing one to keep an eye on the airfield and judge one's position. The fresh air intakes - adjustable 'bubbles' in the door windows - also work well.





Left: Visibility through that raked-back windscreen, set at a shallow angle to minimise drag, is surprisingly good.



Control forces are comfortably low, the aircraft reacting directly to any input. I found there was a degree of friction in the control system, but again, this has since been sorted out. The forward-cranked stick works to advantage when flying through gusts, where there is no tendency for the weight of one's hand to pull the stick back and increase G-forces - very sensible. Artificially limited to 97kts as

"The maximum speed in gusty weather is 108kts"

we were, it was of course not possible to test the maximum cruising speed. However, given the ease with which we reached the limit at part throttle, I would say that the advertised 113kts cruise for the Speed Cruiser with fixed-pitch propeller appears realistic, and gives credence to the 132kts cruise claimed for the aircraft when fitted with a VP prop. The maximum speed in gusty weather is 108kts, permitting fast cruising even in rough

weather conditions.

The fixed fin area is relatively small and the rudder surface is quite large. Although the aircraft was stable and would fly straight with hands and feet off the controls, it was sensitive to the smallest inadvertent rudder input and tended to yaw from side to side when flying through gusts. B.O.T. plans to either increase the fin surface or to add a small fin below the fuselage, to reduce these tendencies.

The Speed Cruiser gives plenty of notice as it nears the stall. Power on and flaps up, the controls start feeling mushy at an indicated 43kts, and after light buffeting and a very clear increase of the angle of attack, it starts wallowing noticeably at 40 - 41kts. Further back pressure on the stick results in a wing drop, which stops immediately upon applying opposite rudder and easing the stick forwards. The behaviour remained the same with progressive stages of flap, 15°, 30° and 42° (full flap), the indicated stall speed falling by 2 - 3kts at each step. Power-off stall speeds were about 4kts higher, with a tendency for the nose to nod downwards as the aircraft

B.O.T SC07 SPEED CRUISER

▲ DIMENSIONS

LENGTH	6.65m	21ft 9.8in
HEIGHT	2.10m	6ft 10.6in
WING SPAN	8.1m	26ft 7in
WING AREA	10.03m ²	108 sq ft

▲ WEIGHTS AND LOADINGS

EMPTY WEIGHT	290kg	639lb (including BRS)
MAX AUW	472.5kg	1042lb
USEFUL LOAD	182.5kg	403lb
WING LOADING	47.1kg/m ²	9.65lb/sq ft
POWER LOADING	6.4kg/kW	10.4lb/hp
FUEL CAPACITY	87lit	19 imp gal

▲ PERFORMANCE

VNE	140kts	260km/h
CRUISE	116kts	215km/h (FP prop)
STALL	34.5kts	64km/h
CLIMB RATE	1,240ft/min	6.2m/s

▲ ENGINE

Rotax 912 ULS, liquid-cooled flat-four, producing 100hp (74kW)

▲ PROPELLER

Junkers Profly two-blade carbon fibre composite fixed-pitch propeller (optional hydraulic VP propeller)

▲ MANUFACTURER

B.O.T. Aircraft GmbH
Robert-Kronfeld-Strasse 2, 33813 Oerlinghausen, Germany
Phone: +49-5202-9247241 E-mail: info@bot-aircraft.com
Web: www.bot-aircraft.com



Above Not quite perfect... Production aircraft will be fitted with enlarged vertical surfaces, to dampen the yaw response and improve stability.

wallowed, no doubt due to absence of propeller wash over the tailplane. (This characteristic may have changed, now that the angle of incidence of the tailplane has been altered.) While I would have said the stalling characteristics are fine, Ostermeier still wants to reduce the tendency to drop a wing. He thinks that the installation of winglets - and maybe a bit of washout at the aileron tips - should deliver some improvement.

The control harmony was excellent, and even in slow flight the very effective Frise ailerons minimised adverse yaw. Shortly before my flight, the aileron and flap slots had been optimised, and this resulted in an extremely high roll rate. At 65kts, I managed a 45°-45° bank change in only 1.6 seconds! I would say that an aerobatic roll capability of this kind is really a bit too much for the average pilot. Indeed, it is possible to stall the down-going aileron and induce a flick roll by an abrupt input of opposite

control. For serial production, the maximum aileron deflection will be limited and, together with the planned winglets, this should endow the Speed Cruiser with roll behaviour that can be handled by everybody.

The large slotted flaps permit steep approaches and I barely needed the full 42° flaps. Sideslipping also was

"Fun and easy to fly... excellent performance"

perfectly straightforward: like most high-winged aircraft, the Speed Cruiser wants to lift its nose when slipping. I found a sensible approach speed with 30 or 42° flaps was between 51 and 54kts, and even in gusty crosswind (like you find it usually at Oerlinghausen with its forest along the runway) the aircraft remained always under perfect control. While

holding off, speed decreased quickly with none of the tendency to float that you often experience when flying a low-wing aircraft even the slightest bit too fast on the approach, and the Speed Cruiser touched softly down on its well damped carbon fibre main undercarriage. I was able to hold the nosewheel up until the speed dropped to a very low level, which is useful both to protect it from wearing out prematurely and to get a degree of aerodynamic braking.

Although the final tuning was still to be done when I flew the SCO7 Speed Cruiser, I think it has the potential to become a very interesting competitor in the E-LSA category as well as being a good ultralight/microlight. It is fun and easy to fly, and offers a very good view - by high-wing standards - from the roomy cockpit. It also offers excellent performance and good safety reserves, both in terms of limiting speed and control authority, when flying in turbulent air.

