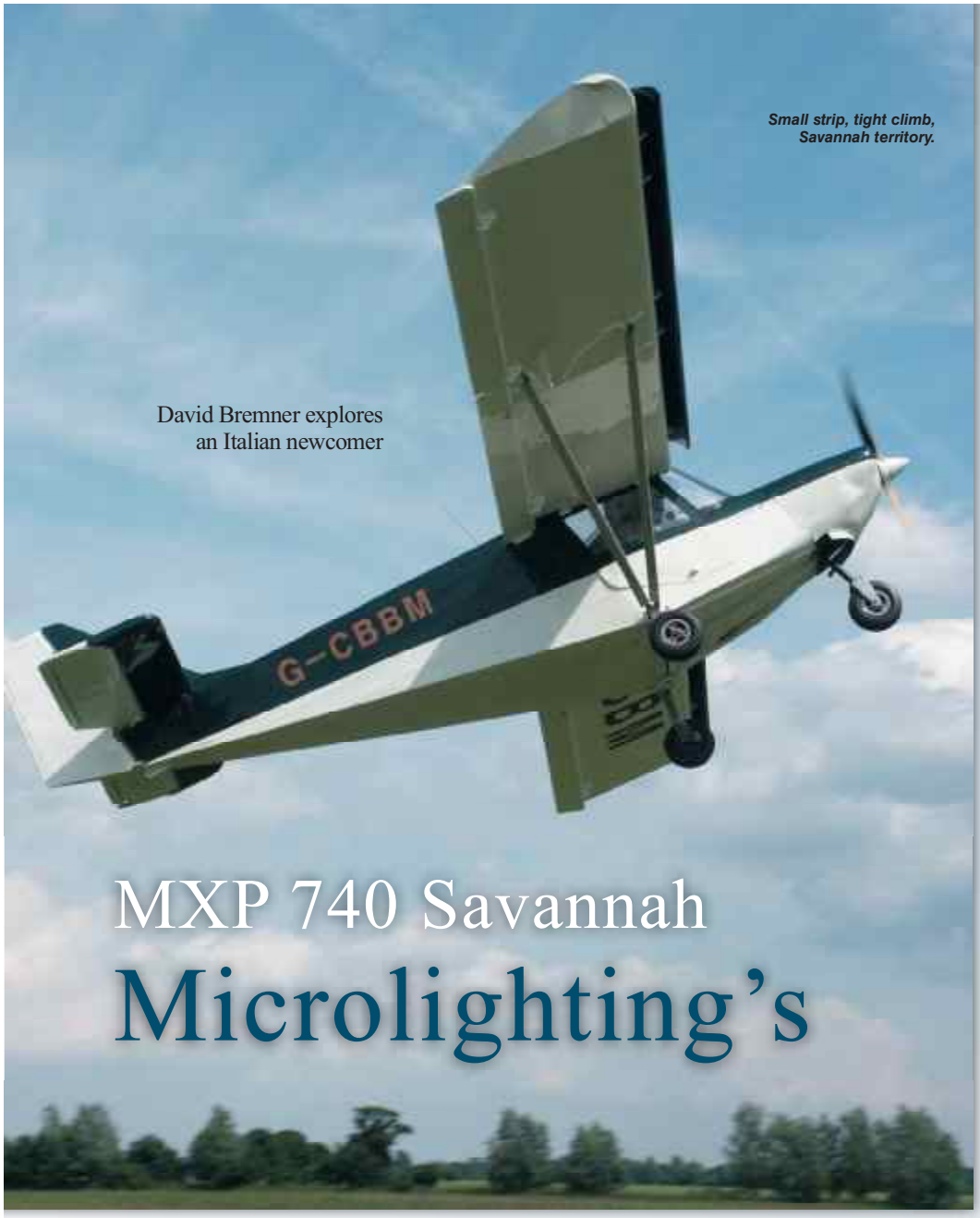


Small strip, tight climb, Savannah territory.

David Bremner explores an Italian newcomer

MXP 740 Savannah

Microlighting's Land

Combination flaperons mechanism

Jamming cleat can be seen on back of stick. Plenty of room for instruments.

View down the tail boom: all metal means just that.

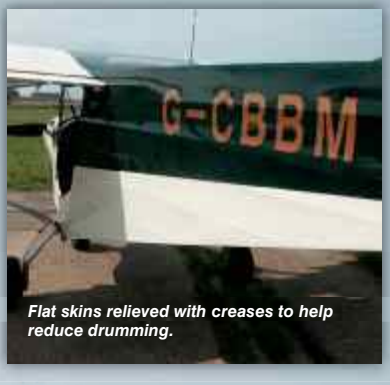
Y-shaped stick is clever.

Small zipped-off luggage compartment behind seats.

Undercarriage well able to take punishment.

Serious STOL capability.

Not a hotship, but certainly quick enough to go places.



Flat skins relieved with creases to help reduce drumming.

Very stable and great fun!

Vis only average.

Rover

When you're trying to choose between flying flexwing or fixed-wing, one of the factors that may have influenced you was the ability of flexwings to get in and out of very short, rough strips. Generally speaking, fixed-wing aircraft go faster and are more comfortable, but need a slightly more civilised strip to operate from.

Well, here's a fixed-wing aircraft that doesn't recognise those limitations. The name Savannah implies wide-open spaces, but in practice it needs no more than 100m of space to operate from — and yet still cruises at 75-80mph!

Chris Heintz designs the Zenair range of light aircraft. They are very popular throughout the world, and I suppose he must feel some sort of wry pride at the fact that his designs must be more copied than anyone else's. The Savannah shares its angular functional lines with his Zenair CH701, with leading-edge slots on the deep-chord wings and all-aluminium construction.

However it's slightly smaller overall, has a fixed fin and the elevator doesn't have the inverted aerofoil section. The rest of it is pretty similar, however, and the result is a tough hauler that looks ideally suited to UK flying conditions — short, rough fields and wet, cold weather. Time to check it out!

We turned up at Sandtoft in uncharacteristically warm weather, where we met Steve Whittaker and Pete Wilson, aka Sandtoft Ultralight Partnership, who are importing the Savannah from Italian manufacturer ICP, based near Turin. The company manufactures brake parts for the automotive industry and also, thanks to the passion of its owner, ultralight aircraft. The factory utilises CNC manufacturing techniques, enabling high quality at reduced cost, and the resultant kits require the minimum of time to assemble — all the rivet holes come drilled and de-burred.

The Savannah is certified as an ultralight aircraft in Italy, France, Germany, Israel, Norway, Slovakia, Belgium, Holland and Luxembourg, with more than 400 factory-manufactured aircraft and kits produced.

Steve's a straight-talking Yorkshireman who's accustomed to calling a spade a spade, and is refreshingly down to earth about the pluses and minuses of his new toy. Pete is cast in the same mould, though his language is slightly more diplomatic. Since he's the lighter of the two, he generally gets to do the demonstration flying!

When they took on the rôle of importer more than two years ago, they can't have had any idea how drawn-out a process it would be. For them, it was simply a question of acting as go-between from manufacturer to BMAA, and ending up with the aircraft they wanted to own. But instead, they've had to broker some significant changes to the design of the aircraft to meet UK requirements, and it's only now that they are able to offer the kit for sale with a full permit to fly.

At the core of the problem was longitudinal stability. Broadly speaking, it's regarded as a *good thing* if the more you pull (or push) the stick from the trim position, (a) the faster (or slower) the aircraft goes, and (b) the larger the forces are. The Savannah was fine at doing the first, but there weren't enough centring forces, and a low-hours pilot could accidentally apply lots of up or down stick without realising it. BMAA test pilot Tim Cripps spent a long time getting the figures for all this, and helping to devise a simple get-around that didn't involve too much modification.

The simple fix may not look too elegant,

but it works and, since it involves a length of bungee and a jamming cleat, Thruster owners will feel right at home!

Anyway, finally the modifications were sorted out, so now we can go and fly.

First Look

Sandtoft is an ex-military base, with part of the perimeter track doing service as a runway long enough for a polka-dotted Jet Provost to use (just!). The atmosphere is relaxed and friendly, and after the obligatory cup of tea we went down to the hangar. The Savannah is tricked out in a very dignified green and cream livery which suits it very well.

The look is sturdy and purposeful, with every surface apart from the engine cowling either flat or of simple curvature. The nose and cabin are conventional and unexceptional; it has a boxy empennage with uncompromising flat sides and chunky tail surfaces, and the wings are — how shall we say it politely? — short and fat, with fussy leading edge slots attached to the front. Sexy? No. Practical? Certainly looks it.

Under the bonnet (which has only three screw-lock fasteners per side) is a Jabiru 2200 engine of 80hp, chosen because of its 13.5kg weight advantage over the Rotax 912. There's enough space to get at most things without too much trouble, but removing the lower half of the cowling is very simple, and then there's really no excuse!

The cowlings are of composite construction, as are the ends of all the flying surfaces; everything else is metal, and most of that is aluminium.

The fuselage surfaces are all flat, with creases in the skins to improve rigidity and reduce drumming, at which they are partially successful. The stressed skin is stiffened by a few internal frames in the rear fuselage, but if one is suspicious about the rigidity of the structure, you only have to yank on one side of the tailplane to convince yourself of its efficacy.

The tail surfaces are of conventional lay out and all-aluminium cantilever construction. The tailplane tip fairing neatly houses the elevator tip, and an all-new anti-servo tab is built into the trailing edges of each tailplane half. This had been intended to replace the bungee trim, but proved insufficiently effective at all combinations of power and flap, so the bungee and internal balance spring system has had to be retained for the moment.

There is an enormous inspection hatch in the underside of the rear fuselage, allowing good access to most of the inside of the rear fuselage, and the aileron / flap linkage.

The undercarriage looks very sturdy. The nosewheel has telescopic bungee suspension and a no-nonsense fork which looks capable of taking considerable punishment. The main wheels are mounted on stocky aluminium legs which sit on rubber blocks, allowing fore-and-aft movement, and again look as if they will withstand the attentions of even the most ham-fisted driver, in the roughest of cow pastures. The propeller clearance didn't look huge, but if the nosewheel suspension can't go too far, it may be fine. Time will tell.

The twin-strutted high wings are all-aluminium again and of unusually thick section, with the characteristic leading edge slot which is (according to Steve and Pete) the most difficult bit to make, but was to prove its worth spectacularly later on. What look like separate flaps and ailerons are in fact combination flaperons, with inboard and outboard sections set at significantly different angles, in order to provide washout.

The operating mechanism mounted on the rear of the bulkhead behind the seats is surprisingly large, but certainly works well. Removing the wings is possible, but impractical for normal stowage. On the other hand, the all-metal construction should make it possible to keep it outside without significant deterioration, unlike composite or fabric-covered types.

Twin fuel tanks are mounted in the wings, both feeding into a small central header tank in the fuselage. There are advantages to wing tanks; it makes more space in the fuselage, they can be mounted on the CG and they limit the bending load applied to the wings. The downside is that they are difficult to fill, and (since they are inevitably very shallow) it's difficult to measure the contents accurately. The total usable contents of the Savannah are a very useful 77 litres, however, and since they are both permanently connected to the header tank, there's no need to remember to switch tanks.

The cabin is easy to get into. A combination of wing struts fixed behind the entrance and top-hinged doors with gas struts, make it easy to sit on the seat, although you have to be a bit careful not to catch the floor-mounted flap lever as you swing your feet in.

Time to Go

Without further ado, Pete invited me into the left-hand seat. Once I'd negotiated the unusual flap lever, which is floor-mounted between your legs, the seating position is very comfortable, and although neither seats nor pedals are adjustable, both Pete (5ft 6in) and I (6ft 3in) were equally comfortable. The central stick has a Y-shaped top which, although unusual, is (in my opinion) a very good system. It keeps the seating position clear of clutter, reduces the cost and weight of the control system and still allows dual control — so important for instruction.

Floor-mounted rudder pedals are coupled to the nosewheel and fitted (in the left seat only) with toe-operated hydraulic brakes. There are dual fascia-mounted push-pull throttles, and (again in the left seat only) a large flap lever between your legs. It's an unusual arrangement, and not particularly instinctive. To operate, you have to pull the handle up out of a detent and move it forward for flaps on, back for flaps off. ICP has recognised the shortcomings of this system and is looking at alternatives.

Mounted on the back of the stick is the jamming cleat for the bungee trimmer required by the UK approval. It might look a bit basic, but in flight it proved generally simple to operate and very effective.

There's a good-sized panel, enabling a spacious instrument fit.

The seats slope back considerably, giving a secure feel, and the four-point harnesses are well-positioned, easy to fasten and easy to adjust. Behind you is a small parcel shelf, with a small zipped-off baggage compartment behind, just about big enough for a very small tent and sleeping bags.

From outside, the cabin looks pretty small, but I found that it wasn't particularly cramped inside. There was enough elbow room for the two of us, and plenty of head and knee room. The view outside is adequate, but will inevitably feel a bit restricted to flexwing pilots, or anyone who's flown the Foxbat. Looking ahead on the ground is fine, as is the view sideways — even for a beanstalk like me. The flat windows mean that the view backwards and downwards is a little limited, and the skylight in the roof is welcome, but not as good as, say, the Rans.

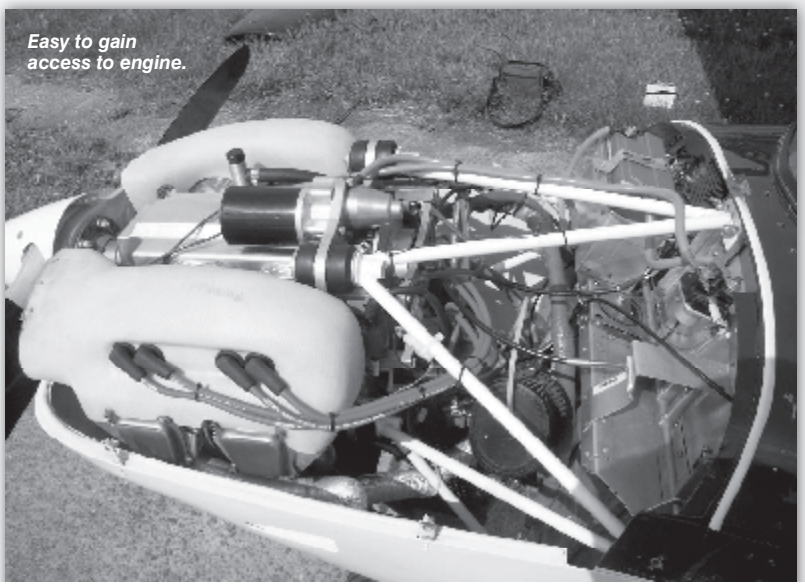
Chocks Away

Once we were all strapped in, checks complete, it was time to start up. Master switch on, choke out, throttle shut, and mags on; turn the key, and we were away. There's a tendency for all-metal airframes to reverberate, but the Savannah wasn't at all bad. The brakes were good enough to hold us against full power, and taxiing was a breeze, with a tiny turning circle and short wings.

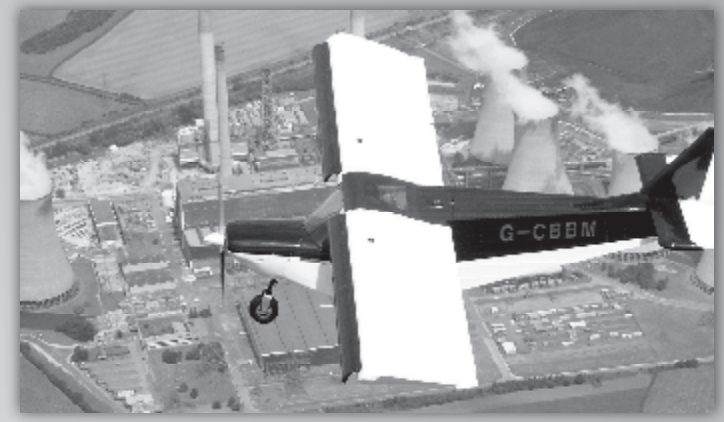
Pete recommended one stage of flaps for take-off, so we lined up on Sandtoft's tarmac and opened the taps.

The acceleration was brisk and we leapt into the air, Pete exhorting me to haul it off even quicker. We climbed out and popped it down in a nearby grass field to play without disturbance. Here, after a couple of goes to get the hang of it, I was confident of getting it in and out of a 100m field with adequate hedge clearance with flaps down, in hot, calm conditions and with two up.

Flaps up, the ground roll was probably more near the 100m mark, but either way, this is definitely a *short* field machine; the official figures don't seem to do it justice. Moreover, the degree of control at all speeds was instantly confidence-boosting. I felt instantly



Easy to gain access to engine.



at home doing low-level circuits and operating in and out of small fields.

As a mark of confidence, I stood 100m from the hedge with a camera, while Pete took off straight at me. As the photographs show, there was a massive safety margin.

We took to the air again, this time to explore the upper air handling. Rate of climb, hot and heavy, was around 700ft/min, with the engine turning at 2900rpm and 43mph showing on the ASI. That's more than adequate, and bear in mind that it was a very hot day, so you could expect better performance under standard conditions.

We settled into the cruise. On Pete's recommendation, this was at 2500rpm, which (on this propeller) gave 60mph indicated. 'Only 60mph?', I hear you mutter. But this is a very pessimistic ASI, and since it's been properly calibrated there's a conversion chart which shows that it's actually doing a much more healthy 68mph. In fact, for only a tweak more power, you can get 63mph indicated, which is a very healthy 75mph calibrated. Time to have a look round and take in the view.

The aircraft sits a little nose-high. The top of the cowling sits just about on the horizon (and I'm above average height), giving an adequate view ahead, but I've seen better. The view sideways and downwards is good, as you'd expect for this type of aircraft, and the roof window, while better than nothing, is fairly small, so that you can only see into the turn once you've cranked up a fairly tight turn. There are plenty of worse aircraft in this respect, and overall, I would say it scores 7/10 in this area.

Pitch stability is good (as you'd expect, after all that work!), and the pitch forces increase progressively with out-of trim. The bungee trim is also good, and it's possible to set it to within a few mph. Stick free, there is little tendency for the speed to wander (the 'phugoid' mode, when the aircraft sets up a switchback motion, trading height for speed and vice versa), making for relaxing flying in the cruise.

In calm conditions you can take your hands of the controls to refold the map or eat a sandwich without the speed diverging significantly from trim.

I then tried the effect of power on trim, and more power tended to make the speed drop, which is on the safe side. Yaw stability is also good — if you put in a bootful of rudder and let go, it will return to the straight and narrow. One of the major factors here is the friction in the rudder circuit, which can be dramatically affected by any friction in the nosewheel bushes. ICP is looking at modifying the nosewheel suspension to improve things further.

In roll, the short span and large ailerons give a very positive response, 90° of roll taking 3-4s. There was little roll inertia either; basically the Savannah stops wherever you put it. We weren't able to verify fuel consumption figures at this visit, but Pete assured me that the two of them had averaged 12 l/h on the trip down to Sandown the previous month, which (speaking as a two-stroke driver) I can only dream about.

How Fast will it Go, Mister?

Throttle to the firewall, the ASI crept round to 82mph in level flight (90mph calibrated), with the Jabiru doing 3000rpm. Experts will know that the Jabiru is rated at maximum power at 3300rpm, so it might be possible to squeeze a little more if you really wanted to, but this seemed a comfortable compromise to me. At this speed, and indeed all the way up to V_{ne} at 126mph, the Savannah behaved with perfect decorum, and no sign of vibration, unusual control forces or changes in stability.

And so to the Savannah's party trick, slow speed flying. Everybody who reads the newspapers knows that a stall in an aircraft is extremely dangerous, and often fatal, and while most microlights are well-behaved in this respect, there are high-performance machines for which high degrees of concentration are required to avoid a stall becoming a spin.

The first stall we tried was with flaps up and no power. At 35mph, there was unmistakeable buffet. At 30mph, the stick was hard against the stop, the window ledge was at 30° to the horizon, and we sat, with all the controls functional and a steady rate of descent. Letting the stick forward allowed a gentle return to more conventional flight. At □

TECHNICAL DATA

ICP Mxp740 (Savannah) J1

MANUFACTURER

ICP srl, Via Torino 12, Fraz Gallareto, I-14020 Pio-via' Massaia (AT), Italy; tel +39 0141 996503; fax +39 0141 996506; <info@icp.it>; <www.icp.it>.

IMPORTER

Sandtoft Ultralight Partnership, Low Lodge, Main Street, West Haddlesey, North Yorkshire YO8 8QA; tel 01757 229565; mob (Steve) 07876 507688, (Pete) 07980 359915; fax 01757 229225; <info@sandtoft-ultralights.co.uk>; <www.sandtoft-ultralights.co.uk>.

SUMMARY

Side-by-side two-seat high-wing monoplane with conventional three-axis control. Wings have unswept leading and trailing edges, constant chord; conventional tail. Pitch control by elevator on tail; yaw control by fin-mounted rudder; roll control by combination flaperons. Wing braced by struts; wing profile NACA 650-18; 100% double-surface. Undercarriage has three wheels in tricycle formation; single-piece Dural full-width sprung undercarriage on mainwheels and bungee telescoping suspension on nosewheel. Push-right go-right steering connected to aerodynamic controls. Brakes on mainwheels. All aluminium alloy (Dural 6061 T6) construction with plastic wing tips. Engine mounted below wing height, driving tractor propeller.

EXTERNAL DIMENSIONS & AREAS

Length overall 6.4m. Height overall 2.4m. Wing span 9.0m. Constant chord 1.41m. Dihedral 0°. Sweepback 0°. Main wing area 12.7m². Aspect ratio 6.4/1. Wheel track 1.50m. Wheelbase 1.50m. Main wheels dia overall 38cm. Nosewheel dia overall 38cm.

POWER PLANT

Jabiru 2200 engine, air-cooled, direct drive. Max power 80hp at 3300rpm. GT 2-blade propeller, 1.57m diameter x 0.98m pitch. Power per unit area 6.30hp/m². Fuel capacity 77 litre.

WEIGHTS & LOADINGS

Empty weight 255kg. Max take-off weight 450kg. Payload 195kg. Max wing loading 35.4/m². Max power loading 5.63kg/hp. Load factors +4, -2 recommended, +6, -3 ultimate.

PERFORMANCE*

Max level speed 90mph. Never exceed speed 125mph. Economic cruising speed 75mph. Stall speed 33mph. Max climb rate at sea level 740ft/min. Min sink rate 300ft/min at 50mph. Best glide ratio with power off 7.5/1 at 55mph. Take-off distance to clear 15m obstacle 198m. Landing distance to clear 15m obstacle 140m. Service ceiling 12,000ft. Range at average cruising speed 450 miles. Noise level N/A.

**** Under the following test conditions***

Airfield altitude corrected for ISA ft. Other conditions N/A.

PRICE INCLUDING VAT

£18,500 as tested, with specification as above, but excluding paint.

Airframe-only kits £9500 (to build airframe with fuel tanks and undercarriage), or £12,000 (to include everything except propeller and engine).

NA = Not available

Figures above are manufacturer's/importer's data

Figures in text are tester's experience.

Pete's encouragement, we moved on to the same thing, but with power on.

This time, the nose came further and further back, until finally we were sat with nothing showing on the ASI, and the aircraft sitting at no less than 45° to the horizon. It was a weird sensation. Our weight was being taken largely by the backs of our seats, the controls (at least for small movements) were fully functional, and one's mind could only boggle at the contortions being performed by the air as it entered those leading edge slots — the angle through which it was being turned didn't bear thinking about!

We didn't stop at this attitude for long — no-one was quite sure about the oil-feed situation with all the oil at the back of the sump — but it certainly proved that stalling the Savannah accidentally is pretty unlikely! Incidentally, I'm told that with full flaps and full power, she goes to a vertigo-inducing 80° before doing a conventional stall break!

Trials showed that it was virtually impossible to induce a spin in any but the most extreme conditions, and that letting go the controls returned it to a spiral dive instantly. All in all, if you want to go pottering about at low level in and out of tiny fields, you won't find a better machine than the Savannah.

On our way back to Sandtoft, we tried the flaps again. The handle does take some getting used to, and I would want to get some practice in at high level before using it in anger. I also felt that it was easy to apply accidental side loads to the handle, and it didn't seem particularly substantial in that regard. Nonetheless, it functions correctly, and the very positive detents hold it very securely in whichever position you choose. When you put the flaps down, the nose tends to rise, which needs to be anticipated on a go-around.

With the throttle closed, a 400ft/min sink rate was indicated at 45mph. VSIs are not always accurate, but it's an admirably low figure. Sideslips are a good alternative to use of flaps and the Savannah slips like a good'un — it's also a good way of checking the runway clear on finals by improving the forward view.

The landing approach is very straightforward — flaps half down on downwind, with full flaps being applied on finals and the speed reduced to 45mph. The view is good, control is excellent, and I found it easy enough to judge the flare for a reasonably civilised arrival. During test flying, Tim Cripps demonstrated a 12m landing roll (in a strong breeze) and a successful landing in a 32kt crosswind! Basically, it's a breeze, suitable for low-hours pilots, but capable of remarkable STOL performance.

Summing Up

Considering the very small market (about 4000 members of the BMAA) there is an astonishing choice of hardware available. To simplify things, let's assume that you've already made your choice between flexwing and three-axis.

Generally speaking, the second-hand prices for two-seaters start at something over £10,000. If you've decided you want a new one, you have very rapidly to decide if you want to build it first. If you don't, your choice is limited to the Thruster in a variety of guises ranging from about £16,500 to over £22,000, the Jabiru at about £30,000 and the Pegasus CT at more like £45,000, with the Eurostar recently approved for factory build at £41,000.

The range of build-your-own is wider, with the number of options positively bewildering, so that price comparisons are very difficult. You also need to bear in mid the ease of building; some kits are more prefabricated than others.

As a general rule, most of the kits available are pretty straightforward, with much, if not all of the cutting and drilling done. Nevertheless, if you're doing it for the first time, it will *always* take longer than you thought.

Two-seat kits start with the X'Air (around £10,000 for the most basic), moving on up the price range to the Sky Ranger, followed by the Easy Raider, Rans S6, and then a wide range of super-microlights such as the Ikarus, Tecnam Echo, Jabiru kit, Zenairs, Foxbat, Eurostar kit, and the esoteric Banbi, right up to about £35,000.

Biggest seller over the past year has been the Sky Ranger, and it's clear that short field performance coupled with 75-80mph cruise is a popular format. Look out for the Escapade from Easy Raider, too; flight testing is virtually complete, and it has an extremely practical wing fold (although building will involve fabric-covering).

The Savannah fits squarely into that bracket, and will compete pretty much head-on both in terms of price, performance, handling and space. The main advantage of the Savannah at first glance is the ability to be stored outside, due to its all-metal construction.

And finally

I liked the Savannah a lot. It's an honest machine, with no bad habits. It will be excellent for popping in and out of tiny fields and throwing around a bit, but still has long enough legs to be a comfortable touring machine, with the direct-drive Jabiru engine up front quietly chugging away. Its performance and price are in the most popular market segment, and at the time of writing no fewer than six kits were on their way to clients. It deserves to do well. MF