The Sherwood Ranger LW

The Ranger is not just a 'pretty' biplane: it performs like a group 'A' aeroplane, it's good fun to fly and it doesn't drain the wallet. Is it the microlight to dispel its classification prejudices? Miles McCallum reports

The big problem for anyone who flies purely for fun is the expense of getting into the air. Coughing up something like £80 an hour to whizz around in the wild blue with no particular place to go takes quite a lot of the gloss off, leaving many pilots to question whether it's really worth it. Some shrug their shoulders, and laugh off an hour in the air as the '£100 cup of coffee', and others simply give up.

Buying your own aircraft – if it's a certified, factory built example – won't really make any difference to the ultimate operating costs; by the time you have forked out for tie down or hangarage, maintenance, recertification and fuel, the chances are that it will have cost you more at the end of the year than just hiring one when you have the urge – or the means.

Going the homebuilt route is a way out... sometimes. The problem there, apart from a year or five stuck in a workshop (and not in the air) is that weight and performance bear a direct relationship to the ultimate cost. Simple: reduce the weight, accept lower performance standards, and things become more affordable. If you take the argument to its logical conclusions, we are talking a microlight. The trouble is, that generally means tighter weather criteria: you can't fly if the wind is up above 15 kt, and every gust or thermal gives you a good jolt. If you are into control and handling, the sort that puts a smile on your face, you're unlikely to end up with something that responds like a Europa, or a Slingsby, or even a Grumman. Flying something that feels like the stick is attached to the controls with frayed elastic with the responses of a dead cat is no fun – so why bother?

People do, of course, on the basis that flying is at least flying, but for many the choice is either a 'proper' aeroplane, one that feels solid in a bit of weather – with all its attendant costs – or nothing. The reality of the situation, however, is that the dividing line between microlights and heavier aircraft is becoming increasingly blurred. You can still pigeonhole them purely on the basis of weight, speeds or whatever, but the truth of the matter is that modern microlights do perform and they can be good fun – especially if you consider feel and handling to be at the top of the requirements list. Ah well, another prejudice bites the dust!

For more ideas and information on cutting the cost of your flying turn to page 24

The microlight for all pilots

Russ Light's Sherwood Ranger LW is an aeroplane that we have been watching for a couple of years now, monitoring progress and waiting for a chance to evaluate it. I have to confess that the desire to fly it was partly based on the fact that it is a very pretty biplane with classic lines (I'm a sucker for anything with two wings) and partly because he promised that a heavier, faster, aerobatic version would follow. Never mind that – flying the LW microlight version is a knock out. This is a real pilot's aeroplane,

and any theoretical disadvantages – rapid progress excepted – accruing from its classification just didn't enter the frame.

The majority of the kit is manufactured 'in house', obviating quality control problems, and follows current very

The Ranger displays all the features of a classic British 30's biplane fighter

light aircraft tube, wood and fabric practices. The fuselage is largely made from aluminium tubing riveted together with gusset plates or machined fittings. All the metalwork thicker than 0.064mm (0.016") is precut, drilled, and formed where necessary, the rest being drilled and marked out ready for cutting using tinsnips or a bandsaw. Some critical areas are bonded as well, using a structural adhesive as a belt and braces backup. This is estimated to weigh 30% less than an equivalent steel tube fuselage. All tubes are precut and drilled with pilot holes so any damaged components can be easily replaced with off the shelf items. The tail surfaces are made in much the same way as the fuselage structure.

The first kitbuilder, Dan Nelson, reports that the entire fuselage framework can be assembled using clecos (temporary fasteners) in around six hours, and it is effectively self jigging. The pilot holes are drilled to size and either bolted or riveted using 'cherry' (aircraft quality) pop rivets. The turtledeck and sides are fleshed out with ply formers and spruce stringers, and the cockpit top and cowling are fibreglass mouldings. The ply components are marked out ready for bandsawing, and the spruce is machined to section and needs cutting to length.

The wings require a purpose-built flat surface measuring 3.7 x 1 metres to construct them, but are in effect four identical units – as long as you build right and left sides. Don't laugh: quite a few builders have ended up with a 'spare' handed component in the past. An ali tube spar takes all the bending and torsional loads, and a diagonal ali tube takes care of drag loads. Prestamped birch ply ribs fitted with spruce 'U' section capstrips are slid into place, and extra nose riblets fitted before bonding on the 1/2 round ali leading edge. The trailing edge and wing tips are spruce, and the aft outboard corner of each panel is then lifted a specific amount to provide the washout demanded before all the ribs are bonded into position using chopped mat fibreglass and polyester resin. Critical areas – such as the drag strut fixing – are backed up with rivets for safety. Again, Dan reports that it's simple, strong and light.

The entire airframe is covered with heatshrink dacron fabric, bonding it to the structure, and only the elevators and rudder require ribstitching for security. Careful attention to keeping the weight as low as possible is a must: the prototype has only the minimum amount of dope applied to the wings in an effort to keep the weight within the legal maximum, although this may change in the course of time.

A time for building

The kit has been designed to be built in a little over the PFA minimum of 500 hours, hence various parts are not being prefabricated as much as they could be: even the rawest novice should have no problems with construction. The instructions are

The 26 feet wingspan is rather elegant, with a slight sweepback and very clean lines

detailed, clear, simple and well illustrated. You could in theory build the Ranger using hand tools only, although Dan relates that some power tools made the job easier. The engine, prop, instruments, upholstery and finishing materials are not included in

THE SHERWOOD RANGER'S OWN TRANSPORT

Hangarage accounts for one of the largest chunks of fixed costs when you own an aircraft. You'll see various competitors extolling the advantages of keeping an aeroplane at home, proudly quoting 'only' 20 or 30 minutes rigging and derigging time. Pretty good, I suppose, compared to a Cessna, but that's enough to put most people off from using the option – indeed, all the pilot/owners I know who have such aeroplanes usually only derig them and tow them home for the winter or for repairs.

The Ranger has been designed with folding wings so it can be towed home on a trailer: no mean feat with a biplane. A dedicated trailer has been created specifically for the aeroplane, and the entire operation is simplicity itself, even without any helpers. The forward inboard ends of each pair of wings are held apart with a temporary brace, and the wings are swung into position, and locked in place with a pin through each forward root fitting. The brace is removed for flight... and that's it. Lift the tail off the trailer and wheel the aeroplane forward 20ft, and you are ready to go. The fuel and pitot/static lines remain coupled, as do the aileron cables, and the flying and landing wires require no adjustment.

The Sherwood Ranger can be unstrapped and rigged in about the same time it takes to read this panel

the kit, so you'll have to do some research when budgeting the finances.

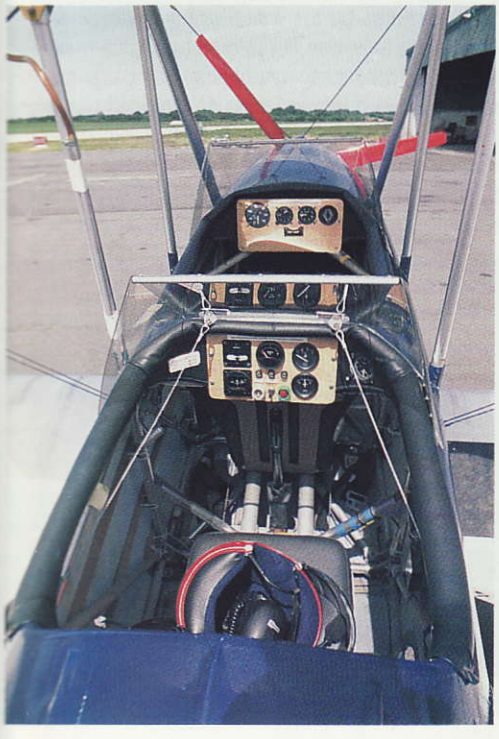
The instructions currently only cover the installation Rotax 2-stroke engines, but the factory is willing to help with other options being considered. The LW (microlight) version has been designed for 50-65hp motors, and the rest for up to 80hp – although I'll be surprised if the XP ('extra performance' aerobatic version) doesn't end up with a 100hp 2-stroke. Should you be the first to opt for a Rotax 912 (80hp 4 cylinder 4-stroke) it'll take next to no arm twisting to persuade Russ Light (of TCD Ltd, the manufacturers) to sort out the installation for you. Eventually, cowlings for the 912 will be available.

There are some optional extras available: long range (wing mounted) auxiliary fuel tanks, wheel spats, and even a canopy, but these are likely to take you over current microlight weight limits.

The view from the cockpit

Walking around the aeroplane reveals that it is surprisingly big – the wingspan is 26ft, larger than either Skybolt or Starduster. The LW has a single fuel tank (enough for 80 minutes) in the left top wing, but another three tanks – one in each wing – can be fitted if legality allows. The fuel gauge is a simple sight level tube at the trailing edge. Climbing into the rear cockpit is simple, with a step built into the fuselage side, but getting into the front pit is not so easy. This involves climbing through the 'cabane' struts and half out of the other side but poses no real problems. The advantage is that the passenger sits right on the C of G, and doesn't affect the handling at all. Both cockpits have full dual controls with the exception of pitch trim in the rear cockpit only, but that is an extra in the LW: not that it needs it, once the aeroplane has been trimned for cruise. Both pits are surprisingly roomy and comfortable, and are fitted with four point harnesses.

In an effort to keep weight to a minimum, the flight and engine instruments are divided up between the two cockpits



Giving the stick a stir reveals that there is very low friction in an essentially all-cable system, something that adds greatly to the feel of the aeroplane in flight. The only slightly odd aspect was the brakes. A small lever in the rear cockpit can be positioned in one of three positions: 'Off' (completely) gives no brakes and full rudder travel for serious messing around, 'Off' (partially) gives differential brake at nearly full rudder pedal travel (like a Chipmunk) and 'On' gives run up brakes by slipping your feet in front of the rudder pedals.

The view ahead taxying out is excellent: no need to weave to clear the way ahead unless you have a very full front cockpit. Ruddering a turn produces a gradual change in direction, and getting onto a brake tightens it up to a point where you can do a 180° turn in about a wingspan's width. The tailwheel is a full swivel unit, with no lock, but it all felt quite natural and easy to taxi.

Shoving the throttle forward for 'full noise' results in a startling acceleration: push forward on the stick and the tail rises in a second or so. After another three or four seconds it's light on the gear, and as the ASI swept through 50mph a slight tug persuading the ground to drop away rather rapidly. There was little tendency to swing, and the rudder and ailerons were effective from the moment the throttle went forwards. The climb rate was comparable to something with twice the horsepower, and watching Russ take off showed how quickly it'll get off the ground solo: in a 10kt wind, I doubt he rolled more than 50 yards before disappearing upwards at over 1,000fpm.

Visibility is excellent from either cockpit, and both are surprisingly wind free, with just a little buffet on the top of my helmet: slightly taller windshields will sort that out. You do need to be fairly organised as losing a chart over the side is the penalty for inattention. The noise is pure biplane: push the nose over, and the whistle turns to a howl, pull back and it abates to a gentler wail. A few hours of experience, and you'll never need to look at the ASI; the noise will tell you all you need to know about airspeed

Yaw stability will be improved in the production kits by increasing the fixed vertical tail area

A pleasure to fly

The controls are a delight. Designed with aerobatics in mind, the ailerons are light with almost no breakout forces, elevator is a touch heavier, and rudder complements the other two perfectly. Of the three, the ailerons stand out – in fact, compared to the majority of aircraft, light or heavy, they are outstanding. The response is linear, more pressure producing proportionately faster roll; whilst the roll rate isn't anywhere near that of say a Pitts – at around 90°/second, it's faster than that of a Cessna 152 – the roll acceleration is instant. Complementing that, releasing the stick stops the bank dead at whatever position you happen to be in. The aerobatic legal versions are going to be a ball to do hesitation rolls in.

THE ST AND XP VERSIONS

The ST and XP versions differ from the LW in various ways. The fuselage tubing and wing spars have been increased in thickness to deal with higher loads and loadings, and the rear cockpit has been moved back three inches giving extra leg room and more panel space for additional instruments.

The top wing is positioned slightly higher, and is mounted on streamlined cabane struts. The wing leading edges are sheeted (using premoulded composite skins) as far back as the spar to improve the aerofoil section and provide better damage resistance.

The XP prototype will be fitted with a 75hp Rotax 618. It has 'clipped' wings – 18 inches

It does exhibit classic taildragger traits: forget what your feet are for and there is a fair amount of adverse yaw, but lead with a squeeze of rudder to keep the ball centred and the turn rate speeds up considerably. Power off, the Ranger is positively stable in roll but checking the stick-free pitch stability was difficult in the prevailing conditions. It was fairly windy, with a good smattering of thermal activity; however, trimmed for a 70mph cruise, it required little attention to peg the altitude selected, showing that it is positively stable in pitch.

Yaw stability is a little on the light side, but that too showed itself to be positively stable. Kicking in a good slip and releasing the controls smoothly allowed the nose to straighten up with no oscillations or wandering – pretty good considering that we were flying at an aft C of G position. Stronger rudder centring springs have been fitted, which improved things from the initial test flights, but a little more fixed vertical fin area (as all kits will have) will take care of any nitpicking in that direction.

The stall behaviour is quite exemplary too. Power off, there was no real aerodynamic warning, with a very gentle break just above 40mph indicated. Holding the stick hard back eventually produced a gentle right wing drop that could be contained by either rudder or aileron – still fairly effective in departed flight. Popping the stick forward slightly and getting on the power produced a full recovery with about a 50ft altitude loss. Repeating the exercise with some power carried and the nose eventually dropped to the horizon; keeping the stick full back produced no tendency at all to drop a wing, and it just sat there, descending gently, wings level. Full power stalls brought the ASI back to the mid-thirties, wings level, and produced a gentle climb. Very docile, and amongst the safest aeroplanes I have had the pleasure to fly.

Back in the pattern, it was slightly daunting to be informed that the wind was 30° off the runway, blowing at about 15kt. Sliding down finals at about 60mph was a breeze, with excellent speed stability (and no need to trim) but a healthy dose of crab to offset the crosswind. In the event, there was absolutely no need for concern: the controls are powerful enough to handle rather worse conditions, and despite touching down a little tail high, it skipped once and settled gently with no tendency to weathercock or swing. Just to make sure, full power had us off the ground and the subsequent landings followed suit. There is a danger with very light aircraft in that they will bleed speed off very quickly when you pull the nose up because they have very low inertia. It's the opposite side of the fast take-off coin: if you flare a little high, it's all too easy to find the airspeed has bled off faster than expected, resulting in the aeroplane dropping in. In skilled hands, it will allow the Ranger to be landed in very short distances. I reckon that this is one of the easiest taildraggers to land I have come across.

SPECS: SHERWOOD RANGER 'LW'

Wingspan	26ft
Length	20ft
Height	7ft 4in
Max weight	860lb
Payload	435lb, inc fuel.
'Derigged' dimensions	20'L x 7'4"H x 7'7"W
Wing loading	5.1lb/sq ft
Power loading	13.2lb/bhp
Engine	65hp Rotax 582
Fuel consumption, 75%	3.5gph, mogas
Top speed	85-90mph
Cruise speed, 75%	70mph
VNE	100mph
Stall speed	42mph
Rate of climb	800fpm
Take off (ground roll)	300ft
Landing (from 50')	500ft
Range	70 miles in still air,
Licence requirement	PPL 'A'
Airframe kit price	£8,950 + VAT
Partial kits	Available
Video	£12.00
Info pack	£7.00 inc P&P.

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The fun of a biplane

The Sherwood Ranger LW is not an aeroplane to go travelling in unless you have plenty of time and no particular schedule to stick to: it's really designed for local area messing around. With an effective range of about 70 miles, (burning three and a half gallons, with a 20 minute reserve) it will require frequent stops, but for pure fun it is hard to beat. Full throttle pushes the speed up to 85 to 90mph, probably a realistic cruise speed for an 80hp example; that is fast enough to contemplate cross-country, especially as the MAUW is 140lb higher for the ST and XP, and not all of that will be swallowed by a larger engine.

Given a few hours of taildragger training you could happily let a very low time pilot loose in a Sherwood Ranger, and be confident that they will return with no dramas. Experienced pilots will find it puts a broad grin on their faces, both in the air and after totting up the expenses. I'd quite happily settle for an LW, but the prospect of the ST or XP is really quite exciting. Another 15 or 30bhp will make this a pocket rocket, a real hooligan's aeroplane. Just watch this space... ●

THE ST AND XP VERSIONS OF THE SHERWOOD RANGER

off each panel to improve the roll rate – with fibreglass tips, a little more fixed vertical fin area, and curved, slightly taller windshields. Some of these modifications may become standard items. This has raised the empty weight by 100lb, but at around 500lb it is still a very light two seat aeroplane. Microlights are prohibited from doing aerobatics, but the heavier versions will only really fall into the aerobatic category when flown solo, due to the aerobatic maximum weight.

The ST and XP will come with a very nifty little stall warner, available as an option on the LW. It's a pressure transducer patch about the size of your thumbnail and about one mm thick, stuck to the leading edge of one wing. It senses the change in aerodynamic pressure around the leading edge as angle of attack approaches the stall, triggering a beeper in the cockpit that can be clearly heard despite helmets, headphones, and the wind in the wires (a low moan at this point). By moving the patch up or down, the margin of warning can be altered to suit your tastes or legal requirements. Powered by a battery that will require changing only every couple of years, it is always 'on', and totally independent from any electrical system – should you even have one.

Hopefully, Russ can be persuaded to do a version that interfaces with a standard avionics suit, delivering the tone to your headsets.