FLIGHT TEST

GREEN GENIE

The secret is out! Stan Hodgkins reveals the truth about the Vans RV-9 and tells us to forget the 6 or 7, this is the Vans for everyman and is ‘the nicest RV to fly’

PHOTOS David Spurdens

38 LIGHT AVIATION AUGUST 2009
FLIGHT TEST

‘It struck me as an aeroplane in which a low-time pilot would feel much more quickly at home’

Of the 6000 plus RVs built so far the majority are the side-by-side models 6 and 7. The seven is an improved version of the six with an increased all up weight. These aircraft feature the famous low aspect ratio ‘Hershey bar’ wing and are fully aerobatic. However when Vans looked at customer feedback they noted that not all their builders were that crazy about pointing their bums at the sun – many just wanted a more docile-handling, efficient cruiser. The current best-seller, the seven, was an obvious starting point.

The big change was the wing. The standard short wing gives a really sporty performance with light ailerons, a snappy rate of roll and very acceptable short field performance. However it does not suffer fools gladly and can generate serious rates of sink on the approach if operated on the backside of the drag-curve. Vans considered that there was real market for an aircraft based on the seven incorporating a new wing using a different aerofoil and greater span. Not only would this make the aircraft more forgiving but meant that a smaller engine could be used if economy was important – in fact the prototype used a O-235 from a C.152 which gave a maximum cruise speed of 144kts TAS. Short field performance would be further enhanced by the fitting of large span slotted flaps. To make it more suitable for touring, aileron forces would be increased. As with earlier models the machine could be a tail-dragger or tricycle. From the word go, the RV-9 was enthusiastically received and to date over 33 have flown in Britain and 41 are currently under construction.

I was lucky enough to do the initial test flights in G-HUMH, one of the first in the UK, three years ago. Incidentally Vans actually produced the 9A before the tail-wheel version. Built by Humphrey Daines, this aircraft is a nose-wheel 9A fitted with an O-320 and was a delight to fly. Surprisingly, quite a different animal compared with the short-wing machines, it struck me as an aeroplane in which a low-time pilot would feel much more quickly at home than the other RVs. In particular I was very impressed with the rate of climb and take-off and landing performance. Also it was probably the easiest-to-land aeroplane I have ever flown and the speed penalty for the larger-span wings seemed to be almost non-existent. I thought at the time that it would make the perfect trainer if fitted with the O-235 and with a slightly beefed-up, student-proof nose-wheel. It is a disgrace that, due to sheer over-regulation, students these days in many cases have to train on vintage aircraft with appalling handling and at enormous cost.

The subject of today’s flight test is G-HOXN a tail dragger, again with the O-320, and one I test flew in 2007. It has now completed about 200 hours which include a trip to Portugal last year. A quick-build kit constructed by Andrew Castleden and his three partners over a three year period, it is flown from Horham disused airfield in Suffolk. Horham was the home of the 95th Bomber Group’s B17s during WWII and Hoxne is the village just north of the airfield. On the fin is a white square with the letter ‘B’ inside – the fin codes of the B17s of the 95th. G-HOXN is finished in a simple two-tone, British racing green and white scheme – white nose, rudder, wingtips and spats which gives a sort of pre-war Miles look to it. Very English, I feel. Maybe it’s the oval RV-9 logo on the nose that does it. The aircraft is bog standard with old round instruments and no fancy add-ons or internal sound-proofing. It is however fitted with Vetterman Exhaust mufflers which reduce cockpit noise. Like my own machine, it was planned before cockpit glass became easily affordable and like me Andrew would probably do it differently today. He says he would probably fit the basic Dynon EFIS but hang on to the analogue engine gauges. That way the heavy and unreliable suction system can be binned. Due to its simplicity the aircraft came out light at 1090lbs and it certainly shows in performance.

Walking around the aircraft, it looks at first just like all the other Vans products, but on closer inspection the differences start to show. The wing is obviously different, being of noticeably wider span and reduced chord. Also the wing section is different with the point of maximum thickness much further forward than usual. As the wing is of greater span there is room for longer flaps and the slot is obvious with the flaps extended. The flaps are marked at 10, 20 and 30 degrees extension on the

The RV-9’s superb low speed characteristics made formatting on the camera ship incredibly easy

Very ‘English’ green and white colour scheme
Frolicking along the coast in the sunshine whilst most of East Anglia was in the gloom.
An ideal 'straight and level' tourer – stable and docile yet fast and economical.
The tailplane is also completely different being of larger area constant chord design and all trailing edges, except for the elevator trim tab are riveted rather than folded. The vertical surfaces look identical to the RV-7 but in fact are slightly bigger. The fuselage is the same as the RV-7 except for the wing attachment points and the landing gear is standard RV.

Sitting in the cockpit you could be in a RV-6 or 7 except for the control column, which is markedly longer. Cockpit layout is just so straightforward, with the standard six flight instruments ahead of the pilot and the Vans engine gauges arranged in two vertical columns to the right. In front of the passenger is the Bendix-King moving map with the radio and transponder above together with a voltmeter, ammeter and intercom. On the far right of the cockpit is a large glove-box with all the mandatory placards on the lid. The necessary switches and circuit breakers are below the flight instruments with the flap switch on the right, easily accessible from either seat. Below the centre panel are the usual plunger controls for throttle and mixture with the carburettor heat control. The manual trim control is between the seats directly below the throttle.

The fuel state was about three-quarters, approximately 100 litres (max 136) and with Andrew and I our all-up weight was about 1540lbs – well within the max of 1750lbs. With full fuel, two average adults with a full baggage allowance of 100lbs would have a safe range of at least 530 miles with an hour’s fuel to spare.

Start-up is standard Lycoming and we soon followed the Cessna out to the threshold. The view over the nose for taxiing is improved over the 6 and it is hardly necessary to weave the nose for look-out. After letting the 152 get well airborne we rolled in turn with 10 degrees of flap set. Only a little right rudder was necessary to keep straight and the tail could be lifted almost straight away. The effect of the extended wing became apparent very quickly and the aircraft became airborne noticeably sooner than a short wing model, I think those flaps had a lot to do with it. Also the heavier ailerons were noticed but in no way was that a problem; rather it gave the impression of a more stable, steadier aeroplane which, after all, was the intention. The Cessna was climbing at about 70kts and we rapidly overhauled it and

### PERFORMANCE FIGURES

The following cruise performance figures were obtained at 3000 feet:

<table>
<thead>
<tr>
<th>Power</th>
<th>RPM</th>
<th>IAS (kts)</th>
<th>Fuel Burn (ltrs/hr)</th>
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<tr>
<td>Max</td>
<td>2600</td>
<td>150</td>
<td>Lots</td>
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<tr>
<td>High Speed Cruise</td>
<td>2500</td>
<td>140</td>
<td>27</td>
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<tr>
<td>Econ. Cruise</td>
<td>2350</td>
<td>133</td>
<td>22-23</td>
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settled in loose echelon starboard. Levelling out at 2000 feet we aimed for the bright bit in the distance, north of Sizewell B at about 80kts. Flying formation, even at this low speed, flapless, was easy and as we reached the coast the sun almost came out. After 30 plus minutes of ‘up a bit, down a bit, out a bit, in a bit’, we completed the photography, mainly over the seaside and we could get on with the flight test. By now I had fully remembered how immediately at home this little aircraft makes you feel – it really is pilot friendly. The low speed controllability is outstanding and forming with a C.152 in the climb demands exactly that. Climbing to 3000 feet (1200 fpm) we started by looking at various stalls. Approaching the clean stall, the speed is slow to reduce and the stall warning light operated at 65kts. No pre-stall buffet was apparent which is why it is mandatory to fit a vane-operated stall warning system under LAA rules. The stall itself occurred at 58kts IAS with just a gentle buffet and mild nose drop. Ailerons continued to be effective throughout the manoeuvre. With 20 degrees of flap selected stall warning was at 55kts and the stall at 50kts IAS, with the same symptoms. Slow flight was practiced at 65kts and the aircraft felt completely under control. Adverse
yaw was present and rudder was needed with aileron to keep the ball in the middle. General handling was delightful with powerful, responsive controls which are entirely suited to the touring role of the aeroplane. Steep turns just come natural; wingovers seem the obvious thing to do – some so-called aerobatic aircraft are much less inviting to maneuvre. Stability was checked from the normal cruise of 2350rpm and 130kts IAS and was positively stable in all three axes. In pitch, from a 20 degree disturbance, stick free, the aircraft returned to level flight in approximately 2 cycles of 35 seconds each. Directional stability was very positive and in roll less so, but the wing could be picked up with rudder alone.

Andrew assures me that great fuel economy really is achieved and as speed is reduced the high aspect ratio wing really pays dividends. Lowering the nose we accelerated smoothly into the yellow arc which starts at 155kts. Approaching the VNE of 180kts the controls remained smooth and responsive and there was no sign of vibration in the airframe or through the controls. As we returned to join the circuit I put the aircraft into a power-off glide and at a steady gliding speed of 70kts a rate of descent of 650fpm was recorded. Again this is an improvement on the low aspect ratio wing and Andrew tells me that it is extremely easy to get high during a practice forced landing or on final approach. The rate of descent however can be increased by either side-slipping or reducing speed below 60kts.

On slowing down to join the circuit I got the familiar feeling of almost coming to a standstill that seems to be peculiar to RVs for some reason. It’s probably that having bored around at 140kts plus, when you do slow down it seems like you’ve stopped. I have noticed this effect on pilots new to the RV and they are usually reluctant to slow down to landing speed for fear of stalling. It invariably takes an hour of stalling/slow flight before I let them come anywhere near the ground. I am sure it is a factor in the nose-wheel related accidents and is simply due to pilots landing much too fast.

A normal circuit was flown using an approach speed of 70kts and a threshold speed of 60kts. Landing is very straightforward for a tail-dragger. The forward view is excellent and on grass, in average wind conditions, there is little tendency to swing. Of course, like all tail-wheel aircraft it can be a different story on a hard runway with a cross-wind.

I estimated our landing roll to be in the region of 200 metres. For a short landing

‘General handling is delightful with powerful, responsive controls suited to the touring role’
the speeds can be reduced by up to ten knots with practice and power maintained until touchdown.

Although the RV-9 is not for me as I confess to being a bit of a hooligan from time to time, I fully understand its appeal to the more responsible aviator. I think, though, that if I did go for one I would install the O-235 and keep it light, simple and cheap – I bet the performance would not disappoint.

FOOTNOTE
Andrew Castleden has asked me to pass on a cautionary tale concerning G-HOXN which may help somebody avoid a nasty blow to their pride and maybe a bigger one to the wallet. Earlier this year one of the group was manoeuvring on the ground after landing and was intending to swing the aircraft downwind using a burst of power and a jab on one brake. The ground was soft and a combination of factors caused the aircraft to nose over and the prop to strike the ground, with all the ensuing grief and cost. It seems that the high drag of the inner wheel, plus the burst of power and the tailwind all added up in an instant and the damage was done. Incidentally the elevator was held back as the aircraft yawed downwind. This could have made a difference but who knows which had the greater effect – the prop-wash over the elevator or the up elevator with a tailwind?

This incident is uncannily identical to that involving an RV-4 at Old Buckenham last year. In both cases the pilots were experienced and were horrified that things happened so quickly. The larger tyre option available for RVs may have prevented this, but maybe not.

Remember, think wind, ground conditions and control positions at all times – with a tail-dragger you are flying the aeroplane until it’s in the shed!

ESSENTIAL INFORMATION:

PERFORMANCE
Max speed 196mph
Cruise at 75% 188mph
Stall speed flaps 44mph
Take-off roll 500ft
Landing roll 400ft
Climb 1,400ft/min
Range @ 55% 860sm

DIMENSIONS
Wingspan 28ft
Wing area 124 sq ft
Length 20ft 5in
Height 6ft

WEIGHTS & LOADS
Empty 1057 lbs
MTOW 1750 lbs
Max baggage 75 lbs
Fuel capacity 36 US Gallons

POWER
160hp Rotax 912 ULS (or 115hp Rotax UL 914)
Propeller according to builder (typically Lycoming).

PRICE
Airframe kit Standard ~ $20,220
Airframe kit Quick Build ~ $30,200
Firewall forward kit (separate from above and depends on engine choice), instruments etc available from Vans.

MANUFACTURER
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The aircraft is very standard, fitted with conventional analogue instruments and minimal interior trim. However, simplicity speeds the build and adds lightness, which in turn produces benefits in performance. Baggage bay is sufficiently large for the aircraft’s defined role as a touring aircraft.