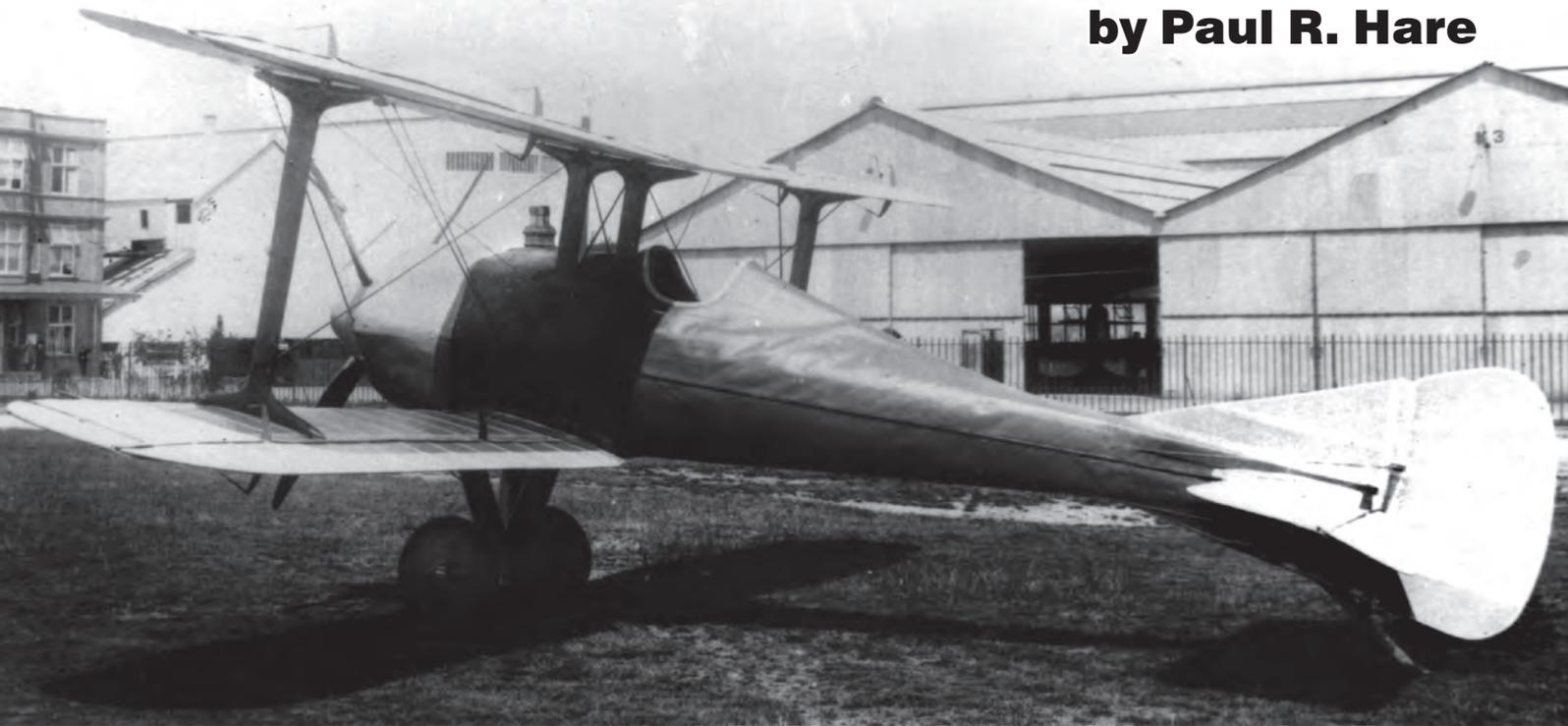


# The Royal Aircraft Factory SE4

by Paul R. Hare



**A**LTHOUGH IT EMBODIED a number of innovative and original features in its design, Scouting Experimental No. 4 was not intended as a research or test vehicle, it was created for one simple and straightforward reason; to be the fastest aeroplane possible at that moment in time. However, as was frequently the case, the events leading up to its creation were rather less simple or straightforward. From the outset it was intended to be powered by a 160hp Gnome *Lambda-Lambda* 14 cylinder, two row rotary engine, but that engine, probably the most powerful rotary then commercially available, was considered for at least one other project before the SE4 was conceived, suggesting that an example was on hand and its owners were unsure exactly what to do with it.

First of all, on 15 May 1913, Major F.H. Sykes, officer commanding the Royal Flying Corps (Military Wing) wrote to the secretary of the War Office<sup>1</sup> as follows:-

*I have the honour to request that authority be given to the Superintendent, Royal Aircraft Factory, to design and construct a B.E.3 type two seater aeroplane fitted with the 160 h.p Gnome engine.*

*My reasons for this recommendation are as follows:-*

*One of the most important lines of development which should in my opinion be pursued, is towards machines of large radius of action for strategically reconnaissance. Such machines should, in order to enable them to evade hostile aircraft, be possessed of the highest practicable speed; both these requirements involve the use of an engine of high power.*

*The 140 h.p. Gnome 'B.E.' machine (B.E.7, serial No. 438) has now been some time at the Central Flying School, and is understood to be very satisfactory. I understand that the 160 h.p. Gnome engine is proving a successful type and it is not very much heavier than the 140 h.p. engine.*

*A further argument in favour of the policy of providing a few fast high power machines in the military wing is the necessity of training officers to handle such machines.*

As it turned out such authority for a fast two seater was not given, most probably because it was later discovered that, far from being 'very satisfactory', as Sykes then believed, flames from the exhausts of the BE7's 140hp engine, when running

rich, as rotaries often do, had burned and seriously weakened the fuselage frame, leading to the machine being grounded.

Meanwhile the Royal Aircraft Factory, following on the success of the SE2 (*See CCI Journal Vol 41/3*) had begun work on the next project in the series, SE3, which was to incorporate a number of innovative features, such as single interplane struts and full span ailerons which could also be used together to act as flaps and could be reflexed upwards by an angle of 4 degrees<sup>2</sup> to reduce induced drag at high speeds. It was intended to be a high speed scout and was included, as such, in a list of experimental designs to be produced by the Royal Aircraft Factory, prepared by Mervyn O'Gorman, the Factory Superintendent in the late summer of 1913.<sup>3</sup> Although some preliminary concept work was done on the project, including calculations of wing and tailplane areas and angles of incidence,<sup>4</sup> it is doubtful whether any actual drawings were produced, certainly none have survived, although an estimate of £2050, including £650 to cover the cost of its 100hp Gnome engine, was submitted and approved.

On 3 December 1913, the War Office placed order No 487 with the Royal Aircraft Factory, for a fast scout powered by the 160hp Gnome engine and, in consequence, the BE3 project was abandoned in favour of a design that could take full advantage of the big rotary, the SE4.

The design, by Henry Folland, was for the most advanced aeroplane possible at the time, with every possible measure taken to reduce drag to a minimum, so as to attain the greatest possible speed.

Folland's preliminary sketches<sup>5</sup> show a compact biplane, very like the finished design, with single bay biplane wings, of equal span and with rounded tips, their span, area and plan form being identical to those of the SE2. The wings were un-staggered, with only a very shallow dihedral angle and had single 'I' shaped inter-plane struts, as in the BE3, their ends flared to provide a mounting point at both wing spars. Fixing bolts were finished flush, and the centre-section struts made hollow to provide a route for the cables to the upper ailerons. To further reduce drag, bracing employed streamlined cross section Raf-wires, and the single landing and flying wires were arranged