

'The Pulpit'



The Royal Aircraft Factory BE9

by Paul R. Hare

THE BE9 WAS VERY MUCH A PRODUCT of its time and represented the Royal Aircraft Factory's attempt, in the days before the availability of any synchronization gear, to combine the aerodynamic efficiency of the tractor type with the forward field of fire then only available in a pusher. Although ungainly, and almost comical to modern eyes, to a generation of airmen who had grown up with such unconventional designs as the Phillips Multiplane or the Lee Richards Annular it appeared to offer a practical solution to a growing problem by arming an aeroplane effectively.

The design concept may not have been entirely original, as the French SPAD company had taken out a patent¹ for a similar idea in February 1915, and it seems improbable that O'Gorman's staff would have been unaware of it.

The Farnborough design was based on the BE2c, which was then probably still the most effective two-seater in service with the RFC and drawings were completed sometime in June 1915. The forward fuselage was shortened, moving the engine back into the space previously occupied by the observer's cockpit, which put the propeller about 15 inches ahead of the upper wing. The centre section struts were splayed out to give clearance to the cylinders of the V8 RAF1a engine, thereby increasing the span of the centre section to a little over six feet and, since standard BE2c wing panels were retained, increasing the overall span by nearly four feet. The lower wing mountings were extended to give a matching span and leaving a gap at the root to improve the pilot's downward vision. The engine exhausts were first drawn discharging upwards but were later re-designed to sweep down to below the pilot's cockpit as in the earlier BE2s. The observer was to be housed in a plywood nacelle mounted on a ball race on the front of the propeller shaft, and supported by four struts added to the undercarriage. Bracing wires ran from this nacelle to the wings to increase the stability of the nacelle whilst a hoop shaped guard projecting up from the rear of the nacelle was intended to offer a reminder of the presence of the propeller.

The nacelle was initially designed with a raised forward lip, giving a profile similar to that of the Maurice Farman, which might have afforded some protection from the elements but prevented the provision of an effective gun mounting, and so production drawings show the front edge level with the upper longeron, as in the FE2a, which was then starting production.

Wind tunnel tests² were carried out on both a 'faired' nacelle, which was almost ovoid in plan, as well as one whose sides followed the contours of the fuselage behind it, the latter being the design finally chosen. The underside of this nacelle, and of the pilot's cockpit, was to be provided with a steel sheet covering as protection against ground fire.³

Additional fin area was necessary to counteract the increased side area so far forward and initial drawings show a surface with a curved leading edge similar to that subsequently adopted for the BE2e, but production drawings show a far larger surface which projected well above the rudder.

Instrumentation was typical for the period and comprised air speed indicator, altimeter, tachometer, compass, clinometer and watch.

In order to create the BE9 it was decided that, rather than build from scratch, it would be more expedient to convert an existing airframe. However, since the Royal Aircraft Factory had none in production at that time, a contractor-built machine was used. The machine selected was 1700, a Bristol built example, works number 402, which was delivered to Farnborough on 21 June. It was, at that time, fitted with a 70hp Renault engine, which was removed for re-use elsewhere.

New components necessary for the conversion, were submitted for inspection as they left the Farnborough workshops throughout July, and by August the new machine was ready for erection. It was completed, ready for final inspection on 13 August, with approval being given at 14.30 the following day.

Frank Goodden took it up for its first flight at 17.45, spending just five minutes in the air. It did not fly again until after the