Gloster F.9/37: potent

What was the most heavily-armed fighter of 1940? Had its armament been installed, that accolade would undoubtedly have been attributed to the Gloster Aircraft Company's twin-engined fighter to Specification F.9/37. **ROGER DENNIS** provides fresh insight into the intended weaponry for this sleek design

ABOVE The first F.9/37 prototype in camouflage but with its serial number, L7999, writ large across its wing undersurfaces. The gun ports in the lower nose cone have been faired and overpainted, rendering them almost undetectable. This machine, first flown on April 3, 1939, had 1,050 h.p. Bristol Taurus radial engines.

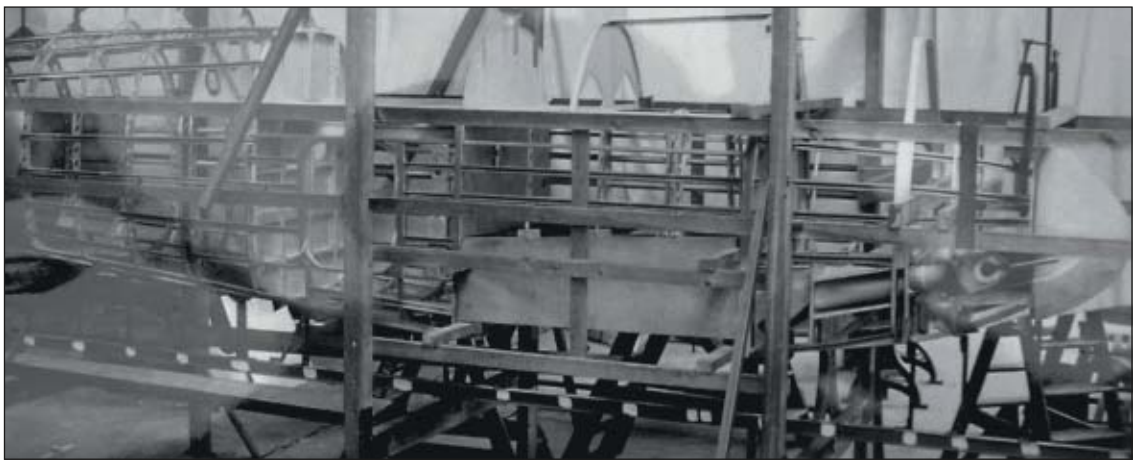
IN SEPTEMBER 2004 MEMBERS of the Royal Air Force Association (Cheltenham Branch) Aviation History Group were given a talk on the Gloster F.9/37 fighter. The speaker, Air-Britain member Jack Meaden, showed a photograph of the dorsal cannon installation with access covers removed. I immediately knew this to be an unpublished photograph. A week later the November 2004 issue of *Aeroplane* carried a *Crosswind* item on the Gloster F.9/37. The cannon photo came from an album owned by Roff Jones, also mentioned in the same issue. These coincidences are the catalyst for this article.

In true British fashion I am fascinated by the "also-rans" of the aviation world. Those aircraft that made it off the drawing board to become flying prototypes, like the F.9/37, are inevitably of greater interest. Published works state its armament as six cannon, two in the nose and four in an unusual dorsal installation, and that the latter were definitely not machine-guns. This information can finally be corrected, but I have allowed some additional speculation, in the hope that readers might be able to add more to the story.

tially powerful punch

Air Ministry Specification F.9/37 called for a twin-engined fighter with two nose cannon and a retractable turret with four guns. An earlier Gloster proposal, to F.34/35, was to have had a Boulton Paul Type A turret. Work on this design ceased when the Defiant, to F.9/35, was chosen. Gloster's new chief designer, W.G. Carter, used the company's F.34/35 design as the starting point for an F.9/37 proposal. For reasons now unknown, the turret element was deleted, the fighter becoming a single-seater. My own speculation is that the retractable turret proved to be impossible, as there were then no retractable dorsal turrets. The nearest to the description would be Bristol's B.I, but even this was not truly retractable, and even then only mounted a single Vickers gas-operated (GO) gun. Boulton Paul had no comparable turret design, although it had schemed one in its P.70 design, to Spec

LEFT Inside the F.9/37's cockpit. Note the canopy hinged on the starboard side, and the control column spade grip with firing button. Unfortunately this illustration is a computer copy, the original having been replaced in the album. Consequently it is not known whether the first or second prototype is depicted; nor is the manufacturer's photo number known.



RIGHT A starboard side view of the uncovered forward fuselage structure, including the cockpit and gun bay, showing the positions of the bulkheads, frames and formers. This is manufacturer's photo number 9486E, taken in August 1938.

"A nose cannon inclined at 15° to the horizontal was at

B.9/32. This turret was a simple, flat-topped "birdcage" type, equipped with a single Lewis gun. It could not have mounted four Brownings.

The first Gloster F.34/35 prototype, L7999, with Bristol Taurus radial engines, appears never to have had any armament. Certainly none was fitted by Gloster. However, from the outset, both the nose and dorsal guns were to be were angled upwards. A wing-root blanking plate was installed, creating a gas-tight compartment for the Hispano cannon. The forward part of this compartment can now be seen, as an inclined tube. This extends through the bulkhead behind the pilot, and through the cockpit itself, into the nose, emerging in a trough. In some photographs a blast tube is installed around the cannon, but most shots show the nose cannon ports blanked off. In point of fact, the photographs that appear to show a nose cannon actually show a steel rod, as can now be seen! The construction photographs also show the dorsal gun troughs, both open and blanked off. With no known records, written or photographic, what this dorsal mounting might have been has to be a matter of pure speculation.

A nose cannon inclined at 15° to the horizontal was at least unusual and, I believe, was unique in aircraft design. It would have required special sights, quite apart from an attack position a long way behind the target. Photographic evidence can now be presented to show that the dorsal armament was intended to be four guns. There is insufficient space to accommodate four Hispano cannon, which were then fed by 60-round drums, so the provision has to have been for four Browning 0·303in machine-guns.

The decision to remove the turret seems to have been a late one, as a photograph shows a horizontal sub-frame in the gun bay. Although it has a four-sided opening, it is in the position required to support a turret ring. Rather than modify the fuselage that was taking shape, it seems to have been expedient to leave the frame in position. As Gloster had the lateral imagination for an angled gun installation, I would like to think that the company's imagination had stretched even further. For instance, were the dorsal guns actually fixed?

John Maynard speculated on what a *Schräge Musik* de Havilland Mosquito might have achieved. The elements for such an installation were present on the F.9/37. Although the Browning barrel jackets would lie in the dorsal troughs, there is no reason to suppose that they might

BELOW A view of the unpainted, natural-metal first prototype shortly after completion, with the nose-cannon ports blanked off. Gloster photo 10146B, taken early in April 1939.

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not have had some degree of elevation. If the guns were mid- or rear-pivoting, this would have raised them further into the slipstream. To avoid this they could equally well have been pivoted well forward, such that the breech ends could be moved within the turret support frame. The four-sided shape is not at odds with this, since the belt feeds would have necessitated a staggered mounting, two forward, two rearward.

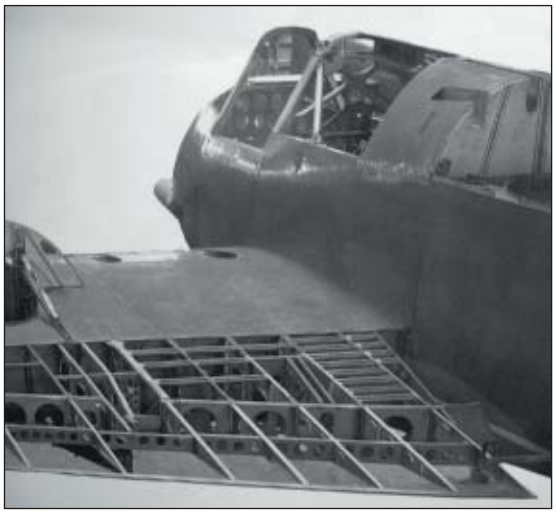
In addition there is a large side hatch on the starboard side. The auxiliary framing around this is washed outwards, where it would have mated with the upper contour of the wing-root fillet. The basic hatch frame reaches below the fillet, but no hatch is yet installed, so its actual shape cannot be determined, but it may have had its lower section curved out to form part of the fillet. The gunner in a Boulton Paul Type A turret gained access from above, through the transparency. Thus this hatch must be for access to the ammunition tanks, which logically would be below the weapons they served.

The author spoke to two ex-Gloster employees, Roff Jones and Cyril Richardson, both of whom saw the prototype at close hand. Roff worked in the experimental department and carried out some of the skinning on the Taurus-engined prototype. He then received his Territorial Army call-up, so he never saw the prototype completed. Cyril worked in the planning office, and had to duck under the wing to get to the office. Neither can shed any further light on the details of the armament provision. Our hope is that some reader may have saved other documentation that could confirm or refute my speculation. In any event, it seems that an armament of machine-guns was only provided for, so the design process may not even have covered the form of gun mounting. The side view of the completed aircraft shows a single dorsal access panel over the gun bay, in the manner of a car bonnet.

The second prototype, L8002, with Rolls-Royce Peregrine engines, was quite different. The armament was changed to dorsal cannon, and photographs have been published showing these. I have never been happy with the published interpretation of these photographs, namely that two of four cannon were shown. Thanks to Roff's far-sightedness a photograph has survived, and it shows that there were only three dorsal cannon. It is not known whether this was intended as an alternative fit for later production, had it occurred, or perhaps was a tempting upgrade to the new "in vogue" Hispano

ABOVE, FAR LEFT Photo 9457E, dated May 26, 1938, shows the forward face of the rear cockpit bulkhead. Note the holes for the Hispano cannon installation.
ABOVE, SECOND FROM LEFT The rear face of the forward gun-bay bulkhead, showing the four slots for Browning machine-guns, is well portrayed in photo 9457F of May 26, 1938).
ABOVE, THIRD FROM LEFT A general view of the fuselage centre-section aft of the gun-bay area and the starboard Taurus installation . This is photo 10059A, dated February 1939.
ABOVE An overall view of the complete fuselage, looking forward, is provided by photo 10059C of February 1939.

LEFT A side view of the newly-completed first prototype at Gloster's Brockworth airfield. Note the doped, fabric-covered rudders and the factory under construction in the background on the left. This is photo 10146D, taken in early April 1939.



RIGHT A forward port side view. Note the blast tube for the nose cannon, seen in greater detail in the enlarged section alongside. This is photo 10059D, taken in February 1939.

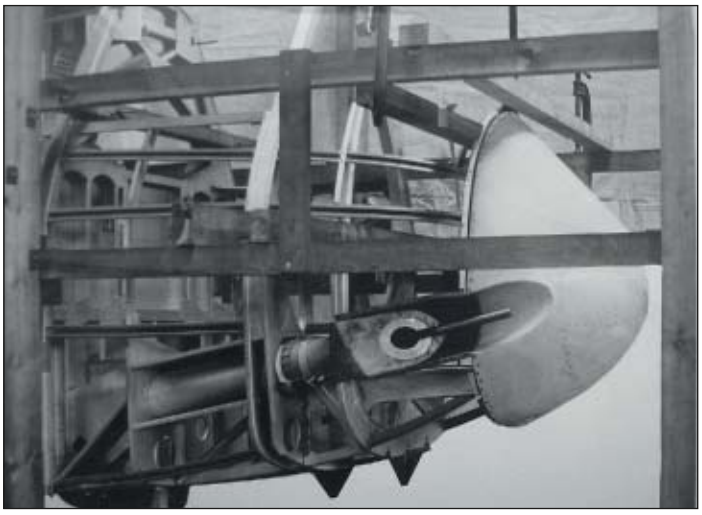
cannon. As the cannon was a much longer weapon the gun bay could no longer accommodate it; nor was there lateral space for four of them. Accordingly, the bay was extended aft to the next-but-one fuselage frame. The original rear gun-bay bulkhead had the skinning removed from its upper section, leaving just a frame. The next frame had had skinning at the top, with large lightening holes. The whole upper part of this frame was removed and its in-fill re-inserted one frame further back. In addition, a second horizontal frame was installed, aft of the turret support frame, to carry the breech mounting points.

The Hispanos could now be fitted over the "gun ring support frame", under the first relieved frame, reaching back to the next frame aft. Early Hispano cannon were fed by 60-round drums mounted on top of the gun. For a dorsal armament to fit under the fuselage skinning, the breech ends of the cannon had to be lower than the muzzles. That, and the increased length of the gun, dictated the 15° fixed elevation, coinciding with the same fixed angle on the nose cannon. For the dorsal cannon armament to have had variable elevation, a major redesign would have been necessary, since there is a transverse frame member immediately under the cannon.

A complex, outward-tapering support framework has been inserted into the opening in the gun ring support frame. On this was an assembly of three barrel support tubes, so the means of support is obscured. The forward gun bay bulkhead has been redesigned, but was plainly made to the original drawings, as the outermost gun slots are still visible, albeit closed off by small riveted plates. New slots have been cut, inboard of the old machine-gun slots, to accommodate the port and starboard Hispanos. To install the centreline cannon, the vertical stiffeners on either side of the bulkhead have been cut away. The cannon were close-set, so, to allow for the centre ammunition drum, the cannon is mounted a drum's length forward. The outline of the starboard side hatch can still be determined, but it no longer looks like a removable panel. There are now two access panels; a forward one, over the original gun bay, and a second over the breech ends and ammunition drums.

History records that the Bristol Beaufighter obviated any need for the F.9/37. A promising design that was pleasant to fly, according to the Aeroplane and Armament Experimental Estab-

BELOW The second F.9/37 prototype, L8002, was powered by a brace of 885 h.p. Rolls-Royce Peregrine 12-cylinder liquid-cooled vee engines. This aircraft first flew on February 22, 1940. The barrels of the two undernose cannon are conspicuous.



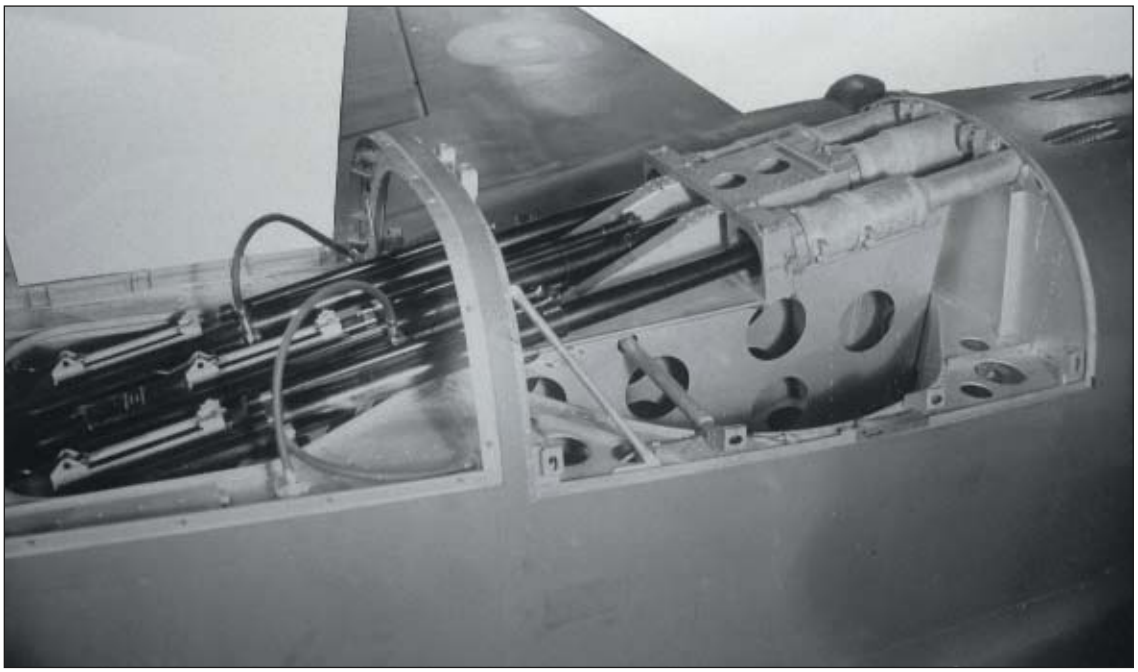
lishment, was thereafter relegated to testing work. *The Aeroplane* of May 19, 1944, carried an article and a photo feature on the F.9/37. The text states that the aircraft was ballasted to represent a turret in position and comments that it was a pity that a turret was not fitted. This comment is puzzling, since the turret had been abandoned, so the date at which this ballasting took place is of interest. Specification F.18/40 called for a two-seat day and night interceptor with fixed armament. Gloster intended to enlarge its F.9/37 design to accommodate a radar operator, and the company worked in conjunction with Boulton Paul on the project. A mock-up of the forward fuselage, the port wing centre section and a Merlin engine was built. It shows the double arrowhead airborne interception radar antenna in the nose. The "Reaper", as it was to be called, had four nose cannon. The significant fact is that L8002 was test flown with ballast, but in representation of the F.18/40 design.

In his book *Armament of British Aircraft 1909–1939* (Putnam, 1971), H.F. King added: "Should confirmation be forthcoming that the rear 20mm guns were four in number, as appears probable, then the Gloster F.9/37 may be accorded the distinction of being the most heavily armed single-seat fighter in the world during the fateful year 1940. Indeed, as Bristol Beaufighters were initially delivered without their wing-mounted machine-guns, it may well have been the most heavily armed fighter of all".

Despite there being only five cannon, I believe the F.9/37 can still maintain its position as the most heavily-armed fighter of 1940. If hairs are being split, then it has to be admitted that the Beaufighter did eventually have four machine-guns in place of the F.9/37's fifth cannon, but who knows? If events had turned out differently, perhaps Gloster could have squeezed at least four machine-guns — maybe six — into their wing as well, as there was certainly space. Another thing: I cannot think of another twin- or single-engined fighter, of any nation, that had five 20mm cannon.

If any readers can add factual (or even hearsay) data to the above, then I would be delighted to hear from them. Despite over half a century of passion for aircraft, this is the first occasion on which I can add to far more professional offerings. Since my writing forté is in a completely different field, I hope my modest effort will be forgiven!

ABOVE LEFT The turret support frame in L7999, viewed from below, starboard side, as depicted in photo 9486B of August 1938.
ABOVE LEFT A view of the starboard nose section of L7999, showing the tubed accommodation for the barrel of the Hispano cannon. A steel-rod "cannon" is in position in this photo, number 9486A of August 1938.



LEFT The triple Hispano installation in the Peregrine-engined second prototype, L8002. Note the revisions to the bulkhead, frames and formers This is photo 10273J, taken in February 1940.

■ THE AUTHOR wishes to thank Cyril Richardson, Roff Jones and Phil Butler, members of the Aviation History Group, (RAFA Cheltenham Branch), for their help in the preparation of this article.