

# GRIM REAPER

ITEM NO.	ITEM.	WEIGHT LBS.				(x)	(y)	(x+y)	(x-y)	(x+z)	(y+z)	(x+z)	(y+z)	(x+z)	(y+z)
1	WINGS	1490	10.5												
2	FINS & HULLDOGS	70	20.5												
3	TAILPLANE & ELEVATORS	150	22.5												
4	FUSELAGE	700	22.25	0											
5	1/2 (RETRACTING) & BRAKES	485	0.8	87											
6	RETRACTING GEAR	120	36.2	85											
7	TAILWHEEL ETC.	55	297.1	0											
8	FLYING CONTROLS	30	63	0											
9	ENGINE MOUNTINGS	80	36.2	93											
10	ENGINE & RADIATOR COMB.	110	55.25	93											
11	NACELLE COMB.	90	0.7	92											
12	PROPELLERS	600	87.2	93											
13	ENGINE & ACCESSORIES	2152	49.8	93											
14	EXHAUST MANIFOLDS	80	54.1	93											
15	RADIATOR, OIL COOLER ETC.	375	362.7	93											
16	ENGINE CONTROLS	30	78.6	46											
17	FUELS & TANKS	1140	11.2	45											
18	OIL & TANKS	102	8.3	93											
19	FUEL & OIL SYSTEMS	80	25.0	93											
20	HEADER TANKS & WATER	35	78.2	93											
21	WATER SYSTEM & WATER	80	56.7	93											
22	AIR INTAKES	8	24.3	93											
23	PILOT & PARACHUTE	200	31.5	0											
24	GUNNER & PARACHUTE	200	69.3	0											
25	CANNONS & AMMUNITION	350	13.3	14											
26	SHOWING-GUNS	30	50.3	0											
27	AMMUNITION BOXES & CRATES	229	52.6	0											
28	TURRET & HYD. GEAR	255	50.6	0											
29	FUSER BOMB SEAR	35	46.7	0											
30	PARACHUTE FLARES	45	30.8	5											
31	MONEY PISTOL & CART	10	22.9	0											
32	EQUIPMENT	70	91.5	0											
33															
34															
35															
36															
37															
38															
39															
40															
41	SAFETY BELT														
42	FIRST AID														
43	WIRELESS														
44	COCKPIT														
45	OXYGEN														
46	OXYGEN														
47	GENERATOR														
48	GENERATOR														
49	FIRE EXTINGUISHER (TURRET)														
50	ELECTRICAL WIRING														
51															
52	FIRE EXTINGUISHER (COCKPIT)														
53	FIRE EXTINGUISHER (TURRET)														
	TOTALS	9859													

ABOVE Although showing enormous potential, it was believed the F.9/37 would have been outclassed by newer and more advanced enemy fighters relatively quickly. As it turned out, the advent of the jet killed off Gloster's interest in the type.

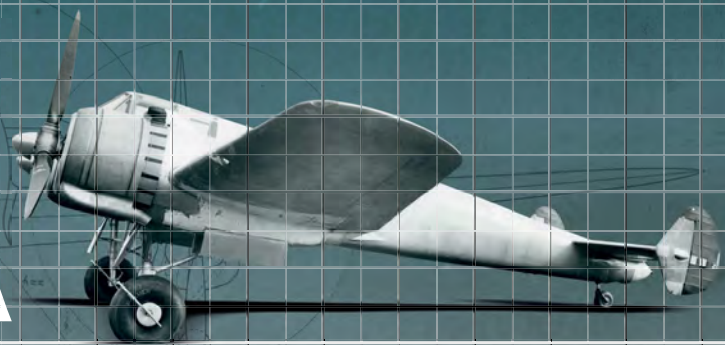
Although contemporary to Westland's fearsome-looking Whirlwind, the Gloster F.9/37 was a moderately small twin-engined fighter designed as World War Two approached. Both types were armed with cannon rather than machine guns, and one F.9/37 later flew with the Whirlwind's Rolls-Royce Peregrine powerplant. However, the Gloster type never entered production and subsequently gains little recognition today.

The story of the F.9/37 began in 1935 with a proposal from Gloster to meet Specification F.34/35, which requested a new turret-equipped fighter. A prototype, serial K8625, was ordered in February 1936 but the project fell by the wayside before it was built, when it was realised that Boulton Paul's proposed Defiant fighter fitted the bill. Continuing its self-funded studies into twin-engined concepts, Gloster's chief designer Henry

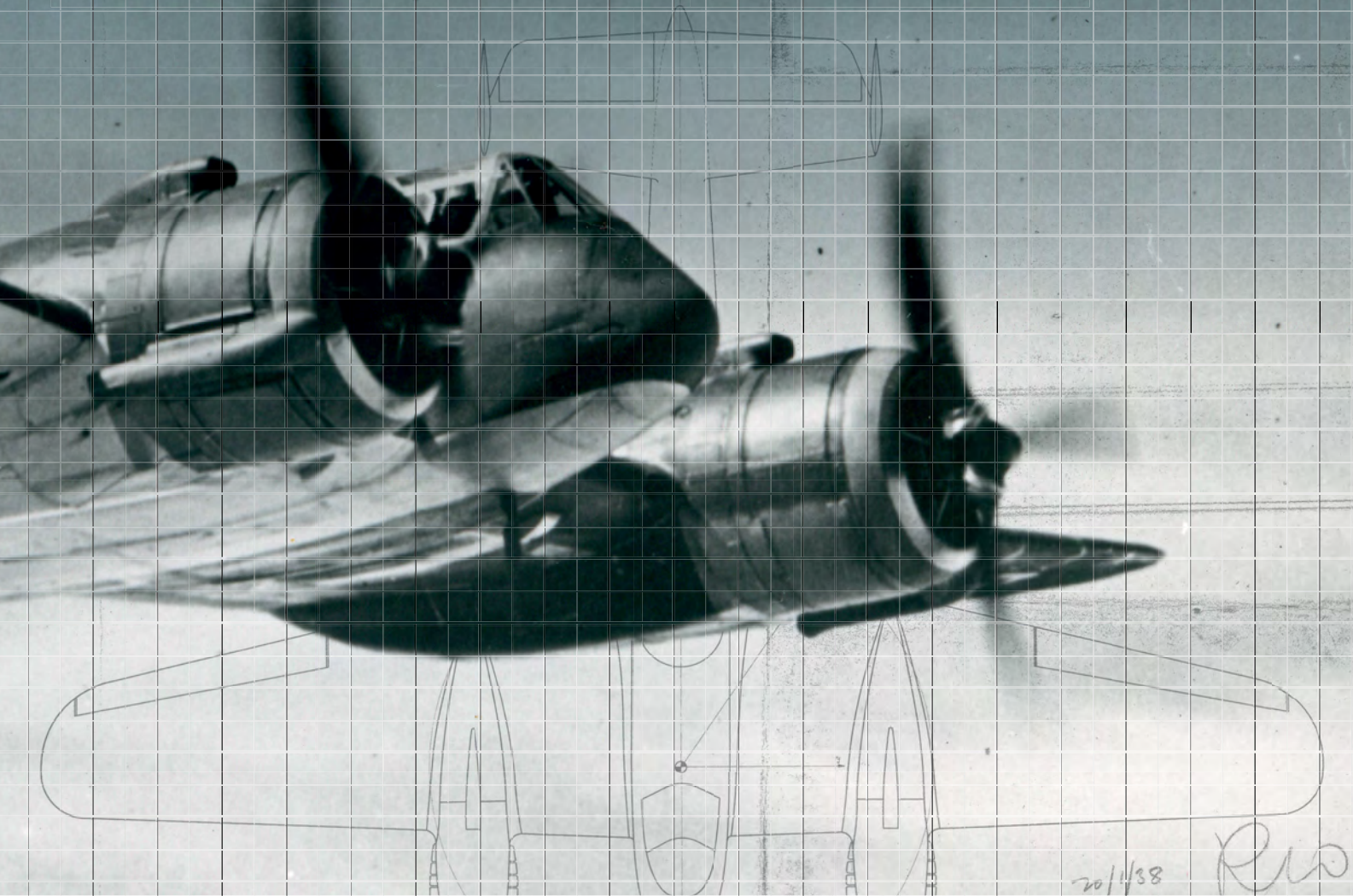
Folland left the firm following its takeover by Hawker and was replaced by George Carter in 1936. The new type was to become Carter's first concept while in charge and was the only piston-powered project he worked on while with the company. The F.9/37 label referred to the covering specification issued in September 1937, demanding a fighter capable of at least 300mph (483km/h) and reaching 15,000ft in just over six minutes. At that stage,



# APER



The brief career of Gloster's F.9/37 is greatly overshadowed by the manufacturer's later successes. **Tony Buttler** delves into the history of this lesser known prototype



the requirements called for both forward-firing armament and a retractable turret operated by an observer/gunner. However, in late autumn 1938 the latter was deleted, turning the F.9/37 into a fixed-gun, single-seat fighter. Although never officially named, the resultant aircraft gained the unofficial moniker Gloster Reaper.

Two airframes – serial L7999 and L8002 – were initially ordered with the first powered by Bristol Taurus air-cooled radials

and the other utilising liquid-cooled Peregrines, featuring chin radiators. Despite having different engines, both aircraft were fitted with standard Rotol variable-pitch, three-bladed metal propellers 10ft (3.04m) in diameter. The layout included twin fins and rudders – a feature retained from the earlier F.34/35 prototype – which, along with the wing were constructed from a light alloy with metal skin covering; the ailerons, elevators and horn-

balanced rudders were all fabric-covered. The fuselage structure was an all-metal, stressed skin monocoque, while the main undercarriage and tailwheel were retractable, the former folding rearwards into the engine nacelles. From the very start of the process, Gloster planned to operate a system of dispersed production using a semi-skilled workforce, meaning the sub-assemblies, jigs and tooling were kept as simple as possible.

TOP RIGHT Prototype L7999 prior to painting, shortly after rolling out of the factory in late March 1939. Note the propellers have spinners fitted but these were later removed.

PHOTOS TONY BUTTLER • JET AGE MUSEUM





RIGHT The first Gloster F.9/37 prototype, L7999, undertaking an air-to-air photographic sortie. Test pilot Michael Daunt is believed to be at the controls.

## F.9/37 L7999 with Taurus engine specifications

<b>Powerplant</b>	2 x Bristol Taurus T-S(a) 14-cylinder radial engines 1,050hp (783kW)
<b>Span</b>	50ft 1/2in (15.25m)
<b>Length</b>	37ft 1/2in (11.29m)
<b>Gross wing area</b>	384sq ft (35.71m <sup>2</sup> )
<b>Maximum load</b>	11,653lb (5,245kg) during trials
<b>Rate of climb</b>	2,030ft/min (619m/min) at sea level
<b>Maximum speed</b>	360mph (579km/h) at 15,000ft
<b>Service ceiling</b>	30,000ft (9,144m)
<b>Armament (proposed)</b>	2 x fixed 20mm Hispano cannon, 3 x fixed 20mm cannon



ABOVE RIGHT The F.9/37's fuselage was bulged to house three-fixed 20mm cannon, fitted behind the cockpit at an upwards angle of 12°.

BELOW RIGHT Wearing typical Dark Earth and Dark Green camouflage, F.9/37 L7999 is seen at Hucclecote shortly after painting.

### Fear the reaper

Two forward-firing 20mm Hispano cannon were positioned under the cockpit, just ahead of the rear wing spar and angled up slightly above the datum line. The F.9/37's short nose arrangement meant the cannon barrels would protrude beyond the metal skin, though during early trials both aircraft flew with the gun ports plated over. Three more 20mm cannon were to be fitted behind the pilot at an

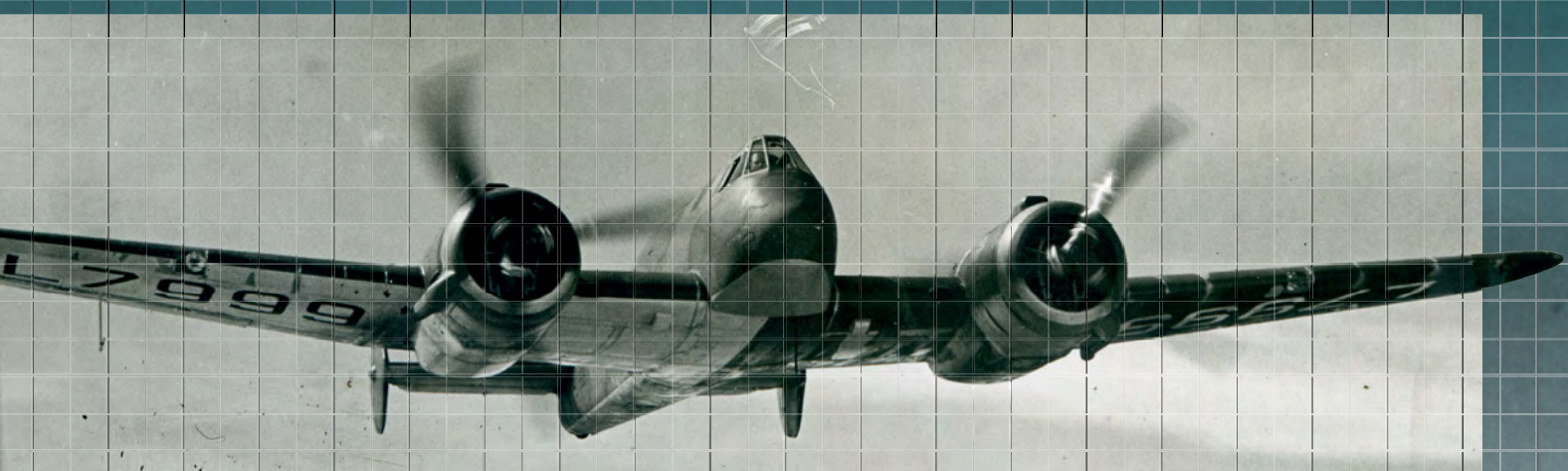
upwards angle of 12° – and would fill the space where the turret would have sat. With the fuselage bulging slightly to accommodate this formidable firepower, the fixed gun arrangement fired forwards and up over the cockpit glazing. Given the slight incline in both nose and dorsal guns, special 'sights' were designed. A similar upward-firing cannon installation, known as Schräge Musik, was utilised by the Luftwaffe during

World War Two in various night-fighters, including the Bf 110 and Junkers Ju 88.

Notable, though, are photographs from Gloster's archive indicating there was not enough room for the dorsal weapon to fit as originally planned. It is therefore assumed those first pictured were in fact machine guns. The second prototype was eventually fitted (briefly) with three 20mm weapons in the upper fuselage.







Construction of L7999 began in earnest during February 1938 at Gloster's Experimental Department in Hucclecote, Gloucestershire with chief test pilot Flt Lt Gerry Sayer performing the first flight on April 3, 1939. Sayer and another company test pilot, Michael Dauht, shared the early test flying. Moving the preliminary trials forward rapidly, the F.9/37 achieved speeds in excess of 360mph, while the overall performance and handling characteristics showed great potential.

### Demonstration

On May 23, 1939 L7999 was flown cross-country to RAF Northolt, near London, and demonstrated to the Air Ministry along with many other types. The objective was to show the government where money allocated to the RAF during its vast expansion was being spent. Reporting on the event, *Flight* magazine noted: "[The ground park] contained three Hurricanes, three Spitfires, three Gladiators, a Hudson, three Hampdens, three Whitleys, three Wellingtons, three Blenheims, three Battles, and examples of the Henley, Harvard, Tutor, Oxford, Anson, Walrus, Beaufort, Defiant, Roc, Skua, and Master." Later in its coverage, it

**"To some at the time, the F.9/37 was one of the most agile twin-engined types to have flown thus far"**

added: "the fastest time of the day was not put up by the Spitfire, but by a secret twin-engined machine, which streaked over from the west." This was of course the F.9/37, but at the time the aircraft was still unknown and as such had not been disclosed to the public. It was to be another five years before any details were officially released.

On July 8, 1939 Gloster delivered L7999 to the Aeroplane and Armament Experimental Establishment (AGAEE) at RAF Martlesham Heath, Suffolk to undergo an official performance, handling and maintenance evaluation. Sadly, the trials were cut short when the machine was severely damaged following a



belly landing just two weeks later. Even during this brief period the fighter had left a favourable impression on those who'd flown it. Returned to Hucclecote by road, the machine was rebuilt with a new version of the Taurus, the T-S(a) III which, unlike the original powerplant introduced a de-rated supercharger.

### Testing times

Back at the AGAEE in April 1940, L7999 rejoined the establishment at its new Wiltshire airfield, RAF Boscombe Down. However, the new engines proved problematic and unreliable, causing long periods of unserviceability. These issues, along with the airframe's use in gunnery trials, meant the planned test programme was never finished – although sufficient flying was undertaken to establish the Taurus-powered variant's maximum speed, ceiling and climb performance. However, a brief handling assessment and maintenance check were also completed during its tenure.

Boscombe Down's report, compiled in July 1940, enthused about the fighter. The cockpit layout

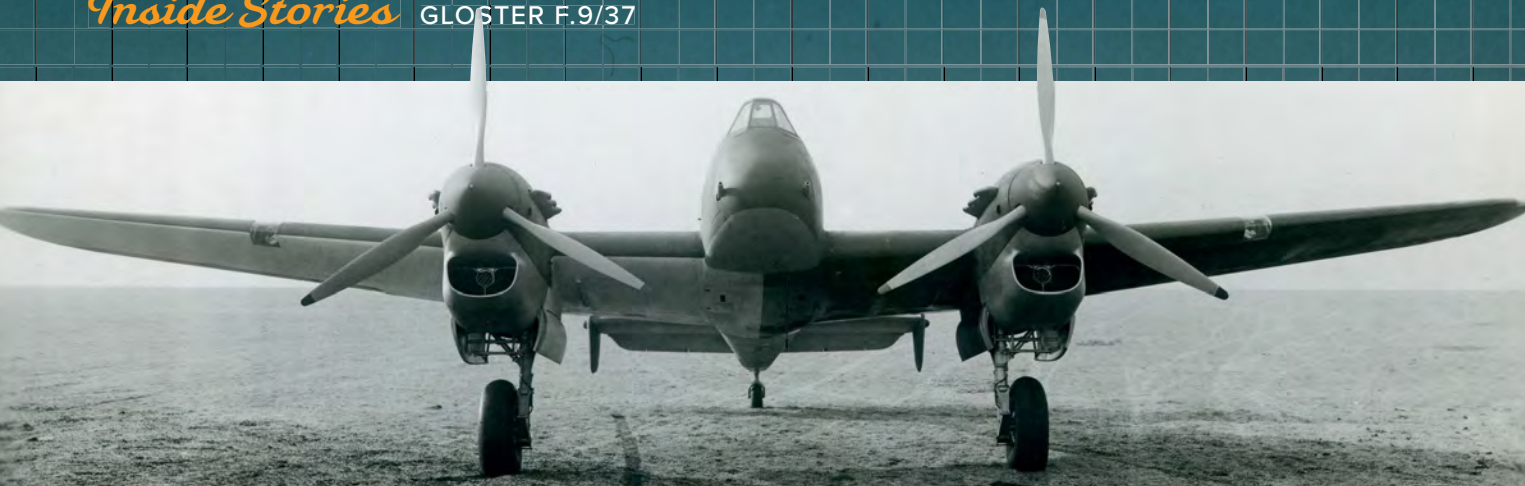
**TOP** Delivered to the Aeroplane and Armament Experimental Establishment on July 8, 1939, L7999's time with the organisation was cut short following a belly landing two weeks later.

**ABOVE** Despite its bulky appearance, the F.9/37 won praise for its agility. Here, L7999 shows off its fuselage bulge to good effect.

**LEFT** A contemporary of the fearsome-looking Westland Whirlwind, F.9/37 L7999 undertakes dive trials sometime in 1940.







**ABOVE** The second prototype F.9/37, L8002, exhibits the cleaner lines the type gained with the use of in-line Rolls-Royce Peregrine engines, especially when compared to the bulky Bristol Taurus radials.

**BELOW RIGHT** The dorsal cannon arrangement was only installed in the second F.9/37 prototype, L8002. Although it never entered production, with an armament of five cannon the Reaper was one of the most heavily armed fighters of the period. Evident is the 12° incline to allow them to fire over the cockpit.

was described as generally good, with the view to the front and side excellent, although to the rear it was poor. Access to the airframe for maintenance was also considered very respectable. Initial handling trials were conducted at a weight of 11,460lb (5,198kg), which found the controls to be well harmonised, light and effective throughout. On approach and landing, the best speed was found to be 90-95mph, with the resulting touchdown both straightforward and easy. The lower power rating of the Taurus T-S(a) III gave a maximum speed of 332mph at 15,200ft, while the best altitude recorded was 28,000ft. Overall the F.9/37 was reported as “easy and pleasant to fly”.

Gerry Sayer also took L8002 on its maiden flight from Hucclecote on February 22, 1940. However, by this stage the Air Ministry’s interest in the aircraft was beginning to wane, leading to the cancellation of the official A&AEE trials of the Rolls-Royce-powered version. Despite this, photos of the aircraft at around the time of its first flight appear to have been taken at Boscombe Down.

The Peregrines fitted to the second prototype were heavier and gave slightly less power, which reduced the rate of climb and cut the top speed to 330mph. Fortunately, stability and control were unaffected - both prototypes could be looped and rolled in comfort. To many at the time the F.9/37 was said to be one of the most agile twin-engined types to have flown thus far.

Apart from the Peregrines and the resultant differing shape of the engine nacelles, there were two further visible changes when the two prototypes were compared. First, a modified undercarriage

featuring longer doors was incorporated in L8002 and second, the engines were ‘handed’ (the propellers rotated in opposite directions) to negate its tendency to swing during take-off.

There were some proposed developments of the F.9/37, including renewed plans to fit a turret. But more importantly, in November 1940 a two-seat night-fighter, powered by two Rolls-Royce Merlin XXs and armed with four cannon was put forward to meet Specification F.18/40. Such was the level of official interest in this project, both L7999 and L8002 continued flying after plans to build the single-seater had faded.

Shortly after, L8002 was flown with ballast to represent its new all-up weight. By late November 1940, L7999 had returned to Gloster for conversion work to the then intended two-seat configuration. This work was halted on December 18, 1940 when the project was moved to ‘low priority’; it was ultimately abandoned in May 1941 following the introduction of far superior night-fighters including the Bristol Beaufighter and de Havilland Mosquito. In addition, the manufacturer was turning its attention elsewhere – to jet fighters – the E.28/39

having already flown with Gerry Sayer, and the Meteor already on the drawing board.

### To reap no more

With the project stalling, both prototypes languished at Hucclecote until April 2, 1942 when Michael Daunt flew L7999 to Halton, Buckinghamshire where it became a ground instructional airframe. Following suit, L8002 was delivered to RAF Cosford, near Wolverhampton on April 25 for tuition duties.

Although the F.9/37 offered much potential, had it been put into production it would have almost certainly been outclassed by newer and more advanced enemy fighters mid-way through the war. Nevertheless, with an armament of five 20mm cannon, this aircraft can lay claim to being one of the world’s most heavily armed fighters during the first two years of the war. Not many documents have survived that describe the F.9/37’s career in detail and, with very few photos, an air of mystery surrounds this striking machine. The early crash of the first prototype while with the A&AEE delayed its trials by almost nine months and this may have made all the difference to the Reaper’s story. **FP**

