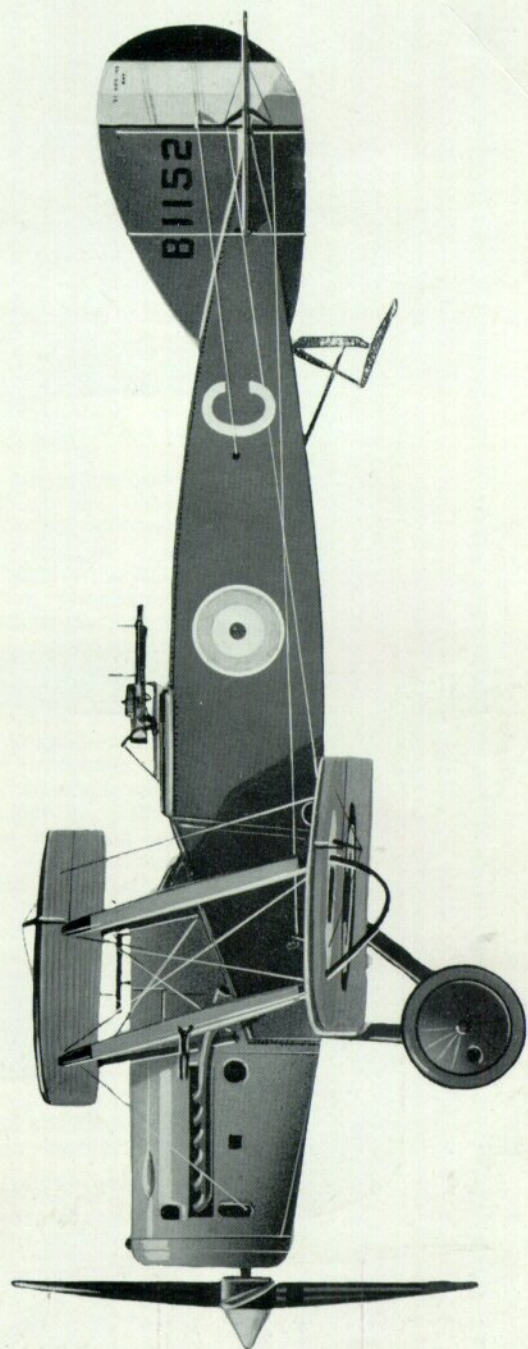


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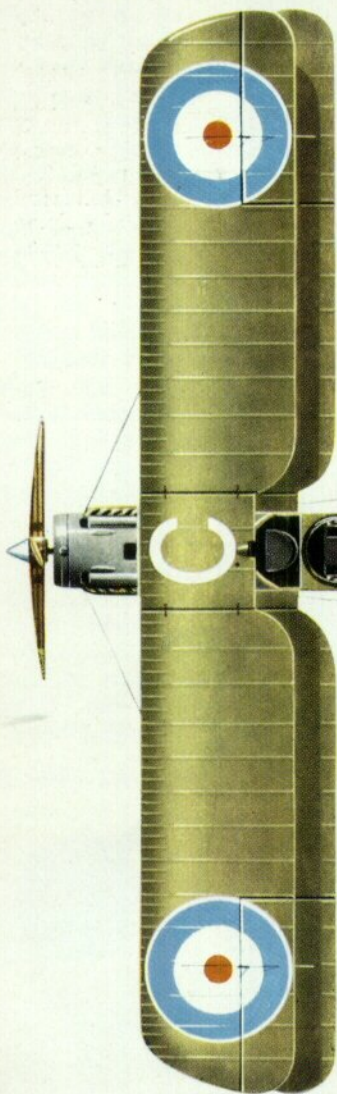
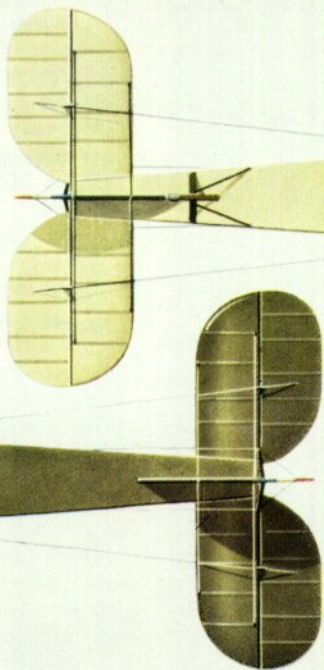
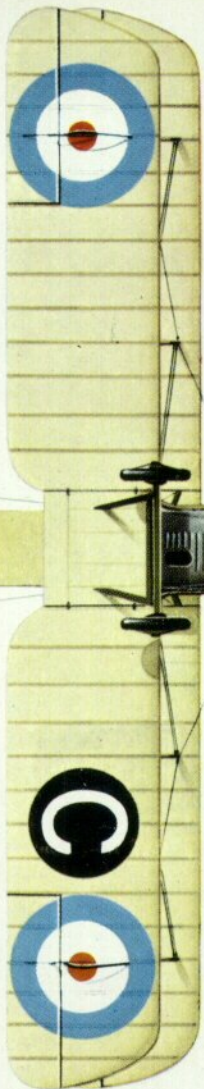
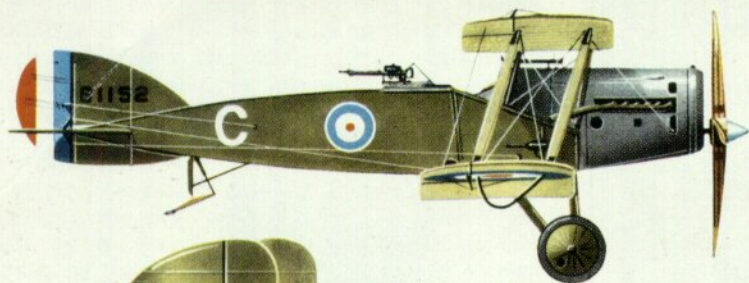
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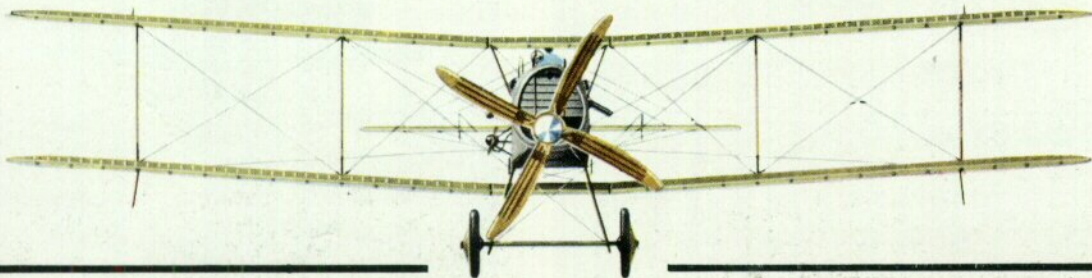
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Bristol F.2B (Rolls-Royce 275 h.p. Falcon III) of No. 22 Squadron, R.A.F., Vert Galand, 1918.







# The Bristol Fighter

by J. M. Bruce

*Extensively re-designed for greater loads H1420 was the prototype Bristol F.2B Mk. III, and is here seen at Filton in March 1926. An oleo tailskid was fitted; the message pick-up hook and trailing-aerial fairlead can be seen under the fuselage.*

(Photo: Bristol Aeroplane Co. Ltd.)

On 1st July 1916 when the Battle of the Somme began the Royal Flying Corps had a total of 417 operational aircraft in France. Of these, 81 were single-seat scouts; of the 336 two-seaters 185 were B.E.2c's or B.E.2d's. The need for an effective replacement for the B.E. had been foreseen in the autumn of 1915, when R.F.C. Headquarters in France had sent home a specification for a corps-reconnaissance and artillery-spotting aeroplane. In it, particular emphasis was placed on the need for the aircraft to be capable of defending itself.

The Royal Aircraft Factory responded with the R.E.8 design, of which the preliminary layout was drawn in March 1916 and the first prototype was submitted for final inspection on 16th June 1916. The first production R.E.8 was completed by 13th September 1916, and thousands were built, unsatisfactory though the type was.

In March 1916, at the same time as the Royal Aircraft Factory design team were setting down their ideas for the R.E.8, Frank Barnwell at Filton was designing a replacement for the B.E. types. His first project, designated Bristol R.2A, was for an equal-span two-seat biplane powered by a 120-h.p. Beardmore. This was succeeded by a revised design for an unequal-span biplane, the R.2B, with a 150-h.p. Hispano-Suiza. In both designs the fuselage was mounted in mid-gap, the crew were close together, the fuselage tapered to a horizontal knife-edge at the tail, the fin and rudder had a distinctive curved profile, and

the pilot was armed with a fixed Lewis gun.

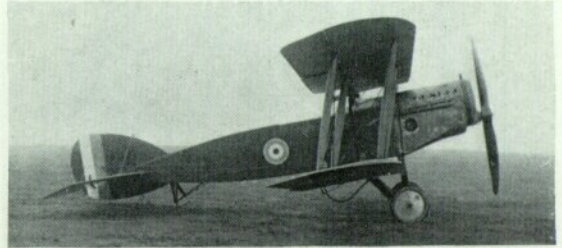
When the 190-h.p. Rolls-Royce Falcon became available, Barnwell drew up a third design that embodied in a completely revised airframe the features of the R.2A and R.2B mentioned in the preceding paragraph. The availability of a British machine-gun synchronising mechanism enabled Barnwell to install a fixed Vickers gun centrally immediately in front of the cockpit.

The new type was regarded primarily as a fighting aeroplane, a change of function that was reflected in its designation Bristol F.2A. An order was placed for two prototypes, A3303-A3304 and fifty production aircraft numbered A3305-A3354. The first prototype made its initial flight on 9th September 1916, at which time its Falcon engine had two tall side radiators in line with the front centre-section struts; the lower wings were attached to an open wing-anchorage frame and had end-plates at the roots. The second aircraft, which had been completed by 25 October, had a 150-h.p. Hispano-Suiza engine with a circular frontal radiator; its tail-skid was built into the base of the rudder.

At an early stage it became apparent that the radiators on A3303 obscured part of the pilot's field of view. The nose was redesigned round a single frontal radiator of roughly circular shape in a deep nose cowling; no shutters were fitted at this stage. Soon afterwards, the end-plates were removed from

*Left: The first Bristol F.2A prototype, A3303, in its original form with twin flank radiators and end-plates on the lower wing roots. It is here seen at Central Flying School, Upavon, in September 1916. At this time the rear cockpit was simply a circular opening in the top of the fuselage; the observer's Lewis gun was carried in temporary fashion on the starboard upper longeron.*

*Right: A3303 on a later visit to Upavon, possibly the occasion of its official performance trials in mid-October 1916. It now has the frontal radiator, a rudimentary coaming has been added about the cockpits, and the end-plates have been removed from the lower wings.*







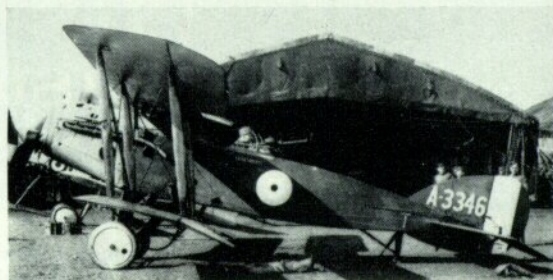
The second F.2A prototype, A3304, with 150-h.p. Hispano-Suiza, in its original form.

(Photo: Bristol Aeroplane Co. Ltd.)

the lower wing-roots and a shallow coaming was fitted about the cockpits; there was no gun mounting on the rear cockpit.

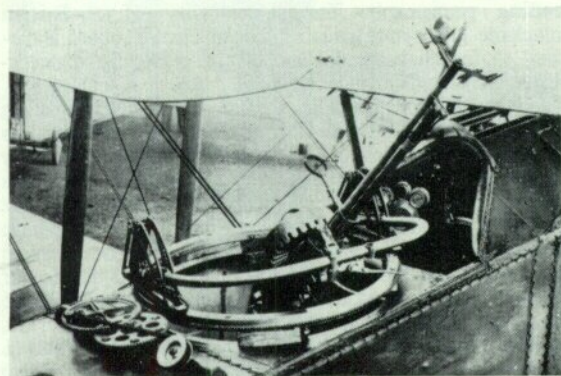
A3303 underwent official trials at Central Flying School, Upavon, on 16th and 18th October 1916, possibly in the form just described. It was tested with both a 4-blade airscrew of 9 ft. 2 in. diameter and a 2-blader of 9 ft. 8 in. diameter. By the time A3303 reached the experimental armament station at Orfordness it had been fitted with a Scarff No. 2 Ring Mounting on the rear cockpit and an Aldis optical sight had been provided for the pilot's Vickers gun.

The fifty production F.2As were powered by the 190-h.p. Rolls-Royce Falcon I. They were substantially similar to the final form of A3303 but had blunt



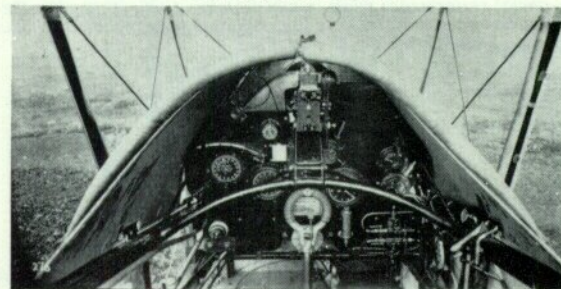
Production F.2A.

(Photo: Imp. War. Mus.)



The later Bristol F.2Bs of Home Defence squadrons had a Neame illuminated gun sight mounted on the centre section at an upward angle of 45°. The observer aligned his Lewis gun fore and aft at this angle, the pilot used the special sight and gave the signal to fire. Experiments at Orfordness had shown that the trajectory of bullets fired at this angle from an aircraft flying at 100 m.p.h. remained straight for some 800 yards. Some of the proving flights were made by this F.2A, which was fitted with a mechanism that apparently enabled the pilot automatically to rotate the Scarff ring to the fore-and-aft position; this device was also tested with twin Lewis guns. In this case the pilot's sight was apparently an Aldis.

Cockpit of Bristol F.2B.



raked tips on the mainplanes in place of the B.E. planform of the prototypes, and there were detail differences in the engine cowling. The armour plate that had been fitted to the pilot's seat on the prototypes was not perpetuated.

Deliveries of production aircraft began just before Christmas 1916. The first R.F.C. squadron to receive the F.2A was No 48, its pilots having gained some experience of their new aircraft at Rendcombe, where a training squadron had been set up. No. 48 Squadron went to France on 8th March 1917, two days after No. 55 Squadron had taken its equally new and untried D.H.4s to the front. Preparations for the Battle of Arras were in hand, and Major-General Trenchard decided that in order to achieve the maximum surprise, the use of these new types was to be restricted until the battle started.

Thus it was that Bristols of No. 48 Squadron did not cross the lines on their first offensive patrol until 5th April. Only two of the six F.2As returned, one of them badly damaged; the other four had been shot down by five Albatros D IIIs of *Jagdstaffel 11* led by Manfred von Richthofen. Other early disasters cast doubts upon the F.2A's effectiveness as a military aircraft. Fortunately, a few pilots chose to disregard the wholly baseless rumours that the Bristol lacked structural strength and flew their aircraft as if they were fighters, using the front gun as the primary weapon and leaving the observer to take care of attacks from the rear. This technique proved remarkably successful, and the Bristol never looked back.

Two hundred more Bristols, numbered A7101–A7300 had been ordered in November. On these aircraft the lower wing-anchorage frame was replaced by a fully covered centre section; and the upper longerons sloped downwards from the rear of the pilot's cockpit, allowing the upper fuselage ahead of the cockpit to be reshaped. The pilot's forward view was thus improved. New horizontal tail surfaces were fitted; these were of reduced chord and increased span. Most of these



modifications were tried out on the second prototype F.2A, A3304, which was then fitted with a Scarff ring mounting on the rear cockpit and a revised radiator. The production aircraft were given the new designation Bristol F.2B, but to all who knew and flew the aircraft it was the Bristol Fighter.

The first 150 aircraft had the Falcon I engine; A7251-A7300 had the 220-h.p. Falcon II. Radiator shutters were standardised on all Falcon-powered F.2Bs. On some of the F.2As the pilot's compass was built into the trailing edge of the upper centre section; this was standardised on the F.2B.

Further orders for Bristol F.2Bs quickly followed the initial 200. All subsequent aircraft built for fighter-reconnaissance duties had the 275-h.p. Rolls-Royce Falcon III; and it is with that engine that the Bristol is best remembered. The first installation of a Falcon III was made in A7177, and deliveries of the production Falcon III Fighter began with B1101 on 18th July 1917.

The F.2Bs were issued to No. 48 Squadron to supplement and replace the F.2As of that unit, and were also allocated to R.F.C. Squadrons Nos. 11 (in May-June 1917), 20 (August), and 22 (August); Nos. 11 and 22 had had F.E.2b's, No. 20 F.E.2d's. The first Bristol pilot posted to No. 11 Squadron at the time of its re-equipment was a Canadian, Lt. A. E. McKeever. He and his regular observer, Sgt. (later Lt.) L. F. Powell were perhaps the finest exponents of the Bristol Fighter. After two combats on 20th and 21st June 1917, in both of which he bested his opponents, McKeever scored his first positive victory on 26th June, when he shot down an Albatros single-seater that crashed between Etaing and Dury.

An action typical of McKeever, Powell and the Bristol was fought on the morning of 30th November 1917. While on line patrol south of Cambrai they met two German two-seaters escorted by seven Albatros scouts. McKeever attacked and shot down one of the two-seaters from a range of fifteen yards; Powell shot down two Albatros; and McKeever destroyed another



Captured F.2B, reported to have been used as a communications aircraft by Jagdstaffel 5. (Photo: Egon Krueger)



Another captured Bristol F.2B, believed to be A7231 of No. 11 Squadron, shot down on 17th October 1917 by Feldwebel Karl Bey of Jasta 5. The crew of the Bristol were 2nd Lts. E. Scholtz and H. C. Wookey, who were tried by a German Court Martial on 1st December 1917 because their aircraft had been carrying propaganda leaflets; the British Officers were sentenced to ten years' penal servitude (see *The War in the Air*, Vol. IV, pp. 219-226). The wording means "Good people don't shoot".

that had overshot the Bristol. Powell's gun jammed, and McKeever took the fight down to within 20 feet of the ground before breaking away from the five surviving enemy aircraft. By the end of 1917 McKeever's score stood at thirty, and Powell's ultimately totalled eight. McKeever returned to England on 25th January 1918 to serve as an instructor for the remainder of the war. When he was appointed C.O. of No. 1 Squadron, Canadian Air Force, in 1918 he had as his personal aircraft the Bristol Fighter F4336. This Bristol was taken to Canada after the armistice and became G-CYBC.

In July 1917 the War Office decided to standardise the Bristol F.2B as the equipment of all fighter-reconnaissance squadrons and plans were made for a great increase in production. Eight hundred aircraft (C751-C1050, C4601-C4800 and D7801-D8100) were ordered from the British & Colonial Aeroplane Co., under Contract No. A.S. 17573 dated 4th September 1917, but it was obvious that operational demands were greater than could be met from the



Above: The final Arab installation, using a radiator of the shape designed for the 300-h.p. Hispano-Suiza, here seen on F4640. (Photo: Imp. War Mus.)

An early installation of a Sunbeam Arab engine was made in C906, seen here at Filton in April 1918. The twin radiator blocks and shutters were apparently of the same type as those used on the S.E.5a Arab and Viper installations. (Photo: Bristol Aeroplane Co., Ltd.)







Left: Siddeley Puma engine in Bristol-built F.2B H1690. (Photo: W. K. Kilsby); Right: B1200 at Martlesham Heath with 200-h.p. Wolseley W.4A Viper, October 1918. The aircraft's serial number was painted under the lower wings.



Left: One of the R.A.E.'s experimental Bristols was A7260, here seen with a 200-h.p. R.A.F. 4d engine. It was used in 1918 in tests of the Calthrop A.1 parachute, and in comparative trials with other R.A.F. 4d F.2Bs that had single-bay and three-bay wings. (Photo: P. L. Gray); Right: This U.S.A. O-1 had two radiators mounted in flank positions in line with the rear centre-section struts. At a later stage a single radiator was mounted on the centre section; it is believed an underslung radiator was tried. (Photo: P. M. Bowers)

Bristol company's output. Contracts totalling 800 aircraft were therefore placed with the Gloucestershire Aircraft Co. on 30th October 1917 (for C9836-C9985), and with Marshall & Sons (D2626-D2775) and National Aircraft Factory No. 3 (D2126-D2625) on 22nd November 1917. On 22nd February 1918 further orders were given to the Standard Motor Co. (for E5179-E5428), Armstrong Whitworth & Co. (E1901-E2150), and Angus Sanderson & Co. (E2651-E2900); a second contract was given to the Gloucestershire company on 20th March (E9507-E9656); and on 21st May the Birmingham firm of shop fitters, Harris & Sheldon, were brought into Britain's aircraft industry with Contract No. 35A/1218/C.1158, which was for F5074-F5173. Last of the wartime contractors was the Austin Motor Co.

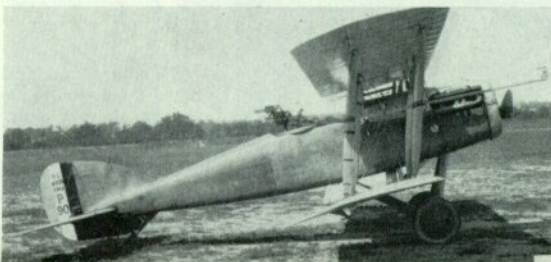
This expansion of production implied large demands for engines. Official incision and delay had led to difficulties over Rolls-Royce engines, and by August 1917 the firm's output of new engines was seriously behind schedule. Alternatives had to be sought for the Bristol Fighter programme. One official document indicates that the 200-h.p. Sunbeam Arab was specified for all aircraft built by contractors other than the parent company, with the exception of those ordered from National Aircraft Factory No. 3, for which the 200-h.p. Hispano-Suiza was indicated. Apparently the Arab was regarded as an acceptable alternative power unit for F.2Bs built by the parent company, but with

few exceptions Bristol-built aircraft had the Falcon engine. The exceptions were those F.2Bs that had experimental installations of other engines and 171 aircraft made late in 1918 of which 153 had Arabs, the remainder Pumas. It seems that the Bristols of the batch C751-C1050 were meant to have Arab engines but in fact these aircraft were completed with Falcons and most of them saw operational use with the squadrons in France, Italy and on Home Defence; only two, C906 and C1025, are known to have had Arabs.

In point of time a Hispano-Suiza installation was the first to undergo official tests. In January 1918, B1201, fitted with the Brasier-made 200-h.p. Hispano-Suiza No. 16456/W.D.11334, was tested at Martlesham Heath; a frontal radiator of roughly circular shape was fitted. B1204 with a Sunbeam Arab was similarly tested in March. Performance of both aircraft was poorer than that of the Falcon-powered F.2B.

At that time the supply of Hispano-Suiza engines had just passed crisis point, and Mayen-built engines were coming forward in sufficient numbers to enable S.E.5a production to develop. As it was obvious that the supply of Hispano-Suiza engines would not suffice to meet the Bristol Fighter production programme the Sunbeam Arab was standardised for the type. In view of the reduced performance, it was decided to issue the Arab-powered F.2B to corps-reconnaissance squadrons as a replacement for the R.E.8; it was planned to start this re-equipment in April 1918. The Falcon-

Left: The first U.S. XB-1A, S.C.40125, with the semi-monocoque fuselage developed at McCook Field. This fuselage weighed only 165 lb.; that of the U.S.A. O-1 weighed 275 lb. Right: This XB-1A, A.S.64177 (P-205) had its lower wing faired into the fuselage. (Photo: P. M. Bowers)







Left: A few Falcon-powered Bristol F.2Bs had radiators of increased area that substantially altered the shape of the nose. This one was photographed at the Isle of Grain shortly after the Armistice; another was at Cranwell in August 1919. Right: In the early post-war years experiments were conducted with free-flying target gliders, one of which is seen here on a Bristol F.2B. A larger type of glider was launched from a Westland Walrus.



Left: Single-bay wings of 30 ft. 11½ in. span, 7 ft. chord and an aspect ratio of 4.69 were fitted first to A7860 (R.A.F. 4d engine). The Falcon-powered F.2B F4360 is here seen at the R.A.E., Farnborough, on 25th January 1923, fitted with similar wings. (Photo: Crown copyright); Right: Also photographed on 25th January 1923 was F4728, fitted with the experimental three-bay wings of aspect ratio 9.78. (Photo: Crown copyright)



powered F.2B was to be reserved for the fighter-reconnaissance units. As the 200-h.p. Hispano-Suiza had been abandoned as a power unit for the Bristol, the aircraft built at the Cunard-managed National Aircraft Factory No. 3 were delivered with Falcon engines; the only known exception was D2132, which had an Arab.

Unfortunately, the Arab was a bad choice. On the recommendation of the internal combustion engine sub-committee of the Advisory Committee for Aeronautics, made under some pressure at the end of January 1917, the Arab had been ordered in large numbers from the Austin Motor Co. and from Willys-Overland of Canada Ltd., Toronto. At that time the engine's trials had not been completed, and by May 1917 serious weaknesses of cylinder and crank-chamber design had become apparent. So many modifications had to be made that the design of the Arab was not finally settled until the end of 1917. Willys-Overland production was further delayed owing to an extraordinary decision to convert all dimensions to inches from the metric units used on the original British drawings.

The substantial expansion programme for the Royal Flying Corps had envisaged an output of 1,800 Arab engines by the end of 1917: in reality only 81 were delivered by that date. Indeed, by the end of 1918 only 1,311 had been delivered, 116 of them made by Willys-Overland. Even after its lengthy development period the Arab was incurably unsatisfactory. It vibrated severely, a fault that, in the Bristol Fighter, led to the installation of more substantial engine bearers than were needed for the Falcon.

The Arab cooling system underwent several modifications. An early installation in C906 used twin radiator blocks of the kind fitted to the Arab and Viper engines on S.E.5a's and had a generally similar appearance. In view of the vibration difficulties encountered with the Arab the possibility of using the new 300-h.p. direct-drive Hispano-Suiza was examined, and the Arab installation, radiator and cowling were revised to accommodate either engine. This modified design was standardised, but at least one

Arab-powered Bristol F.2B that was at Martlesham late in 1918 had a radiator "gable-end" shaped.

On 31st October 1918 the Royal Air Force had on charge 721 Arab-powered Bristol Fighters. Only 79 of



Above: Post-war use of the Bristol F.2B in India and the Middle East led to cooling problems that were investigated at Farnborough. One attempted solution was this liberally-louvered cowling, almost certainly on C4654, photographed on 29th April 1923. (Photo: Crown copyright); Below: The greatly enlarged upper fin and rudder fitted in 1920 to the Puma-powered Bristol Fighter C4655 were similar in outline to the original surfaces. At Farnborough a few years later C4776 was fitted with revised vertical surfaces incorporating a balanced rudder, foreshadowing the tail unit of the Bristol Fighter Mk. IV. This photograph is dated 23rd March 1925.

(Photo: Crown copyright)







Dated 6th January 1930, this photograph depicts J6721, perhaps the most extensively modified Bristol F.2B of all. It had R.A.F. 34-section wings of steel construction embodying leading-edge condensers for the experimental evaporative cooling system fitted to the engine, which drove a Leitner-Watts adjustable-pitch airscrew. The wings had increased gap and were mounted at a large angle of incidence. (Photo: Crown copyright)



First of two Bristol Fighters to go to Canada, F4336 became G-CYBC. (Photo: R.C.A.F.)

these were in France, however; the only units known to have used the variant were the Long-Range Artillery Spotting Flights L, N, O and P.

Other alternative engines were tried in the Bristol Fighter. First of these was the 230-h.p. Siddeley Puma, a six-cylinder in-line engine that could only have been chosen because, like the Sunbeam Arab, it had been ordered into large-scale production in 1917. The earliest recorded trials of a Puma Bristol were conducted in February 1918, the subject aircraft being B1206. Performance was only marginally better than with the 200-h.p. Hispano-Suiza and Arab, and the Puma was difficult to install in the F.2B airframe. The installation, which had been designed at the R.A.E., resembled that of the D.H.9; a large, clumsy exhaust pipe was fitted on the port side and the radiator was underslung. The Puma engine had its own troubles, but later in 1918 a substantial number of production F.2Bs were fitted with it; in particular it seems likely that the aircraft ordered from the Austin Motor Co. were to have the Puma.

In September 1918 C4654 was tested with the high-compression version of the Puma, which gave 290-h.p. The extra power did not improve performance significantly and no development ensued. The Bristol C4654 later had a Falcon engine installed and remained in use at the R.A.E., Farnborough, for some years as an experimental aircraft.

Directional control of the Puma Bristol was not good. The R.A.E. designed a greatly enlarged fin and rudder and fitted them to C4655. They were similar in shape to the standard surfaces, but their total area was 29.3 sq. ft., whereas that of the standard fin and rudder was 17.9 sq. ft. This improved the aircraft's response to the controls but made it heavier to handle. Squadron Leader R. M. Hill (the late Air Chief Marshal Sir Roderic Hill, K.C.B., M.C., A.F.C.) and Flight Lieutenant J. Noakes both suggested that a balanced rudder would be a more effective solution. The enlarged tail was not standardised, but later variants of the Bristol Fighter had balanced rudders.

A Wolseley Viper engine was tried in B1200; the radiator and cowling were generally similar to those that had enclosed the 200-h.p. Hispano-Suiza on B1201. When tested in October 1918 the Viper Bristol

returned poor performance figures and no wartime development was undertaken.

Several Bristol F.2Bs were fitted with the 200-h.p. R.A.F. 4d engine at the R.A.E., Farnborough, but it seems unlikely that this air-cooled twelve-cylinder engine was ever seriously considered as a possible power unit for the aircraft. By 26th July 1918, B1201 had acquired the R.A.F. 4d engine No. 30324/40 and had been fitted with three-bay wings of 44 ft. 1½ in. span and 4 ft. 9 in. chord. In this form it was flown in comparative trails with A7260 and A7860, both of which also had the R.A.F. 4d; A7260 had standard mainplanes, those of A7860 had a chord of 7 ft., a span of 30 ft. 11½ in., and single-bay bracing. The Falcon-powered Bristols F4360 and F4728 were also fitted with the single-bay and three-bay wings respectively; they were at Farnborough in this form in January 1923, by which time B1201 had reverted to standard two-bay wings while retaining its R.A.F. 4d engine.

The Bristol Fighter's fine reputation naturally commended it to the U.S.A., which had entered the war with nothing that could seriously be called a military aeroplane, either in being or under construction. On the personal recommendation of General Pershing, made on 1st August 1917, plans were initiated for the production of the Bristol F.2B in the U.S.A.; the power unit mentioned in the original proposal was the 200-h.p. Hispano-Suiza. A specimen F.2B, A7207, was sent to America and arrived at the Smithsonian Institution, Washington, on 5th September 1917. Unfortunately, Colonel V. E. Clark of the Bolling Commission redesigned the aircraft to have the 400-h.p. Liberty 12, an engine that was quite unsuitable for the Bristol and was badly installed.

A contract for 1,000 aircraft was first placed with the Fisher Body Corporation but subsequently cancelled and re-allocated to the Curtiss Aeroplane & Motor Co. On 7th December 1917 the order was increased to 2,000. The first aircraft, which was given the designation U.S.A. O-1, was completed on 25th



Above: This Bristol Fighter was presented to King Albert of Belgium by Handley Page Ltd. on 14th May 1920. It returned to Cricklewood for modifications requested by its royal owner and was flown back to Brussels on 23rd July 1920. A second Bristol was presented to the Queen of Belgium. Below: The first Bristol Fighters to go to New Zealand, H1557 and H1558, retained their wartime khaki dope. The five aircraft subsequently delivered to the N.Z.P.A.F. were doped silver overall; this photograph is of 6857. (Photo: D. P. Woodhall)





January 1918, despite the grave misgivings of Captain Barnwell, who foresaw serious difficulties. It did not fly until 5th March. Matters were not helped by the introduction of unnecessary modifications; the misdirected industry of Major E. J. Hall of the U.S. Signal Corps had, by the end of March 1918, rendered about 1,400 Curtiss production drawings obsolete. Output was held up, and crashes of O-1s on 7th May, 10th June and 15th July brought the design, quite unjustifiably, into disrepute: the first two accidents were caused by faulty workmanship, the third by pilot error.

By the end of June 1918, *A7207* (by then P-30 of McCook Field) had been fitted with the only existing specimen of the American-built 300-h.p. Hispano-Suiza. This combination seemed a better proposition to the U.S. Air Board, who suggested to Curtiss that work on the Liberty version should be abandoned in favour of the Hispano-Suiza. In spite of the company's protests the contracts for the U.S.A. O-1 were cancelled on 20th July after two prototypes and 25 production aircraft had been built.

A second British-built F.2B was sent to the U.S.A. in 1918 and, as P-37, was fitted with the 280-h.p. eight-cylinder Liberty 8. This aircraft crashed before trials could be conducted. The most sensible suggestion that emerged from the American Bristol Fighter débâcle was that put forward by W. C. Potter of the Bureau of Aircraft Production; namely, that the original Bristol Fighter be produced exactly as Frank Barnwell had designed it, but with either the Liberty 8 or the 300-h.p. Hispano-Suiza. Unfortunately, it was never taken up. The nearest approach to it was a proposal to fit four U.S.A. O-1 fuselages with the Hispano-Suiza and a further four with the Liberty 8, the aircraft to be designated U.S. B-1 and B-2 respectively. This scheme was abandoned, but work proceeded on two developments, using these engines but having semi-monocoque fuselages made by the McCook Field engineers, and the respective designations U.S. B-3 and B-4. These were subsequently changed to U.S. XB-1 and XB-2; the former was to have twin Marlin guns for the pilot, the latter

two Brownings. The XB-2 was abandoned because the Liberty 8 was unsatisfactory; the XB-1 had to be rebuilt after storm damage and, with Browning guns in place of the intended Marlins, was re-designated U.S. XB-1A. It was tested at McCook Field on 3rd July 1919. Forty were built by the Dayton-Wright company, powered by the 300-h.p. Wright H; they were apparently intended for use as night observation aircraft. One was fitted experimentally with the 350-h.p. Packard 1A-1327 engine, another with the 400-h.p. Curtiss D-12. For all the effort that went into all the American variants none of them was any better than the original Bristol F.2B.

The Bristol Fighter ended the war supreme in its class. It had fought with distinction with six fighter-reconnaissance squadrons in France; with the redoubtable crews of No. 1 Squadron, Australian Flying Corps, in Palestine; with No. 139 Squadron in Italy; and had equipped five Home Defence squadrons in England.

During the closing months of the war the operational use of radio telephony was pioneered by Bristol Fighter squadrons, of which the first to be equipped was No. 11. In No. 88 Squadron, which was using R/T in August 1918, only the flight commander's aircraft had a transmitter, all the others having receivers. The equipment relied on trailing aerials, which had to be wound in when combat was imminent, and its usefulness was therefore limited.

The Bristol was also used in early experiments at the R.A.E. with parachutes. Two Calthrop A.1. static-line parachutes were carried in the underside of the fuselage, the experiments starting in 1918 and continuing after the armistice. Bristol F.2Bs that were modified to accommodate the parachutes were *A7260* and *H1561*.

After the war the Royal Air Force adopted the Bristol as its standard army co-operation aircraft. In this capacity it equipped squadrons in England, India, Palestine, Egypt and Turkey, undergoing many modifications and acquiring much strange equipment. Production continued in 1919-20 with the Bristol Fighter Mk.II, which had a tropical radiator with more numerous shutters, and provision for desert equipment. The Mk.III, redesigned to take higher loads, followed in 1926; the Mk. IV applied to Fighters Mk. II and III that had Handley-Page slots, a revised upper fin and balanced rudder, and a stronger undercarriage.

At an early post-war stage some thought was given to the possibility of using the Bristol F.2B as a carrier-borne aircraft. An engineless airframe had been subjected to immersion trials off the Isle of Grain on 9th November 1918, and *F4453* was later used in a series of deck landings, apparently aboard H.M.S. *Eagle*.

In the years following the armistice, many war-surplus Bristol F.2Bs were sold to foreign countries. In 1922 Norway bought five reconditioned F.2Bs from the Bristol company. Eight standard Falcon-powered aircraft were bought by the Irish Free State from the Aircraft Disposal Co., followed in 1925 by six new F.2Bs from Bristol. Belgium purchased fifteen aircraft with the 300-h.p. Hispano-Suiza from the Aircraft Disposal Co., and sixteen new aircraft with the same engine, Frise ailerons and oleo undercarriages, in 1923; finally the Société Anonyme Belge de Constructions Aéronautiques (SABCA) obtained a licence for the manufacture of the F.2B. They built forty in 1925; these had the 300-h.p. Hispano-Suiza,



Above: Possibly a SABCA-built Bristol F.2B, this was No. 45 of l'Aéronautique Militaire Belge, with 300-h.p. Hispano-Suiza engine, oleo undercarriage and horn-balanced rudder. Below: One of twelve new-built Bristols supplied to Spain in 1924 with 300-h.p. Hispano-Suiza, oleo undercarriage and Frise ailerons.

(Photo: Bristol Aeroplane Co., Ltd.)





oleo undercarriage and horn-balanced rudder.

After buying a number of Hispano-powered Bristols from the A.D.C., Spain ordered a dozen new aircraft from Bristol in 1924; these last had Frise ailerons. The ten aircraft delivered to Mexico in 1928 had these ailerons, balanced rudders and oleo undercarriage. Others went to other places by devious ways; one was reported to be on the strength of Sun Yat Sen's rebel air force in China; at least two found their way on to the U.S. civil register.

Oddly, very few went to Commonwealth air forces. In addition to F4336 (G-CYBC) only D7869 went to Canada to become G-CYDP. Under the Imperial Gift scheme H1557 and H1558 went to New Zealand, where they were used by the N.Z. Permanent Air Force. Five more Falcon F.2Bs were ordered by New Zealand; they were flown wearing their Bristol works sequence numbers (6856-6857 and 7120-7122) as serial numbers. No. 7122, a Mk.III, was delivered in July 1927.

Many variants and derivatives of the remarkable Bristol appeared in the 1920s, but in British and Commonwealth military service the Falcon-powered version was, fittingly, the last to remain. The R.A.F. finally relinquished its greatest two-seat fighter in 1932. Last of all were those of the R.N.Z.A.F., which were withdrawn in 1936, and scrapped in 1939.

Two examples of the Bristol F.2B survive. The Imperial War Museum, London, houses E2581, the more authentic of the two; this aircraft bears markings that suggest it may have been used by a Home Defence squadron in 1918. The other is the well-known D8096, which was with No. 208 Squadron in Turkey in the mid-1920s, was allotted the civil identity G-AEPH in 1936, and was restored to airworthy condition with its original serial number in 1951.



Bristol F.2B Mk. II with oleo undercarriage, enlarged tyres, flare brackets and post-war radiator shutters, 1920. This aircraft, J6790, was tested at Marletsham Heath later became G-ACCG, and survived until 1939.

(Photo: Bristol Aeroplane Co., Ltd)



In service in India, F4349 displays some of the impedimenta with which the post-war Bristol F.2B was encumbered. This aircraft has the underslung auxiliary tropical radiator, an adjustable-pitch airscrew and navigation lights. (Photo: D. P. Woodhall)



The prototype Mk. IV, H1417, had square-tipped upper wings and its upper ailerons were linked to the slats.

(Photo: Bristol Aeroplane Co., Ltd.)

### SPECIFICATION

Power: 190-h.p. Rolls-Royce Falcon I; 220-h.p. Falcon II; 275-h.p. Falcon III; 150-h.p. Hispano-Suiza (A3304 only); 200-h.p. Hispano-Suiza; 200-h.p. Sunbeam Arab; 230-h.p. Siddeley Puma; 290-h.p. high-compression Puma; 200-h.p. Wolseley W.4A Viper; 300-h.p. Hispano-Suiza; 200-h.p. R.A.F. 4d; 290-h.p. Liberty 8; 400-h.p. Liberty 12 (in U.S.A. O-1); 300-h.p. Wright H (in U.S. XB-1A); experimental installations of 350-h.p. Packard 1A-1327 and 400-h.p. Curtiss D-12 in U.S. XB-1As.

Dimensions (standard F.2B, Falcon III): Span 39 ft. 3 in.; length 25 ft. 10 in.; height 9 ft. 9 in.; chord 5 ft. 6 in.; gap 5 ft. 4½ in.; stagger 18-1 in.; dihedral 3° 30'; incidence 1° 45'; span of tail 12 ft. 10 in.; airscrew diameter (P.3045, four blades) 9 ft. 4 in., (two blades) 9 ft. 8 in.; wheel track 5 ft. 5½ in. (tyres, Palmer 750×125 mm. on wartime F.2B). Span of the F.2A prototypes was 39 ft. 2½ in., of the U.S. XB-1A, 39 ft. 4¾ in.

Areas: Wings (F.2A) 389 sq. ft. (F.2B) 405.6 sq. ft., ailerons, each 13 sq. ft.; tailplane (F.2A) 26 sq. ft., (F.2B) 22.25 sq. ft.; elevators (F.2A) 22.5 sq. ft., (F.2B) 23.25 sq. ft.; fin, upper 6.9 sq. ft., lower 3.8 sq. ft.; rudder 7.2 sq. ft.

Production: Under wartime contracts more than 5,500 Bristol Fighters were ordered, but not all were delivered; official statistics indicate that 3,101 had been accepted for service with the R.F.C. and R.A.F. up to the end of 1918. The Bristol company received post-war contracts for a total of 378 Bristol Fighters for the R.A.F. and supplied 49 new aircraft to foreign governments. It is difficult to determine precisely how many new Bristol Fighters were built altogether, but the following blocks of serial numbers were allocated.

British & Colonial Aeroplane Co. Ltd., Filton and Brislington (later the Bristol Aeroplane Co. Ltd.): For Bristol F.2A: A3303-A3354. For Bristol F.2B: A7101-A7300; B1101-B1350; C751-C1050; C4601-C4800; C4801-C4900; D7801-D8100; E2151-E2650; F4271-F4970; H1240-H1739 (H1708-H1739 cancelled); J1231-J1430 (cancelled). For Bristol F.2B Mk.II: J6586-J6800; J7617-J7699. For Bristol F.2B Mk.III: J8242-J8291; J8429-J8458. Additionally the Bristol company supplied F.2Bs to other government as follows: New Zealand, 5 (works sequence numbers 6856-6857, 6120-7122); Greece, 6 reconitioned aircraft (s/ns 6156-6161); Spain, 5 reconitioned (s/ns 6140-6144) and 12 new F.2Bs (s/ns 6510-6521); Belgium, 16 (s/ns

6223-6238); Mexico, 10 (s/ns 7222-7231); Irish Free State, 6, I.F.S. Army Nos. 17-22 (s/ns 6858-6863).

Sir W. G. Armstrong, Whitworth & Co. Ltd., Gosforth, Newcastle-on-Tyne: E1901-E2150; H3796-H3995 (cancelled).

Austin Motor Co. (1914) Ltd., Northfield, Birmingham: H6055-H6058 known; Puma engines fitted.

Gloucestershire Aircraft Co. Ltd., Sunningend, Cheltenham: C9836-C9985; E9507-E9656; H926-H1060 (known part of larger batch).

Harris & Sheldon Ltd., Stafford Street, Birmingham: F5074-F5173, Marshall & Sons, Gainsborough: D2626-D2775; J2292-J2391 (cancelled).

National Aircraft Factory No. 3, Aintree, Liverpool: D2126-D2625, Angus Sanderson & Co., Newcastle-on-Tyne: E2651-E2900.

Standard Motor Co. Ltd., Cash's Lane, Coventry: E5179-E5428 (E5253-E5308 were completed by British & Colonial Aeroplane Co., E5253-E5258 with Puma engines; E5309-E5428 were cancelled).

#### Production in the U.S.A.

Curtiss Aeroplane & Motor Corporation, Buffalo, N.Y.: Two prototypes of U.S.A. O-1 and 25 production aircraft.

Dayton-Wright Airplane Co. Dayton, Ohio: Forty U.S. XB-1A, including A.S.64115 (P-171), A.S.64156, A.S.64158 (P-179), A.S.64160 (P-181), A.S.64161 (P-182), A.S. 64177 (P-205), A.S.64300 (P-180), A.S.94107 (P-150), A.S.94108 (P-151).

Engineering Division of the Bureau of Aircraft Production, McCook Field, Dayton, Ohio: Prototype U.S. XB-1A, S.C.40125 (P-90).

#### Production in Belgium

Societe Anonyme Belge de Constructions Aeronautiques, 13 rue de Brederode, Brussels: Forty F.2Bs with 300-h.p. Hispano-Suiza 8Bfs for l'Aeronautique Militaire Belge.

#### Wartime A.R.D. Rebuilds

B883, B7947, B8915, B8925, B8928, B8947, E9971, F5811, F5817, F5821, F5995, F5997, F5999, F6042, F6116, F6235, F9616, H7061-H7065.

Armament: One fixed 0.303-in. Vickers machine gun with Constantinesco C.C. synchronising gear, Aldis and ring-and-bead sights, Hyland Type B loading handle. One 0.303-in. Lewis machine gun, or a double-yoked pair, on Scarff No. 2 ring mounting with Norman sight or Hutton illuminated sight. Up



Bristol Fighter F.2B,  
No. 139 Squadron, R.F.C., Italy. Late 1918



No. 139 Squadron.

Bristol Fighter F.2B in night  
fighter finish. Unit unknown. ▲



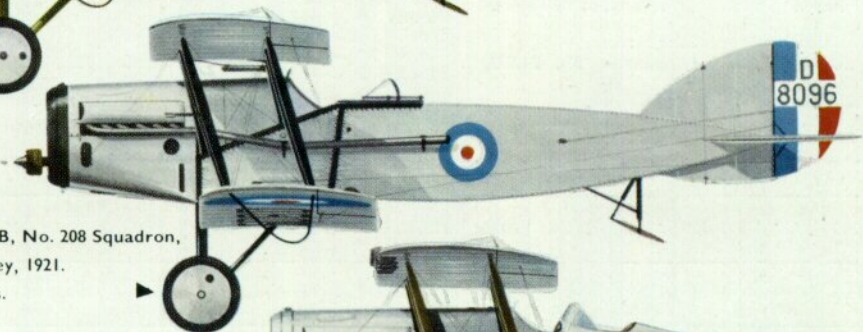
Bristol Fighter F.2B, No. 48 Squadron,  
R.F.C. Pilot Keith Park. ▼

Bristol Fighter F.2B, No. 22 Squadron,  
France, 1918. ▼

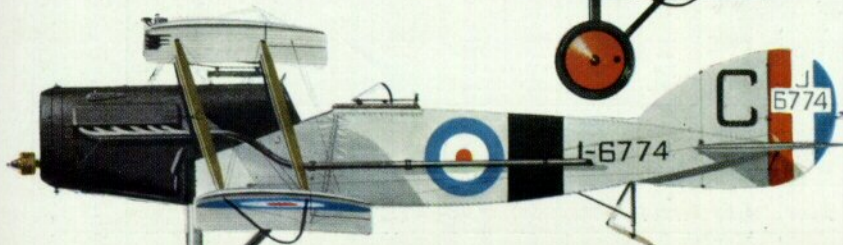


No. 62 Squadron.

Bristol Fighter F.2B, No. 208 Squadron,  
San Stefano, Turkey, 1921.  
D8096 still survives. ▶



Bristol Fighter Mk.III,  
'Prince of Wales Own'  
converted to V.I.P. transport  
by No. 24 Squadron. ▶



No. 11 Squadron. Aircraft number  
or letter usually aft of marking.

Bristol Fighter Mk.II, No. 20 Squadron, Peshawar,  
India, 1930. This a/c had tropical header tank  
and underslung radiator.





The standard Bristol F.2B Mk. IV had automatic slots on mainplanes of standard plan-form, strengthened undercarriage and fuselage, an enlarged upper fin and horn-balanced rudder.

to twelve 20-lb. Cooper fragmentation bombs could be carried on racks under lower wings; Negative Lens bomb sight.

Service use—wartime

Western Front: Bristol F.2A. No 48 Squadron, R.F.C. Bristol F.2B. Squadrons Nos. 11, 20, 22, 48, 62 and 88; one or two Bristols attached to Squadrons Nos. 4, 10, 12, 15 16 and 35 and to No. 3 Squadron, Australian Flying Corps; Long Range Artillery Spotting Flights L, M, N, O and P.

Home Defence: Squadrons Nos. 33, 36, 39, 76 and 141.

Palestine: No. 67 (Australian) Squadron, R.F.C. (later No. 1 Squadron, Australian Flying Corps); part of No. 111 Squadron, R.F.C.; one Bristol F.2B with 'X' Flight at El Gueira and 'Azraq, September 1918.

Italy: One Flight of No. 28 Squadron, March 1918, detached and transferred to No. 34 Squadron as 'Z' Flight end March, finally expanded to become No. 139 Squadron on 3rd July 1918. Post-war service, Royal Air Force.

Home-based squadrons Nos. 2, 4, 13, 16, 24. Ireland: Nos. 100, 105, 106. Germany: Nos. 5, 11, 12. Iraq: Nos. 6 and 8. India: Nos. 5, 20, 27, 28, 31. Palestine: No. 14. Turkey: Nos. 4 and 208. Egypt: Nos. 47 and 208.

Belgian use: Bristol F.2Bs equipped four escadrilles of l'Aeronautique Militaire Belge.

Examples of Bristol F.2Bs used by operational squadrons.

Wartime: No. 11 Sqn.—A7127, A7171, (aircraft '3'), B1332, C775, C797, E2215.

No. 20 Sqn.—A7144, B1307, C859, D7919, E2407, F6116.

No. 22 Sqn.—A7223, B1209, C795, C961, D7896, E2408.

No. 48 Sqn.—F.2As A3320, A3322, ('S'), A3323, A3330, A3336

('I'), A3343, F.2Bs A7213, B1124, B1299, C814 ('I2'), C943, F5995.

No. 62 Sqn.—B1207, C796, C4633, D7945, E2468, F5168.

No. 88 Sqn.—B7947, C785, D8064, E2263 ('Q'), E2459 ('I2'), F5997.

No. 67 Sqn.—A7198, B1128, B1129 (Capt. Ross Smith, M.C., D.F.C., A.F.C.), B1146, C4624, C4840.

No. 139 Sqn.—C916, C997, D2185, D7972 (Maj. W. G. Barker, D.S.O., M.C., flew Maj. H.R.H. The Prince of Wales as passenger, 16th September 1918), E2284, E2285.

No. 141 Sqn.—C820, C977, C4822, D2245, D2535, D7987. 'L' Flight—F4306.

Post-war. No. 2 Sqn.—F4490, F4854, J6669, J6794, J7699, J8267. No. 4 Sqn.—E2624 ('4A').

No. 5 Sqn.—C801 ('A'), C1039 ('B'), D8035 ('A'), F4320 ('D'), J6613, J6654 ('B').

No. 6 Sqn.—C766, DR8056, E2629, FR4744, H1493, J8281.

No. 8 Sqn.—D7823, D7852, D7881, D7901.

No. 12 Sqn.—C9982 ('A1'), D8059 ('B5'), E2533 ('C6'), F4414 ('B2'), H1568, ('C6'), J6600.

No. 13 Sqn.—F4503, F4957, H1440, J6743, J7660, J8290.

No. 16 Sqn.—F4513.

No. 24 Sqn.—F4688.

No. 31 Sqn.—E2297, F4494 ('F'), F4658.

No. 40 Sqn.—C4879.

No. 208 Sqn.—D8096, FR4583, F4950, H1678, J6767, JR6788.

The author acknowledges his indebtedness to the researches of C. H. Barnes and L. E. Opdycke.

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#### WEIGHTS AND PERFORMANCE

Aircraft	A3303	A3304	C4808	A7183	B1201	B1204	B1206	C4654	B1200	E2400	P-30	U.S.A. O-1	U.S. XB-1A	U.S. XB-1A P-180
Engine	Falcon I	150-h.p. Hispano-Suiza	Falcon II	Falcon III	200-h.p. Hispano-Suiza	Arab	230-h.p. Puma	290-h.p. Puma	Viper	300-h.p. Hispano-Suiza	300-h.p. Hispano-Suiza	400-h.p. Liberty 12	300-h.p. Wright H	350-h.p. Packard IA-1327
Weights (lb.):														
Empty	1,727	1,474	—	1,934	1,733	1,886	1,918	1,944	1,867	2,067	—	—	2,010	—
Military load	180	160	—	185	192	185	185	185	185	185	—	—	283	—
Crew	360	360	—	360	360	360	360	360	360	360	—	—	360	—
Fuel and oil	486	479	—	300	345	373	347	344	394	408	—	—	341	—
Loaded	2,753	2,473	2,860	2,779	2,630	2,804	2,810	2,833	2,806	3,020	2,910	2,937	2,994	3,983
Max. speed (m.p.h.):														
At ground level	110	—	—	—	—	—	—	—	—	—	—	—	124	—
At 6,500 ft.	105	99	—	119	—	—	—	—	100.5	—	113.6	138	121	121.5
At 10,000 ft.	101	95	111.5	113	105	104	104	110	95	107	—	—	118.5	—
At 15,000 ft.	96	—	103.5	105	97.5	94	99	103.5	—	101	—	—	112	—
Climb to:	m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	m. s.
6,500 ft.	7 30	10 30	—	6 30	8 40	8 5	7 40	7 00	12 20	7 10	—	—	7 50	—
10,000 ft.	14 30	19 00	—	13 15	11 15	15 5	14 25	13 30	11 55	22 20	10 45	8 30	13 20	15 20
15,000 ft.	31 00	—	—	21 20	28 50	29 45	25 10	22 10	—	24 50	—	—	24 00	—
Service ceiling (feet)	16,000	14,500	20,000	20,000	19,000	17,000	20,000	20,500	14,500	18,250	—	—	20,900	—
Endurance (hours)	3½	6	3	3	—	—	—	—	—	—	—	—	—	—