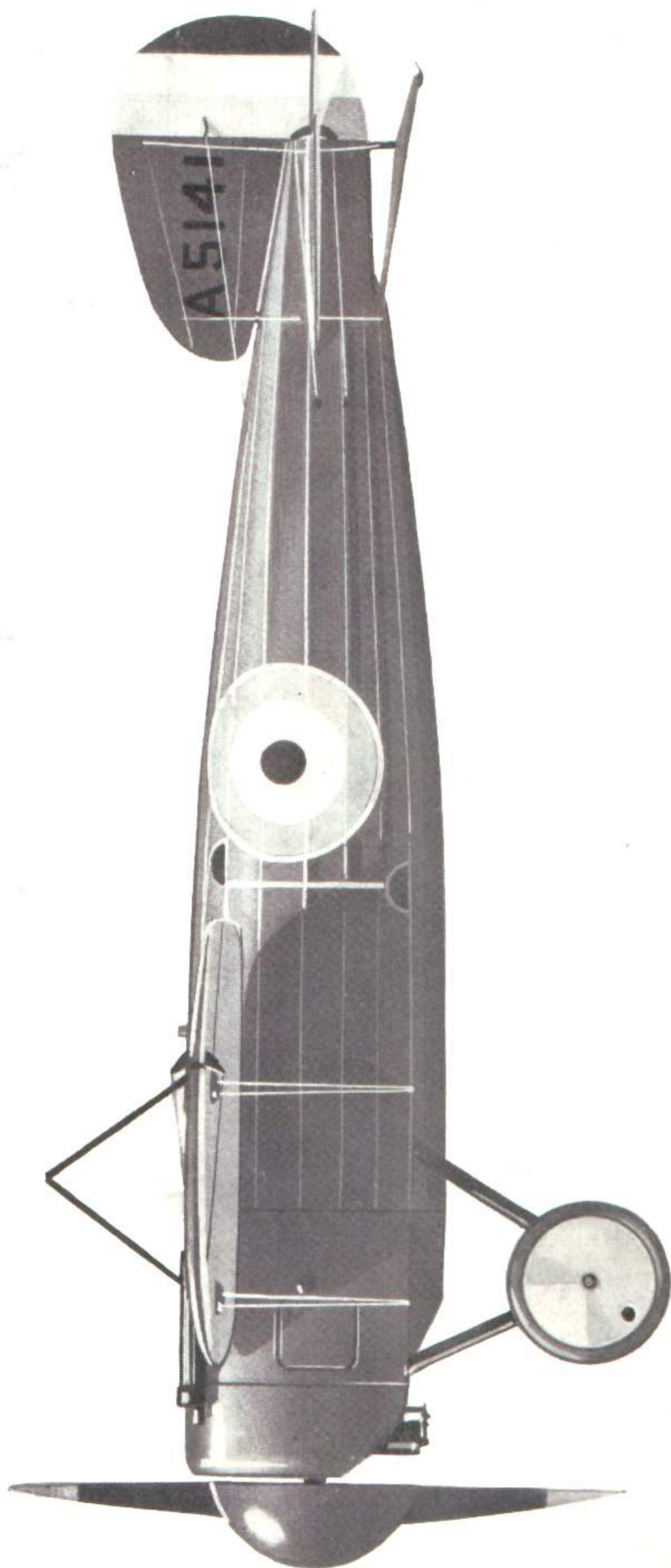


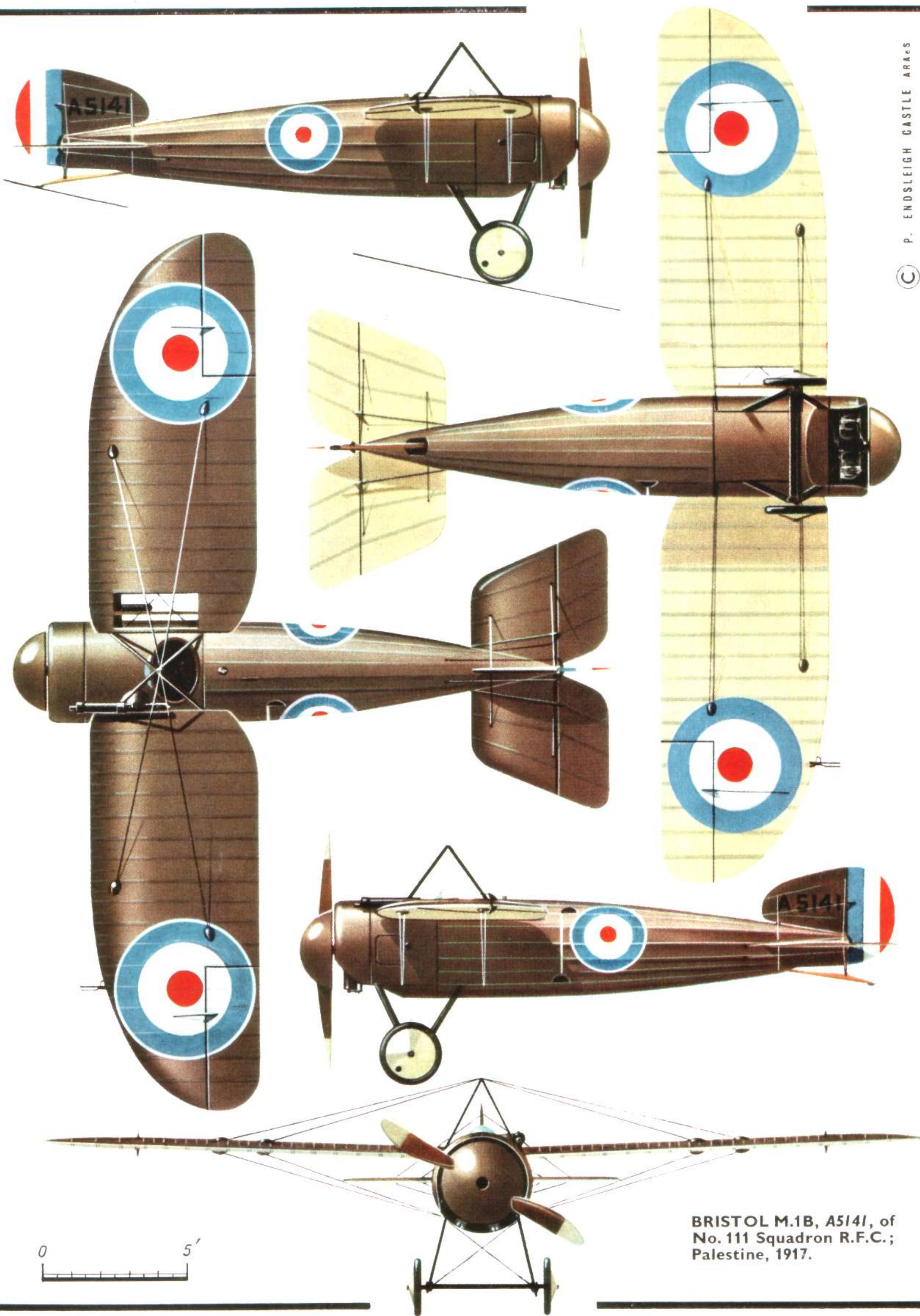
**PROFILE
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The
Bristol
M.1

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BRISTOL M.1B, A5141, of No. 111 Squadron R.F.C.; Palestine, 1917.



The Bristol M.1

by J. M. Bruce

The Bristol M.1A photographed at Filton shortly after its emergence from the factory.

(Photo: Bristol Aeroplane Co.)

The history of the D.H.5 (*Profile* No. 181) is the account of one great designer's attempt to produce a fighting aircraft with high performance and optimum view for the pilot. The Bristol M.1A was Frank Barnwell's solution to the same problem. The Bristol appeared to be incomparably the better and more development-worthy aeroplane of the two, yet its production was limited and its operational service obscure.

As related in *Profile* No. 139 (the Bristol Scouts C and D) a few Scouts D were experimentally fitted with 110 h.p. Clerget engines and large-diameter spinners. Considered as engine installations these were generally successful and Barnwell incorporated this design feature in the new single-seat fighter that he began to design in the early summer of 1916.

Barnwell's design was, at that time, even more radical than that of the D.H.5. Within the state of the art and the limitations imposed by considerations of production and ease of maintenance in the field he produced the cleanest aeroplane that it was then possible to build. It was a monoplane. This alone was a bold conception, for only four years had elapsed since the War Office had misguidedly banned the use of monoplanes by the Military Wing of the R.F.C. following a number of fatal accidents involving such aircraft. The effects of the so-called "monoplane ban" are traditionally held to have influenced British aircraft design inflexibly in favour of the biplane for a disproportionately long time. There is doubtless some truth in this, but the fact cannot be ignored that, with the primitive materials and techniques available to manufacturers at the time, the convenience, simplicity and strength of a biplane

wing truss had much to commend them; and pre-war biplanes like the B.S.1, Sopwith Tabloid and Avro 504 had been able to demonstrate that their performance was at least equal to that of many contemporary monoplanes and better than most.

Designated Bristol M.1A and powered by a 110 h.p. Clerget 9Z engine, the prototype of the new fighter emerged in July 1916. Its Bristol works sequence number was 1374. It must have been one of the simplest and cleanest aircraft of its day, for Barnwell had designed the fabric-covered fuselage to be fully faired throughout its length, and formers and full-length stringers preserved a circular cross section to a point behind the wing. From there aft the fairing tapered smoothly to the rudder post.

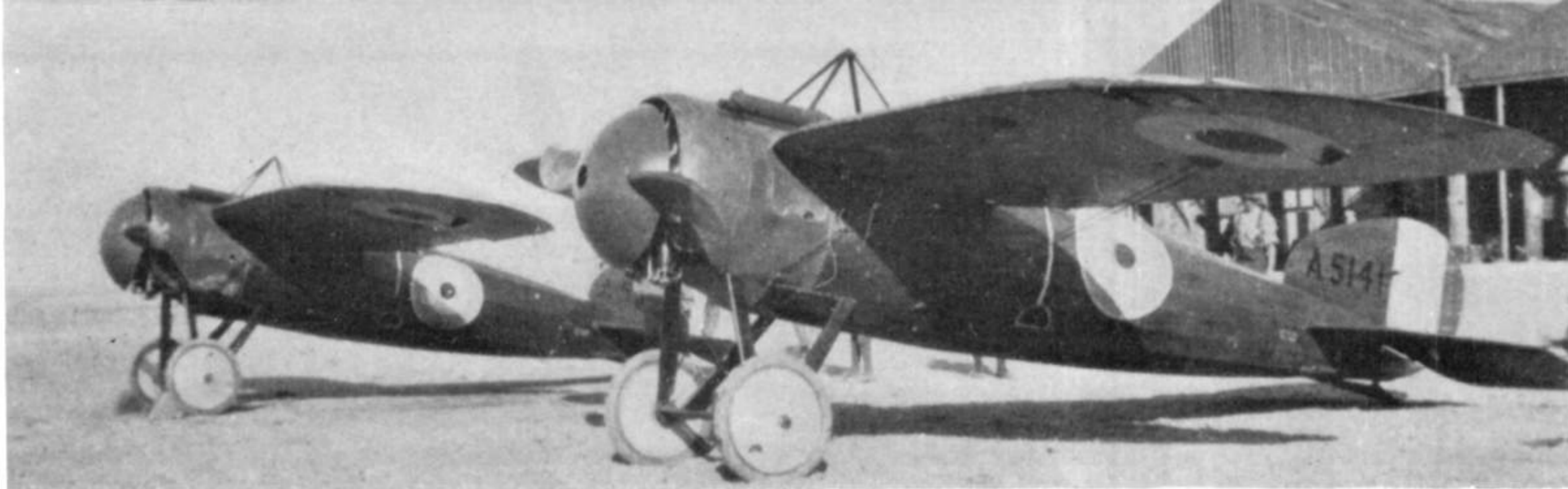
The wings were attached to the upper longerons, their outer leading edges being given a wide, semi-elliptical sweep-back at the tips. This meant that the front spar was appreciably shorter than the rear, and that there was no inter-spar cross bracing beyond the end of the front spar. Thus two-thirds of the span of the broad-chord ailerons ran along the extensions of the rear spars.

To anchor the landing wires a cabane structure of unusual shape was used. It consisted of two members, each a curvilinear component of streamline-section steel tubing, meeting on the centre line directly above the cockpit. No doubt this curious shape was chosen to facilitate the pilot's ingress to and egress from his seat. The flying wires (duplicate Rafwires) ran from the lower longerons of the fuselage to points on the

F. P. Raynham in the cockpit of the M.1A.

The Bristol M.1A on the occasion of one of its earliest flights, possibly its first.





The second and third M.1Bs, A5140 (left) and A5141 (right) with No. 111 Squadron, R.F.C., in Palestine, 1917. Note the slightly different placing of the fuselage roundels on these two aircraft. (Photo: John H. Blake)

underside of the wings corresponding to the attachment points of the landing wires. Typical of Barnwell's attention to detail was the provision of fairings over the anchorage points above and below the wings.

Throughout its structure the M.1A employed the materials and techniques then in general use and presented no manufacturing difficulties. The fairings of the fuselage might require more man-hours than a simpler flat-sided structure, but this was more than offset by saving on wing-construction time.

The M.1A's first flight took place on 14th July 1916 at Filton. The pilot was F. P. Raynham, and the speed attained was a phenomenal 132 m.p.h. Later that month the M.1A was tested at Central Flying School, Upavon. It had no armament when Raynham first flew it, but the C.F.S. report includes a weight figure of 50 lb. for "military equipment". This does not necessarily mean that a gun was fitted: the weight might have been ballast only. A total of 17½ gallons of petrol were carried in three tanks: 6¼ gallons in the main pressure tank, an equal quantity in the auxiliary pressure tank, and 5 gallons in the gravity tank.

The C.F.S. report (No. M.21) notes that no attempt was made to establish the M.1A's maximum

speed at ground level because its airscrew was designed to give its best performance at altitude. Excellent performance figures were again recorded. The speed at 5,400 ft. was 128 m.p.h., at 9,300 ft. 120 m.p.h., and at 15,000 ft. 110.5 m.p.h. Three climbing trials produced slightly varying results; the best were obtained with the aircraft climbing at an indicated air speed of 70 m.p.h.

Nevertheless the narrative portion of the report, if not altogether unenthusiastic, was somewhat lukewarm:

Stability: Lateral very good; longitudinal fairly good; directional good. Length of run to unstick, 85 yds.; to pull up (engine stopped) 114 yds.

Control: Stick. Single. Machine tiring to fly. Requires good pilot. Moderate ease of landing. Machine trims at 95-105 m.p.h. with engine all out at 8,000 ft. Machine is nose heavy when gliding. Tendency to turn to right with engine on."

A remarkable omission from that report is any mention of the view from the cockpit. In all upwards directions it was uninterrupted; forwards and downwards it was virtually nil.

In August 1916 a Bristol monoplane airframe was



(Left) The first Bristol M.1B, A5139, had its clear-view panel in the starboard wing root covered with transparent material. This view shows clearly the Vickers gun mounted on the port upper longeron and the white guide line between the upper and lower foot-holds in the fuselage side. (Right) This frontal view of A5141 in Palestine shows the Clerget engine, small frontal opening in the spinner, and position of the Vickers gun. (Photo: John H. Blake)



(Left) The fourth M.1B, A5142, with its Vickers gun installed centrally on top of the fuselage. (Photo: I.W.M. H(AM) 1469) (Right) The first production M.1C, C4901, together with another M.1C and an Avro 504A, photographed in Egypt. The absence of armament indicates that the Bristols were used for training purposes.



subjected to proof-loading tests. As no other aircraft of the type was then in existence the tests must have been performed on the prototype itself. The M.1A provided convincing proof of its structural strength. In normal flight position with a total load of 9,900 lb. on the wings (8.8 times normal flying load) the fuselage spacer between the front wing spars failed in compression. When stripped and examined, the wings themselves showed no sign of failure. Under a down load of 2,200 lb. the horizontal portion of the cabane structure began to bow, and at a load of 2,550 lb. the forward fixing lugs of the cabane gave way and the tubular members collapsed. All other components withstood substantial loads before failing.

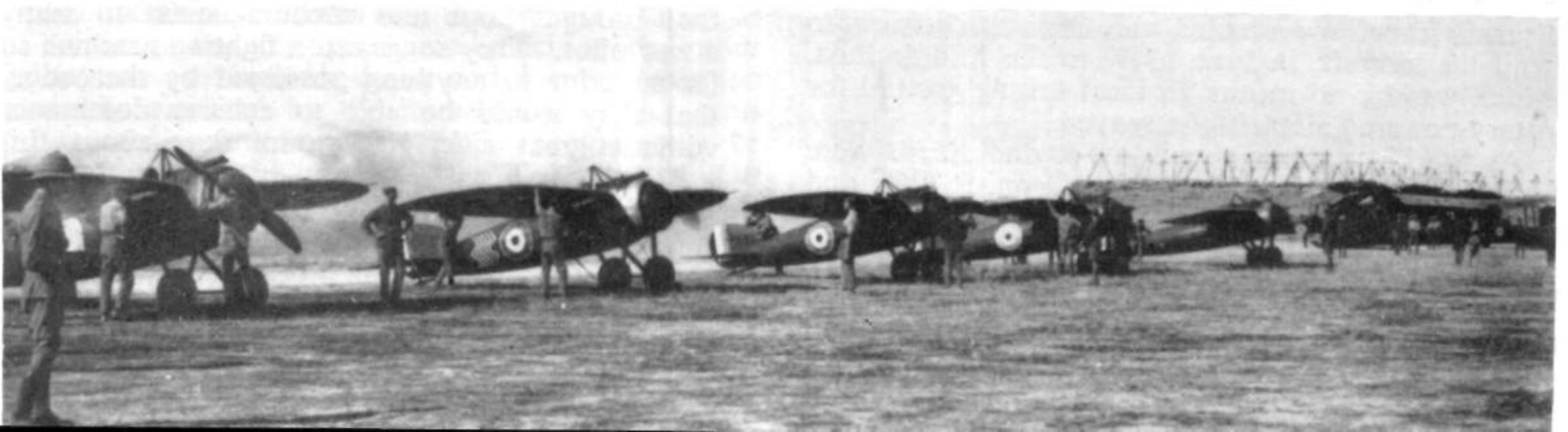
From such external evidence as exists it appears that the War Office was in no hurry to make up its mind about the Bristol monoplane. The excellent performance and structural-test figures did not find ready acceptance as adequate reasons for ordering the type in quantity, and this at a time when production aircraft could have been available long before the production Camels and S.E.5s. Instead a contract (No. 87/A/761) was given for the construction of four further prototypes, and then not until 9th October 1916. The contract included the M.1A, and the serial numbers allotted to the five aircraft were A5138-A5142. The Bristol works sequence numbers of A5139-A5142 were 1481-1484.

The M.1A was apparently repaired after the structural tests and, with the serial number A5138, was delivered to Central Flying School on 29th November 1916. By that time it had been modified in several respects, and was virtually identical with the four further prototypes. These were designated M.1B and had a single Vickers gun mounted on the port upper longeron just ahead of the cockpit. The cabane consisted of a pyramidal arrangement of four straight steel tubes converging above the cockpit, and a large inter-spar cut-out was made in the starboard wing root



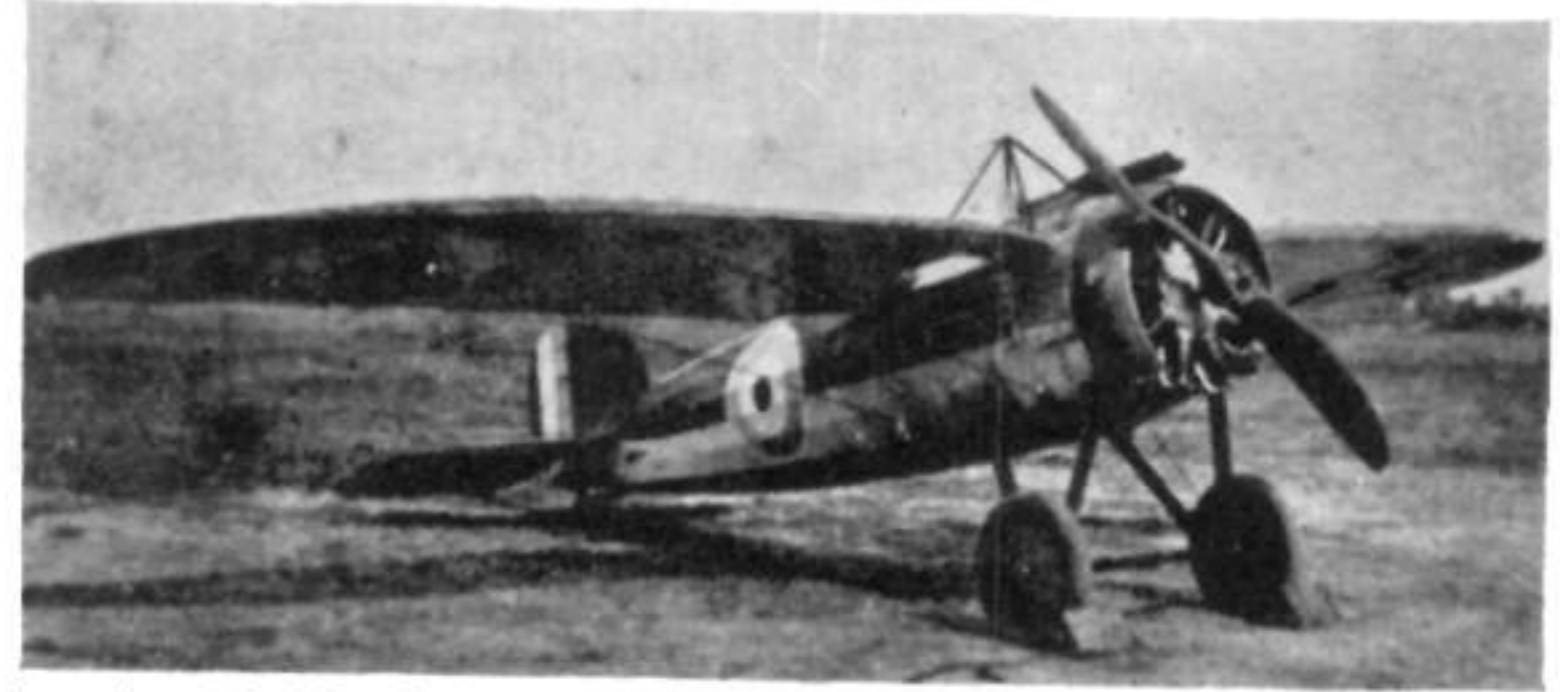
C4912 of No. 150 Squadron, R.A.F., at Salonika, 1918. This aircraft was flown by Lt. K. B. Moseley on 26th July 1918 when, as described in the narrative, he shot down a D.F.W. two-seater. (Photo: E. F. Cheesman)

Bristol M.1Cs of No. 72 Squadron in Mesopotamia, 1918. The aircraft second from the left is the subject of one of the colour drawings on page 11, and is the only one to bear the multiple zig-zag marking on the fuselage sides. The fifth and most distant M.1C has no roundels on the fuselage sides. (Photo: I.W.M. H(AM) 1583)



The eighth production M.1C, C4908, photographed at Martlesham Heath, where it was tested in December 1917 as the subject of the official Trials Report No. M.161.

(Photo: I.W.M. H(AM) 885)



Another M.1C of No. 150 Squadron, with its spinner removed to improve cooling of the engine. This aircraft had tyres of thicker section than was standard.

to give the pilot some downward vision. Whereas the M.1A had provided two foot-stirrups on both the lower and upper longerons the M.1B provided only one in each position. A vertical white guide line was painted on the fuselage side between the upper and lower foot-holds in order to guide the pilot on his way into and out of the cockpit, entering which must have been something of a contortionist feat.

The first two M.1Bs, delivered to C.F.S. on 15th December 1916 and 19th January 1917 respectively were, like the M.1A, powered by the 110 h.p. Clerget 9Z. The third M.1B, A5141, which was completed by 8th February 1917, had a 130 h.p. Clerget 9B. Much more remarkable was the engine of A5142: when despatched from the Bristol works at Filton on 22nd March 1917 it was powered by a 150 h.p. A.R.1 and underwent official performance tests during that same month. The recorded results were remarkably poor. Just how the Bristol company, who were not major Admiralty contractors, contrived to obtain at that early date a specimen of the latest engine developed for the R.N.A.S. and installed it in an aircraft ordered by the War Office is one of the minor mysteries of the war. Only three A.R.1 engines had been delivered by the end of March 1917 and, as recorded in Profile No. 31 (The Sopwith F.1 Camel), the first A.R.1 was fitted to the second Admiralty Camel prototype,



Another M.1C with spinner removed out of consideration for its Le Rhône engine. It is believed that this photograph was taken at Heliopolis; certainly the fitting of a camera gun indicates that this Bristol was used for training purposes.

N518, which did not undergo official trials until May 1917.

It seems that the M.1Bs were given the same restrained reception as the M.1A had had, for there was no quick decision to put the type into production. Two main reasons have been suggested for the Bristol monoplane's failure to find favour. One is that its landing speed of 50-52 m.p.h. was considered to be too high for its use from the tiny fields that passed for aerodromes on the Western Front. Yet the landing speed of the D.H.2 had been as much as 45-50 m.p.h. and of the B.E.12 about 45 m.p.h.; moreover the test report on the M.1A had recorded the fact that its landing run was no more than 114 yards. Those of the D.H.4 and D.H.5 were both 120 yards when tested at C.F.S. under similar conditions, and the B.E.12 required no less than 230 yards. It would seem, therefore, that this reason for not adopting the Bristol monoplane was not a particularly strong one.

It has also been said that official prejudice had been created because a senior officer had made a somewhat unpolished landing in a Bristol monoplane and had promptly blamed the aircraft. In his book *Bristol Aircraft since 1910* C. H. Barnes wrote:

"The pilot's view was also criticised, but Capt. Barnwell himself flew one of the monoplanes at Upavon and found no difficulty in landing, although he was well known to be a somewhat erratic pilot."

The reason for official reluctance was probably a compound of prejudice and disproportionately great dislike of the limited downward view from the cockpit. Nevertheless the War Office did not abandon the type without further trial, for some of the M.1Bs were sent overseas for operational evaluation. Apparently the fear of landing difficulties in the small French airfields prompted the curious decision to send the aircraft, in June 1917, to the Middle East, which was by no means an ideal testing ground for rotary-powered aircraft of any type.

As the illustrations show, A5140 and A5141 were used in Palestine by No. 111 Squadron, R.F.C., and it has also been reported that A5142 was with that unit at one time. This fourth M.1B's armament installation was modified, the Vickers gun being moved to a central position immediately ahead of the cockpit with its breech mechanism enclosed in a

combined fairing and windshield.

It appears that the Bristols of No. 111 Squadron did not distinguish themselves in the Palestine fighting. The official historian wrote of them that they

"... had some usefulness in that they made it a little more difficult for the enemy airmen to reconnoitre, except from great heights, but their very limited endurance prevented them from being used to escort the long-distance strategical reconnaissance aeroplanes."*

In October 1917 Major General W. Sefton Branker left England to assume command of the Middle East Brigade. A few weeks later, when writing of the work of the Palestine Brigade and the aircraft connected with it, he said:

"The Bristol Monoplanes and Vickers Bullets [F.B.19] are not very much good except to frighten the Hun; they always seem to lose the enemy as soon as he starts manoeuvring."

Despite the lack of official enthusiasm for the Bristol monoplane it must have impressed some of its pilots or at least some of those who saw it fly, for it became the subject of optimistic rumours and eager expectation in R.F.C. fighter squadrons in France. It should be remembered that in 1917 the Camel was not beloved by all who flew it, the S.E.5a was experiencing serious engine and armament troubles, and the D.H.5 was a disappointment. Rumours of the Bristol's high speed and manoeuvrability found ready acceptance among R.F.C. pilots.

To recall the aircraft and its qualities against the background of its time and the demands of war it is worth while to quote at considerable length from Major Oliver Stewart's appraisal in *The Clouds Remember*:

"'Bristol Monoplane'. These were the words that brought hope and encouragement to many a war pilot. They suggested a fighting machine so far superior to anything possessed by the enemy that they would be able to achieve dominance without great risk. Rumours flew about this

* The quotation is from *The War in the Air, Vol. V, page 230*. The reference to limited endurance appears to conflict with the C.F.S. report on the M.1A, which stated that its 17½ gallons of petrol would suffice for an endurance of 2 hours 55 minutes. This figure must have resulted from a serious miscalculation at C.F.S. The quoted b.h.p. for the 110 h.p. Clerget 9z is 122 b.h.p. and its fuel consumption 0.878 pints per b.h.p./hour. On that basis the M.1A's 17½ galls. of petrol would suffice for an endurance of only 1 hr. 20 mins. at sea level.



(Left) Bristol M.1Cs of training units seemed to acquire many different individual decoration schemes. The caricature seen here was perhaps the most unkind . . . (Right) but other instructors who "owned" one of the delightful monoplanes (this one was at Shoreham) gave them checkered paint schemes . . .

machine in rather the way they did with the D.H.4 and the Martinsyde Scout before they came into service. And as the rumours flew, so they grew. The little Bristol Monoplane, admittedly a brilliant piece of design and far in advance of its period in many respects, was endowed with Spitfire qualities. Prodigious speeds were quoted as being within its reach and prodigious powers of manoeuvre. It was eagerly awaited. The prospect of getting it and using it over the lines buoyed up the fighting pilots, and especially those who were under the disadvantage of working with inferior quality machines.

There was something almost tragic in the way the pilots waited and the way the rumours grew to a maximum and then began to fade. I am not going to judge those whose duty it was to select and order aeroplanes for the flying services, but I am going to give the impression which obtained in countless Royal Flying Corps messes in France about the Bristol Monoplane. It was believed that this aeroplane would have conferred upon British pilots a tactical superiority through the medium of a considerable excess of speed and climb over the aeroplanes of the enemy, and there seems little doubt that the Bristol Monoplane, although it came out much earlier than the S.E. or the Snipe, was actually superior to both of them in all-round performance and powers of manoeuvre. With the 110 Le Rhône its top speed was 130 to 135 m.p.h., slightly below that of the higher-powered S.E.s but above that of the Snipe, and it climbed to 10,000 ft. in nine minutes which was again better than the Snipe aeroplane.

Here, then, was an aeroplane with a fixed Vickers gun firing forwards through the field swept by the airscrew, with a performance so far superior to that of any of its contemporaries that it would have given our pilots psychological and physical ascendancy of the most convincing kind. Why was it never adopted for the Royal Flying Corps in France? Why was such an outstanding type, without vices so far as the present writer could ascertain, and with every desirable quality, only ordered to an insignificant extent and then sent to serve in Palestine, Mesopotamia and Macedonia?

I do not know the official answers to these questions. The answers which were given in the Royal Flying Corps messes were not flattering to the authorities. It was said that the aeroplane was condemned as a big production machine for France because the outlook down and forward was too much restricted by the monoplane wings. This was an argument whose futility could only be fully appreciated by pilots who had seen the staff striving for a long time so to modify and hack about every service aeroplane as to give unrestricted upwards and forwards view. The D.H.5 and the way in which Camel centre sections were slashed about, the Sopwith Dolphin and even the

S.E.5 arrangement, were all aimed at giving good upward and forward outlook. Yet the Bristol Monoplane, which gave better upward and forward view than any of them, was said to have been condemned because it did not give downward and forward view.

It is true that the downward and forward view was slightly restricted, but there was not a fighting pilot of experience who would not have exchanged that view for the speed and climb of the Bristol Monoplane with alacrity and enthusiasm. There was reason to suppose that the authorities were placing an altogether unjustifiable amount of importance upon view in certain directions and were neglecting more truly important qualities. One other reason which the authorities were supposed to have adduced for not putting the Bristol Monoplane into service in France, was that it was 'difficult to fly'. This view had no foundation in fact. The Bristol Monoplane was as easy to fly as any comparable type, and had no vices."

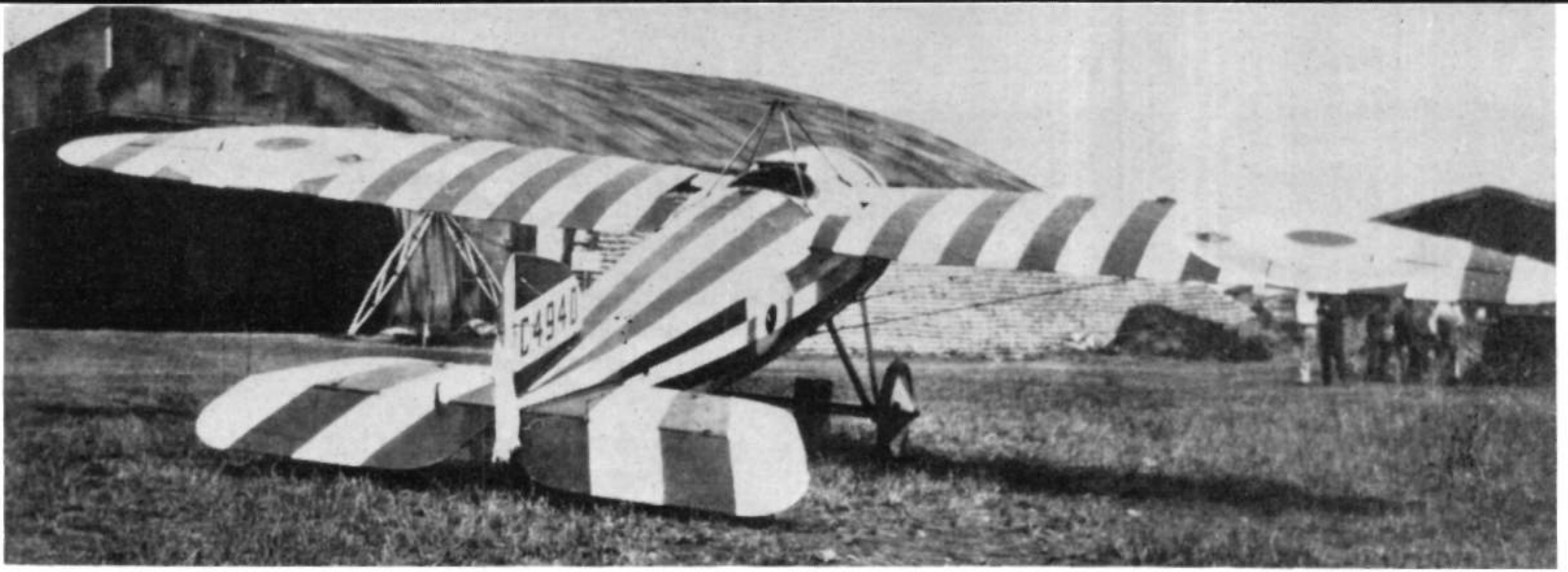
On 3rd August 1917, more than a year after the prototype had made its first flight, the War Office had ordered 125 Bristol monoplanes under Contract No. A.S.8236, to be numbered C4901-C5025 (Bristol sequence numbers 2719-2843). The first was delivered on 19th September 1917. The production aircraft was designated Bristol M.1C and differed from the



(Above) . . . or lattice stripes and sun-ray flashes on the wings . . . (Photo: via John A. Bagley)

(Below) . . . or a scaly pattern of various colours, here seen on C5012 of No. 1 School of Aerial Fighting, Turnberry. This M.1C is fitted with a camera gun; the officer standing beside it is believed to be Major J. Leacroft, M.C., whose victory score as a member of No. 19 Squadron was 25.





C4940, depicted in colour on page 11, was at one time painted with longitudinal white stripes on wings and fuselage, three white flashes on each wheel cover and a white band on its spinner

prototypes in having the 110 h.p. Le Rhône engine as the standard power unit. Cut-outs were provided in both wing roots between the spars, the single Vickers gun was mounted centrally as on A5142, and the frontal opening in the spinner was enlarged slightly.

The M.1C was denied all opportunity of making any kind of name for itself, and it is abundantly clear that there was strong official reluctance to use the type operationally. Official statistics indicate that one Bristol monoplane went to France in 1917, presumably for evaluation by operational pilots, but it is not known whether this was an M.1B or an M.1C. Whatever it was, none of its kind followed it, and the few M.1Cs that saw action were the mere handful that were flown in Macedonia and Mesopotamia. By the end of 1917, a total of seventeen Bristol monoplanes had been sent to the Middle East Brigade. That figure must have included the M.1Bs that had gone to No. 111 Squadron in Palestine. In 1918 eighteen more Bristol M.1Cs were sent to the Middle East Brigade.

Of the balance of Bristol monoplanes, two were sent to training units in 1917 and a further 39 in the following year. The official indifference towards the aircraft was made clear before 1917 was out, that is, before any M.1C had been used operationally. On the outbreak of war the British Admiralty had commandeered two warships being built for Chile in British yards. In part payment for these ships the British government gave Chile six Bristol M.1Cs in 1917: other types of aircraft were more plentiful, yet the M.1C was apparently regarded as expendable before it had entered squadron service.

No squadron was equipped throughout with the Bristol monoplane, and those units that used the type had only a few. The only R.F.C. squadrons operating in Macedonia were Nos. 17 and 47, each equipped with a variety of aircraft. In September 1917 Lieutenant General G. F. Milne, the officer in command of the British forces in Macedonia, wrote to the War Office pressing for an increase in the aviation services available to him. His letter included the plea that

“ . . . the Royal Flying Corps in this country should be reinforced by a strong bombing squadron with a suitable proportion of the most up-to-date fighting machines . . . ”

On 12th October the War Office, in a telegraphed reply, authorized the increase of the establishment of Squadrons Nos. 17 and 47 to twenty-four aircraft but stipulated that only one Flight in each squadron might be equipped with up-to-date single-seat fighters.

. . . . but it was later clear doped all over when on the strength of No. 1 School of Aerial Fighting, Turnberry, as seen here.



In December 1917 a few S.E.5a's arrived for each of the squadrons, and in the following month these were supplemented by Bristol M.1Cs. Each squadron had four S.E.5a's by February 1918, and their strength in Bristols was equally low.

On 1st April 1918, the day on which the Royal Air Force came into existence, a fighter squadron was formed in Macedonia. The new unit was No. 150 Squadron and was created by amalgamating 'A' Flight of No. 17 Squadron and 'A' Flight of No. 47 Squadron. No. 150's aircraft were the S.E.5a's and Bristol M.1Cs that had belonged to Squadrons Nos. 17 and 47, plus a few Nieuport Scouts acquired from the French *Aviation Militaire*. Later the squadron acquired a few Sopwith Camels.

It appears that No. 150 Squadron may not have acquired all of No. 17 Squadron's Bristols immediately it was formed, for Lt. A. E. de M. Jarvis and his Bristol M.1C were still considered to be on the strength of No. 17 Squadron on 25th April 1918, when he had two successful combats. In the first, over Yenimah, he fired 150 rounds into a D.F.W. at close range, the enemy two-seater being last seen in a steep dive towards the Rupel Pass. In the second combat Jarvis and Lt. A. G. Goulding on an S.E.5a attacked another D.F.W. near Nihor later that morning. Although two Albatros D.III's came to the D.F.W.'s aid the two-seater went down vertically over Angista, apparently on fire. This D.F.W. was credited as "out of control", but on the following day, 26th April, Jarvis and Lt. J. J. Boyd Harvey attacked

a D.F.W. over Prosenik with conclusive results. Jarvis was flying an M.1C, Harvey a Nieuport, and their victim crashed in Hristos Gully.

No. 150 Squadron did much good work in Macedonia before the war ended, but few actions by the Bristols have been recorded. On 6th May 1918 Lt. W. Ridley, flying an M.1C, joined Lt. C. B. Green on a Camel in attacking an enemy two-seater, which dived away steeply with smoke issuing from its fuselage. But it was Green, flying the slower Camel, who pursued the enemy aircraft, which was last seen falling out of control north of Cerniste.

Lieutenant J. J. Boyd Harvey of No. 150 Squadron had what appeared to be a more successful combat on 16th June when, flying a Bristol M.1C, he attacked a Rumpler two-seater. He dived out of the sun and hunted the Rumpler down from 17,000 ft. to 6,000 ft., firing all the time. The enemy then went down in a steep dive, obviously out of control, but Harvey had to break away to defend himself against an Albatros D.III that had come on the scene and was unable to witness the crash of the Rumpler.

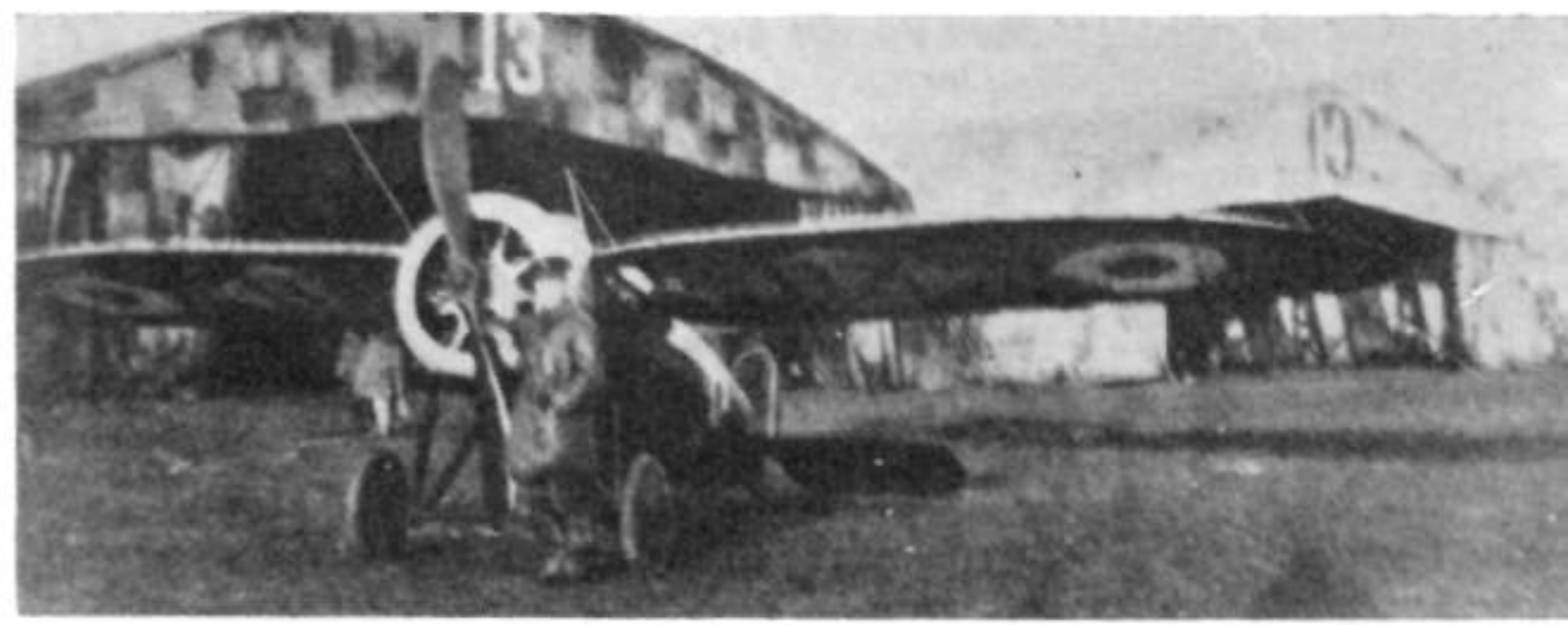
In the following month Lieutenant K. B. Moseley, also of No. 150 Squadron, won two victories while flying an M.1C. On 9th July he shot down an Albatros D.V over the Rupel Pass, and on the 26th he attacked a D.F.W. two-seater that was being escorted by an Albatros D.V. The D.F.W. crashed north of Demirhisar.

In the heat of the Macedonian summer some of the Bristols were flown with their spinners removed in order to improve engine cooling. This practice was by no means confined to the M.1Cs in this theatre of war. Some of the Bristols used for training purposes at Heliopolis were also deprived of their spinners for the same reason.

The British aerial force in Mesopotamia was reinforced on 2nd March 1918 by the arrival at Basra of No. 72 Squadron, R.F.C. This unit had a motley collection of D.H.4s, S.E.5a's, Spads, Martinsydes and eight Bristol M.1Cs. The monoplanes equipped 'C' Flight, which was sent to Mirjana on the Diyala river to work with the III Corps.

The Bristols' first achievement in Mesopotamia was unique in the annals of aerial warfare. A display of aerobatics by two of the monoplanes so impressed some Kurds that their entire tribe gave their allegiance to the British forces. Thereafter the M.1Cs saw a good deal of use on ground-attack duties, starting on 26th April 1918, when Lieutenants Lees and Thomas shot up a large Turkish cavalry detachment outside Kifri, inflicting many casualties. For several days during the actions against Kifri and Kirkuk the M.1Cs of 'C' Flight attacked ground targets, including an anti-aircraft gun that was put out of action.

Of No. 72 Squadron's Bristol monoplanes the



An unusually modified M.1C with cambered, open-front cowling of the kind more usually fitted to rotary engines in 1917-18. This aircraft may have belonged to No. 2 School of Aerial Fighting, Marske. (Photo: via Sqn. Ldr. D. G. Beeton)

official historian wrote:

"These aeroplanes could carry enough petrol to keep them in the air for only one and three-quarter hours, and were not therefore suitable for reconnaissance work, but they were capable of rapid manoeuvre and their pilots, by swift diving attacks from low heights, brought terror to the disheartened and war-weary Turkish soldiers."

In the final battles of October 1918, 'C' Flight's Bristols were again in action against ground targets. On one occasion an attack on a Turkish long-range gun from 200 ft. put the gun out of action. One of the Bristol M.1Cs, flown by Major O. T. Boyd, the squadron's Commanding Officer, joined 'A' Flight in the bombing and machine-gunning of enemy ground positions.

By November 1918 the three Flights of No. 72 Squadron were brought together from their stations in Persia, Mirjana and Samarra and assembled at Baghdad. It is not known how many of their Bristol M.1Cs had survived until that time, but at least two were added to the strength of No. 63 Squadron, an R.E.8 unit that maintained an operational detachment at Kazvin and Enzeli in Persia until August 1919, co-operating with British troops and Persian Cossacks in the campaign against Kutchik Khan, chief of the Jungalis.

Two Bristol M.1Cs were at one time with the detachment at Kazvin, but the brunt of such aerial actions as were undertaken seems to have been borne by the R.E.8s, for no mission was specifically attributed to the Bristols. They may well have been used as high-speed personal transports, for it is recorded that Major O. T. Boyd, M.C. (who by then was O.C. 31st Wing, R.A.F.) visited the detachment of No. 63 Squadron at Kazvin on 27th March 1919, flying an M.1C. On 2nd June Lieutenant G. M. Lees, who had been on loan to No. 63 Squadron by the Civil Commissioner, flew back to Kirkuk on a Bristol monoplane; and the squadron records indicate that Lieutenant-Colonel Boyd "tested" a Bristol monoplane on 6th July 1919. On 9th July Boyd flew, in a Bristol M.1C, from Baghdad to Basra in a total time of 2 $\frac{3}{4}$ hours. These Bristol monoplanes of No. 63 Squadron must have been the last of the type in service.

There can be no doubt that the Bristol M.1C was a popular

C4964 in full service markings before its acquisition by Major C. H. Chichester Smith, who flew it in the 1919 Aerial Derby. The aircraft was doped overall with P.C.10 khaki-brown dope.

(Photo: Peter M. Bowers)



C4964 photographed on the occasion of the 1919 Aerial Derby. Its roundels were painted out and the numerals of its Service serial number were painted in small characters on the fin.

(Photo: Flight International 293)



mount of instructors at training units in the United Kingdom. It was flown by many famous fighting pilots who were doing an instructional stint between operational tours; these included Captain J. T. B. McCudden, V.C., D.S.O., M.C., M.M. and Major G. J. C. Maxwell, M.C., D.F.C., A.F.C. Several of these instructional M.1Cs were painted in highly individualistic and colourful paint schemes.

Shortly after the Armistice one of the Chilean M.1Cs made news. On 12th December 1918 Teniente Dn. Dagoberto Godoy of the Chilean Military School of Aviation became the first man to fly across the Andes when he flew an M.1C from Santiago de Chile to Mendoza in Argentina. This feat was repeated on 4th April 1919 by Teniente Cortinez, also on a Bristol M.1C.

A few Bristol monoplanes acquired civil identities after the war. The first of these was C4964, which was flown in the 1919 Aerial Derby by the late Major C. H. Chichester Smith. This M.1C had the minor refinement of a small head fairing behind the cockpit. The civil registration G-EAER was allotted to this M.1C, but it is doubtful whether the aircraft ever wore these markings. It was reported as being sold to the Grahame-White Aviation Co. and its ultimate fate is unknown.

The British and Colonial Aeroplane Co. bought one M.1B and three M.1Cs for modification and resale as sporting single-seaters. One of the M.1Cs was sold to an American owner, and its subsequent history has yet to be told. The M.1B was registered G-EAVP, the other two M.1Cs G-EASR and G-EAVO. Despite their high performance and excellent flying qualities the monoplanes did not sell. Not until November 1921 was G-EAVO sold. It was bought by Señor Juan Pombo who, as recorded in *Profile* No. 139, had wanted to buy a Bristol Scout. His M.1C, re-registered M-AFAA, was flown to Madrid by Larry Carter.

In their civilian sporting form the Bristol monoplanes were stripped of all armament and the cut-outs in the wing roots were covered over.

The Bristol Company kept G-EASR as a demonstration aircraft until it was withdrawn from use in 1925. In January 1922 G-EAVP, the former M.1B, had been modified to have the 100 h.p. Bristol Lucifer three-cylinder radial engine. With this power unit the aircraft had an enlarged fin and rudder, and was given the new designation Bristol M.1D.

The Lucifer installation was made as part of the development programme of the engine, but the M.1D participated in several air races with con-

siderable success. It first appeared in public at Croydon on 17th April 1922, and on 3rd June Captain C. F. Uwins flew the M.1D to win the handicap race at the Croydon Whitsun meeting. With Larry Carter as pilot, G-EAVP won the 1922 Aerial Derby Handicap on 7th August at an average speed of nearly 108 m.p.h.

The M.1D did not race again until 23rd June 1923 when, with Major E. L. Foot as pilot, it took part in the Grosvenor Trophy Race. By that time it had a Lucifer engine that delivered 140 h.p. Foot reached Filton after completing the Lympne-Croydon-Birmingham-Bristol stages in good time, but it was found that the fuel tank was leaking. A hasty repair was made and Foot took off quickly in an attempt to make up the ground he had lost. But when near Chertsey on the approach to Croydon the M.1D dived into the ground and burst into flames; the gallant and popular Leslie Foot lost his life.

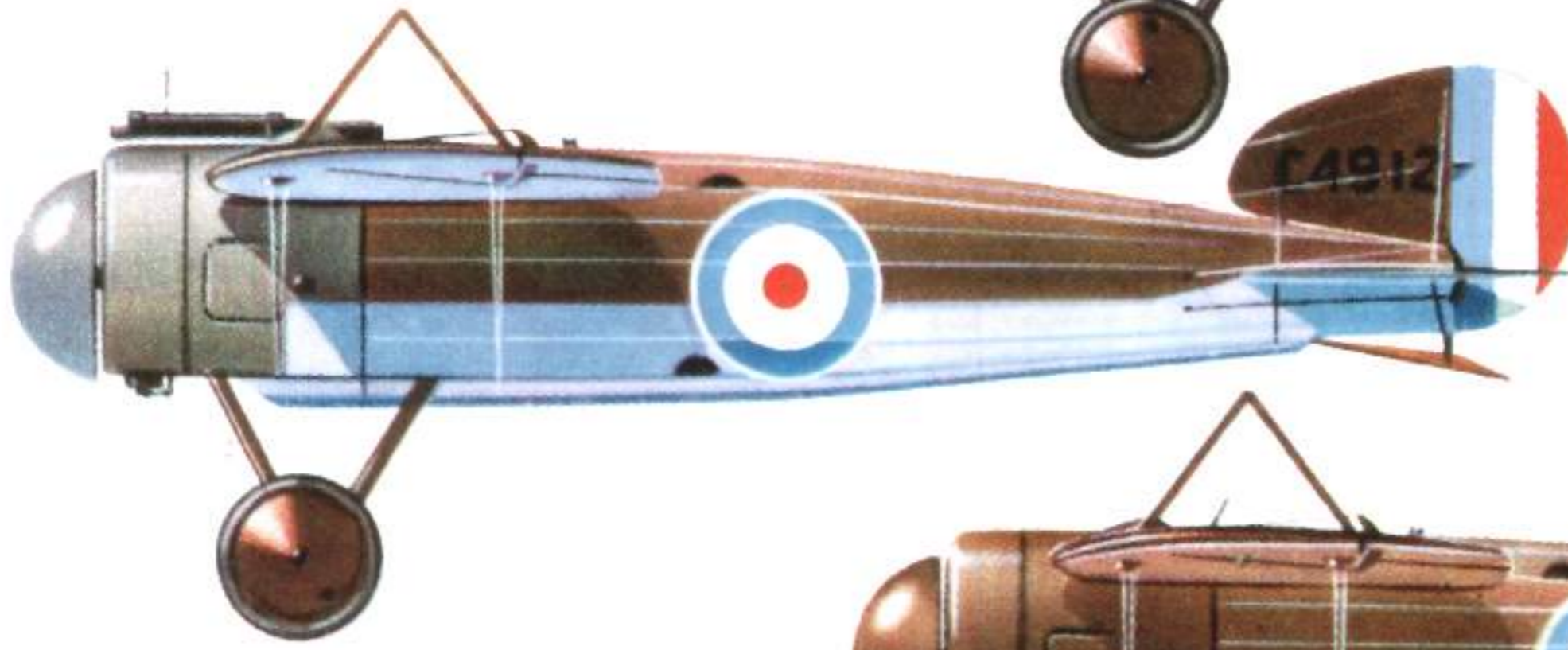
In the summer of 1919 Captain Harry Butler, A.F.C., an Australian, bought C5001 from the Aircraft Disposal Board. He took it back to Australia with him and there, partnered by H. A. Kauper, he flew the M.1C and an Avro 504K from Minlaton. Butler's first exhibition flight after his return to Australia was made at Unley Oval on 23rd July 1919 in aid of the Repatriation Fund; on that occasion he flew the M.1C. This aircraft was given the Australian civil registration G-AUCH, and on it Butler won the first Australian Aerial Derby on 8th September 1920. The M.1C was known as Butler's Red Devil monoplane, and was presumably painted red at that time.

Butler was seriously injured in a crash on the Avro on 11th January 1922 and died at Minlaton eighteen months later, on 30th July 1923. His Bristol M.1C was stored in an Adelaide garage until 1930, when it was found and bought by H. Miller. Miller replaced

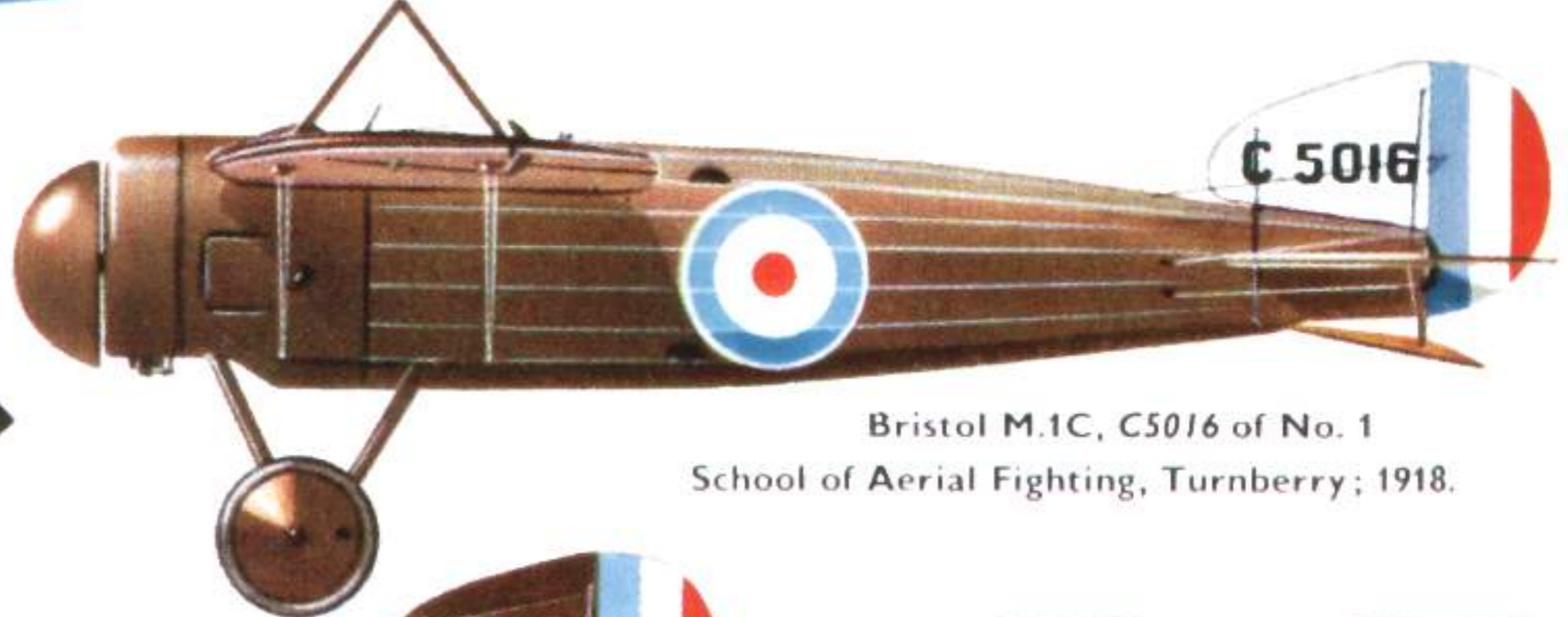
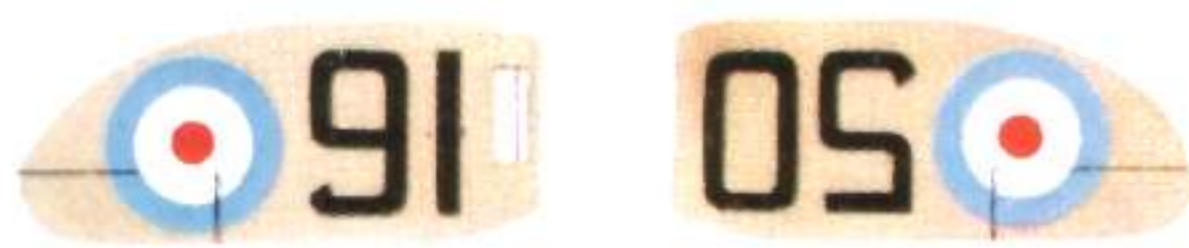


One of three M.1Cs bought back by the British & Colonial Aeroplane Co. was registered G-EAVO and was subsequently sold to Senor Juan Pombo with the Spanish identity M-AFAA.

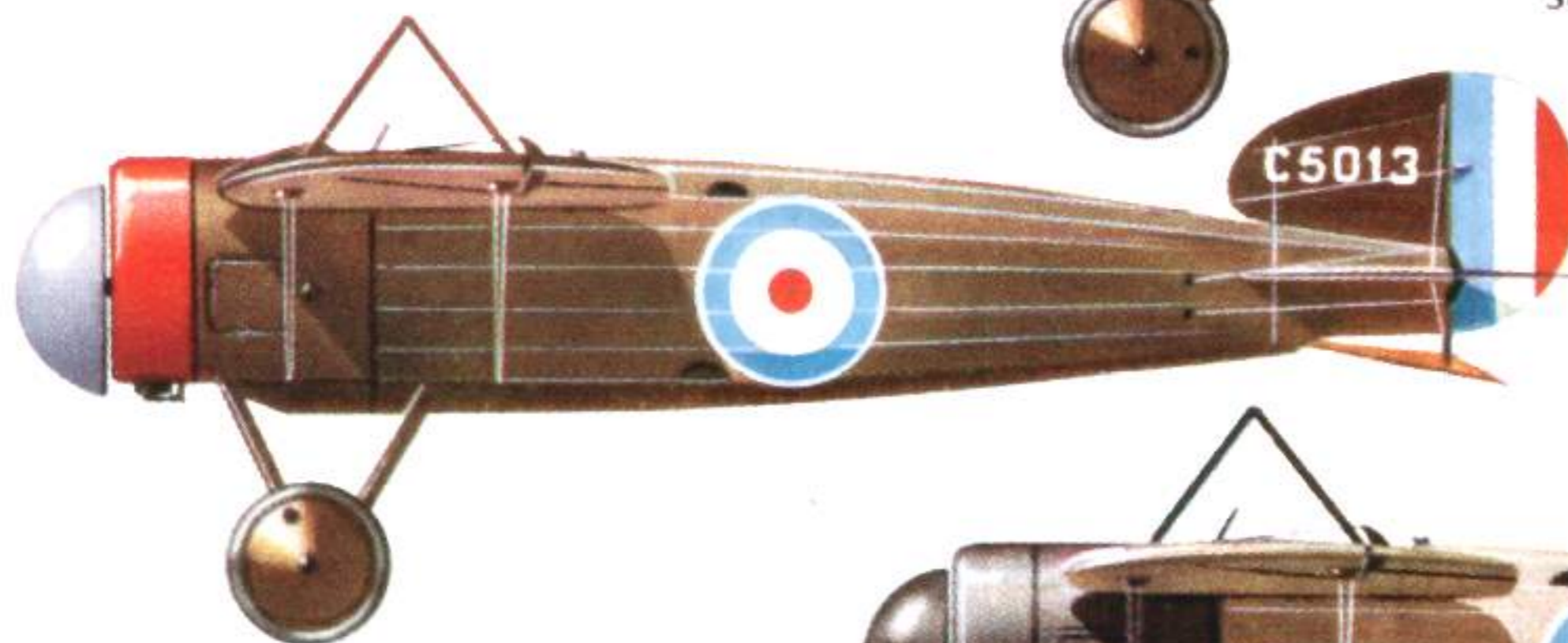
Bristol M.1C of No. 72 Squadron R.F.C.;
Mesopotamia, 1918. Serial unknown.



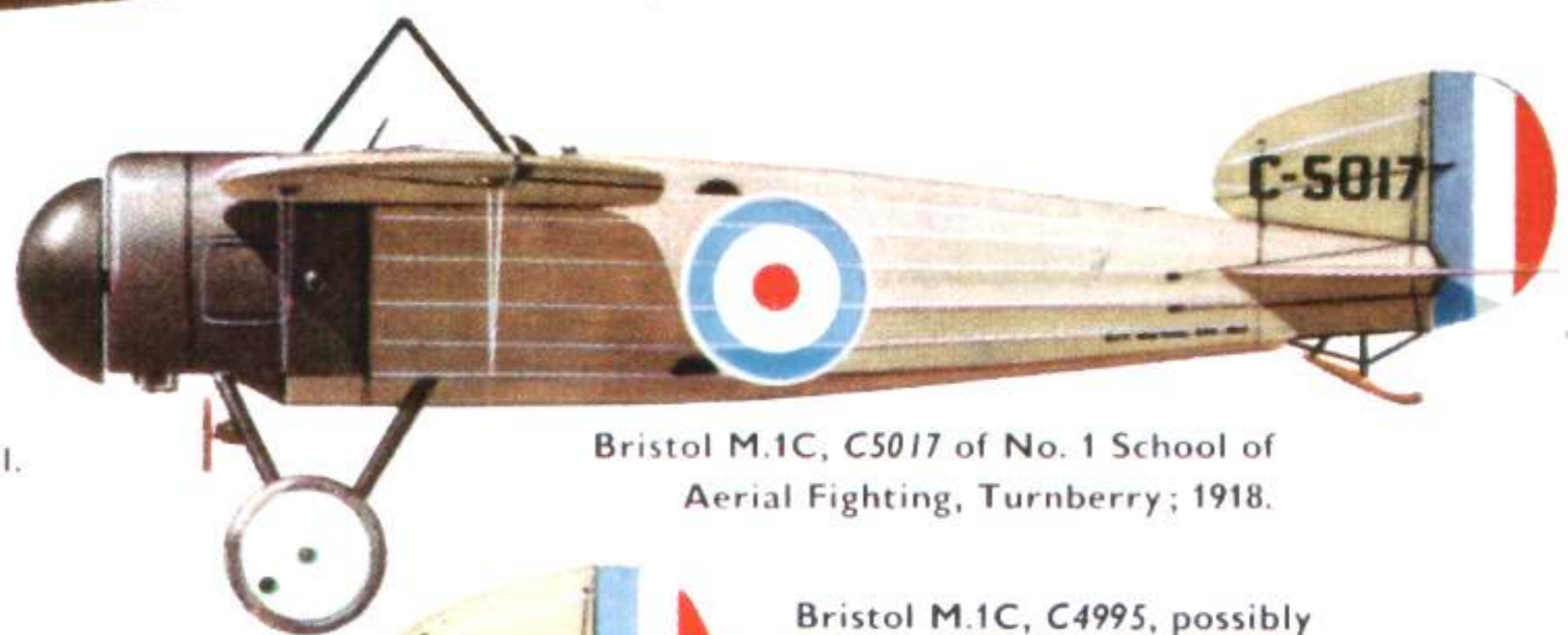
Bristol M.1C, C4912 of No. 150 Sqdn.
R.A.F.; Salonika 1918.



Bristol M.1C, C5016 of No. 1
School of Aerial Fighting, Turnberry; 1918.



Bristol M.1C, C5013 observed at
Stonehenge but not definitely identified
as serving with the Stonehenge-based
training unit. Later served at
Turnberry, where it was clear-doped overall.



Bristol M.1C, C5017 of No. 1 School of
Aerial Fighting, Turnberry; 1918.



Bristol M.1C, C4995, possibly
of No. 2 School of Aerial Fighting

Bristol M.1C, C4940 of unidentified training unit,
later served at Turnberry,
clear-doped overall.



Bristol M.1D, G-EAVP, as in August 1922.





The Bristol M.1D, G-EAVP, a conversion of an M.1B with Bristol Lucifer engine. Comparison of this photograph with that of G-EAVO illustrates the revised shape of the M.1D's fin and rudder.

the Le Rhône with a borrowed D. H. Gipsy II engine in 1931 and removed the fairings from the fuselage sides.

Re-registered VH-UQI, the Bristol won the Adelaide Aerial Derby in 1931 and 1932, and was extensively flown in the Commercial Aviation Co.'s aerial circus. Its last flight was from Adelaide to Perth in 1938, whereafter it was stored in the roof of a hangar at Guildford Airport. It was rediscovered eighteen years later by C. B. Tilbrook of Minlaton and was restored for exhibition by Aviation Services, Parafield (S.A.) Ltd. It now forms the centre-piece of the Harry Butler Memorial at Minlaton.

Although this final restoration bears no resemblance to the aircraft as flown by Butler (indeed, it is doubtful whether at any time during its active life the aircraft was in precisely its present form and colour), VH-UQI is almost certainly the only substantial surviving link with the Bristol M.1C for which such high hopes were entertained but which was condemned to obscurity, apparently by nothing more substantial than unfounded prejudice.

When, in 1923, Captain Barnwell initiated the numerical system of Bristol design type numbers the designations retrospectively allotted to the Bristol monoplane sub-types were as follows: M.1A, Type 10; M.1B, Type 11; M.1C, Type 20; M.1D, Type 77.

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SPECIFICATION

Power: A5138-A5140, 110 h.p. Clerget 9Z; A5141, 130 h.p. Clerget 9B; A5142, 150 h.p. A.R.1; production M.1Cs, 110 h.p. Le Rhône 9J; M.1D, 100-140 h.p. Bristol Lucifer.

Dimensions: Span 30 ft. 9 in.; length (M.1A) 20 ft. 7 in., (M.1B with A.R.1 engine) 20 ft. 8 in., (M.1C) 20 ft. 5½ in.; height 7 ft. 9½ in.; chord 5 ft. 11 in.; dihedral 2 deg.; incidence 0 deg.; span of tail 10 ft. 3 in.; wheel track 4 ft. 7 in.; tyres 700×75 mm.; airscrew diameter (British & Colonial Type P3017) 8 ft. 6½ in.

Areas: Wings 145 sq. ft.; ailerons, each 9 sq. ft., total 18 sq. ft.; tailplane 20 sq. ft.; elevators 15 sq. ft.; fin 5 sq. ft.; rudder 4.5 sq. ft.

Armament: One fixed 0.303 in. Vickers machine-gun with Constantinesco C.C. Type B synchronizing mechanism or Sopwith-Kauper interrupter gear. Loading handle: Cox's D Type. Sights: Aldis, Ring and Bead No. 9.

SERVICE USE

Palestine: Two, possibly three, M.1Bs used by No. 111 Squadron, R.F.C.
Macedonia: Used in small numbers as the partial equipment of R.F.C. Squadrons Nos. 17 and 47 and by No. 150 Squadron, R.A.F.

Mesopotamia: No. 72 Squadron, R.F.C./R.A.F. (mainly by 'C' Flight).
Persia: A few ex-72 Squadron Bristol M.1Cs taken over by No. 63 Squadron, R.A.F., after the Armistice.
Chile: Six M.1Cs went to Chile late in 1917 and were used by the Chilean Military Aviation Service.

PRODUCTION

One M.1A, four M.1Bs and 125 M.1Cs were built by the British and Colonial Aeroplane Co., Ltd., Filton and Brislington, Bristol. Serial numbers were:
A5138: Bristol M.1A; A5139-A5142: Bristol M.1B; C4901-C5025: Bristol M.1C.

NOTES ON INDIVIDUAL BRISTOL MONOPLANES

A5140 and A5141: Used by No. 111 Sqn., R.F.C., Palestine, 1917.
A5142 also reported with No. 111 Sqn.
C4901: Used for training purposes at Heliopolis, Egypt.
C4912: Flown operationally from Salonika by either No. 17 or No. 47 Squadron, R.F.C. and possibly by No. 150 Squadron, R.A.F.
C4923: First Bristol M.1C to be fitted with Aldis gun sight.
C4964: Was at one time at Leuchars. Flown in 1919 Aerial Derby by Major C. H. Chichester Smith; civil registration G-EAER allotted.
C4965: At Hounslow, February 1918.
C5001: Taken to Australia, summer 1919; became G-AUCH, later VH-UQI.
C5013: Flown at Stonehenge, later at Ayr.
Bristol M.1Cs used at No. 1 School of Aerial Fighting, Ayr, 1918: C4940, C4954, C5009, C5010, C5012, C5013, C5016.

WEIGHTS AND PERFORMANCE

Aircraft	M.1A	M.1B A5142	M.1C C4902*	M.1C C4908	M.1D
Engine	110 h.p. Clerget	150 h.p. A.R.1	110 h.p. Le Rhône	110 h.p. Le Rhône	Lucifer
Weights (lb.)					
Empty	913	930	900	896	950
Military load	50	80	80	80	—
Pilot	180	180	180	180	—
Fuel and oil	183	180	180	192	—
Loaded	1,326	1,370	1,340	1,348	1,300
Max. speed (m.p.h.)					125†
at 6,500 ft.	127	115.5	—	—	—
at 10,000 ft.	118	110	106	111.5	—
at 15,000 ft.	110.5	100	99.5	104	—
Climb to	m. s.	m. s.	m. s.	m. s.	m. s.
6,500 ft.	4 50	5 50	5 50	5 30	—
10,000 ft.	8 30	11 5	10 25	10 10	—
15,000 ft.	17 25	27 40	20 40	19 50	—
Service ceiling (ft.)	17,000	15,000	21,000	20,000	22,000
Endurance (hours)	2½ ‡	1½	1½	1½	1½

* The official performance report on C4902 contained this note: "The figures given above for the speed trials are probably 5 m.p.h. too low, as they were obtained from the readings of the air-speed indicator corrected for density only".

† Altitude unknown; probably at ground level.

‡ Endurance as quoted in official report, but see footnote on page 6.

