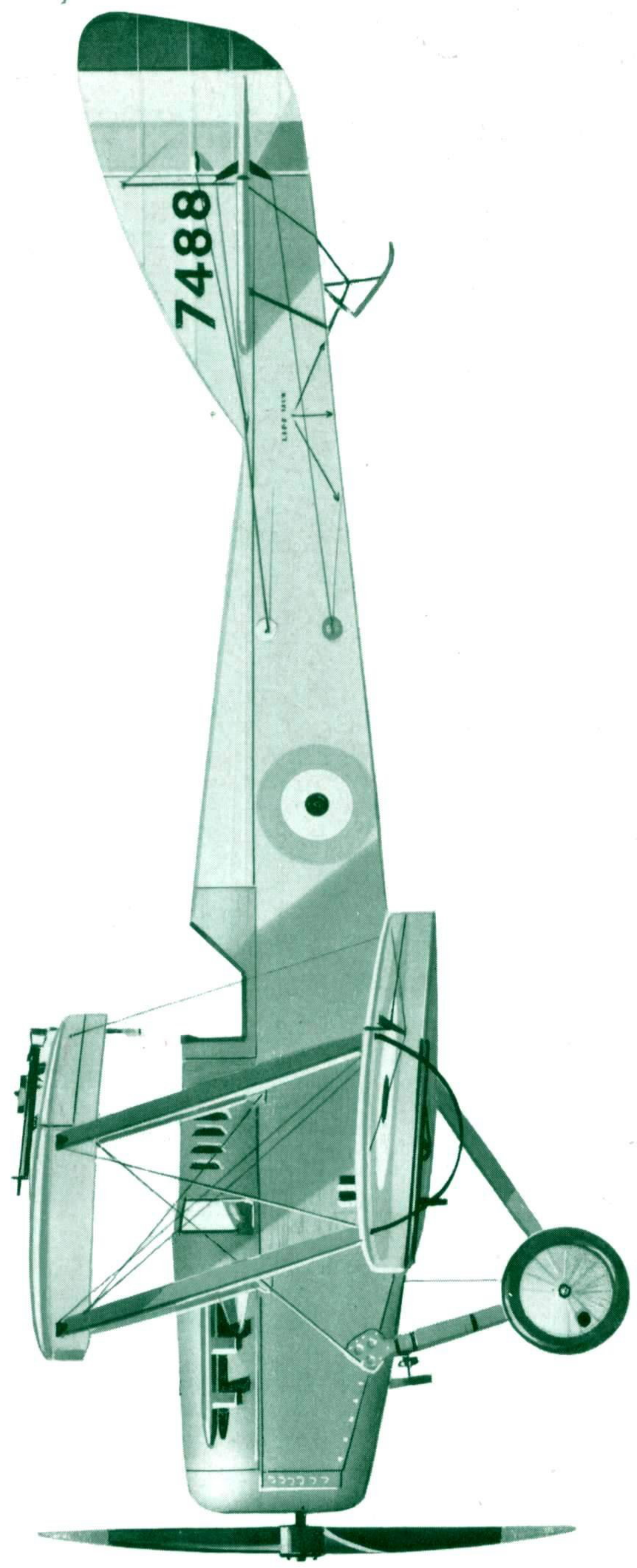


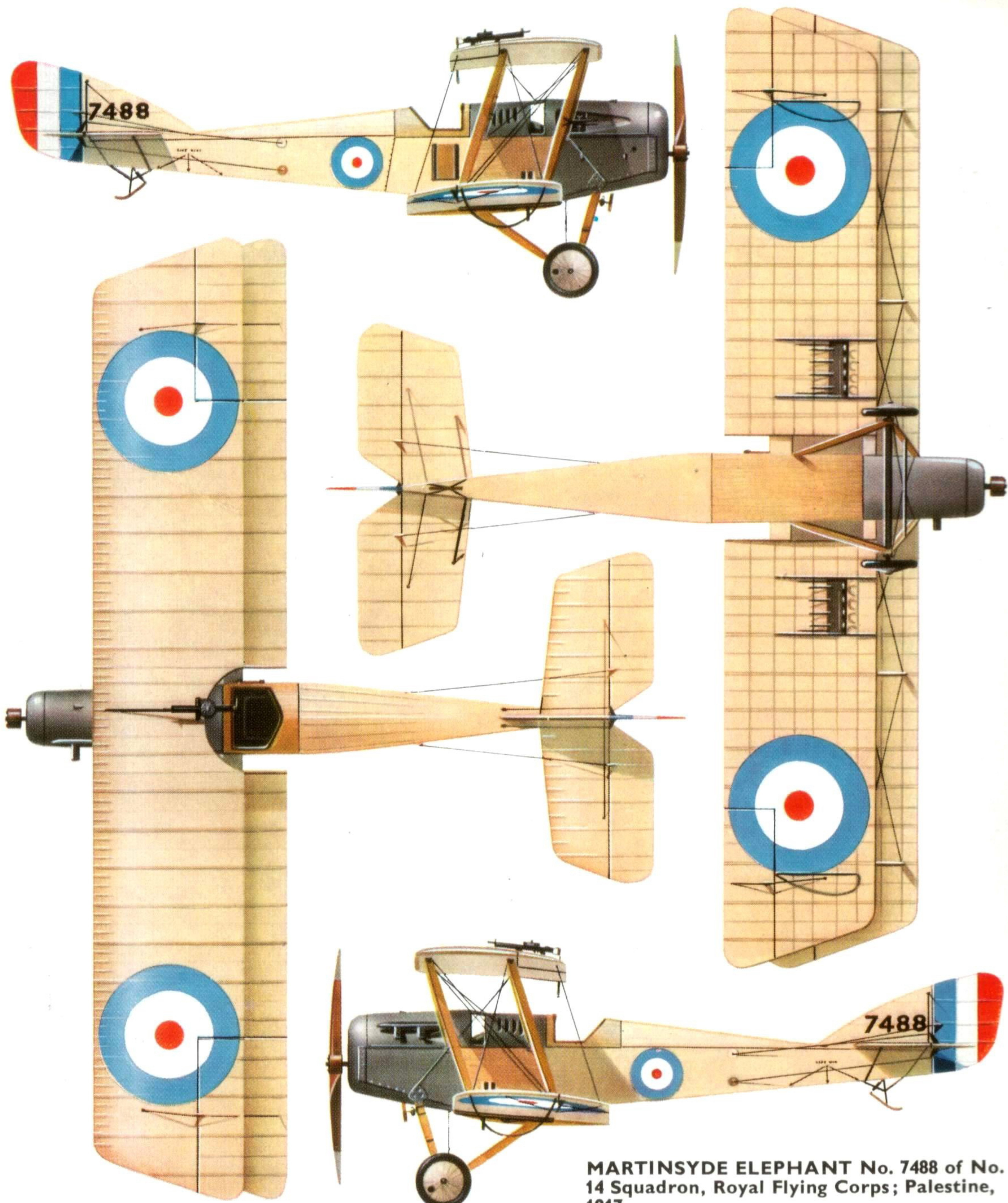
# PROFILE PUBLICATIONS

## The Martinsyde Elephant

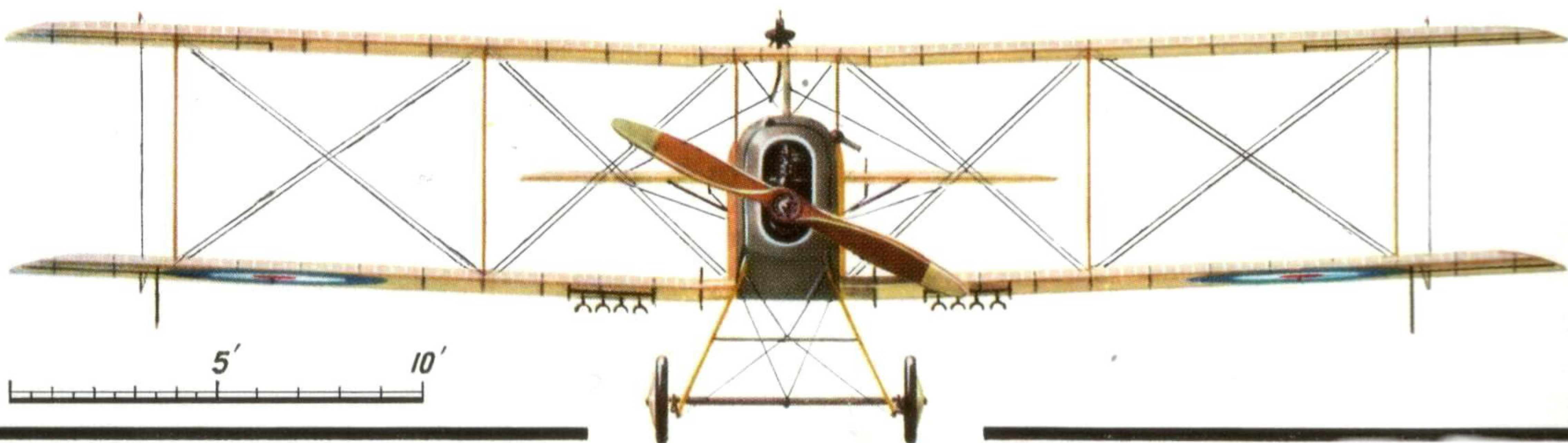
**NUMBER 200**







**MARTINSYDE ELEPHANT No. 7488 of No. 14 Squadron, Royal Flying Corps; Palestine, 1917.**







The prototype Martinsyde G.100, 4735, photographed at Brooklands. The original long tail-skid can be seen clearly.  
(Photo: Imperial War Museum Q57642)

# The Martinsyde Elephant

by J. M. Bruce

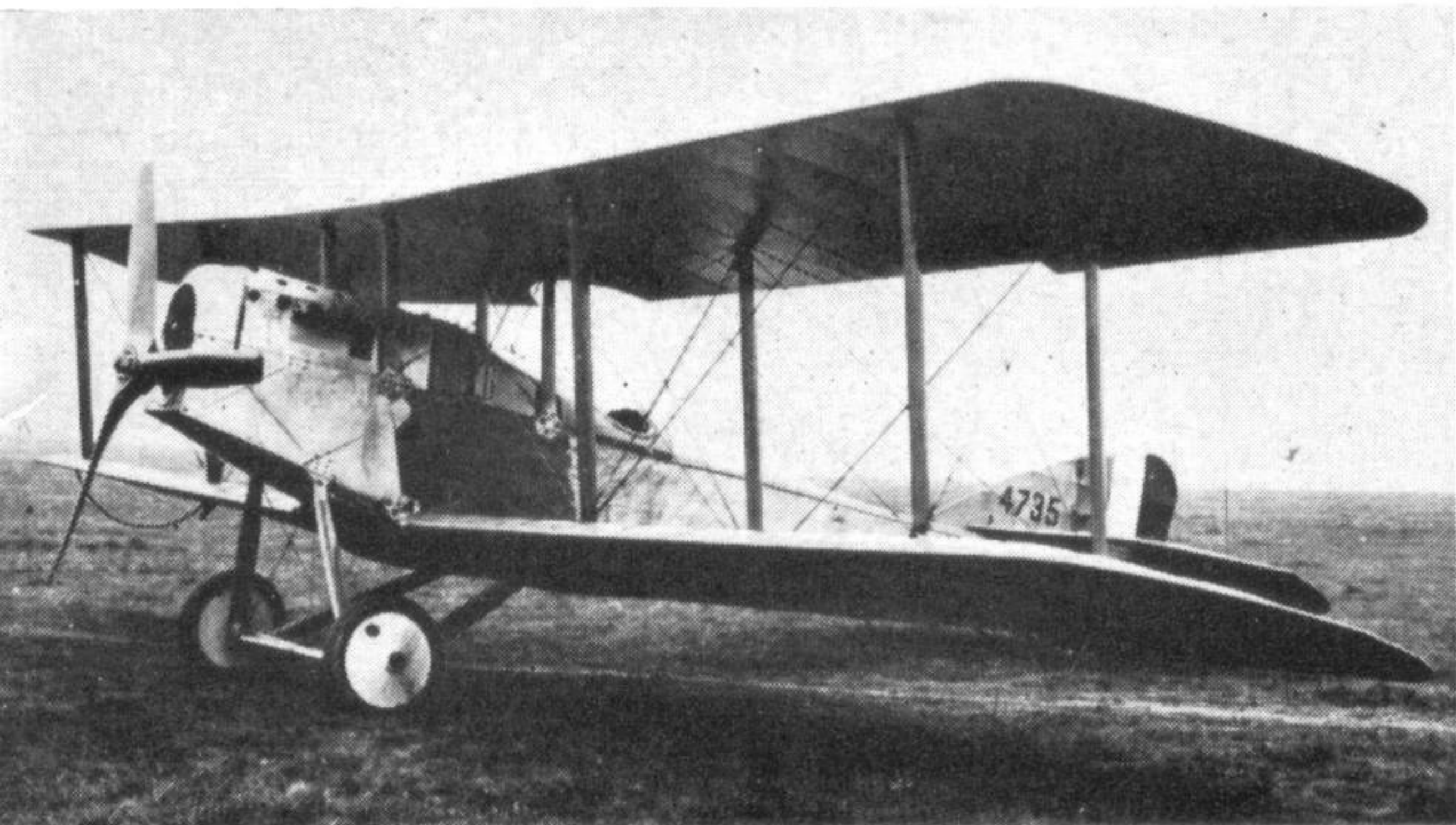
During the early years of the 1914-18 war that respected aeronautical journal *Flight* continued its feature "Eddies", which appeared over the pen-name Aeolus and provided many thinly-veiled references to new British aircraft of the time. In the issue dated 29th October 1915 Aeolus wrote:

"A little while ago a new Martinsyde made its first appearance, but with an avenging sword, in the shape of the censor's stern edicts, hanging over my head I am debarred from giving my readers any description whatsoever of this startling machine, much as I may desire to do so . . . However, the new Martinsyde really is something quite out of the ordinary and I have no hesitation in saying that its like has probably never been seen in any other country, certainly not in this. And the remarkable thing about it is that the excellent results it has already given have been obtained without making it in any way a freak, simply by sheer good, sound commonsense design."

Three items later in his column that week Aeolus reported that, when passing the offices of the London and Provincial Aviation Co. in Colindale Avenue he had

". . . caught a glimpse at one of the windows of a

The prototype at Farnborough, 18th October 1915.  
(Photo: Imperial War Museum MH3267)



face which, although familiar, was not filed in the pigeon-holes of my memory as particularly associated with Hendon. On opening the door I was greeted with the smiling face of one Fletcher, until recently with the Martinsyde firm at Brooklands, but who now has transferred his activity to the L. & P. Co."

The ubiquitous Aeolus did not connect these two news items, but in fact the aircraft mentioned in the first could only have been the prototype Martinsyde G.100, which was the last major Martinsyde type designed by A. A. Fletcher before he left the Brooklands company to join the London and Provincial Aviation Co. as their designer.

The G.100 was of distinguished descent. The founders of the Martinsyde company were Helmuth Paul Martin of London and George H. Handasyde of Edinburgh, both of whom had very early connections with the automobile industry in Britain. Martin was a partner in the new company of Trier and Martin, Ltd., manufacturers of carburettors and automobile accessories, when he and Handasyde met shortly after Handasyde moved to London. In 1908 the two men embarked on the design and construction of a small monoplane, powered by a four-cylinder Beeston-Humber automobile engine that had been persuaded to deliver about 22 h.p. In the event, this proved too much for the monoplane's three-blade airscrew, which disintegrated when the engine was run up, whereupon the engine shook itself out of its bearers.

The first Martin-Handasyde aircraft was abandoned, but it was followed by a series of graceful monoplanes, clearly inspired by the French Antoinette types, that culminated in the large, handsome monoplane of spring 1914, powered by a 120 h.p. Austro-Daimler engine, that was tested at Farnborough in May 1914.

The Martin-Handasydes were characterized by sound engineering and excellent construction, and G. H. Handasyde's faith in the monoplane configuration was reflected in his greatest pre-war design, the

\* It should be noted that at least two earlier Martin-Handasyde monoplanes were flown with the Austro-Daimler engine.



large aircraft designed for an attempt on the Transatlantic flight, in which it was to have been flown by Gustav Hamel. Construction continued after Hamel's death on 23rd May 1914, but the aircraft was still unfinished when war broke out in August and was apparently never completed. Also abandoned at this time was a pusher biplane, intended to compete in the 1914 Aerial Derby, that was a seeming retrogression in view of the successes of the elegant monoplanes.

By early 1913 the company's products had become popularly known as Martinsydes, but it was not until 9th April 1915 that a notice appeared in the journal *Flight* recording the registration of a new company, Martinsyde, Ltd., of Brooklands, Weybridge, which had acquired the "business carried on at Brooklands, Weybridge, as Martin and Handasyde, manufacturers and designers, aeronautical engineers, etc. First directors, H. P. Martin, G. H. Handasyde, and H. Fulton."

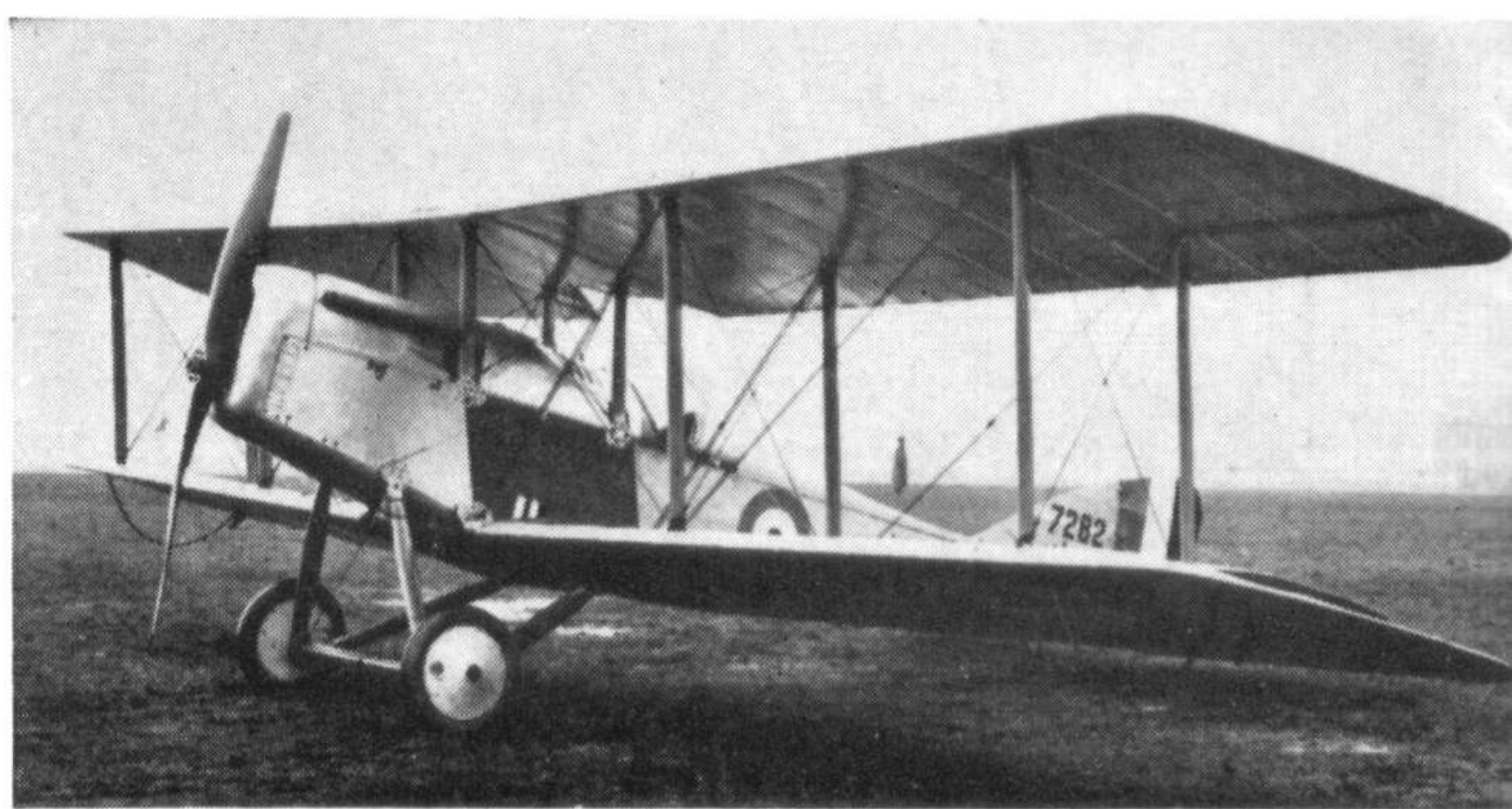
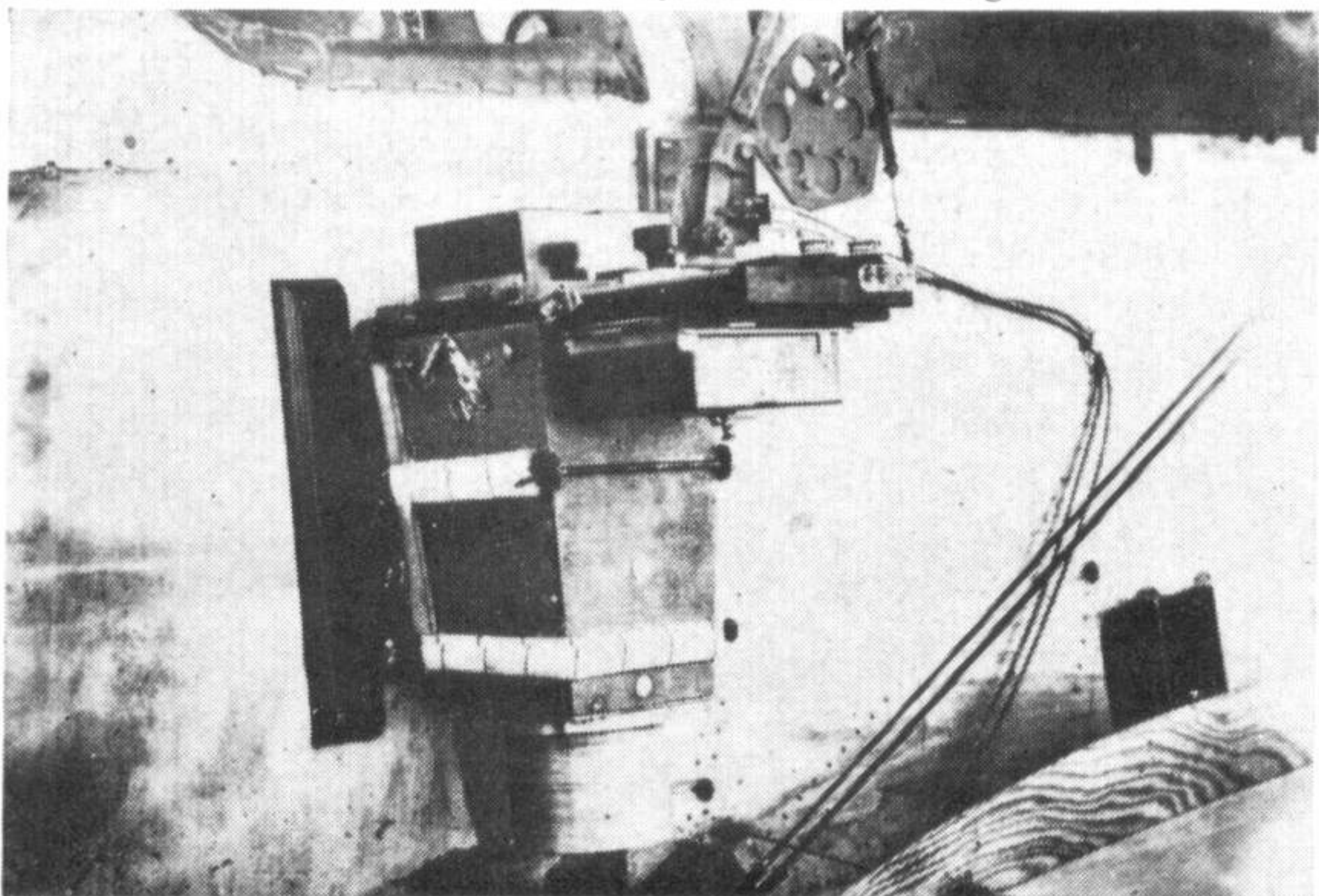
In that summer of 1914 that was to change the world forever and for the worse, the Martin-Handasyde works were building, in addition to the pusher biplane and Transatlantic monoplane, a small single-seat tractor biplane with an 80 h.p. Gnome. Although clearly inspired by the Sopwith Tabloid and Bristol Scout (see *Profile* No. 139), the new type displayed a family likeness to its monoplane antecedents and embodied many structural features characteristic of the work of A. A. Fletcher.

This single-seater was built in small numbers for the R.F.C. as the Martinsyde S.1 and saw limited operational service in France and in the Middle East. It was a sturdy little aeroplane but its performance was unspectacular and its flying characteristics left something to be desired.

Fletcher's next design was the uninspired and ill-proportioned two-seater that began life with an 80 h.p. Gnome engine and was later fitted with an 80 h.p. Anzani. Although this aircraft was tested at Farnborough in its original form the War Office sensibly decided it wanted nothing to do with it and it ultimately passed into private ownership and was extensively flown in 1916-17 by Herbert Sykes.

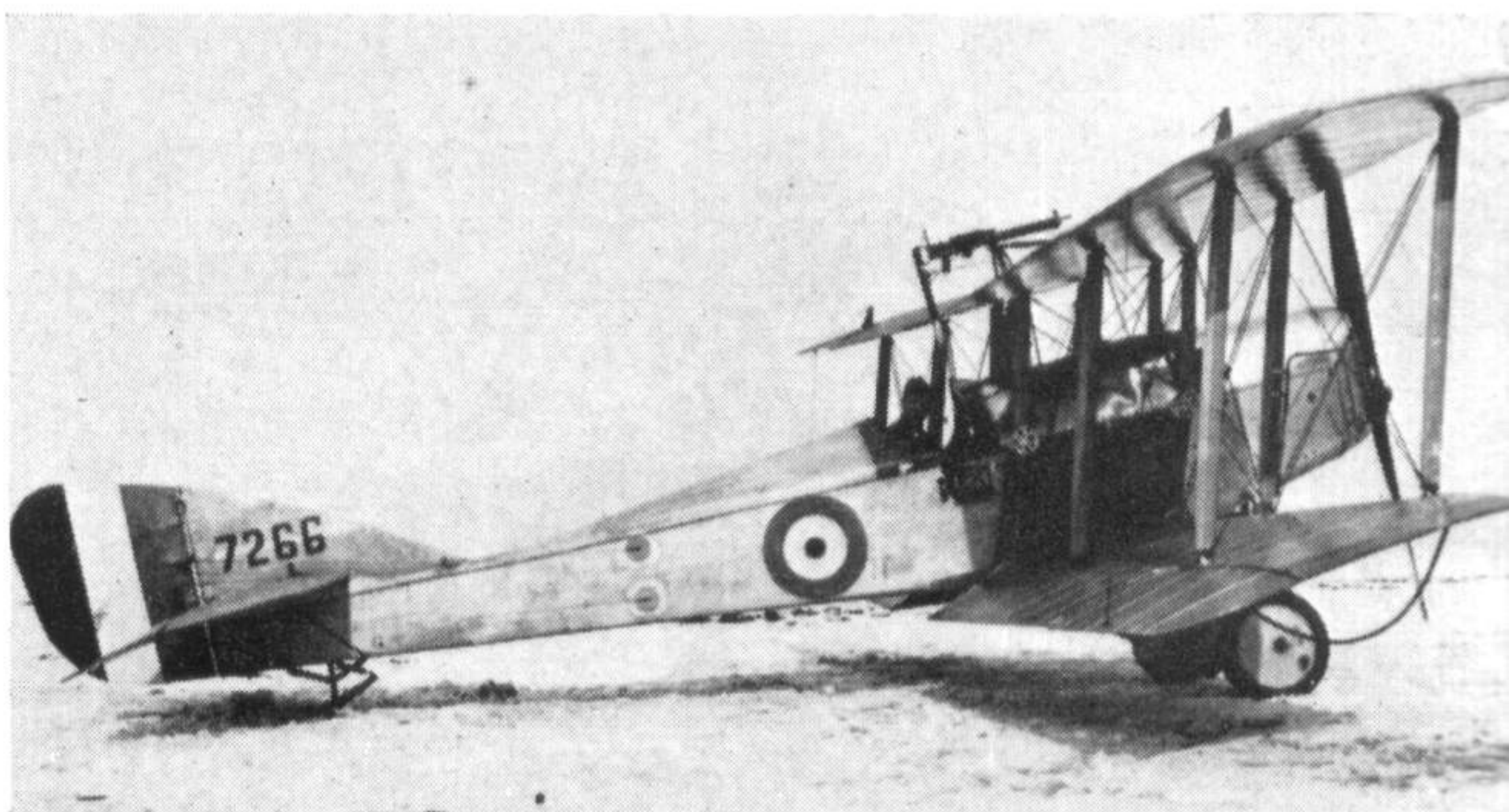
It seems likely that the prototype of the Martinsyde G.100 single-seater, No. 4735, first appeared in August 1915. Certainly it was subjected to official performance trials at Central Flying School, Upavon, on 8th September 1915. By the 27th of that month it was at Farnborough, at which time it was powered by

*Camera mounted on a Martinsyde Elephant. Note the perforated fitch plate at the base of the rear centre-section strut, a feature typical of the designs of A. A. Fletcher, and the plywood endplate on the root of the lower wing.*



*This photograph of an early production G.100 provides a clear comparison with the prototype as seen in the preceding illustration. No. 7282 was also photographed at Farnborough, where it was first reported on 17th March 1916. This photograph shows the improved engine cowling, revised cockpit shape, and the wind-driven petrol pump on the port front leg of the undercarriage V-strut.*

(Photo: Imperial War Museum MH3268)



*No. 7266 of No. 27 Squadron, photographed at Dover en route for France. Note the overwing Lewis gun and, on the side of the fuselage by the cockpit, the mounting for a camera.*

(Photo: the late H. H. Russell)

the Beardmore-built 120 h.p. Austro-Daimler engine No. 302/W.D.1322. driving a three-blade Lang airscrew No. 3076.

It has been customary to regard the Martinsyde G.100 as having been designed as a single-seat fighter. At the time when its design must have been initiated, however, the true conception of the single-seat fighter had not yet fully taken shape. The D.H.2 prototype was under construction (see *Profile* No. 91), the first aeroplane specifically designed to get one man and a machine-gun into the air; but, even if he knew of the D.H.2, it is doubtful whether Tony Fletcher intended his new design specifically as a combat aircraft. The Martinsyde G.100 had an unusually long flight endurance and, to carry the load of fuel that was needed to ensure this, the aircraft was large for a single-seater. The total fuel-tank capacity was  $50\frac{3}{4}$  gallons, sufficient for an endurance of  $5\frac{1}{2}$  hours. It seems probable that the new Martinsyde was perhaps the last British aeroplane to be designed primarily as a high-speed scout (that is, a reconnaissance vehicle), and was intended to reconnoitre distant objectives beyond the range of its contemporaries. It is significant that most production aircraft had as a standard fitting a camera mounting on the starboard side of the fuselage.

In appearance the G.100 blended handsomely some of the characteristics of the little S.1 biplane with some of the elegance of line that had distinguished the pre-war Martinsyde monoplanes. It was a two-bay biplane with staggered wings of equal span



and chord; ailerons were fitted to upper and lower mainplanes.

The airframe was a typical wire-braced wooden structure; the rear fuselage and all flight surfaces were fabric-covered; there were plywood panels on the fuselage sides between the centre-section struts, and the decking about the cockpit was also of plywood. Attachments of struts, wings and undercarriage to the fuselage were by the perforated sheet-steel plates favoured by Fletcher. A gap was left in each mainplane beside the fuselage, and there was the unusual refinement of a plywood end-plate on each root rib.

On the prototype the engine cowling was an ugly affair that marred the G.100's appearance. The portion below the upper longerons had no leading-edge camber and therefore looked angular; this was accentuated by the cross-shaped stiffening corrugations made on the side panels of the cowling. The upper cowling had a cambered entering edge but the rectangular air intakes for the radiator (which was installed behind the engine) were surmounted by six individual exhaust stubs, above which a further row of holes were made, and the overall aspect was not pleasing. A leather strap, buckled on the port side, held down the top cowling: this was an inheritance of a detail feature of some of the pre-war Martin-Handasyde monoplanes.

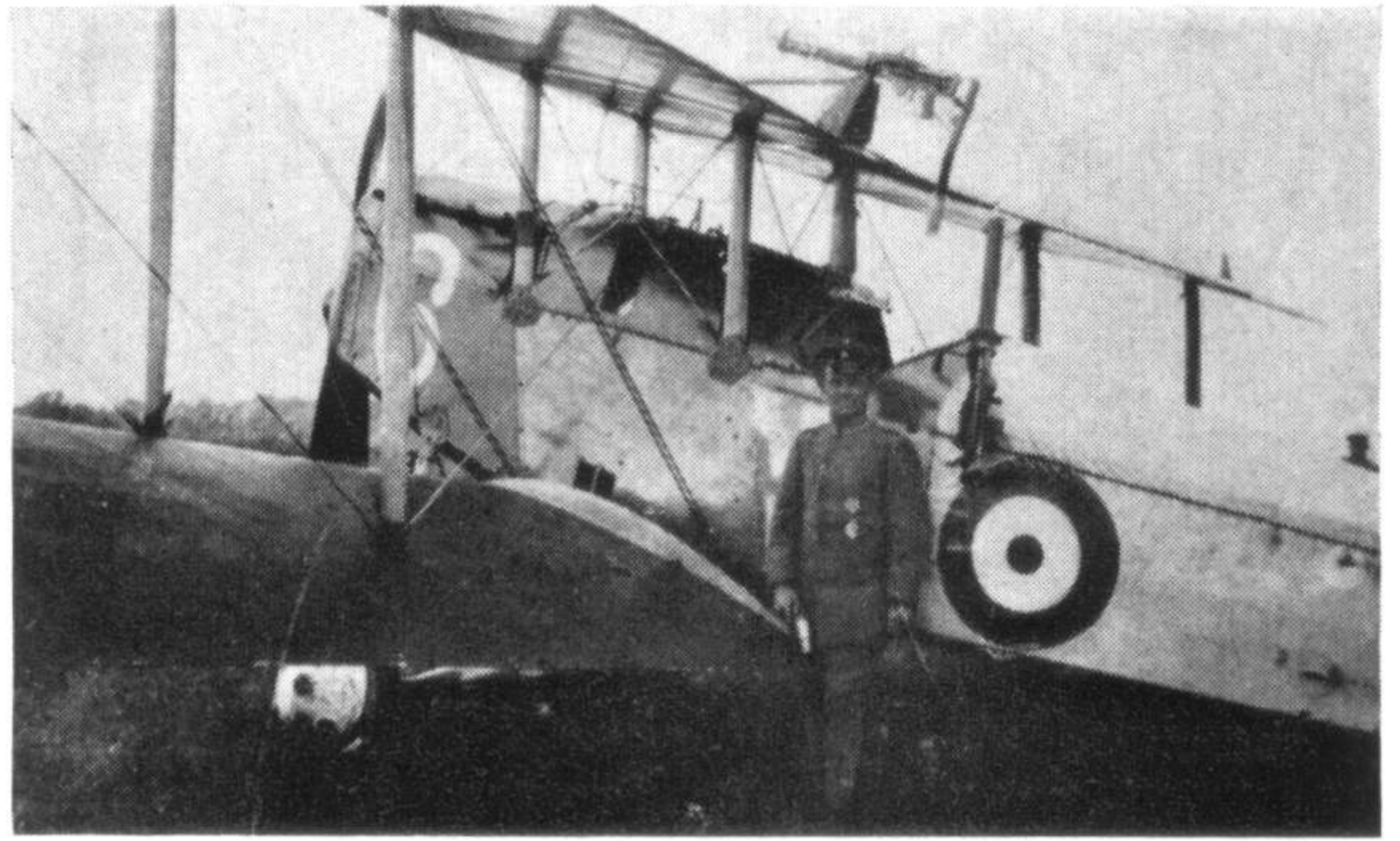
The prototype G.100 was tested at a time when testing methods were primitive and only sketchy performance records were made. Nevertheless it was obviously considered good enough for the equipment of R.F.C. squadrons and a production order was given for fifty aircraft (7258-7307); this was quickly followed by a second order for a similar quantity (7459-7508).

Production began immediately, and the prototype, 4735, was flown to France by Lieutenant Dunn on 29th October 1915. While at St. Omer its original engine was changed and on 5th November, with the 120 h.p. Beardmore No. 265/W.D.1329, it was flown to No. 6 Squadron, R.F.C., by Lieutenant Grey Edwards. What, if anything, it did while with No. 6 Squadron is not known.

Production G.100s began to leave the Brooklands works early in 1916. Output was not conspicuously speedy: the seventeenth aircraft, 7274, was not reported to be at Farnborough until 20th February 1916. A possible explanation for early delays in production may lie in the accident that occurred in February 1916 when a Martinsyde G.100 that was being tested by F. P. Raynham suffered a major structural failure in the tail unit. The aircraft fell 2,000 ft. inverted; Raynham was injured in the crash but recovered and resumed his flying activities later in the year.

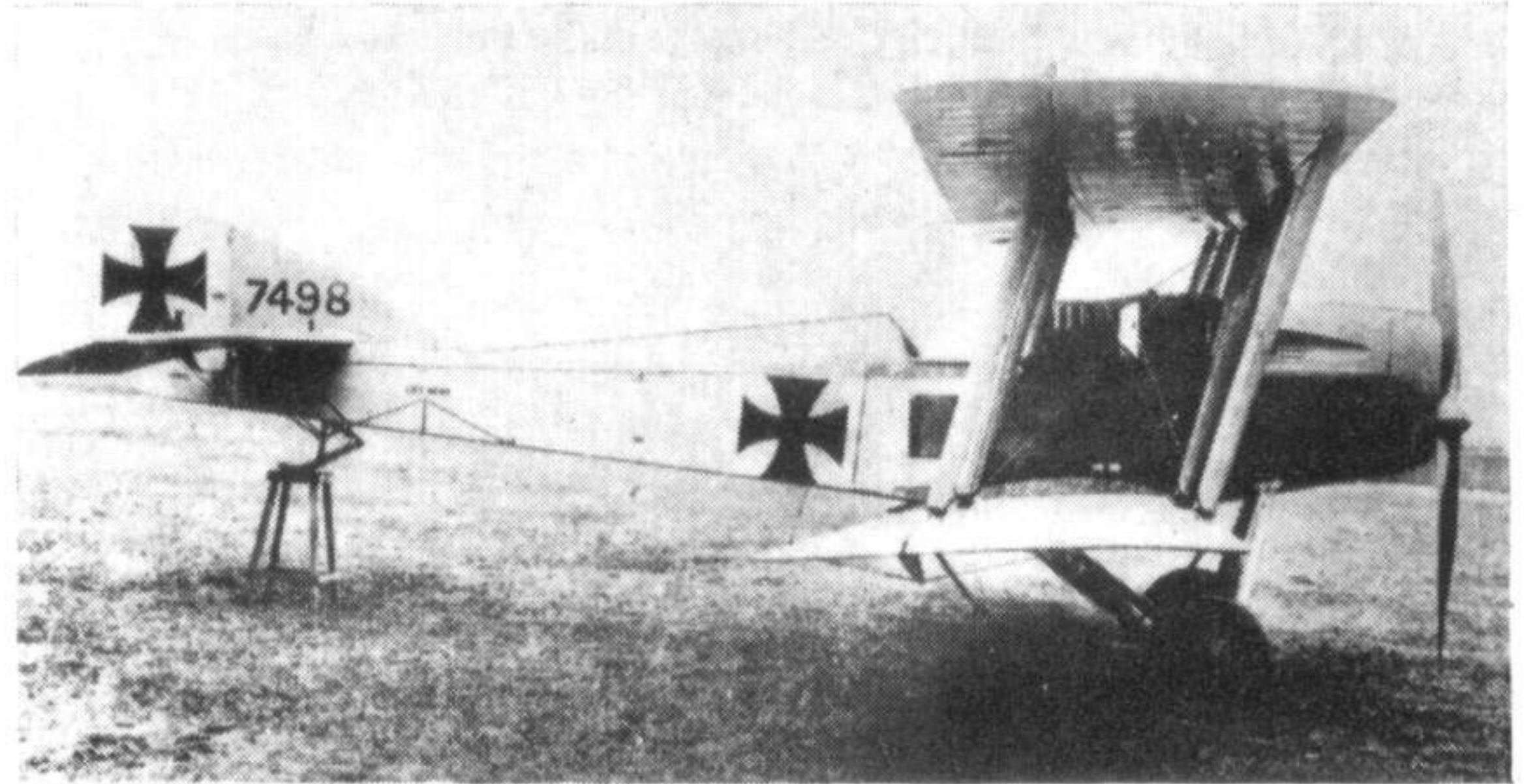
Production of the second batch, 7459-7508, followed directly on the completion of the first. Farnborough had 7462 on 7th June 1916, and the last aircraft of the batch, 7508, was recorded there on 14th October. It seems likely that, apart from the setback of Raynham's crash, production of the Martinsydes might have been faster if their 120 h.p. Beardmore engines had not also been in substantial demand for the F.E.2b and R.E.7.

The production G.100 differed little from the prototype but several refinements and modifications had been incorporated. The nose lines were greatly enhanced by a much cleaner engine cowling; an exhaust manifold was fitted, the radiator air intakes

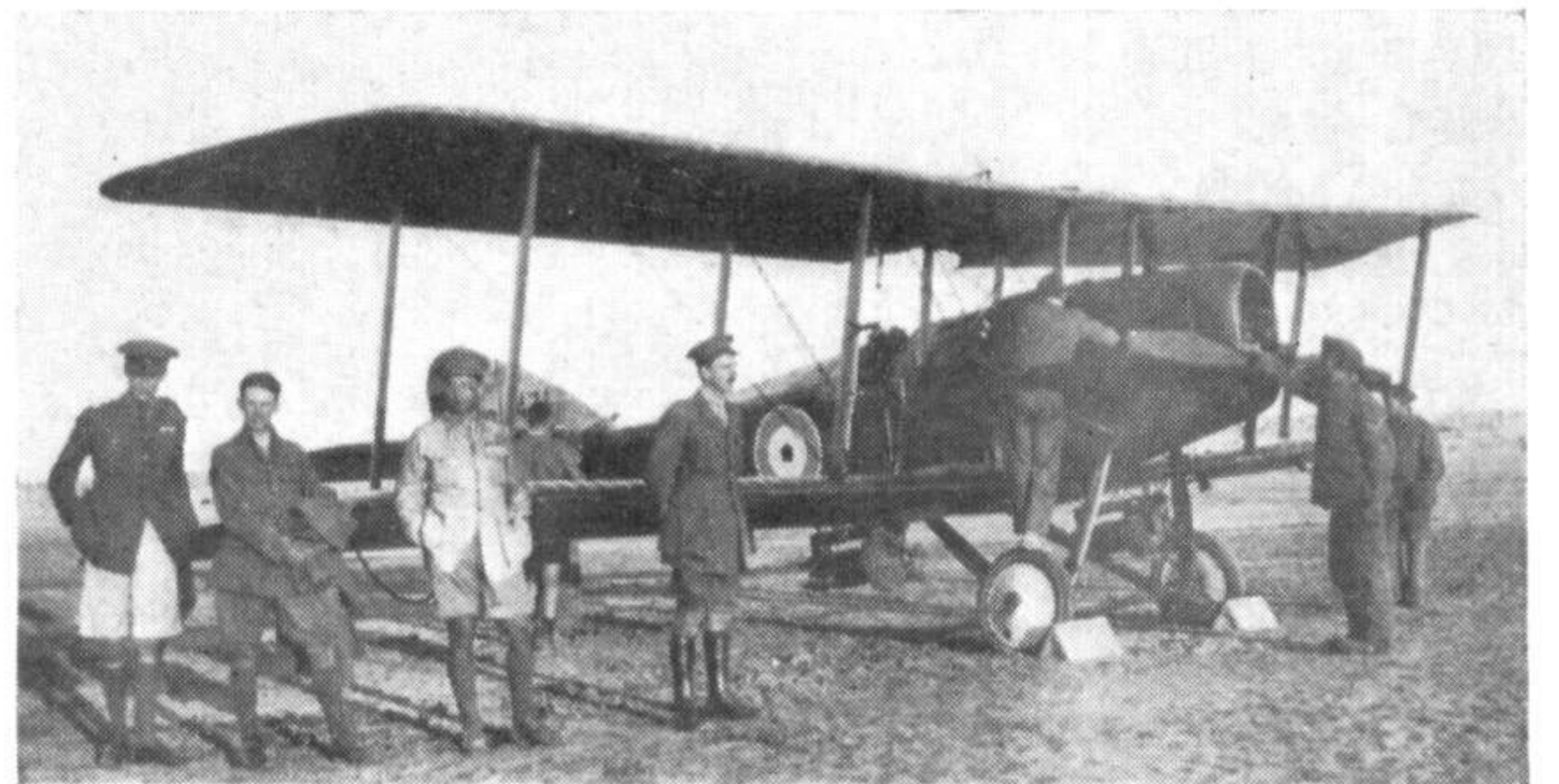


*Offizier-Stellvertreter Max Müller beside No. 7276 of No. 27 Squadron, which he forced down on 14th July 1917. The aircraft has the rear-mounted Lewis gun behind the cockpit.*

(Photo: Egon Krueger)



*Also in enemy hands was 7498, which was obviously flown on evaluation tests by the Germans.*



*No. 7474 of No. 14 Squadron, bombed up and ready to take off on an operational sortie.*

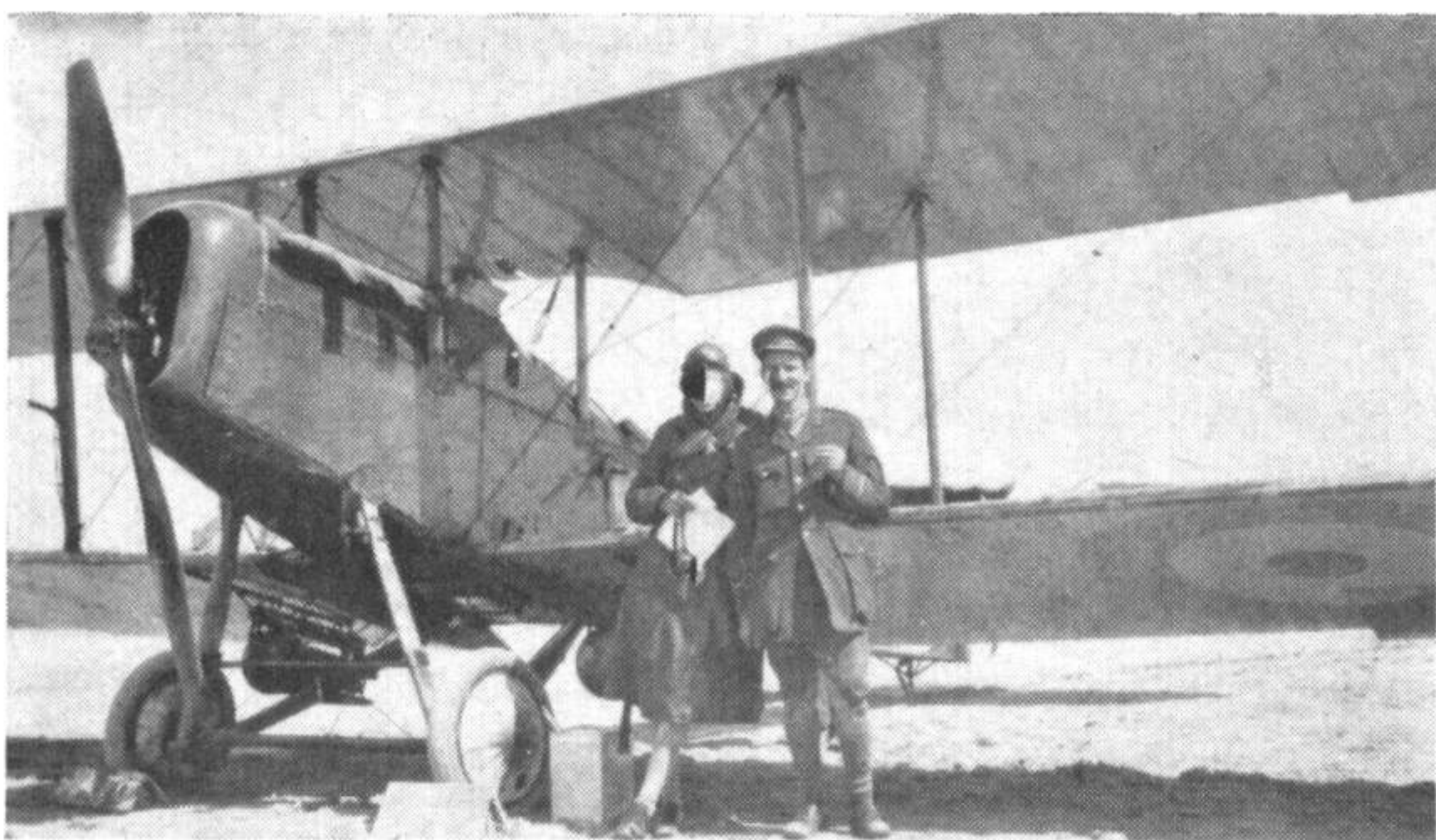
(Photo: John H. Blake)

were of modified shape, and the 120 h.p. Beardmore drove a more conventional two-blade Lang airscrew. The shape of the cockpit opening was modified, and the revised top decking ahead of the cockpit reduced the ugly hump that had marred the appearance of the prototype. A smaller, pylon-mounted tailskid was fitted, and in the interplane bracing streamline-section Rafwires replaced the wire cables of the prototype. The incidence of the tailplane was increased slightly, and a small reflex portion was added to the rear end of the top decking to fair off the leading edge of the tailplane.

As Oliver Stewart recorded in the following extracts from *The Clouds Remember*, the Martinsyde had pleasant but somewhat unusual flying characteristics:

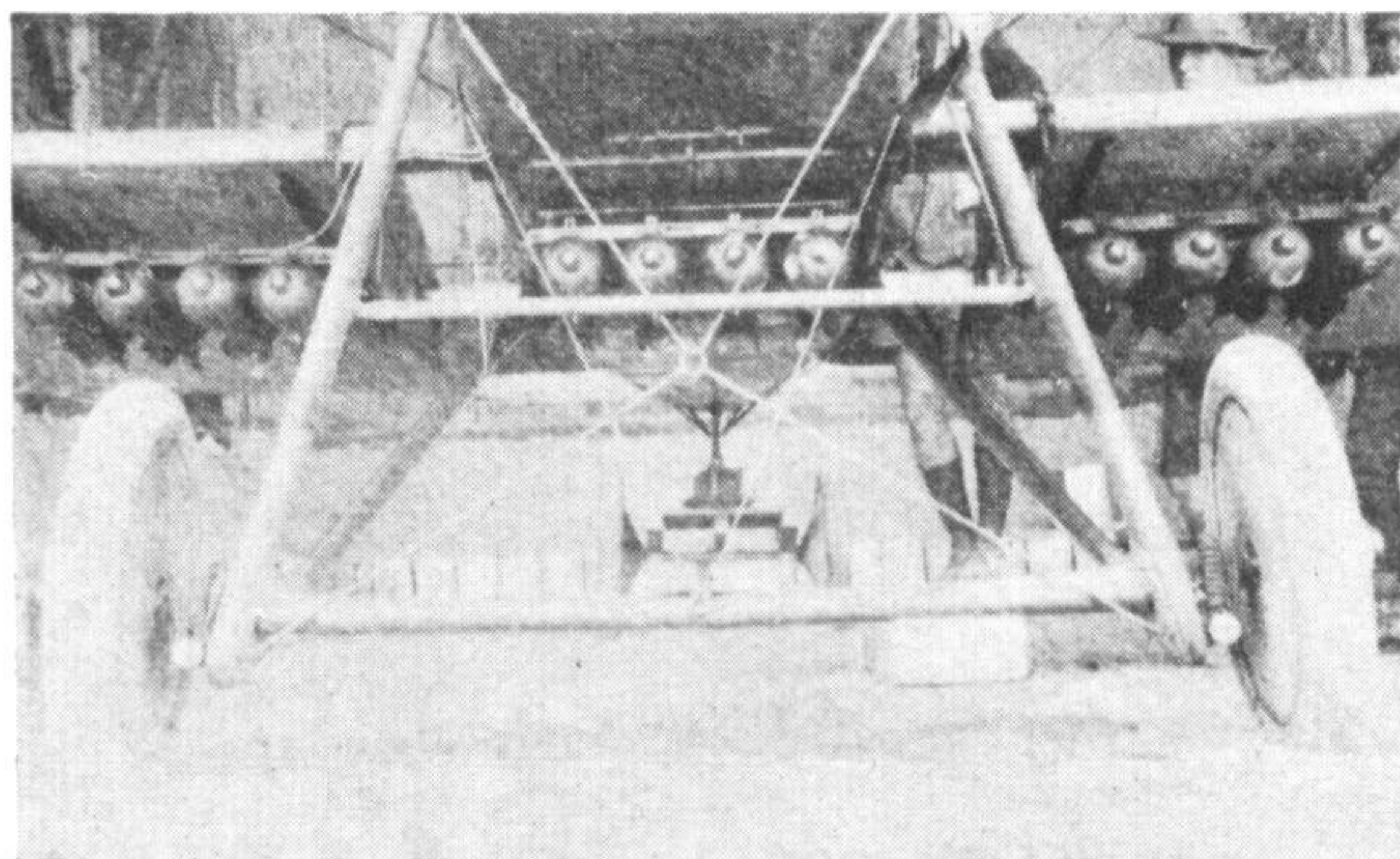
“As a flying machine the Martinsyde Elephant had many pleasing qualities. It ambled through the air with a rather gentle burbling sound and seemed to get about the country fairly quickly. The outlook from the pilot's cockpit was somewhat restricted and the present writer, when he once got lost in one of these aeroplanes on a day when rain





Another of No. 14 Squadron's Elephants, bombed up with somewhere to go. In this photograph can be seen the two notches in the trailing edge of the centre section into which fitted the legs of the overwing Lewis gun when it was swung down for reloading. Also visible is No. 14 Squadron's characteristic modification of the undercarriage, consisting of an additional tie-rod between the forward legs of the V-struts.

(Photo: John H. Blake)



Also believed to be one of No. 14 Squadron's aircraft, this Elephant was loaded with no fewer than twelve 20-lb. Cooper bombs.

(Photo: R. C. Bowyer)

was falling and visibility was bad, found the restricted outlook made it difficult to recognize landmarks. But the flying quality which was chiefly attributed to this machine by the pilots of the period was that of 'floating' when landing.

Actually floating must be regarded as the responsibility partly of the pilot and partly of the aeroplane. In so far as the aeroplane is responsible, it is a testimony to sound design; for the cleaner the design, the greater the float after the approach at a given speed. The war-time machines were mostly far from clean. The biplane does not lend itself to really clean design and there were the struts and bracing wires all contributing to the drag. Pusher aeroplanes, especially, had almost no float because directly power was cut off and the aeroplane tilted for the touch down, the drag pulled it up like a powerful air brake.

When a relatively clean design like the Martinsyde Elephant came out, pilots, used to things that stood still, and dropped the moment the stick was brought back, were a little puzzled by it. If they approached in their habitual manner, with a big margin of speed over stalling speed, they found the machine shooting across the aerodrome towards the opposite hedge at the moment when they expected it to be sitting down on the grass.

It was, as I say, an excellent quality in the aeroplane because it demonstrated low drag. But at that time—and even on occasions today—pilots talk about it as if it were a fault. So the word went round that the Martinsyde Elephant 'floated

badly'. I suppose the reputation of the machine was slightly damaged by this story. But in fact, directly one became familiar with the Martinsyde, or indeed with any other aeroplane with the reputation for floating, one found that the float could be prevented and the landing made in a short space provided only that the approach was adjusted so that only a small margin of speed over the landing speed was maintained.

So when we remember that the Martinsyde Elephant had this reputation for floating we remember a strong testimony in favour of the excellence of the design. As for the controls of the Martinsyde Elephant, they were reasonably good although the ailerons failed to produce as quick or as big a response as many pilots would have liked and the elevator had none of the sensitivity of the elevator, for instance, of a Camel.

The only serious fault was the poor outlook. The pilot sat just behind the trailing edge of the top plane with the trailing edge of the lower plane almost immediately below him. Forwards and upwards a big arc of view was blanked out by the top plane and downwards and forwards there was another big arc of view blanked out. The big chord of the wings added to the blanking effect. In addition, the forward part of the fuselage, and the cowling of the Beardmore engine, came rather high and still further restricted the forward outlook."

When the production G.100s became available several of them were allocated in small numbers to squadrons equipped with reconnaissance aircraft, in accordance with the original practice of providing such units with fighting single-seaters to protect the two-seaters. In France, R.F.C. Squadrons Nos. 18, 20, 21 and 23 all had a few Martinsyde G.100s at an early stage in their careers. No. 23 Squadron had at least three, and retained them long after the other three units had parted with theirs. Indeed of these four squadrons only No. 21 needed fighting escorts for its R.E.7s; the Vickers F.B.5s of No. 18 and the F.E.2b's of Nos. 20 and 23 Squadrons were at that time capable of looking after themselves in combat.

The only squadron to be equipped throughout with the Martinsyde G.100 was No. 27, which received its aircraft at Dover in February 1916. The unit arrived in France on 1st March, when eleven G.100s landed at St. Omer.

Thus the new Martinsyde went to war before a British gun-synchronizing gear was available. It was therefore armed with a Lewis gun on an overwing mounting on the centre section. The day of the Foster mounting had not yet arrived, and the Martinsyde's centre section was unusually high above the fuselage; consequently the Lewis gun retained its rear spade grip, to which a long downward extension was added. This carried a Bowden cable to the trigger to enable the pilot to fire the gun; but changing drums must still have been a difficult matter, for the inverted V-member to which the gun was attached was pivoted on the rear spar and the gun had to swing through quite a large arc in the full blast of the slipstream when being lowered and elevated.

Whatever their designed purpose, the Martinsydes were clearly expected to serve as fighters by the units that had them and at first were not entirely unsuccessful. Of a mission flown on 1st July 1916, the day on which the Battles of the Somme started, the official historian wrote:\*

\* The War in the Air, Vol. II, page 215.



“A later reconnaissance flight to Cambrai and beyond to Busigny and Etreux had to fight its way on the whole round. The escort of three Martinsydes kept the enemy away from the reconnaissance aeroplane—a Morane biplane—and forced two Rolands to land.”

To the R.F.C. the Martinsyde G.100 became known as the Martinsyde Elephant at an early stage in its career. Certainly this was so in No. 27 Squadron, in which the nickname was in general use before July 1916 was out. Its precise origin is uncertain, but it may have been inspired because the aircraft was unusually large for a single-seater and was not so agile as the smaller rotary-powered scouts of the period.

The Somme struggle saw the initiation of the Martinsyde into bombing duties. On 1st July six of No. 27 Squadron's aircraft bombed Bapaume, known to contain a German headquarters, and started a fire that burned for several hours. The six bombing G.100s were escorted by two others and some of No. 60 Squadron's Morane-Saulnier Type N monoplanes. Some of the Martinsydes had cameras aboard and photographed the bombed target.

Throughout the Somme battles the Martinsydes escorted bomber and reconnaissance aircraft and themselves bombed many targets, especially in the area south of the Ancre, where they shared the responsibility for bombing with the R.E.7s of No. 21 Squadron and the B.E.12s of No. 19 Squadron.

The aircraft's performance must have suffered markedly by the addition of the bomb load, which was carried externally, and it must have been appreciably poorer

than the figures given in the table at the end of this history, all of which relate to aircraft that were not carrying bombs when tested. It is therefore not surprising that not later than the end of July 1916 it had been found necessary to supplement the single overwing Lewis gun. The additional defensive armament consisted of a second Lewis carried on a pivoted spigot mounting on the port side immediately behind the cockpit. The combat usefulness of this gun seems highly questionable, but the installation was standardized and the rear gun was occasionally used effectively.

Tremendous courage, initiative and determination were displayed by the pilots of No. 27 Squadron in their bombing attacks which, owing to the Martinsyde's long range, often took them far into German territory and exposed them to much enemy fire. In recording a successful bombing attack on Hirson railway station on 16th November 1916 the official history noted that “All the pilots returned safely after a four and a half hour flight.” Each of the four bombing Martinsydes had carried two 112 lb. bombs.

The squadron continued to mount offensive patrols in addition to its bombing work. On 21st July 1916

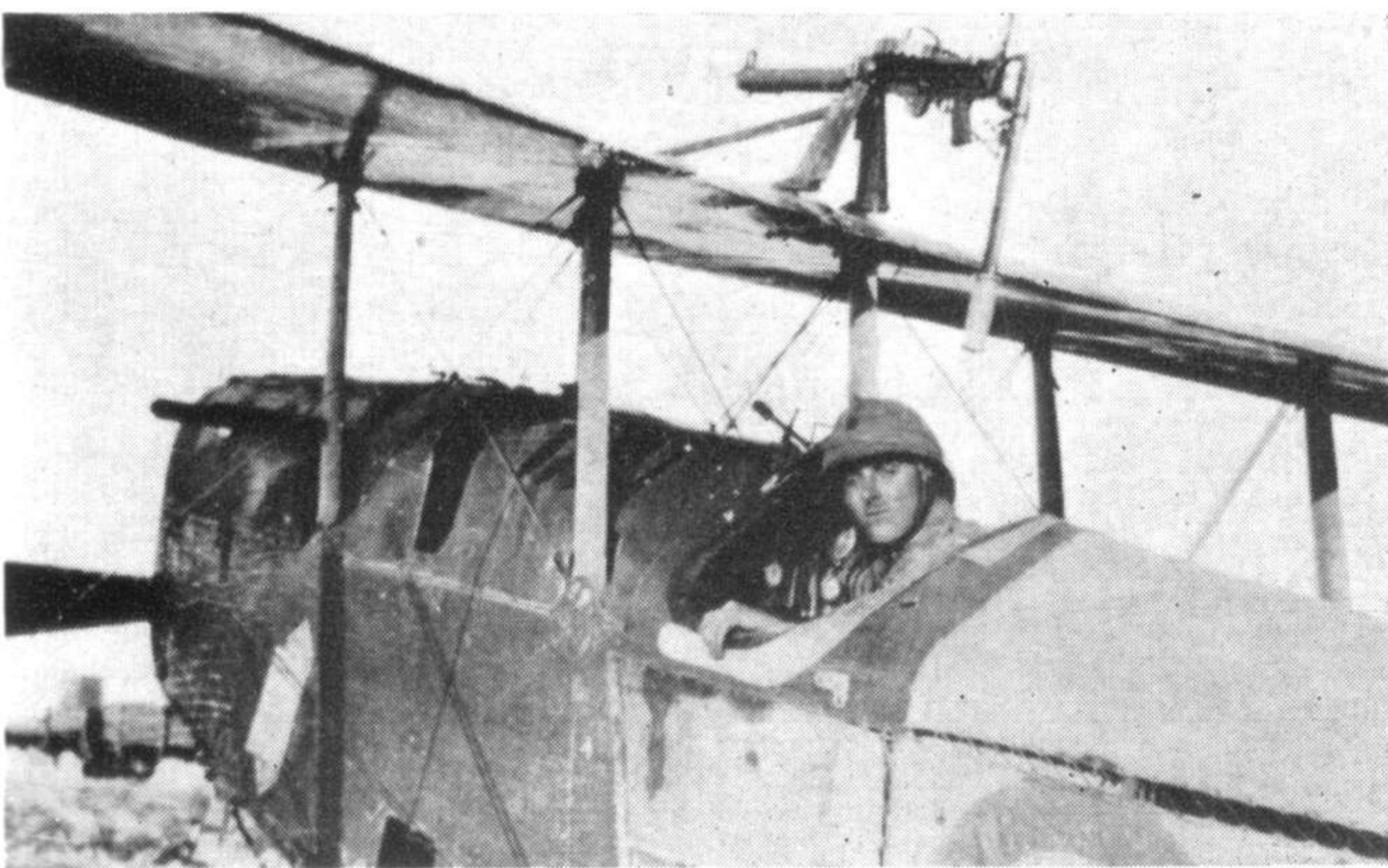
“... an offensive patrol of six Martinsydes of No. 27 Squadron, led by Captain O. T. Boyd, was attacking isolated aeroplanes above their aerodrome at Bertincourt. They drove three down, fighting them to within a thousand feet of the ground. Captain Boyd's two guns had been put out of action by bullets early in the fighting, but he continued to lead his patrol for the full specified time and brought his formation safely back.”\*

During much of the Somme fighting the Martinsyde proved to be a versatile and by no means unsuccessful aircraft, but it was no match for the new Albatros fighters that appeared over the front in September 1916. By that time production of the 160 h.p. version of the Beardmore engine was getting into its stride: whereas a total of only 45 engines of this type had been delivered up to the end of June 1916, a total of 124 were handed over during the next three months and a further 148 were delivered in the last quarter of 1916.

As 160 h.p. Beardmores became available they were fitted to Martinsydes, but the slow initial production of the engine and the greater demands for it for the more numerous F.E.2b make it difficult to determine the precise point in the Martinsyde production run when the 160 h.p. engine was introduced. With the more powerful engine the type was designated Martinsyde G.102, and it has been reported that the aircraft of the third production batch (A1561-A1610) were of this variant. It seems unlikely that all were G.102s, however. A1561 itself was reported to be at Farnborough as early as 15th July 1916, when scarcely fifty of the 160 h.p. engines had been delivered to the R.F.C., and some three months before the last aircraft of the 7459-7508 batch were delivered there. Deliveries of aircraft of these batches appear to have overlapped to some extent. Moreover, it is known that 160 h.p. Beardmores had already been supplied to No. 11 Squadron for its F.E.2b's and were proving so troublesome that that unit had been obliged to fall back on some Vickers F.B.9s to maintain its patrols.

The first aircraft in respect of which a specific note

\* The War in the Air, Vol. II, page 263. Some of Captain O. T. Boyd's later activities are chronicled in Profile No. 193, the Bristol M.1A-D monoplanes.



Cockpit and centre section of an Elephant of No. 30 Squadron. The aircraft appears to have the original, Mark I, form of the overwing gun mounting: the later Mark II mounting had the legs pivoted on the underside of the centre-section rear spar. Note the gap in the laced-on fabric of the rear fuselage.

A Martinsyde Elephant in the Middle East with a single heavy bomb under the fuselage.

(Photo: Imperial War Museum Q67952)







*A battered Elephant recaptured from the Turks at Tikrit. The aircraft had earlier fallen into Turkish hands and had been marked with Turkish insignia.* (Photo: Imperial War Museum Q24400)

of a 160 h.p. Beardmore occurs was *A1599*, which was at Farnborough on 18th December 1916, fitted with the 160 h.p. Beardmore No. 879/W.D.7489 (but of course this is not to say that some of its predecessors may not also have had the more powerful engine). The C.F.S. performance trials of a 160 h.p. Martinsyde did not take place until 23rd January 1917.

There can be no doubt that operational Martinsydes were fitted with the 160 h.p. Beardmore to the limit of engine availability. That Elephants originally built as G.100s may have been converted to G.102s is suggested by the following extract from an official document\* listing the total number of man-hours required to install certain types of engines in various aircraft:

“To install, run up and test 160 h.p. Beardmore fitted to Martinsyde Scout—90 man-hours. The increase of hours on this type of machine is due to fitting 160 h.p. Beardmore engine to a machine that was made for 120 h.p. Beardmore engine. It is necessary to convert the whole of controls from a positive control to Bowden.”

Several late-production Martinsydes were in fact fitted with the 120 h.p. Beardmore. These included *A4001*, *A6267*, *A6281* and *A6283*; which were reported to be at Farnborough on, respectively, 7th April, 30th July, 23rd July and 16th July 1917, *A4001* with the 120 h.p. Beardmore No. 370/W.D.2342, *A6267* with No. 409/W.D.2381, *A6281* with No. 375/W.D.2347, and *A6283* with No. 420/W.D.3292. By 10th August, however, *A6267* had been fitted with the 160 h.p. engine No. 37/W.D.9485.

The G.102 was externally indistinguishable from the G.100. Its more powerful engine enabled it to lift one 230 lb. or two 112 lb. bombs with greater ease. This in turn led to the fitting of a substantial bomb-carrying beam under the fuselage of some Elephants. The greater fuel and oil consumption of the 160 h.p. Beardmore (a combined rate of 0.63 pts. per b.h.p./hour as compared with 0.563 pts. per b.h.p./hour on the 120 h.p. engine) reduced the aircraft's endurance to 4½ hours.

Late-production Elephants had revised exhausts: three separate outlets replaced the full-length external manifold of the earlier aircraft, and at least one Martinsyde, *A3948*, had an internal manifold with a single frontal outlet. It is doubtful whether the

\* Unfortunately the document bears no date, but its inclusion of the Sopwith Dolphin means that it cannot have existed earlier than the autumn of 1917.

modified exhaust arrangement can be regarded as an infallible indication that the aircraft to which it was fitted was a G.102.

What the original members of No. 27 Squadron could not have foreseen in February 1916 was that their distinguished unit would still be flying Elephants nearly two years later; but it was not until November 1917 that the squadron started to re-equip with D.H.4s. It is difficult to understand why No. 27 had thus to wage so much of their share of the war in an aircraft that had an undistinguished performance, was inadequately armed and gave its pilot a restricted view in all directions vital for bombing. Its long flight endurance must have been principally responsible for its long survival in France.

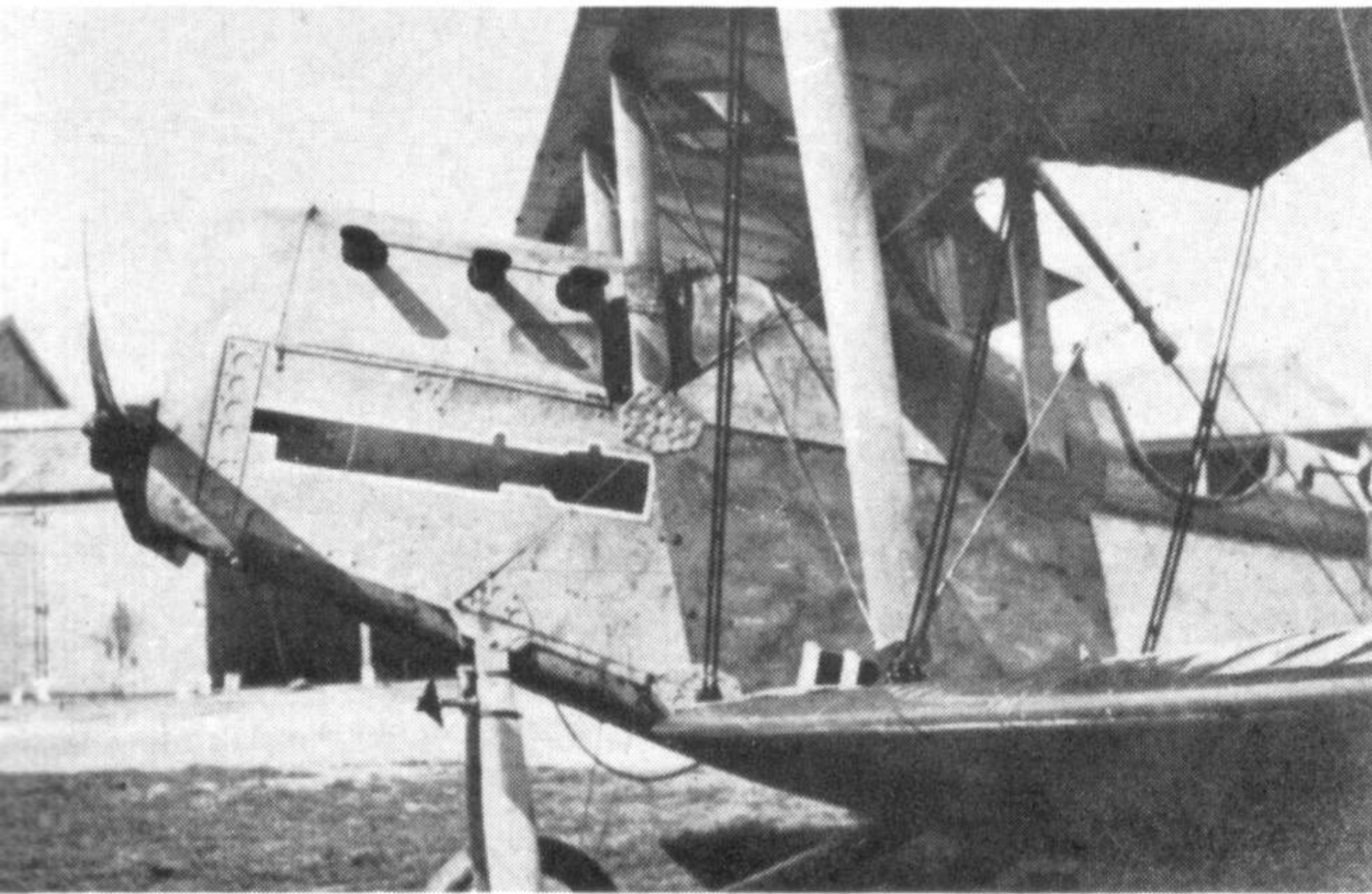
Throughout the Battles of Arras, Messines, Ypres and Cambrai the Elephants bombed enemy railway stations, ammunition dumps and aerodromes at such places as Ath, Vyfwegen, Marcke, Heule, Ingelmunster, Phalempin, Seclin, Courtrai, Bisseghem, Abeele, Wervicq, Aelbeke, Tronchiennes, Gontrode, Dadizeele, St. Denis Westrem and Douai. Sometimes they were given fighting escorts, sometimes not. As late as 20th November 1917, a day of low cloud, No. 27's Elephants were sent out singly or in pairs to bomb enemy aerodromes.

One of the finest feats of navigation performed during the war was the attack on the Gontrode airship sheds by Sergeant S. J. Clinch of No. 27 Squadron on 1st November 1917. His Elephant was one of three that had left Serny but the other two were soon lost in the low cloud and poor visibility. Flying by compass alone (itself a remarkable feat of airmanship in 1917) Clinch emerged from the cloud over Gontrode, dived to roof level to bomb, and returned to Serny, again flying by compass.

Various modifications were made or tried during the Elephant's long operational service. At least one aircraft, *7498*, had its overwing Lewis gun on a non-standard mounting offset to starboard; and as early as 16th June 1916 Major Burton tested *7298* with its centre section covered with transparent Cellon. This modification was not adopted, however.

As early as 14th July 1916, *7463* was tested at Farnborough with an experimental periscopic bomb sight. This aircraft was flown to Orfordness on 18th July 1916, but the periscopic sight was not developed sufficiently to see operational use in Elephants; nevertheless, Farnborough continued experiments with it installed in other aircraft.





*The forward fuselage of A6299, which had the Eeman mounting for three Lewis guns firing forwards and upwards at an angle of 45 deg. The uppermost Lewis gun can just be seen in this photograph, forward of the starboard rear centre-section strut; the other two guns fired through the slots visible in the centre section.*

In August 1917 A6299 was tested with the Eeman triple mounting of three Lewis guns. As on the S.E.5a B4875 (see *Profile* No. 1, page 7) the guns were mounted within the fuselage and fired upwards at an angle of 45 deg. through three slots cut in the centre section. Possibly a Home Defence application was envisaged, but the Elephant did not have the performance to make it successful in this field, and only one aircraft of the type was allocated to a Home Defence squadron. When tested against a standard G.102 A6299 proved to have a poorer performance, despite its lower loaded weight.

In the preceding month Martlesham Heath had tested the G.102 A3997 fitted with a German radiator installed in the centre section. The aircraft was tested with the wing radiator only, with the standard radiator reinstated and the wing radiator disconnected, and with the wing radiator faired over with plywood. The results of these tests could not be expected to be very conclusive, particularly as the intakes to the standard radiator were at no time faired over.

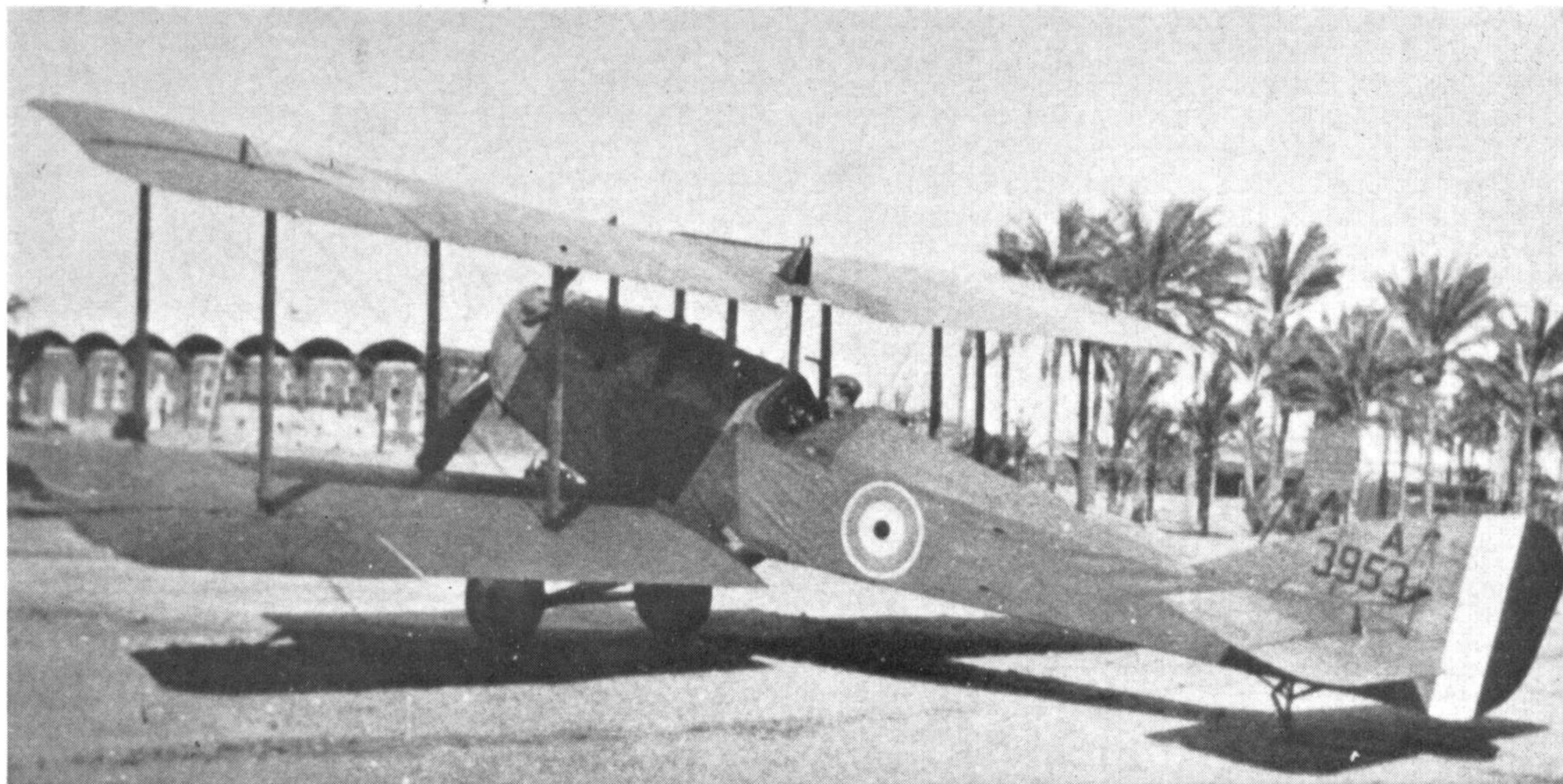
In the early summer of 1917 a 200 h.p. Sunbeam Elephant A3953 at Abu Qir, where it was used for training purposes.

Arab V-eight engine was installed for test purposes in a Martinsyde aircraft that could only have been an Elephant. The engine was at that time at the height of its development troubles, but the example (engine No. 9008) in the Martinsyde was reported to have performed satisfactorily on its second flight, which was made on 18th July 1917. Unhappily, the engine had been selected for mass production before it had been tested, and later Arabs proved to be anything but satisfactory. The Arab-Martinsyde is known to have struck a post during its landing run and damaged one of its lower wings at the conclusion of its flight on 18th July. It was returned to the Sunbeam works for repair.

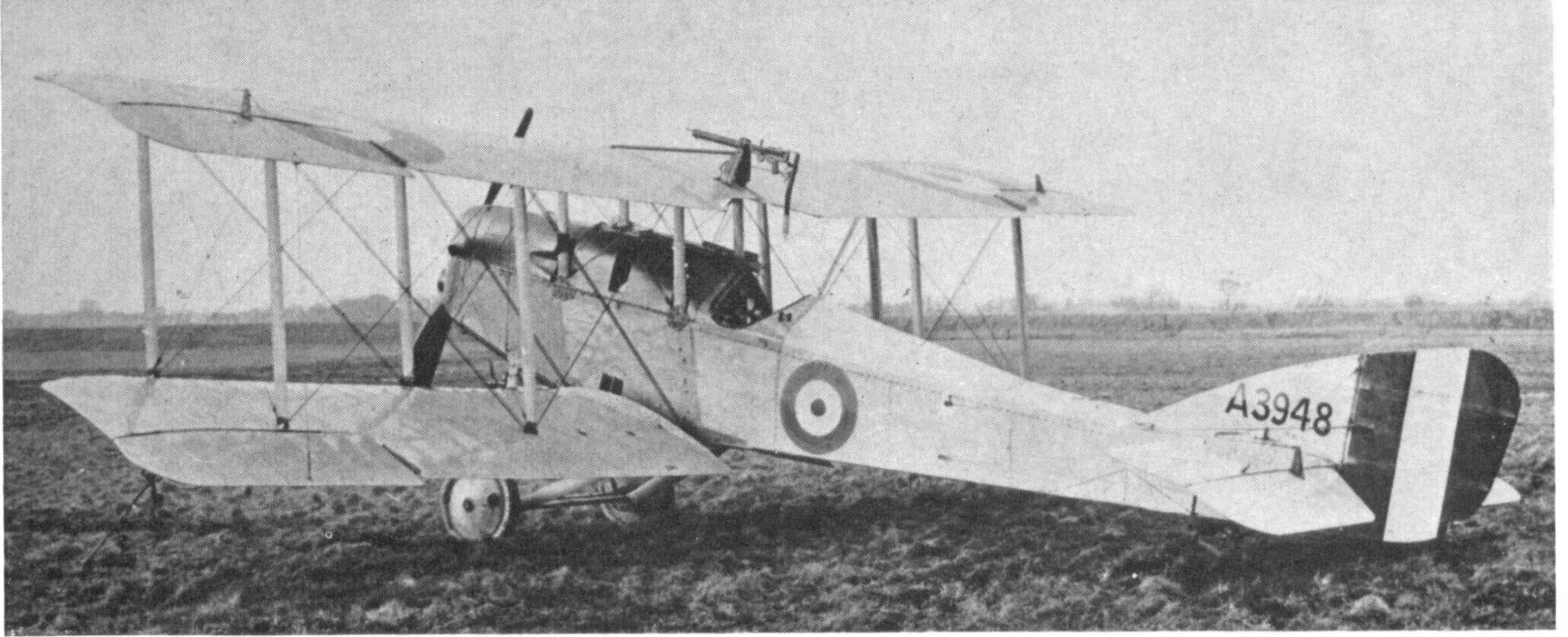
The Elephant saw extensive operational service in Palestine with squadrons Nos. 14, 67 (Australian) and 142, and in Mesopotamia with squadrons Nos. 30, 63 and 72. None of these units was wholly equipped with Martinsydes, and in all only 64 Martinsydes went to the Middle East. There, as in France, they were employed as bombers, one of their earliest actions in Palestine being the bombing of the German aerodrome at Beersheba on 8th January 1917 by three Elephants escorted by three Bristol Scouts. These aircraft, although unidentified in the official history, must have been of No. 14 Squadron, R.F.C.

At that time the Australians in No. 67 Squadron had only three Elephants, one to each Flight, but on 26th January 1917 it was decided that the establishment of squadrons in Egypt, Salonika and Mesopotamia was to be twelve B.E.2c, 2d or 2e two-seaters and six Martinsyde or D.H.2 single-seaters. By March 1917 No. 67 Squadron had its quota of six Martinsydes.

In the Middle Eastern theatre of war the Martinsyde featured in several successful rescues of pilots of other aircraft forced down behind the enemy lines. In the most famous of these, Lieutenant F. H. McNamara of No. 67 Squadron, although badly wounded in the leg, landed his Martinsyde beside Captain D. W. Rutherford's B.E.2c (No. 4135), which had been damaged by anti-aircraft fire. McNamara tried to take off in the Martinsyde with Rutherford aboard, but his wound prevented him from controlling his aircraft adequately and the Elephant crashed. Setting fire to the Martinsyde,







A3948 of the armament experimental station at Orfordness had a single forward outlet for the exhaust manifold and was fitted with an Aldis gun-sight.

they succeeded in restarting the B.E.'s engine and McNamara managed to take off under the fire of approaching Turkish forces. For this action, which occurred on 20th March 1917, McNamara was awarded the Victoria Cross.

On 26th June Lieutenant A. T. Cole, on a Martinsyde, attempted to rescue the pilots of two B.E.2c's (Lts. C. le B. Brown and R. A. Austin), both of whose engines had successively failed. Unfortunately the load was too much even for the gallant Elephant; its labouring and overheated engine also failed, the aircraft crashed, and Cole, Brown and Austin had to walk back across a perilous stretch of No Man's Land.

No. 67 Squadron began to receive Martinsyde G.102s in October 1917 and had five at the end of January 1918. By the end of March the Australian squadron was equipped throughout with Bristol Fighters and had handed over its Martinsydes to the newly-formed No. 142 Squadron. The new unit was made responsible for bombing raids across the Jordan, but its equipment of elderly Martinsydes and B.E.12a's made its task a difficult and dangerous one.

In February 1918 No. 67 Squadron created from the fuselage of a Martinsyde Elephant one of the most remarkable craft to be used in the war. Nicknamed *Mimi*, it consisted of the stripped fuselage of an Elephant mounted on a float undercarriage that must have belonged to a Sopwith Baby. *Mimi* was the idea of Lt.-Col. R. Williams, her objective to deprive the Turks of their boats in the Dead Sea. The craft was erected near Jericho on 28th February, and before dawn on 1st March *Mimi* set out to attack a group of Turkish boats on the eastern shore of the Dead Sea, captained by Capt. J. A. D. Dempsey with Capt. P. D. Drury and A.M.1 Doig. Dempsey was to cover with two Lewis guns Drury's and Doig's attempt to swim to the Turkish boats and hitch them to *Mimi*, which would then tow them away. But the water-rudder control broke; *Mimi* drifted southwards and was beached. Next day an attempt was made to reach the Turkish boats by using *Mimi's* floats as canoes but this, too, proved abortive.

The bombing and fighting duties that fell to the Martinsydes in Palestine were shared by No. 14 Squadron R.F.C., but by October 1917 that unit was equipped entirely with B.E.2e's. No. 14 Squadron strengthened the undercarriages of their Elephants by fitting a steel-tube tie-rod athwartships between the front legs of the undercarriage V-struts.

In Mesopotamia six G.100s arrived in September

1916 and were allotted to No. 30 Squadron, R.F.C. A full year was to elapse before No. 63 Squadron became operational at Samarra, with one Flight equipped with an assortment of Spads VII, Bristol Scouts and Elephants for the protection of its R.E.8s. The Martinsydes bombed and fought after the manner of their kind, and on 31st October 1917 Lt. F. Nuttall of No. 30 Squadron landed in the face of the enemy to rescue 2nd Lt. A. P. Adams, whose B.E.2e had been shot down. Scattering Turkish troops with machine-gun fire, the two made good their escape.

A few more Martinsydes were on the strength of No. 72 Squadron, which arrived at Basra on 2nd March 1918. The Martinsydes were allocated to 'B' Flight at Baghdad, moving to Kazvin at the end of May. From that base they operated frequently against the Jungalis under Kutchik Khan. Two, flown by Lts. M. C. Mackay and R. P. Pope, were detached to Baku in August. By 14th September both Elephants were unserviceable and were burnt, their pilots thereafter fighting with the infantry.

In the anti-Jungali operations that continued after the Armistice, one or two Elephants were still in use with No. 63 Squadron in the summer of 1919. The old G.100 No. 7468 was tested at Kazvin by Lt. Catling on 23rd April 1919, and A1584 was still flying with No. 63 Squadron as late as 11th August 1919.

That is the latest known reference to a Martinsyde Elephant in Service use. At home the type had seen limited use with training units, the last recorded survivor being A6286, which was still serviceable at the R.A.E., Farnborough, in February 1919. Its Rafwire interplane bracing had been replaced by cables, and it was flown on 25th February by Major G. H. Norman.

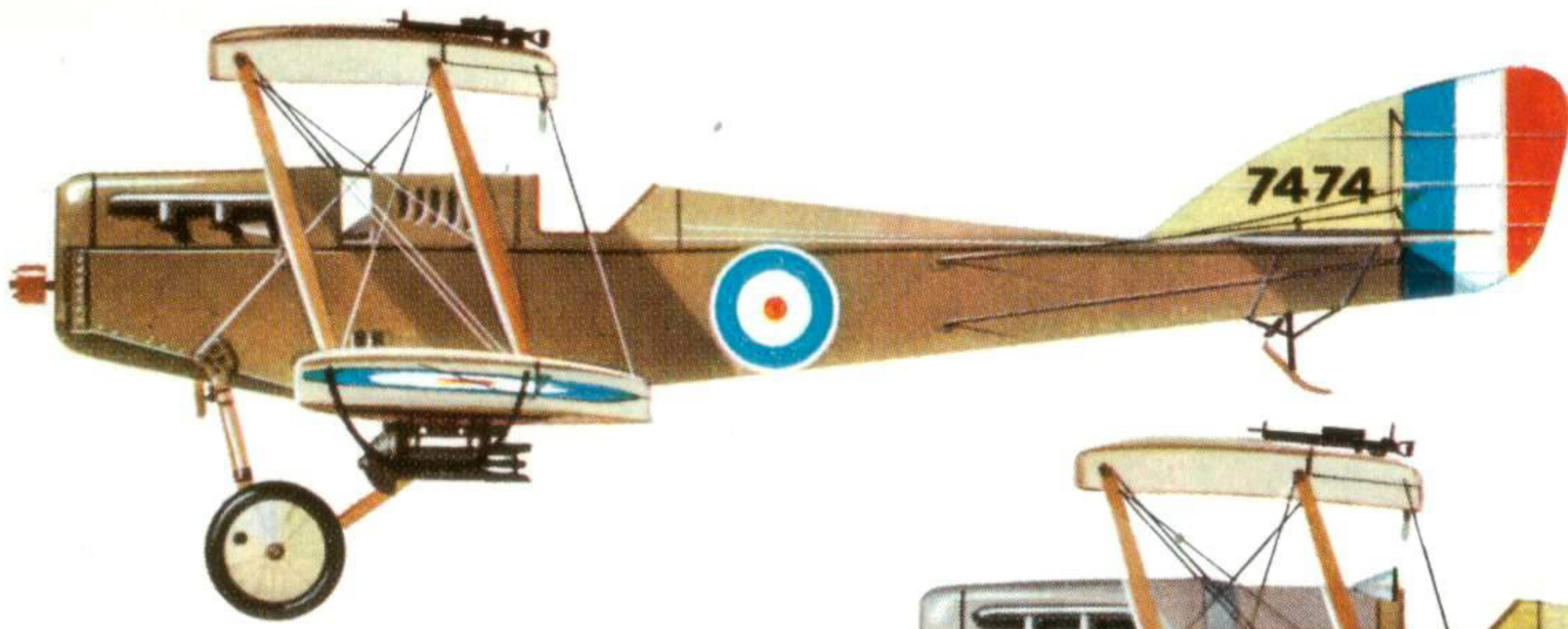
The Martinsyde Elephant has never been regarded as one of the great aircraft of the 1914-18 war, but its record speaks for itself. Designed when the war was less than a year old, it was still in service in 1919, having accomplished things that Tony Fletcher could not have imagined when he designed it. Its name is perpetuated in the badge of No. 27 Squadron, R.A.F., the central feature of which is an elephant. Only two other aircraft of the 1914-18 war, the Sopwith Camel and Dolphin, were similarly honoured. The Elephant lives on in heroic company.

*The author gratefully acknowledges the contribution made to this history by Mr. Bruce Robertson.*

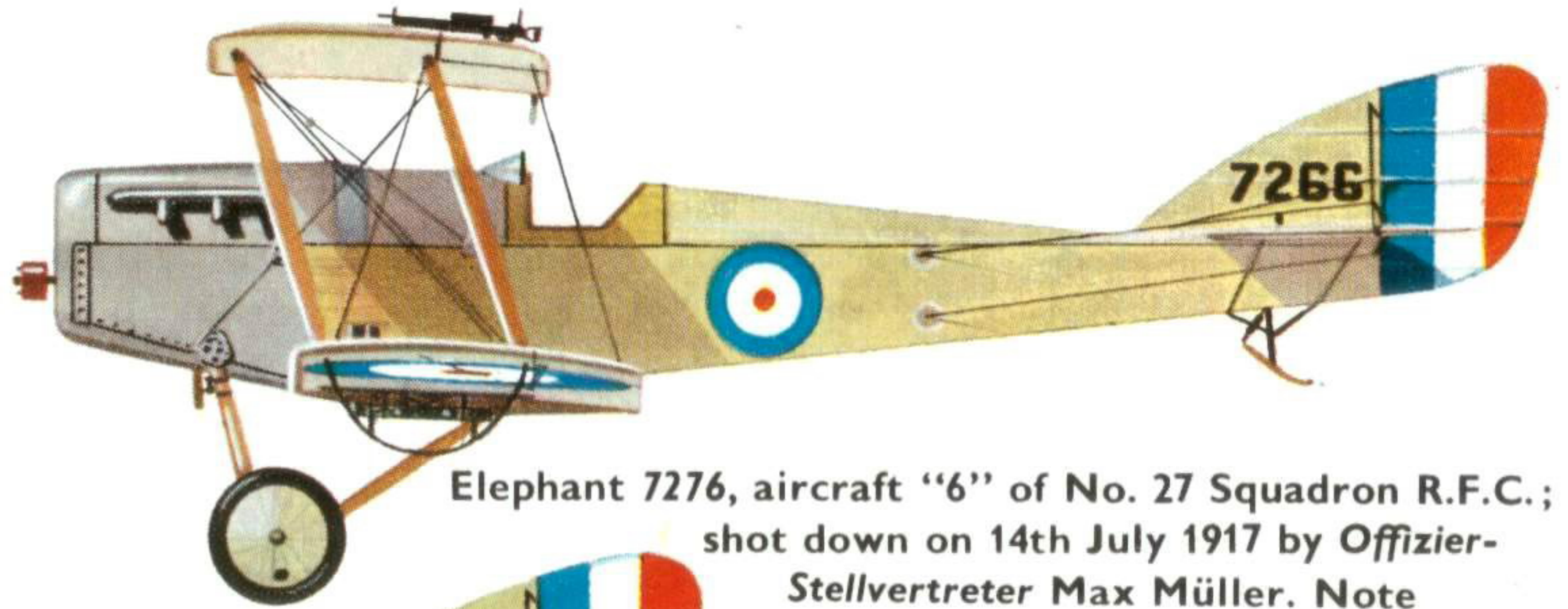
© J. M. Bruce, 1967.



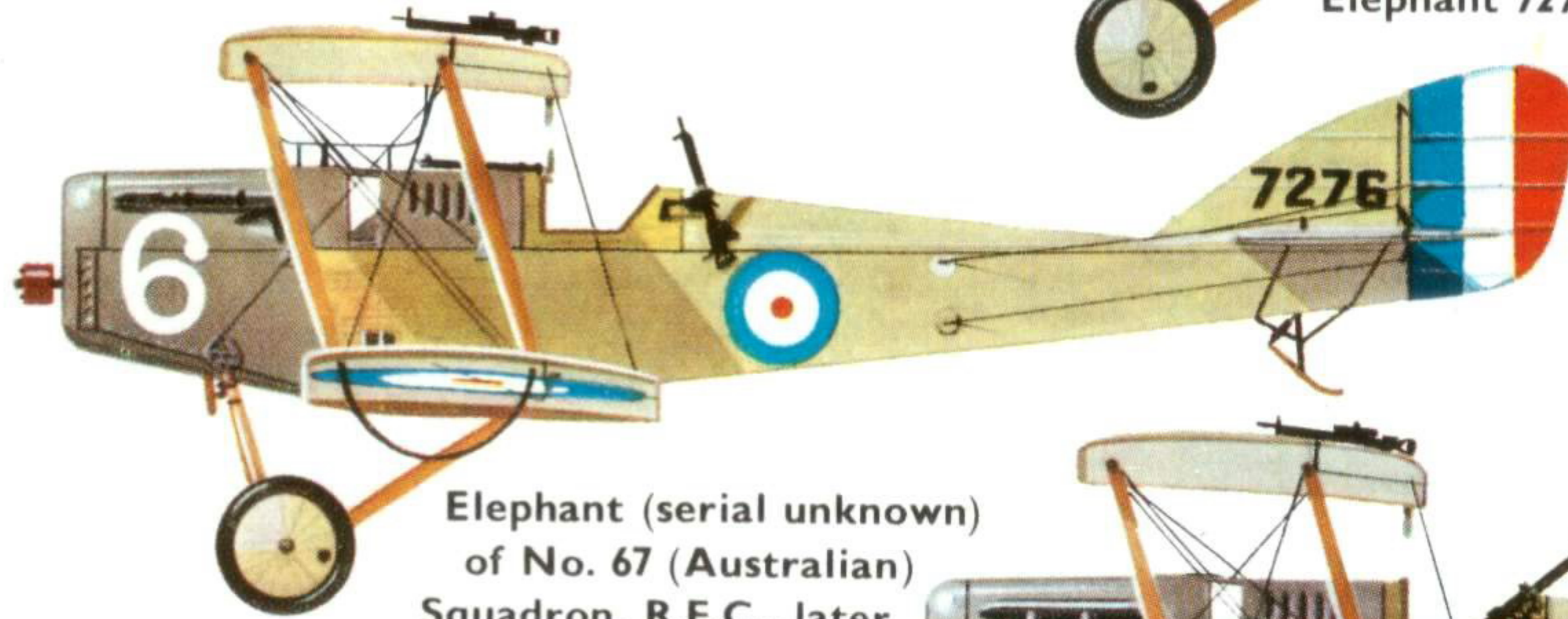
Elephant 7474 of No. 14 Squadron R.F.C.;  
Palestine, 1917.



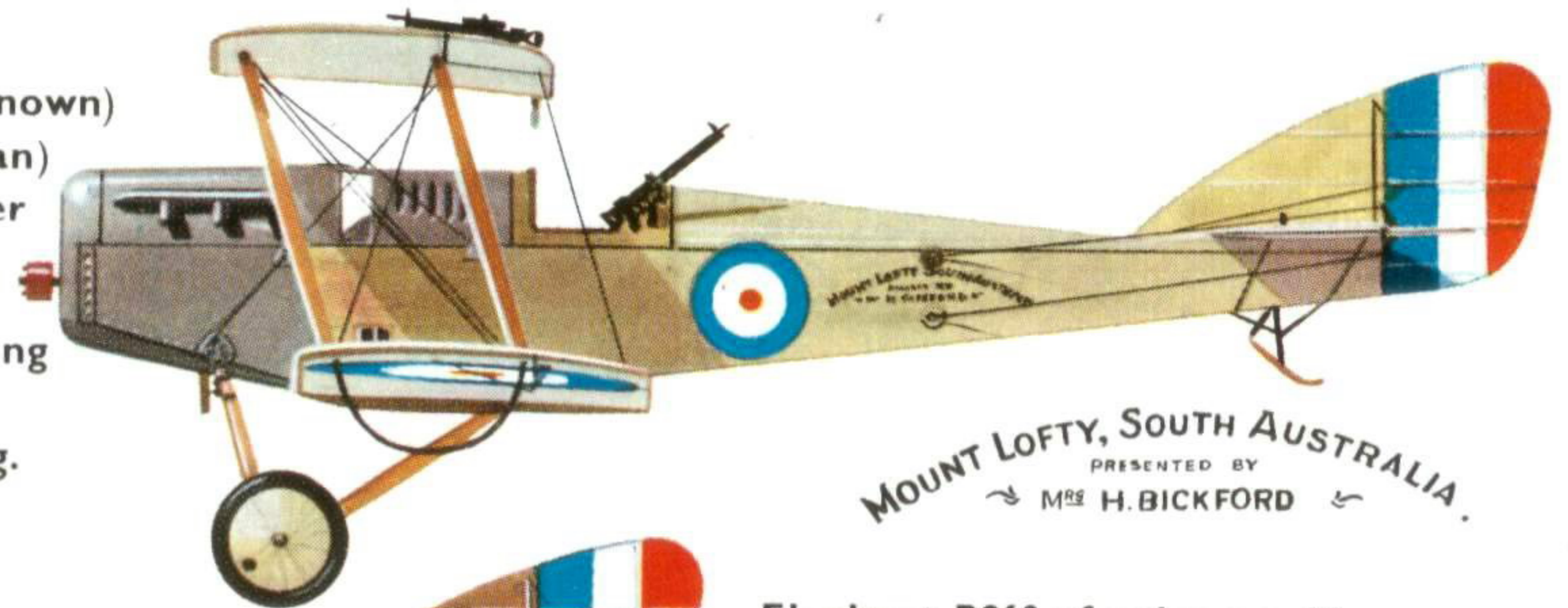
Early production G.100 Elephant,  
7266, of No. 27 Squadron R.F.C.;  
February, 1916.



Elephant 7276, aircraft "6" of No. 27 Squadron R.F.C.;  
shot down on 14th July 1917 by *Offizier-  
Stellvertreter* Max Müller. Note  
rear-firing Lewis gun on  
bracket mounting behind cockpit.

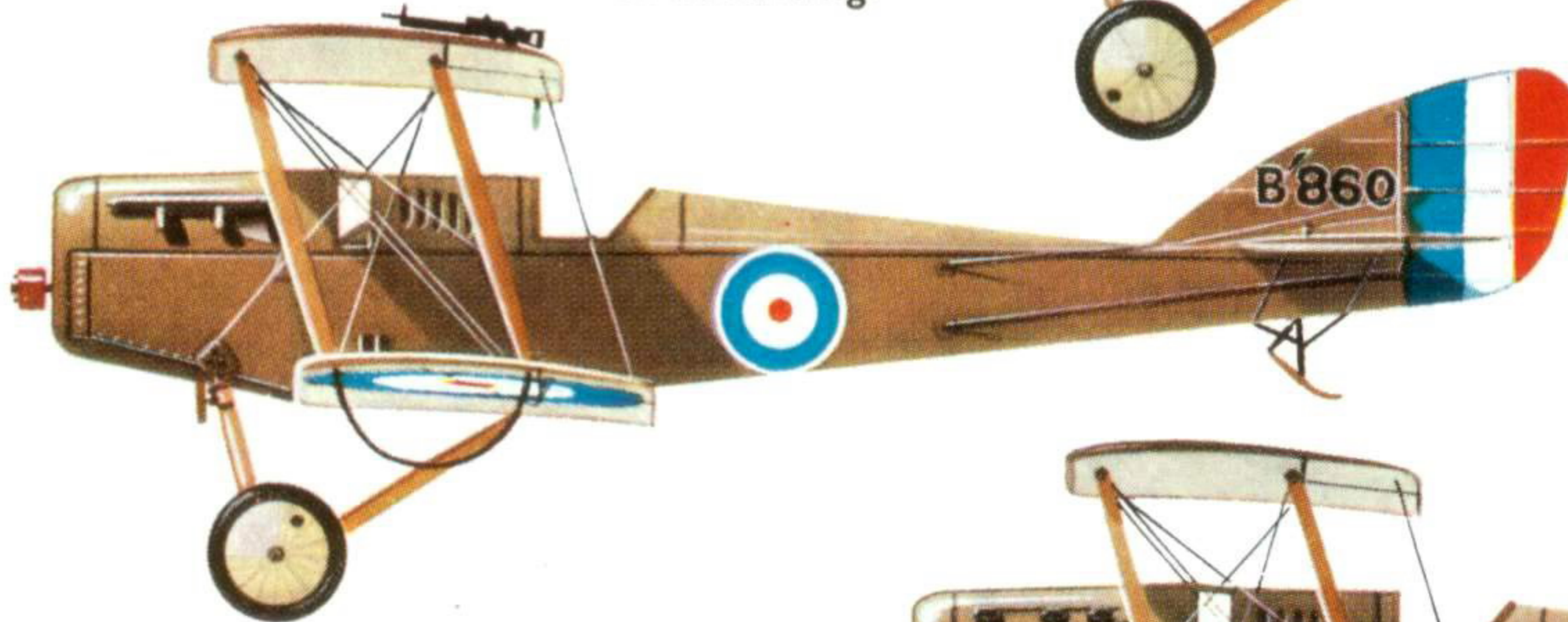


Elephant (serial unknown)  
of No. 67 (Australian)  
Squadron, R.F.C., later  
No. 1 Sqn., Australian Flying Corps;  
Palestine, 1917. Note presentation  
inscription on fuselage side, and rear-firing  
Lewis gun on different style  
of mounting.



MOUNT LOFTY, SOUTH AUSTRALIA.  
PRESENTED BY  
MRS H. BICKFORD

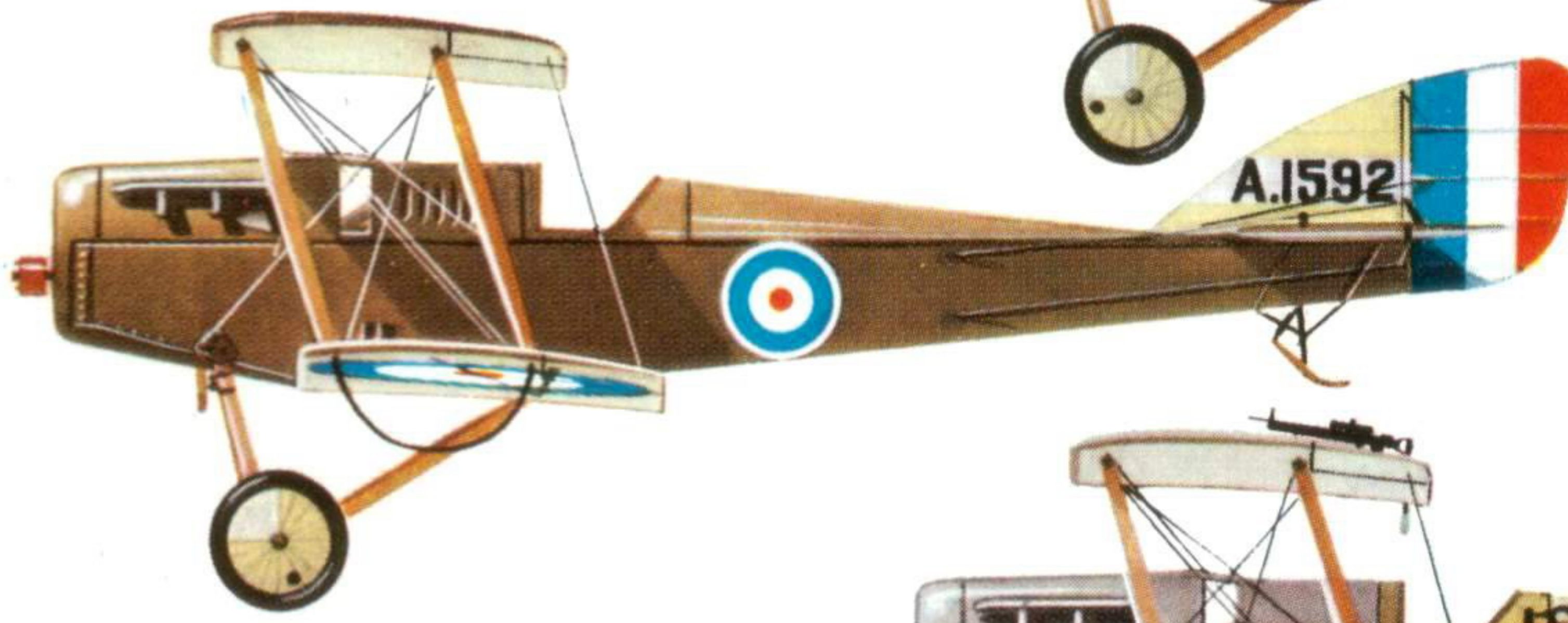
Elephant B860 of unknown Home  
Establishment unit, possibly training  
squadron.



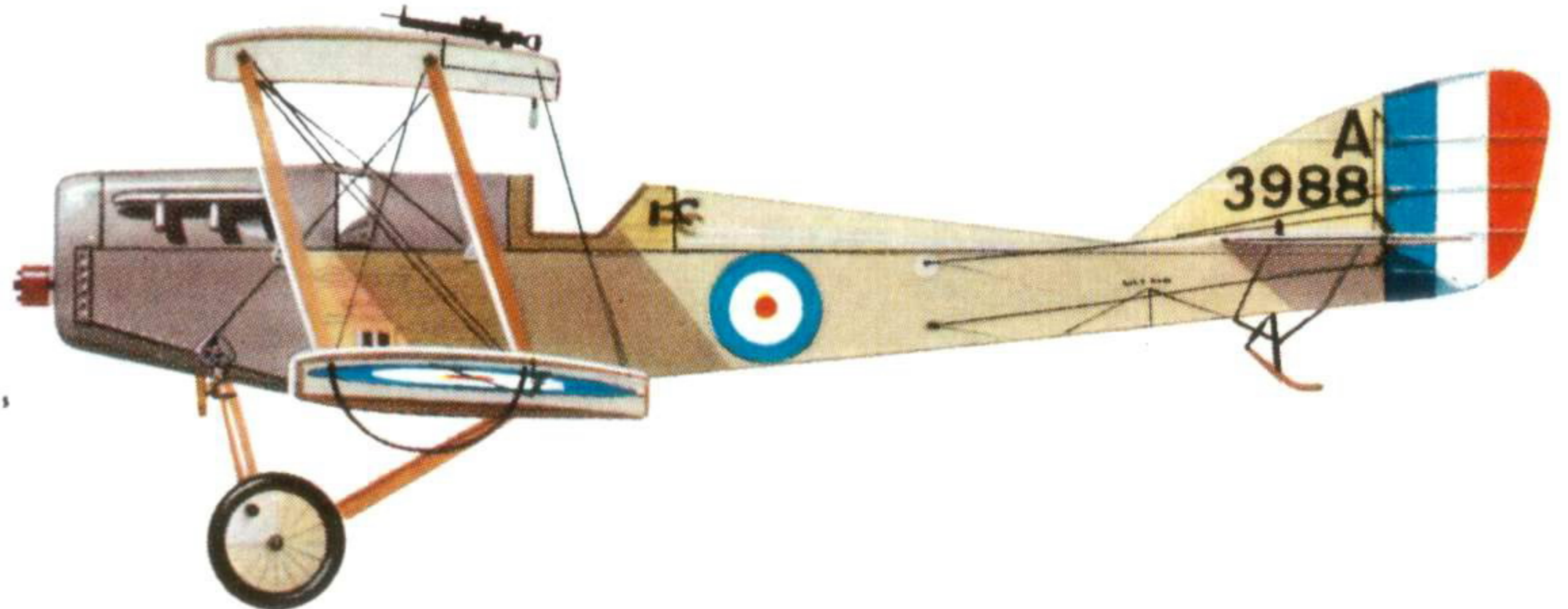
Elephant A3949 of unidentified  
training unit in U.K.



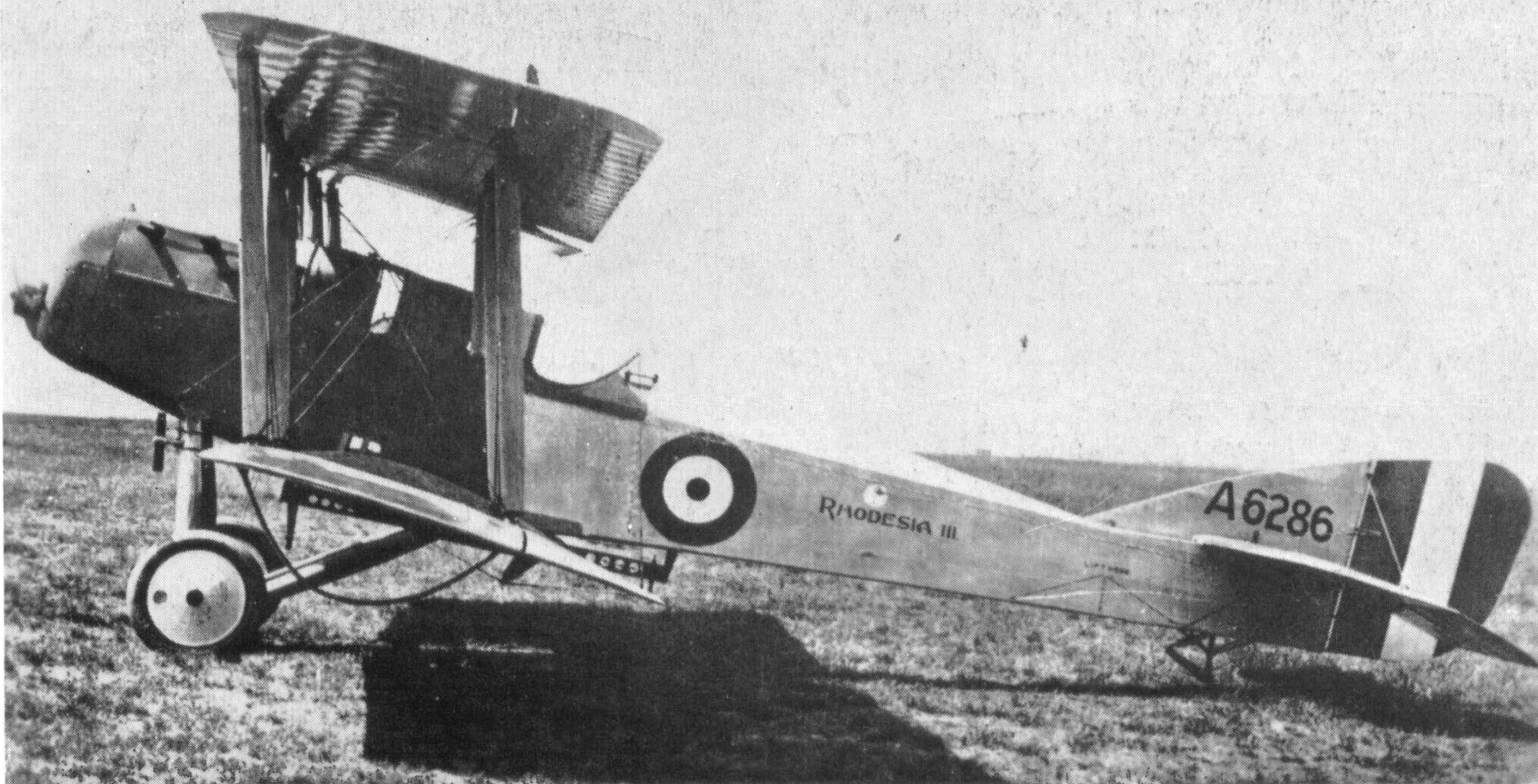
Elephant A1592 of unidentified unit.



Elephant A3988, possibly of No. 27 Sqn.,  
R.F.C. Note bracket mounting for  
Lewis gun behind cockpit.







One of the last Elephants in service was A6286 which, as noted in the text, was still flying at Farnborough in February 1919.

### PRODUCTION

A total of 272 Martinsyde G.100s and G.102s were ordered from Martinsyde Ltd., Brooklands, Byfleet, Surrey, with the following serial numbers: 4735, 7258-7307, 7459-7508, A1561-A1610, A3935-A4004, A6250-A6300.

Rebuilds by No. 1 (Southern) Aeroplane Repair Depot, Farnborough, Hants.: B860, B864, B865.

### SERVICE USE

Western Front: R.F.C. Squadrons Nos. 6, 18, 20, 21, 23 and 27.

Palestine: R.F.C. Squadrons Nos. 14, 67 (Australian) and 142.

Mesopotamia: R.F.C. Squadrons Nos. 30, 63 and 72.

### EXAMPLES OF MARTINSYDE ELEPHANTS USED BY SQUADRONS

No. 6 Sqn.:—4735.

No. 27 Sqn.:—7266, 7298, 7299, 7301, 7464, 7469, 7471, 7475, 7478, 7479, 7481, 7484, 7485, 7492, 7495, 7499, 7500, 7501, 7503, 7504, 7506, 7507, A1566, A1567, A1572, A1573, A1578, A1579, A1599, A3976, A3977, A3978, A3986, A3990, A3991, A3993, A4004, A6250, A6251, A6258, A6259, A6260, A6262, A6263, A6287, A6288, A6290, A6291.

No. 14 Sqn.:—7472, 7474, 7476, 7477, 7488.

No. 30 Sqn.:—7459, 7466, 7467, 7468 (later to No. 63 Sqn.) 7493, A1596.

No. 63 Sqn., Kazvin, 1919:—7468 (ex No. 30 Sqn.), A1594.

No. 67 Sqn.:—A1600, A3945, A3946, A3947, A3955.

### SPECIFICATION

Power: 120 h.p. Beardmore; 160 h.p. Beardmore; experimental installation of 200 h.p. Sunbeam Arab.

Dimensions: Span 38 ft., length 26 ft. 6½ in., height 9 ft. 8 in., chord 5 ft. 11¾ in., gap 5 ft. 8 in., stagger 18 in., dihedral 2 deg. 30 min., incidence 3 deg., span of tail 13 ft. 6 in., wheel track 6 ft. 0⅝ in., tyres 700×100 mm., airscrew diameter (Lang 920 on 120 h.p. engine) 9 ft. 6 in., (Lang 2400 on 160 h.p. engine) 9 ft. 6.2 in.

Areas: Wings 430 sq. ft.; ailerons, each 10.5 sq. ft., total 42 sq. ft.; tailplane 26 sq. ft.; elevators 21 sq. ft.; fin 4.75 sq. ft.; rudder 10 sq. ft.

Armament: Two 0.303 in. Lewis machine-guns, one on a fixed mounting above the centre section, the other on a spigot mounting behind the cockpit on the port side. The bomb load could consist of one 336 lb. bomb, one 230-pounder, two 112-pounders, four 65-pounders, or up to twelve 20 lb. Cooper bombs. The 336 lb. and 230 lb. bombs were carried under the fuselage, the 112-pounders and 65-pounders on individual racks under the lower wings, and the Coopers on racks under the lower wings and fuselage.

### WEIGHTS AND PERFORMANCE

Aircraft	G.100 prototype 4735	Production G.100	Standard G.102	A6299 with Eeman gun gear	A3997 with German radiator in centre section, normal radiator in use	
					Wing radiator disconnected	Wing radiator faired over with plywood
Engine ... ..	120 h.p. Beardmore			160 h.p. Beardmore		
Weights (lb.)						
Empty ... ..	1,400	1,759	1,793	—	—	—
Military load ... ..	—	64	96	134	—	—
Pilot ... ..	—	180	180	180	—	—
Fuel and oil ... ..	—	421	389	—	—	—
Loaded ... ..	—	2,424	2,458	2,370	2,464	2,464
Max. speed (m.p.h.)						
at ground level ... ..	98	—	108	—	—	—
at 6,500 ft. ... ..	—	95	102	98.5	—	—
at 10,000 ft. ... ..	—	87	99.5	97	—	—
at 15,000 ft. ... ..	—	—	94	92	—	—
Climb to	m. s.	m. s.	m. s.	m. s.	m. s.	m. s.
3,000 ft. ... ..	4 0	— —	— —	— —	5 30	4 25
6,500 ft. ... ..	— —	10 0	9 0	9 55	— —	— —
10,000 ft. ... ..	— —	19 0	15 30	17 45	24 55	18 20
15,000 ft. ... ..	— —	— —	34 0	36 55	54 35	34 55
Service ceiling (ft.)	—	14,000	16,000	17,500	15,000	—
Endurance (hours)	—	5½	4½	4½	—	—