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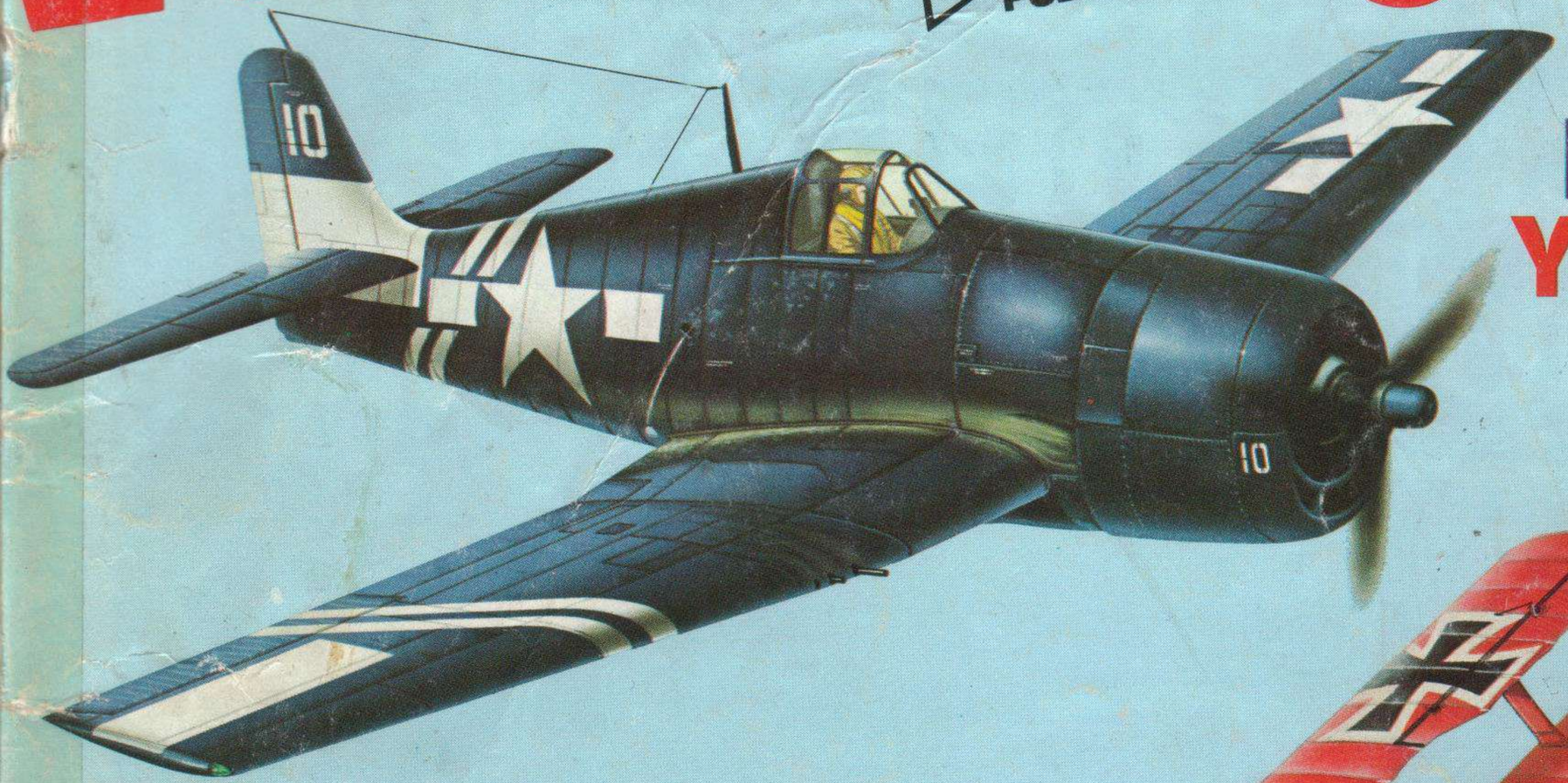
WARPLANE SPECIAL

MAP MODEL PUBLICATION



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SCALE MODELS WARPLANE SPECIAL

Compiled by
RAY RIMELL
Art Editor
STEVE ARCHIBALD

This 'Special' marks a significant departure from previous SCALE MODELS 'one-shots' in that it contains no true modelling features as such. Regular SM readers with an interest in aviation (by far the majority) constantly besiege our offices with requests for more scale drawings, colour plates, cutaways and photo references to aid them in their modelling. Because of all the many other diverse subjects that have to be covered each month in SCALE MODELS it is not always possible to do *full* justice to individual types, hence this new publication.

Within the pages that follow, the reader will be provided with a wealth of data hitherto unmatched in a publication of this type. Emphasis is very much on pictorial reference at the expense of historical material which is so readily available elsewhere and hardly requires repetition from us.

We have prepared the 'Warplane Special' with *all* aviation enthusiasts in mind. Whether you are a modeller of static, plastic models or flying scale aircraft, or whether you are just an aircraft enthusiast, you will find this 'Special' useful. Included with each feature are tables listing references, available kits and plans appropriate to each type. The reader may query some omissions but we have only included references we personally consulted in the production of this 'Special' and only listed kits which are still (at present) currently available.

Whilst the colour plates which appear in the middle of the 'Warplane Special' have been as carefully researched as possible, we are as fallible as anyone else. Wherever practical, colours have been matched to extant paint chips, or colour notations, and detailed references are to be found within the individual aircraft sections.

The cross-section of types selected spans virtually the entire period of aviation history with a team of well-known illustrators, artists and writers pooling their not inconsiderable talents to provide an invaluable and unique contribution to aviation publishing. We emphasise this claim. Eighty per cent of the material in this 'Special' is *original* and has not appeared elsewhere before which ensures that the SCALE MODELS WARPLANE SPECIAL is destined to become a valuable collector's item over the years to come.

R L Rimell, Managing Editor

CONTENTS

Cover Art
Grumman F6F-5 Hellcat, AG36, USS Siboney, 1945. By Steve Archibald. Fokker DrI Triplane, JG1, 1918. By Ray Rimell. Me Bf109G-2, 44th Fighter Division, 1951. By Daniel Frka

AN MAP PUBLICATION. PO BOX 35, Bridge St., Hemel Hempstead, Herts HP1 1EE

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1

BE2/12 SERIES

The oft-maligned RAF machines described by R L Rimell

The Royal Aircraft Factory BE2c was the result of designer Edward Teshmaker Busk's protracted experiments with inherent stability qualities. At the time (1914) such qualities were deemed highly desirable when aircraft were regarded purely as reconnaissance platforms and thus the BE2c was placed into quantity production. Within a few months of its arrival on the Western Front it was realised that although this slow, stable, viceless machine performed its intended role perfectly, no resistance could be offered against the new German Fokker monoplanes with their synchronised forward-firing machine guns. Yet despite crippling losses, production of the BE2c continued unhalted.

But it was as a makeshift single-seat night-fighter that the type's inherently stable qualities proved so valuable. Thrown against the Zeppelins in 1915 and 1916, BE2cs achieved spectacular success; five German airships falling to their guns. Most famous of these aircraft was 2693 flown by Lt. William Leefe Robinson who destroyed SLII on the night of September 3, 1916. For bringing down the first airship over England, Robinson earned the VC but the historic BE was wrecked a fortnight later following an abortive take-off incident.

Several BE2c and BE2e machines on home defence duties were fitted with *Le Prieur* rocket mountings and tests were actually carried out by the RNAS on BE2c 8407 but there is no record that these rockets were ever fired in anger. The incendiary bullet was found to be a much more effective counter-measure against airships . . .

During its long and varied career the BE2c was fitted with numerous other forms of armament as well as fulfilling many operational requirements beyond the wildest dreams of its designer. BE2c, and later 2d, types equipped Nos 2, 4, 5, 6, 7, 8, 9, 10, 12, 13, 15, 16 and 21 Squadrons of the RFC in France; No. 1Wing RNAS, and the Belgian 6 *em'e Escadrille*; others served in the Middle East, India, Africa, Australia and Macedonia.

In late spring 1916 came the single-seat BE12, a hoped-for successor to the BE2c, powered by a 12-cylinder 150 hp RAF 4 engine as opposed to the eight-cylinder 90 hp RAF 1a of the earlier machine. All production machines were constructed in Coventry by three firms, Daimler, Standard Motor and the Coventry Ordnance works. Outwardly similar to the BE2c, the BE12 was fitted with a reduced area tailplane and retained the larger fin seen on many late 2c types. Forward fuselage construction was also revised to accommodate the RAF 4 engine and the larger petrol tank.

The BE12 was serving with Nos 10, 19 and 21 Squadrons in France by the end of August 1916 and withdrawn within the next few weeks. For in actual fact the 12 was even less handy in the air than its predecessor and although it also served overseas, and in the UK with Home Defence squadrons, it was quickly superseded by other types.

Yet another, later, production BE was the 2e, which boasted the fuselage of the 2c mated to single bay wings with raked-back tips: the upperwing appreciably greater in span than the lower. (The same wing design was later to be mated to the BE12 to become the BE12a.)

The prototype BE2e first flew in February 1916 and was built in far greater numbers than any other of the BE series. But despite this, the type was not much of an improvement on the earlier aircraft although it is thought nearly 1800 were built by over seven contractors. BE2es began being delivered to the RFC in July 1916, and were gradually to replace the 2c in most units, serving in the Middle East as well as in France. Home Defence units in the UK were also partially equipped with the type notably 50 HDS who had some of theirs doped black overall with white rings in place of the national markings.

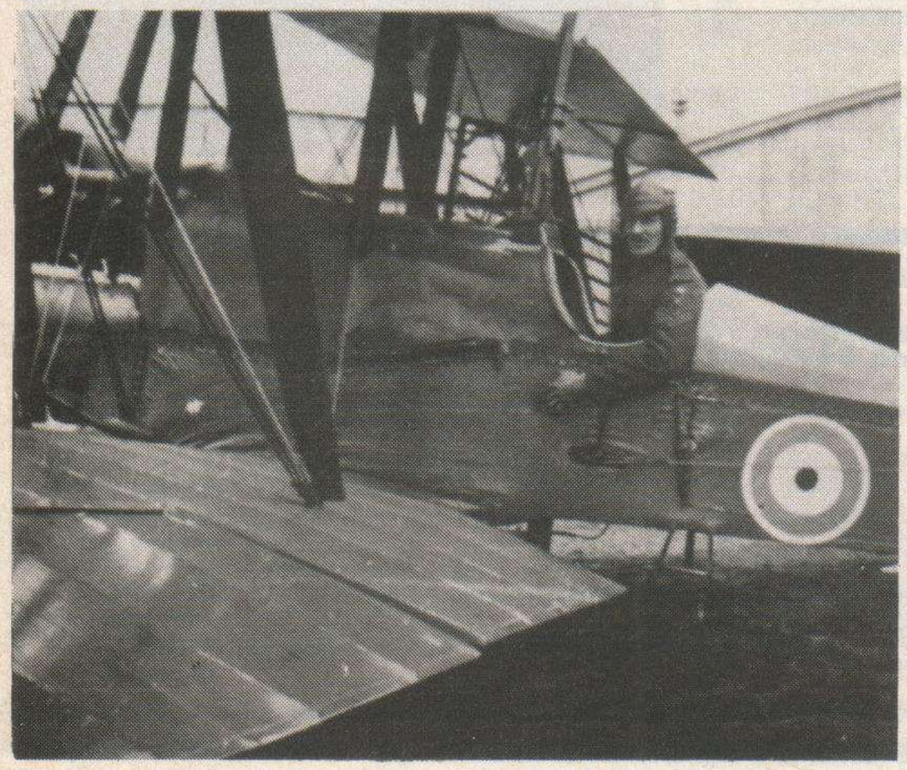
Early BE2c machines were clear doped overall with V114 clear non-shrinking varnish on top, (**Methuen** 4A3) with natural metal or *Battleship Grey* varnished (B1-C1) panels. Roundels were carried in the usual six positions. Later *PC10* (*ie*, standard Khaki in any five standard doping schemes) was adopted for the uppersurfaces. As for the other, later, machines of the BE series, they received most of the current colour schemes including *PC12* (8(E-F)8) for Middle East use, *Nivo* (27F3) and black for night flying purposes. But the most common application was PC10 over all fabric upper and side surfaces and, initially, over shellac-varnished ply panels. PC12 was applied in similar fashion but Nivo and black were usually painted overall. Most of these aircraft were converted from day use by over-varnishing in Nivo and having the white areas of the roundels and rudder stripes painted over in grey or dulled by a black wash.

1. An historic BE2c. This is 2693 of B Flight, 39 HDS, RFC, photographed at Suttons Farm in September 1916. In the cockpit is Lt. William Leefe Robinson VC; hours previous to this picture being taken, Robinson had destroyed the German Army airship SLII over Cuffley, Hertfordshire. In front of the pilot can be seen the upward-firing Lewis gun with which Robinson brought down the raider.

2

2. BE2c 8416, with early-style exhaust pipes, in plain linen finish.
3. Home Defence BE12 with RL Tube and Le Prieur Rocket tubes.
4. BE12 with ten rocket tubes, Holt flare brackets and navigation lights photographed at Spittlegate in 1917.
5. BE12b of No 77 Sqn. at Penstone. Aircraft is armed with overwing Lewis gun and two 100 lb bombs in underwing racks.

3



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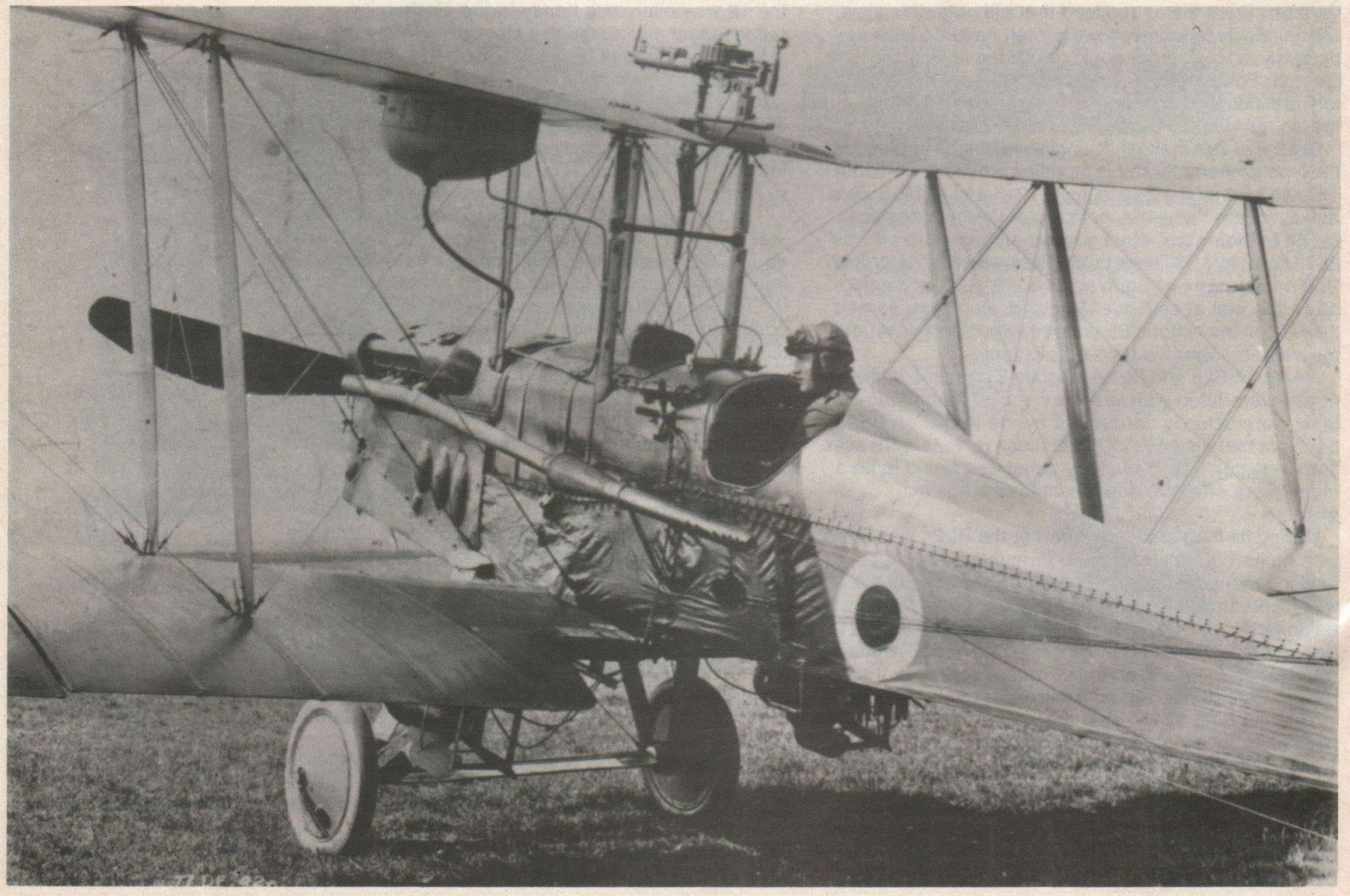
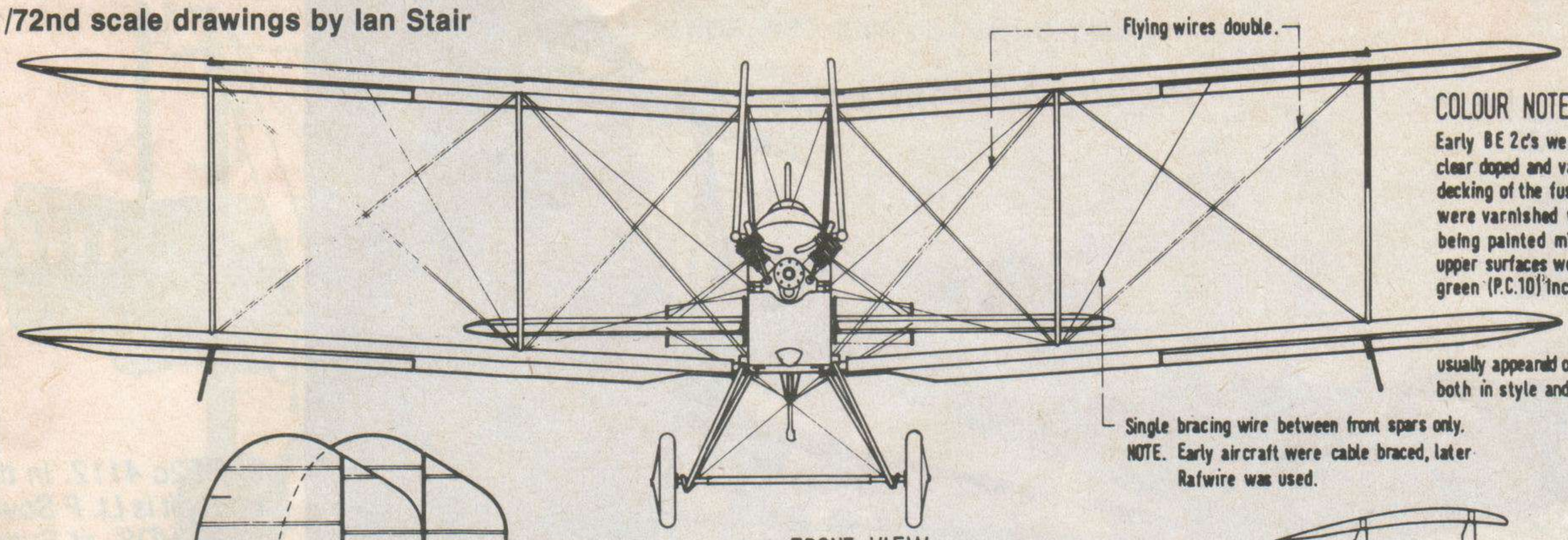
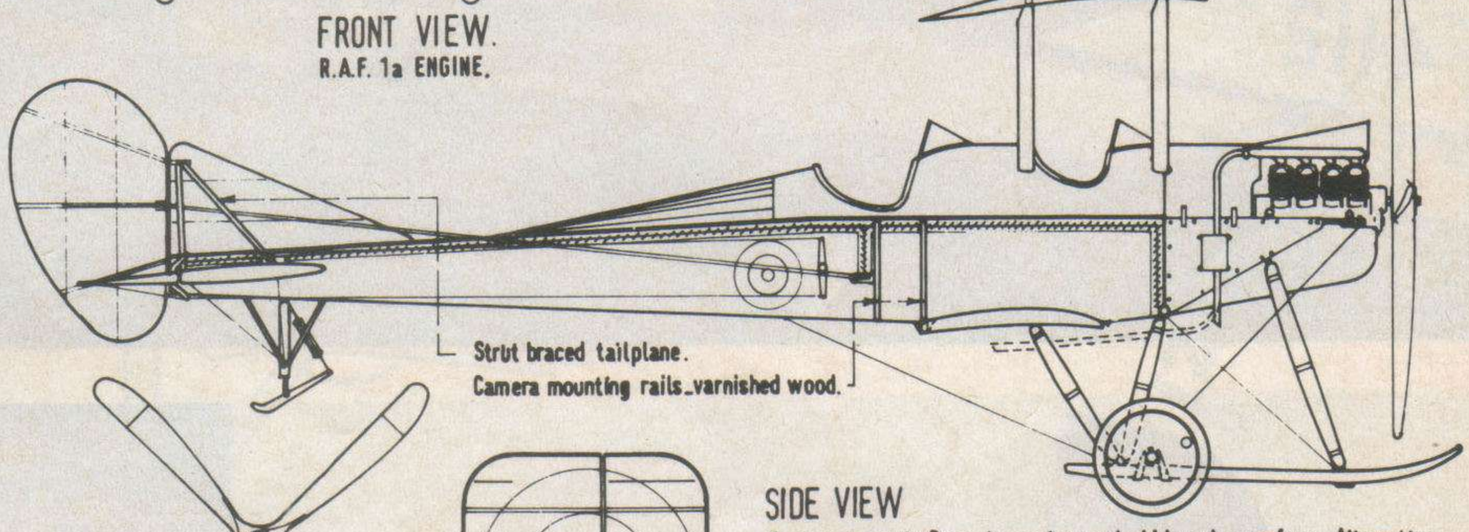




COLOUR NOTES.

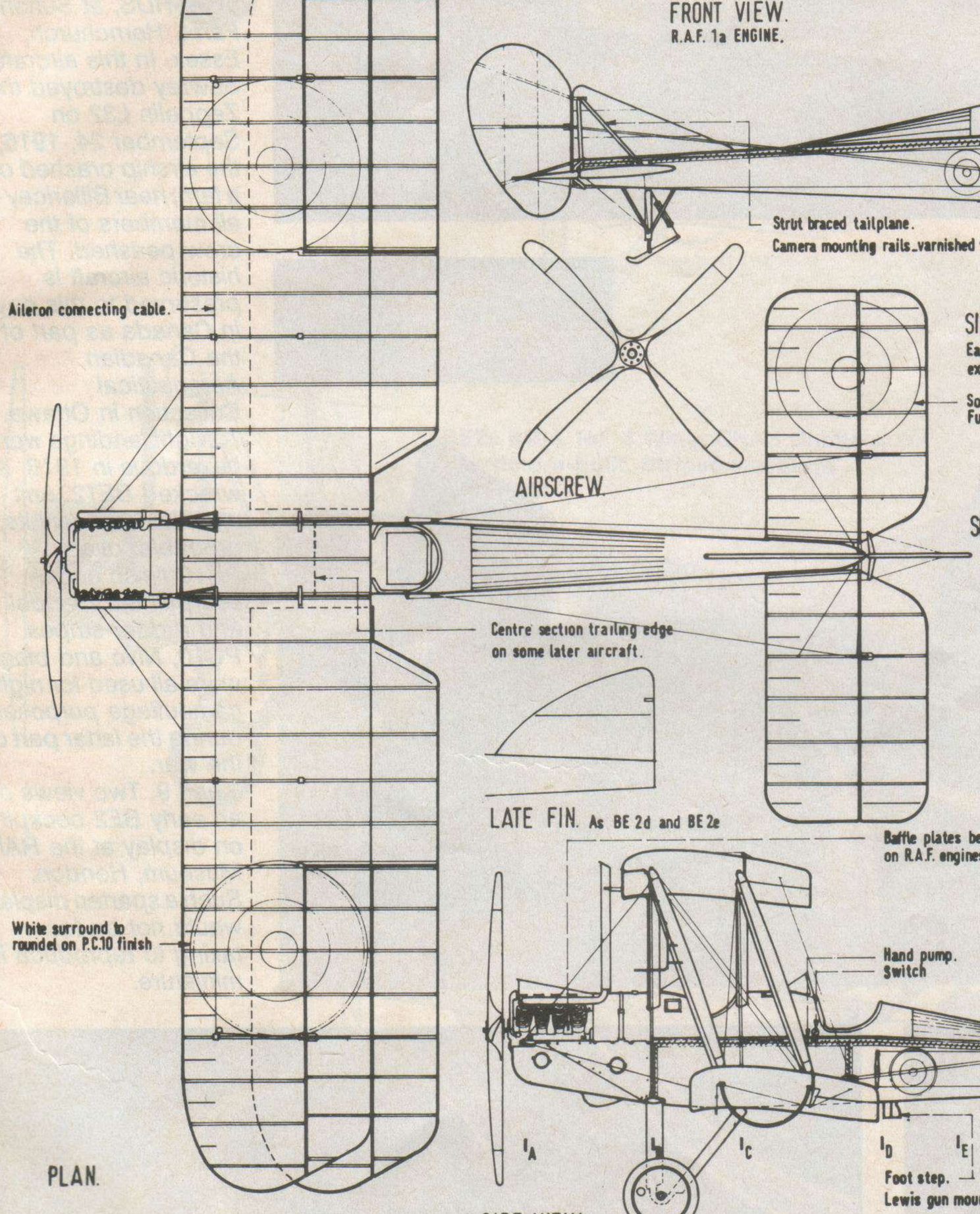
Early BE 2c's were covered in linen clear doped and varnished. The top decking of the fuselage and the struts were varnished wood. Metal parts being painted mid grey. Mid 1916 upper surfaces were painted khaki-green (P.C.10) including ply decking and fuselage sides. Aircraft number usually appeared on the fin and varied both in style and size.

FRONT VIEW.
R.A.F. 1a ENGINE.



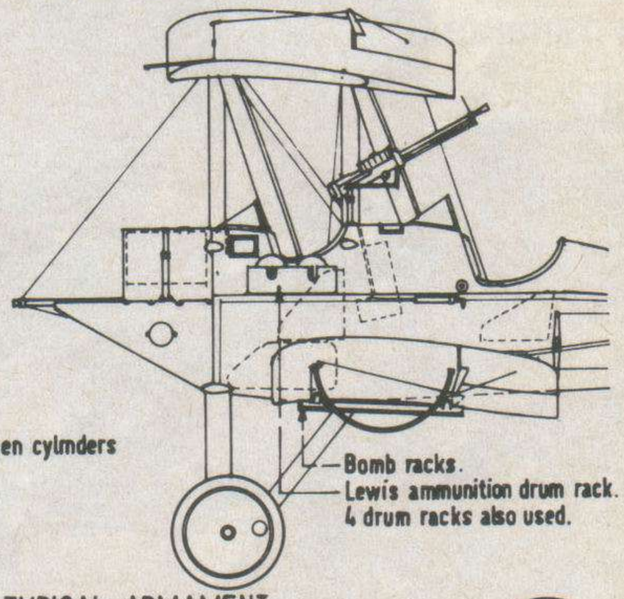
SIDE VIEW
Early type with Renault engine and skid undercarriage. Alternative exhaust shown dotted. Vertical exhaust stacks were also used.

AIRSCREW.

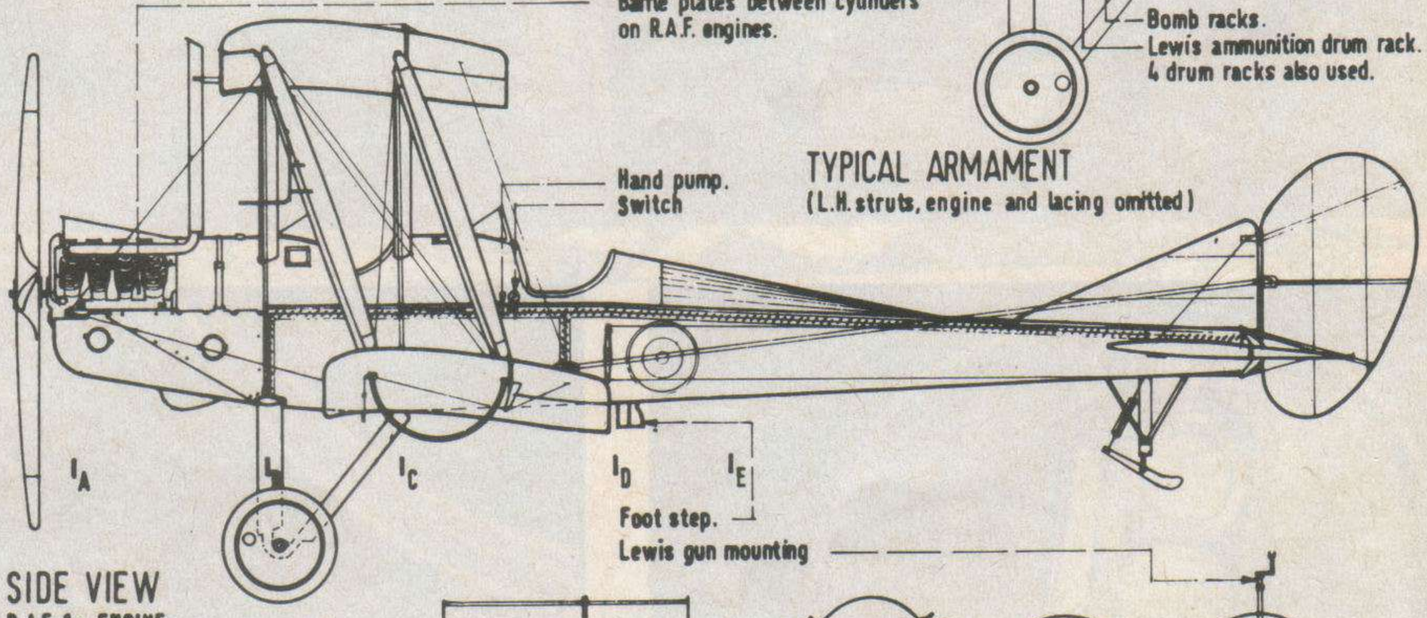


SCRAP PLAN VIEW OF FUSELAGE DECKING.

LATE FIN. As BE 2d and BE 2e

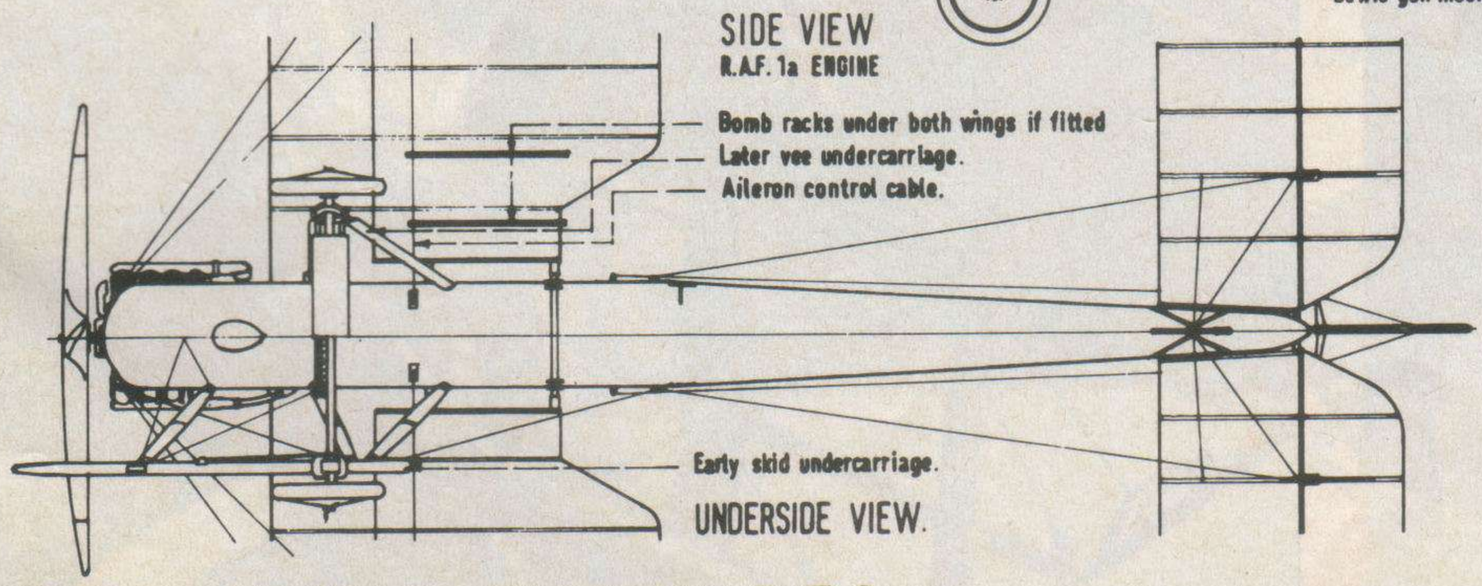


TYPICAL ARMAMENT
(L.H. struts, engine and lacing omitted)

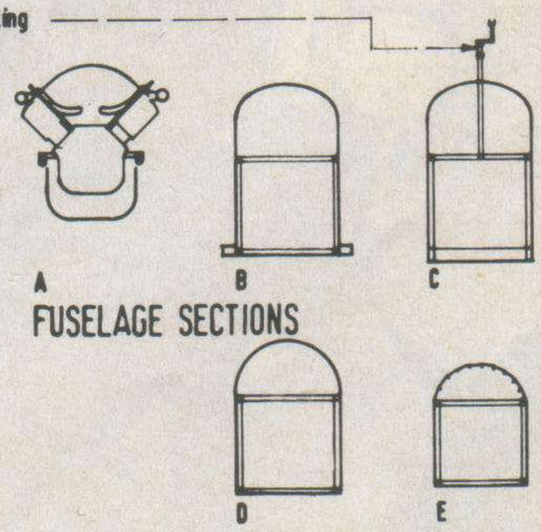


PLAN.

SIDE VIEW
R.A.F. 1a ENGINE



UNDERSIDE VIEW.

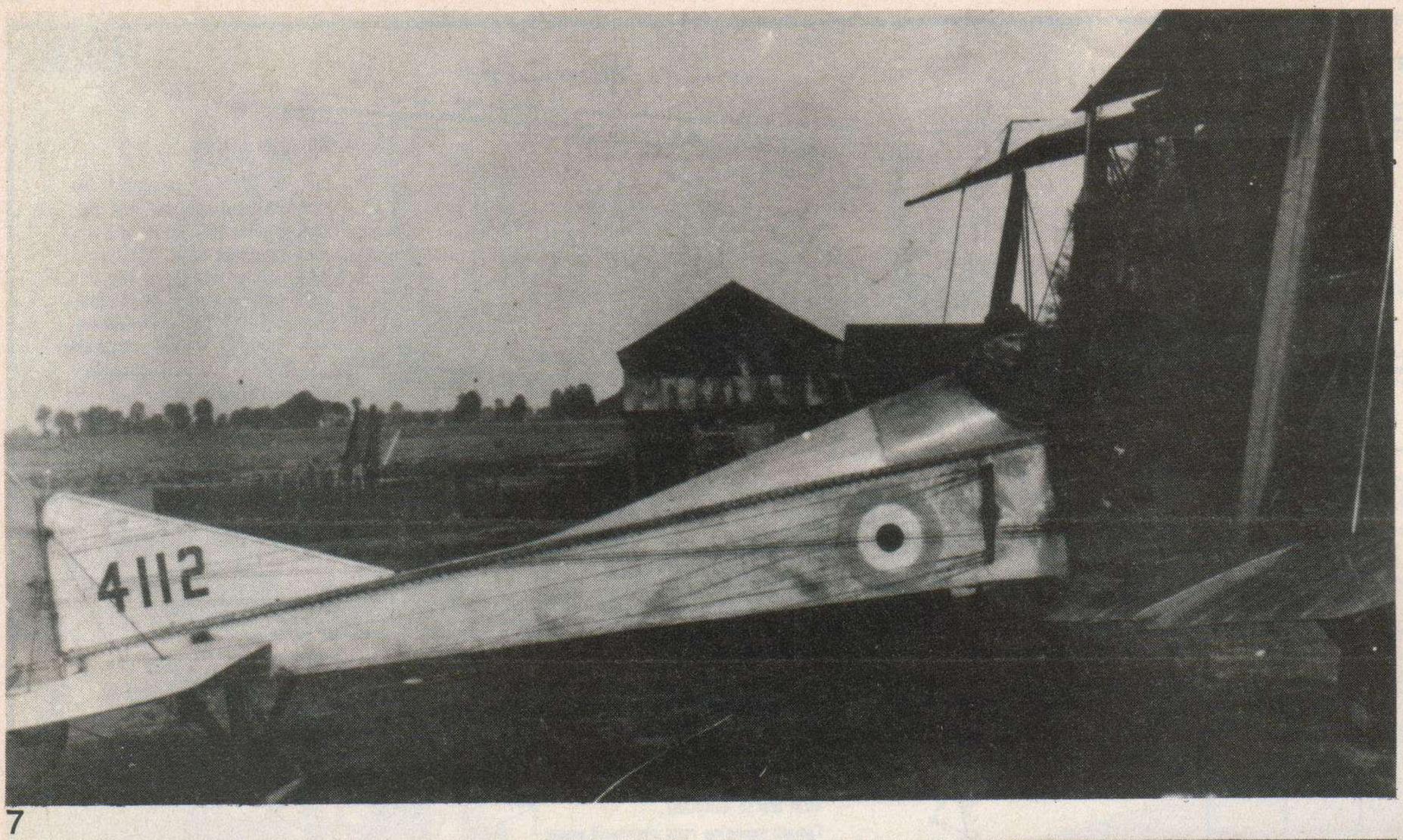


FUSELAGE SECTIONS

SCALE Meters 0 0·5 1 2
Feet. 0 1 2 3 4 5 6

ROYAL AIRCRAFT FACTORY B.E.2c.

DRAWN AND TRACED BY IAN R. STAIR.



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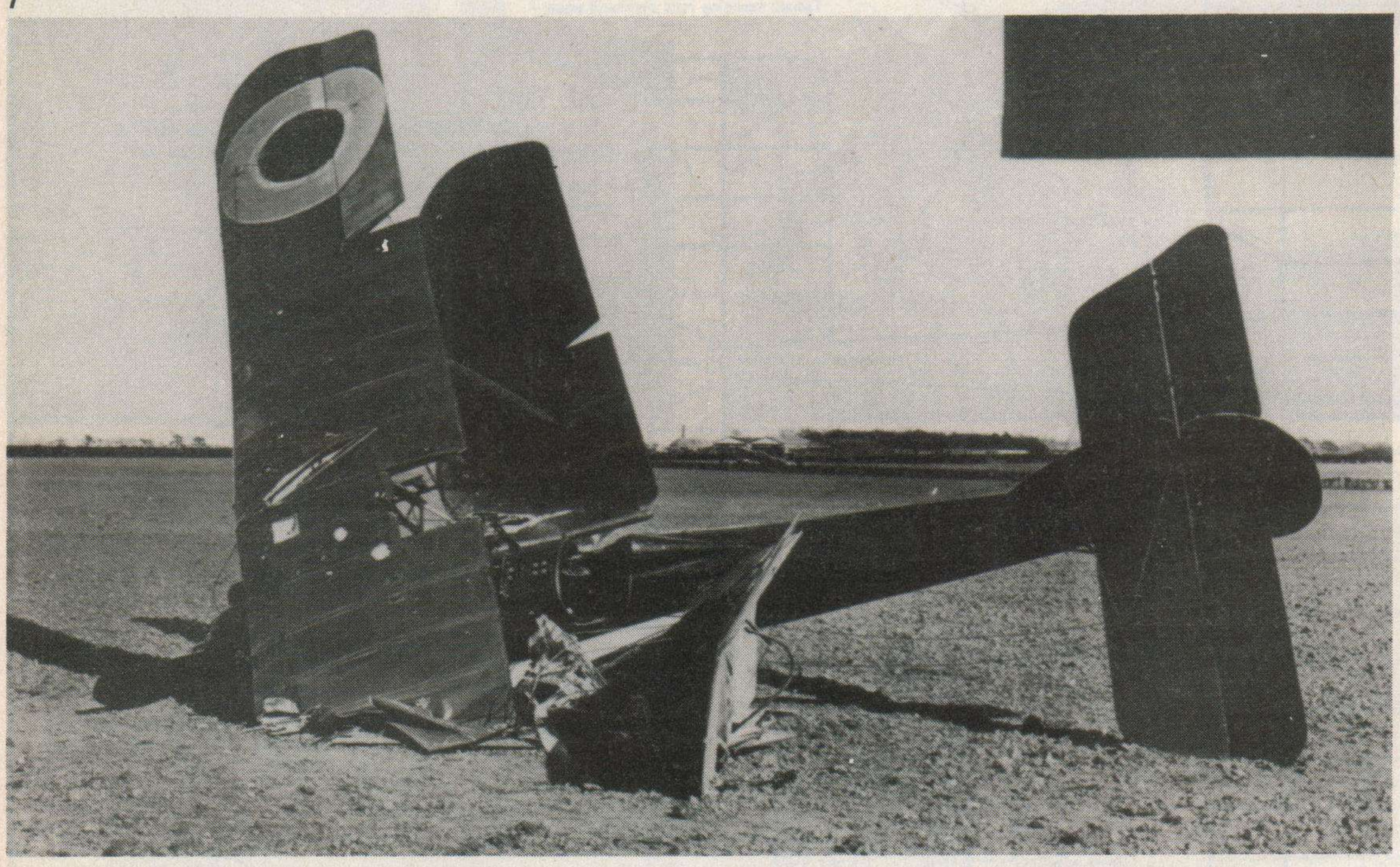
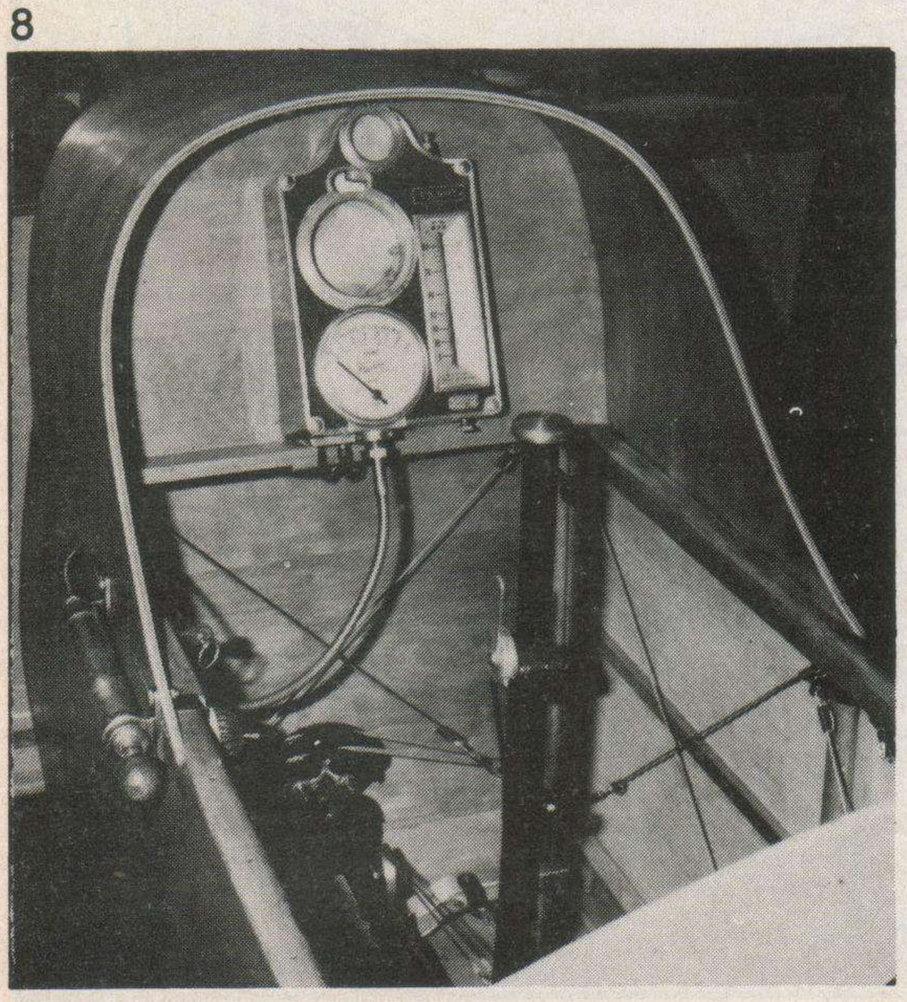


6. BE2c 4112. In the cockpit is Lt. F Sowrey of 39 HDS, at Suttons Farm, Hornchurch, Essex. In this aircraft, Sowrey destroyed the Zeppelin L32 on September 24, 1916; the airship crashed on a farm near Billericay – all members of the crew perished. The historic aircraft is preserved to this day in Canada as part of the Canadian Aeronautical Collection in Ottawa.
7. Night landings were hazardous in 1918. A wrecked BE12, unit unknown, reveals its, probable, overall PC10 finish and overpainted roundel and rudder stripes. PC10, Nivo and black were all used for night camouflage purposes during the latter part of the war.
8 and 9. Two views of an early BE2 cockpit on display at the RAF Museum, Hendon. Such a spartan display would not be too taxing to reproduce in miniature.

8



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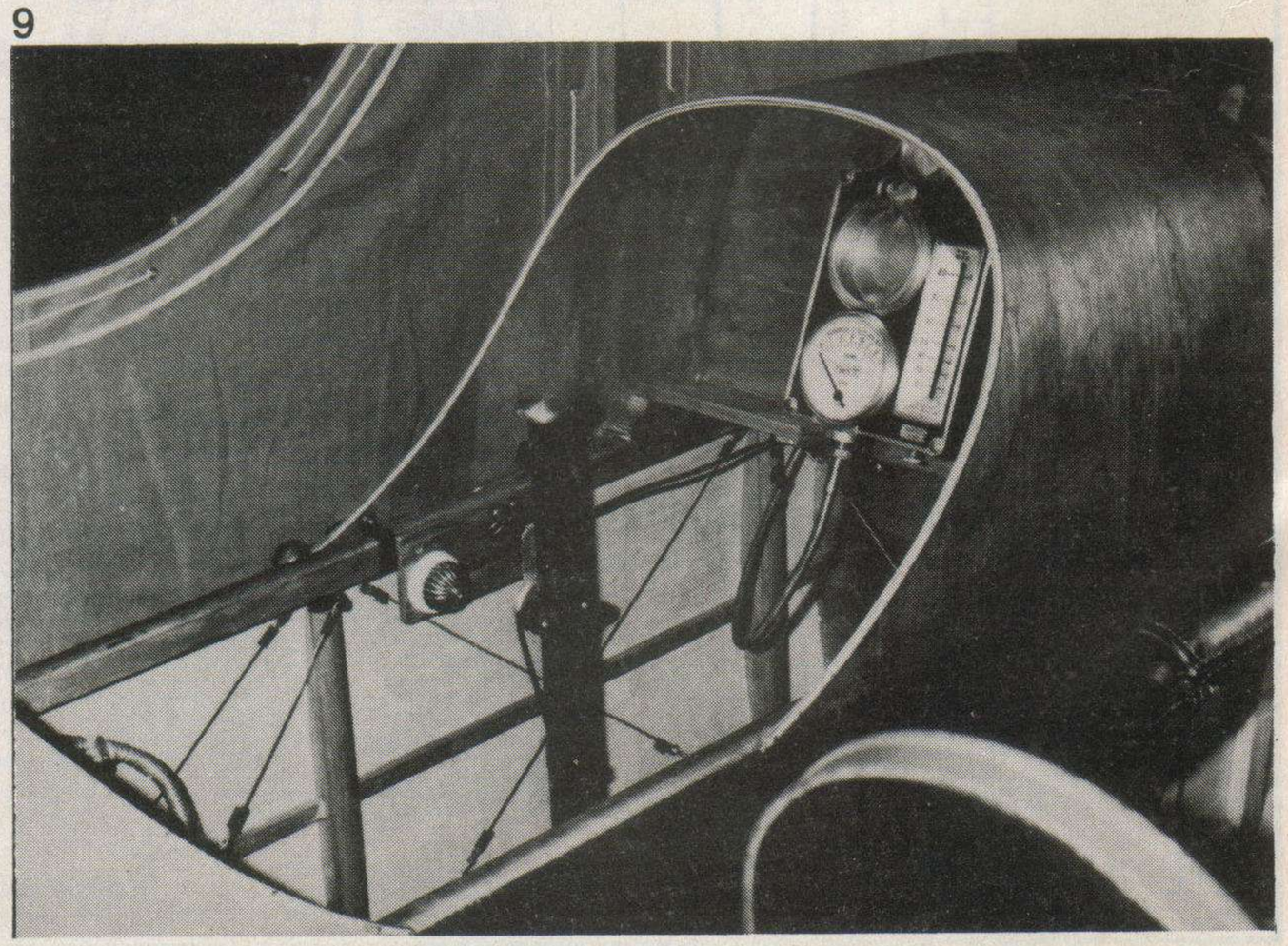
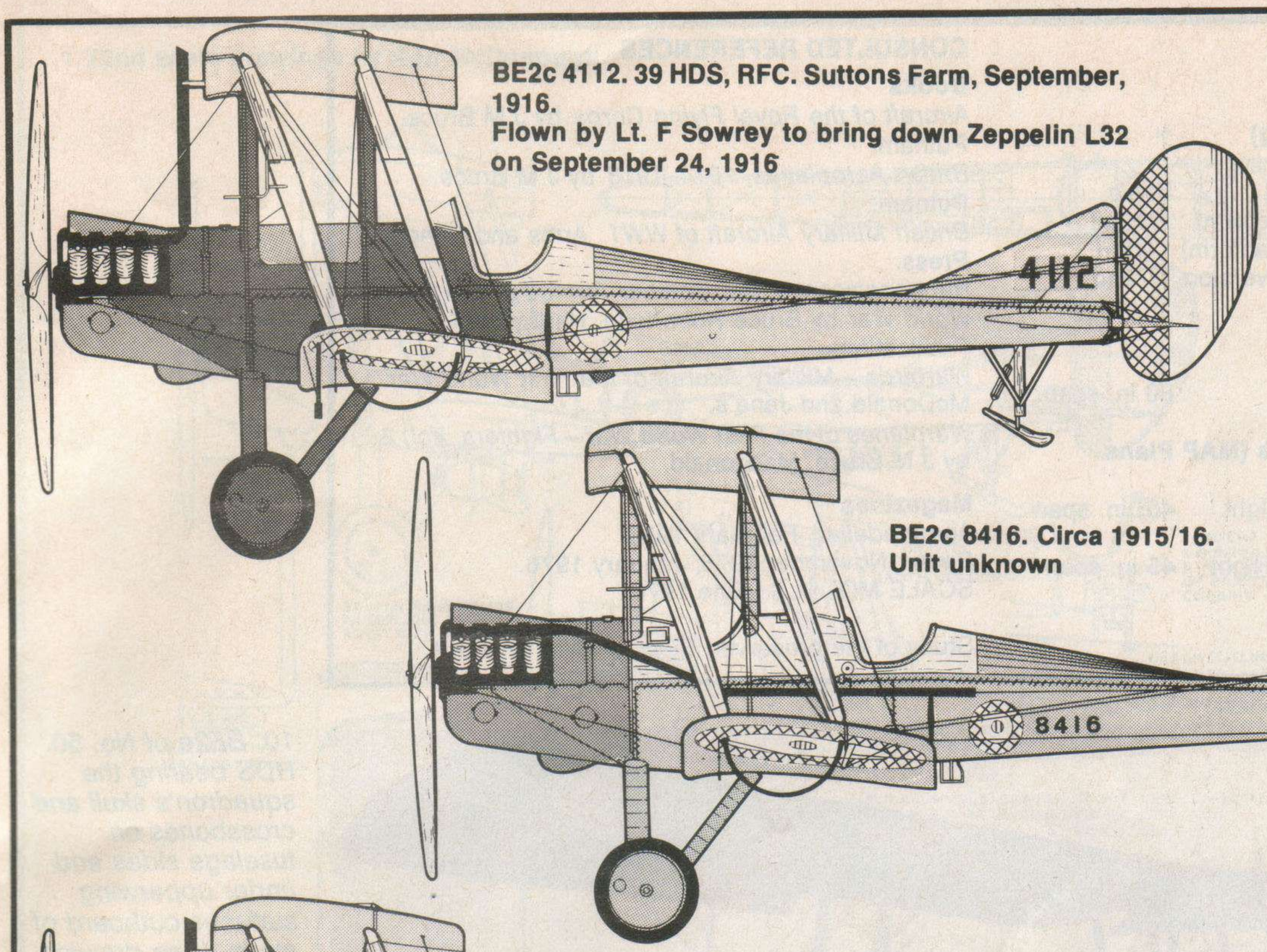


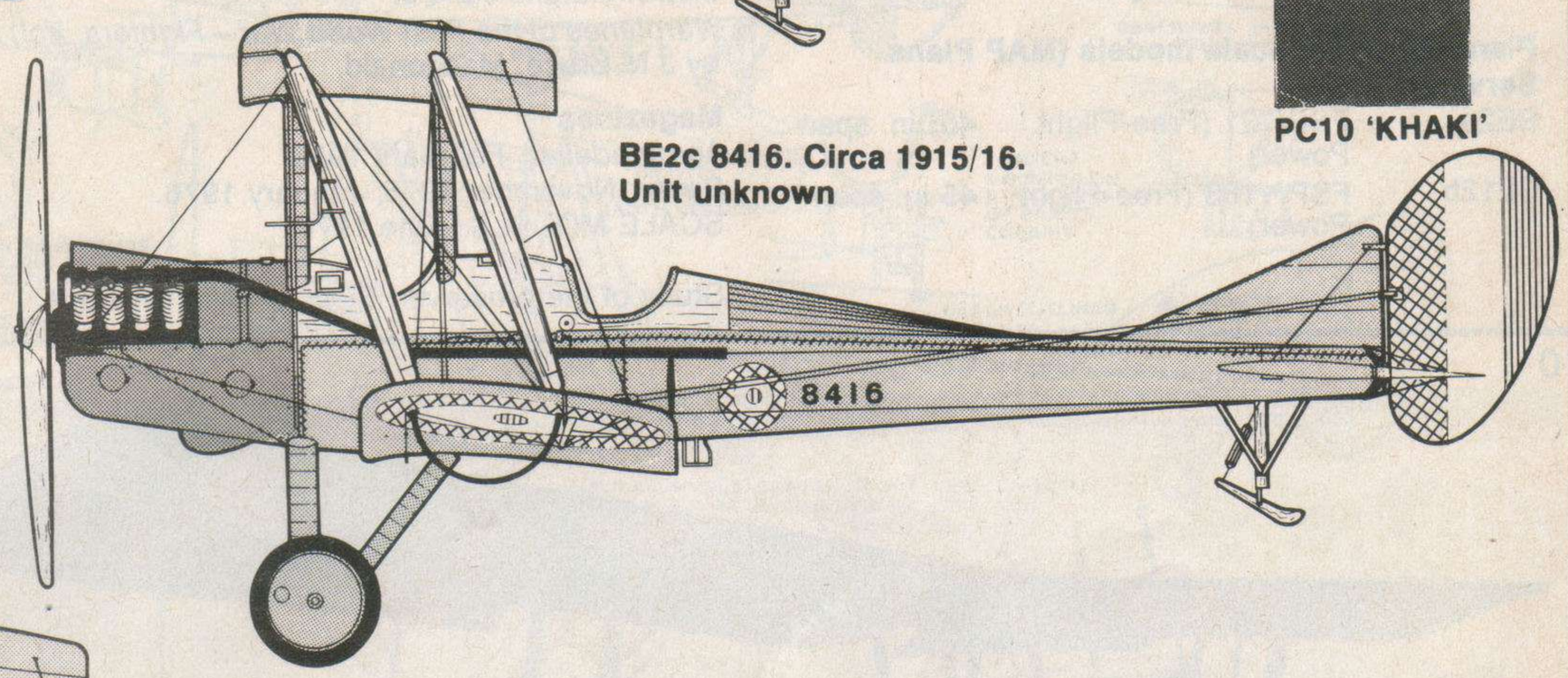


BE2c 4112. 39 HDS, RFC. Suttons Farm, September, 1916.
Flown by Lt. F Sowrey to bring down Zeppelin L32 on September 24, 1916

CLEAR LINEN

BATTLESHIP GREY

PC10 'KHAKI'

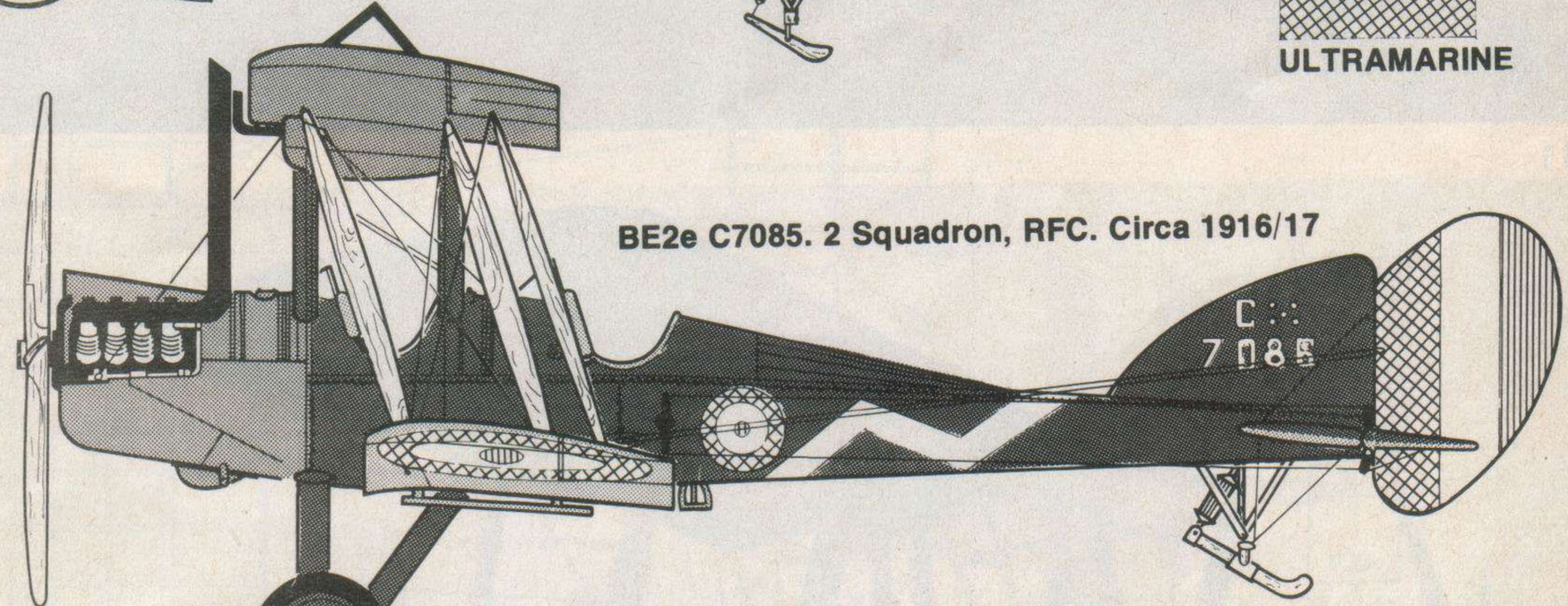


BE2c 8416. Circa 1915/16.
Unit unknown

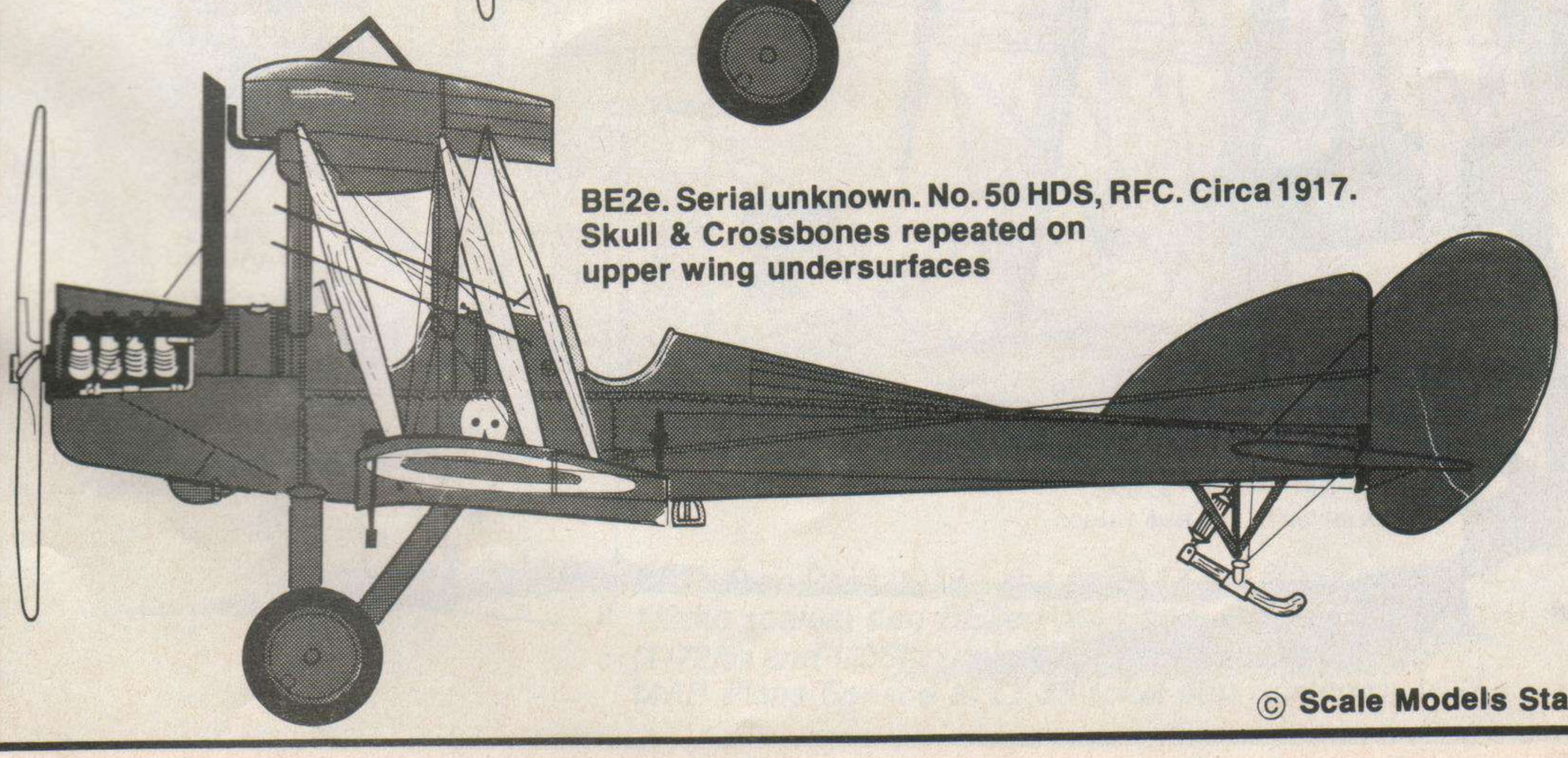
BE2c 8494. No. 4 Wing, RNAS Dunkerque.
Beardmore-built. Striped elevators – as rudder

VARNISHED PLY

ULTRAMARINE



BE2e C7085. 2 Squadron, RFC. Circa 1916/17



BE2e. Serial unknown. No. 50 HDS, RFC. Circa 1917.
Skull & Crossbones repeated on upper wing undersurfaces

VERMILION

ZINC WHITE

BLACK

BE2c/e/12 SERIES

Available models (non-flying)

Model	*Manufacturer*	*Scale*
BE2c	Forma-Plane (Vacform)	1/72nd
BE2c	Falcon Models (Vacform)	1/48th
BE2e/12 variants	Forma-Plane conversion set (Vacform)	1/72nd

Available models (flying)

BE2e	Practical Scale	80 in. span

Plans for flying scale models (MAP Plans Service)

BE2e	FSP/721 (Free-Flight Power)	40¾ in. span
BE12b	FSP/1183 (Free-Flight Power)	45 in. span

CONSULTED REFERENCES

Books

Aircraft of the Royal Flying Corps by J M Bruce. Putnam.

British Aeroplanes, 1914–1918 by J M Bruce. Putnam.

British Military Aircraft of WW1. Arms and Armour Press.

Reconnaissance and Bomber Aircraft of the First World War by Bruce Robertson. Harleyford Publications.

Warbirds – Military Aircraft of the First World War. McDonald and Jane's.

Warplanes of the First World War – Fighters, Vol. 2 by J M Bruce. Macdonald.

Magazines

Aeromodeller. February 1955.

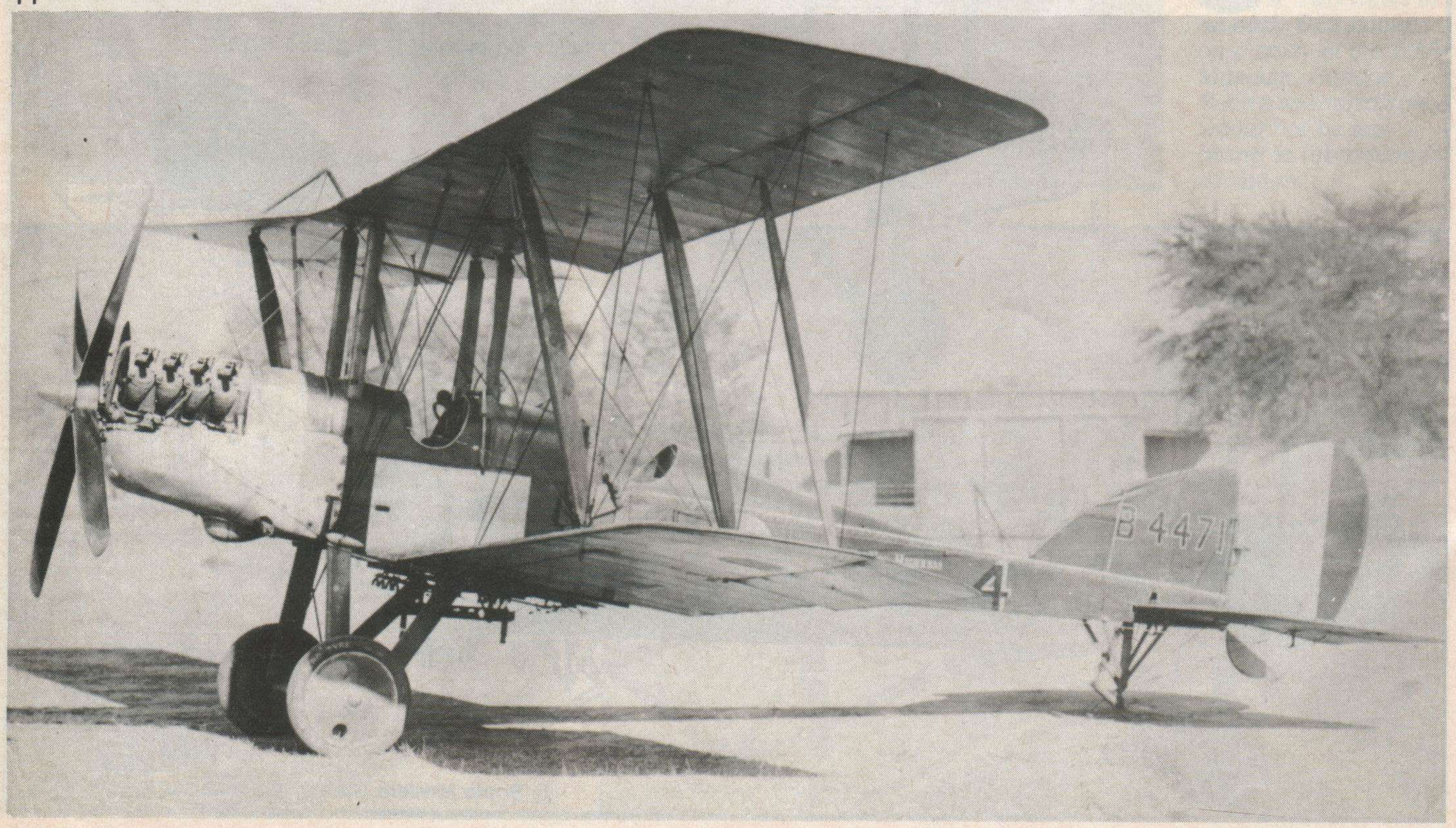
Battle. November 1975; January 1976.

SCALE MODELS. June 1976.

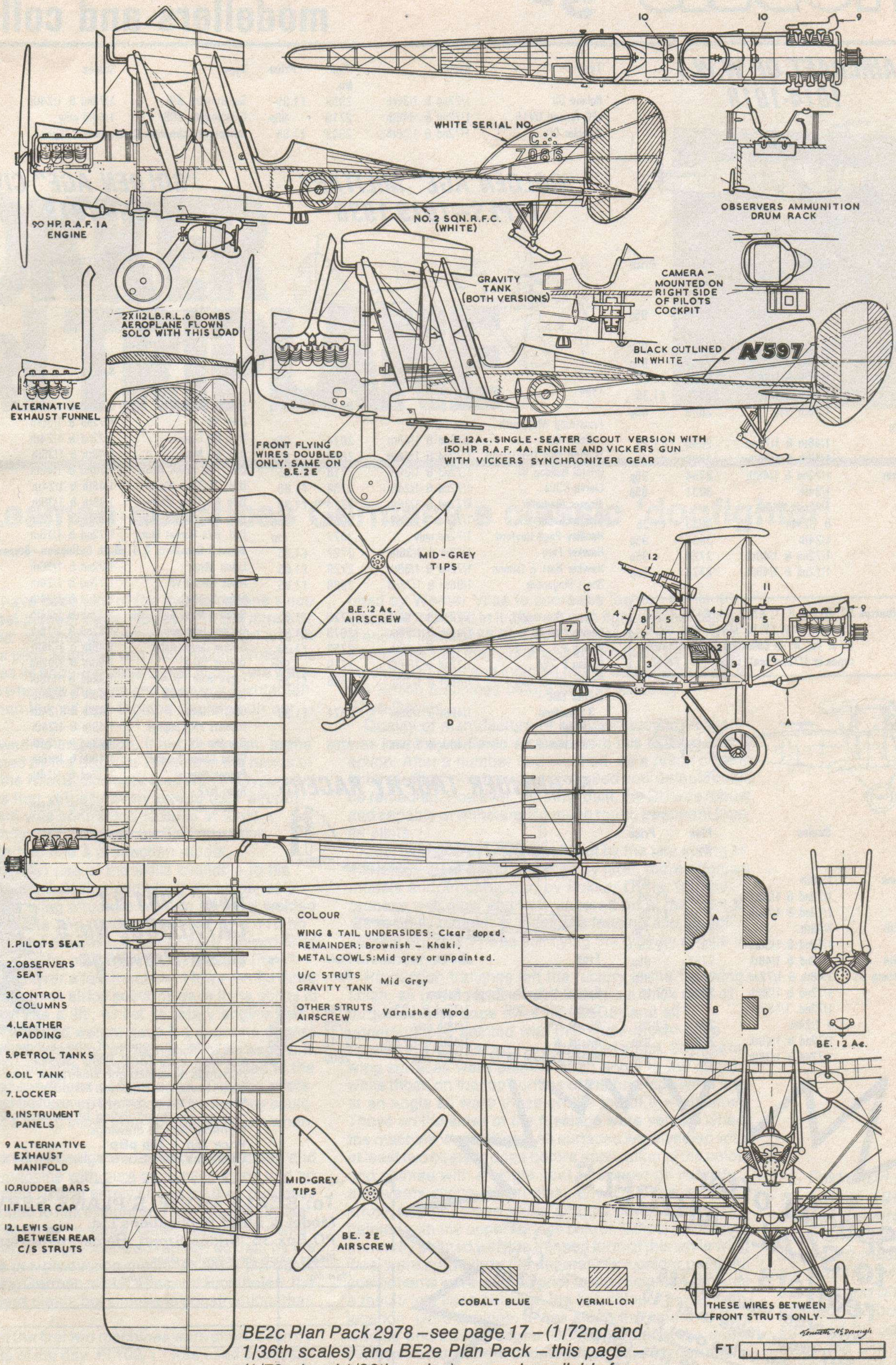
Study of the preserved BE2c at IWM, Duxford.

10

11



10. BE2e of No. 50 HDS bearing the squadron's skull and crossbones on fuselage sides and under upperwing surfaces outboard of struts. (See drawing on previous page).
11. BE2e B4471, built by the British and Colonial Aeroplane Co. Ltd., Filton. Note extra protection for observer in front cockpit by use of bolt-on metal plate! Plenty of modelling reference is afforded by close study of this excellent period photograph.



BE2c Plan Pack 2978 – see page 17 – (1/72nd and 1/36th scales) and BE2e Plan Pack – this page – (1/72nd and 1/36th scales) are each available from MAP Plans Service at £1.35 (plus 40p postage).

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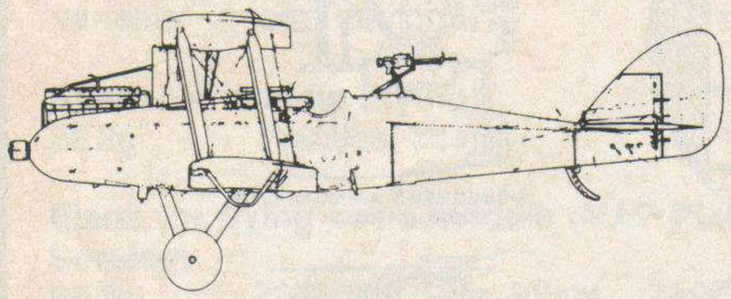
AIRCRAFT OF W.W.1 1914-1918



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D.H.4.	1/48th & 1/36th	2735	£1.85
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Felixstowe F2a Flying Boat	1/48th & 1/72nd	2980	£1.85
R.E.8	1/48th & 1/36th	2703	£1.35
Sopwith Dolphin	1/72nd & 1/48th	2754	95p
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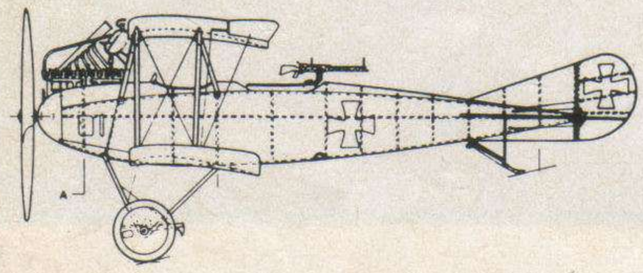

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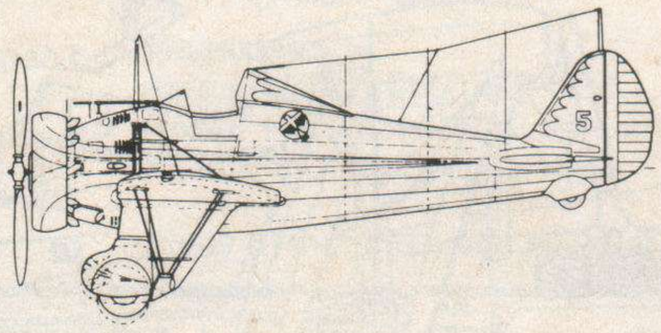
"GOLDEN AGE" MILITARY TYPES—1919-1938



Type	Scales	Plan No.	Price
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Clerva C30a	1/72nd & 1/24th	2758	£1.85
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Gloster Gamecock	1/72nd & 1/48th	2960	95p
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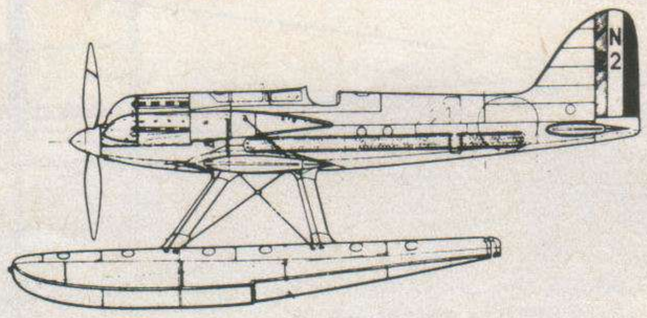
Curtiss SBC—3 Cleveland	1/48th & 1/36th	2671	£1.35
Grumman Gulfhawk (F3F)	1/48th & 1/36th	2706	95p

SCHNEIDER TROPHY RACERS



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Gloster IVb	1/48th only	2255	75p
Gloster VI	1/48th & 1/72nd	2742	95p
Macchi Castoldi MC72	1/48th only	2800	75p
Supermarine S-5	1/72nd & 1/24th	2764	£1.85
Supermarine S6B	1/48th only	2331	75p
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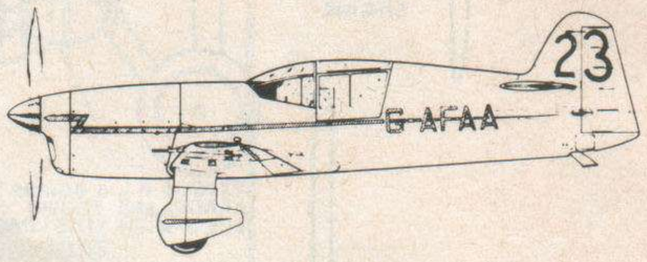
"GOLDEN AGE" CIVIL TYPES—1919-1938



Type	Scales	Plan No.	Price
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FOKKER DrI TRIPLANE

12

P S Leaman describes Germany's classic 'dogfighter'

Triplanes have been part of the aviation scene since the earliest pioneer days. However, in the minds of most, 'triplane' conjures up Anthony Fokker's DrI and its most famous pilot, Manfred von Richthofen. Whilst this machine owes its enduring fame to that pilot, there were many others who flew the type and even von Richthofen flew other than the 'all red' triplane depicted on our cover.

The DrI owed its inspiration, if not its design, to the success gained by the Sopwith Triplane in the hands of the pilots of the RNAS. So impressed with the type were the Germans that virtually every one of their aircraft manufacturers was contracted to build at least a prototype. Only that designed by Fokker's team succeeded to become a production model.

Making the best use of the skills available to his company, Fokker's design combined an immensely strong wooden wing structure with an all-steel welded fuselage, tailplane and rudder. Powered by a 110 hp rotary engine, and mounting a pair of fixed forward-firing machine guns in the classical manner above the cowling, it was never a fast machine. However, its three wings with their thick airfoil sections gave it the ability to climb virtually 'like a lift', whilst its rotary engine and forward concentrated weight gave it a supreme degree of lateral manoeuvrability. In the hands of an expert, it was a most formidable opponent and well suited to the close combat conditions of the period. Triplane pilots invariably had the 'ace up their sleeve' in that they could disengage in a steep climb from combat to return when they chose.

Fokker's original design was an extremely clean and uncluttered machine with pure cantilever wings and no external bracing. Whilst amply strong for their purpose, the wings tended to flex in flight and thin interplane 'ties' were added at an early stage. Other apparently minor, but significant, changes followed rapidly, so that, by the time that the pre-production machines were put out to the two leading German pilots, Voss and Richthofen, the design was less clean, but simpler in construction, than the original.

The lives of the first two machines were short, even by the standards of the day. FI 102/17 was used briefly by von Richthofen but was destroyed in combat on September, 15 1917 whilst he was on leave. Kurt Wolff, who was flying it at the time, was killed. FI 103/17 was used by Werner Voss to score the last ten of his 49 victories. He died in it after an epic fight against pilots of B and C Flights of 56 Sqn. RFC on September, 23 1917. Though he had many chances to break off the combat, he chose to stay and inflicted heavy damage on most of the British machines before he was killed by Rhys-Davids.

Quality of manufacture of early production Fokkers was low, they suffered as much from this as from enemy action. After a number had crashed, as a result of wing failure in flight, the type was grounded until defects could be remedied. However, properly built, the DrI was robust and capable of withstanding much rough treatment from its pilots.

Just over 300 DrIs were built but by the late spring of 1918 they were being replaced by later, more effective models and, in particular, by Fokker DVIIs. But the process was slow and they lingered on at the front for some time. Indeed, at least one leading ace, Josef Jacobs of *Jasta* 7, was still flying the type by choice in November 1918.

Production triplanes left the factory in the following finish: all undersurfaces painted with a thick coat of turquoise-blue dope (Methuen 25C5) and all uppersurfaces painted with thin khaki-brown dope applied in a manner to give a streaked effect. Streaks on wing surfaces were painted at an angle to the chord while those on the top surface of the fuselage were also at an angle as were those on the top of the tailplane. Those on the sides of the fuselage were vertical when the machine was in flight. All surfaces were sealed with at least two coats of dope before application of the colour and painted with a single coat of linseed oil varnish afterwards giving a high gloss effect. Centre-section struts, undercarriage struts and the cowling were painted with the uppersurface colour. Wheel discs were generally painted with the thinned form of this while wing 'ties' were normally in the undersurface colour paint. All components were painted prior to final assembly and, as a result, join lines between the two colours varied with location. On the wings, it was along the centre of the leading and trailing edges. On the tailplane, the upper surface had a narrow undersurface blue border and a similar border ran along the lower edge of the fuselage side. The rudder was painted entirely white. Any variation from this 'norm' that appears upon a

12. Fokker DrI of Jasta *12, spring, 1918. In front of the aircraft is* Leutnant *Müller with squadron mascot to his left. The white cowling and black rear fuselage colours were adopted by* Jasta *12 when the unit was supplied with Albatros aircraft prior to the arrival of the triplanes.*

13. A standard production Fokker DrI with late-type ailerons. Note how the lower surface turquoise dope overlaps the lower fuselage longeron even continuing over the white cross panel in many instances – as here.

photograph of a production machine is sure indication that the machine in question has been repainted, probably with either individual pilot's or unit's markings or colours.

National markings applied to all triplanes at the factory took the form of a slightly sub-sized range of 'iron crosses'. These were painted on to white panels above the top wings, below the bottom wings and on the fuselage sides. They also appeared on the all-white rudder. After March, 20 1918, to conform with a ministry instruction, those machines still in service had their crosses changed to a 'straight-sided' type. As this was done at unit level, the change often took some time to complete and led to variation of interpretation of cross proportions. The change was made by overpainting and the original form was frequently visible underneath the new. The white background panels on uppersurfaces were frequently painted out with uppersurface colours leaving a narrow white border to the crosses.

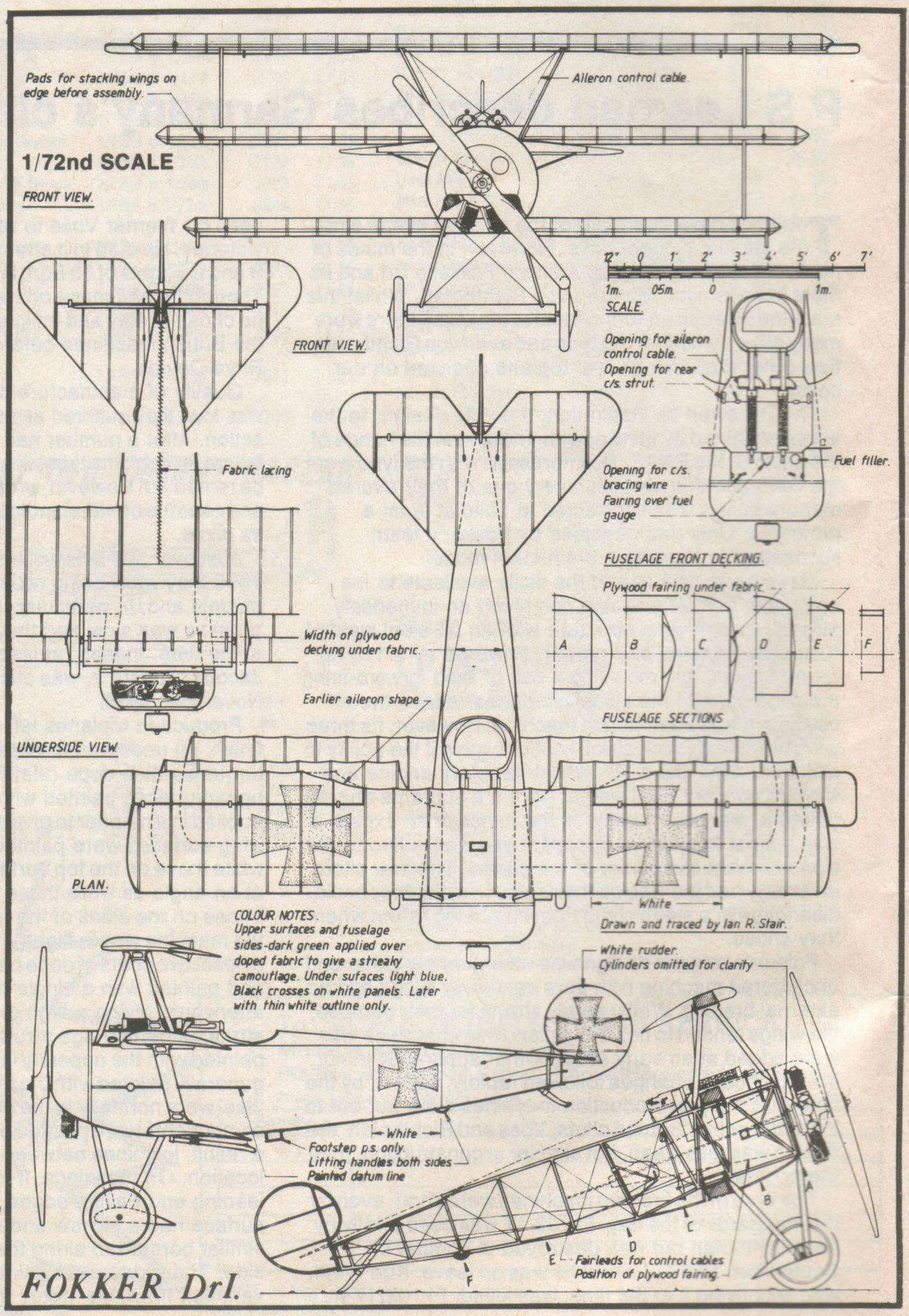
Two serial numbers were marked on triplanes. The first was the factory number which was painted somewhere on most components and clearly marked with the 'Fokker' trademark at the bottom of the rudder. The second number was the military serial number and this was painted at the bottom of the fuselage beneath the cockpit. Both sides of the fuselage had their 'centre-line' painted on from immediately behind the cowling to a point below the middle of the cockpit. The left side only of the fuselage carried a table of laden and unladen weights for the type. Beneath the centre of the top wing was stencilled the wing number and the date of their manufacture. All of this stencilling was done in black paint.

Surviving fabrics show that the 'khaki-brown' of the uppersurfaces was close to *RFC Green* in the **Humbrol** range of paints (Methuen 4F5). The undersurface turquoise-blue can be mixed from the Humbrol range using four parts white, eight parts blue (HG10) and one part green (*No. 38*).

FI 102 and 103/17 differed from the above in that they were apparently painted overall in the undersurface blue before being painted with their top surface colours. The blue thus showed through the thin khaki dope in places leading to a greyer appearance. This was also done with some of the production machines, *ie* 588/17 shown in the centre colour section.

Individual colours, where applied, were generally painted from the front edge of the fuselage cross panel backwards and above the top wing only. Wing undersurfaces were seldom, if ever, overpainted.

A part reprint of this feature, together with 1/24th scale dyelines, is available as Plan Pack 2678 from MAP Plans Service. Price is 95p plus 30p post and packing.



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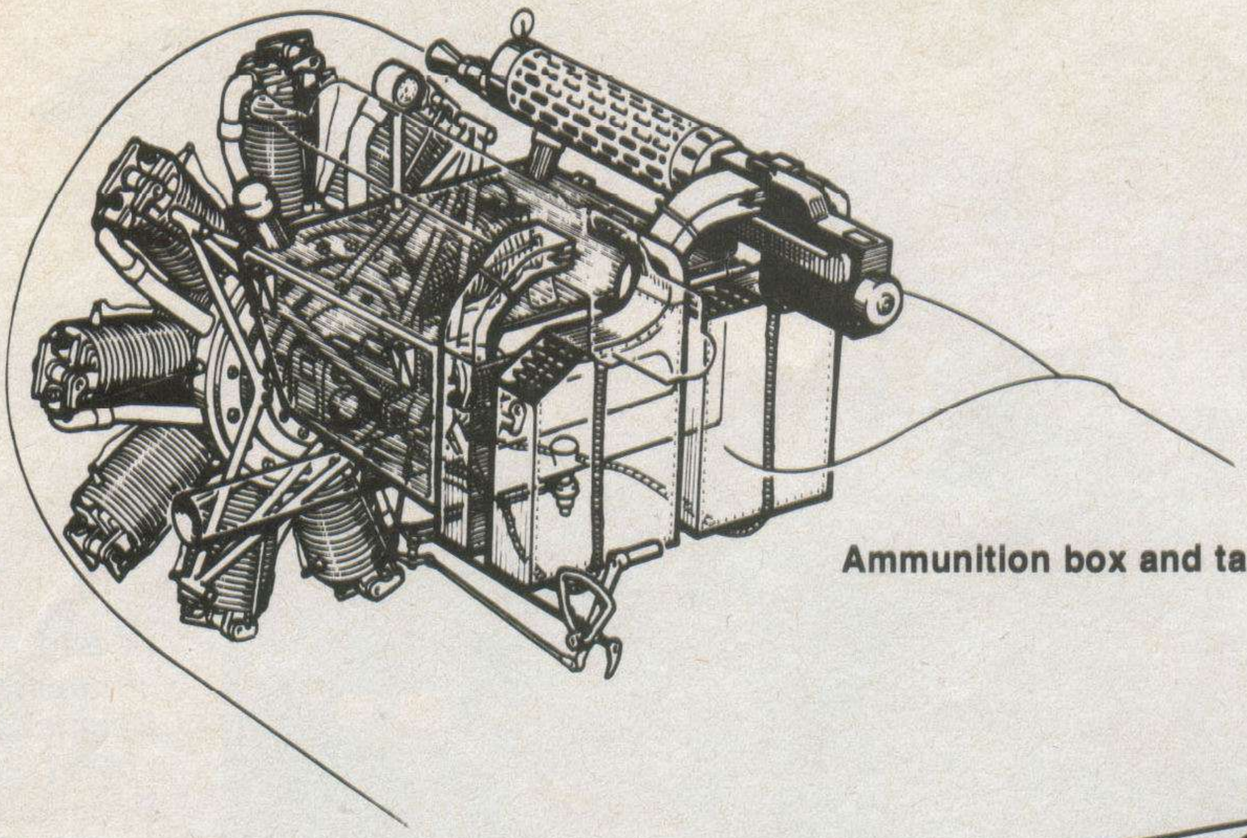
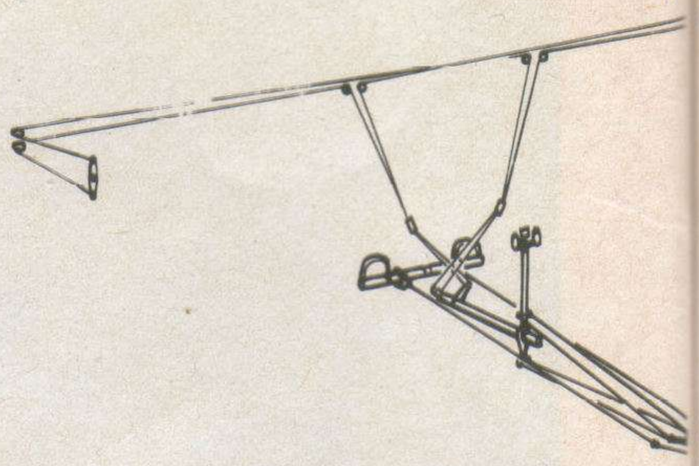
16

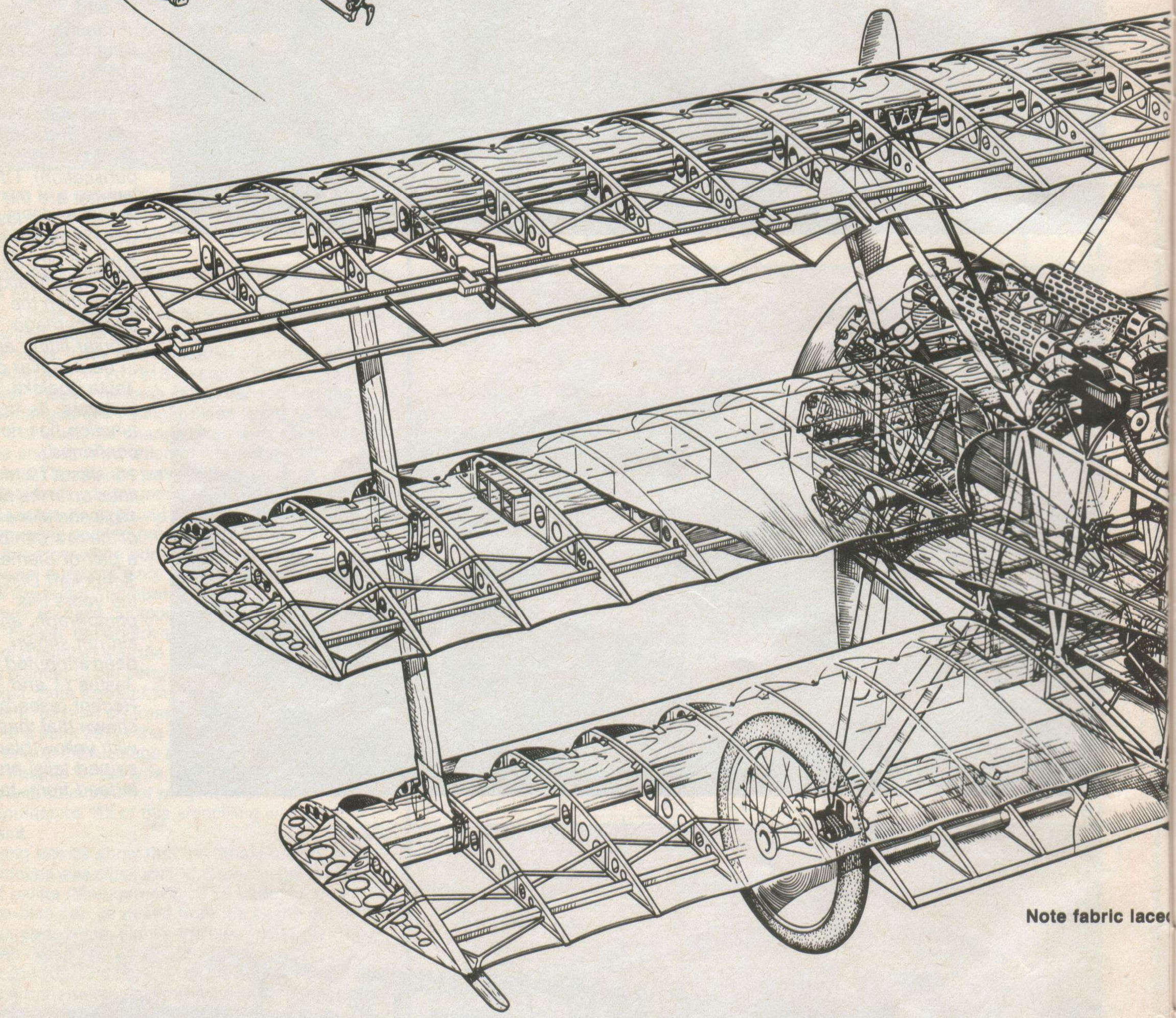
14 and 15. Two views of Leutnant *Paul Bäumer's Fokker Drl, 204/17, of* Jasta *Boelcke. (This aircraft is also illustrated in colour in the middle section of this publication). Of interest are the markings on lower wing uppersurfaces and, on picture 14, the field modification to strengthen the undercarriage. This tubular fitting appears to be peculiar only to* Jasta *Boelcke triplanes. Its* true *function has not been confirmed.*

16. Jasta *19 triplanes lined up in the spring of 1918 and at the far end of the row can be seen a pair of Siemens Schuckert Dllls. Over the years this photograph, and the aircraft shown, have been attributed to both* Jastas *11 and 12. Recent research has shown that these Drls, with yellow/black striped tails, are indeed from* Jasta *19.*



Ammunition box and tank detail.



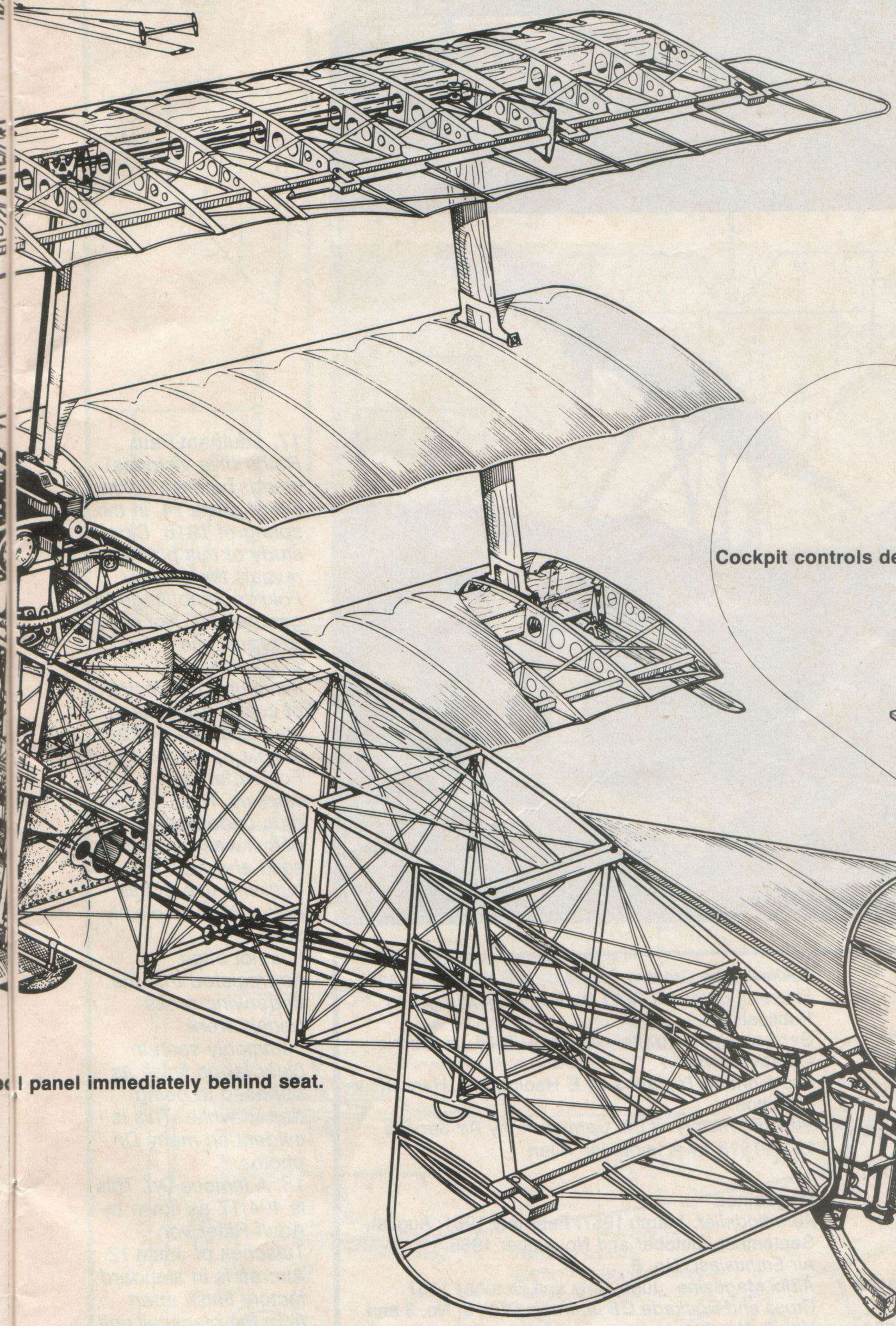


Note fabric laced

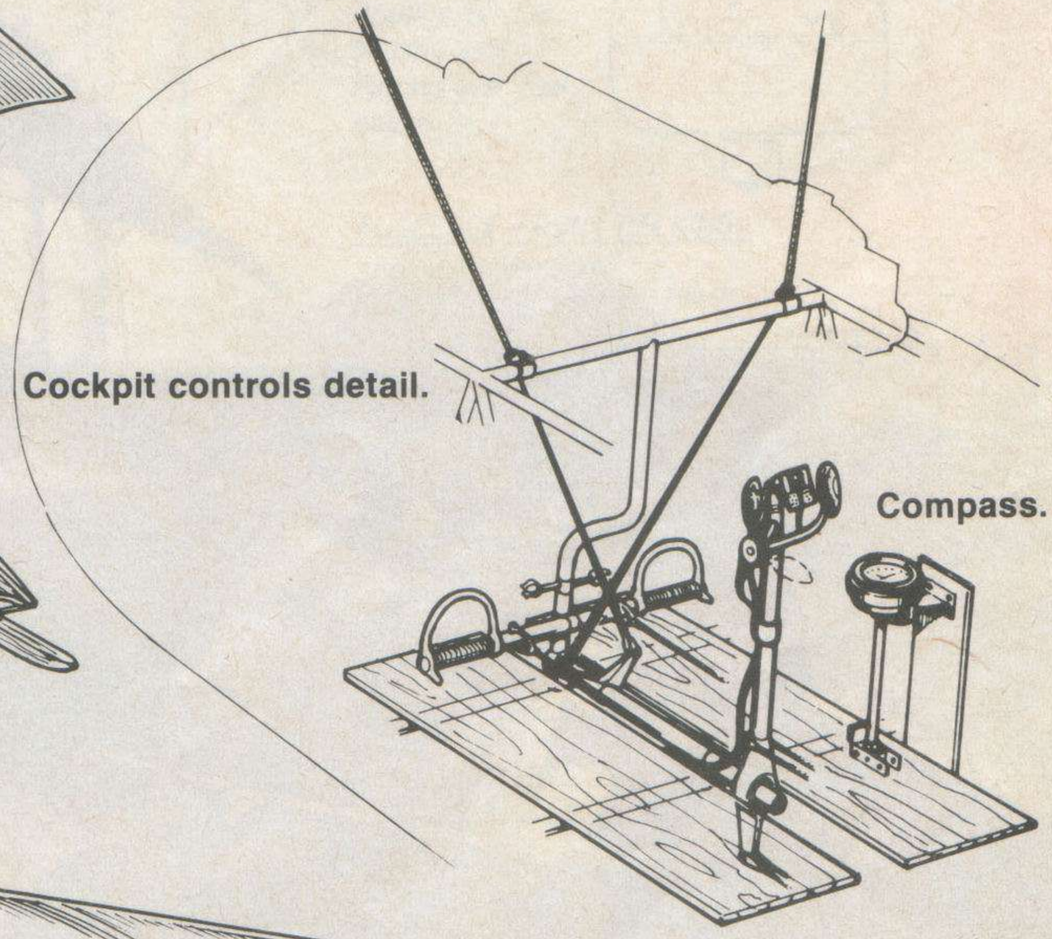
Wingtip skids fitted to all production aircraft.

Fokker Dr. I Triplane

Control system arrangement.



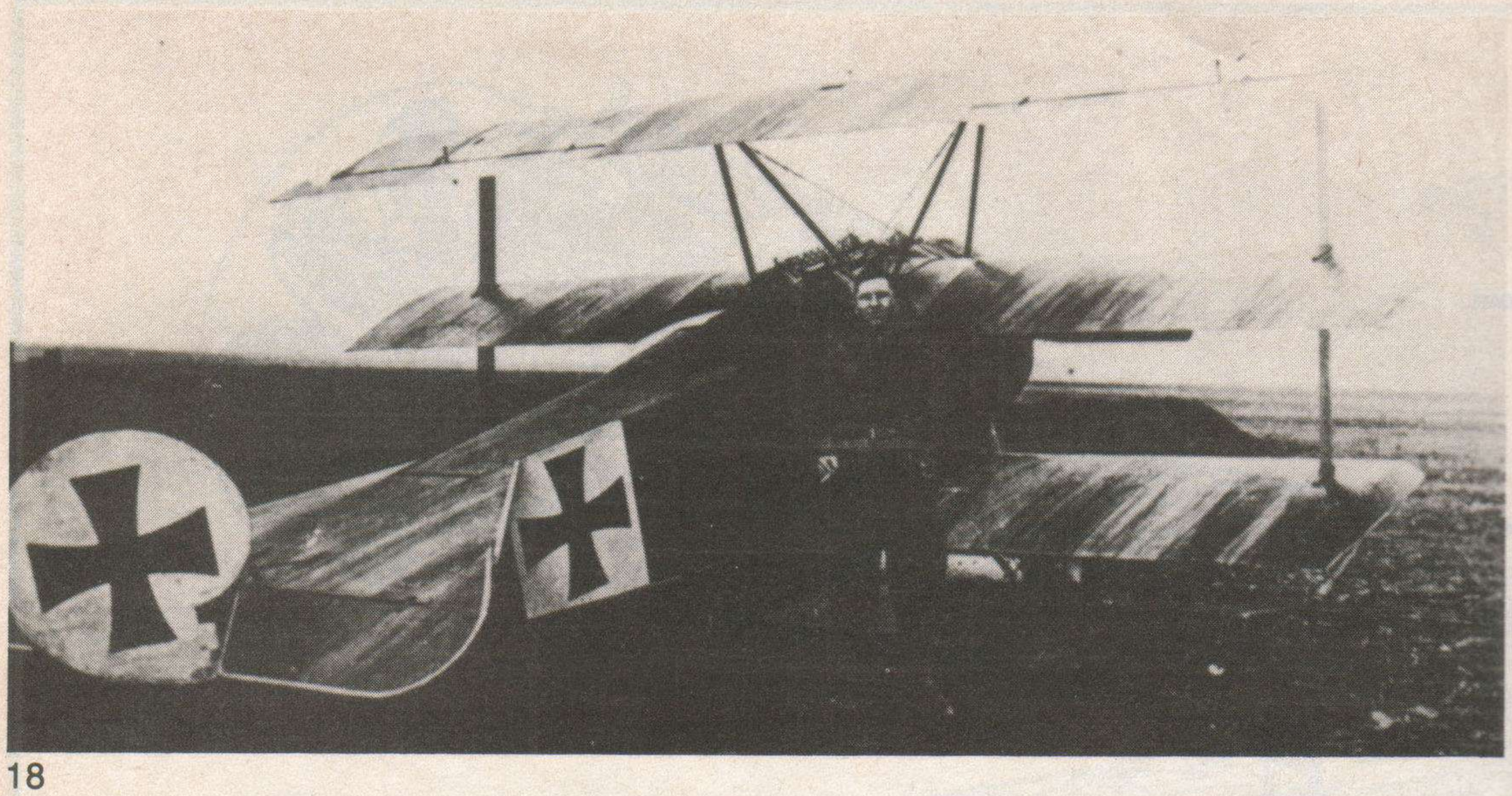
l panel immediately behind seat.



Cockpit controls detail.

Compass.

17



18

17. Leutnant *Paul Rothe (five victories) stands before a Fokker Drl of* Jasta *14, in the spring of 1918. Close study of this photo reveals the streaky Fokker camouflage to good effect. Not easy to reproduce accurately in miniature, this method of colour application was a time-saving and simple operation for Fokker factory workers. The turquoise blue undersurface colour was much more solid and here the outlining use of this colour can be plainly seen.*
It is not often appreciated that the underwing cross panels were commonly seen in clear fabric finish as opposed to being doped white. This is evident on many Drl photos.
18. A famous Drl. This is 404/17 as flown by Adolf Ritter von Tutschek of Jasta *12. Aircraft is in standard factory finish apart from the black tail unit and white cowling. Note black/white streamers attached to trailing edge of lower wing and legend '1988 UR' on lower wing 'tie'.*

FOKKER Drl TRIPLANE

Available models (non-flying)

Model	*Manufacturer*	*Scale*
Fokker Drl	Hasegawa (Available later)	1/8th
Fokker Drl Triplane	Revell	1/28th
Fokker Triplane	Revell	1/72nd

Available models (flying)

Fokker Drl Triplane	VK	47 in. span

Plans for flying scale models (MAP Plans Service)

Fokker Triplane	FSP/453 (Free-Flight Power)	40½ in. span
Fokker Drl Triplane	RC/1213 (R/C – Power)	54 in. span

CONSULTED REFERENCES

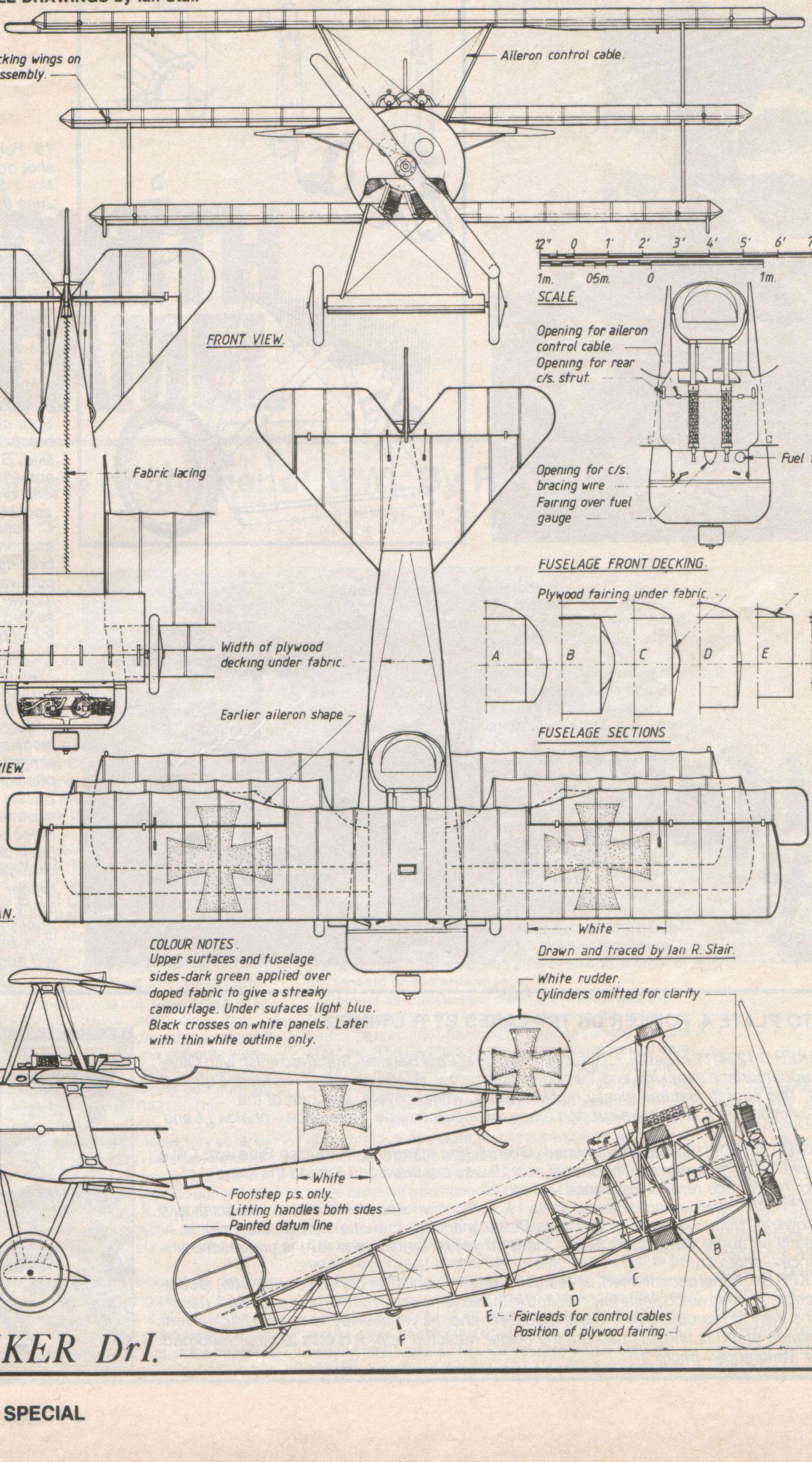
Books

Eisernes Kreuz und Balkan Kreuz by H J Nowarra. Verlag Dieter Hoffman.
Fokker – The Creative Years by A R Weyl. Putnam.
Fokker Fighters of WW1 by P L Gray. Wingspan Publications.
German Fighter Units – June 1917–18 by A Imrie. Osprey/Airwar 17.
The Fighting Triplanes by E Hadingham. Hamish Hamilton.
Pictorial History of the German Army Air Service 1914–1918 by A Imrie. Ian Allan.

Magazines

Aeromodeller. March 1957; February 1961; August, September, October and November 1965.
Air Enthusiast. No. 8.
Airfix Magazine. June, July and October 1967.
Cross and Cockade GB Journals. Vol. 3, No. 3 and Vol. 6, No. 3.
Flight. March 14, 1918.
Modell Fan. March 1979.
Profile Publications No. 55. (By J M Bruce.)
WW1 Aeroplanes. September 1977.
SCALE MODELS. April 1973.

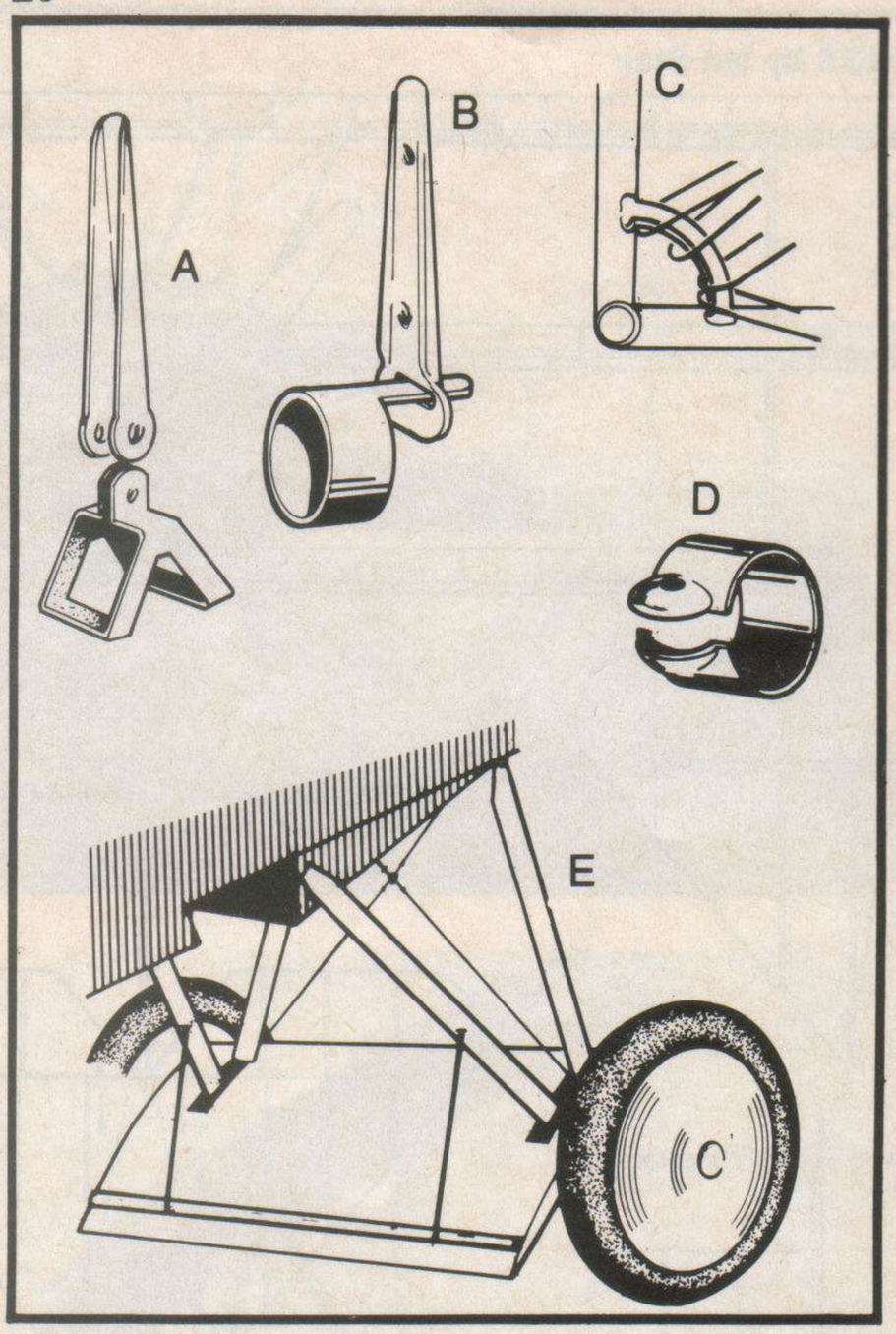
1/48th SCALE DRAWINGS by Ian Stair



FOKKER Dr.I.

19

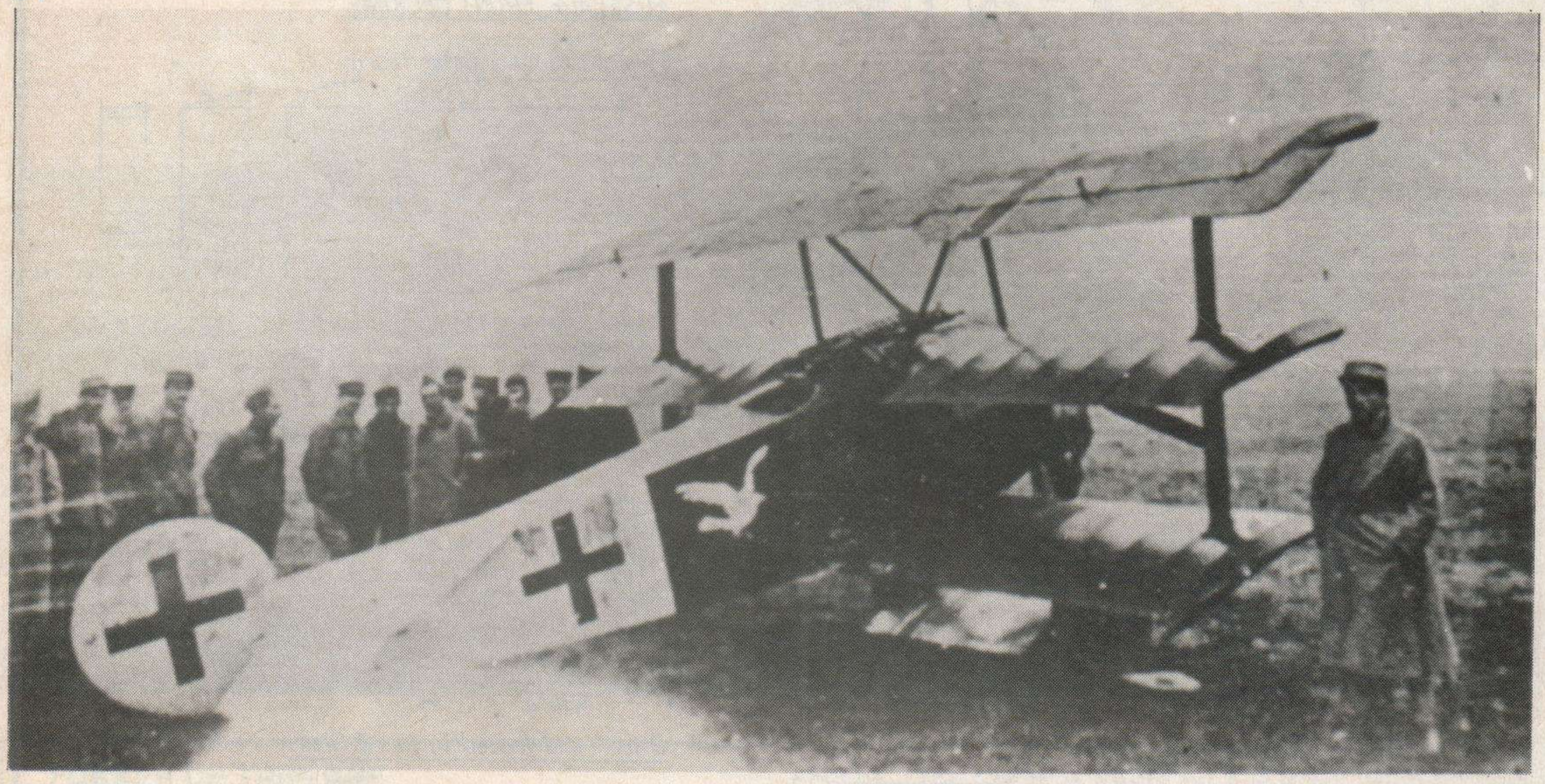
20



19. Fokker Drl 588/17 shot down by SE5as of No. 1 Squadron on June 9, 1918. This particular aircraft was the subject of a detailed intelligence report by the RAF. Fuselage bands are red/white vertically and black/white laterally.

20. Sketches reveal a few novel triplane features. A: Spar clamp and rear bracket for wingtip skid. B: Spar clamp and socket for forward end of wingtip skid socket. C: Fuselage anchorage for internal bracing. (See cutaway.) These tubular quadrants served as anchorage for all bracing wires in the fuselage. D: Typical clip found throughout fuselage. E: The Jasta Boelcke undercarriage modification in simplified form – see photo 14.

21



21. Drl of Jasta 18 captured by the French. Note worn paint around crosses on fuselage and rudder. Contrary to many previously published sources, the dark paintwork was red and not dark blue.

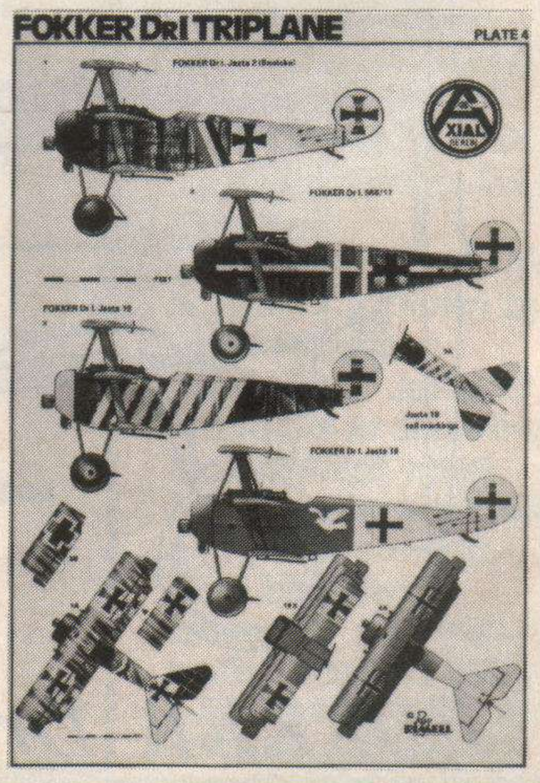
KEY TO PLATE 4. FOKKER Drl TRIPLANES BY R L RIMELL

1. FOKKER Drl 204/17 of Jasta *2 'Boelcke' flown by Lt Paul Bäumer. Standard finish with* Olive Green *uppersurface streaking and* Turquoise Blue *below. (*Methuen *colour references quoted in text). This aircraft features glossy black cowling, wheel covers, and part of the centre-section struts. Note extra support brace for undercarriage.* Reference *– photos 14 and 15.*

2. FOKKER Drl 588/17. Unit unconfirmed. Overall, non-standard, Turquoise Blue *with* Olive Green *over all uppersurfaces. This actual aircraft was captured and formed the subject of a detailed intelligence report.* Reference *– photo 19.*

3. FOKKER Drl. Serial unconfirmed, of Jasta 19. *This colourful aircraft is in standard finish with white cowling. Note overpainting of 'Cross Patee' markings into one style of late insignia – particularly on upper wings (3B). Exact shade of yellow for tailplane (3A) is unconfirmed.* Reference *– photo 16.*

4. FOKKER Drl. Serial unconfirmed, of Jasta *18. Long thought to be dark blue and white, recent research by German enthusiasts has resulted in the scheme shown. This, authenticated, decor would be easy to reproduce by triplane modellers and, as yet anyway, is not too hackneyed! Exact shade of red is unconfirmed but the colour depicted approximates to other recorded shades.* Reference *– photo 21.*



SOPWITH F1 CAMEL

22

The ultimate dogfighter of WWI. By R L Rimell

"IT is indicative of the international fame of the . . . Sopwith Camel, and its pre-eminence in aviation history, that even today, sixty years after that stubby little fighter was in its heyday, its name remains synonymous with the world's first aerial struggle in 1914–18 . . ."

So wrote historian Chaz Bowyer in the introduction to his book, *Sopwith Camel – King of Combat*, published by Glasney Press in 1978. Few would argue with the author's opinions for the Camel was the kind of aeroplane that legends are made of. The current release of **Hasegawa**'s second Museum Series model to $\frac{1}{8}$th scale makes another look at this classic appropriate and timely.

The Camel has always been a popular choice with model kit manufacturers (for static *and* flying), while model plans and factual references are legion. The writer is indebted to J M Bruce, historian, author, and keeper of records at the RAF Museum, for reminding him of some finer aspects of the Camel, rarely appreciated by modellers and illustrators.

On operational Camels in RFC service on the Western Front (and on the majority of RNAS F1 Camels) the decking ahead of the cockpit was cut away, adjacent to the starboard Vickers gun breech mechanism, to produce the asymmetric outline as correctly portrayed in the Hasegawa kit. Beware though, the cut-outs were accomplished in a variety of ways – some Camel pilots also had the decking cut away about the port gun as depicted on our painting of Camel B6313. This modification may have had something to do with windscreen design for it was quite unnecessary as far as access was concerned. Modellers of Hasegawa's kit will have to decide to either reproduce a machine known positively to have the decking cut away, or to convert the kit in order to conform to the exact individual Camel being modelled. This may prove difficult as that particular area of the cockpit is rarely seen clearly in period photographs.

The actual cutting away of the starboard ply decking was usually undertaken by the issuing aircraft depot as standard practice as devised by No. 2 AD and officially designated on July 28, 1917. When night-fighter Camels went to France in 1918 it was agreed that, in the interests of pilot comfort, the cockpits of their standard F1 Camels would not be cut down. Presumably, the official view was that since it was practically impossible to rectify a stoppage of the starboard gun in the dark anyway, there was little point in providing access to guns on such aircraft.

Obviously, with the cutting away of the decking, it became necessary to modify the windscreen and innumerable attempts were made to produce a satisfactory design in the field. Needless to say, these assorted efforts were to produce correspondingly assorted styles of windscreens so it would be wise to check photos before finalising the particular subject.

Another feature worth mentioning is the size of the upperwing centre-section cut-out. Here again, individual modifications produced various shapes, but the standard wide-pattern cut-out was officially introduced on July 3, 1918. Modellers should also take note of the fact that many Camels went on to the Armistice with the basic factory-sized (and quite useless, vision-wise) cut-out.

One other minor point concerns the position of the Rotherham pump. This could be fitted either on the starboard rear centre-section strut or on one or other of the forward undercarriage legs.

Eminent aero historians claim the Camel was the closest designers of the time ever got to the ideal aerobatic machine produced for fighting service in World War One. The Camel could be looped under control from a low air speed and flick-rolled at near-zero altitude without fear of losing precious height. Undoubtedly its greatest characteristic was its ability to be turned left or right in a matter of seconds due to the close forward concentration of weight masses, combined with the tremendous torque created by the rotary engine. In the combats of WW1 this was a tremendous advantage and, in the hands of a competent pilot, the Camel was a force to be reckoned with.

Yet these 'dog-fighting' qualities had their drawbacks. There were traps for the unwary and many a student pilot was killed flying Camels for the first time. It had to be appreciated that unless swift turns were handled correctly the nose would drop and a rapid spin resulted. If the machine was at an insufficient height, the Camel would keep on spinning until it struck the ground, with usually fatal results. The Camel was a true fighting aircraft, it suffered 'foolish' pilots badly, but once its

22. The RAF Museum's, ex-Nash Collection, Sopwith F1 Camel after painstaking restoration. This superb example of the famous Camel is one of the stars of Hendon's WW1 display. Modellers planning a Camel as their next project are strongly urged to make a close study of this machine.

idiosyncrasies were mastered, it proved a most formidable fighting machine.

Camel colour schemes are legion as far as markings are concerned but generally, in RFC/RNAS/RAF service, a standard arrangement was adopted which varied very little. Uppersurfaces were doped in *PC10* which, dependent on mix, could result in a brown-to-khaki-to-dark green range (Methuen 4E8-4F2). Roundels were, typically, *Ultramarine* (21C8), *Zinc White* and *Vermilion* (9A8). Metal cowling and panels were either left natural metal, or could be seen in *Light Battleship Grey* (B1-C1). Plywood panels around the cockpit area were usually plain varnished but could also be in grey or *PC10.*

On many British WW1 aircraft the underwing roundels carried a white outer ring despite the clear-doped (4A3) finish. This feature is not as rare as many people seem to imagine and it would be imprudent to assume that only roundels on camouflaged surfaces bore a white outer ring.

SOPWITH CAMEL

Available models (non-flying)

Model	*Manufacturer*	*Scale*
Sopwith F1 Camel	Hasegawa	1/8th
Sopwith F1 Camel	Monogram	1/48th
Sopwith F1 Camel	Revell	1/28th
Sopwith F1 Camel	ESCI (ex-Eldon/ Match)	1/72nd
Sopwith F1 Camel	Revell	1/72nd

Available models (flying)

Sopwith F1 Camel	VK	56½ in. span
Sopwith F1 Camel	Keilkraft	18 in. span

Plans for flying scale models (MAP Plans Service)

Sopwith Camel	FSP/441 (Free-Flight Power)	42 in. span
Sopwith Camel	FSP/1143 (Free-Flight Power)	28 in. span
Sopwith Camel	RC/1099 (R/C – Power)	56½ in. span

CONSULTED REFERENCES

Books

As listed with the BE2c references with the exception of *Reconnaissance* and *Bomber aircraft of the First World War.*

Fighter Aircraft of the First World War by W M Lamberton. Harleyford Publications.

Sopwith Camel – King of Combat by C Bowyer, Glasney Press.

Sopwith – The Man and his Aircraft by B Robertson. Harleyford Publications.

Winged Victory by V M Yeates. Jonathan Cape, 1934. (This is a novel, but the best. If ever you wanted to know what flying wartime Camels was *really* like, this is the only way to find out . . .)

Magazines

Aeromodeller. March 1958.

Aerodrome Modeler. Vol. 3, No. 3 and No. 4, 1977.

Aeroplane Monthly. March 1973.

Airfix Magazine. May and December 1969, April 1971.

Cross and Cockade (US) Journal. Vol. 7, No. 1 (Scale drawings).

Profile Publications No. 31. (By J M Bruce.)

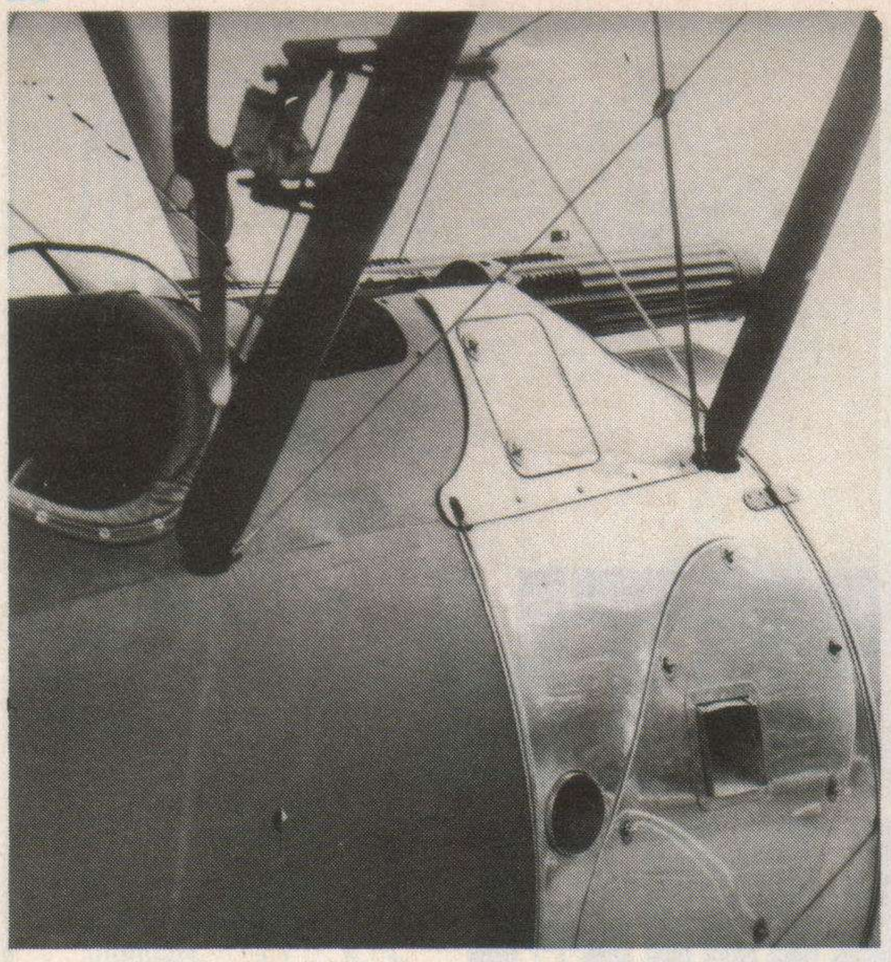
RAF Flying Review. April 1958, August 1960.

SCALE MODELS. April 1970; May 1974; October 1978.

Sopwith Camel. 1/72nd scale drawings. *Aviation News* (5/23).

Study of the preserved example in the RAF Museum, Hendon.

23



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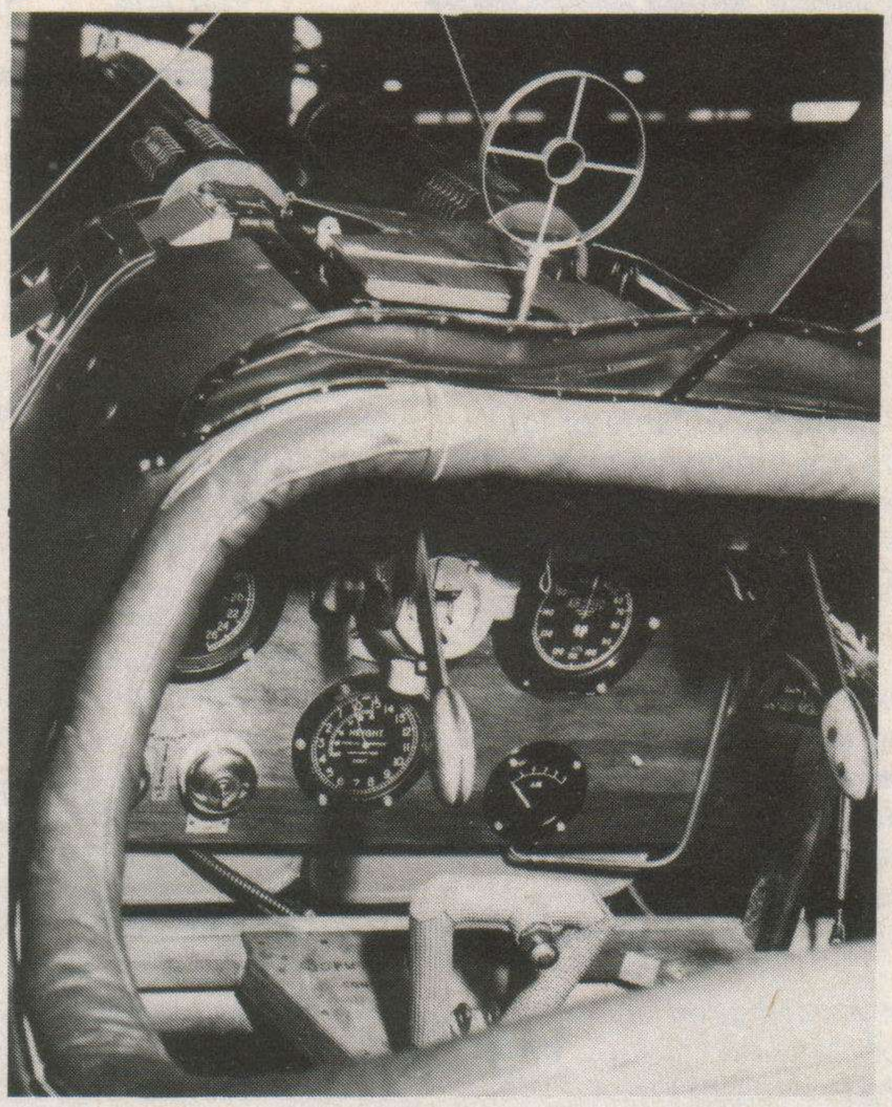
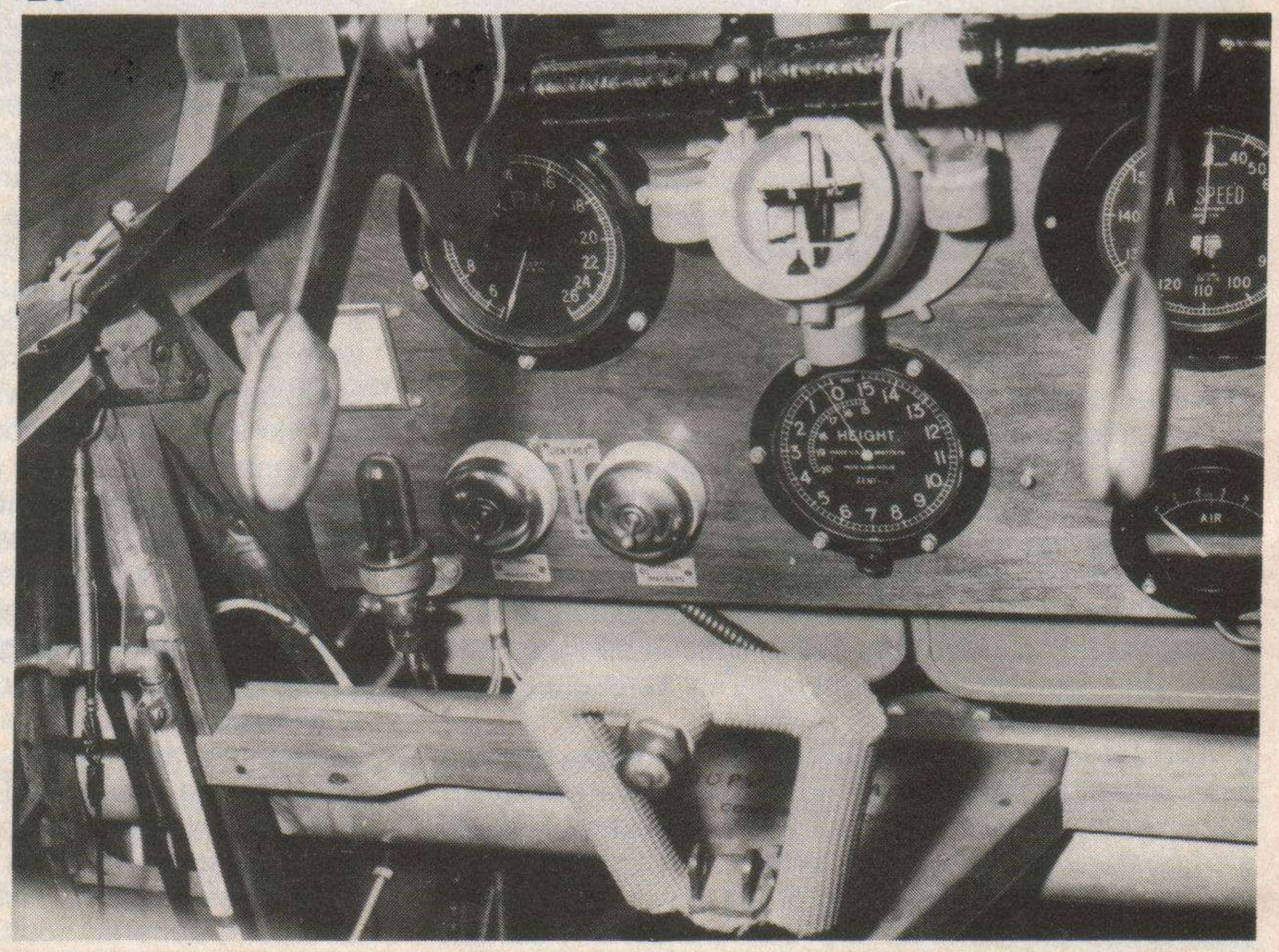


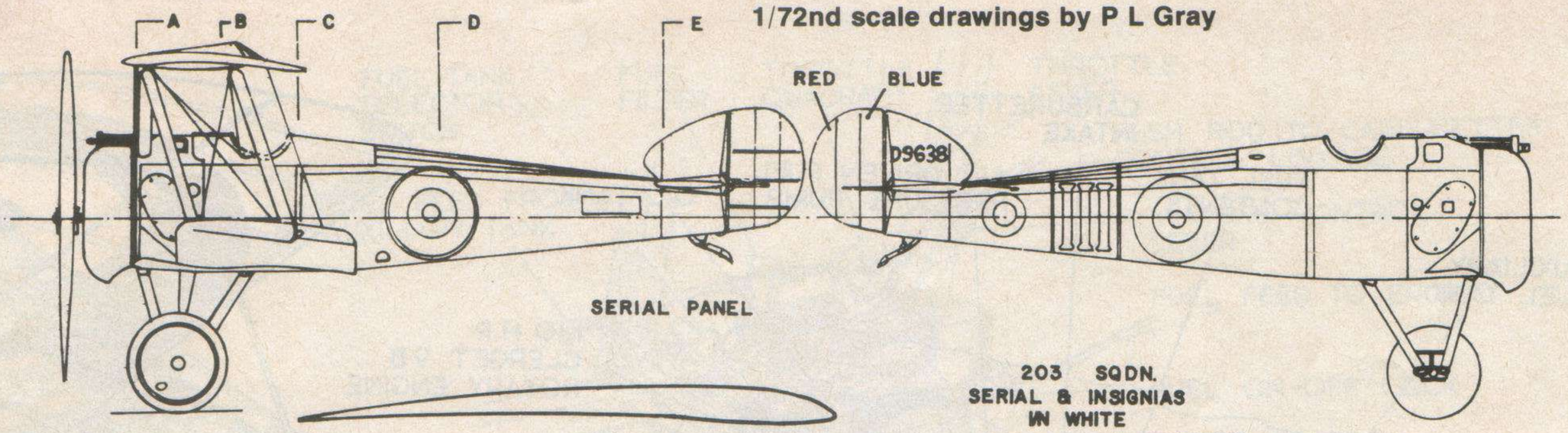
23, 24 and 25. Detail views of the RAF Museum Camel. This aircraft features a symmetrical cockpit surround as opposed to the new Hasegawa kit's offset, albeit still correct, version. Cockpit panel is uncluttered and the stylised control column grip is noteworthy. Dash panel is varnished wood whilst instrument bezels are semi gloss black with the rear bodies of the brass magneto switches in white. That large beam across the cockpit is to lock the controls and should not be mistaken for a typical Camel cockpit fitting!

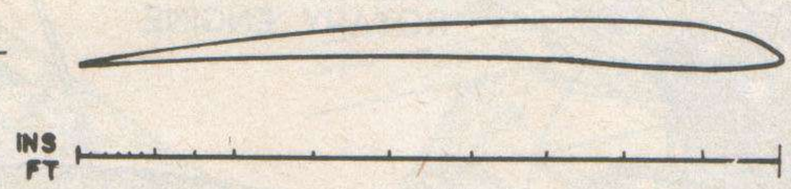
25

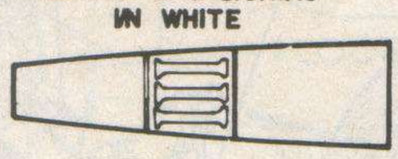


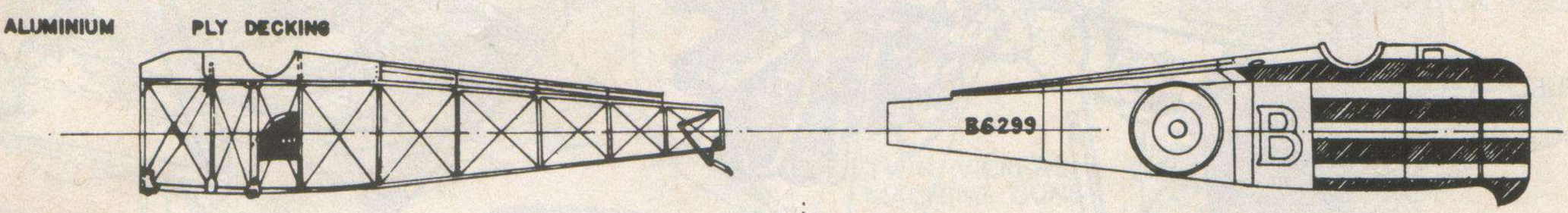
2699

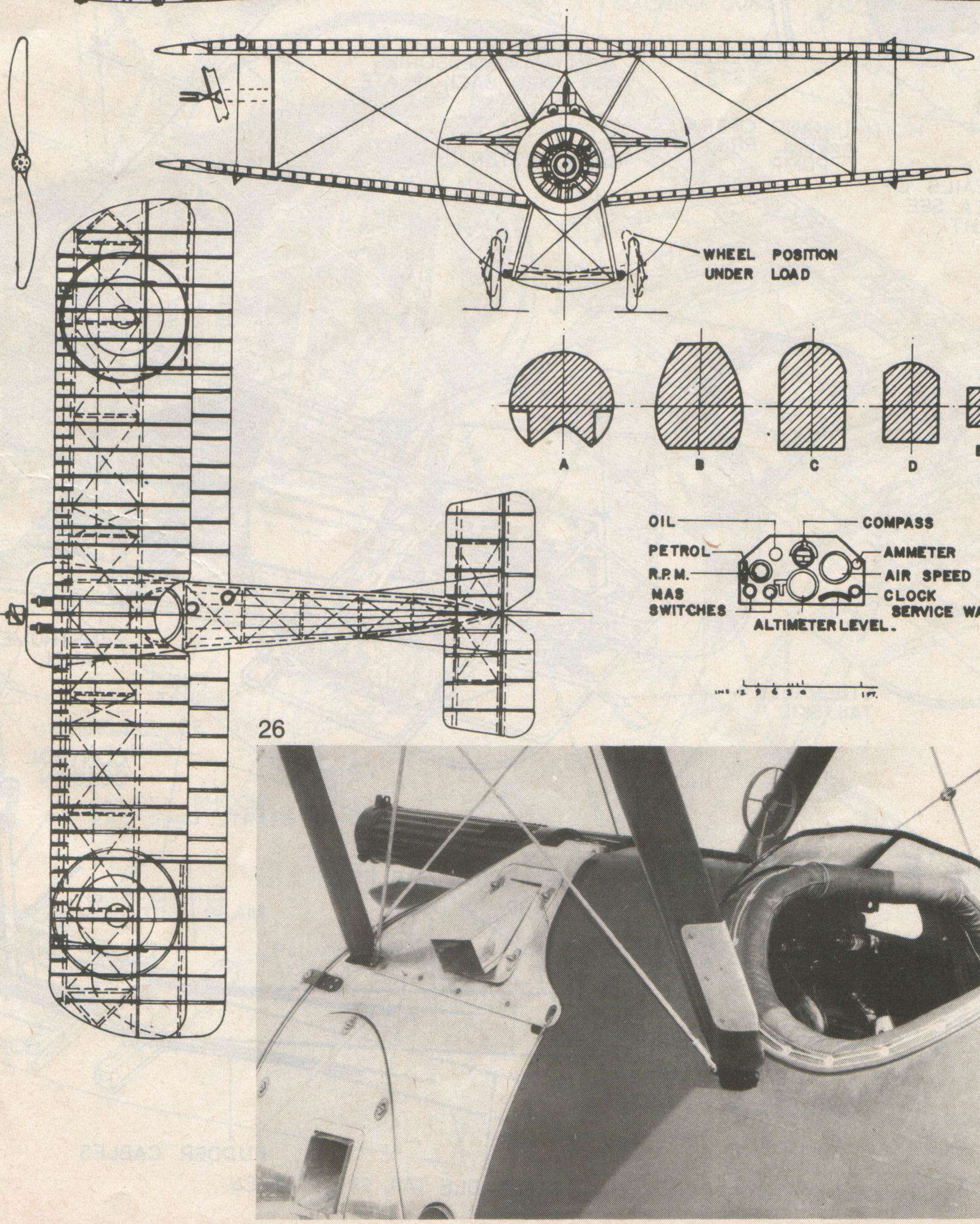
1/72nd scale drawings by P L Gray





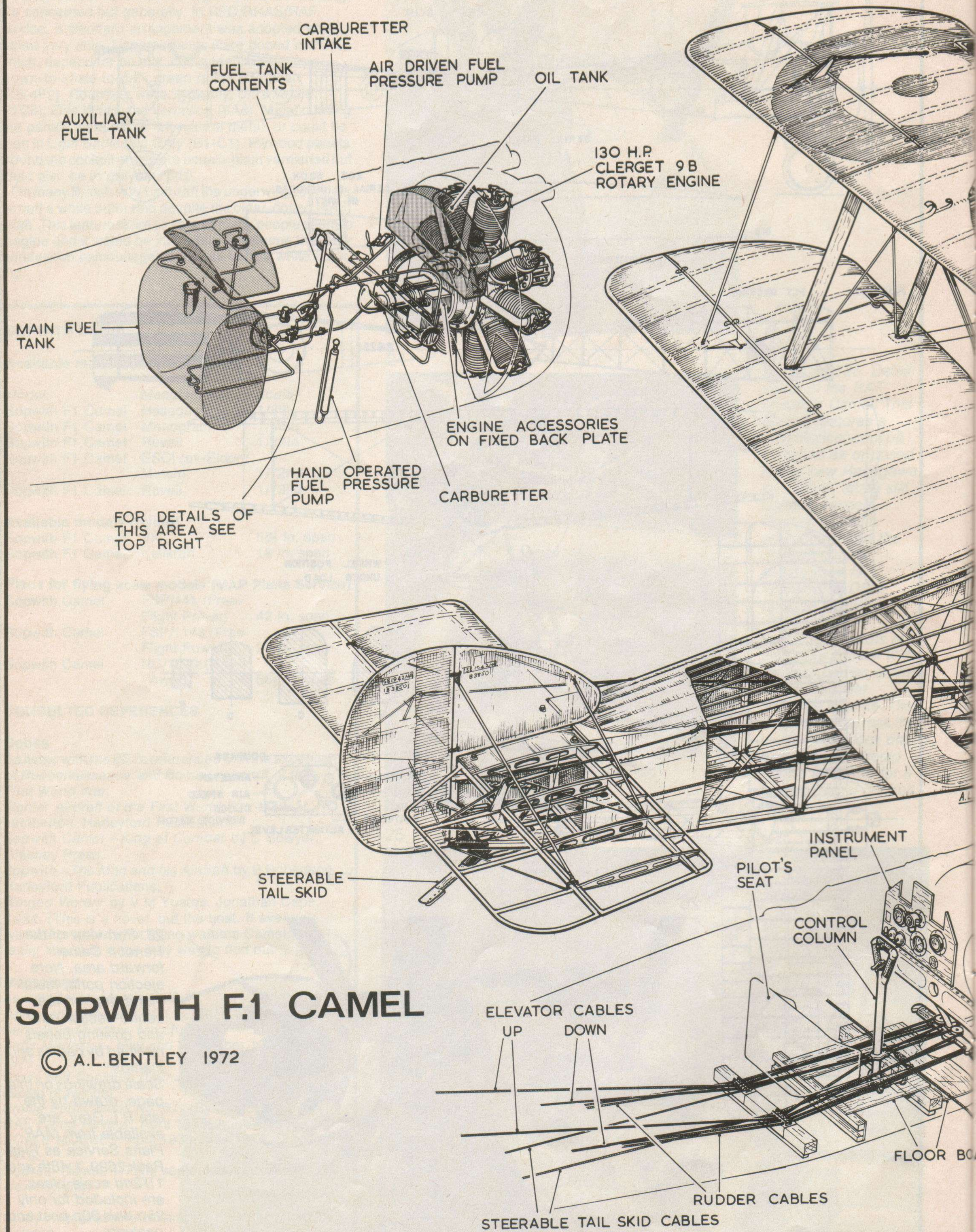




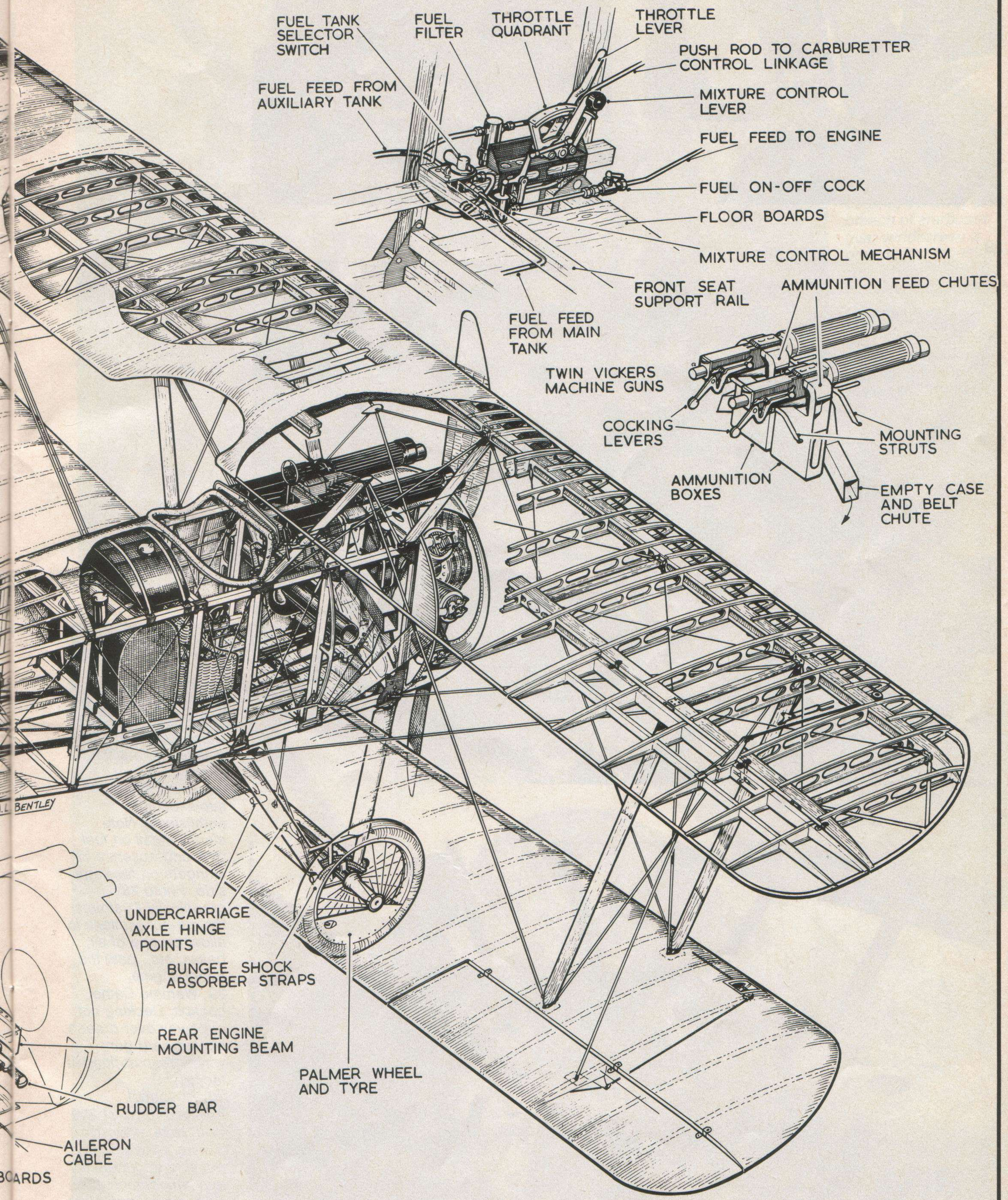


26

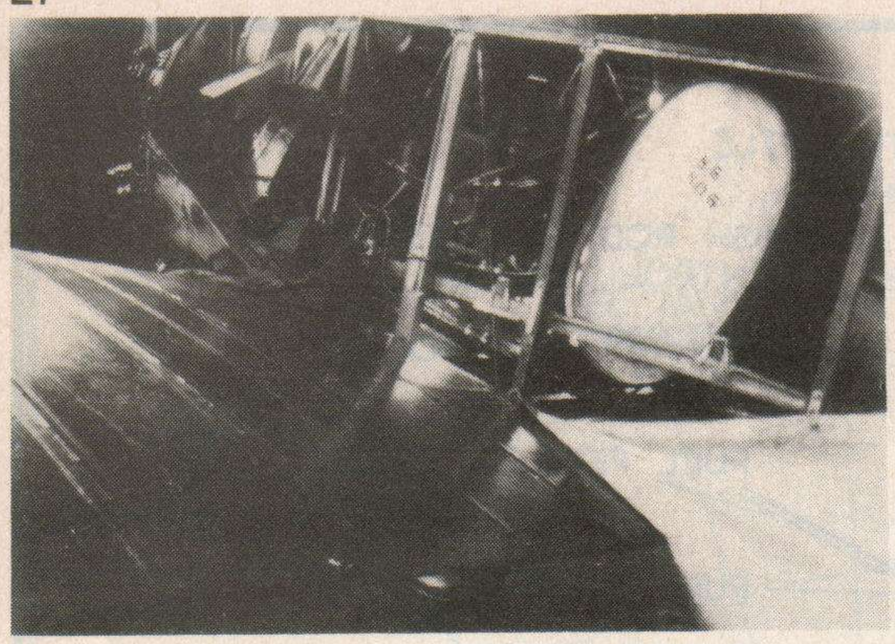
26. Port view of the Hendon Camel forward area. Note ejection ports, metal 'hand grip' on rear centre-section strut and cowling/panels retained by cables and clamps.
Scale drawings on this page, drawn by the late P L Gray, are available from MAP Plans Service as Plan Pack 2699. 1/48th and 1/72nd scale plans are included for only 95p plus 30p post and packing.



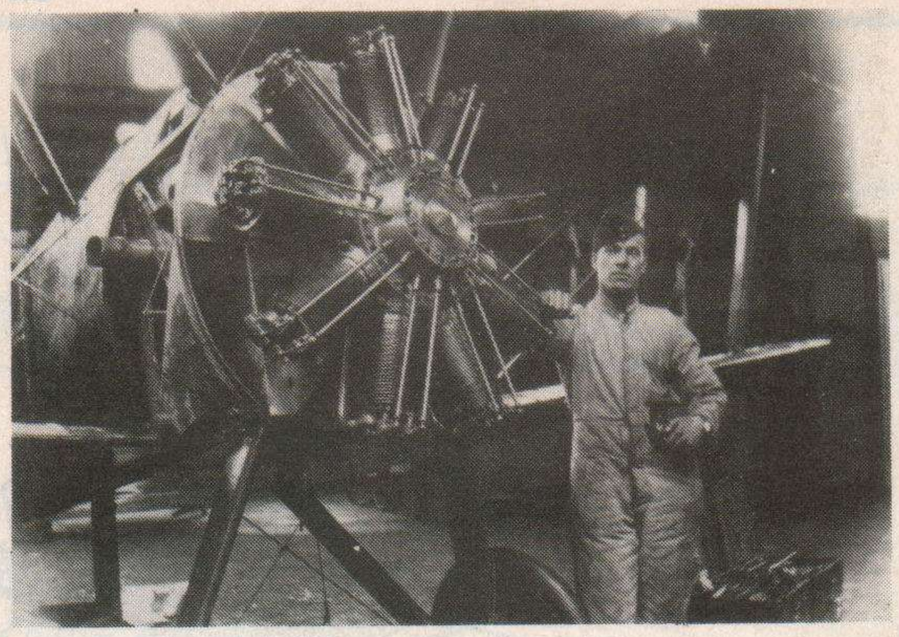
SOPWITH F.1 CAMEL


FUEL TANK SELECTOR SWITCH
FUEL FILTER
THROTTLE QUADRANT
THROTTLE LEVER
PUSH ROD TO CARBURETTER CONTROL LINKAGE
FUEL FEED FROM AUXILIARY TANK
MIXTURE CONTROL LEVER
FUEL FEED TO ENGINE
FUEL ON-OFF COCK
FLOOR BOARDS
MIXTURE CONTROL MECHANISM
FRONT SEAT SUPPORT RAIL
AMMUNITION FEED CHUTES
FUEL FEED FROM MAIN TANK
TWIN VICKERS MACHINE GUNS
COCKING LEVERS
MOUNTING STRUTS
AMMUNITION BOXES
EMPTY CASE AND BELT CHUTE
BENTLEY
UNDERCARRIAGE AXLE HINGE POINTS
BUNGEE SHOCK ABSORBER STRAPS
REAR ENGINE MOUNTING BEAM
PALMER WHEEL AND TYRE
RUDDER BAR
AILERON CABLE
BOARDS

27

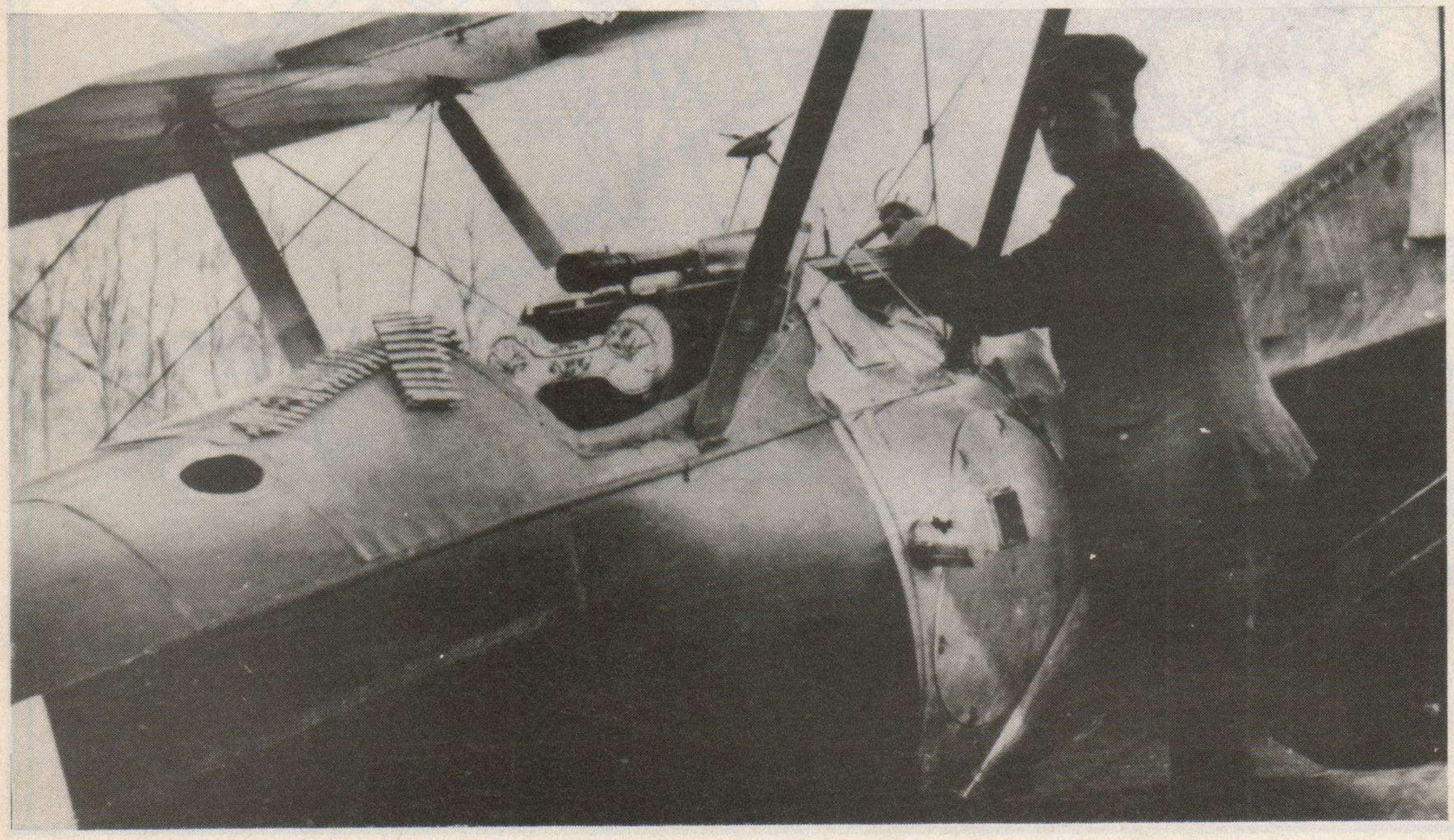


28



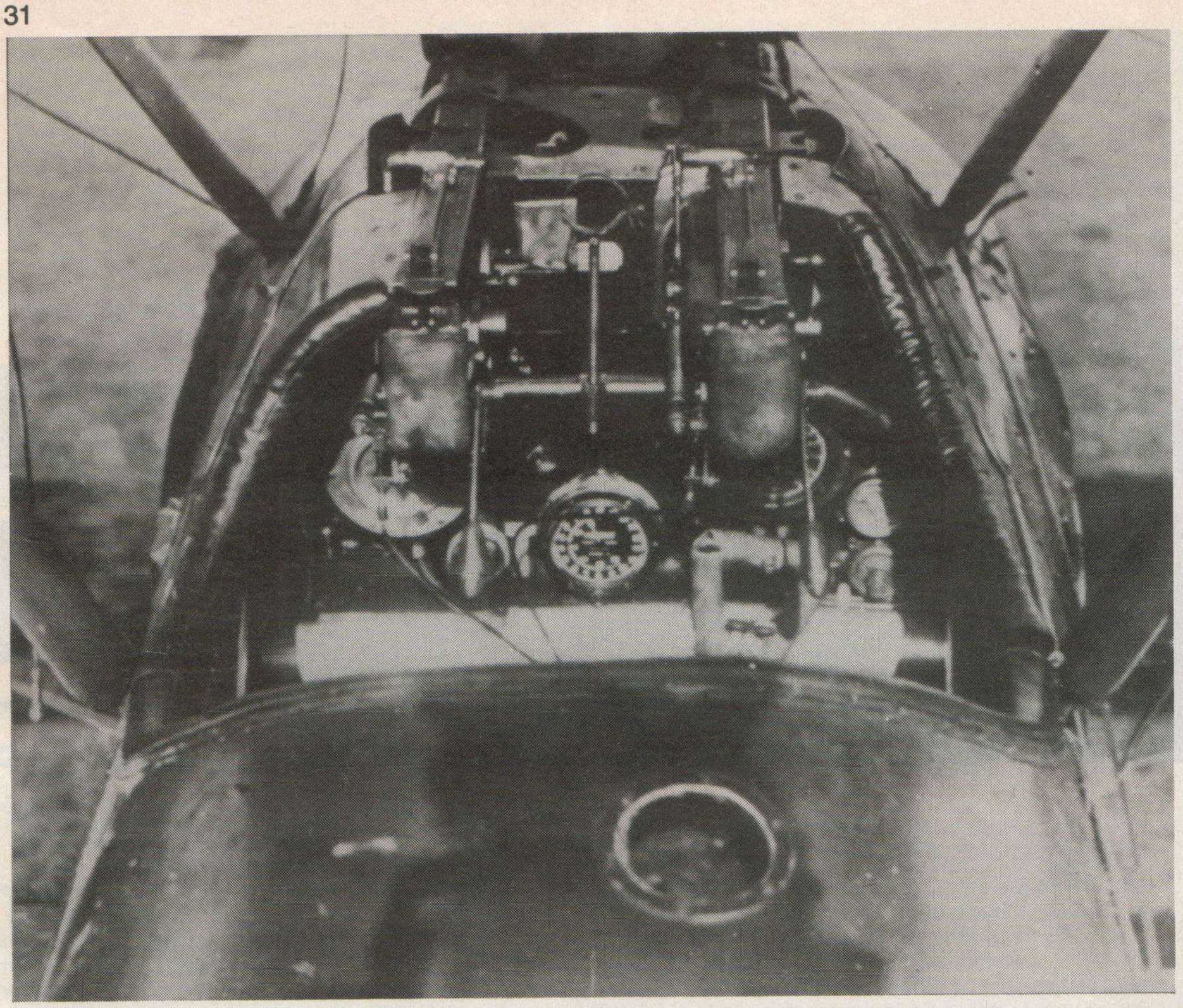
29

30



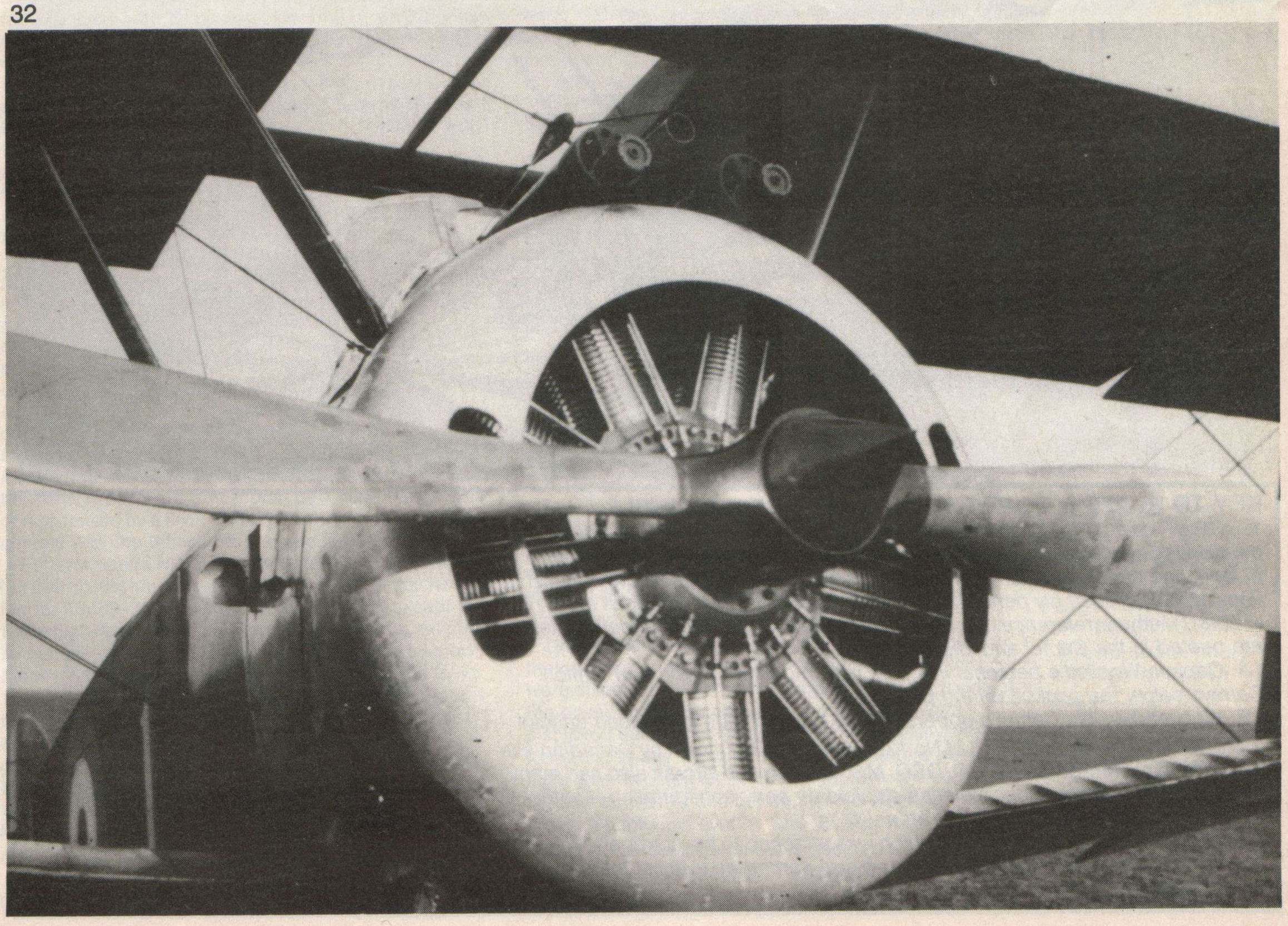
27 and 28. Extremely rare photographs of a 201 Squadron, RAF, Camel undergoing maintenance with plenty of model reference for super-detail enthusiasts. Note stencil detail on fuel tank and absence of stringers on fuselage side. Photo 28 graphically illustrates the cut-out sections to allow escape of air, gases, etc., past the rotary engine.
29. Wartime Camel cockpit. Decking not cut away over breech of starboard gun; windscreen as fitted at factory.
30. F1 Camel, believed to be of 209 Sqn. Note extensive cutting away of decking about guns, and windscreen style. Padding on gun butts appears to be covered in fancy cushion or curtain cloth – model that *in 1/8th!*

31



31. F1 Camel with decking cut away over breech of starboard gun; windscreen is presumably mounted well forward. Clamp for telescopic sight can be seen between the Vickers guns.
32. Camel of No. 201 Sqn. with 150 hp Bentley BR1 rotary. Extra slots in cowling were for cooling purposes when ground-strafing during the Somme offensive of 1918. Note increased centre-section cut-out, pointed spinner and forward position of windscreen.

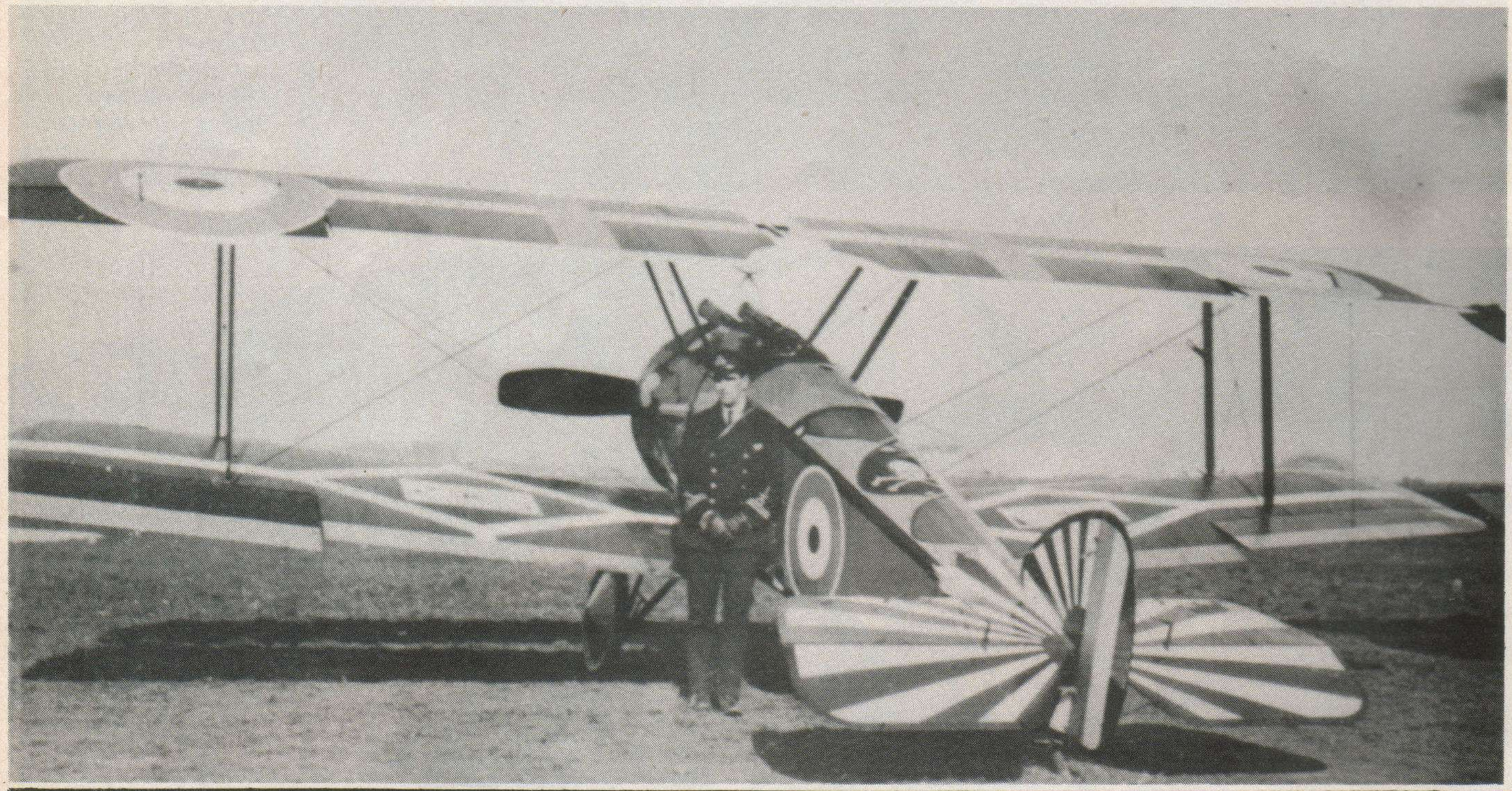
32



33

33. B6289 of A Flight, No. 10 (Naval) Sqn. Nose striping is black and white so it is thought that wheel stripe colours are the same. Yet another windscreen design is apparent.
34. B3926 'Happy Hawkins' of No. 3 (Naval) Sqn. in bizarre decor, colours for which are, regrettably, unconfirmed. This colourful machine was usually flown by Lt. D M Galbraith.

34



KEY TO PLATE 3. SOPWITH F1 CAMELS BY R L RIMELL

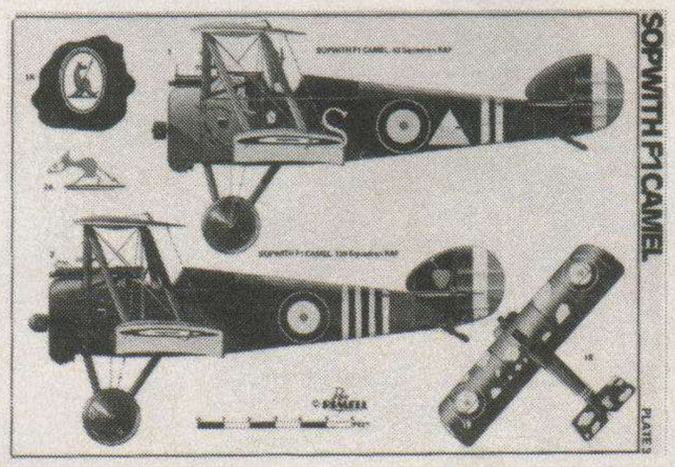
1. SOPWITH F1 CAMEL, D6402 of No 43 Squadron, RAF, 1918. It is believed that the painting accurately portrays this aircraft, flown by Captain Henry Woollett, for at least one period in its long and varied career. Cowling panels are Battleship Grey, *with varnished ply panels around cockpit and all uppersurfaces in PC10 4F(2-8) (*Methuen *reference numbers for all these colours, and roundel shades, are quoted in the Camel and BE2c texts.)*

1A. Captain Woollett's personal insignia, later modified, of a green Griffon. Carried below the cockpit on the port side.

1B. Woollett had his Camel's uppersurfaces painted thus for balloon attacks.

2.SOPWITH F1 CAMEL B6313 of No 139 Squadron RAF flown by Canadian ace Major William George Barker VC, DSO, MC. This famous aircraft also had many changes made to it and the painting depicts an early configuration – note extensive cutting away of cockpit area.

2A. Red devil of light gauge metal which was attached to the starboard Vickers gun as a rudimentary mascot. Whether it also served as a gunsight is pure conjecture.



HANDLEY PAGE HEYFORD

Radlett's second-generation heavy bomber described by B Robertson

The last of a long line of Handley Page biplane bombers, and the last such aircraft to enter RAF service, the 75 feet span HP38 Heyford was designed to meet Air Ministry Specification B19/27. This called for a twin-engined night-bomber with a maximum speed of over 120 mph, capable of cruising with safety margins for 920 miles with bomb combinations up to 2000 lbs. and landing at under 55 mph. The firm's chief designer, G R Volkert, produced an unorthodox design in that the fuselage was attached to the upperwing, so that no other service aircraft had such a marked difference in datum line and ground sit. A crew of four was specified with frontal, dorsal and ventral defensive positions; a requirement met with Lewis machine-gun-armed ring mountings in the nose and in the fuselage decking amidships, with a retractable 'dustbin-type' turret beneath.

The prototype, J9130, first flew on June 12, 1930, powered by 525 hp Rolls-Royce Kestrel II engines. It was finished overall in the matt *Nivo* (Methuen 27F3), a protective scheme that became standard for night-bombers, until the introduction of disruptive patterned camouflage in 1937, and remaining the unvarying overall finish for production Heyfords. Associated with this finish was the night roundel in matt colours of red centre and blue outer, although the rudder striping of the period did not apply to Heyfords. (But by its attendance at the 1932 RAF Air Display at Hendon in the New Types Park, the prototype's camouflage was compromised by a thick white '12' on its fuselage side to comply with the official programme listing.)

For production HP50 Heyfords, to AM Spec B23/32, the 600 hp Kestrel IIIS was adopted. The first batch of 15 Mk Is, K3489–3503, served in No. 99 Sqn. except the first which remained a trials aircraft and the last, retained by Handley Page for modifying to Mk II. The second batch of 23 Heyfords, K4021–4043, mainly going to No. 10 Sqn., were to a new Mk 1A standard, with a different type of engine mounting to save 200 lbs. weight per aircraft and with motor, instead of wind-driven, generators. This applied to all except the first, K4021, built as a Mk I, converted to Mk II and becoming a trials aircraft at Farnborough. K4029 was modified partly to Mk II standard and given an enclosed cockpit, a modification not adopted for service.

Changes to Mk II came with the adoption of the 640 hp de-rated Kestrel VI for a further batch of 16, K4863–4878, enabling No. 7 Sqn. to be armed with the type. These were to AM Spec B28/34 but the bulk of the Heyfords were to Mk III standard (AM Spec B27/35), appearing from August 1935 in two batches, K5180–5199 (20) and K6857–6906 (50). These had their Kestrel VI engines operating at full power giving 695 hp each, with four-blade airscrews replacing the two-blade types of earlier versions. There were also modified air intake and steam condensers in the leading edge tip of the outer planes. The prototype K3503 appeared at the 1934 RAF Display with a temporarily enclosed cockpit bearing Park No. 14, this time marked on the nose.

Serial numbers appeared inconspicuously in black 8 in. high characters on the rear fuselage and rudders. But compromising camouflage was the display of large numbers in white, to contrast, under the lower wings to comply with flying control regulations concerned with identifying culprits in breaches of flying discipline. For air exercises, and in the Munich crisis, these were covered by a green washable distemper. Later the numbers were painted black.

It was Air Ministry policy to equip No. 3 (Night Bomber) Group of the Wessex Bombing Area solely with Heyfords. By mid-July 1936, when the Group came under the new Bomber Command, Nos. 7, 9, 10, 38, 97, 99 and 102 Squadrons were fully armed with this bomber. Later that year Nos 78 and 166 Sqns re-formed with Heyfords, but No. 38 discarded theirs for the Fairey Hendon giving a backing for re-forming No. 149 Sqn. with the type. No. 99 Sqn., the first to arm with Heyfords in November 1933, was the first squadron to introduce the Wellington, releasing its aircraft in November 1938 to No. 148 Sqn., also at Mildenhall, whose former Wellesleys were required in the Middle East.

Unlike day-bombers, night-bombers did not display their squadron numbers, but individual aircraft letters were displayed, either on fuselage sides or each side of the nose, and, in some cases, both. These were displayed quite large as a functional necessity for formating in day-flying exercises. The letters were in flight colours of red for 'A', yellow for 'B' and blue for 'C' flights – but heavy bomber squadrons were normally organised into just two, 'A' and 'B', flights.

Just one embellishment was adopted by some squadrons, that of spat trim. The pattern had been set by Vickers Vildebeest squadrons, flying an aircraft also

35

35. The Heyford remains a classic even though it never dropped a bomb in anger. Modellers of the 'MATCHBOX' 1/72nd scale kit are referred to the 'in depth' kit review published in the October 1980 issue of SCALE MODELS. Photostat copies of the feature are available from SM offices at £2.00 (including postage).

featuring wheel spats which were given a band of colour, appropriate to their flight. On Heyfords these bands were thinly outlined in white as shown on our drawings.

In August 1939 the remaining 20 Heyfords of Mks I, IA and II were declared obsolete and 10 Mk IIIs were also condemned. Only No. 97 then retained Heyford IIIs in squadron service and these were soon replaced. The remaining 36 serviceable Mk IIIs had been allotted to Nos 3 and 4 Air Observer Schools, renamed as Bombing and Gunnery Schools in November 1939. Their squadron markings and identification letters were obliterated and a school identification number substituted. The majority were retired in August 1940 and the rest declared obsolete during April 1941. Only a single Mk I became an instructional airframe, when K3499 was renumbered 1009M on grounding in late 1937.

1/72nd scale drawings of the Heyford Mk 1, by G A G Cox, are available from MAP Plans Service, as Plan 2677, at 75p plus 30p post and packing. Export orders may be obtained from agents at the same price or by post. (Add 50% to order value for airmail, or 30p for surface mail overseas.)

HANDLEY PAGE HEYFORD

Available models (non-flying)

Model	*Manufacturer*	*Scale*
Handley Page Heyford	'MATCHBOX'	1/72nd

CONSULTED REFERENCES

Books

Bombing Colours 1914–1937 by B Robertson. Patrick Stephens Ltd.

Handley Page Aircraft Since 1907 by C H Barnes. Putnam.

Magazines

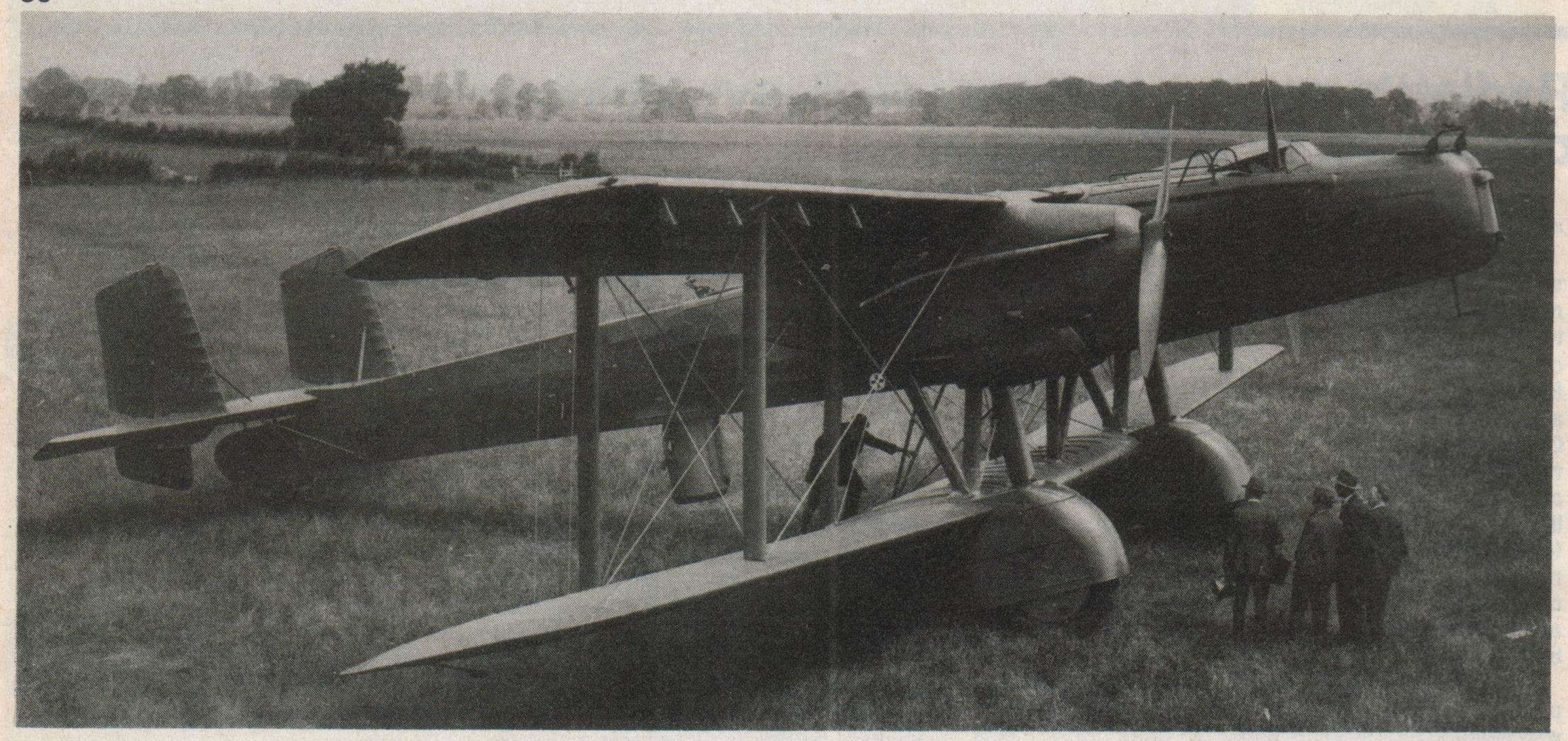
Handley Page Heyford. Scale drawings by I R Stair, *Aviation News* (2/8).

Profile Publications No. 182. (By P J R Moyes.)

SCALE MODELS. October 1980.

Contemporary copies of *The Aeroplane* and *Flight* for photographs and drawings.

36



36. The first production HP 50 Heyford Mk 1 had improved engine cowling lines and here displays the retractable ventral gun turret.

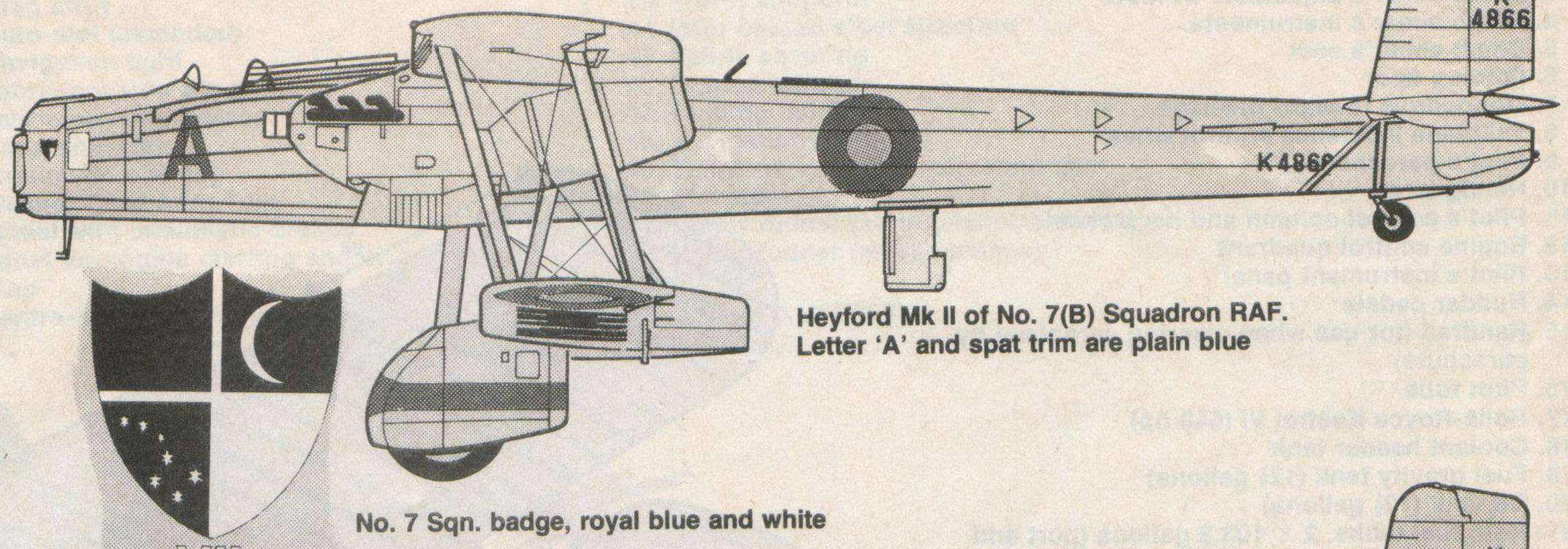
37

37. Heyford Mk 1 of 99 Sqn. RAF at North Cotes in 1934. Note servicing platform, ladder and crank handles on wheel spat.

38

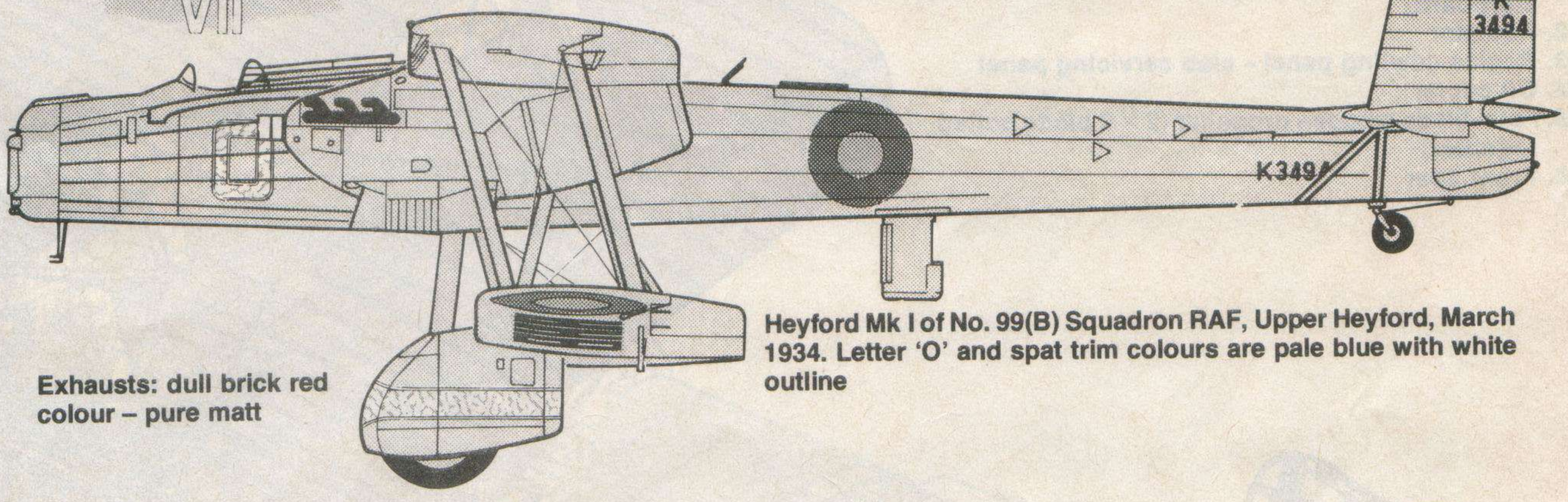
38. A view of one of the same unit's Heyford 1s. Shown to advantage is the ventral turret and fuselage stringers under the taut fabric covering.

All aircraft finished overall in Nivo with dull blue/red roundels. Serial numbers – black



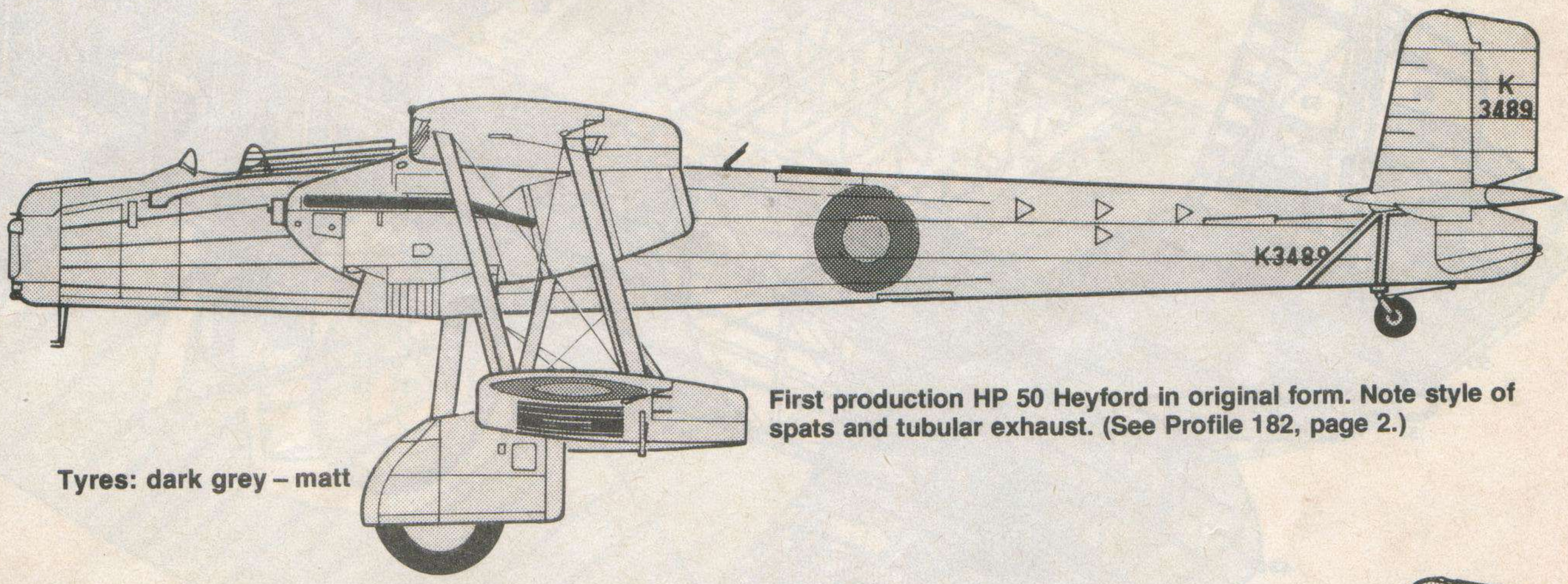
Heyford Mk II of No. 7(B) Squadron RAF. Letter 'A' and spat trim are plain blue

No. 7 Sqn. badge, royal blue and white



Heyford Mk I of No. 99(B) Squadron RAF, Upper Heyford, March 1934. Letter 'O' and spat trim colours are pale blue with white outline

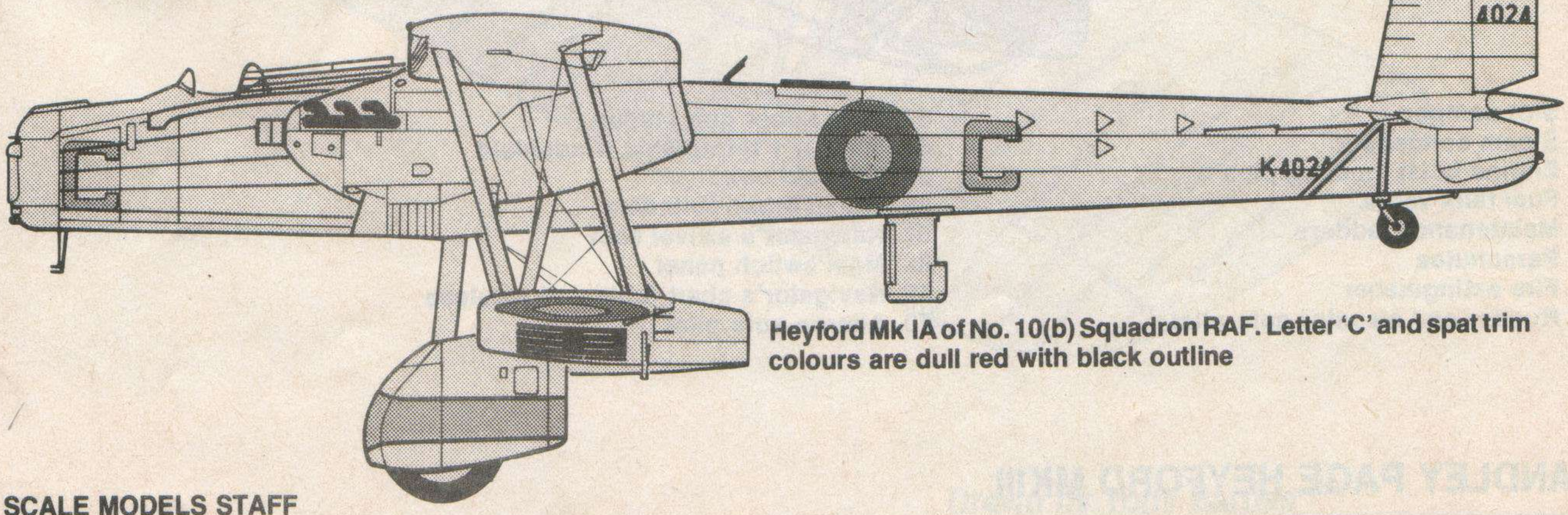
Exhausts: dull brick red colour – pure matt



First production HP 50 Heyford in original form. Note style of spats and tubular exhaust. (See Profile 182, page 2.)

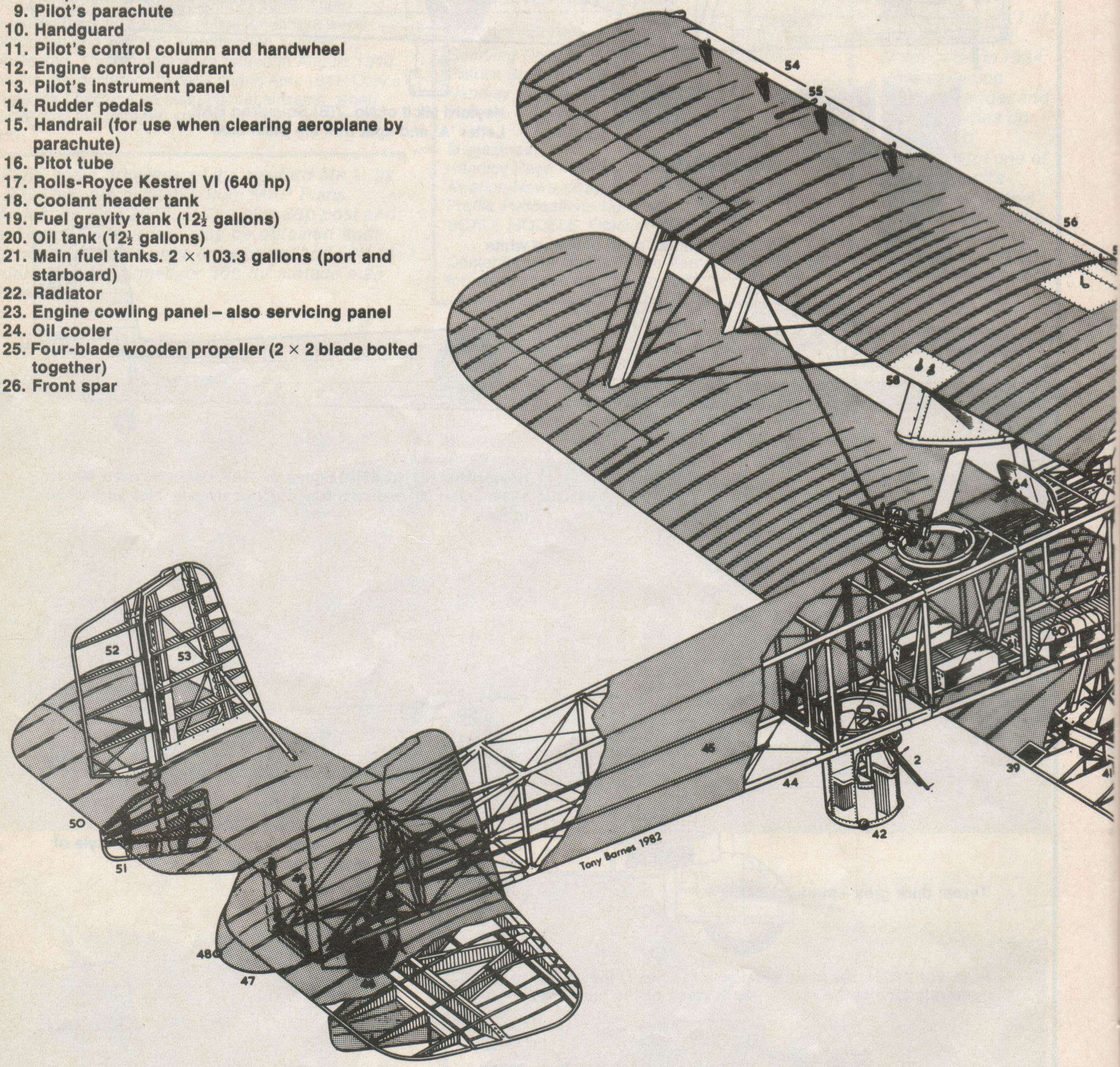
Tyres: dark grey – matt

Note. For K4024, the black shadow surround of the colour numerals face to the rear on both sides of the fuselage



Heyford Mk IA of No. 10(b) Squadron RAF. Letter 'C' and spat trim colours are dull red with black outline

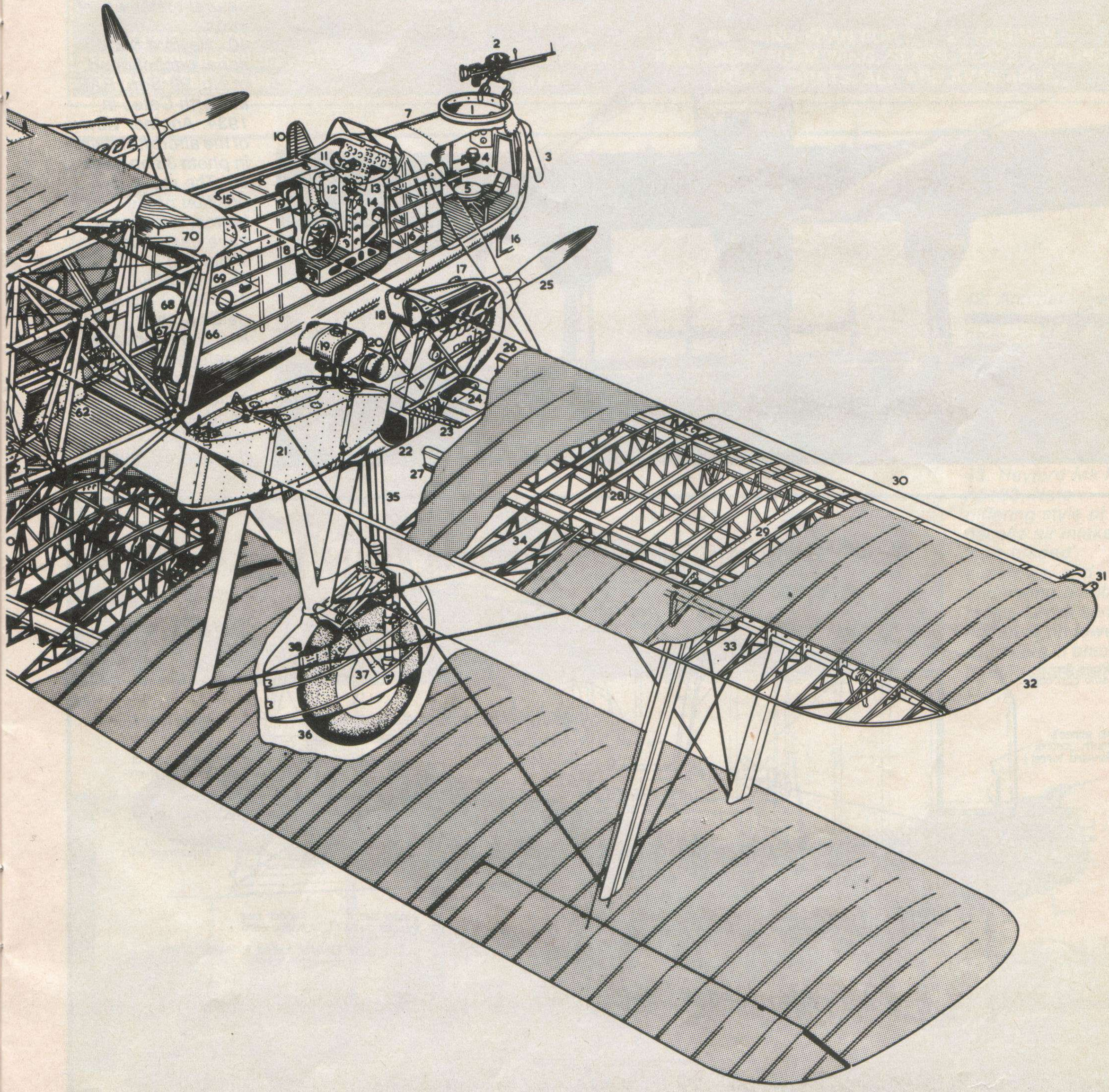
1. Forward gun turret
2. .303 Lewis gun
3. Bomb aimer's adjustable window
4. Bomb aimer's instruments
5. Bomb aimer's seat
6. Folding door
7. Monocoque forward fuselage
8. Tailplane incidence control wheel
9. Pilot's parachute
10. Handguard
11. Pilot's control column and handwheel
12. Engine control quadrant
13. Pilot's instrument panel
14. Rudder pedals
15. Handrail (for use when clearing aeroplane by parachute)
16. Pitot tube
17. Rolls-Royce Kestrel VI (640 hp)
18. Coolant header tank
19. Fuel gravity tank (12½ gallons)
20. Oil tank (12½ gallons)
21. Main fuel tanks. 2 × 103.3 gallons (port and starboard)
22. Radiator
23. Engine cowling panel – also servicing panel
24. Oil cooler
25. Four-blade wooden propeller (2 × 2 blade bolted together)
26. Front spar



55. Slot damper
56. Steam condenser
57. Engine hoist locating pins
58. Fuel tank vents
59. Maintenance ladders
60. Parachutes
61. Fire extinguisher
62. Rudder and elevator auto pilot
63. Rear upper gun station
64. Gunner's retractable windshield
65. First aid box
66. Wheel brake cylinders
67. Navigator's swivel seat
68. Main switch panel
69. Navigator's chart table and wireless
70. Aileron auto pilot

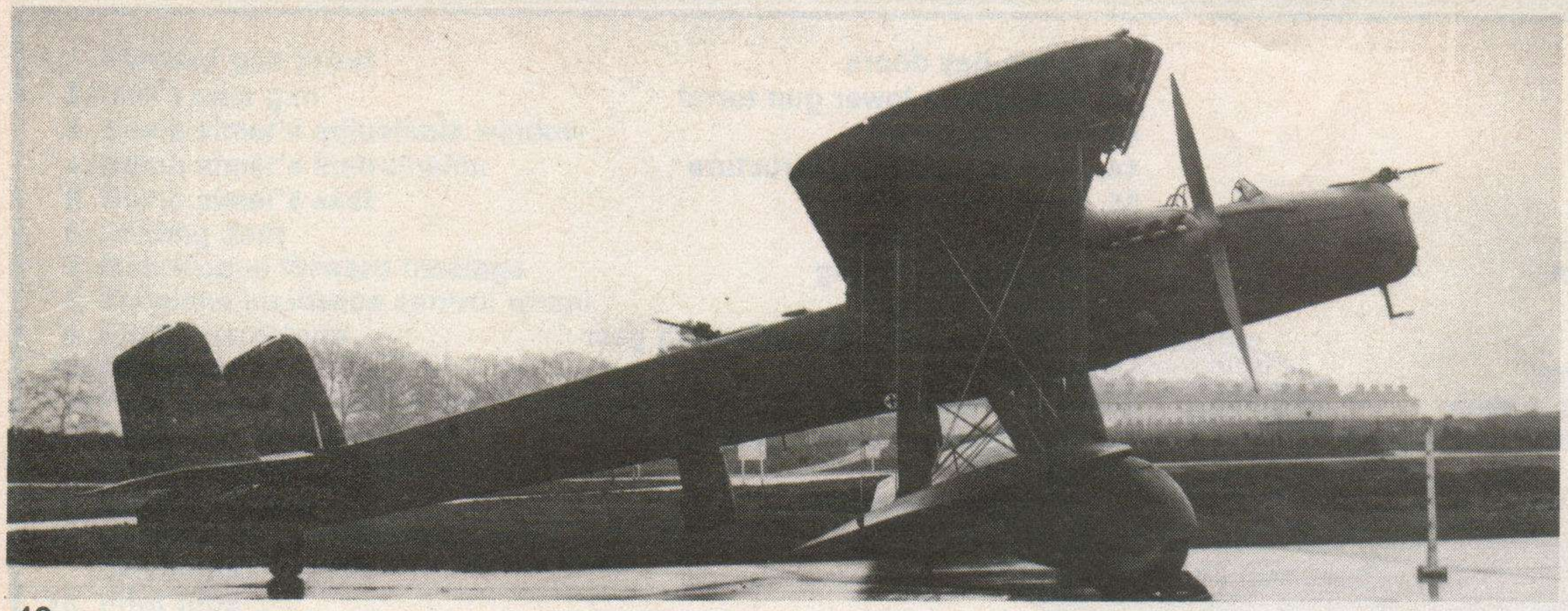
HANDLEY PAGE HEYFORD MKIII

27. Rear spar
28. Aileron control tube
29. Drag strut
30. Auto-slot (extended)
31. Navigation light
32. Fabric-covered wing
33. Fabric-covered aileron
34. Duralumin ribs
35. Pneumatic oleo leg
36. 'Palmer Cord Aero Tyre'
37. Wheel with pneumatic brakes
38. Panel for engine starting and oil fuel filling
39. Step
40. Centre-section bomb bay
41. Bomb-bay doors
42. Retractable lower gun turret
43. Turret supports
44. Wire-braced steel structure
45. Fabric covering
46. Dunlop tailwheel
47. Hinging tail fairing
48. Navigation light
49. Tailplane incidence adjusting gear
50. Elevator
51. Lower rudder (aerodynamic balance)
52. Upper rudder (mass balance)
53. Fin
54. Auto-slot (retracted)



Drawn by Tony Barnes

39



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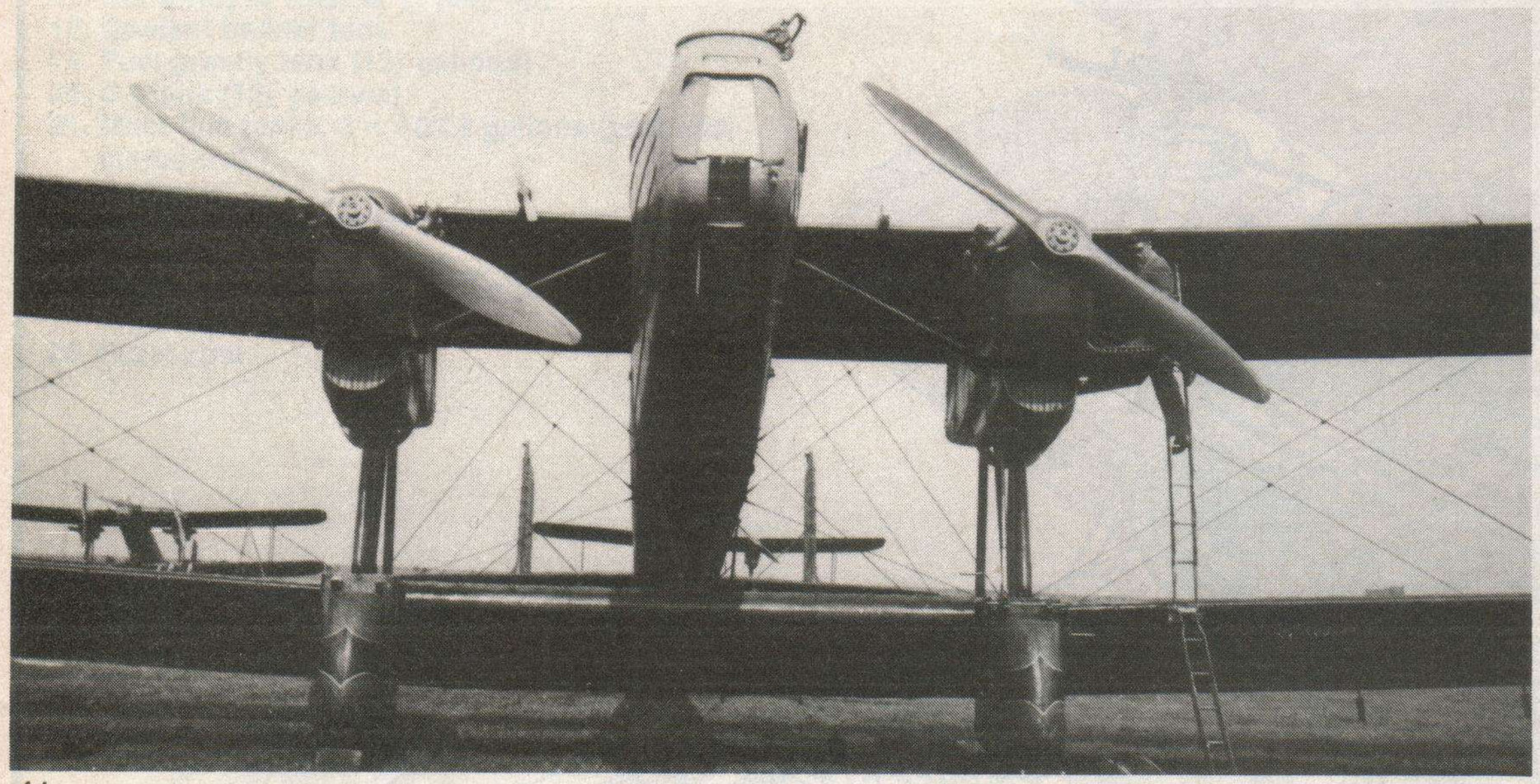
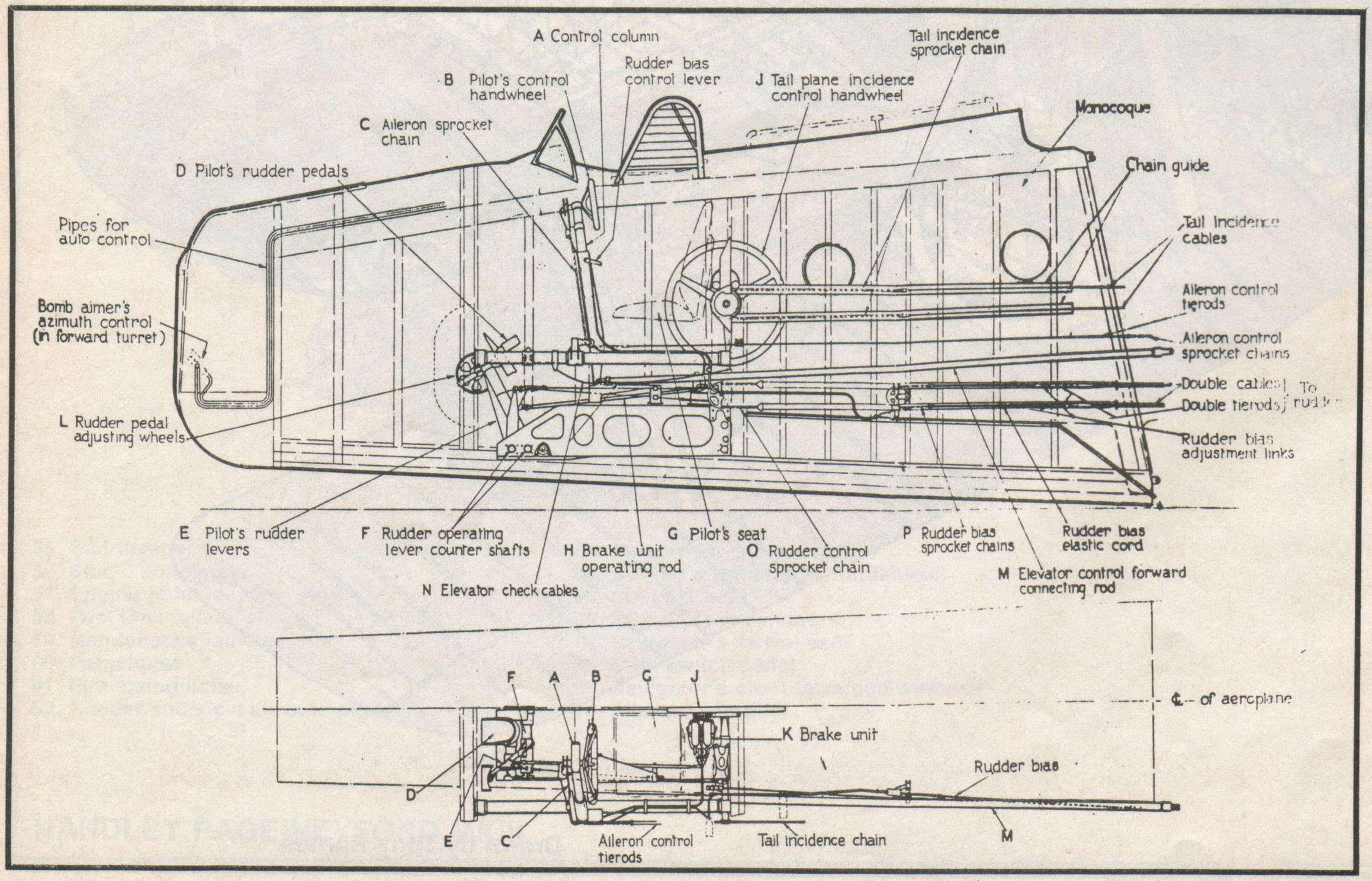
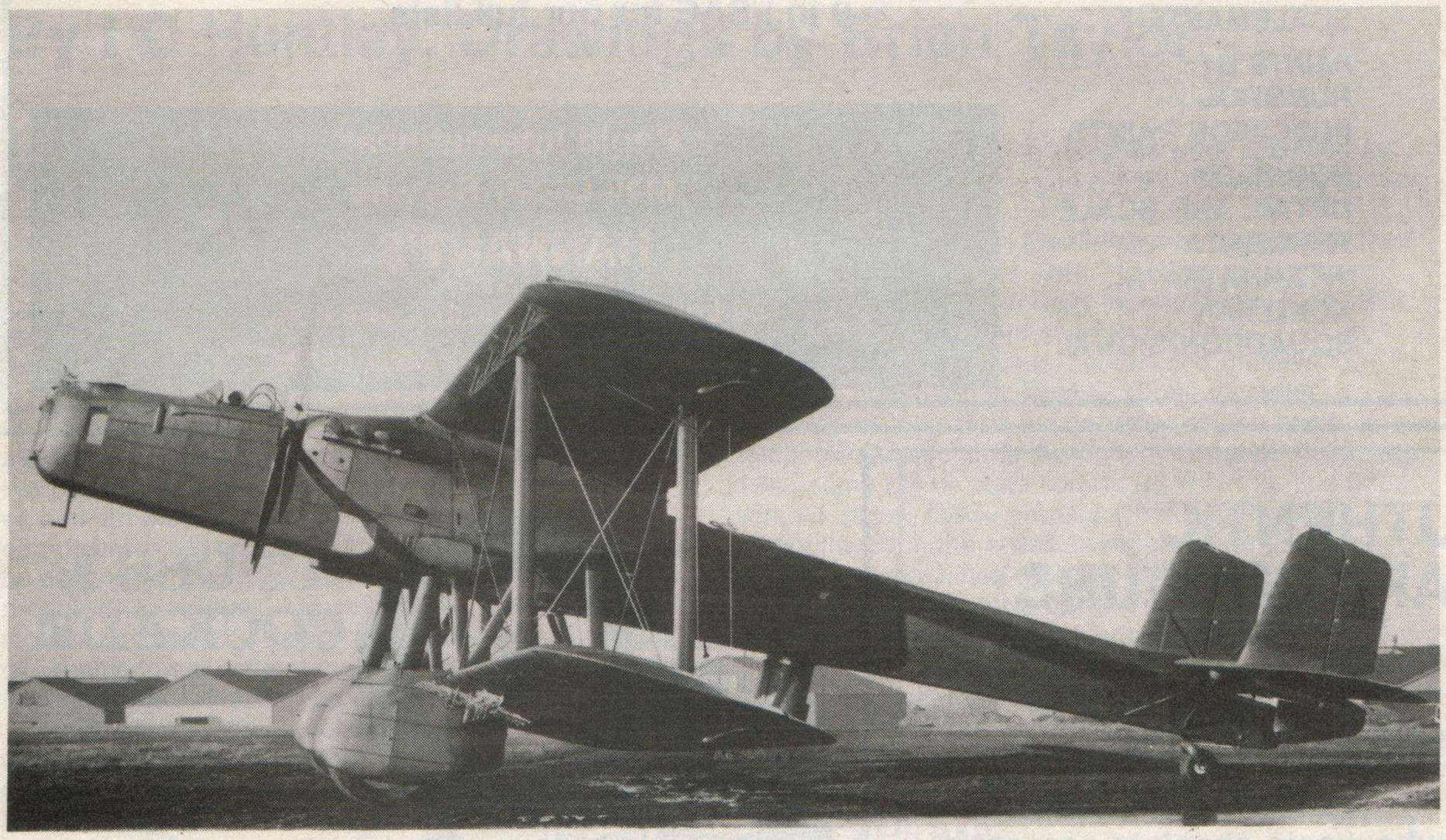


39. Heyford Mk I K3489 in factory-fresh Nivo finish – two bladed airscrews. Note first-aid cross starkly contrasted against the dark green finish and what appear to be natural metal wheel hubs.
40. Heyford Mk1, serial unconfirmed, of No. 99 Sqn. RAF at North Cotes in 1934. Another view of the aircraft shown in photo 38 on page 30. The really low position of the bottom wing must have eased bomb shackling considerably!
41. Useful internal detail of the Heyford's forward fuselage reveals the enormous tailplane incidence control handwheel, and relatively uncluttered layout.

41



42



42. Another view of K3489 – see photo 39 opposite. Aileron mass balances and upperwing leading edge slats are seen to advantage as are the flare holders under lower wings.
43. Heyford Mk III K5188. Note differing style of nacelle air intake, 'four-bladed' airscrews, and underwing bomb racks. Large serial numbers on lower wings are in black 4 ft high characters.

43

FAIREY FULMAR

44

The Fleet Air Arm's forgotten fighter.
By I D Huntley. Drawings by Brian Taylor

When the Air Ministry issued two design proposals for consideration by contractors for a pair of cumbersome monoplane two-seat Fleet Fighters in 1937, the Fairey Aviation Co. Ltd. were not impressed. One study was for an eight fixed-gun fighter, the other for a turret-fighter; having produced some layouts in response the company was somewhat taken aback at the long lists of changes and alterations to the designs.

Fairey were against all proposals for the turret fighter and stopped all further work on that project and, having attempted to submit an eight-gun design little larger than the 'Hurricane' which was fitted out with entirely new equipment proposals, were quickly told that existing equipment would have to be fitted and nothing else could be accepted. After nearly a year had elapsed with little progress Fairey found that, with some modification, their mock-up of the P4/34 design could take all the available naval equipment without too much difficulty, and that folding wings could also be successfully incorporated.

It was only then that Specification 08/38 was issued to cover the modification of the P4/34 design to naval requirements and, in March 1938, the second prototype P4/34, K7555 (F 2266) was aerodynamically modified and subsequently passed its acceptance tests. Even so, the production design emerged with many built-in weight penalties and Fairey had to accept a much lower-rated Rolls-Royce 'Merlin' engine than was originally planned; as a hybrid design it was obviously not going to have the performance that was originally anticipated. Fortunately, the 1080 hp Rolls-Royce 'Merlin' VIII was replaced, as from the 251st production machine, with the 1300 hp 'Merlin' 30 which enabled tropicalisation and other modifications to be incorporated without too much loss in performance.

A total of 600 Fulmars were built, and the aircraft served on most of the Royal Navy aircraft carriers of its day as well as equipping many CAMS vessels. It also carried out valuable service in the Mediterranean theatre, largely from shore bases.

On entry into Fleet Air Arm service, Fairey Fulmar Mk 1s were delivered to units in the standard naval scheme for carrier-borne aircraft. Uppersurfaces were painted in a disruptive pattern of *Dark Slate Grey* (Methuen 29F2)/*Ex*tra *Dark Sea Grey* (21F3) and undersides painted in *'Sky'* (30(B–C)2). Spinners were normally black but frequently repainted in flight colours once in squadron service.

Interior of cockpit, walls, floor, bulkheads, wheel wells, etc., were usually in *Aircraft Grey Green* (27D3) although the latter could also be seen in Sky. In accordance with AMO:DTD No. 83, and amendments in August 1940, upperwing roundels were specified as Type B (Red/Blue) and Type A (Red/White/Blue) for the lower surfaces.

Some Fulmars in the Mediterranean theatre had their codes painted in white – rear fuselage serials were black as was the Royal Navy legend. From June 1942, fuselage roundels were changed to type C1 (36 in. diameter Red/White/Blue/Yellow) and underwing roundels converted to Type C (32 in. diameter Red/White/Blue). The Fulmar retained the basic temperate sea scheme throughout its career but in late 1943 some Mk IIs were converted to NF IIs and fitted with A1 radar. These particular machines were camouflaged in the standard night-fighter finish for land-based machines – overall *Medium Sea Grey* (22D3) with a disruptive pattern of *Dark Green* (30(F–G)4) applied over the upper surfaces.

Initially, codes were painted black but after the full camouflage scheme was adopted they were changed to white. Several aircraft in the Med. carried dull red codes and spinners providing even further variations for modellers.

FAIREY FULMAR

Available models (non-flying)

Model	*Manufacturer*	*Scale*
Fairey Fulmar	RAREplanes (Vacform)	1/72nd

CONSULTED REFERENCES

Books

British Naval Aircraft Since 1912 by O Thetford. Putnam.
Fairey Aircraft Since 1915 by H A Taylor. Putnam.
Find, Fix and Strike! by J Winton. Batsford.
Janes All the World's Aircraft. 1941
Wings of the Navy by E Brown. Macdonald and Jane's.

Magazines

Aero Album. Spring 1971.
Aircraft Illustrated Extra. No. 12, Naval Aviation 1912–1945.
Airfix Magazine. August 1969.
Profile Publications No. 254. (By D Brown.)
SCALE MODELS. July 1975.

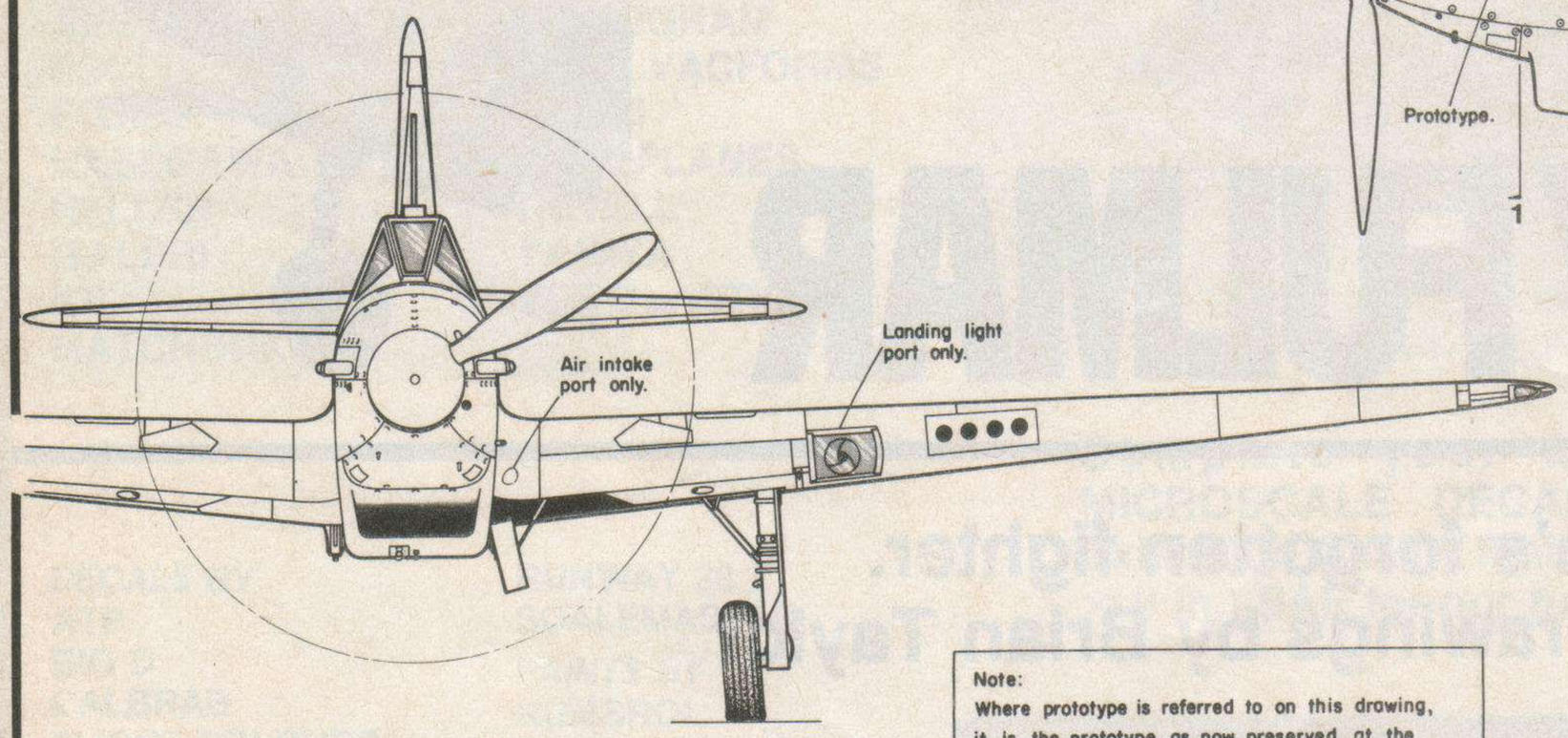
Study of preserved prototype at the Fleet Air arm Museum, Yeovilton.

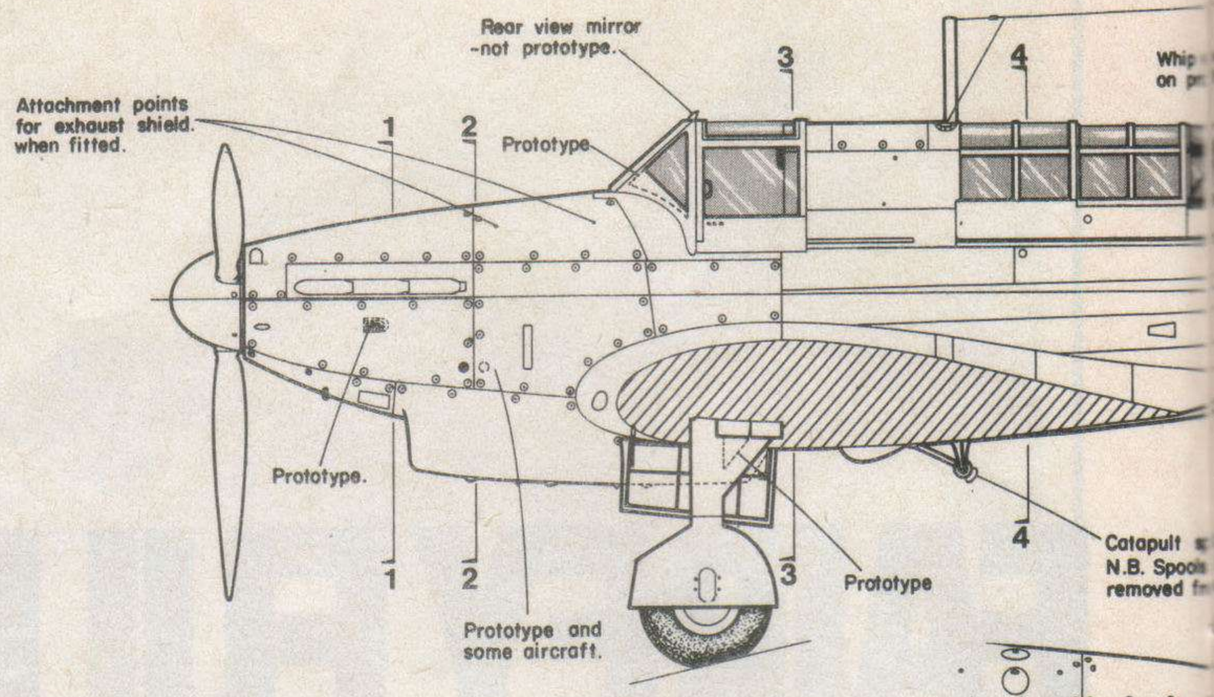
44. Fulmar Mk I, N1858 with undercarriage lowered and at full extension. The strong influence of the earlier Fairey Battle design is easily recognised in the famous Fulmar outline. It is fortunate that the prototype still exists, preserved in the Fleet Air Arm Museum at Yeovilton.

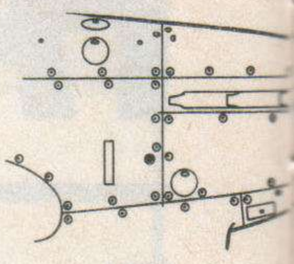
FAIREY FULMAR

Drawn by Brian Taylor.
Traced by Ian Ambrose.

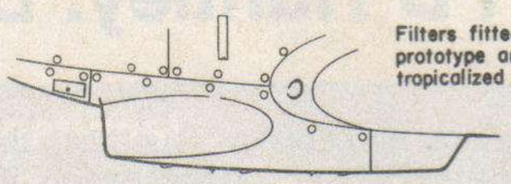
1/72nd scale drawings





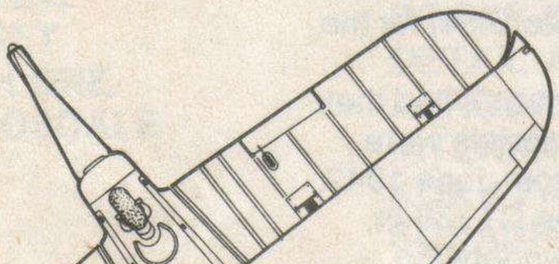


Scrap view of starboard side cowlings.

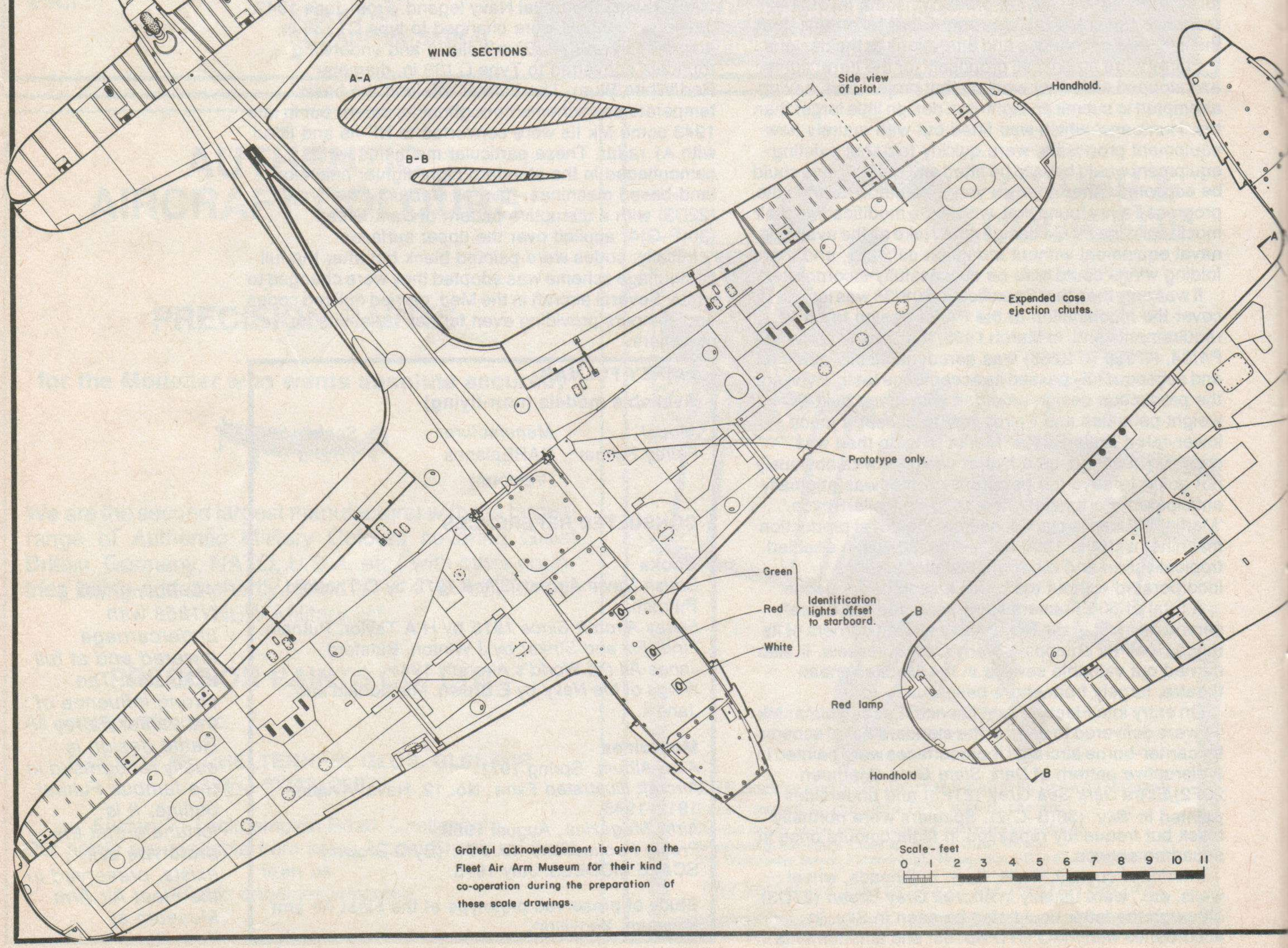


Filters fitted to prototype and tropicalized Mk 2s.

Note:
Where prototype is referred to on this drawing, it is the prototype as now preserved at the Fleet Air Arm Museum, RNAS, Yeovilton Somerset. No external differences were apparent between Mk I and Mk 2 Fulmars. Mk 2s had a more powerful Merlin engine and some had tropical equipment.



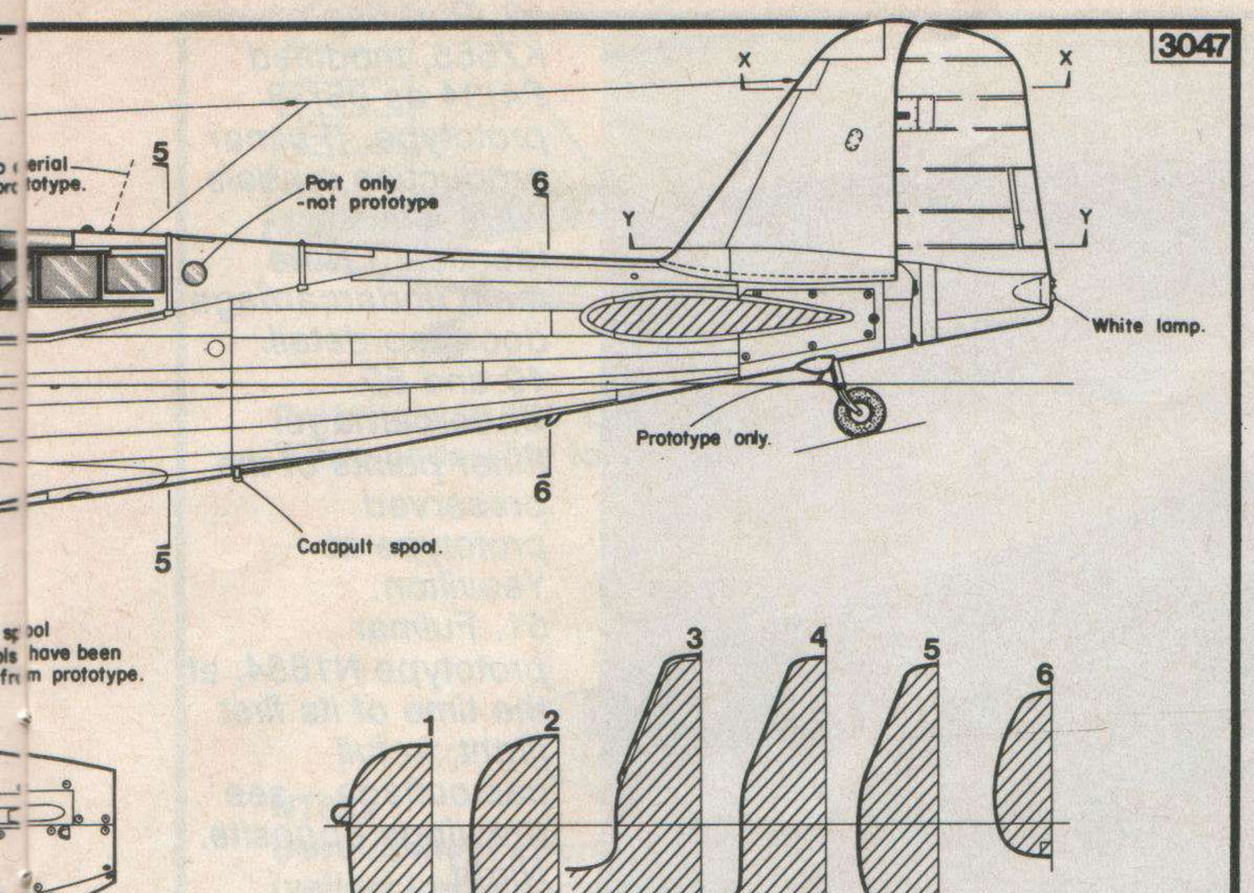
WING SECTIONS

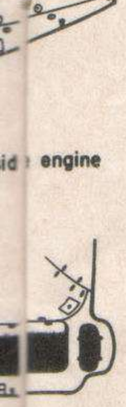


Grateful acknowledgement is given to the Fleet Air Arm Museum for their kind co-operation during the preparation of these scale drawings.

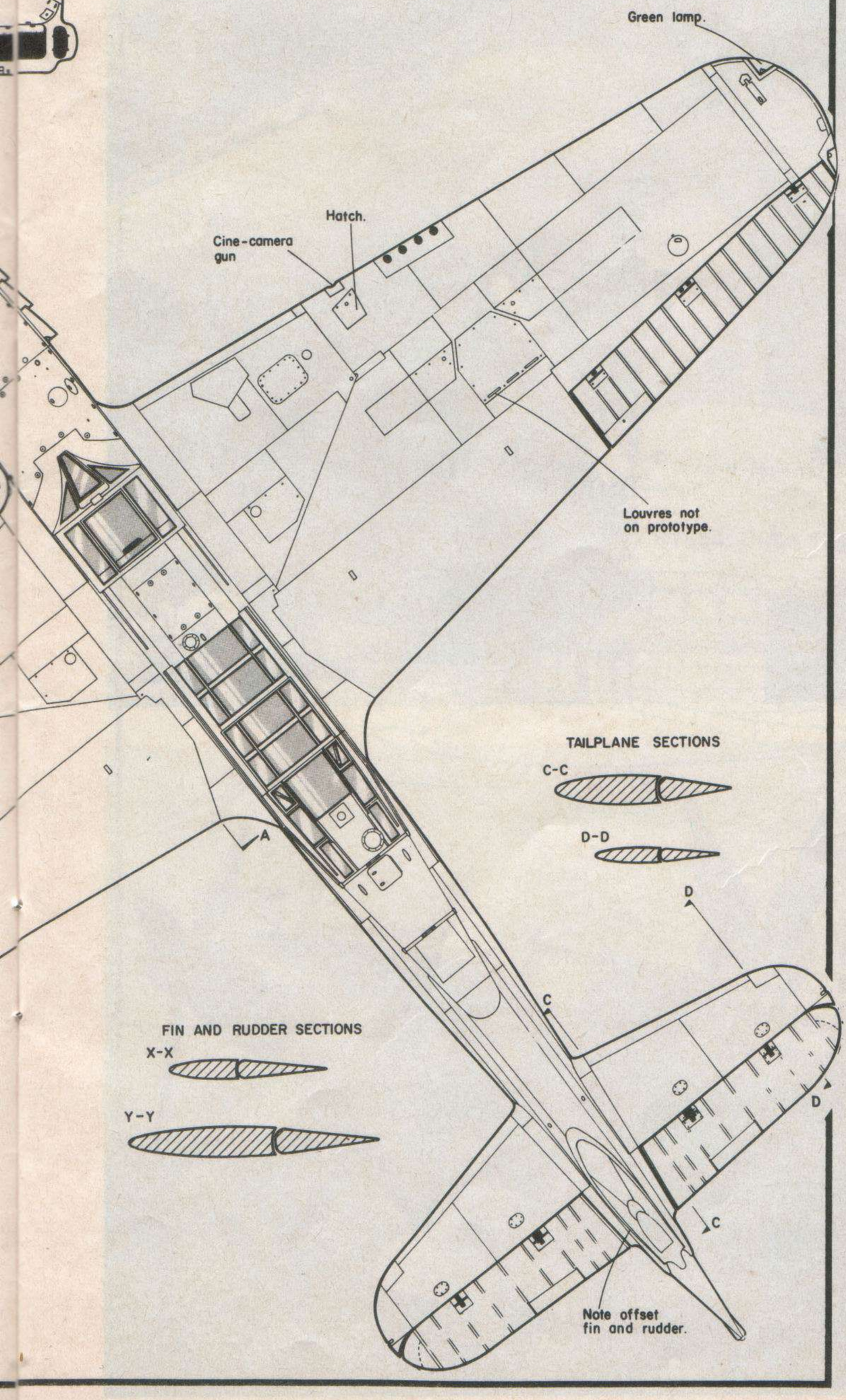
Scale - feet
0 1 2 3 4 5 6 7 8 9 10 11

3047





FUSELAGE SECTIONS



TAILPLANE SECTIONS

FIN AND RUDDER SECTIONS

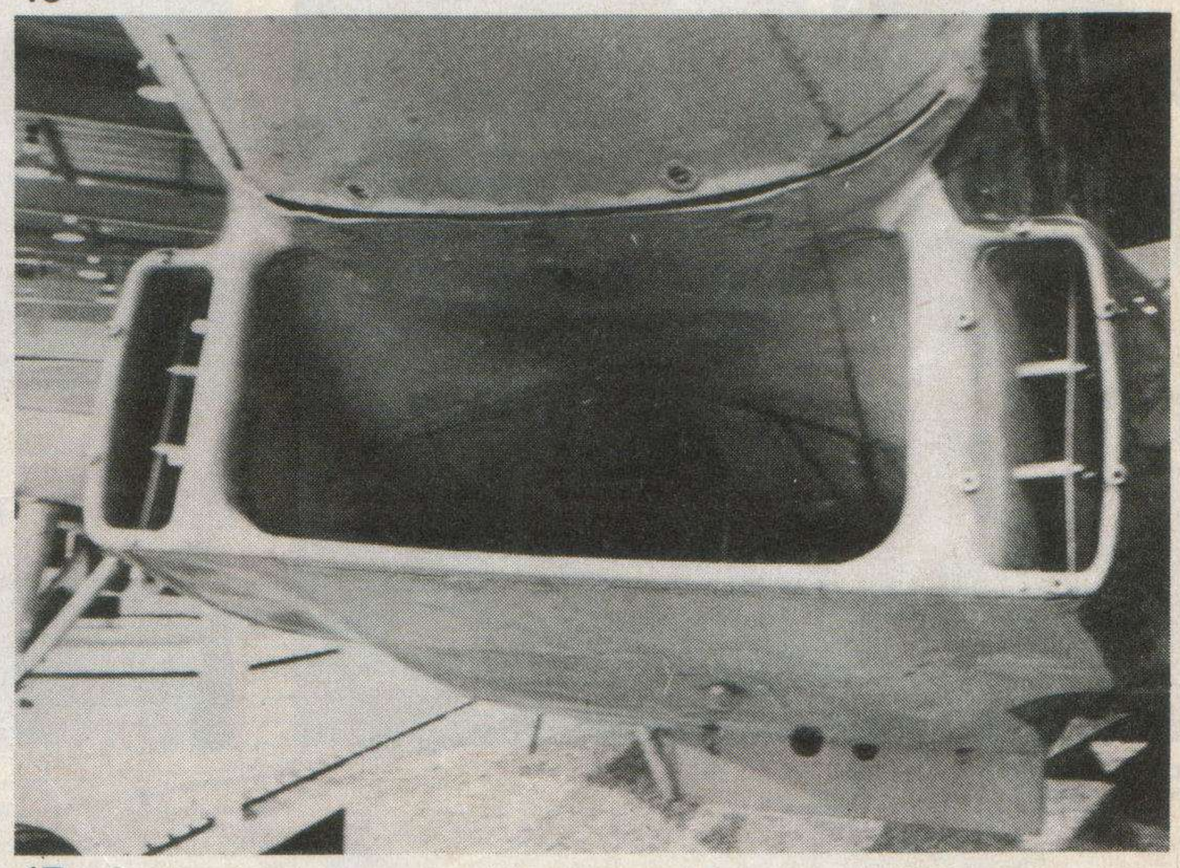
Note offset fin and rudder.

A part reprint of this feature, together with 1/24th scale dyelines, is available from MAP Plans Service as Plan Pack 3047, price £2.25 plus 40p post and packing. Export orders may be obtained at the same price or by post. (Add 50% to order value for airmail or 30p for surface mail overseas.)

45

45. A Fairey Fulmar clears the flight deck of HMS Victorious *in August 1942. Although of poor quality, this wartime photo illustrates the asymmetrically-retracting undercarriage to advantage.*
46 and 47. Views of the prototype Fulmar preserved at the Fleet Air Arm Museum at Yeovilton. Particularly noteworthy is the fuselage shape beyond the air intake aperture (below) and its bulged cheeks (Photo 47). See drawing opposite.

46



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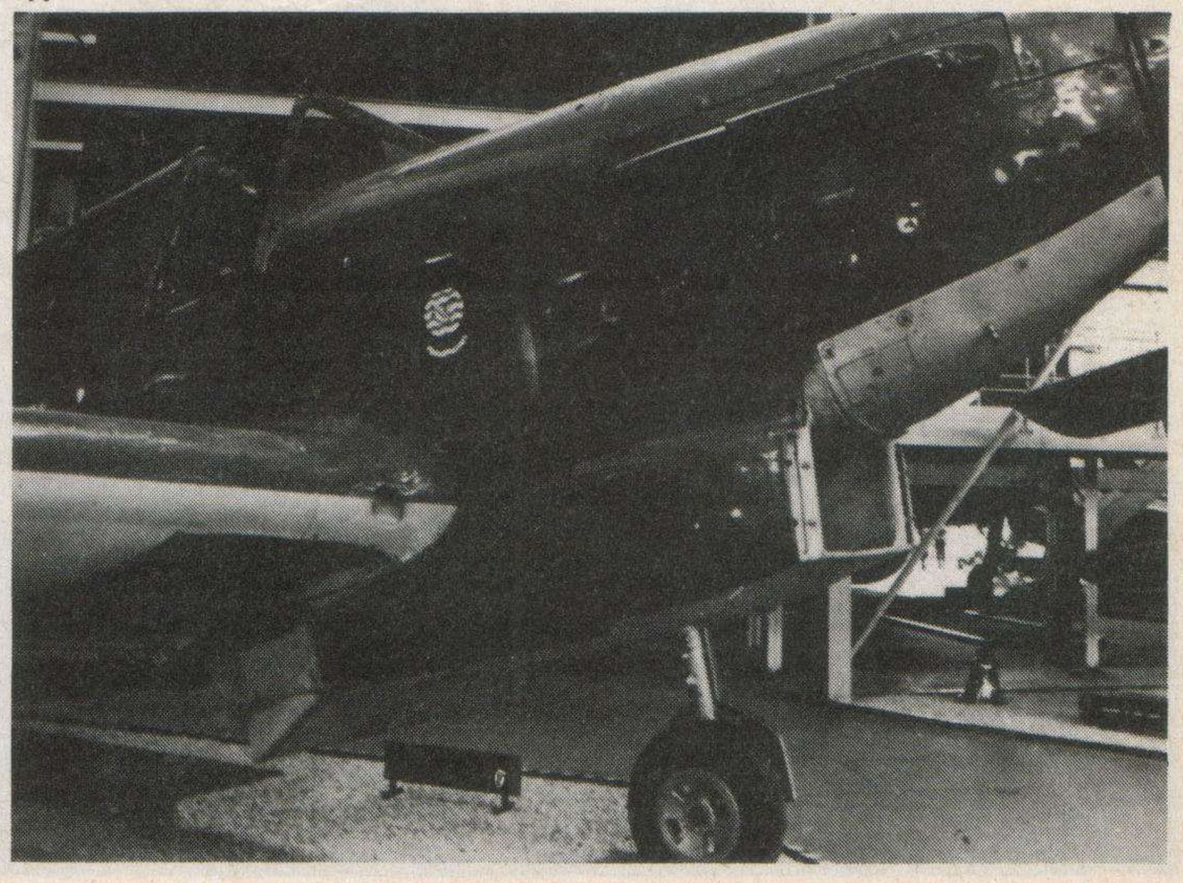

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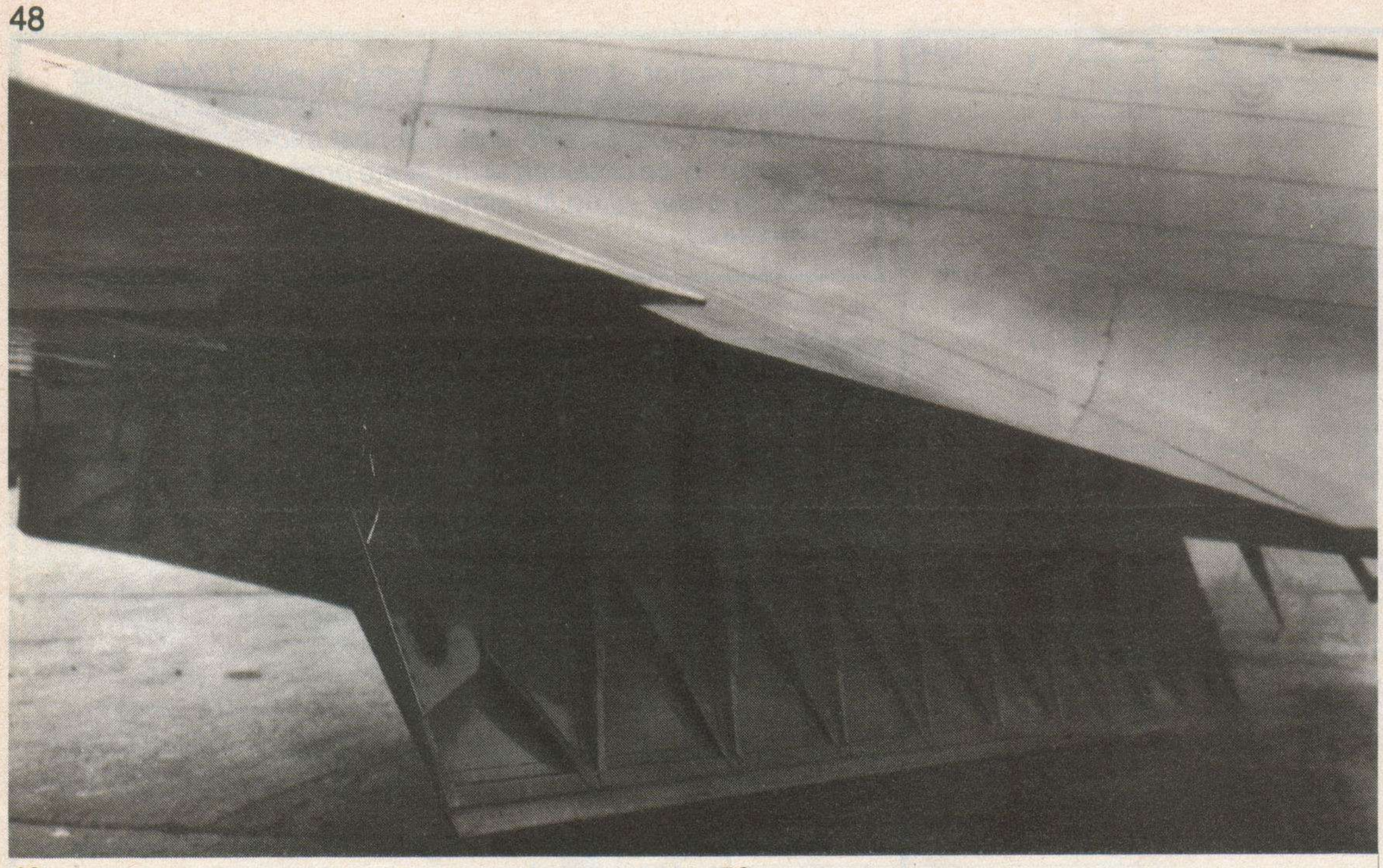
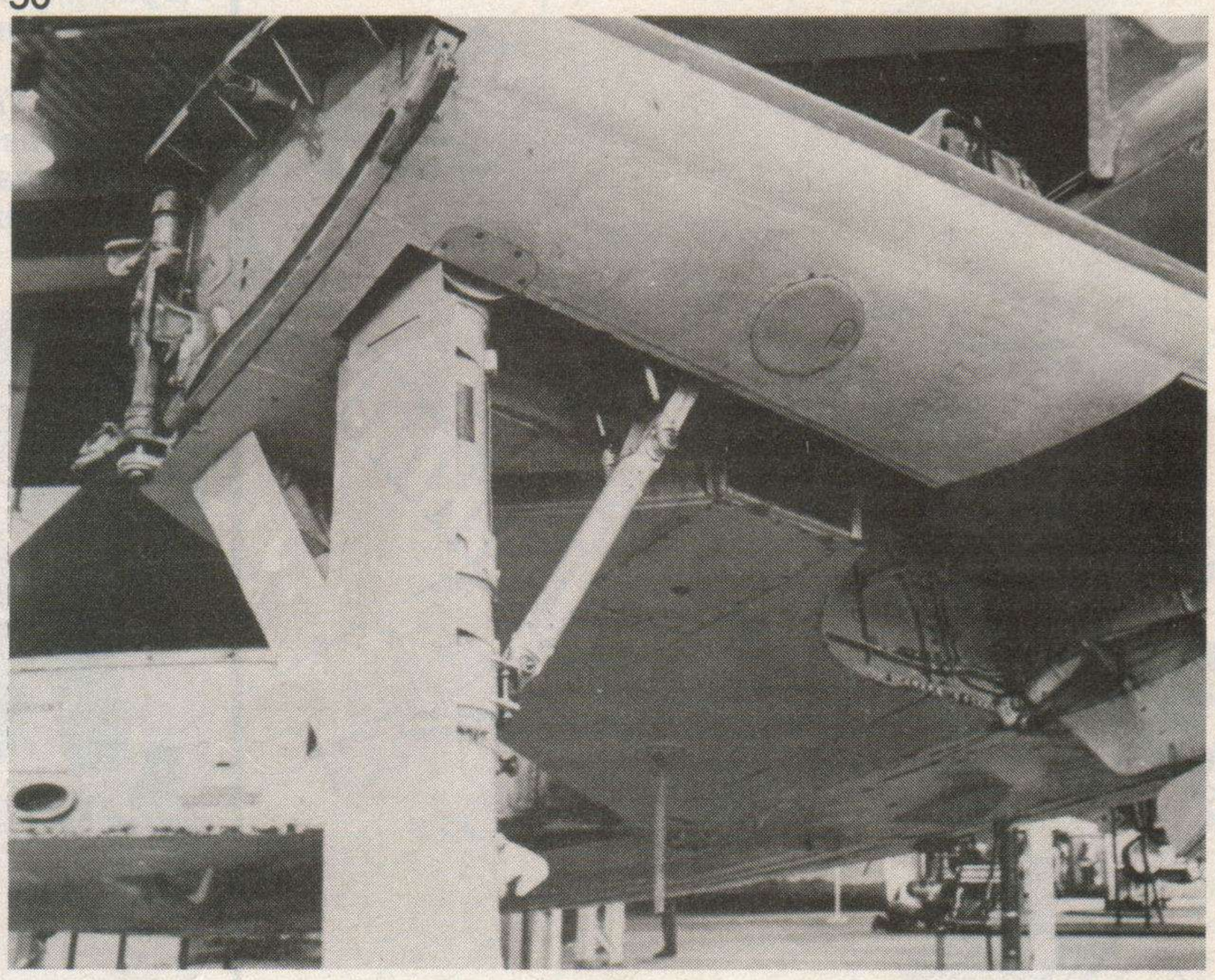


48. Port flap of K7555, modified P4/34 as 08/38 prototype. (Fulmar production models were almost identical.) Note main undercarriage door flap detail.
49 and 50. Undercarriage. Finer points of the preserved prototype at Yeovilton.
51. Fulmar prototype N1854, at the time of its first flight, in full camouflage – see drawings opposite. Night undersurfaces except for white starboard wing and starboard tailplane undersurfaces.

49

50



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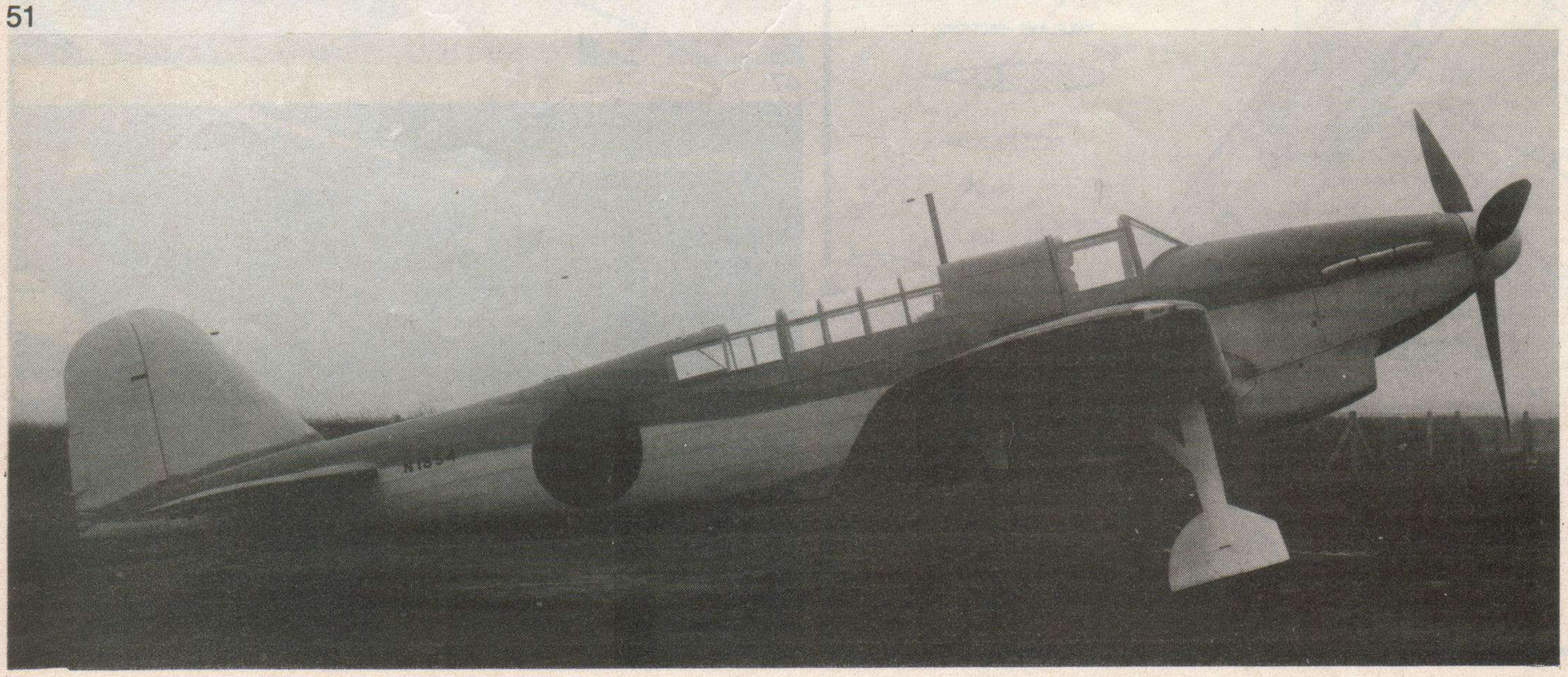
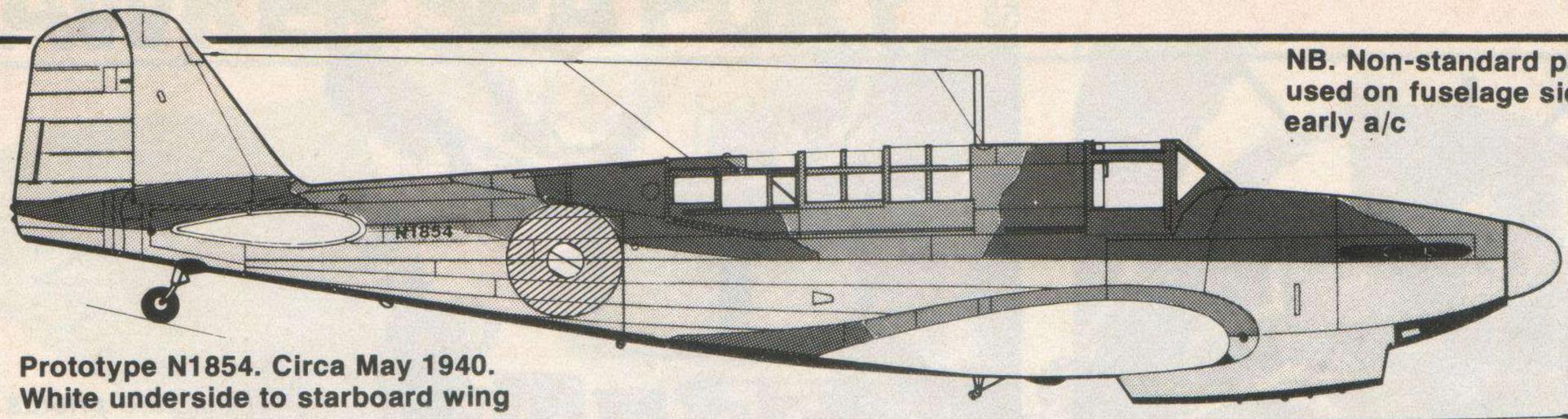
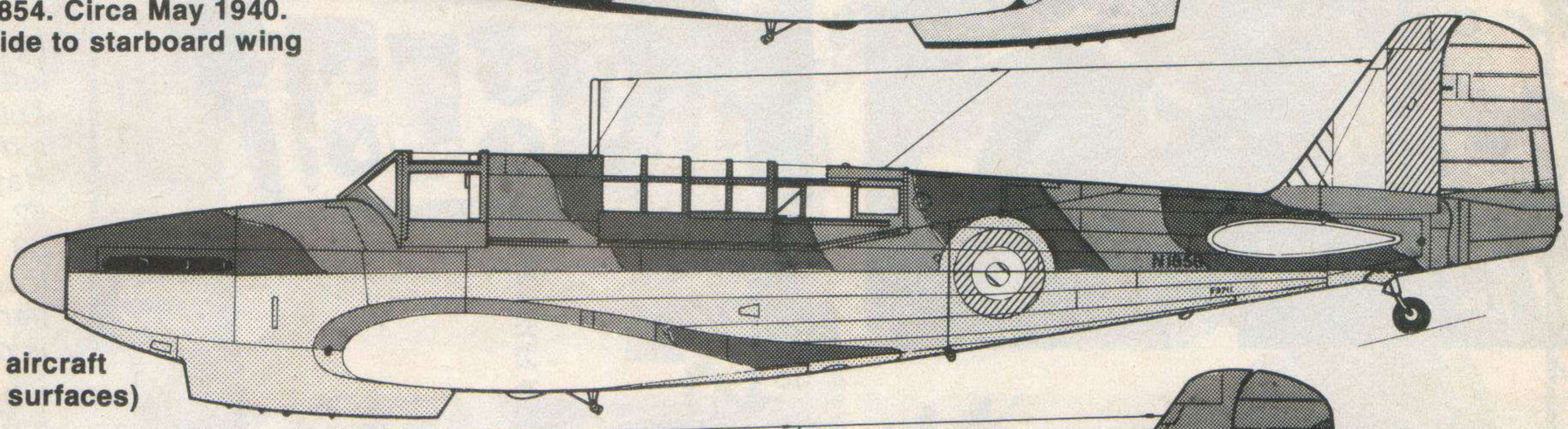


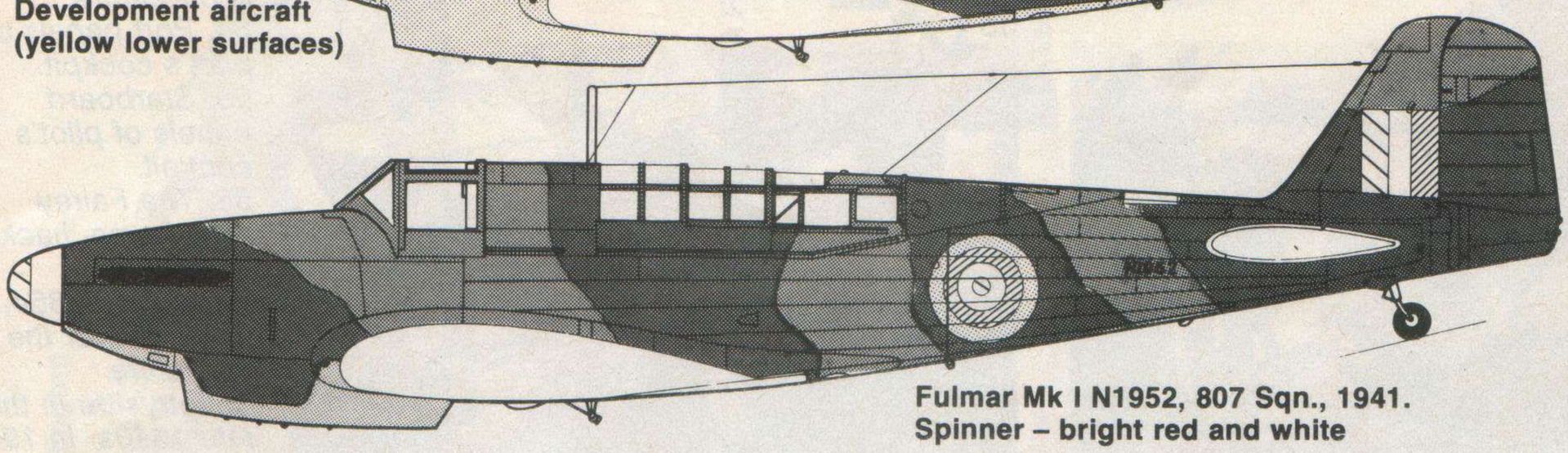


NB. Non-standard patterns were used on fuselage sides of early a/c

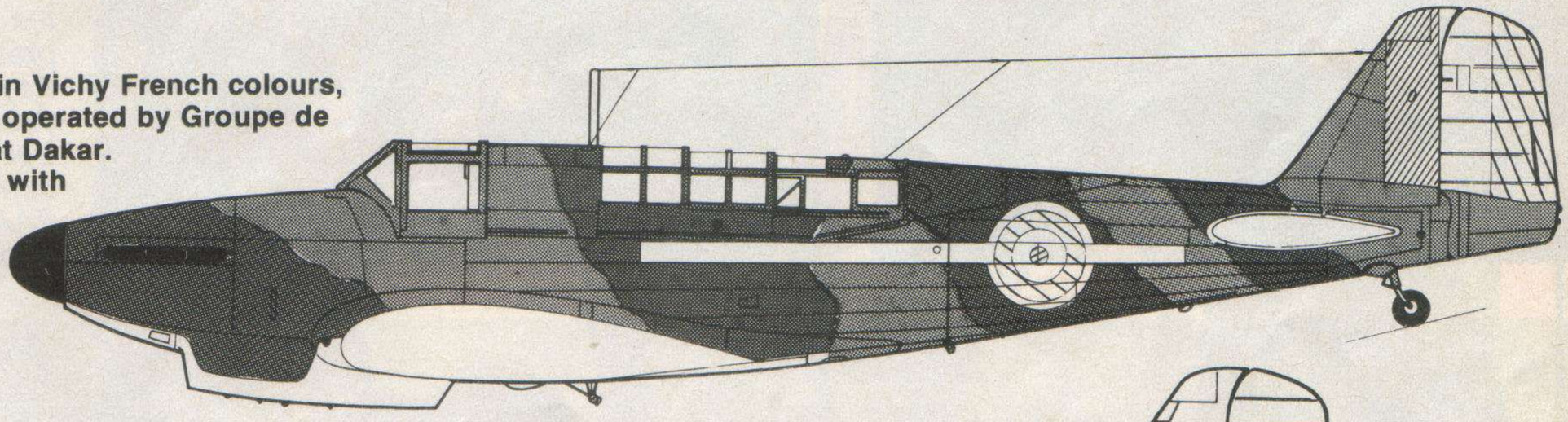
Prototype N1854. Circa May 1940. White underside to starboard wing



N1858 Development aircraft (yellow lower surfaces)

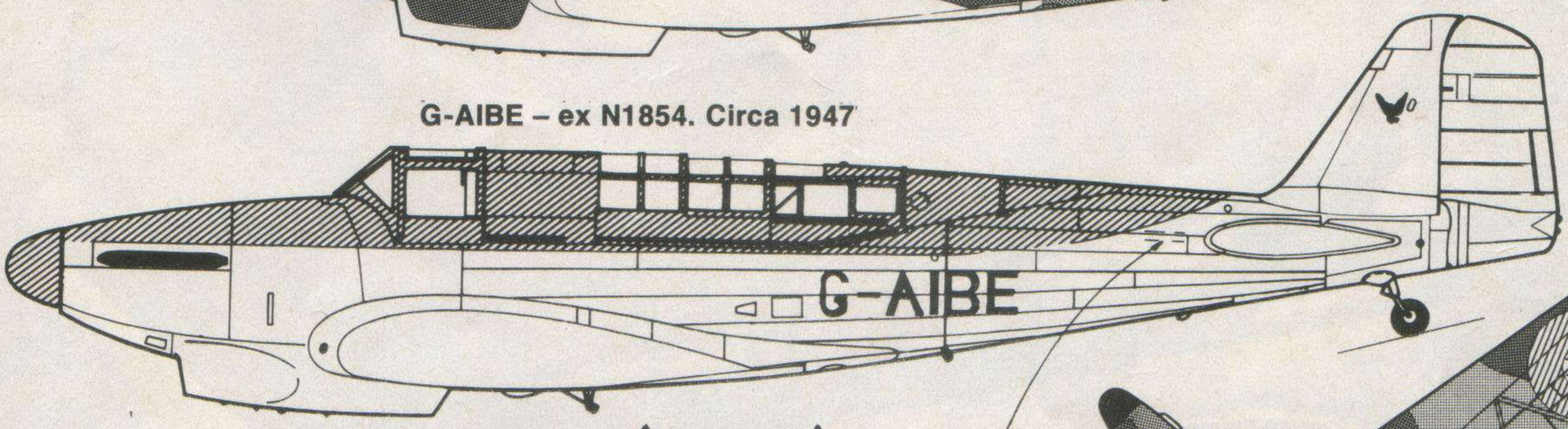


Fulmar Mk I N1952, 807 Sqn., 1941. Spinner – bright red and white



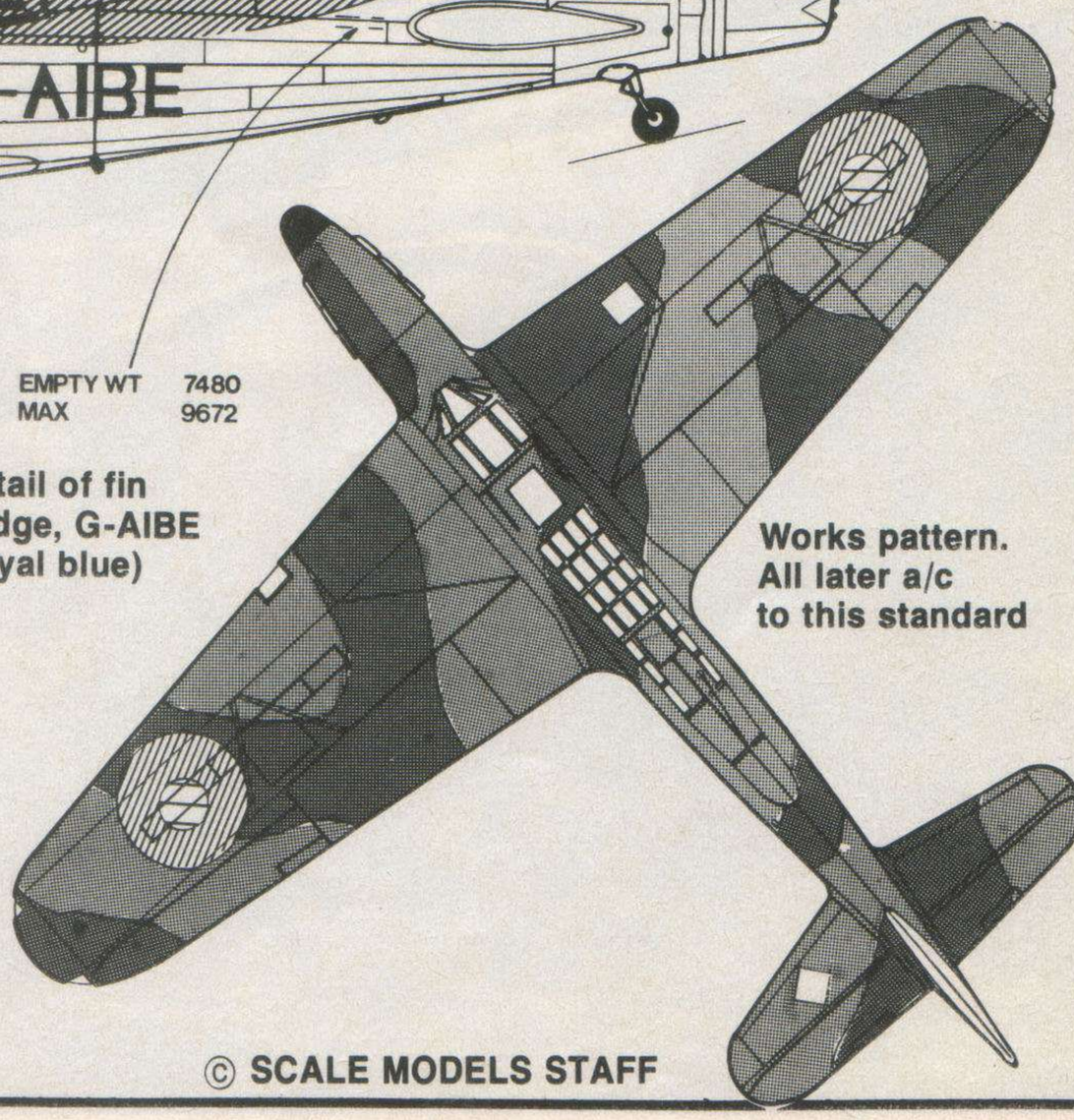
Fulmar Mk I in Vichy French colours, ex 807 Sqn., operated by Groupe de Chasse 1/4 at Dakar. FAA scheme with French national markings

G-AIBE – ex N1854. Circa 1947



Detail of fin badge, G-AIBE (royal blue)

EMPTY WT 7480
MAX 9672



Works pattern. All later a/c to this standard

Night (black)

Extra dark sea grey

Dark slate grey

Sky grey

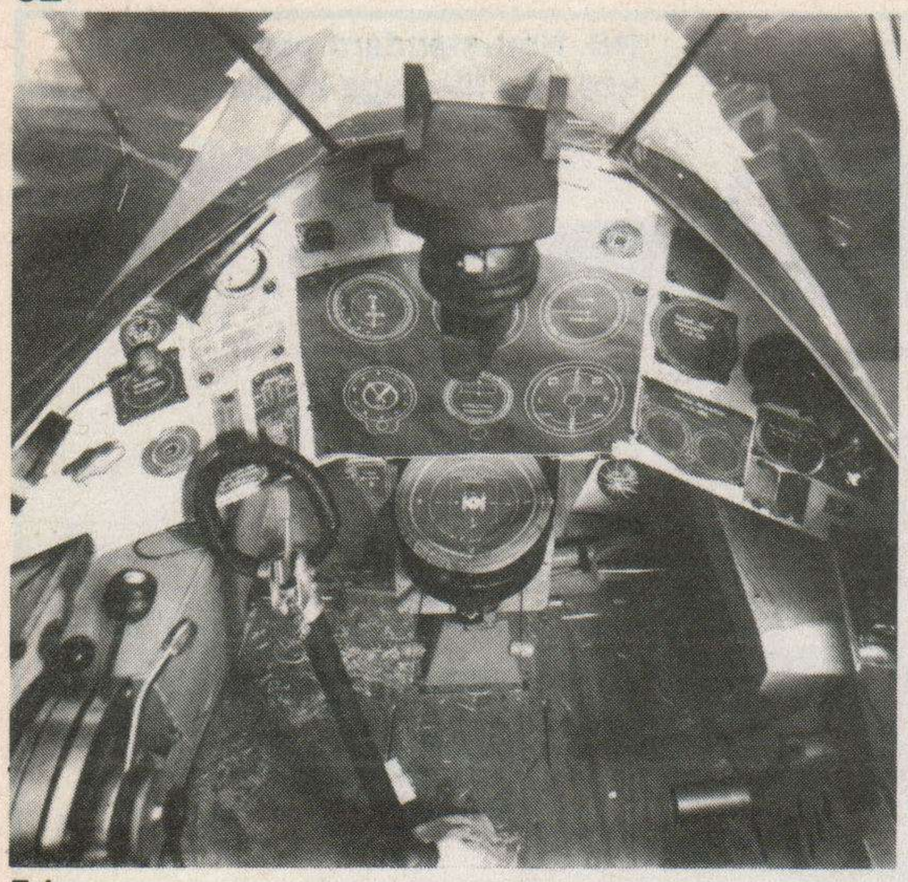
'Trainer' yellow

Roundel blue

Roundel red

White

52



53

54

55

Four rare photos at left show the original Fulmar mock-up airframe at the Hayes plant.
52. Pilot's cockpit.
53. Rear cockpit looking aft – note flare/marker chute is off-centre.
54. Port panels of pilot's cockpit.
55. Starboard panels of pilot's cockpit.
56. The Fairey aerodrome 'hack', ex-prototype Mk I/Mk II/N1854, as G-AIBE over the Berkshire countryside in the late 1940s. In 1962 the aircraft was presented to the Royal Navy and ten years later it was transferred to its current home, the FAA Museum, Yeovilton.

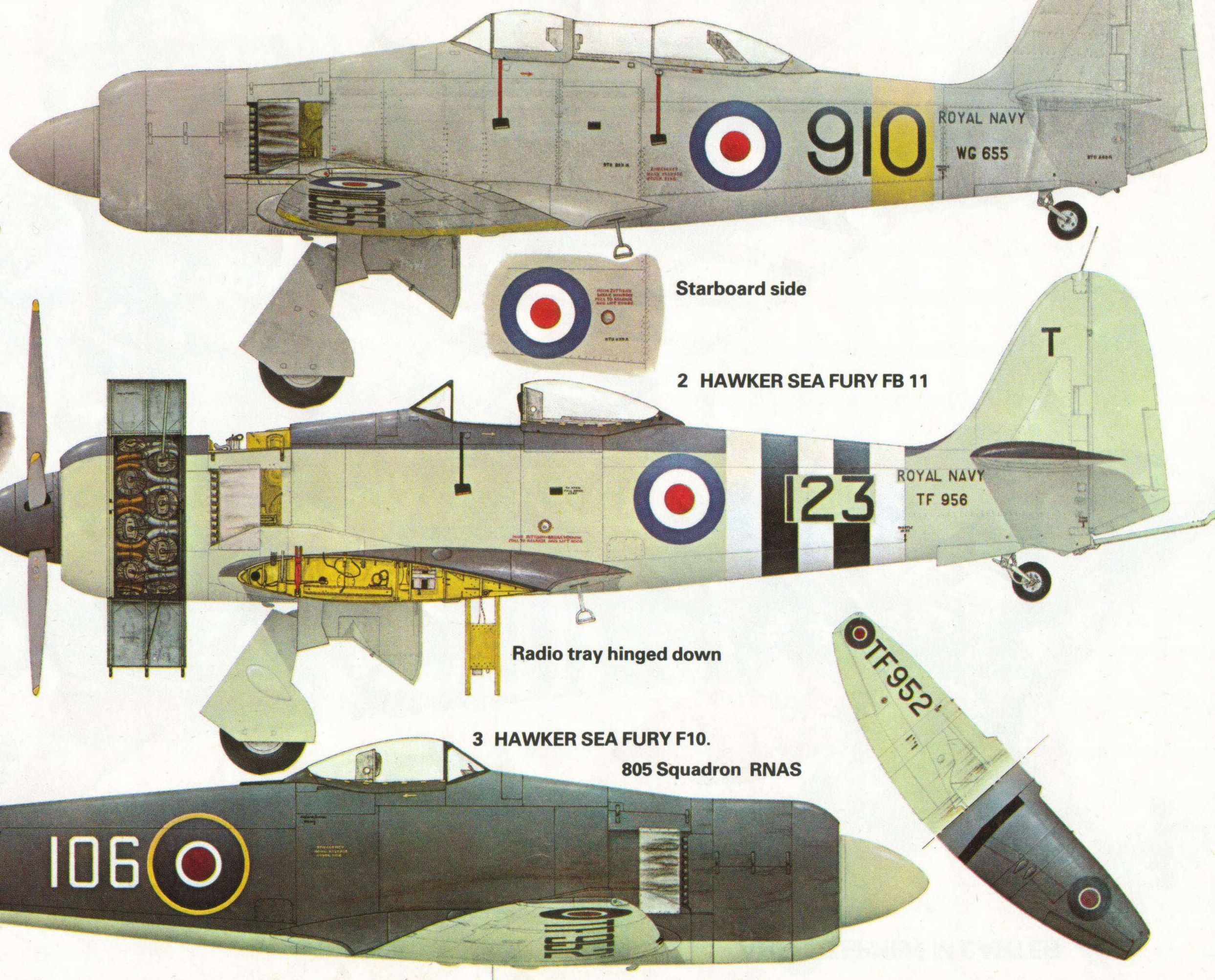
56

CONTINUED ON PAGE 51

HAWKER SEA FURY

1 HAWKER SEA FURY T20. RNAS Eglington

Walkways on wings, both sides



Starboard side

2 HAWKER SEA FURY FB 11

Radio tray hinged down

3 HAWKER SEA FURY F10.
805 Squadron RNAS

PLATE 1

BE2C

ART: STEPHEN M CARTER

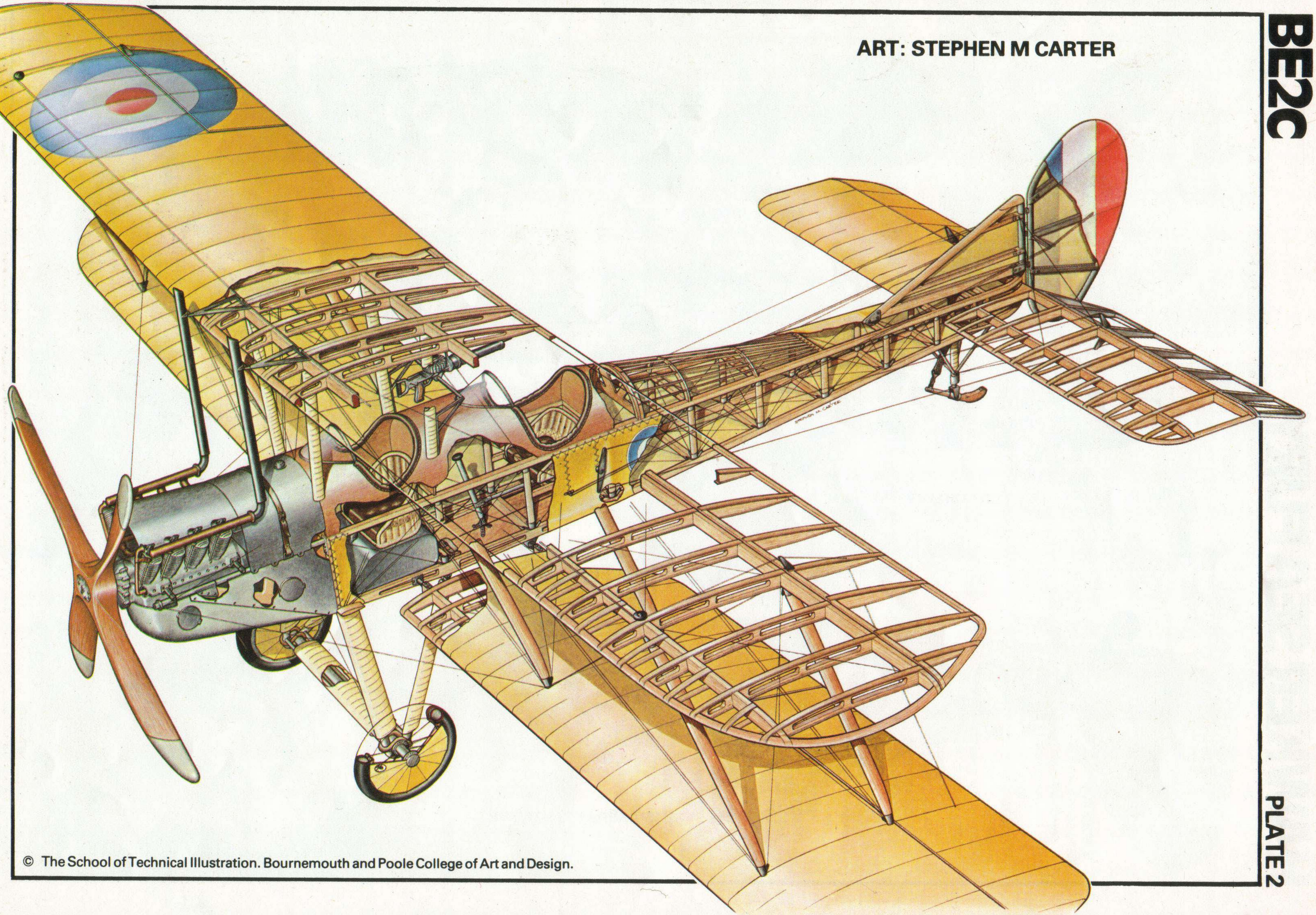
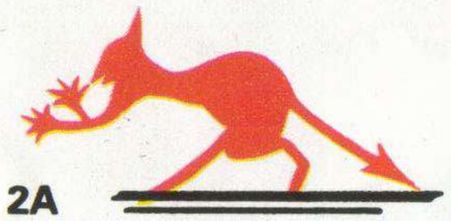


PLATE 2

SOPWITH F1 CAMEL

1A

2A

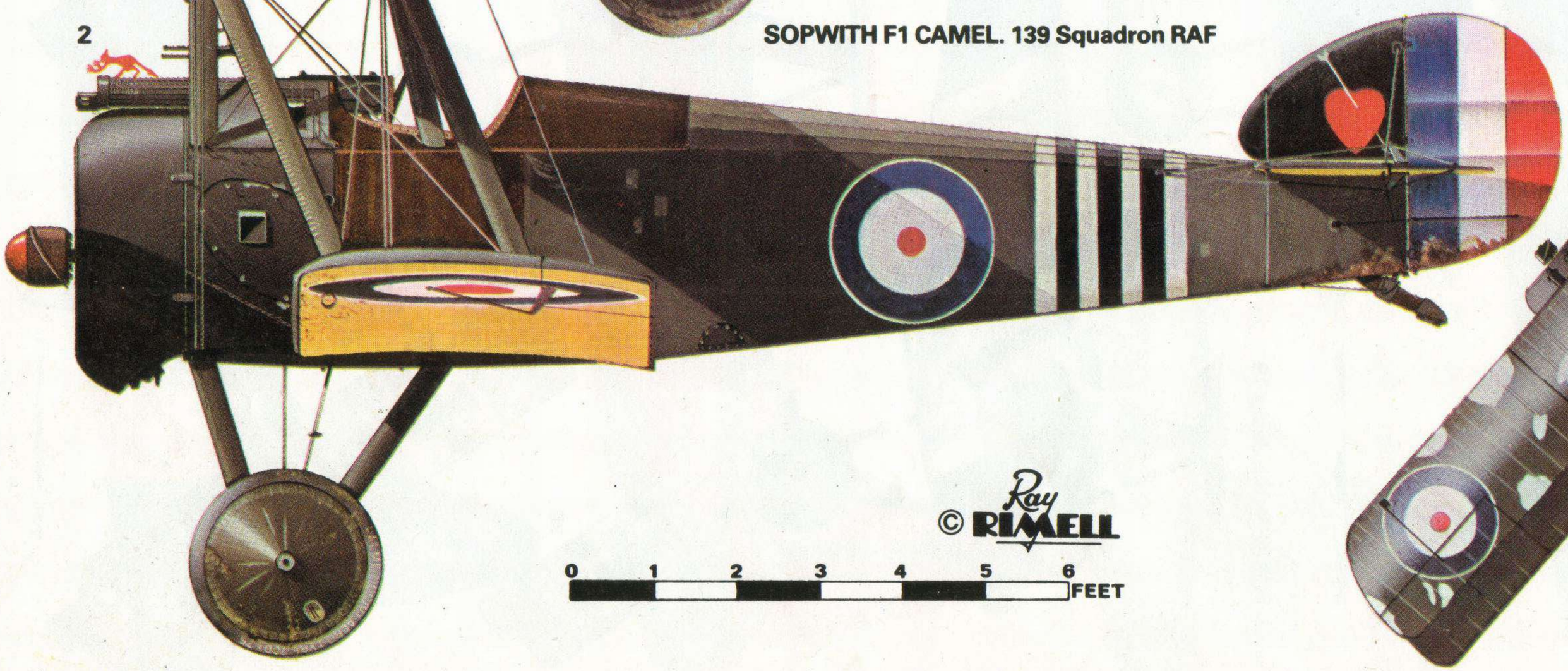


1

SOPWITH F1 CAMEL. 43 Squadron RAF

2

SOPWITH F1 CAMEL. 139 Squadron RAF



1B

0 1 2 3 4 5 6 FEET

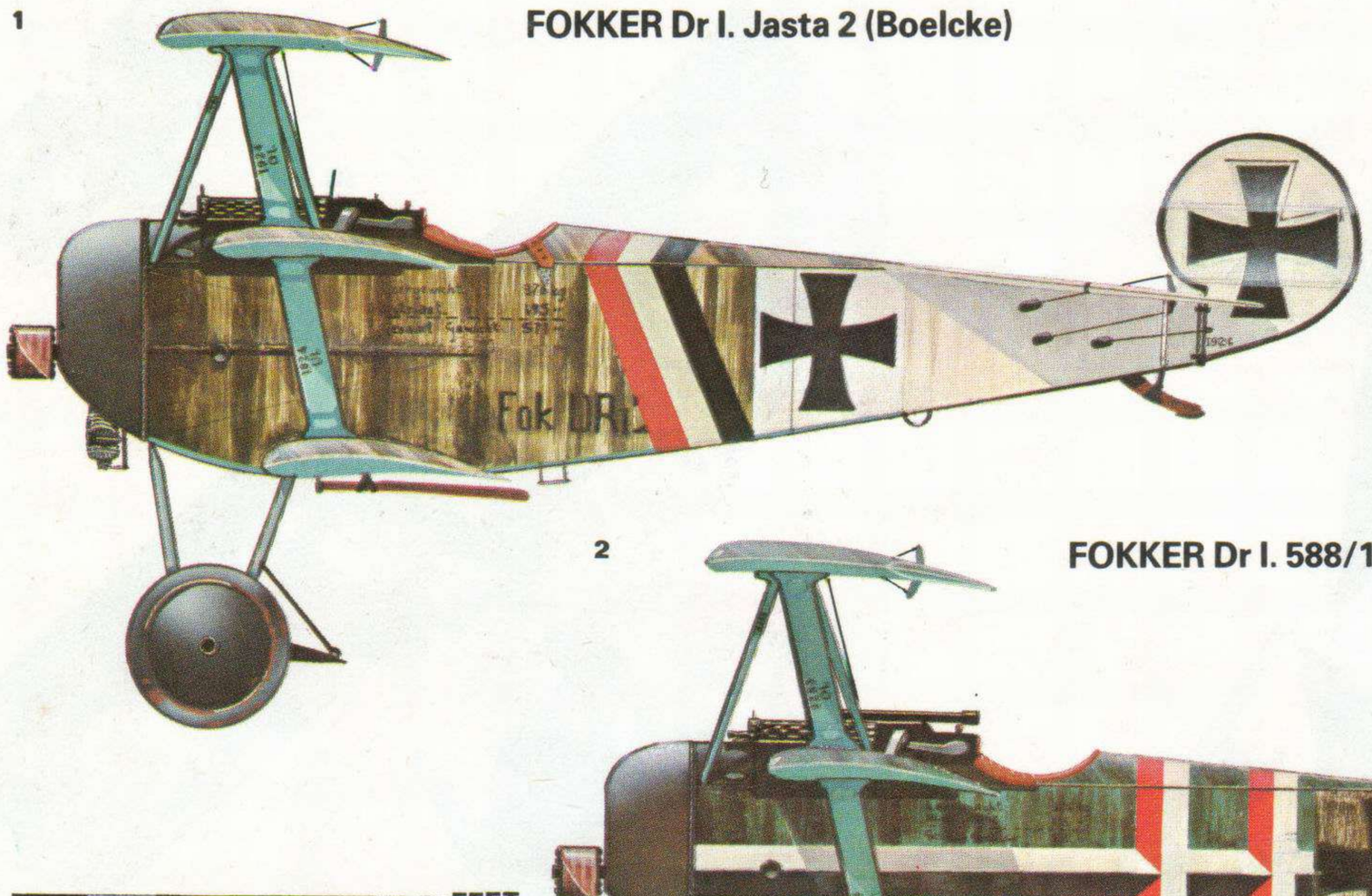
PLATE 3

FOKKER DrI TRIPLANE

PLATE 4

1

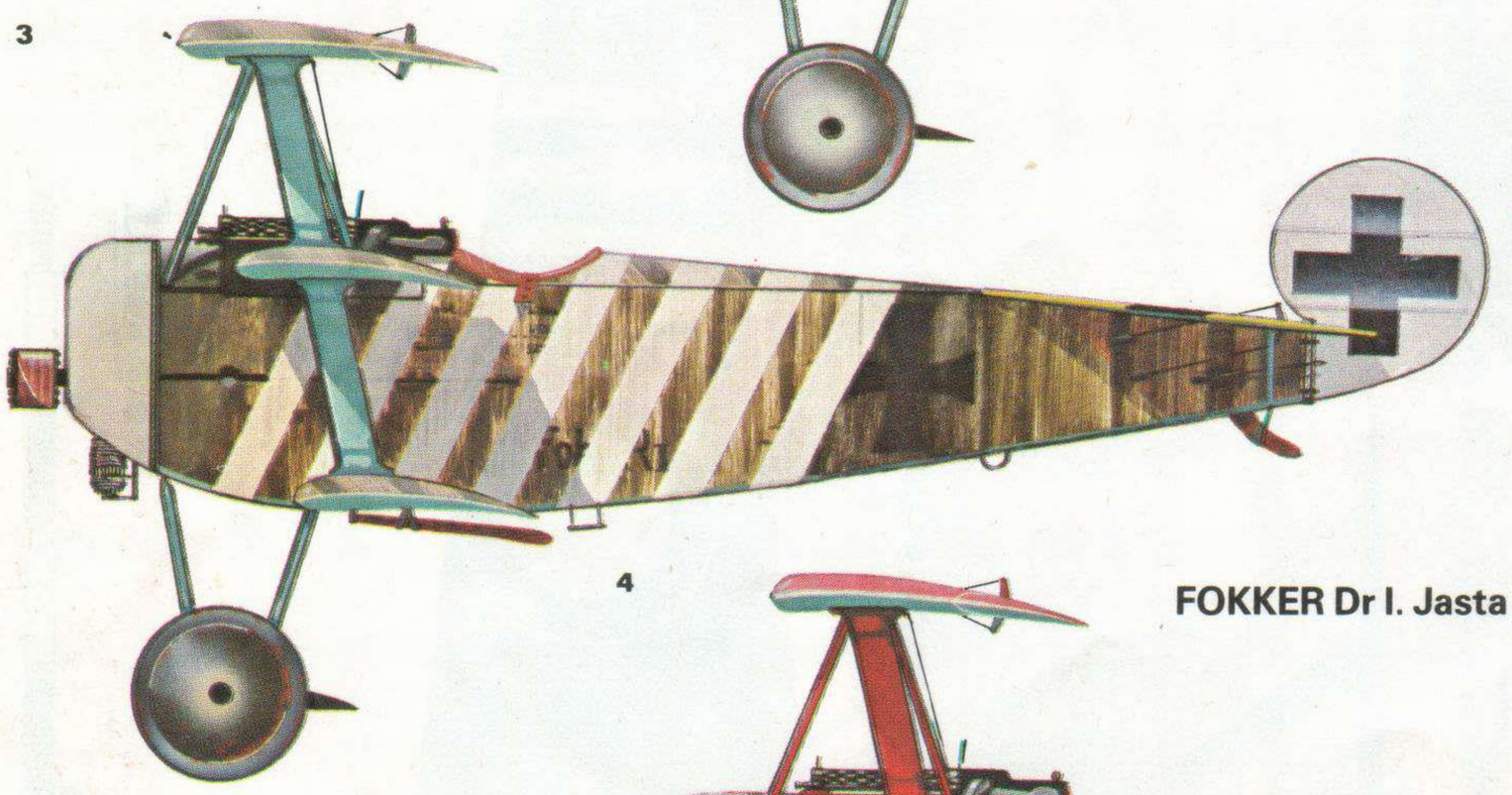
FOKKER Dr I. Jasta 2 (Boelcke)



FEET

FOKKER Dr I. Jasta 19

3



2

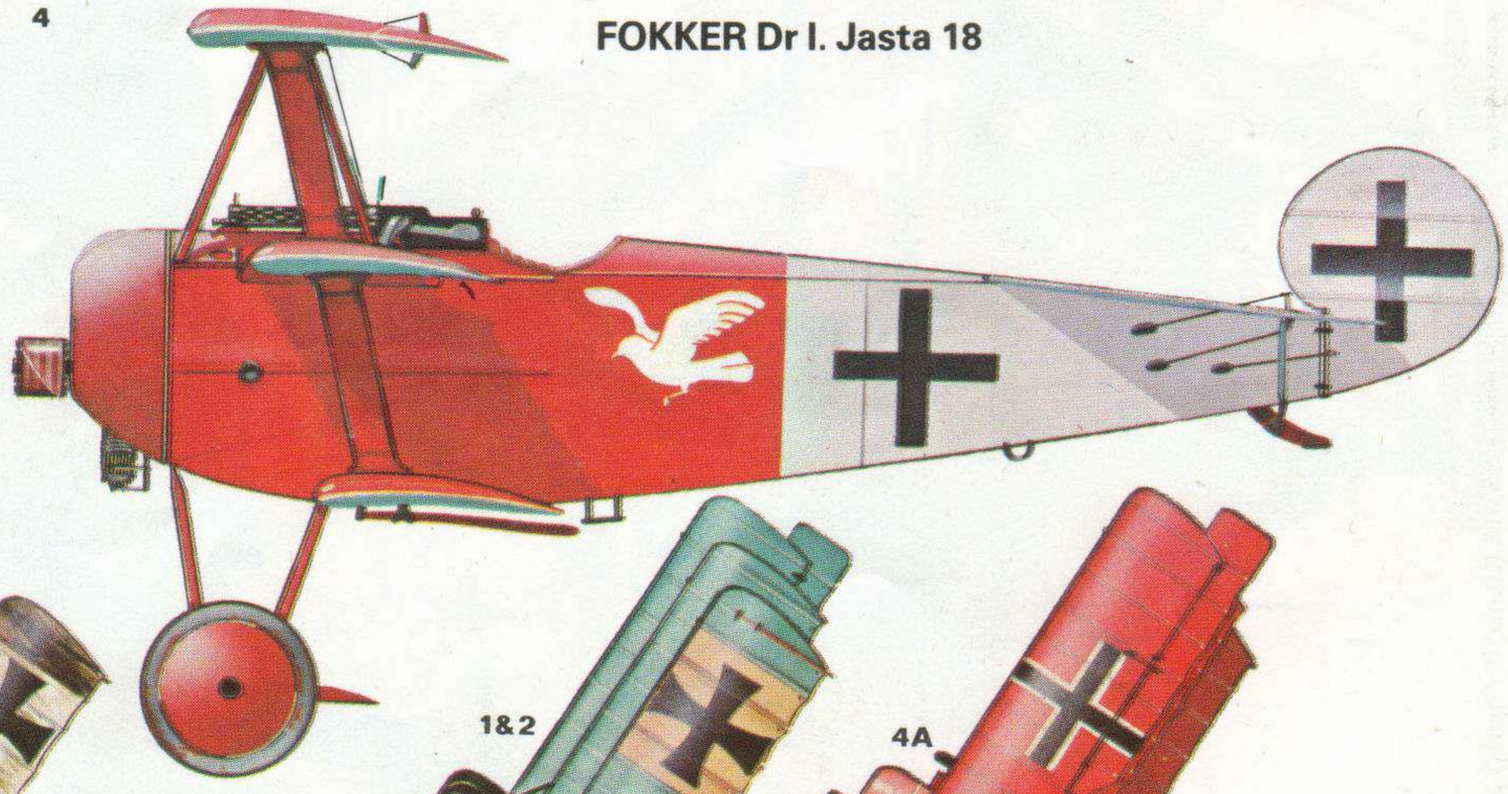
FOKKER Dr I. 588/17

3A

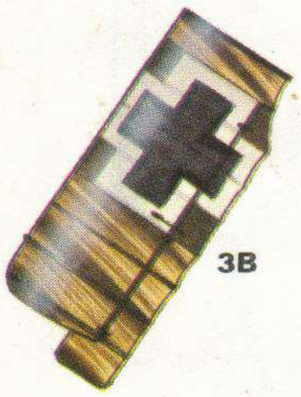
Jasta 19 tail markings

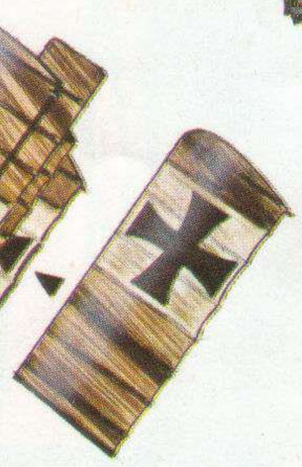
4

FOKKER Dr I. Jasta 18



3B





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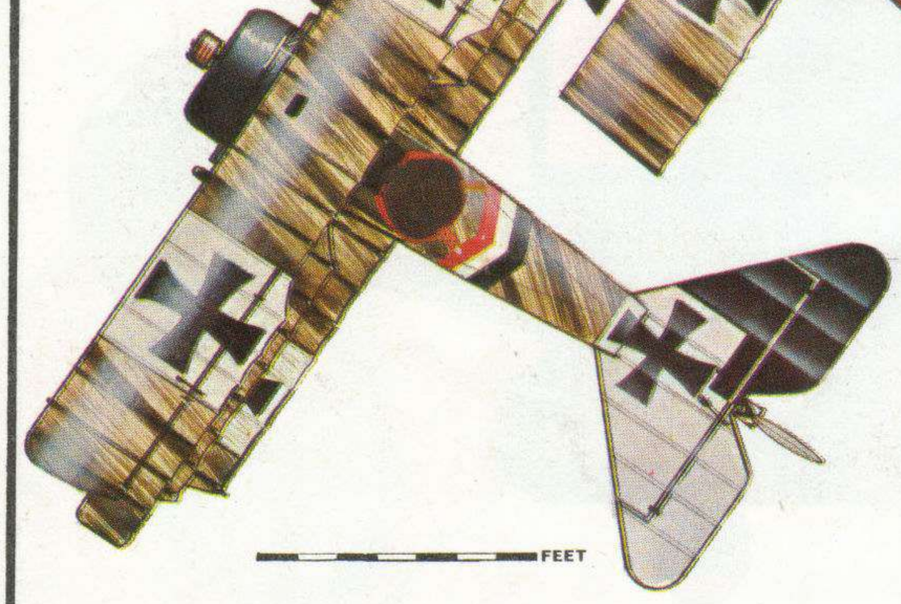
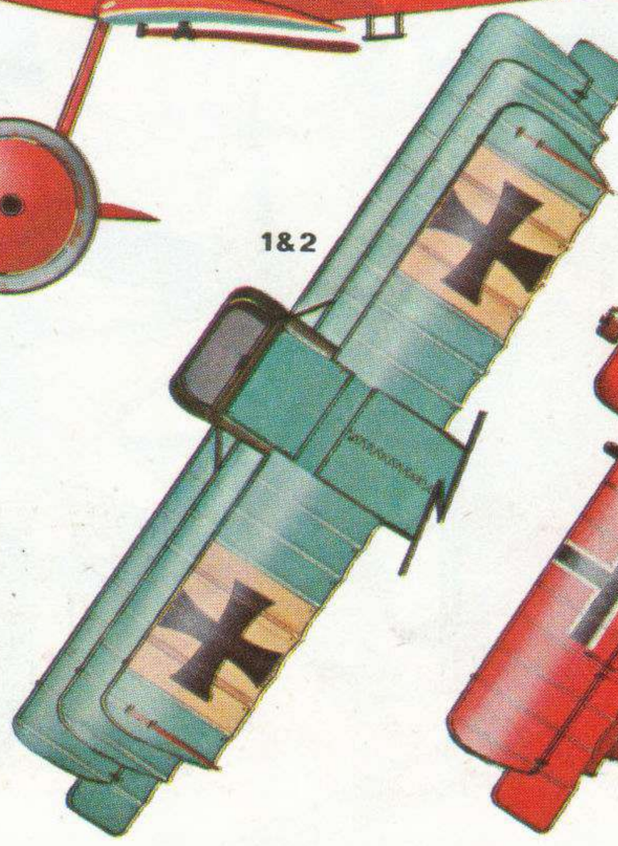
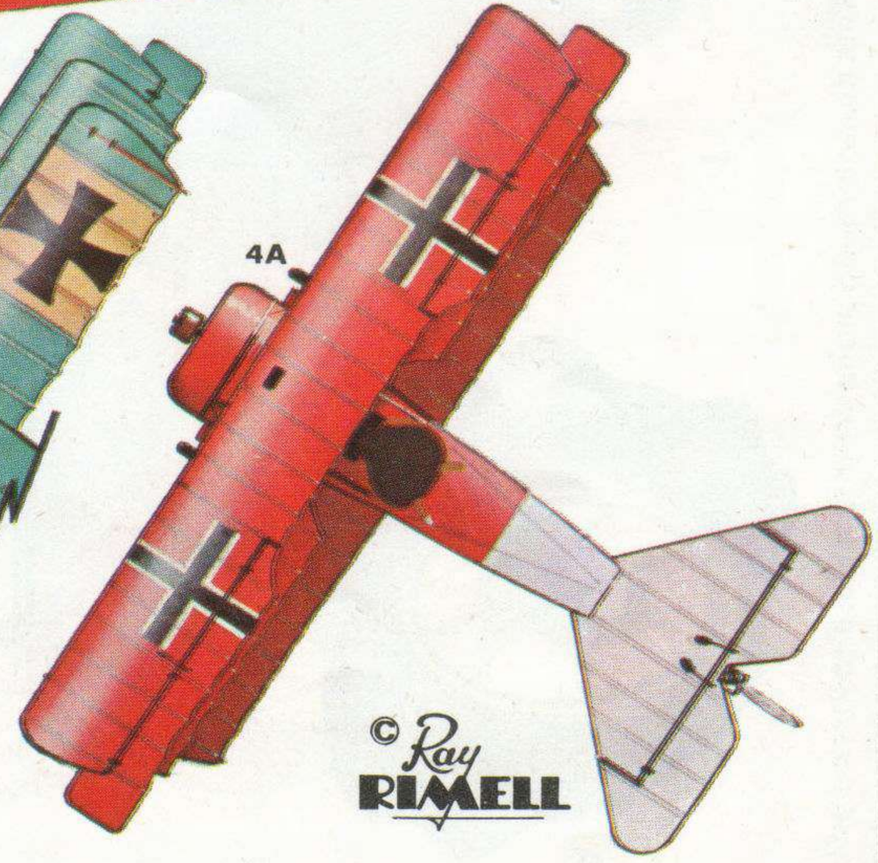


FEET

1&2



4A

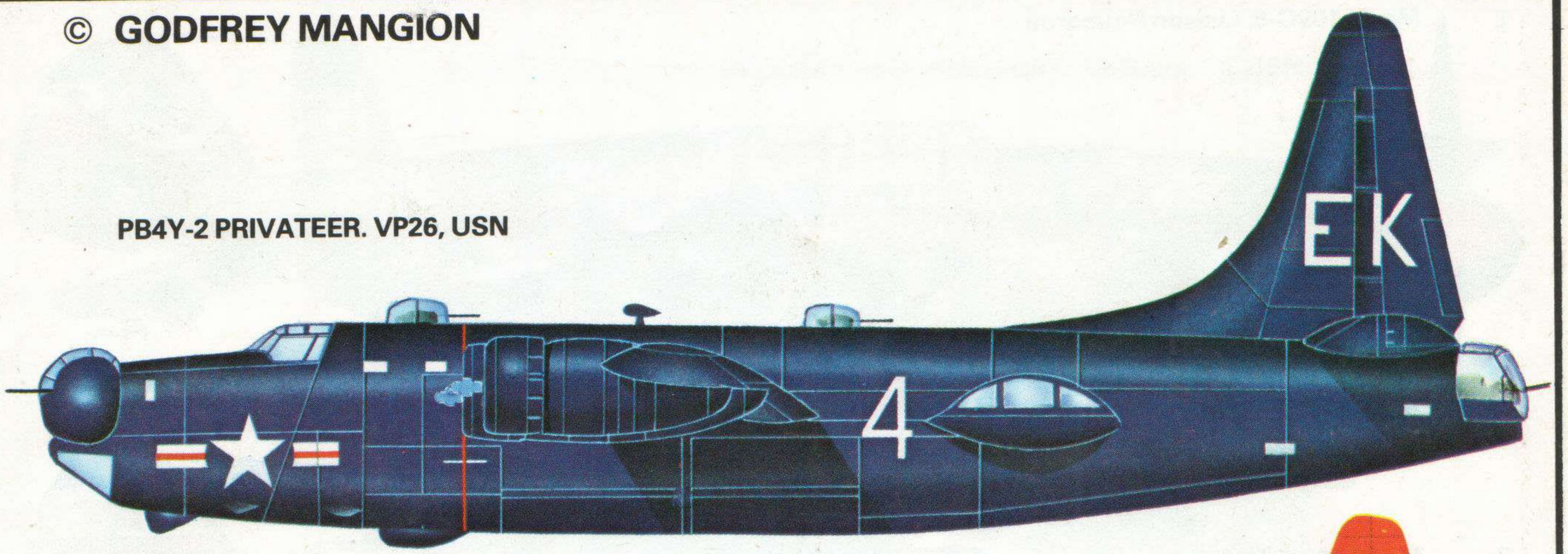


© Ray RIMELL

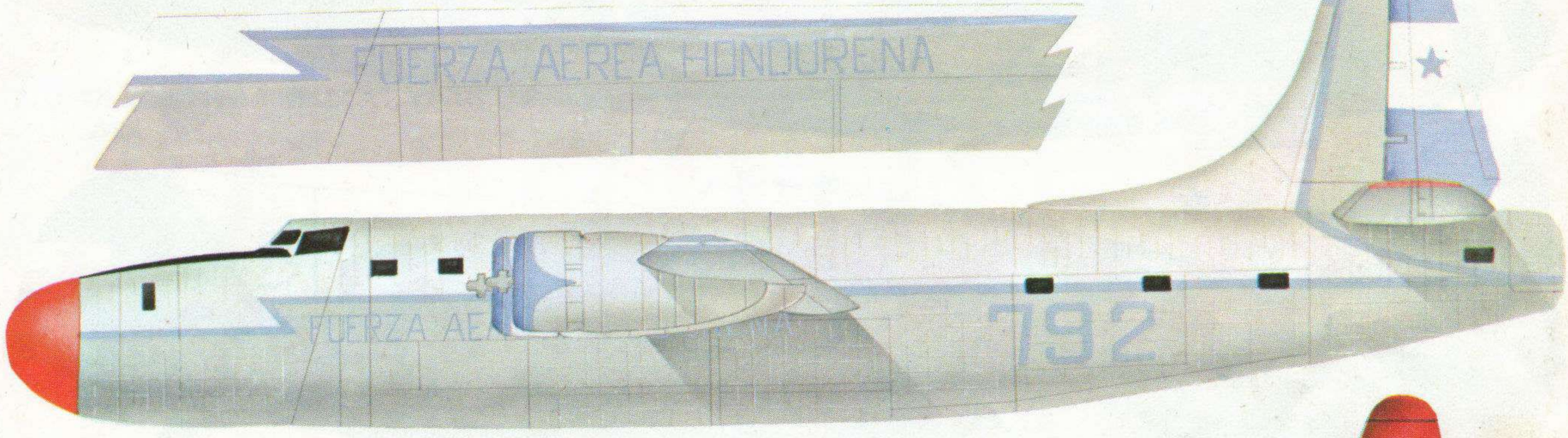
CONVAIR PRIVATEER

PLATE 5

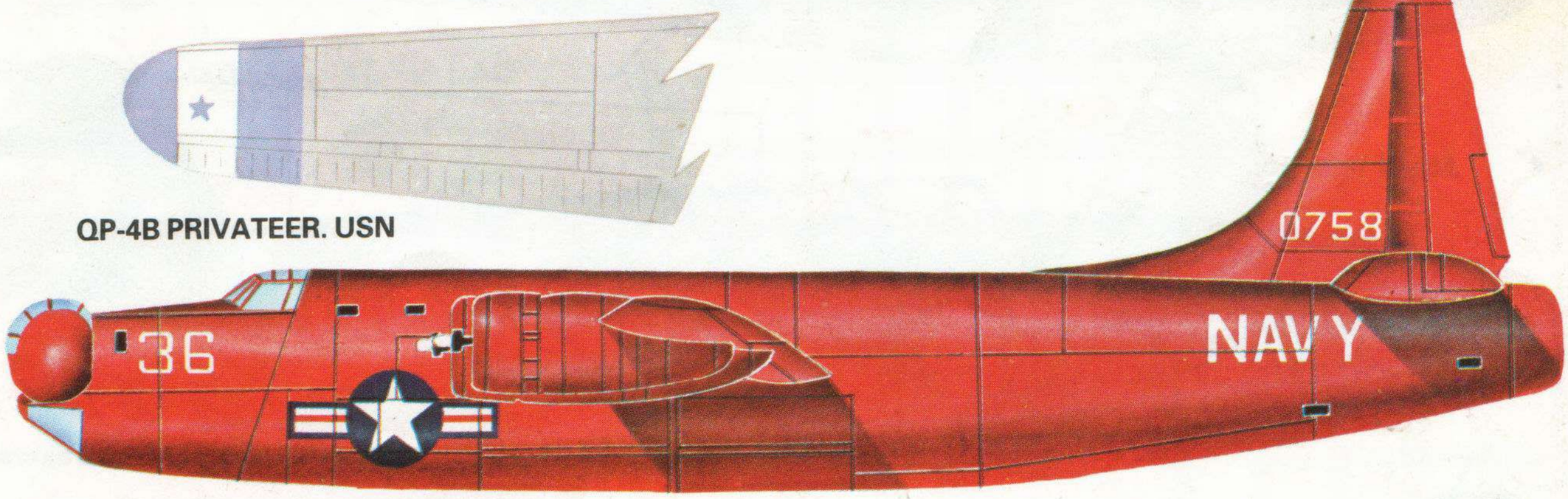
PB4Y-2 PRIVATEER. VP26, USN



P4Y-2 PRIVATEER. Honduran Air Force



QP-4B PRIVATEER. USN



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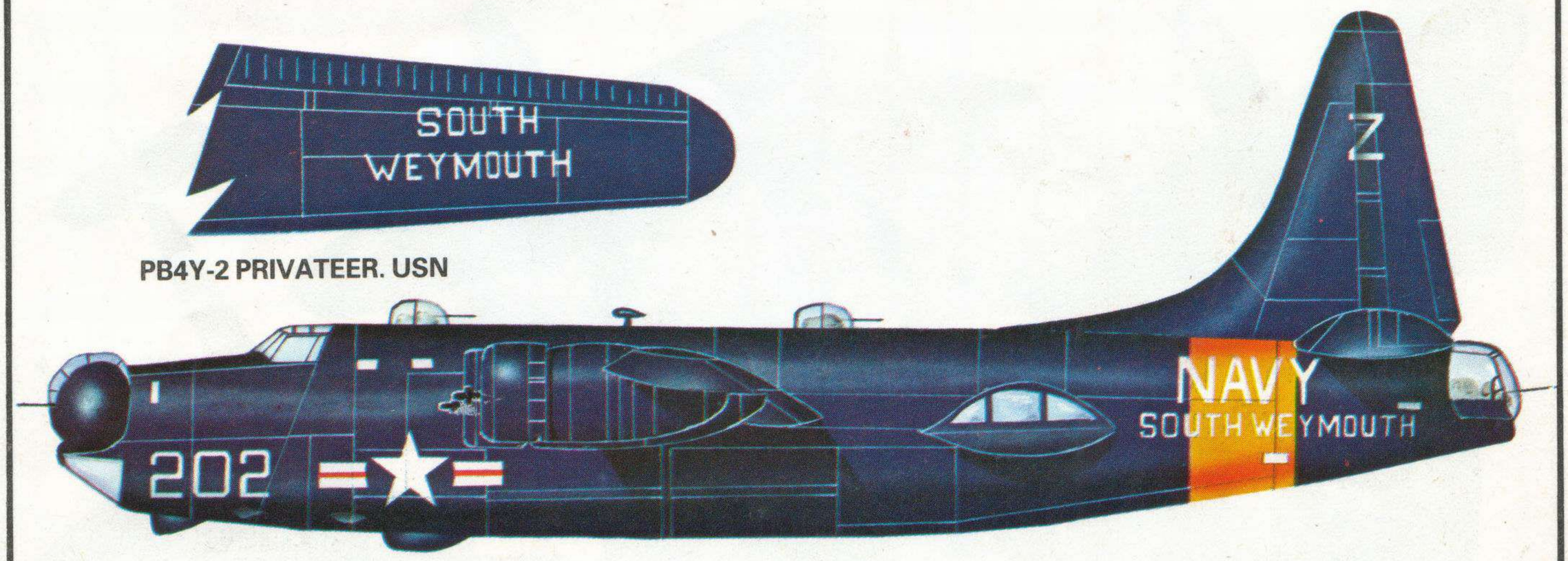
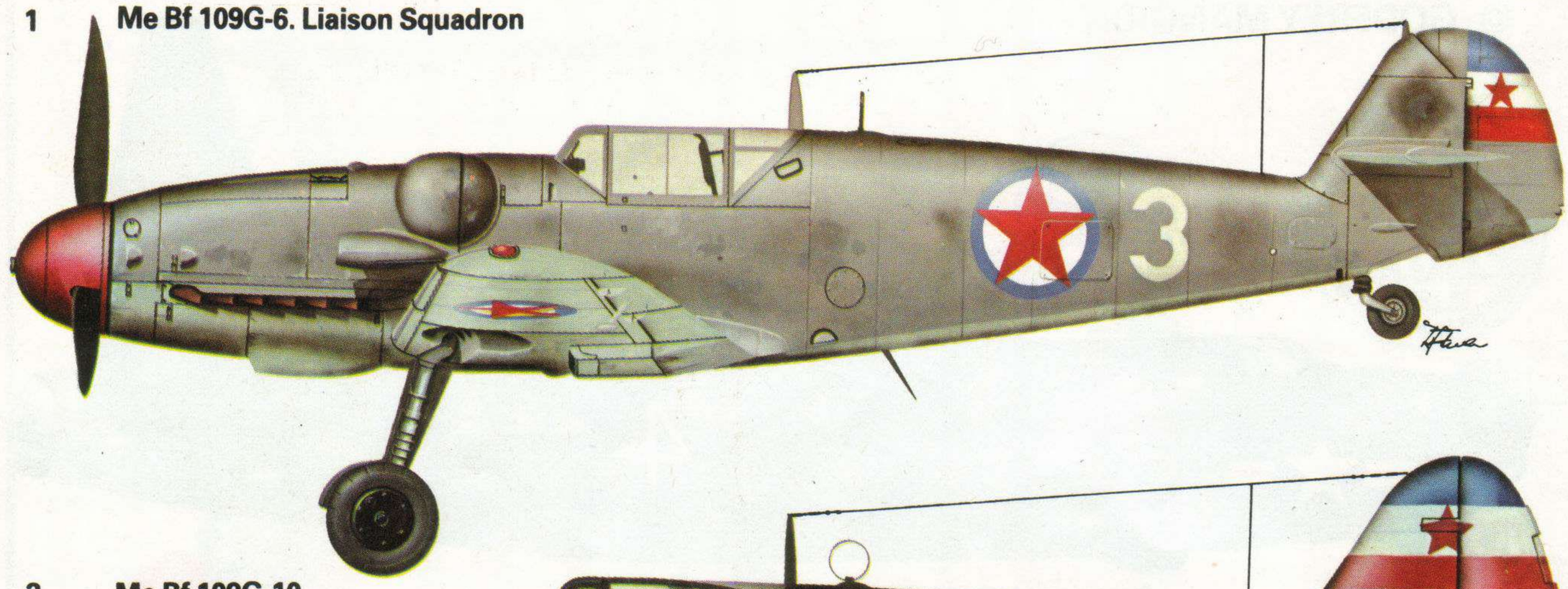


MESSERSCHMITT Bf109G

PLATE 6

1 **Me Bf 109G-6. Liaison Squadron**



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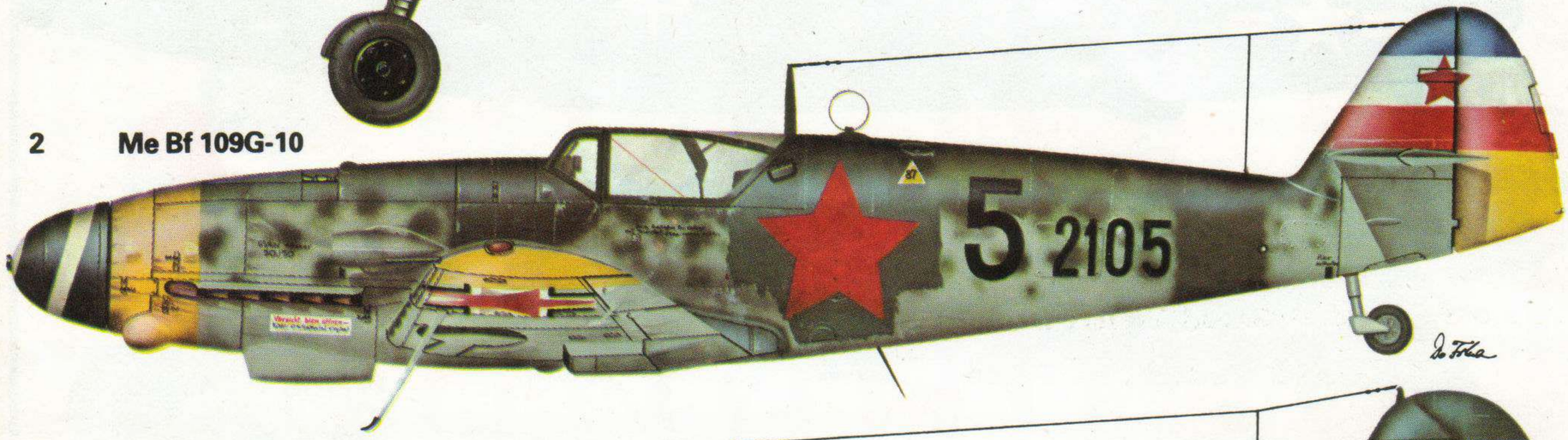
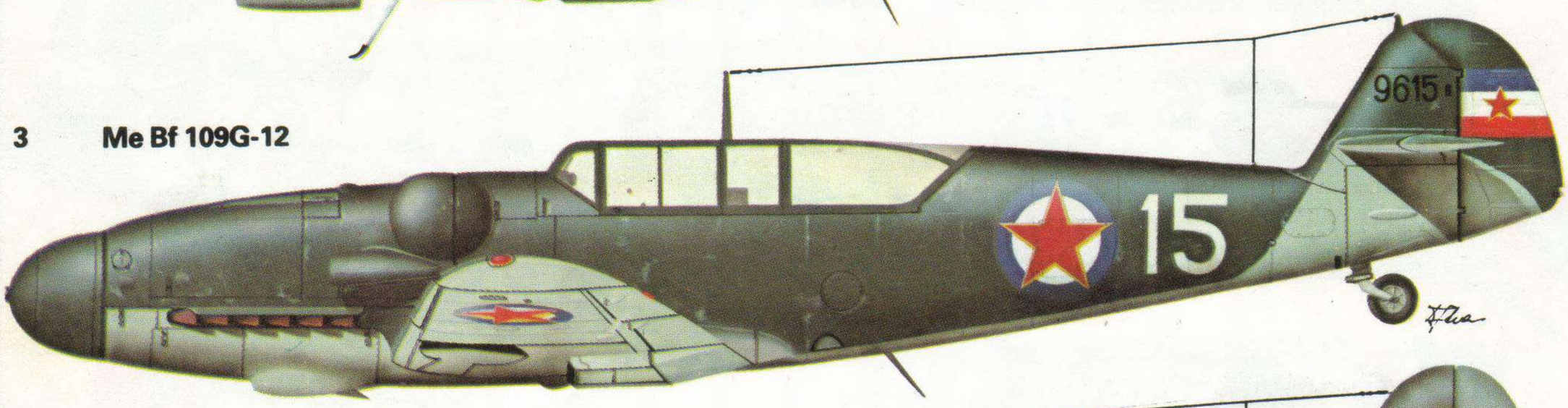
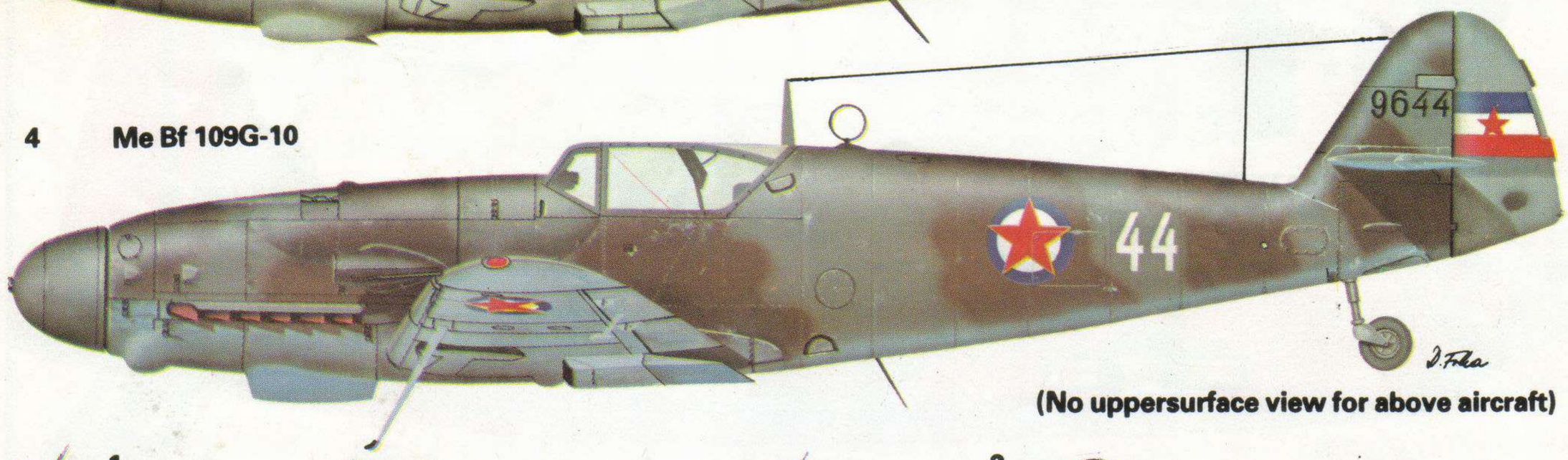


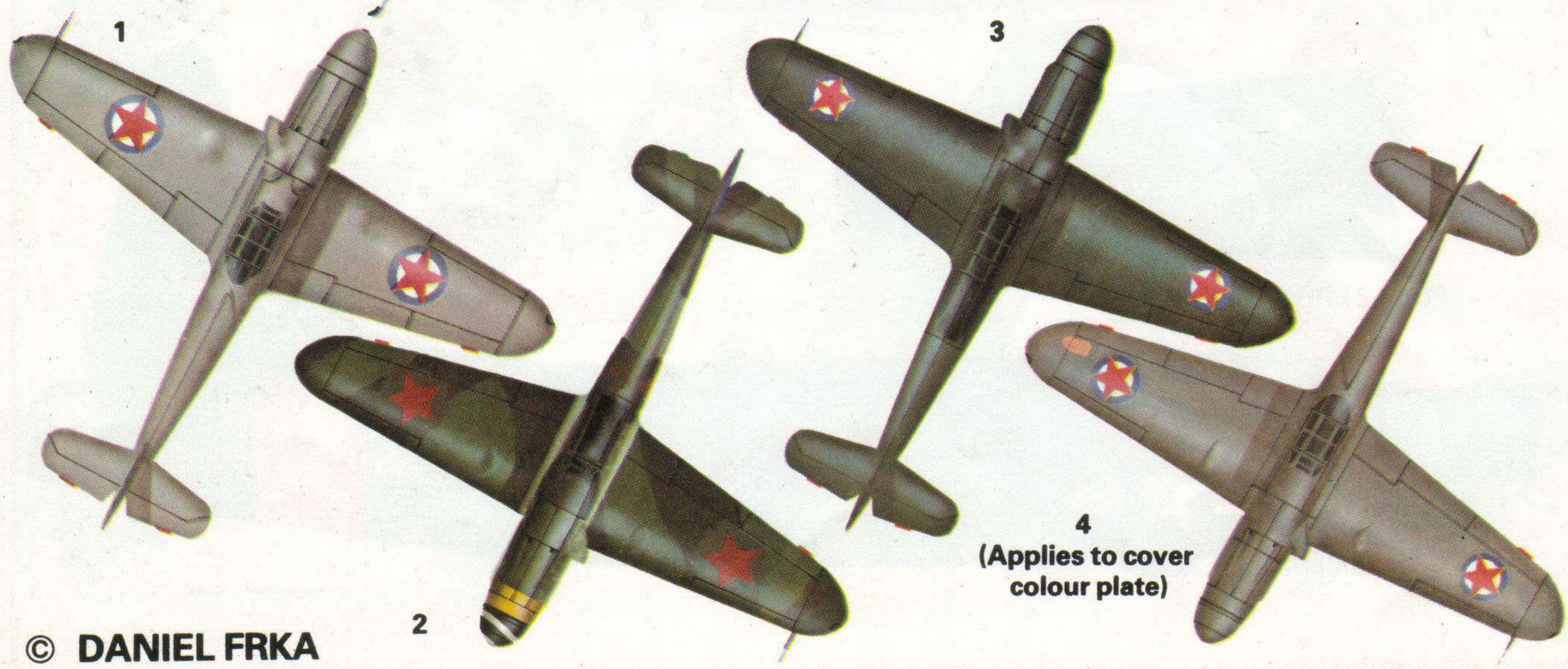
3 **Me Bf 109G-12**



4 **Me Bf 109G-10**



(No uppersurface view for above aircraft)

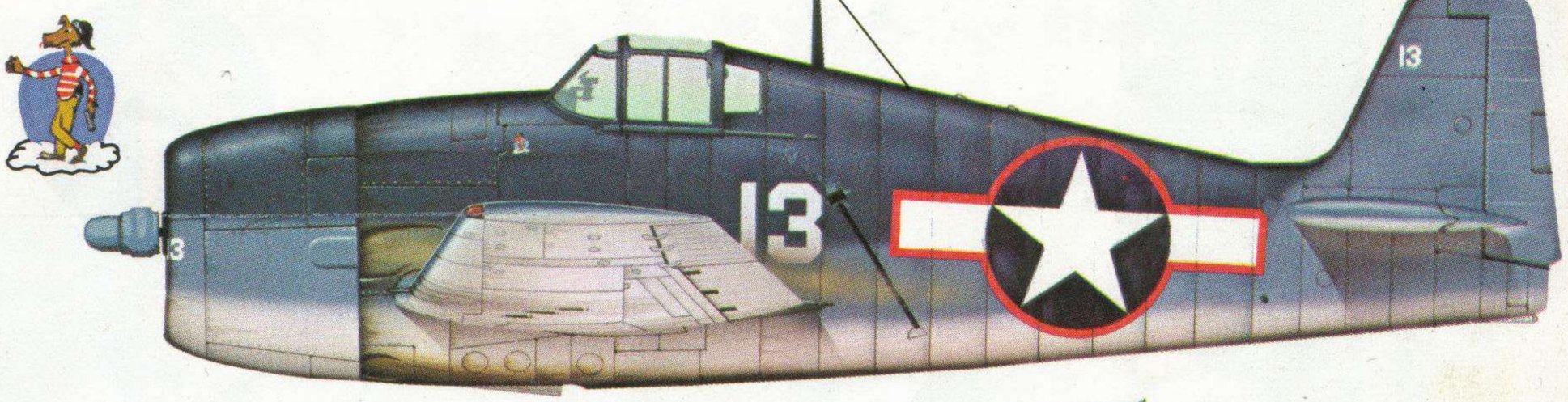


GRUMMAN HELLCAT

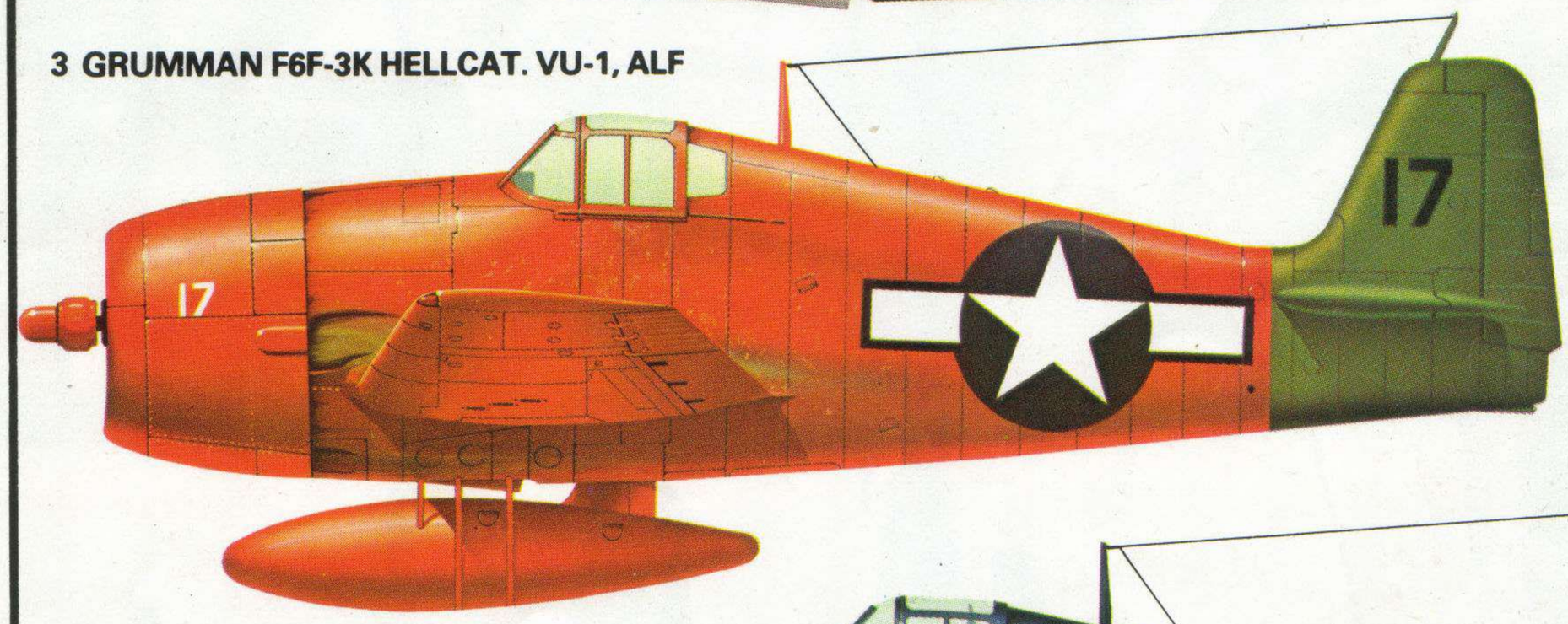
PLATE 7

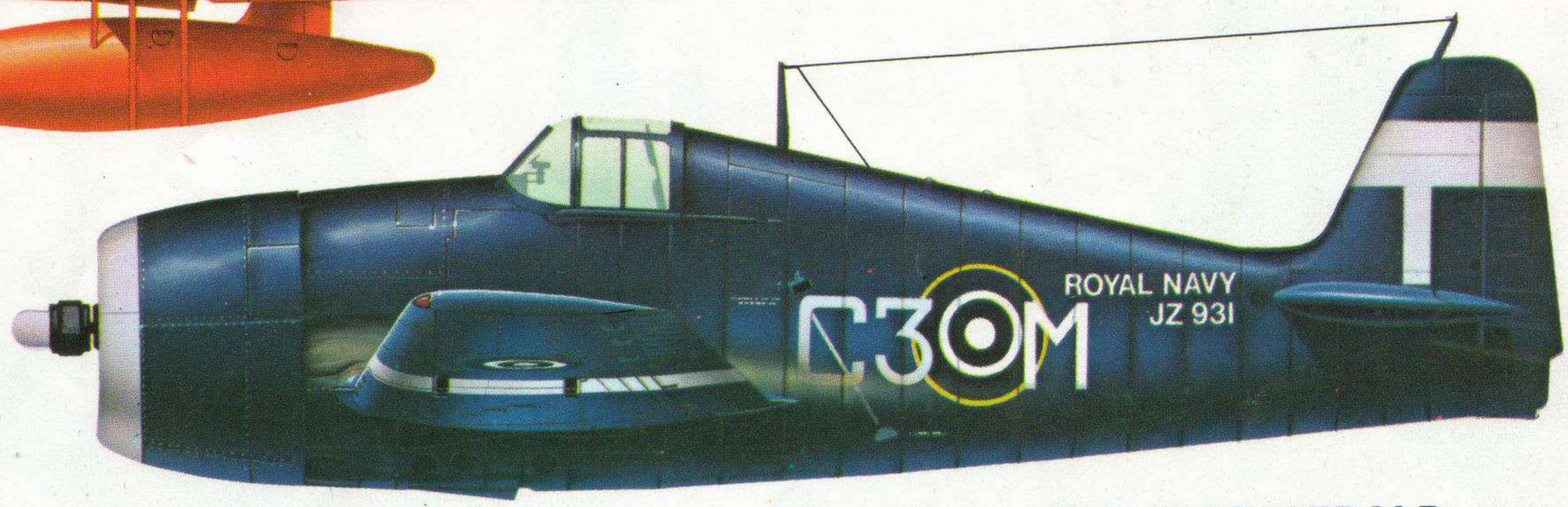
1 GRUMMAN F6F-5 HELLCAT. Air Group 36, USN

2 GRUMMAN F6F-3 HELLCAT. VF-16, USN

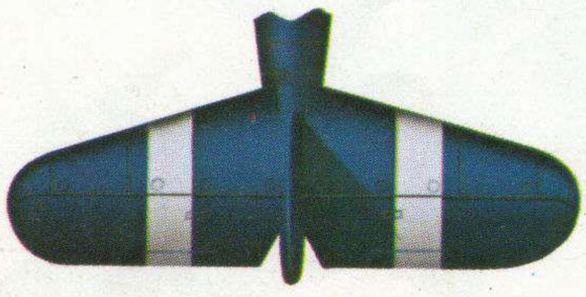


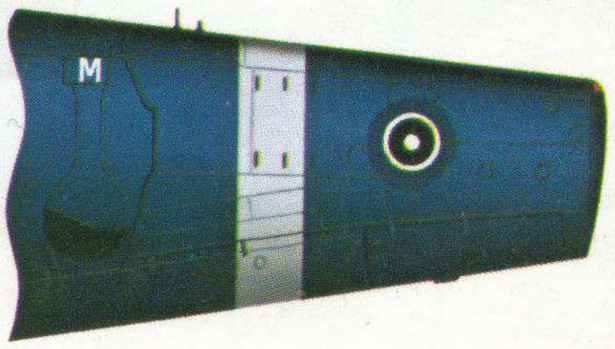
3 GRUMMAN F6F-3K HELLCAT. VU-1, ALF

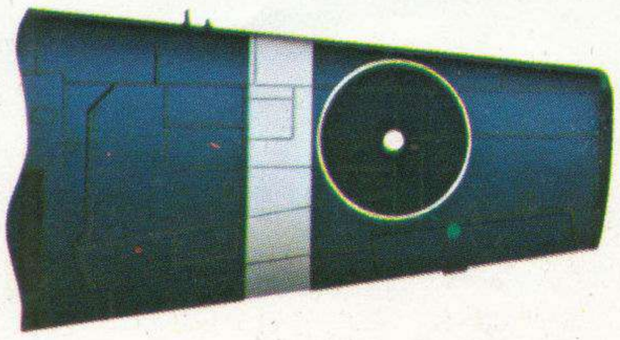




4 GRUMMAN F6F-5 HELLCAT. 800 Squadron, RN.







HANDLEY PAGE VICTOR

1
VICTOR K2 55 Squadron RAF

2
VICTOR B2. 139 Squadron RAF

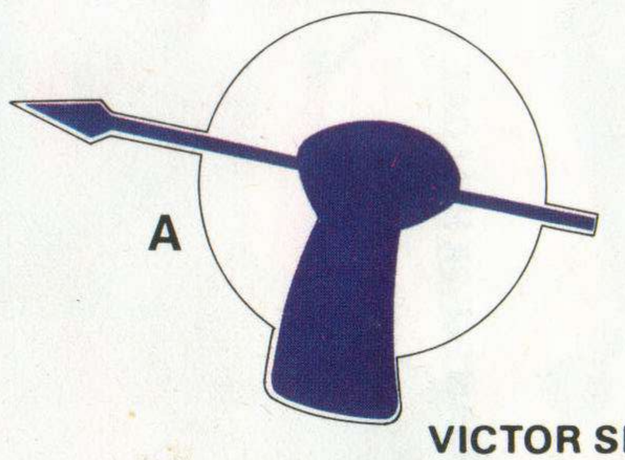
139 Squadron

D

VICTOR K2 55 Squadron
1A

55 Sqn

A



232 OCU

B

57 Squadron

C

VICTOR SR2. 543 Squadron RAF 3

PLATE 8

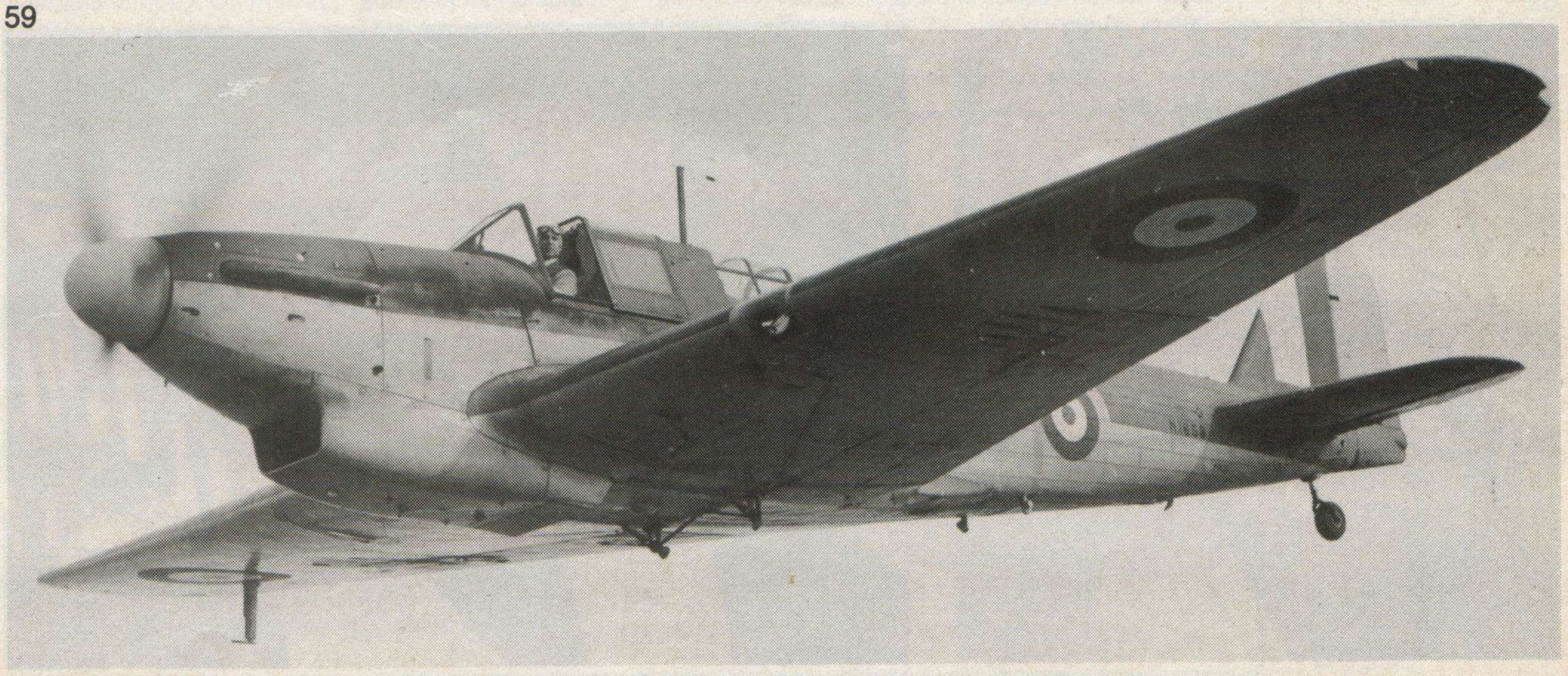
FULMAR – CONTINUED FROM PAGE 42

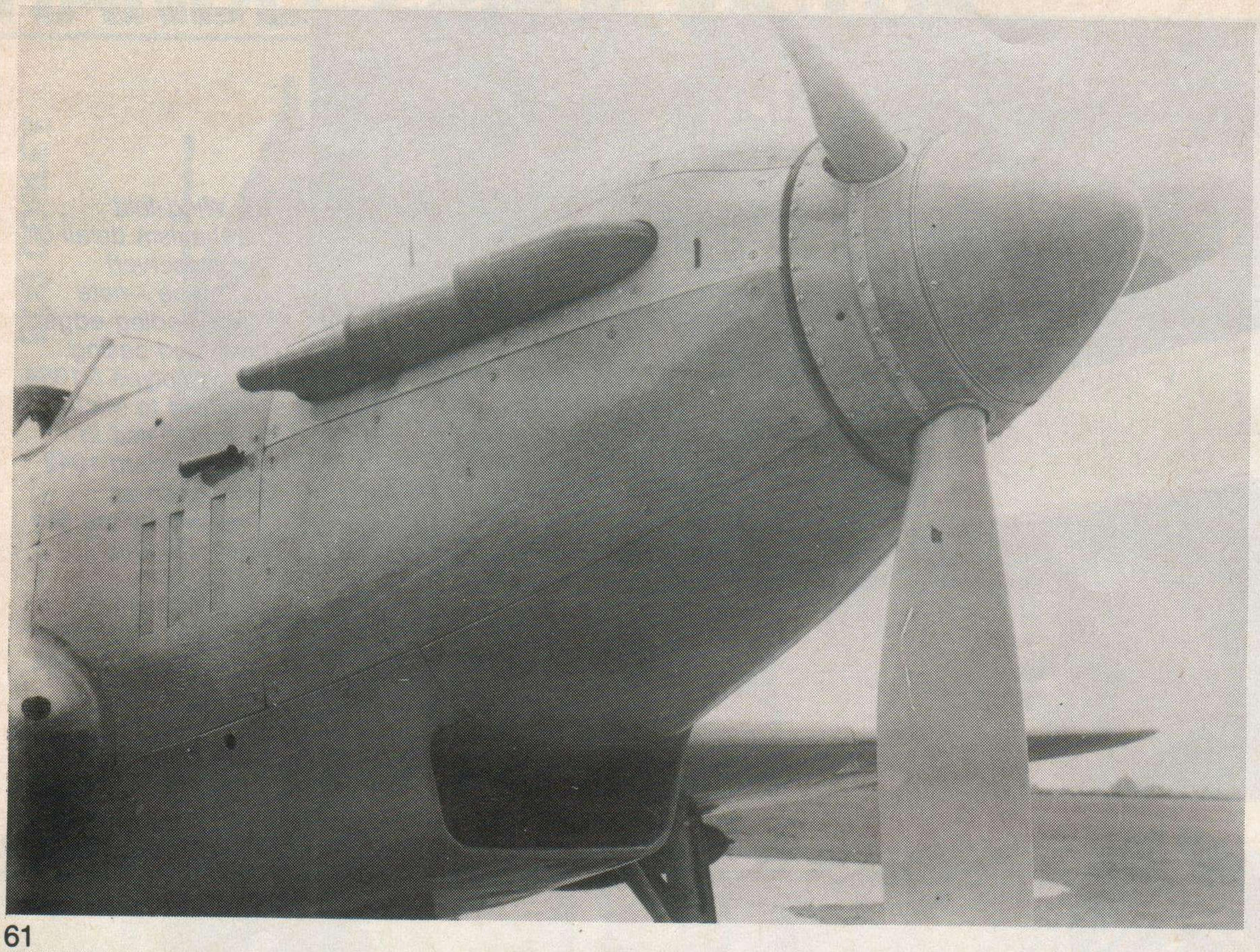
57

57. Wing-fold mechanism detail of the preserved prototype – note large leading-edge lamp and casing.
58. Prototype N1854 modified to Mk II standard and in non-standard 1942 type finish as revealed by the Sky Grey Spinner.
59. N1858 development airframe with yellow undersides. A large gas-detecting square was applied to the port tailplane of the aircraft.

58

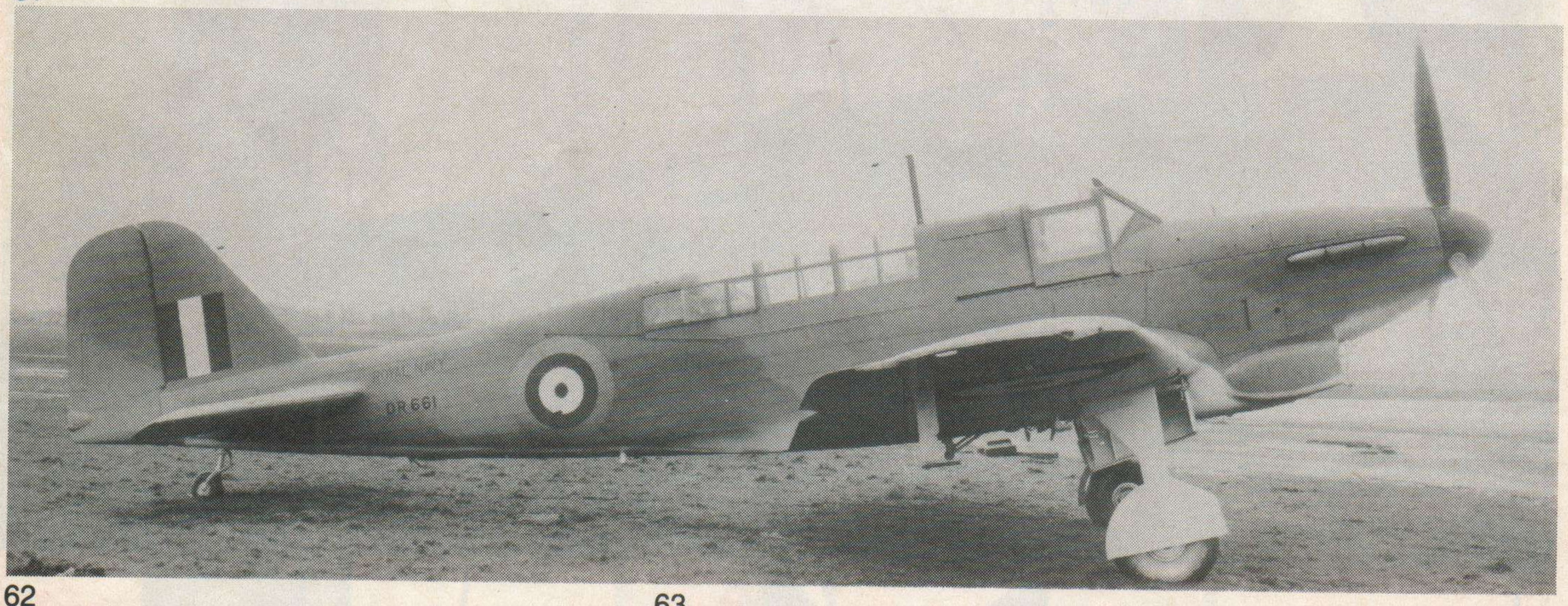
59





61

60. K7555, modified P4/34 as 08/38 prototype. Ejector exhaust fitted and Fairey metal variable-pitch airscrew. That elusive 'bump' over the Merlin cylinder banks is well shown.
61. Fulmar Mk II DR661 (F3898) April, 1942. EDSG/DSG/S finish prior to change of roundel style. Spinner, instrument panels and consoles were in Night, wheel well and cockpit interiors: Aircraft Grey Green.
62. Rear cockpit, chartboard extended, of Fulmar mock-up.
63. Wing fold mechanism lock on preserved prototype at Yeovilton.



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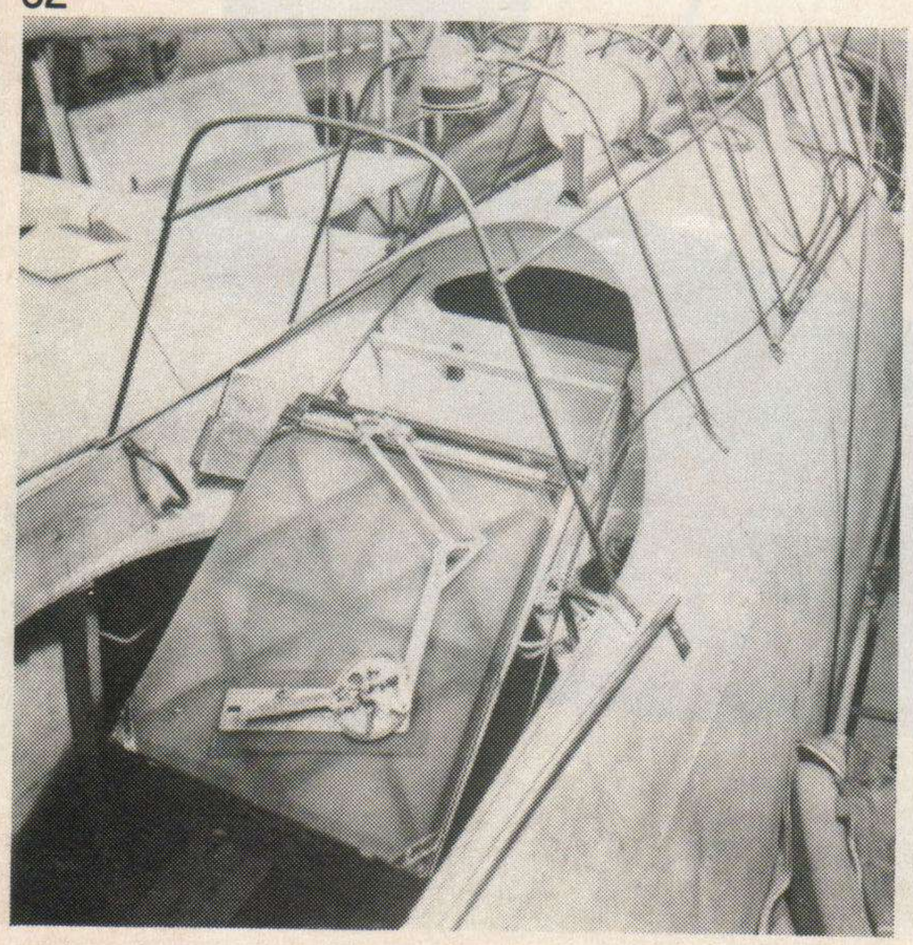

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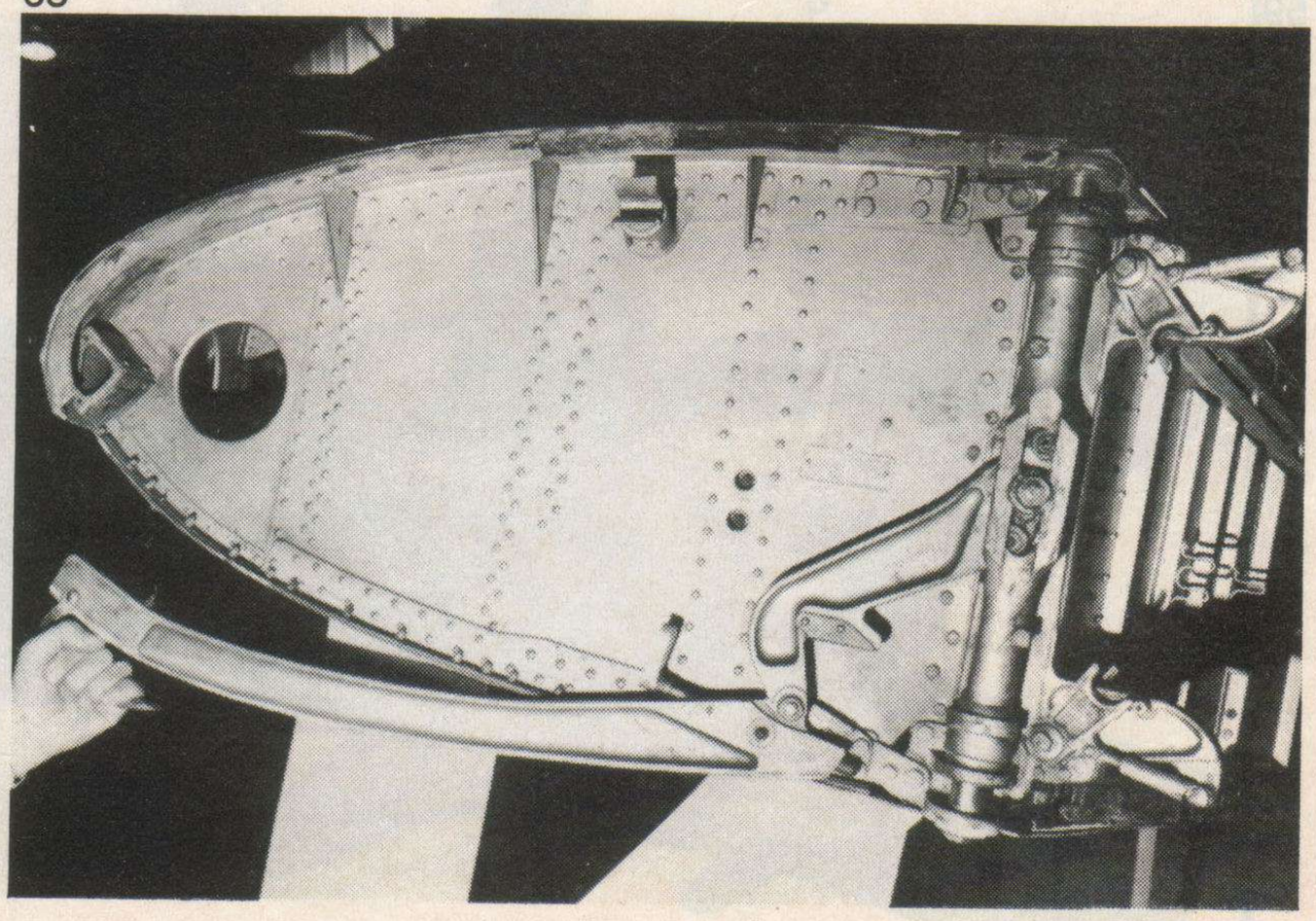


YUGOSLAVIAN Bf109 GUSTAVS

64

A WARPLANE SPECIAL Exclusive.
Story by D Brašnović

At the end of 1944, a great number of Yugoslav pilots flew sorties over their own country, some joining the 1st or 2nd squadrons (No. 352 and 351 RAF) and the others fighting with the Russians in their Group of Air Divisions. Despite this, there were never enough aircraft to support the ground troops of the Yugoslav People's Liberation Army which fought heavy battles against strong German and Quisling forces. Therefore every aircraft found, or captured, on enemy airfields was a welcome reinforcement. These aircraft were repaired and immediately used by some of the pilots that joined the partisan forces after the occupation of Yugoslavia.

It is known that in October 1944, at least 10 Messerschmitt 109s (probably G-6 and G-10 variants) were found on the Kovin airfield in Banat. Half of them were given to the Russians who had taken part in operations with the Yugoslavian liberation army. The rest of the *Gustavs* belonged to the Yugoslav army. These machines were repaired and served in the so-called *Eskadrila za vezu*, a squadron comprising only captured aircraft, and used for liaison duties. Two *Gustavs* were flown over from the Croat Air Force to liberated territory. On April 20, 1945, Majors Helebrant and Zastavnik, Warrant Officer Tatarević, with two other pilots, took off from Zagreb airfield with orders to attack the Yugoslav army concentrations on the Srem front. During the mission the latter pilots turned south and landed on Mostar airfield in the mountains of Hercegovina. Already there was a mixed group of captured aircraft in flying condition: JU-87B Stukas, Do-17s, Ca-313s, Fizir FP3s and Me-109 Gs. The Croat markings were hastily overpainted, red stars added and the newly-formed 'Independent Headquarter's Escadrille of Mostar Airfield, was thrown into battle.

Pilots were taken from the Croat Air Force who wanted to fight with the Liberation army. At the beginning of May 1945, the *escadrille* bombed Quisling forces and fortifications in a corner between the Sava and Bosna rivers. *Gustavs* escorted the bombers and joined in the ground strafing. Helebrant and Tatarević flew alone for a few more operations, diving through the canyons, strafing the retreating enemy in hazardous low-level missions, through heavy flak. Luckily they survived two days in this style before they both lost orientation and made forced-landings far from their base. One machine (Helebrant's 2103) was later repaired. It is interesting to note that the last air operation against the German army was made on May 28, 1945, when a Stuka, escorted by Me-109 G-10s, bombed some troops who had refused to surrender. Shortly after that, the war finally ended.

After the war, 17 *Gustavs* were concentrated at the Zagreb and Beograd airfields. They were not used until

64. Two pilots of the 'Independent Headquarters Escadrille' pose in front of a Me Bf109G10. Left, Me Bf109G-2 9663, as depicted in colour on the cover, of the 44th Fighter Division, Zemunik Zadar airfield, 1951. Light Grey (FS 26270) uppersurfaces and Light Blue (FS 35488) undersurfaces. This scheme was standard for all fighters of the JRV in the early 1950s. This particular aircraft is preserved in the Yugoslav Air and Space Museum, Belgrade. (An uppersurface painting of this aircraft can be found in the colour section – PLATE 6.)

1947, when Yugoslavia received 59 more Messerschmitts (mostly G-2, G-10 and G-12 variants) plus 15 spare engines in exchange for a large number of metal tail surfaces for Bulgarian IL-2 *Sturmoviks*. All these aircraft were transported to Zagreb where they were repaired, checked over and painted. *Gustavs* formed the 83rd Fighter Wing based at Cerklje airfield. This Wing also gave a number of their *Gustavs* to the newly-formed 172nd Fighter Wing, based on the same airfield.

As the dangerous years went by, the *Gustavs* were not written off. Training of young pilots started on nine aircraft, three of them two-seaters. On November 16, 1950, the 172nd, its training completed, moved to the Adriatic coast at the Zemunik airfield near Zadar. The 83rd and 172nd both flew *Gustavs* on patrol sorties alongside the Italian frontier during confrontation with Italy for the free zone of Trieste. Each wing flew 50 hours daily with few accidents. In August 1952, the preparations were made for receiving new fighter types, and so the *Gustavs* were gradually withdrawn from active service.

During their service life with the JRV (*Jugoslavensko Ratno Vazduhoplovstvo*) all the *Gustavs* underwent some changes. Radio sets were exchanged in favour of the ARS-10 type for compatibility with all other Soviet-built aircraft. Photo versions received a new camera, the K-24. On a number of training aircraft a gun camera (G-45) was fitted to aid in combat training and dummy dogfights while the first-aid kit was moved closer to the cockpit. It is interesting to note that all G-12 two-seaters had the so-called 'Galland hood' or 'Erla haube' fitted over the second seat. This modification was probably carried out while the machines served with the Bulgarians.

Today, two examples of the Me-109G exist in Yugoslavia. One, restored by the Air and Space Museum, and the other, a G-10, is awaiting restoration. Both aircraft will one day be displayed in a new building of the Air and Space Museum near Beograd Airport.

MESSERSCHMITT Bf 109G

Available models (non-flying)

Model	*Manufacturer*	*Scale*
Me Bf 109G-6	Revell	1/32nd
Me Bf 109G-10	Revell	1/48th
Me Bf 109G-6	Otaki	1/48th
Me Bf 109G-6	Fujimi	1/48th
Me Bf 109G-6	Airfix	1/72nd
Me Bf 109G-6	Hasegawa	1/72nd
Me Bf 109G-10	Heller	1/72nd

CONSULTED REFERENCES

Books

The Augsberg Eagle by W Green. Macdonald and Jane's.
German Aircraft of the Second World War by J R Smith and A Kay. Putnam.
Messerschmitt 'O-Nine' Gallery by T Hitchcock. Monogram Aviation Publishers.
Messerschmitt Bf 109 by R Grinsell. Jane's Publishing Co Ltd.
Luftwaffe Painting Guide by Smith/Pentland/Lutz. Kookaburra.
Monogram Close-up No. 6 — Gustav Part 1 by T Hitchcock. Monogram Aviation Publishers.
Monogram Close-up No. 7 — Gustav Part 2 by T. Hitchcock. Monogram Aviation Publishers.
The Last of the Eagles by J Beaman. Published by the author.
Wings of the Luftwaffe by E Brown. Macdonald and Jane's.

Magazines

Air Pictorial. May 1974.
Front. September 1981
MODEL COLOUR. Model & Allied Publications (1977).
Random Thoughts (IPMS Canada). January 1978.
SCALE MODELS. December 1978; February 1982.

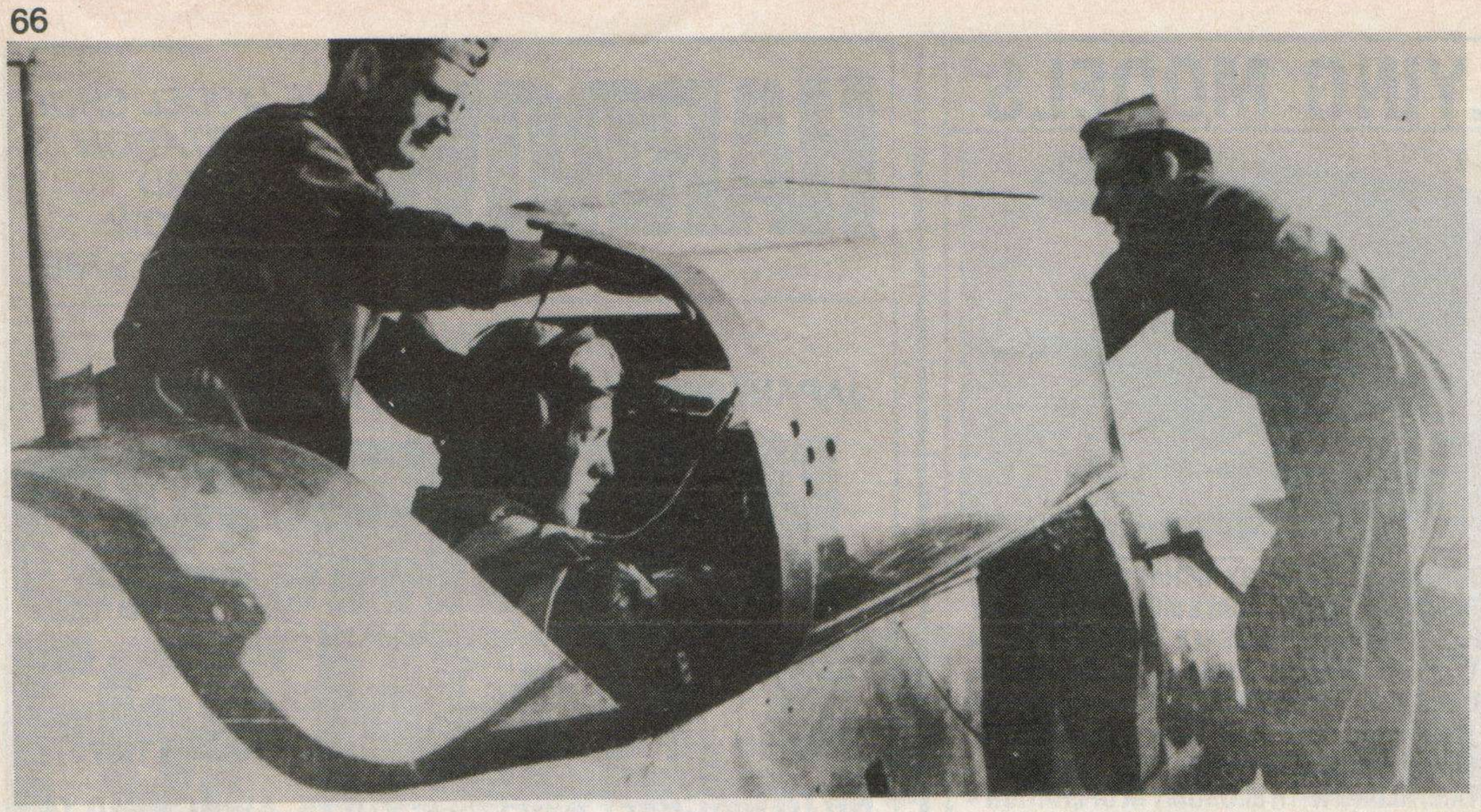
65

65. A long line-up of Messerschmitt Bf109Gs, probably on the airstrip at Cerklje. The second aircraft from the right is a two-seater with 'Erla' Hood — and all the machines are painted green on their uppersurfaces and light blue below.

With so many Me Bf109G kits and references available worldwide, one would have thought all possible alternative schemes to have been covered. Our Yugoslav authors have proven us wrong with this carefully-researched feature on an aspect of Gustav *history hitherto neglected.*

Similar features dealing with other aircraft — notably the Me Bf109e Emil *– are under preparation by the authors for future publication in SCALE MODELS – watch out for them . . .*

66

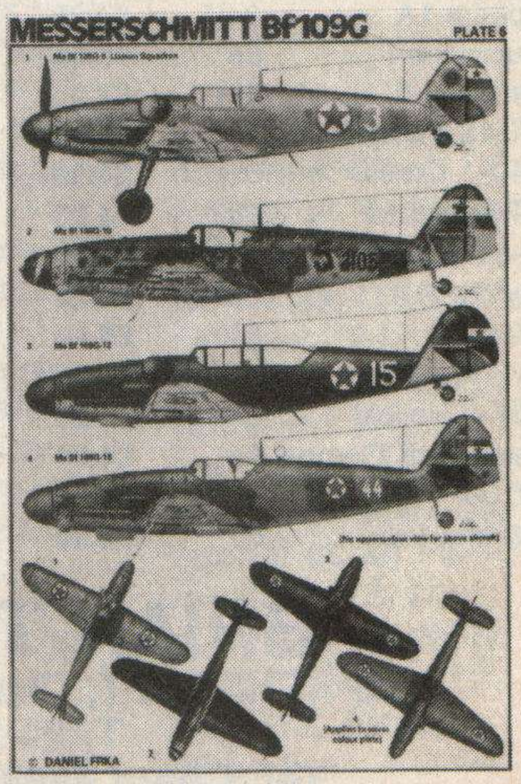


66. While one mechanic prepares to close the canopy of this Me 109G-10, his companion awaits the signal to start the engine . . .. 67. One of the two Gustavs *that 'defected' from the Croats, pictured on Mostav airfield in May, 1945. Note wavy pattern of camouflage on wing leading edges and stars painted over underwing Croat insignia. (Two USAF C47s can be seen in the background.)*

67

KEY TO PLATE 6. ME BF109Gs by D FRKA

1. Me Bf 109G-6. Liaison Squadron of the VŠ NOVJ (Vrhovni Štab Narodnooslobodilačke Vojske Jugoslavije – Headquarters of the People's Liberation Army). Zemun-Beograd airfield, winter, 1944–45. The entire aircraft is painted in Light Grey *with German* Luftwaffe *markings still barely visible under the paint. Undersurfaces in* Hellblau 65 (Methuen *24(B-C)4). Note spiral on overpainted spinner, early style national markings and battle-damage repairs.*
2. Me 109G-10. Croat serial 2105. 'Headquarters' Escadrille of Mostav Airfield, May 1945. (Flown by Tatarevič.) Fuselage colours are 81 Braunviolet *(*Methuen *3(F-H)2)/*82 Dunkelgrun *(*Methuen *(25-26)F4) over* 76 Hellgrau *(*Methuen *(23-24)A2). Undersurfaces in 76 with 81/82 on uppersurface of wings and tail. Croat markings over-painted in green and red stars added. Note that the underwing stars are the wrong way round and rear fuselage yellow band has been overpainted in 81.*
3. Me Bf 109G-12. Jugoslavensko ratno Vazudhoplovstov, 83rd Fighter Wing, Cerklje airfield, 1950. Dark Green *(close to 71* Dunkelgrun *(*Methuen *(29-30)F3) uppersurfaces and* Hellblau *65 below. Note later style markings and black serial: typical for all JRV aircraft.*
4. Me Bf 109G-10. 9644 of the 172nd Fighter Wing, Zadar 1951. This aircraft carries an unusual scheme of Dark Brown *(*Federal Standard *20117) over* Light Grey. *Note that the markings and squadron number have been much reduced in size. This aircraft is currently awaiting restoration by the Air and Space Museum staff; note also that the rudder has been replaced and repainted.*



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GRUMMAN F6F HELLCAT

68

B Robertson describes the US Navy's potent carrier fighter

The Grumman F6F Hellcat is undoubtedly one of the most famous of all naval fighter aircraft due to the vast number built (12275) and its notable operational record; the US Navy claimed the destruction of 4947 enemy aircraft in air-to-air combat by carrier-based Hellcats alone. Two prototypes, designed in 1941, took up the F6F-1 and -2 designations with the re-designed F6F-3 first flying on July 30, 1942, setting the style for initial production early in 1943. Night-fighter versions, carrying APS-4 or APS-6 radar in a pod under the starboard wing, were introduced as F6F-3Es and F6F-3Ns respectively. The main production version was the refined F6F-5, also with an F6F-5N night-fighting version.

Hellcats were armed with six wing-mounted Colt-Browning 0.50 in. machine guns, or alternatively four of these guns in combination with two 20 mm cannon. The 2100 hp Pratt and Whitney R-2800-IOW Double Wasp engine, standard for all but experimental versions, gave the Hellcat a maximum speed of 373 mph at 23400 feet. The range of 950 miles could be increased by a jettisonable fuel tank under the fuselage and smaller auxiliary tanks could be carried on inboard underwing store positions. In an offensive role, up to two 1000 lb. bombs could be carried from these inboard underwing racks or six 5-in. rocket projectiles from underwing zero-length launching rails; three each on outboard positions.

When the Hellcat was put into production, the US Navy had adopted a three-colour camouflage scheme, with *Semi Gloss Sea Blue ANA 606* (Methuen 22G4 approx.) top surfaces fading to *Intermediate Blue ANA608* (22D4 approx.) on fuselage sides to meet *Insignia White* undersurfaces. But in March 1944, *Semi Gloss Sea Blue* was adopted as the overall colour for naval fighters and extended to all carrier-borne aircraft the following June. This description of *Sea Blue*, in reality a very dark naval blue, was generally referred to as *Midnight* or *Midnite Blue*.

On the dark finish, the blue circle of the United States national insignia barely contrasted so that, functionally, the national markings on Hellcats were a large white star with white bands each side. These were displayed on fuselage sides and on port upper and starboard lower wing surfaces only. While this applied to the vast majority of Hellcats, early production aircraft went through a series of insignia changes until August 1943 when red was finally eliminated from the insignia for the rest of the war.

The display of unit markings varied greatly. For 1943, the officially decreed markings were 12 in. letters forward of the fuselage roundel to indicate the number of the aircraft in its squadron, prefixed by F for its fighting role. For the years 1944–45, numbers only were specified; 16 ins. high on fins and rudders in Insignia White. In practice the numbers were presented additionally, or alternatively, on cowlings or fuselage sides.

Hellcats bore their type designation in 1 in. high white characters on their rudders, one-third down the distance between rudder tip and tailplane. The Bureau of Aeronautics serial number was similarly painted in white, matching figures on the fin at the same level. The designations and their number ranges were: XF6F-1, also the XF6F-4 prototype, 02981; XF6F-2 modified to 3, 66244; F6F-3 (including -3E and -3N), 04775–04958, 08798–09047, 25721–26195, 65890–66243, 39999–43137; F6F-5 (including -5N), 58000–58999, 69992–72991, 77259–80258, 93652–94521. Two F6F-5 airframes, 70188 and 70913, were fitted with more powerful P and W R2800-18W engines as XF6F-6s. Postwar, in 1947, designations and serial numbers were re-located at the rear fuselage and displayed in larger form. Some of the F6F-5s remaining in use were modified to F6F-5P reconnaissance aircraft and others as F6F-5K target drones; the latter used operationally against North Korean targets in 1952.

Offset from US Navy production (1943–45) were 252 F6F-3 and 925 F6F-5/5Ns for the Royal Navy, where the respective versions were classified Mks I and II respectively, the fighter versions were given the role prefix F and the 'N' night-fighter versions the letters NF. These Hellcats were re-numbered in British service: FI, FN320–449, JV100–221; FII, JV222–324, JW700–784, JW857–899, JX970–964, JX968–999, JZ775–827, JZ912–946, JZ960–964, JZ968–994, KD118–152, KD158–160, KE118–159, KE170–214, KE220–265; NFII, JX965–967, JZ890–911, JZ947–959, JZ965–967, JZ995–999, KE108–117, KE153–157, KE160–169, KE215–219. These numbers were displayed in 4 in. characters below the words 'ROYAL NAVY' on the rear fuselage, black on grey surfaces, white on Dark Blue.

68. Royal Navy Hellcat at Roosevelt Field, Long Island, New York, USA circa October 1943. Note serial FN 355 roughly rendered in chalk on the engine cowling which identifies this aircraft as an F6F-3 Hellcat Mk I. The type was allegedly named Gannet for the Fleet Air Arm when first ordered . . .

The FIs were given the British Temperate Sea Scheme of a disruptive pattern of *Dark Slate Grey* and *Extra Dark Sea Grey* with *'Sky'* undersurfaces. The Mk IIs in the main retained their US Navy overall finish. (See Fulmar feature for Methuen refs.)

The Hellcat entered RN service in mid-1943 with No. 800 Squadron and eventually served in Nos 808, 881, 885, 888, 889, 891, 896, 898, 1839, 1840, 1844 and 1847 Squadrons. Those in the European and Atlantic Theatres bore RAF Type C roundels, those in the Indian Ocean SEAC roundels and those with the Pacific Fleet, from March 31, 1945, adopted white bands each side of the roundel to conform with American aircraft and, similarly, limited the wing roundels to port upper and starboard lower surfaces only. At one point, to avoid mis-identification as Japanese fighters of the same basic configuration, white bands were marked around mainplanes, tailplane, fin and rudder, and the front of the cowling was also painted white. Unit identification and individual aircraft letters were normally placed each side of the roundel in white.

The surviving Royal Navy Hellcats supplied under Lend/Lease, were returned to the US Navy in 1946. In 1951 the French Navy's *Aéronavale* acquired F6F-5 Hellcats to replace Seafires on their carrier *Arromanches* (ex-HMS *Collossus*) and these were used as fighter bombers later in Indo-China. Small numbers of F6F-5s were supplied under Mutual Aid to the naval air arms of Argentina and Uruguay.

69

70

71

69. Preserved example at the FAA Museum, Yeovilton offers opportunity for close study. Note legends on airscrew blade roots – 'DRWG No 6541A-O'.
70. F6F-5 Hellcat of 800 Squadron, Trincomalee, September 1943. This aircraft also appears in PLATE 7 of our colour centre section. Note mixed style of national insignia.
71. Grumman F6F-5 photographed in August 16, 1946. Minutiae for modellers to note include the distinctive exhaust stain, white stencil legends, bird guano beyond aerial mast (!) and doped patches over wing gunports.

GRUMMAN HELLCAT

Available models (non-flying)

Model	*Manufacturer*	*Scale*
Grumman F6F3/5 Hellcat	Hasegawa	1/32nd
Grumman F6F3/5 Hellcat	Hasegawa	1/72nd
Grumman F6F Hellcat	Monogram	1/48th
Grumman Hellcat	Otaki	1/48th
Grumman F6F Hellcat	Airfix	1/72nd
Grumman F6F5 Hellcat	Heller	1/72nd
Grumman F6F3/Mk 1 Hellcat	'MATCHBOX'	1/72nd

Plans for flying scale models Brian Taylor Plans

Grumman F6F/5 Hellcat	(R/C Power)	64 in. span

CONSULTED REFERENCES

Books

Carrier Operations in WWII. Vol. 1, The Royal Navy. Ian Allan.

Colour Schemes and Markings of US Navy Aircraft 1911–1950 by W C Kilgrain.

Famous Airplanes of the World, No. 22. February 1972. Bunrin-Do.

F6F Hellcat in Action (No. 36) by J Sullivan. Squadron Signal Publications.

F6F Hellcat by D A Anderton Jane's Publishing Co. Ltd.

The History of the Fleet Air Arm by J D R Rawlings. Ian Allan.

Grumman F6F 3/5 Hellcat. Aircam Aviation Series No. 19.

Magazines

Air Combat 1939–1945. No. 4 and No. 6, 1972.

Air International. April 1976.

Grumman F6F Hellcat. Scale drawings. *Aviation News* (7/3).

Japanese Aireview. No. 384. January 1978.

Model Aire International. Vol. 2, No. 5, 1975.

Modelworld. February 1974.

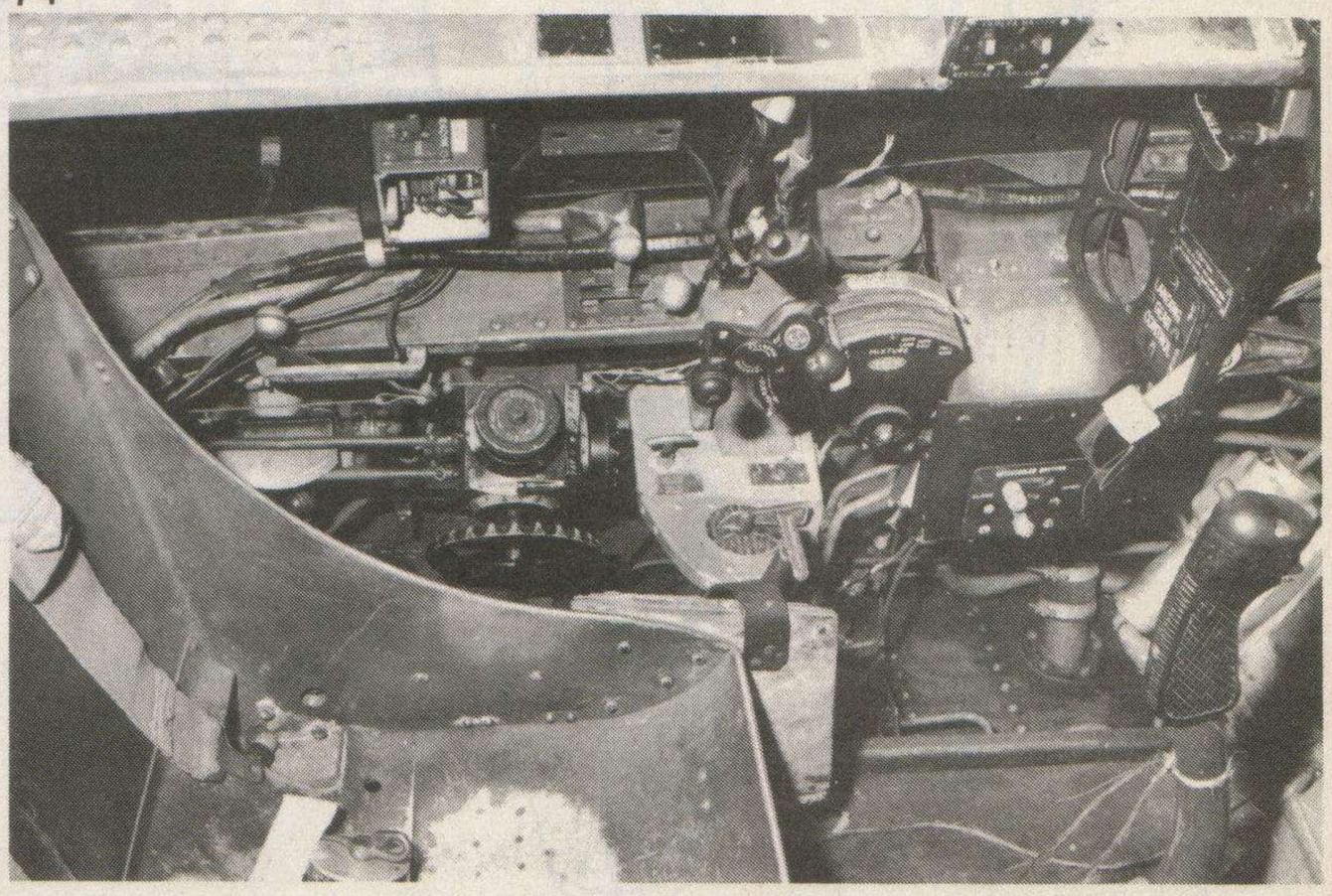
SCALE MODELS. January 1981.

Study of the preserved example at the Fleet Air Arm Museum, Yeovilton.

The 1/72nd scale drawings overleaf, by A L Bentley, are available from MAP Plans Service as Plan Pack 3045. These, a further page of drawings, together with more photographs, will be published in a forthcoming issue of SCALE MODELS. The pack also includes the drawings in 1/48th and 1/24th scales. Price is £3.25 plus 40p postage.

73

74



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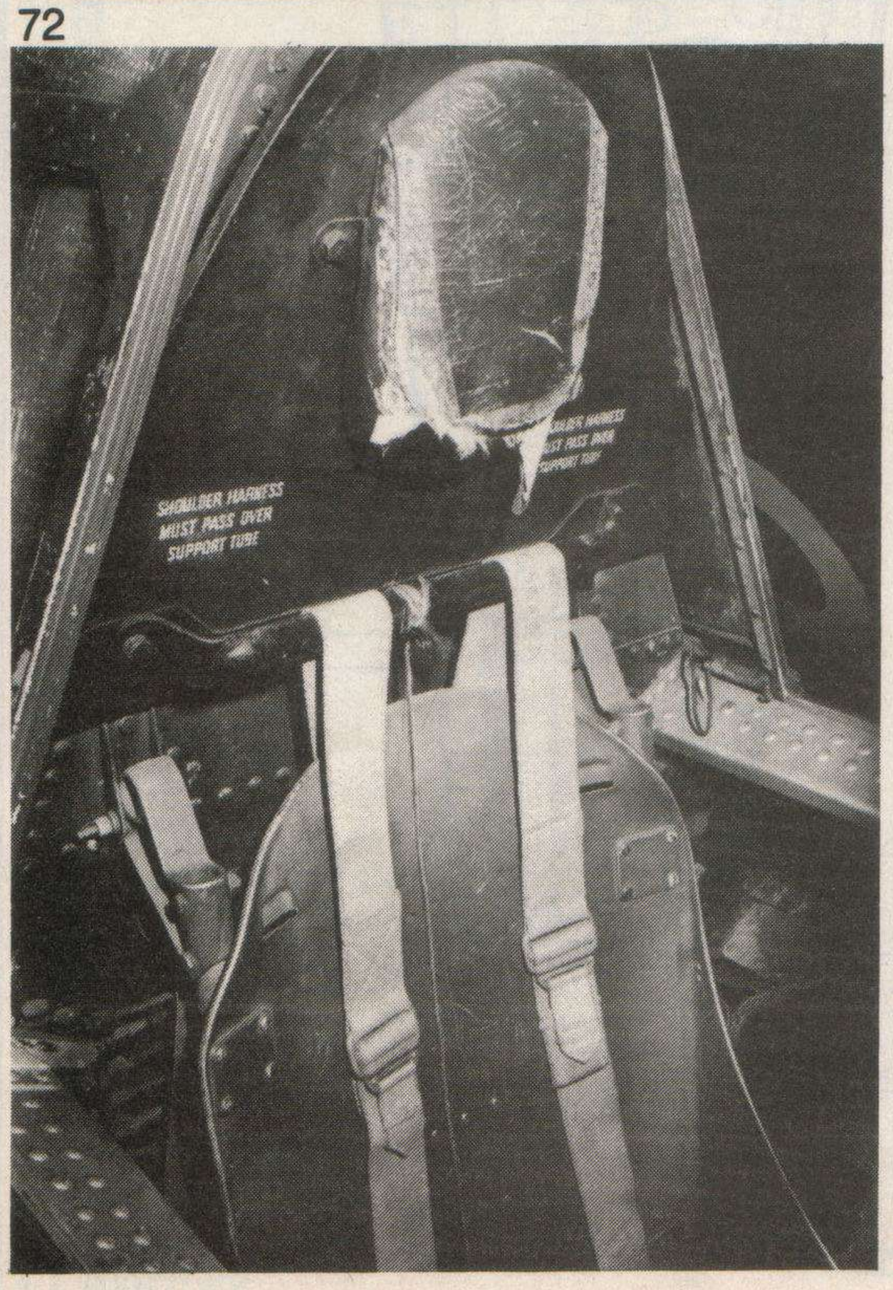

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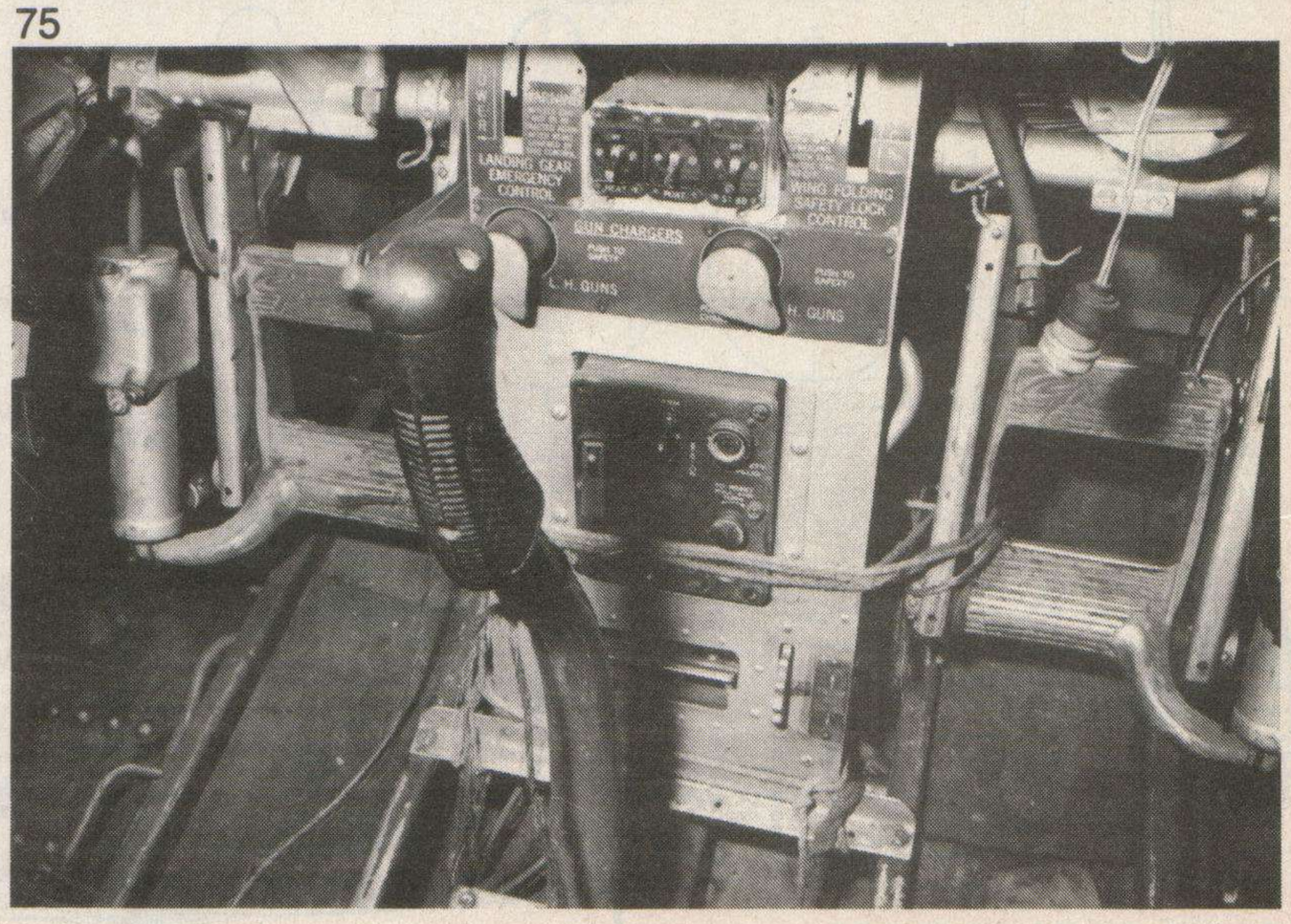
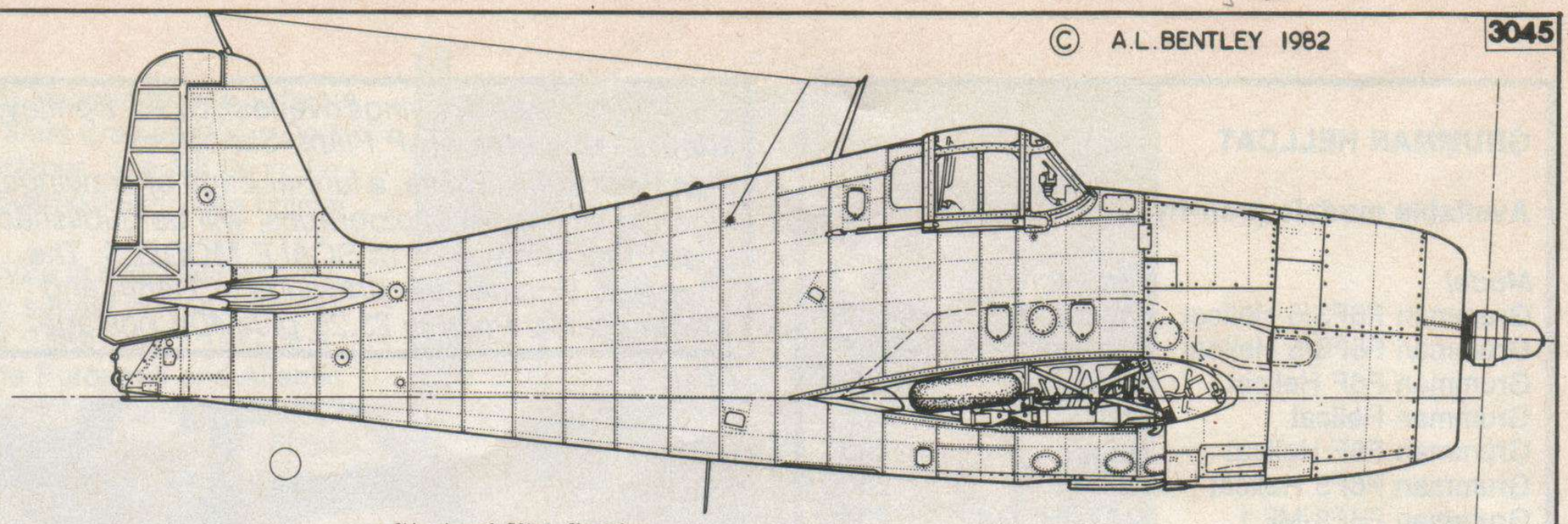
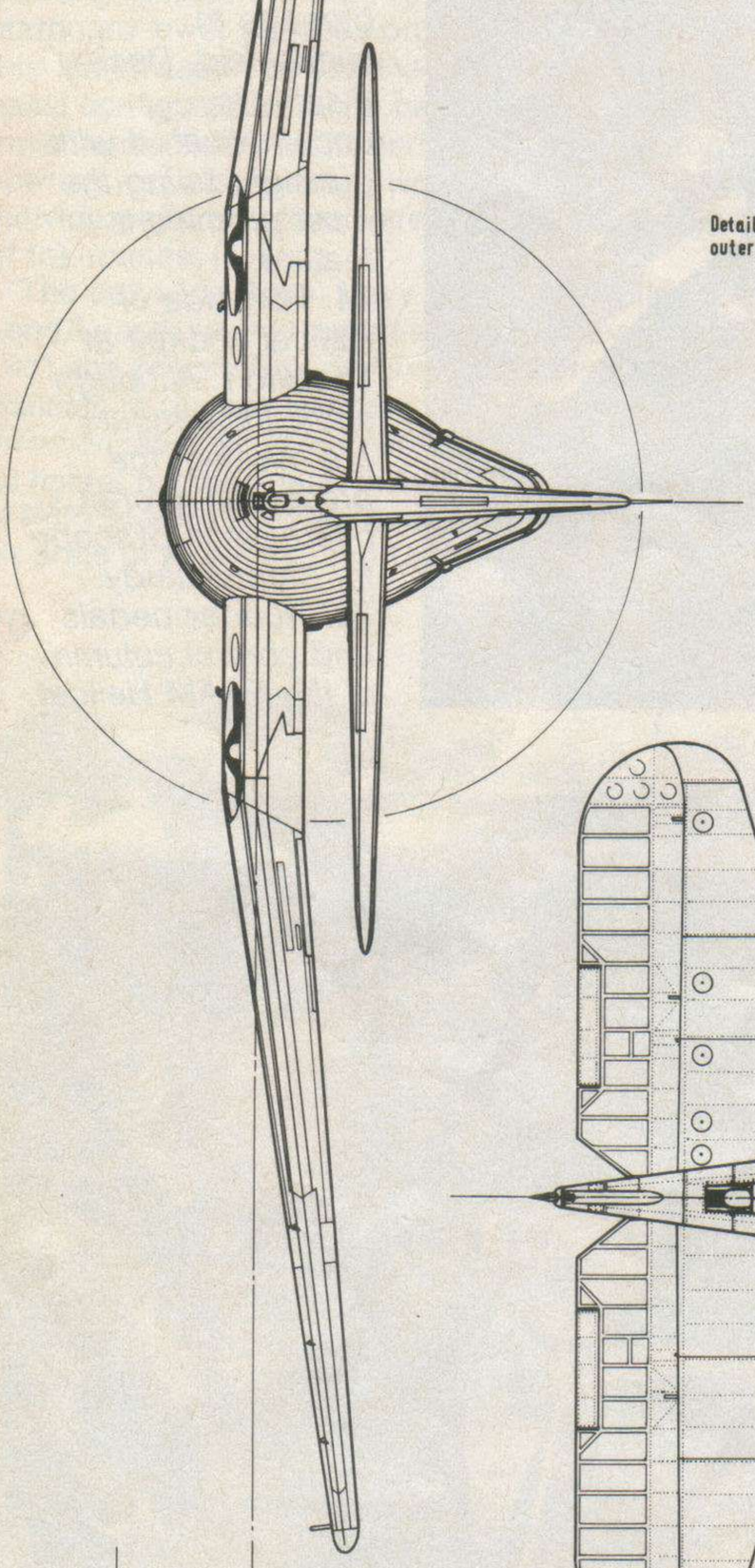


72. Cockpit rear of Yeovilton Hellcat. Note simple bar for strap support, padded head rest, and stark 'bucket' seat.
73. Cockpit of an 800 Squadron Hellcat, JV 131, reveals battle damage to windshield. Dash display is uncomplicated with gunsight being the most prominent feature.
74. Port side of Hellcat cockpit at Yeovilton. Although some instruments are missing, the preserved aircraft offers plenty of scope for careful study.
75. Rudder pedals and control column of the FAAM Hellcat.

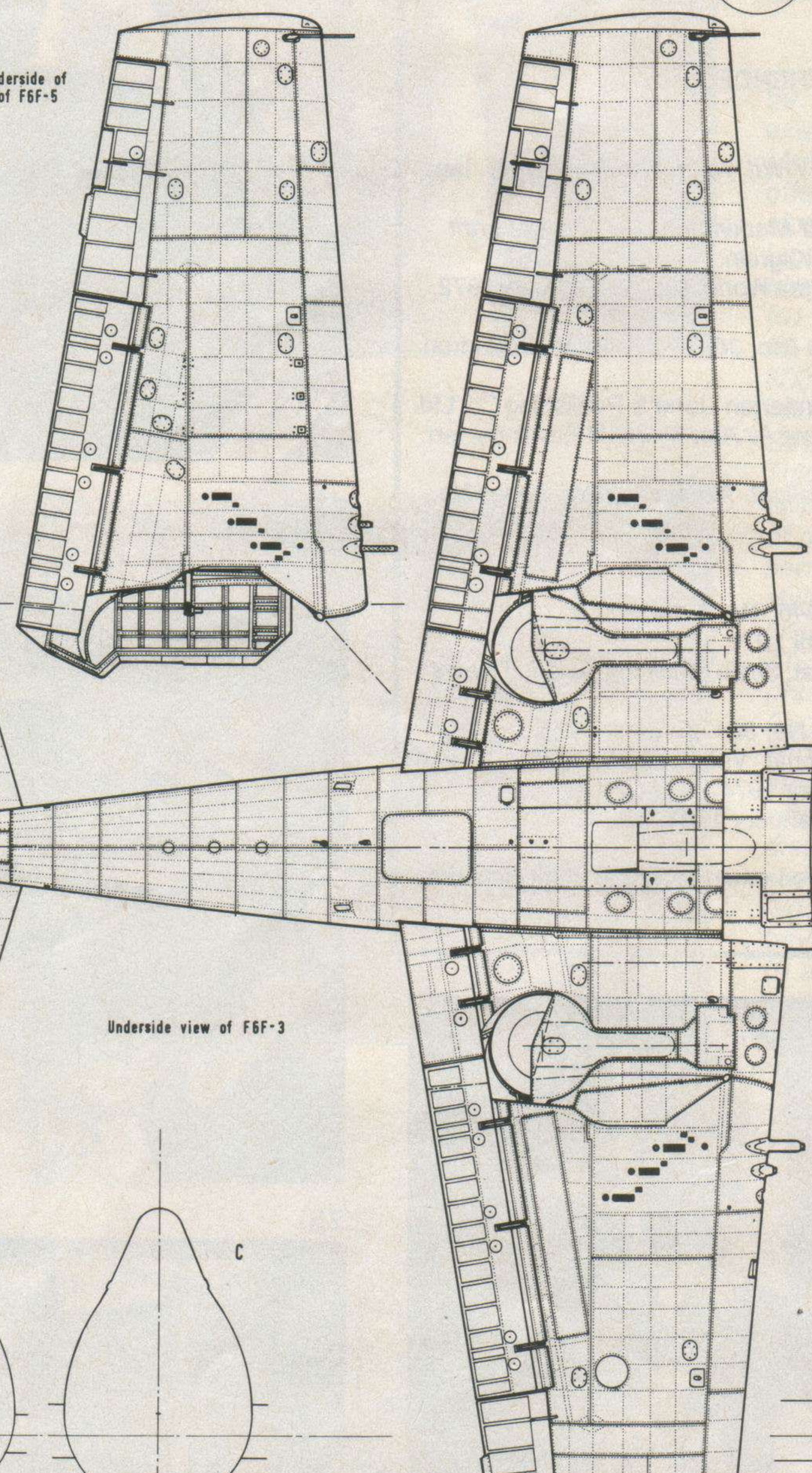
3045



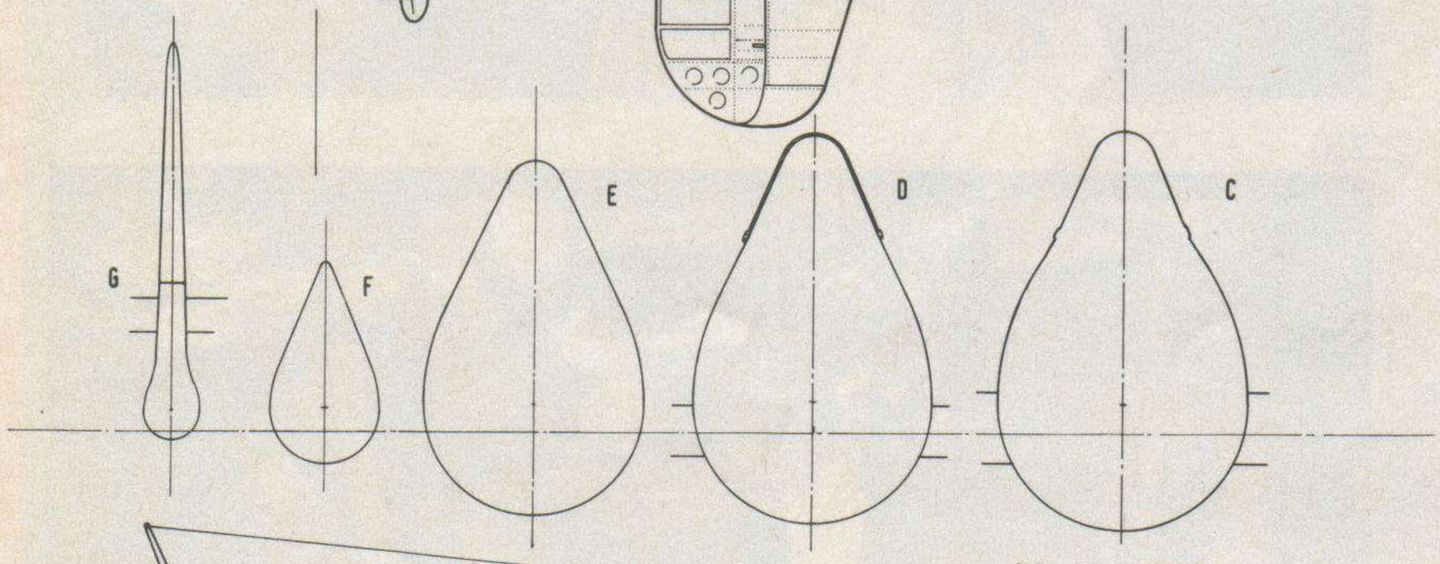
Side view of F6F-3. The outer wing has been omitted to show details of the undercarriage retracted



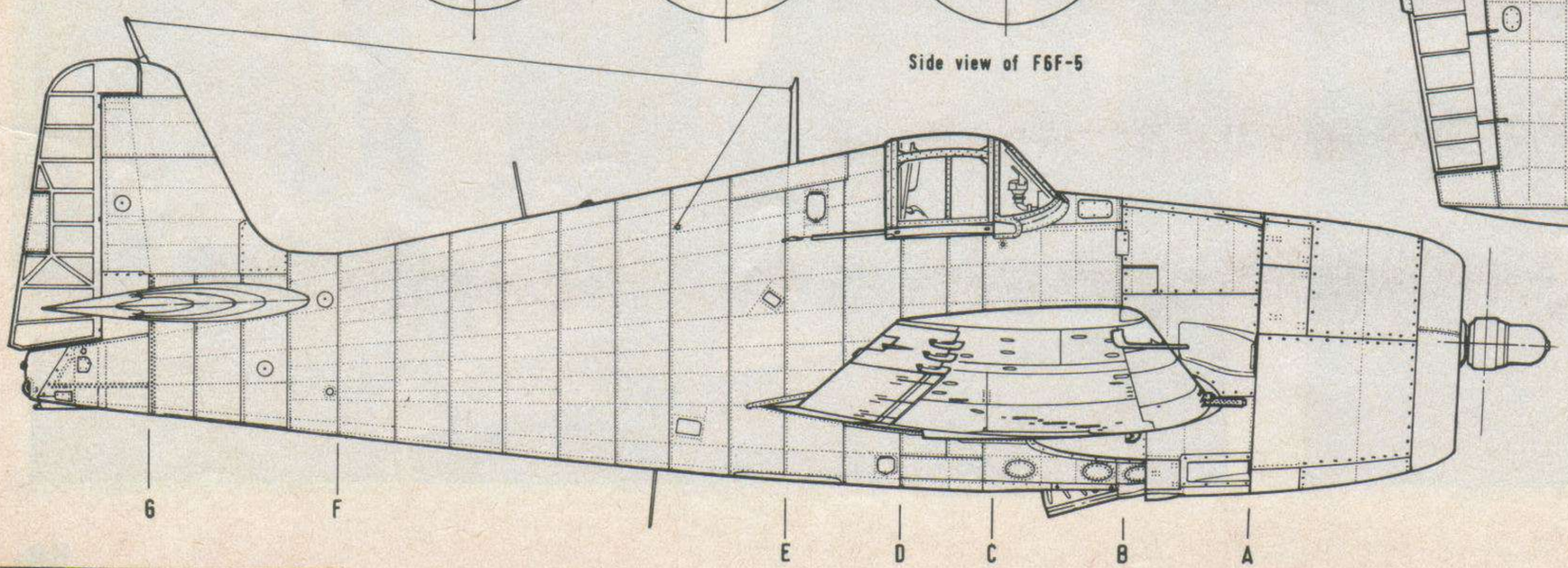
Detail of underside of outer wing of F6F-5

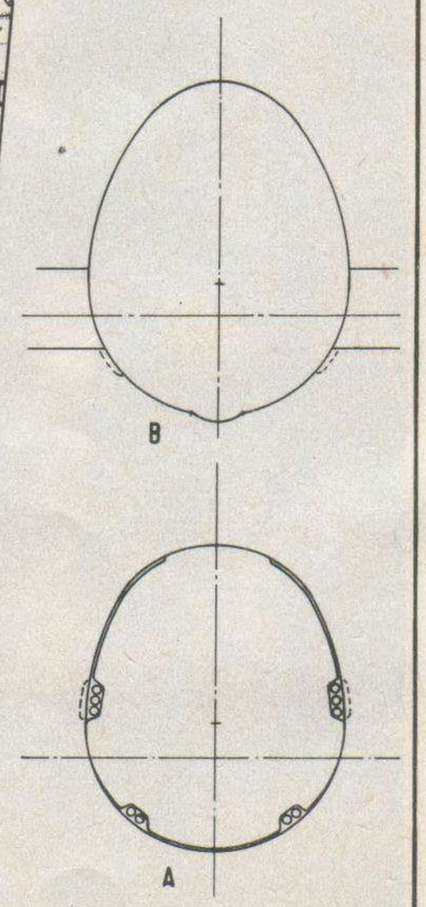


Underside view of F6F-3



Side view of F6F-5





1/72nd SCALE DRAWINGS

Scale in feet 0 1 2 3 4 5 6 7 8 9

GRUMMAN HELLCAT

3046

Side view of F6F-3 The outer wing has been omitted to show details of undercarriage

Detail of uppersurface of outer wing of F6F-5

Front view of F6F-3

Plan view of F6F-3

H

J

Side view of F6F-5P high altitude reconnaissance fighter

A L BENTLEY

1/72ND SCALE DRAWINGS

GRUMMAN HELLCAT

Scale in feet 0 1 2 3 4 5 6 7 8 9

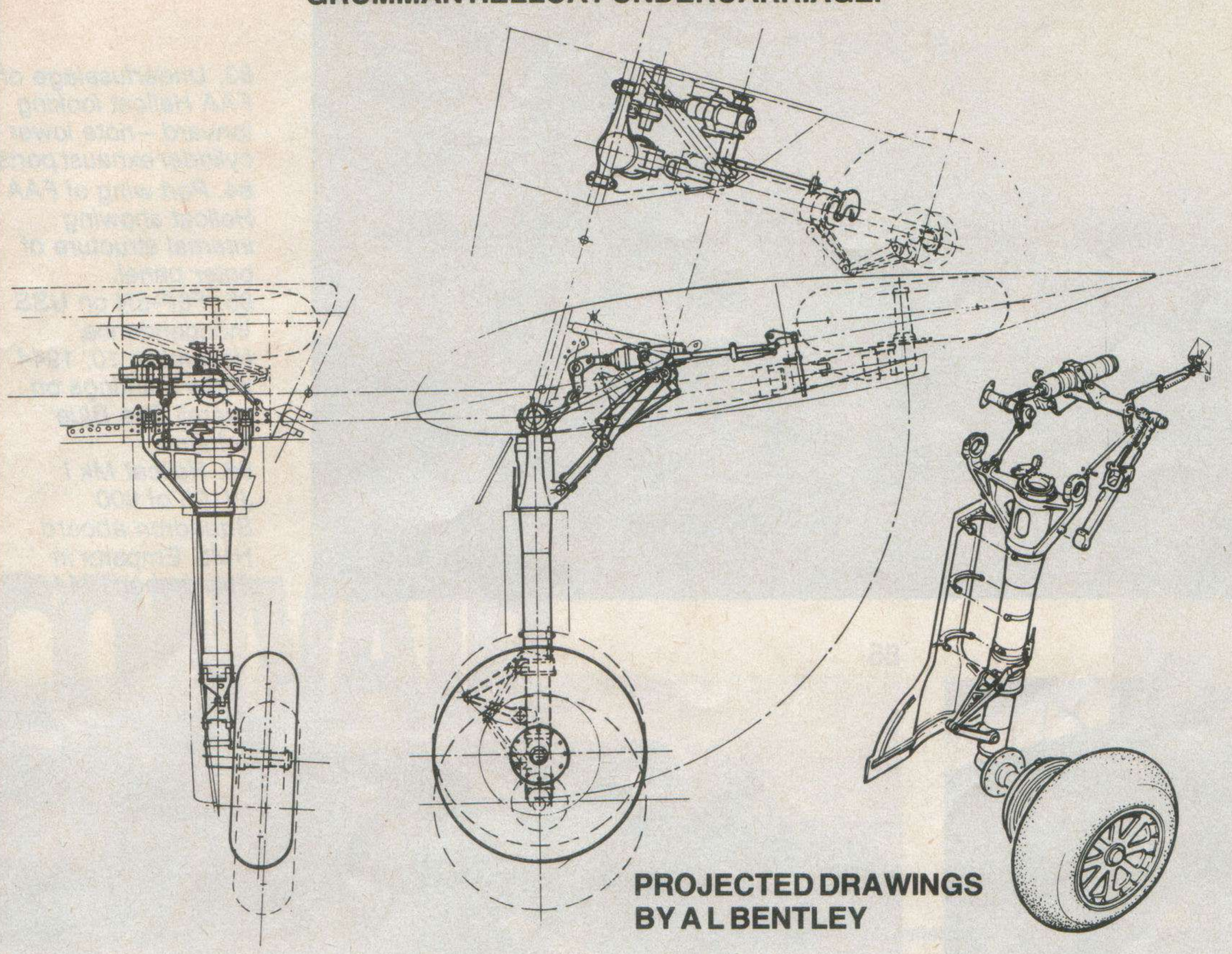
76

77

78

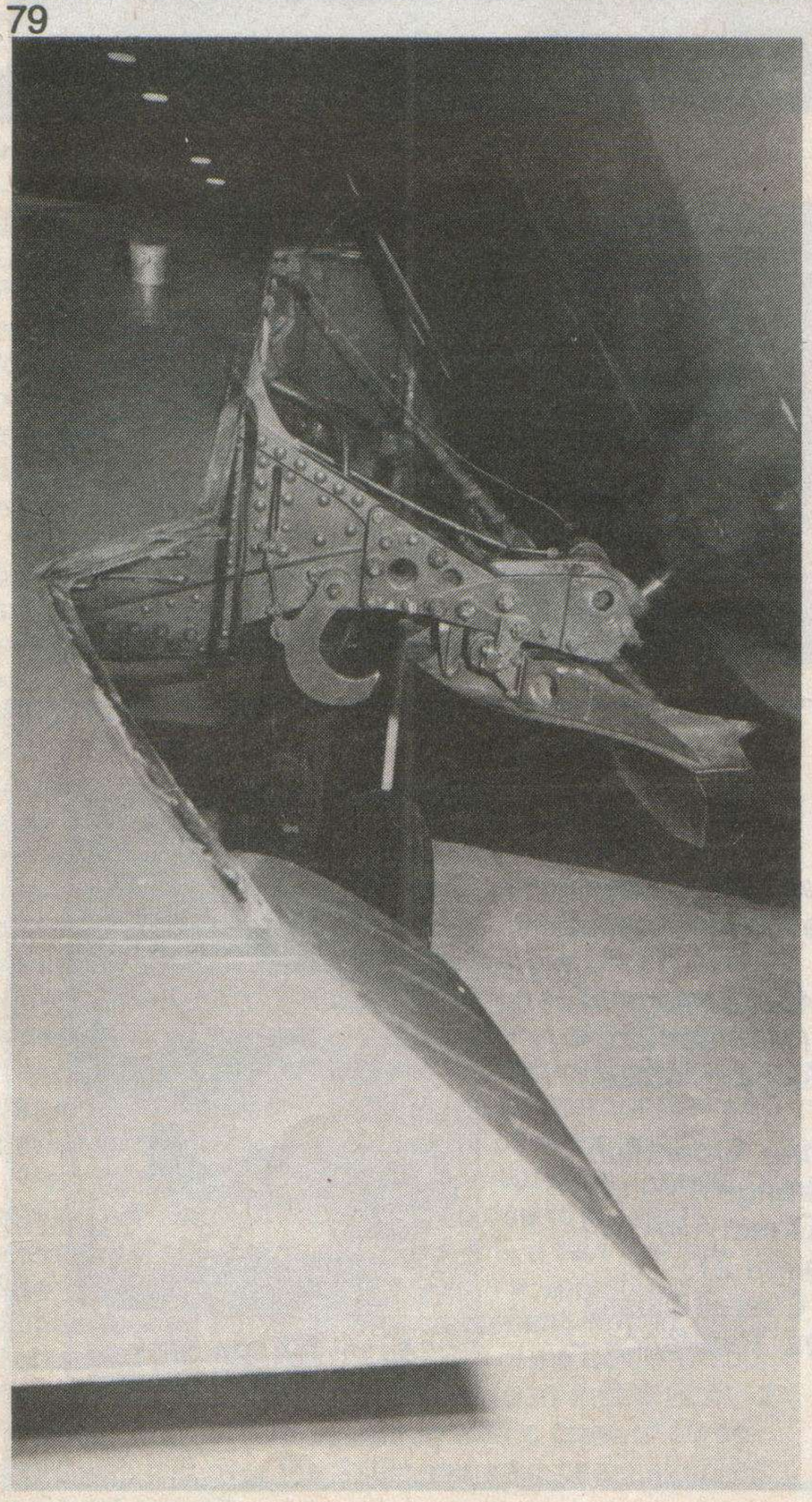
76. F6F-3 aboard USS Lexington, *November, 1943. Three-colour scheme with white numerals, black on wheel covers, and red surround to insignia.*
77. Grumman Hellcat Mk I FN327 of the Royal Navy in standard scheme of EDSG/DSG and, presumably, 'Sky' undersurfaces.
78. Grumman F6F-5N nightfighter with wing-mounted radar and flame-damped exhausts.

GRUMMAN HELLCAT UNDERCARRIAGE.



PROJECTED DRAWINGS BY A L BENTLEY

79



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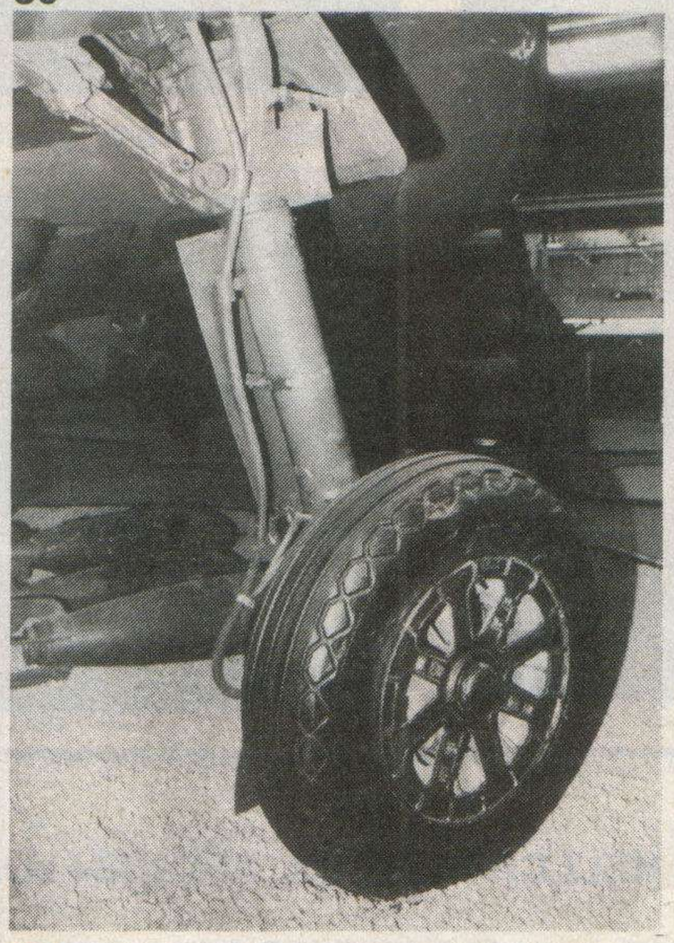

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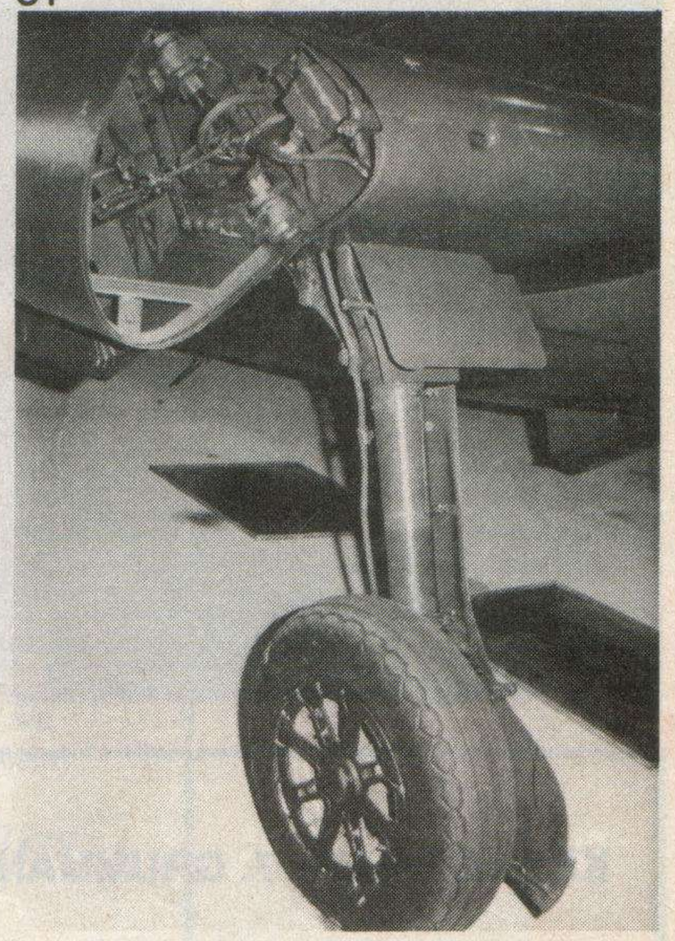
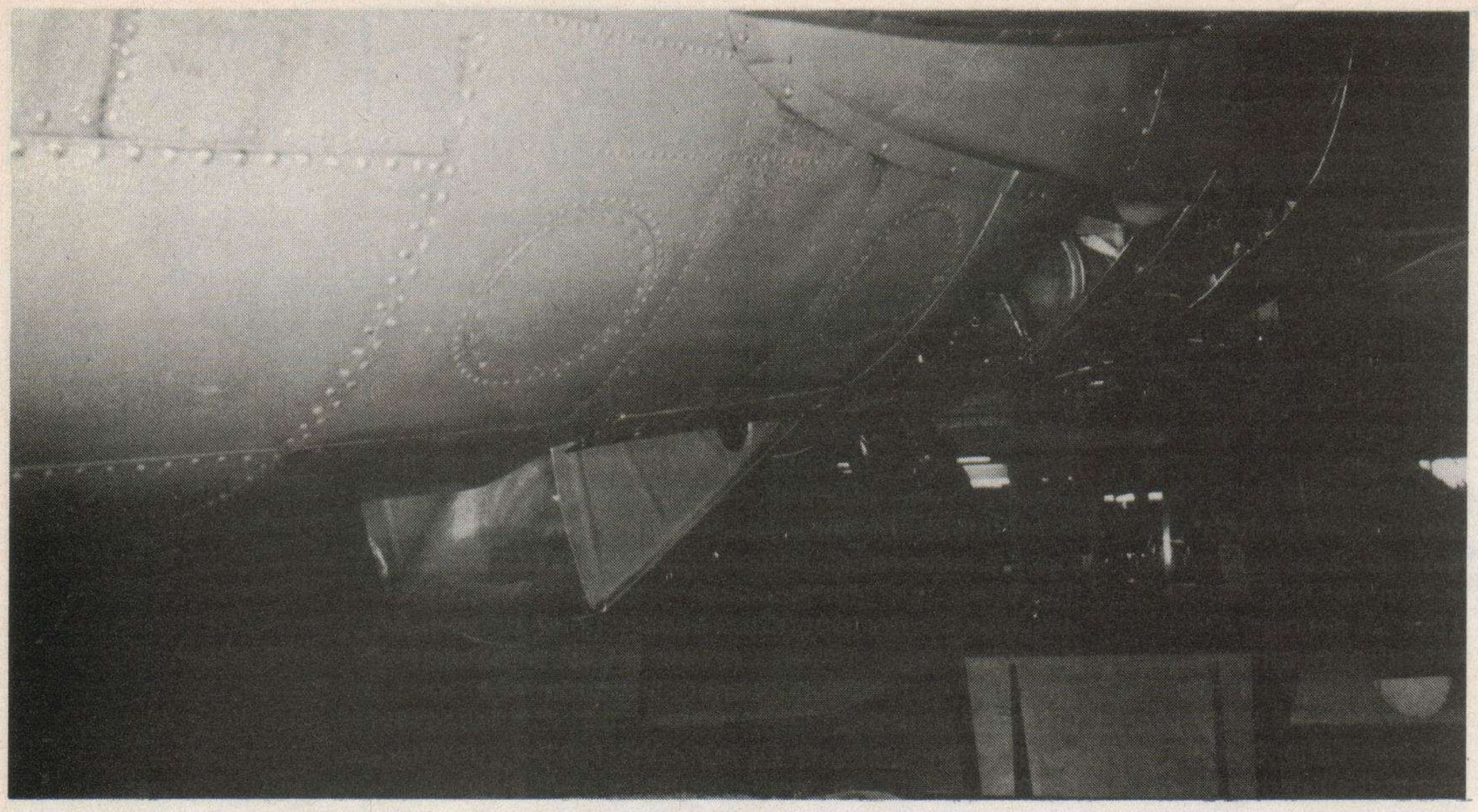


82

79. Rear of Hellcat wing-fold mechanism looking forward – starboard side.
80 and 81. Starboard undercarriage detail and forward area of wing fold mechanism seen below. Tread pattern of tyres and wheel 'spoking' are noteworthy.
82. Oblique view looking up to the starboard wheel well. Door at extreme left is front cover, with the top of the main cover behind.

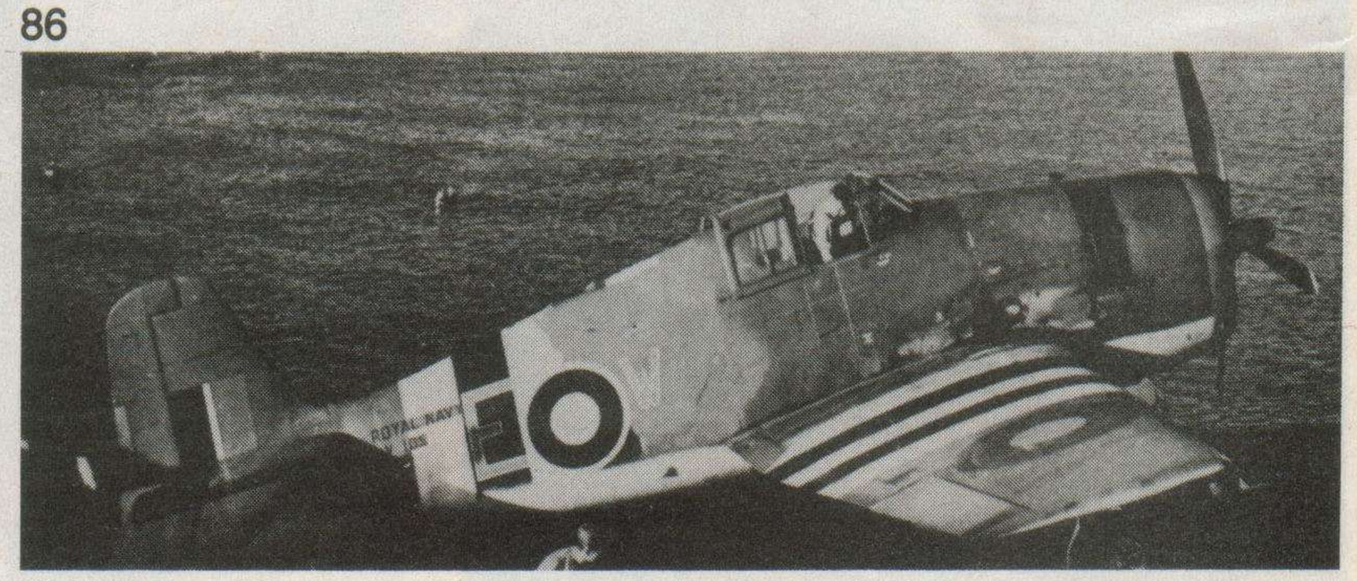


83. Underfuselage of FAA Hellcat looking forward – note lower cylinder exhaust ports.
84. Port wing of FAA Hellcat showing internal structure of outer panel.
85. F6F-5N on USS Independence, *November 10, 1944. White markings on overall Sea Blue scheme.*
86. Hellcat Mk I JV105 of 800 Squadron aboard HMS Emperor *in September 1944.*

84

85

86



KEY TO PLATE 7. GRUMMAN HELLCATS BY S L ARCHIBALD

1. GRUMMAN F6E5 HELLCAT of Air Group 36 aboard USS Siboney, *Summer 1945.* Overall Glossy Sea Blue *ANA 623 (*Methuen *22G4 approx.) with white markings.* Reference Air Combat *Vol 4, No 6 1972, page 176.*
2. GRUMMAN F6F-3 HELLCAT of VF-16 aboard USS Lexington, *December 1943. Fuselage in* Non Specular Sea Blue *ANA 607 (*Methuen *27F4),* Intermediate Blue *ANA 608 (*Methuen *22D4 approx.) and White undersides. Upperwing areas in* Semi Gloss Sea Blue *ANA 623 (*Methuen *22G4 approx.) Reference –* Air Combat *Vol 4, No 6, 1972, page 166.*
3. GRUMMAN F6F-3K HELLCAT drone of VU-1, ALF Bonham, Hawaii. During 'Operation Crossroads' atomic weapon texts, July 1946. Overall colour is International Orange *ANA 508 (*Methuen *2(B-C) approx.) including undercarriage and wheels, with* Interior Green *ANA 611 (*Methuen *30F8) tail unit. Reference –* Model Aire International, *Vol 2, No 5, page 21.*
4. GRUMMAN F6F-5 HELLCAT of 800 Squadron Trincomalee, summer 1945. Overall Glossy Sea Blue *with* Insignia Blue *47 ANA 605 (*Methuen *10D8) and white markings. Reference – photo 70, page 58.*

87

CONVAIR PRIVATEER

Improving the Liberator breed. G Mangion describes the PB4Y-2

Every aircraft enthusiast is familiar with the Consolidated B-24 Liberator, which was produced in large numbers during the Second World War. Being a very versatile design it was converted to take many different roles which the aircraft fulfilled successfully. One such design that evolved from the B-24 was the PB4Y-2 Privateer, which used the same Davis wing but with a completely re-worked fuselage having a seven foot extension, one single fin and rudder, and two large blisters on each side of the fuselage. Another change lay in the engine cowlings which were rotated through 90 degrees so that the longer diameter of the oval section was vertical instead of horizontal as on the B-24.

The US Navy was of the idea that the B-24 would have better stability with a single fin, so a B-24 was modified and tested in 1943, proving them right, and from then onwards the navy received 739 single-fin Liberators which they, in turn, named Privateer. Only few got into action before the war ended, two squadrons: VPB-118 and VPB-119 being operational from Tinian and Midway, but the type stayed in service for many years after the war, mainly as a patrol bomber. In this role the Privateer was slower than the B-24, mainly due to its heavy armament, and the use of slightly uprated power-plants than on the B-24. Armament was formidable and consisted of two twin-gun Martin dorsal turrets, a two-gun Consolidated tail turret, Erco nose ball turret and Erco two-gun type 260TH 'tear-drop' turrets at the waist positions. Besides this armament the Privateer was loaded with extensive radar equipment and fuel was carried in bomb bay tanks instead of in the wings.

Very little is written about the Privateer history in service with the US Navy, maybe due to its short operational service in WW2, but it is a fact that the PB4Y-2 provided the US Navy with a versatile patrol bomber loaded with electronic equipment; indeed, many flights were made round the borders of the Soviet Union. It was during such a flight in April 1950 that a PB4Y-2 Privateer from VP-26 squadron with a crew of 10 on board was lost over the Baltic sea after being attacked by Soviet aircraft.

In 1950 both the new Lockheed P2V Neptune and the Martin P4M-1Q were ready to enter service with the US Navy, and many PB4Y-2s were converted as transports and some used by the Honduran air force and were still in service in December 1966. All armament was removed and a large freight door fitted to one side of the rear fuselage.

Besides the transport role, Privateers were used successfully to fight large forest fires, carrying 2400 gallons of liquid fire retardent.

CONVAIR PRIVATEER

Available models (non-flying)

Model	*Manufacturer*	*Scale*
Convair Privateer	Combat Models (Vacform)	1/48th
Convair PB4Y-2 Privateer	'MATCHBOX'	1/72nd

CONSULTED REFERENCES

Books

Canada's Wings 2. Liberator and Fortress by C Vincent. Canada's Wings.
Consolidated B-240-AA Liberator. Aircam Aviation Series No 11 (Vol. 1).
The B24 Liberator by A G Blue. Scribners.
The B24 Liberator 1939–1945 by M Bowman. Wensum.

Magazines

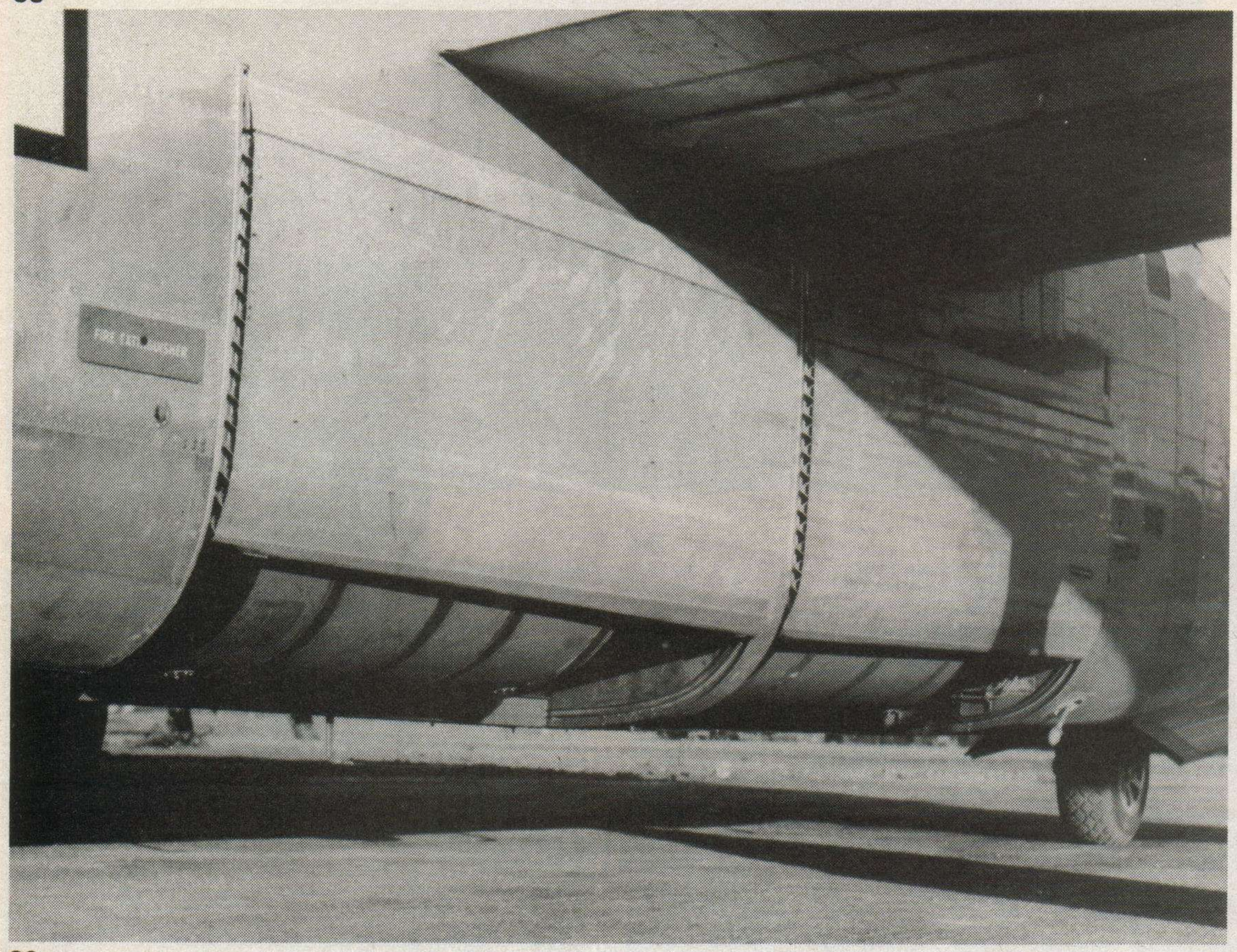
The Aeroplane. March 16, 1945.
Flight. April 5, 1945.
Flying Review International. January 1965.
Naval Aviation News. June 15, 1944.
RAF Flying Review. March, 1958.

87. The distinctive tail of the Convair Privateer is unmistakable. This is Bu 59533 shown more fully in photo 89. Readers should note that an in-depth modelling feature on the Privateer is planned for publication in a future issue of SCALE MODELS.

A reprint of this article, together with 1/72nd scale drawings and 1/48th scale dyelines by A A P Lloyd, is available as Plan Pack 3038 from MAP Plans Service at £2.65 plus 40p postage and packing.

Export orders may be obtained from agents at the same price or by post. (Add 50% to order value for airmail, or 30p for surface mail overseas.)

88



88. Although shown on a C-109 Liberator tanker, this view of the bomb bay is applicable to the Privateer.
89. PB4Y-2 'D67', Bu No. 59533, highlights the typical paint scheme adopted by US Navy patrol units. The blotching of the Intermediate Blue *area of the fuselage side between the* Non-Specular Sea Blue *top and* Insignia White *undersides was quite common, possibly due to problems with some paint batches. The letter/number code was widely applied, although combat units tended to have three, rather than two, numbers.*

89

2A KOPIRAK 2

3038

1/144th scale drawings by A A P Lloyd

(Consolidated-Vultee A/c)
CONVAIR PB4Y-2 'Privateer.'

PORT SIDE ELEVATION : PB4Y-2.

Prototype & Test aircraft only.

N/S Sea Blue.

Nacelle colour lines as fuselage.

Aerials.

Trimmer actuator, top surface starboard side.

Black

NAVY 59602

PB4Y-2

Fin & Rudder is Non-specular Intermediate Blue to here.

Colour line. Non-specular Sea Blue.

N/S Intermediate Blue to here.

N/S White overall undersides & up to here.

Crewman : 5'10".

Insignia : Dark Blue.

N/S Intermediate Blue.

N/S White.

White : Outer cowls only.

SCRAP DETAIL SECTIONS.

Fin upper half.

Fin lower half.

Airfoil camber on L. Edge of Rudder is reversed at the halfway point.

Elevators are symmetrical along their length.

FIN CROSS-SECTIONS.

SCRAP ELEVATION : NOSEWHEEL.

Alternative inward folding wheel doors.

Martin turret.

PLAN VIEW : Some Stbd. wing detail obscured.

FUSELAGE CROSS-SECTIONS.

Up & Down.

Fore & Aft.

SCRAP SECTION & ELEVATION.

To illustrate traverse angles of blister turret.

WING & TAILPLANE CROSS-SECTIONS.

Trimmer actuator, under surface port side.

Retracted wheel fairing.

Oil cooler air exit.

SCRAP PORT SIDE NOSE ELEVATION.

Alternative PB4Y-2 Nose using MPC 5800-5 Turret. (As B-24J).

SCRAP UNDERPLAN : STBD. WING.

Shows undercarriage down & wheel well detail. Landing lamp retracts with wheels.

COLOUR NOTES.

Upper Horizontal & adjoining vertical surfaces down to a mid-point, painted 'Non specular', a non-reflecting almost matt colour : SEA BLUE.

Below this and down to the edges of the under surface, N/S WHITE - was painted N/S INTERMEDIATE BLUE. This included the vertical Fin.

Background to the National insignia was a very DARK BLUE.

Outward retracting undercarriage.

HALF FRONT ELEVATION.

Forward Radome in chain line to show Nosewheel & U/c doors.

Trailing aerial fairlead.

HALF UNDERPLAN.

Wing detail generally symmetrical.

FRONT ELEVATION : PROPELLER.

11'-9" Diameter.

CONVAIR'S PB4Y-2 'Privateer' uses the standard high-lift 110 foot 'Davis' wing together with numerous B-24 parts, an extended fuselage, a drag reducing single fin & rudder, together with uprated P&W R1830-94 non-turbocharged engines in new cowlings gave a faster aircraft with much increased endurance. Heavier armament with improved search equipment suited its role as a maritime patrol & strike aircraft.

Drawn and Traced by :- A. A. P. LLOYD.

Scale : FEET. 0 1 2 3 4 5 6 7 8 9 10 11 12

90

90. Forlorn-looking PB4Y-2, photographed before being made airworthy in Brazil with the registration applied. Airscrew warning stripe only came into use post-war.
91. Honduran Air Force Privateer transport conversion No. 792.

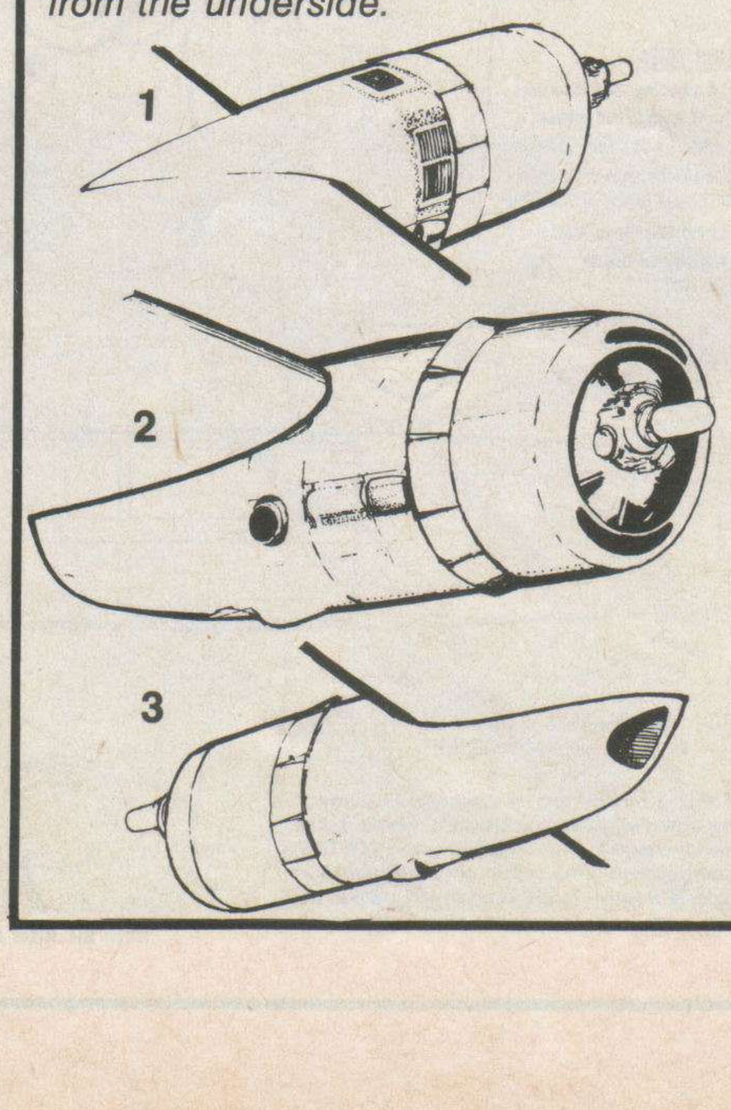
91

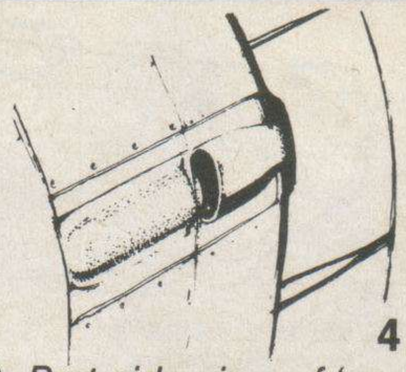
KEY TO PLATE 5. CONVAIR PRIVATEERS BY G MANGION

1. PB4Y-2 PRIVATEER, VP26, USN. Overall finish in semi-gloss Sea Blue ANA 606 (Methuen 22G4 *approx). Reference* – Military Aviation Review. *December, 1979.*
2. PB4Y-2 PRIVATEER, Honduran Air Force. Exact shades of colours are unconfirmed. References – Air Pictorial, *November 1963,* Aircraft Illustrated, *October 1974, and photo 91 (above).*
3. QP-4B PRIVATEER Target Tug. Overall Bright Red ANA 619 (Methuen 4A8). *Reference* – Air Classics, *Vol. 7, No 6.*
4. PB4Y-2 PRIVATEER. Semi-Gloss Sea Blue overall *with* International Orange ANA 508 (Methuen 2 (B-C) 6 *approx.) Faded to yellow in service – as depicted. Reference* – Air Combat *Vol 2, No 2.*

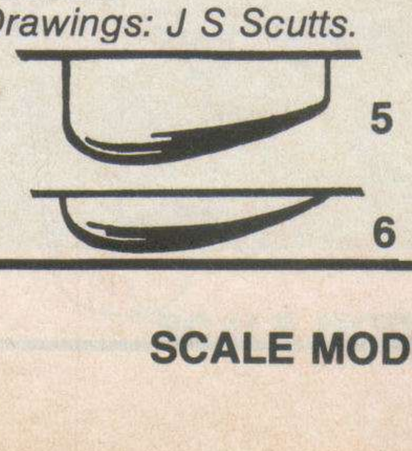
Note: Captions apply to aircraft as they appear in descending order on the colour page.

1. Cowling vents which appear more obvious on photographs of post-war aircraft. There were five in total, with nine louvres in each panel.
2. Inner face of engine nacelles for all WW2 models showing exhaust detail. Some post-war machines had a large curved pipe extending from the underside.





3. Port side view of 'open' end of port side outer engine nacelle; detail noted from photograph of post-war aircraft so may not apply to WW2 models.
4. Forward exhaust detail; cowl flap cut-outs not obvious on WW2 aircraft.
5. Main radome of AN/APR-5 search radar in full extended position – applicable to all aircraft so fitted.
6. Radome in retracted position.
Drawings: J S Scutts.



HAWKER SEA FURY

92

B Robertson describes the Royal Navy's last piston-engined fighter

The Sea Fury, the Fleet Air Arm's last piston-engined fighter, evolved from Hawker Aircraft's attempt to replace the Tempest during WW2. A navalised version of the proposed RAF Fury was prepared to Specification N22/43. This prototype, SR661, was basically a Fury prototype with a sting-type arrester hook, and ready for deck trials in October 1945. A second prototype, SR666, was the first with folding wings and a third, VB857, was partly built by Boulton Paul, whose production order for the type was cancelled, and completed by Hawker. Because of the possibility of a production Fury FI, the first 50 production navalised Sea Fury aircraft batch, TF895–928 and TF940–955, were designated FX; so that the bulk, required as fighter-bombers with jettisonable bomb carriers, were designated FBXIs. From 1947, arabic figures superseded the Roman numerals so that the marks became F10 and FB11.

Conceived in war, and entering service in peace during August 1947, the Sea Furys had radical changes in their finishing schemes, from *Extra Dark Sea Grey* (Methuen 21F3) overall, except undersurfaces, which were 'Sky' (30(B-C)2), to 'Sky' overall except for a strict plan view in grey. Also in 1947 the roundel change was in progress from Type 'C' to 'D' and the Navy at this time ceased using fin flashes to keep this area free for ship, or station, code letters.

Black serial numbers were displayed in 4 in. high characters, 8 in. below the words 'ROYAL NAVY' – also in 4 in. characters – and repeated large under each wing. The range of batch numbers for RN FB11s was: TF956–973, TF985–999, TG113–129, VR918–952, VW224–243, VW541–590, VW621–670, VW691–718, VX608–643, VX650–696, VX707–711, VX724–730, VX748–764, WE673–694, WE708–736, WE785–806, WF590–595, WF610–627, WG564–575, WG590–604, WG621–630, WH581–594, WH612–623, WJ221–248, WJ276–292, WJ294–297, WJ299–301, WM472–482, WM487–495, WN474–479, WN484–487, WZ627–656.

The Sea Fury entered service in August 1947 and served in Nos 801, 802, 804, 805, 807, 808 (Australian), 811, 871 (Canadian) and 898 Squadrons, plus Nos 736, 738 and 764 Training Squadrons and Nos 1831–6 Squadrons of the Royal Naval Volunteer Reserve. Coding was uniform with large, roundel height, black three-digit squadron identification letters on fuselage sides and single letter carrier codes, or two significant letter station codes, half the size, on fins. For example, on HMS *Warrior* whose deck letter was 'J', the 16 Sea Fury FB11s of No. 811 Sqn. bore that letter on their fins and the aircraft numbers 101–116.

There was little embellishment on Royal Navy aircraft during the Sea Fury's period of serving up to 1957 when the reserve squadrons were disbanded. One trim effected was that of coloured spinners, red by 736 and 810 Sqns and black and white by 804. The last-named squadron went further and painted their squadron badge, of a tiger's head mouthing a dagger, on the fins. The most sensational marking was the 'Invasion Stripes' applied during 1950–53 for naval aircraft operating in Korean waters. This conspicuous white-black-white-black-white band marking was chosen as an identification aid as being familiar in June 1944 for the D-Day Normandy landings. The bands were marked around the mainplanes at mid-wing point and around the rear fuselage. There were some variations in application. More limited black-white-black bands on wings were used by Sea Fury FB11s on HMS *Theseus* (appropriately 'T' deck letter) during 'Exercise Grand Slam' in the Mediterranean in early 1952.

The Sea Fury FB11, powered by a 2550 Bristol Centaurus 18 engine driving a five-blade airscrew, had a maximum speed of 460 mph at 18000 feet. Its range of 700 miles could be extended to 1040 with two 90 gallon drop tanks. The fixed armament was four 20 mm cannon in the wings and there was provision for underwing carriage of two 1000 lb. bombs or twelve 60 lb. rocket projectiles. The aircraft was fully combat-worthy after dropping its stores and during the Korean War was successful in air fights matched against the faster MiG-15 jet fighter.

Widely exported, the Sea Fury bore the finishes and insignia of several nations. The Royal Netherlands Navy retained British finish for their 24 F50/FB51s (numbered 10–1 to 10–24) on delivery, and renumbered 6–1 to 6–24 during service, supplemented by 24 Fokker-built FB51s following on to 6–48. To Egypt went 12 basic fighters, Nos 701–712 in natural metal finish plus the Fury prototype NX798 brought up to service standard. Cuba's 15, to FB11 standard, were later given a *Dark Green* camouflage on which the blue band of their national insignia barely contrasted, making the red outlining to their white star most conspicuous. Burma had 18 ex-RN

92. The FAAM's Historic Flight Sea Fury, based at RNAS Yeovilton, is a well-known visitor to summer air displays and a good crowd-puller. This is one of the most authentic of the preserved Sea Furies. The type is popular among modellers but has been sadly neglected by most kit manufacturers. Maybe this feature, with its detailed scale plans, will prompt a glut of new models?

FB11s reconditioned and renumbered UB454–471. Only the 25 specially-built Iraqi Fury fighters, which were non-navalised, received desert camouflage. The largest export was to Pakistan whose 93 FB60s numbered from L900 bore a disruptive patterned camouflage of two shades of brown, light and dark. (Methuen equivalents not recorded). Both the Royal Australian and Royal Candadian Navies used ex-Royal Navy FB11s retaining their finish with new ship and station codings.

A two-seat trainer version evolved from an Iraqi Air Force requirement initially for four, of which two were delivered, another transferred to Pakistan and the remaining one becoming the Royal Navy prototype VX818. Sixty production two-seaters for the Fleet followed, serialled: VX280–292, VX297–310, VZ345–355, VZ363–372, WE820–826, WG652–656. Designated T20, they were finished in the period trainer scheme of natural metal overall with *Trainer Yellow* bands around wings and fuselage. Five supplied to Pakistan as F61s were serialled K850–854, and a similar three ex-RN became UB451–453 in the Burmese Air Force. Two were supplied to Cuba and the *Deutsche Luftfahrt Beratungsdienst* purchased ten in 1957 for modifying and operating as target tugs under contract to the *Luftwaffe.*

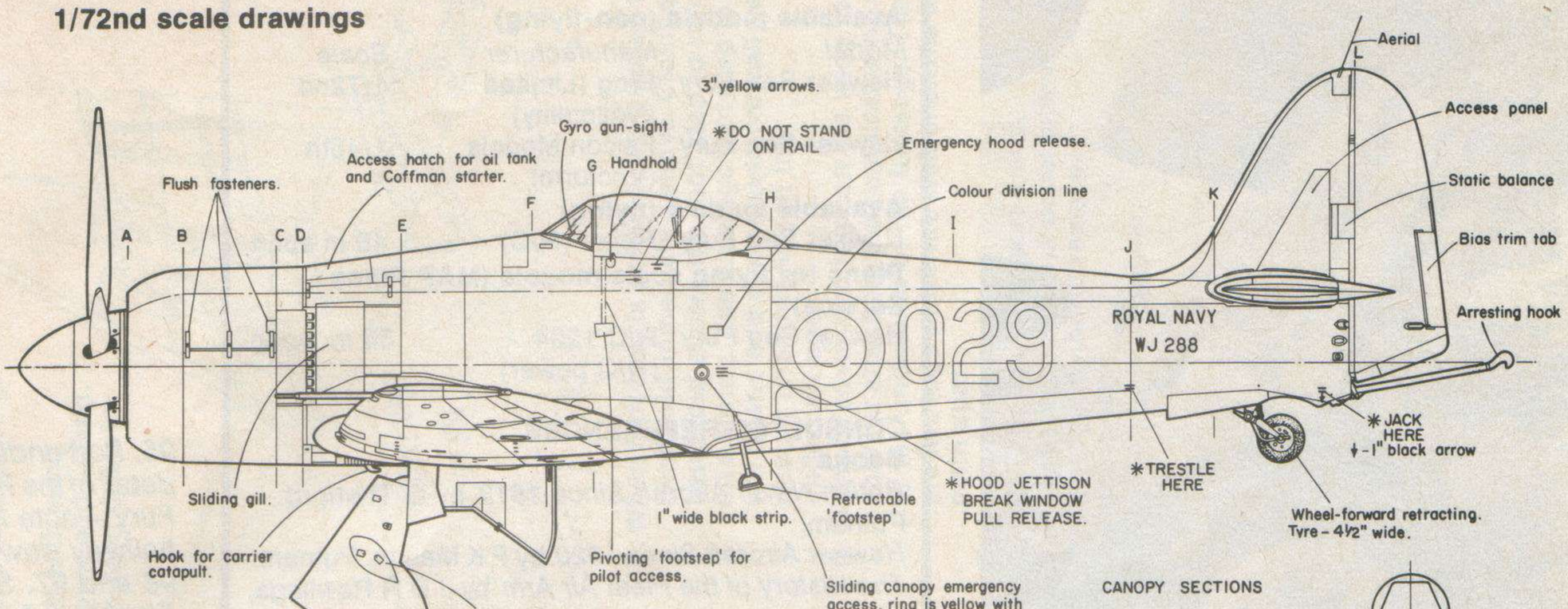
93

93. The FAAM's Historic Flight Sea Fury undergoing overhaul. A challenging project for a potential model diorama perhaps?
94. Sea Fury FB11 VX686 of the Royal Canadian Navy. Note small scale fuselage roundel with fine yellow outer ring and generally 'rippled' appearance of metal panelling.

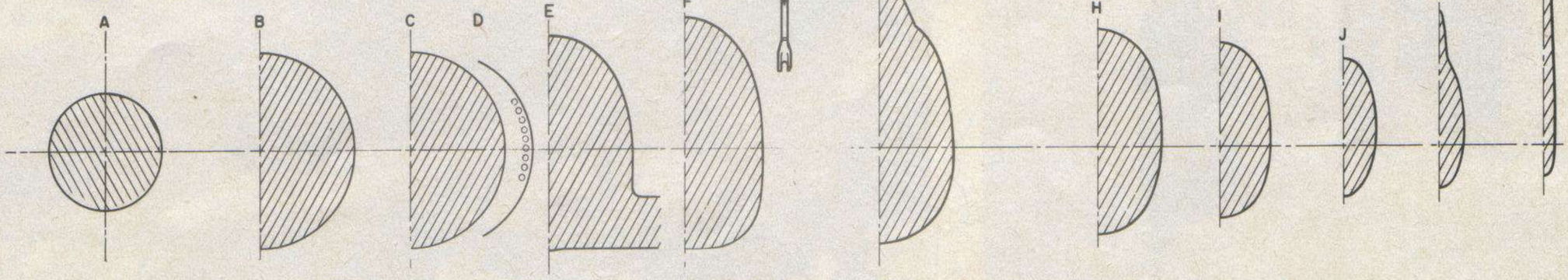
94

HAWKER SEA FURY FB11

1/72nd scale drawings



FUSELAGE SECTIONS.



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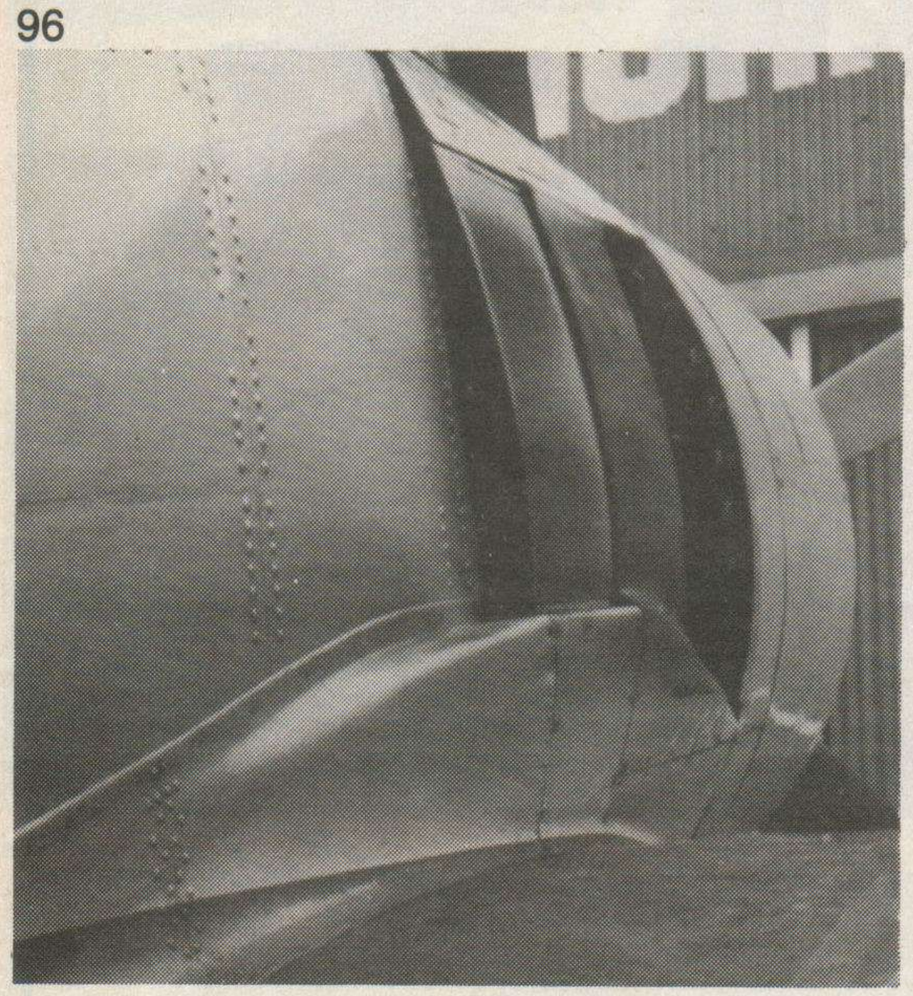


97

HAWKER SEA FURY

Available models (non-flying)

Model	*Manufacturer*	*Scale*
Hawker Sea Fury	Frog (Limited availability)	1/72nd
Hawker Sea Fury	Falcon Models (Vacform)	1/48th

Available models (flying)

Hawker Sea Fury	Rojair (R/C)	48 in span

Plans for flying scale models (MAP Plans Service)

Hawker Sea Fury	R/C 1204 (R/C power)	56 in. span

CONSULTED REFERENCES

Books

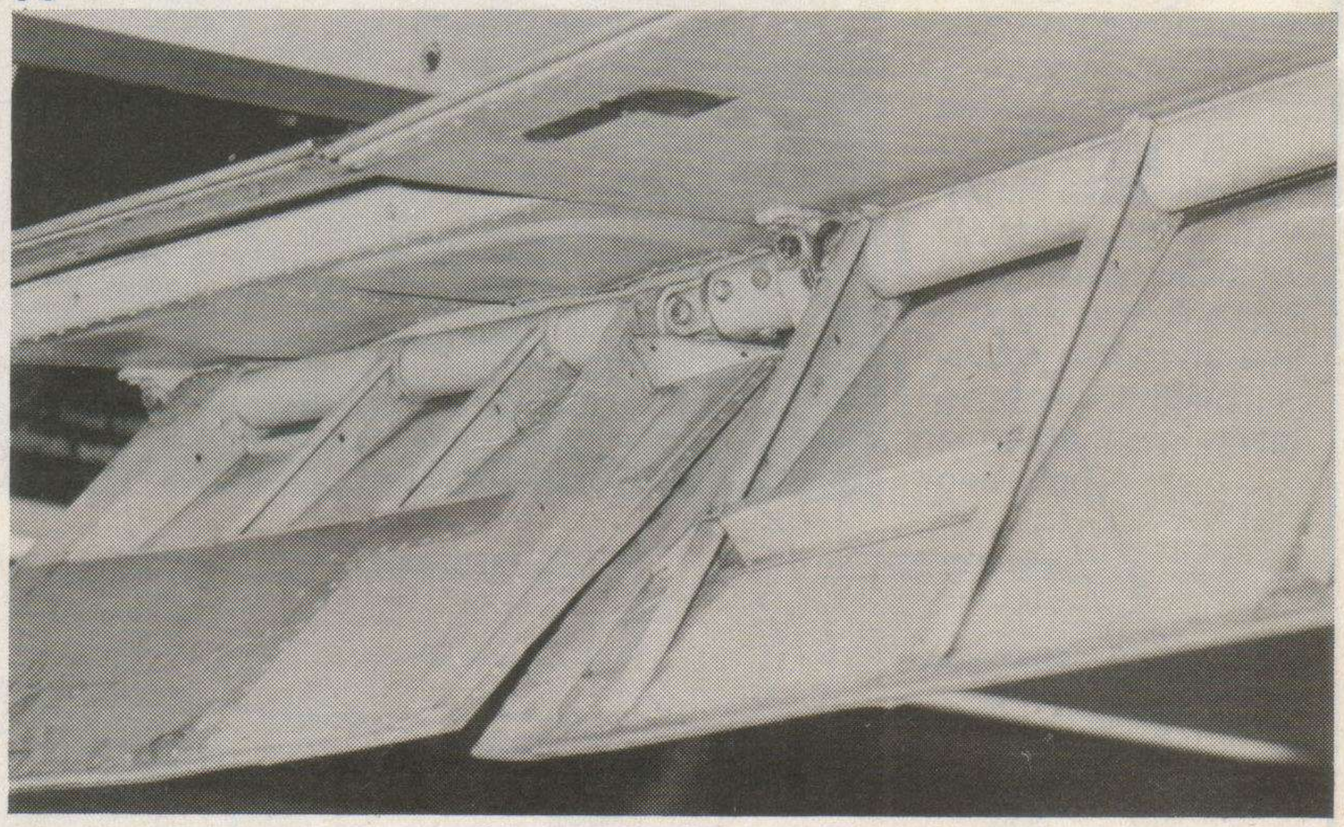
British Naval Aircraft Since 1912 by O Thetford. Putnam.
Hawker Aircraft Since 1920 by F K Mason. Putnam.
The History of the Fleet Air Arm by J D R Rawlings. Ian Allan.

Magazines

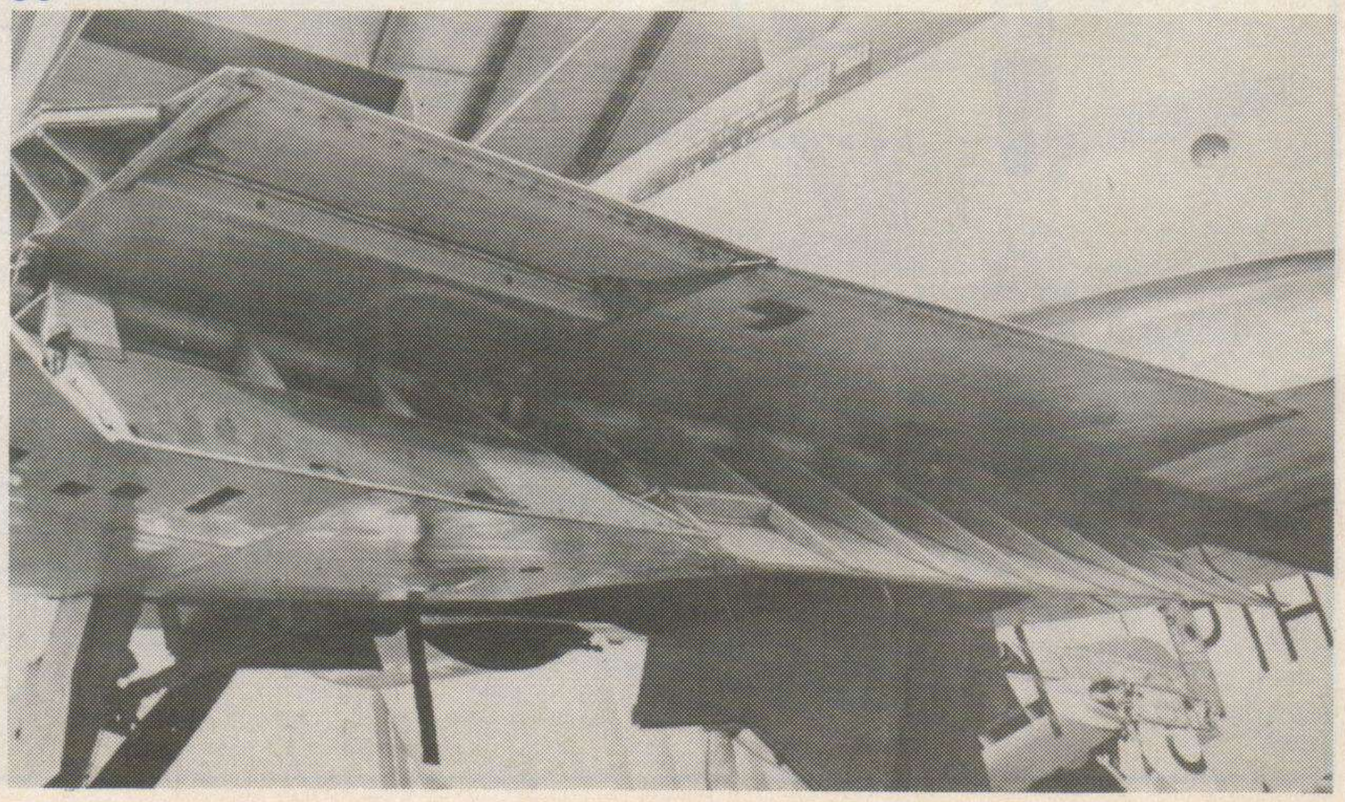
The Aeroplane. January 28, 1949.
Air Progress. May 1971.
Hawker Sea Fury FB11. Scale drawings. *Aviation News* (7/8).
Model Airplane News. January and February 1963.
Random Thoughts (IPMS Canada). September 1972. January/February 1973.
Profile Publications No. 126.
Sea Fury Technical Manual AP 4018B Vol. 1.

Study of preserved examples at the Fleet Air Arm Museum, Yeovilton.

98



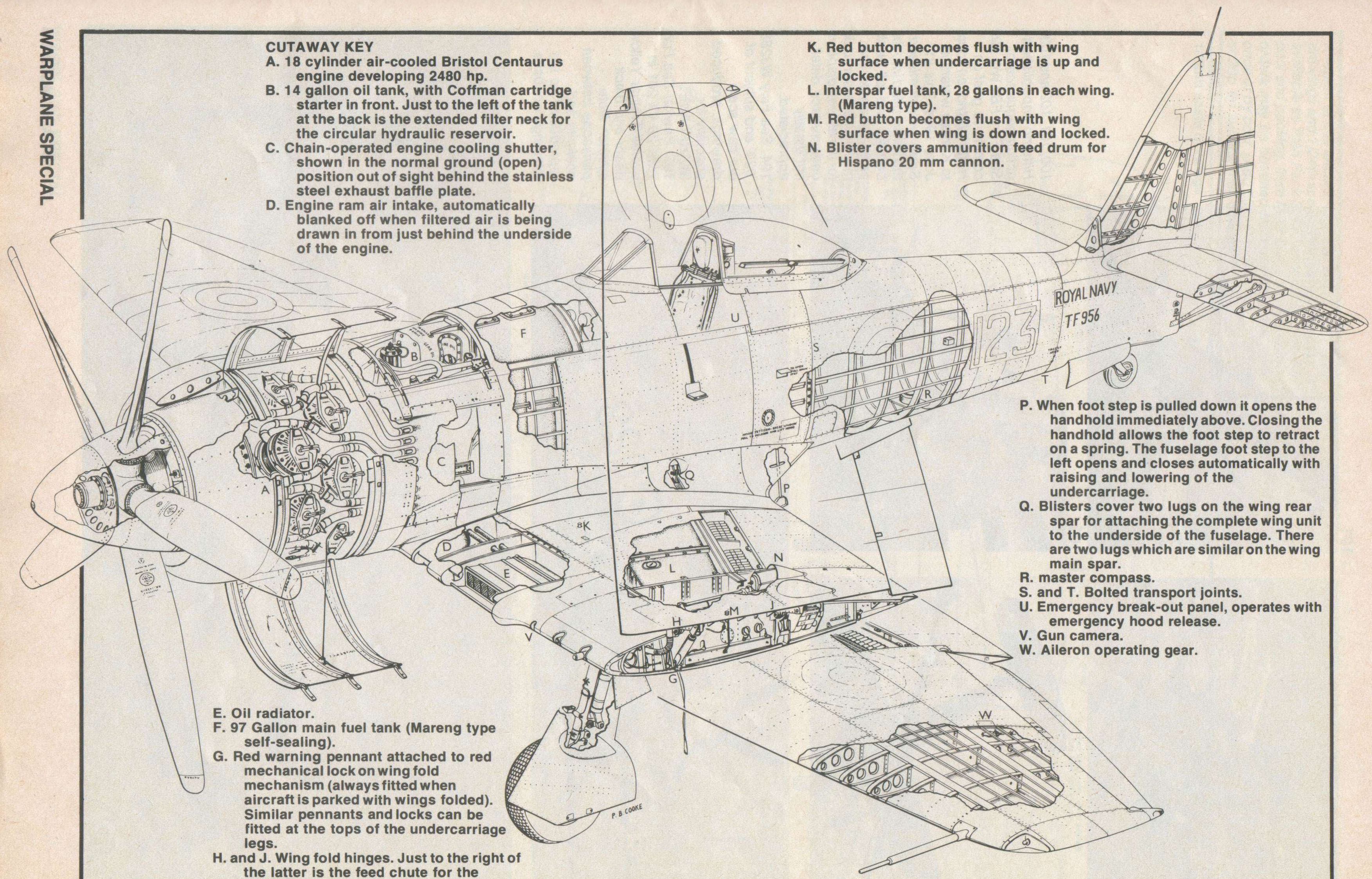
99



95. Port undercarriage detail of the FAAM Sea Fury – note lamp halfway down door.
96 and 97. Spencer Flack's ill-fated G-FURY and the FAAM example reveal the subtle shapes of the cowling 'gills' and exhaust stubs – note sliding portion of 'gill' retracted on lower photo.
98 and 99. Flap detail of FAAM Sea Fury, both pictures showing the port inboard wing section – outer panel is folded upwards.

CUTAWAY KEY

A. 18 cylinder air-cooled Bristol Centaurus engine developing 2480 hp.
B. 14 gallon oil tank, with Coffman cartridge starter in front. Just to the left of the tank at the back is the extended filter neck for the circular hydraulic reservoir.
C. Chain-operated engine cooling shutter, shown in the normal ground (open) position out of sight behind the stainless steel exhaust baffle plate.
D. Engine ram air intake, automatically blanked off when filtered air is being drawn in from just behind the underside of the engine.



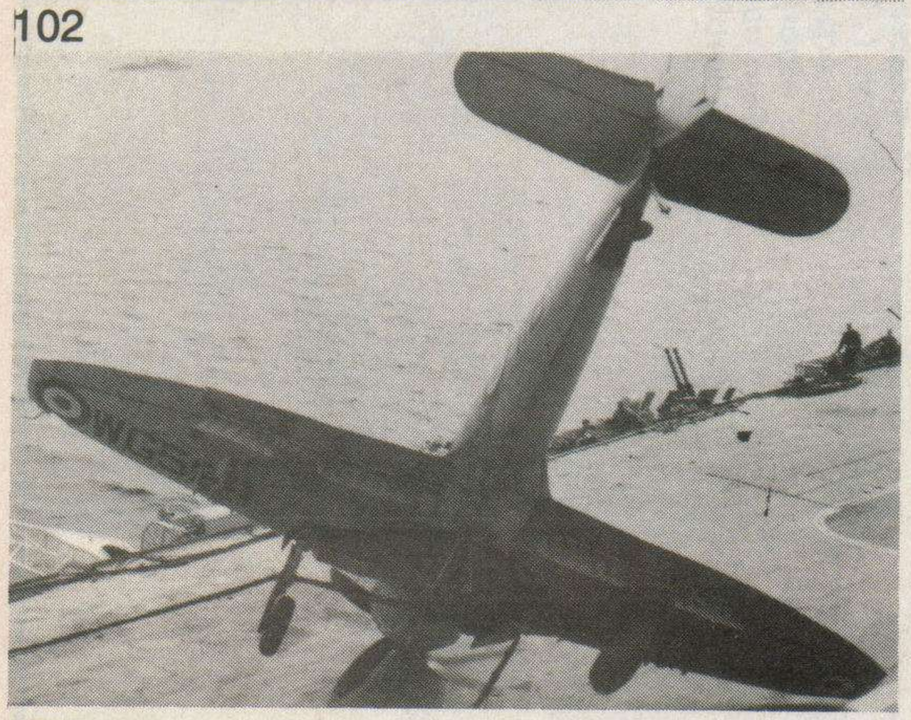
E. Oil radiator.
F. 97 Gallon main fuel tank (Mareng type self-sealing).
G. Red warning pennant attached to red mechanical lock on wing fold mechanism (always fitted when aircraft is parked with wings folded). Similar pennants and locks can be fitted at the tops of the undercarriage legs.
H. and J. Wing fold hinges. Just to the right of the latter is the feed chute for the outboard ammunition tank.
K. Red button becomes flush with wing surface when undercarriage is up and locked.
L. Interspar fuel tank, 28 gallons in each wing. (Mareng type).
M. Red button becomes flush with wing surface when wing is down and locked.
N. Blister covers ammunition feed drum for Hispano 20 mm cannon.
P. When foot step is pulled down it opens the handhold immediately above. Closing the handhold allows the foot step to retract on a spring. The fuselage foot step to the left opens and closes automatically with raising and lowering of the undercarriage.
Q. Blisters cover two lugs on the wing rear spar for attaching the complete wing unit to the underside of the fuselage. There are two lugs which are similar on the wing main spar.
R. master compass.
S. and T. Bolted transport joints.
U. Emergency break-out panel, operates with emergency hood release.
V. Gun camera.
W. Aileron operating gear.

HAWKER SEA FURY FB11

100

101

102



103

100, 101, 102 and 103. Hitherto unpublished action sequence of Sea Fury FBII WG 599 coming to grief on HMS **Warrior** *en route to Korean waters in June 1954. This 811 Sqdn aircraft missed the wires, piled into the barriers and fell back on to the deck. This misfortune is our luck for the aircraft displays undersurface detail not usually appreciated.*

104. Sea Fury WJ288 '029' and subject of our new scale drawings, produced specially for 'WARPLANE'.

105. Hawker Sea Fury TMK 20 VX 281 in overall **Trainer Yellow** *decor and black spinner. Note periscope between cockpits and reproduced on the drawings opposite.*

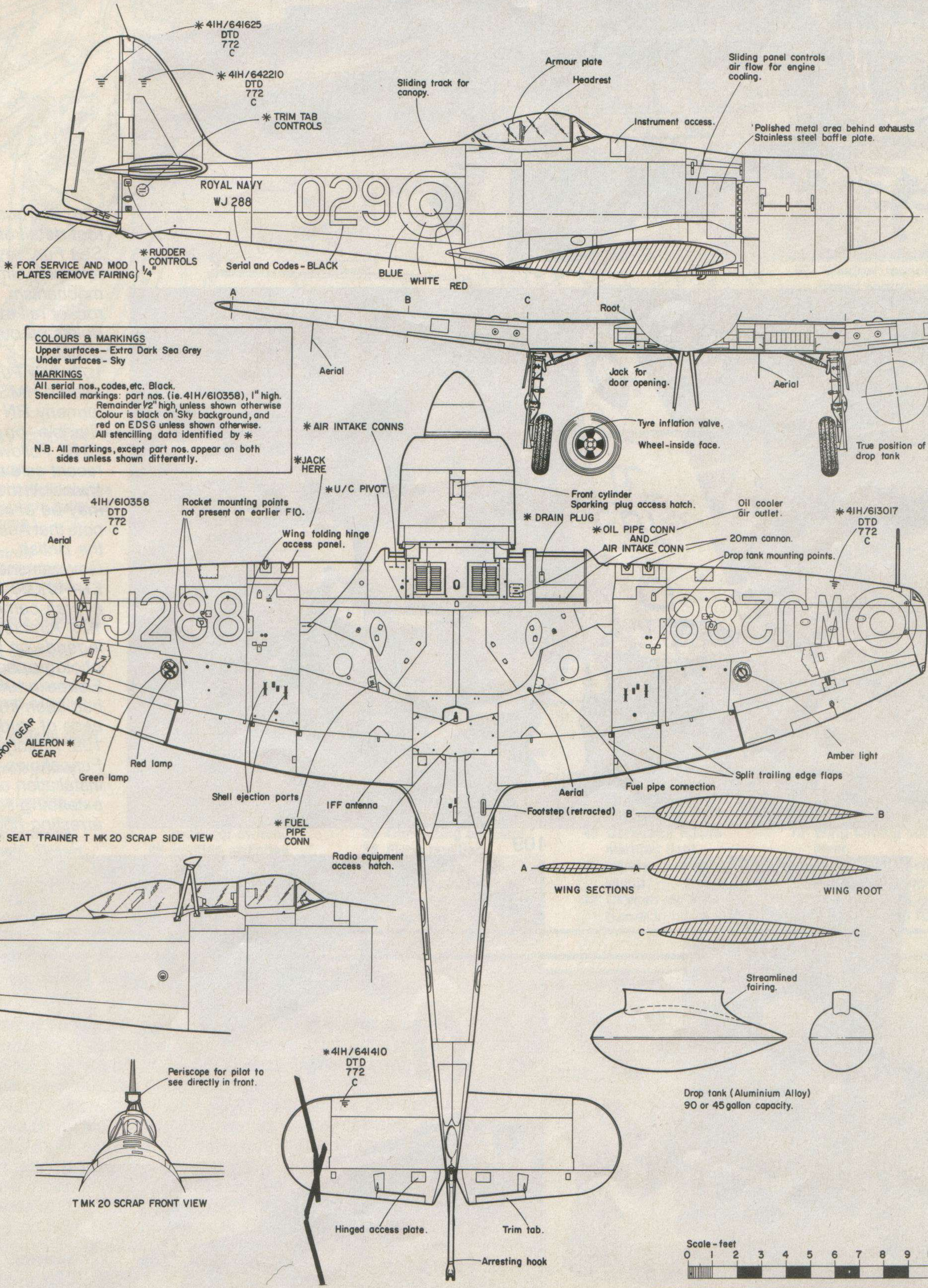
104

105

A reprint of this feature, together with 1/48th scale drawings and 1/24th scale dyelines by John Levy, is available as Plan Pack 3046, price £3.25 plus 40p post and packing, from MAP Plans Service. Export orders may be obtained from agents at the same price or by post. (Add 50% to order value for airmail or 30p for surface mail overseas).

1/72nd scale drawings

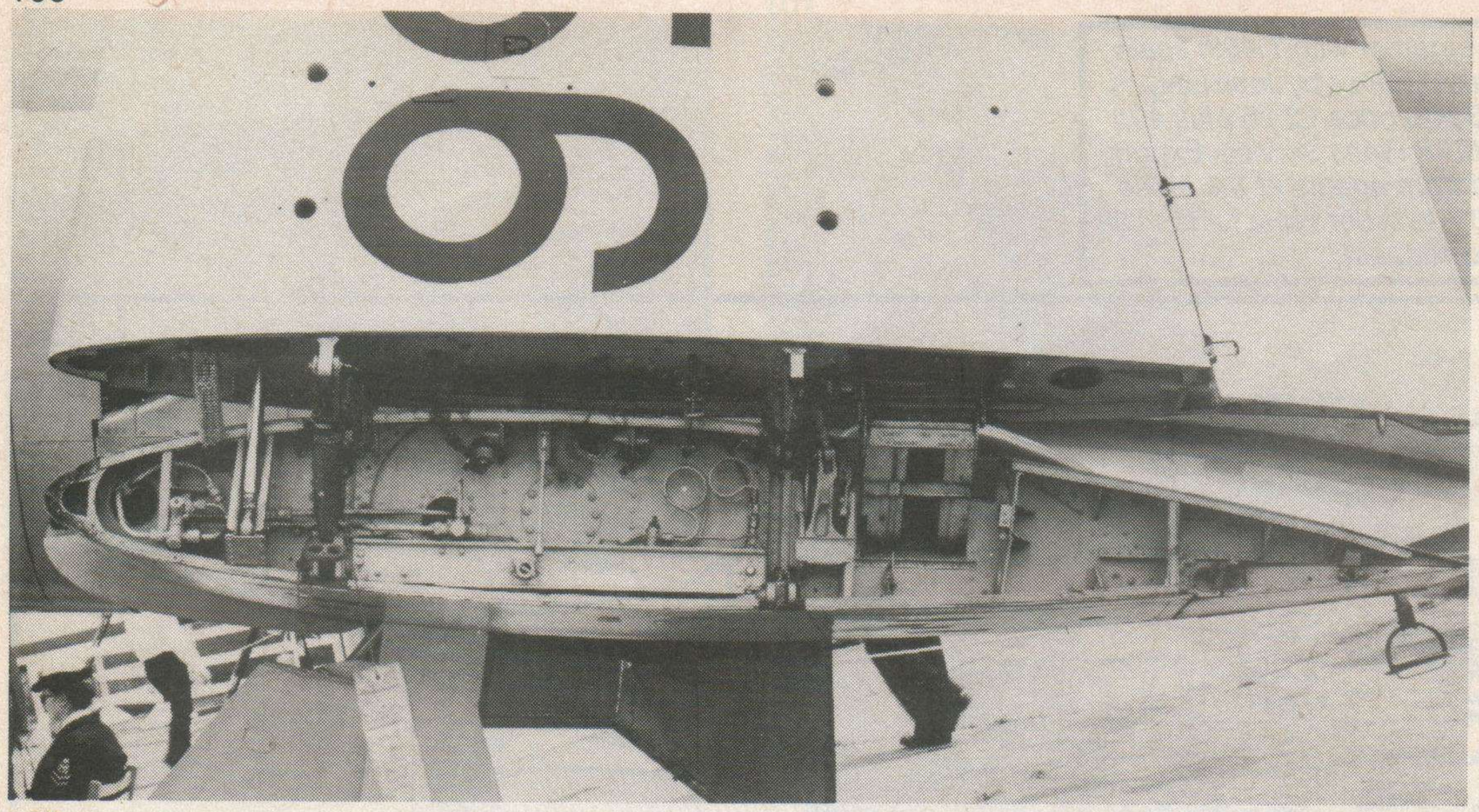
3046



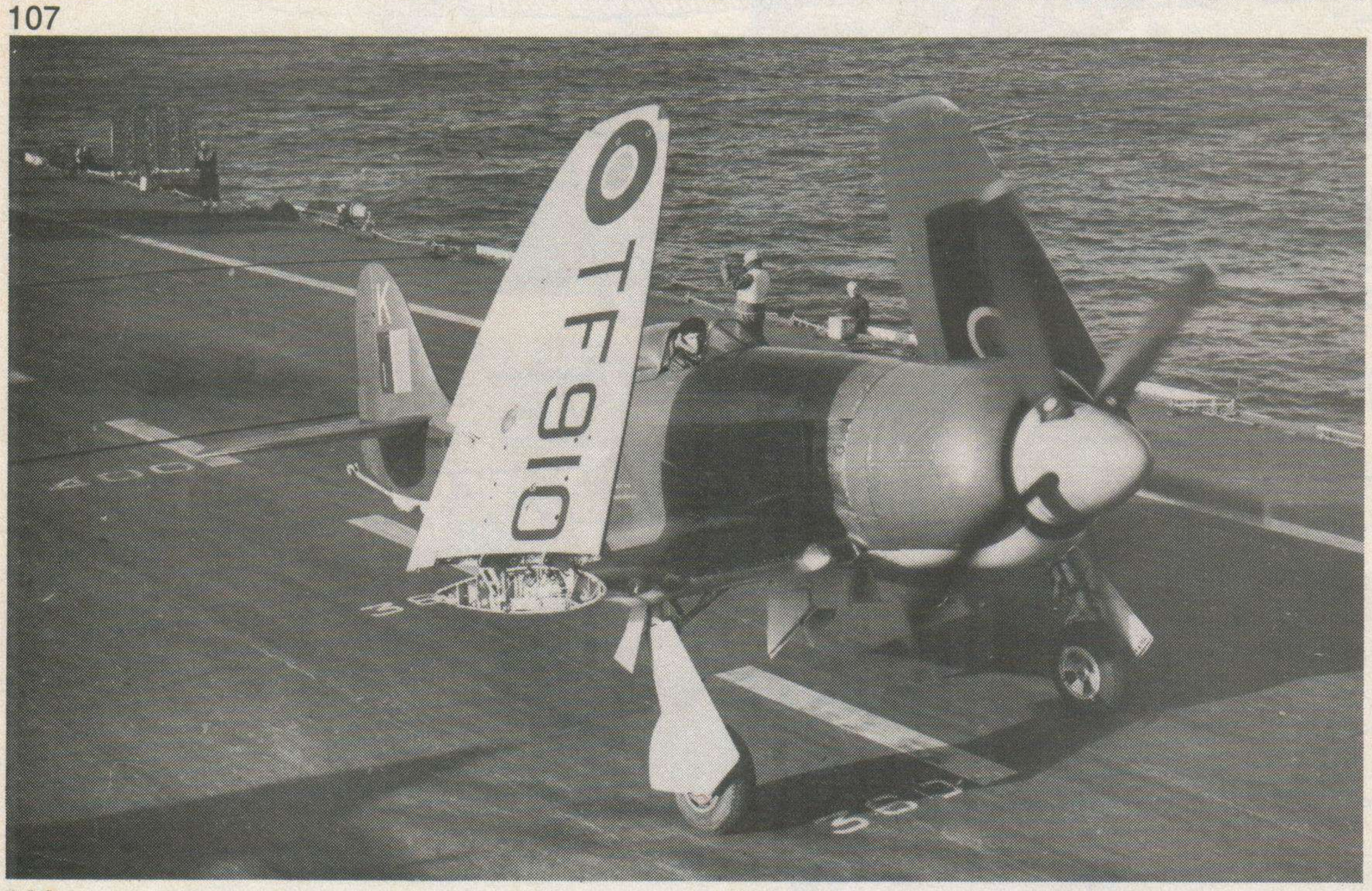
Sheet 2 of 2 Drawn by John Levy © 1982.

HAWKER SEA FURY FBII

106



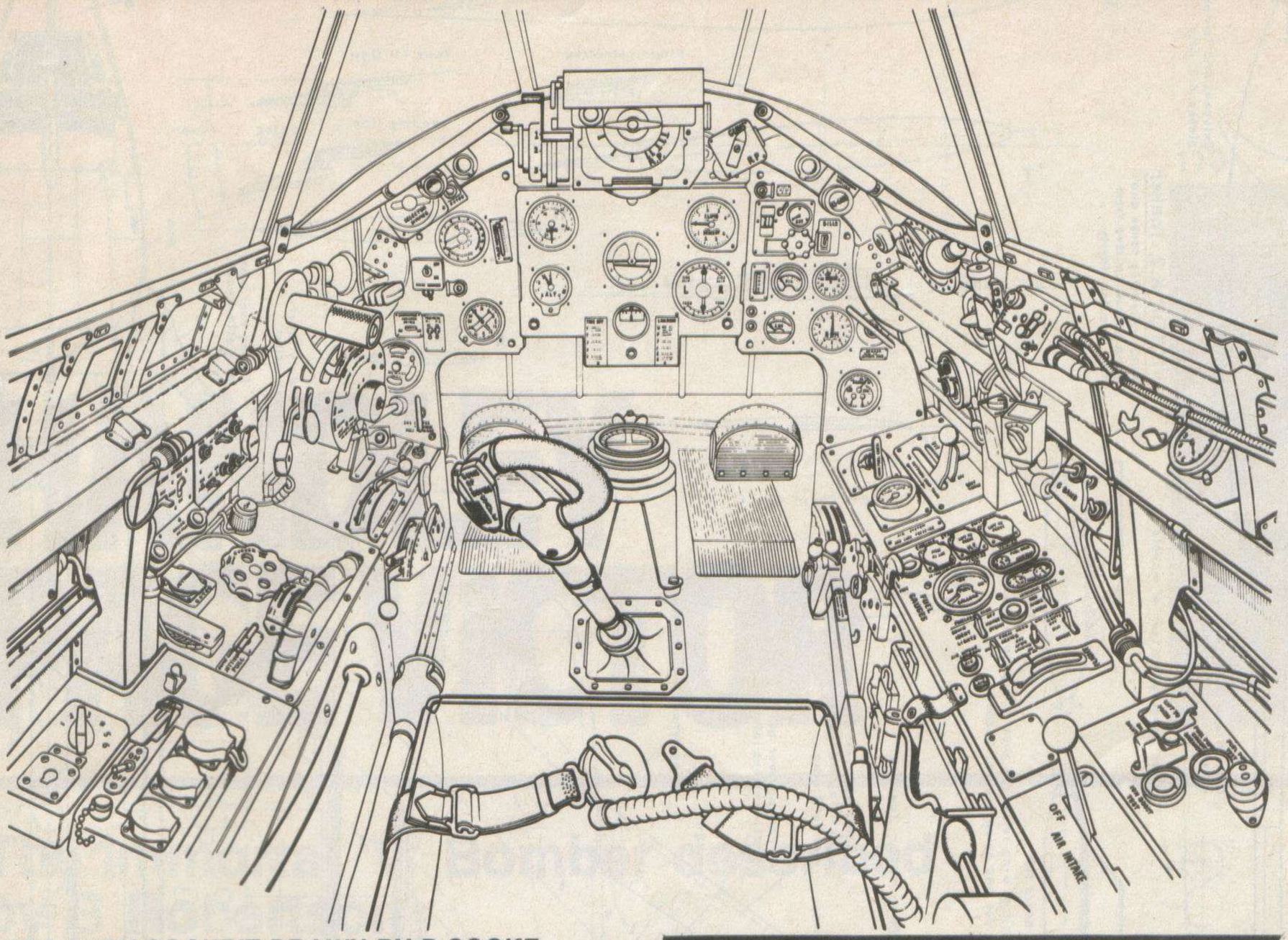
107



106. Starboard wing root detail of FAAM Sea Fury reveals relatively simple mechanism. Note rocket rail mounting points on outer wing panel.
107. Sea Fury TF910 aboard HMS Sydney *– formerly RN HMS* Terrible *– on March 30, 1949. Following the recent sale of* Invincible *to the RAN it may be of interest to note that Australia paid the British Government £1,440,000 for her first aircraft carrier . . .*
108. Airscrew root legends on G-FURY photographed at Elstree in 1980. Picture has been inverted for ease of study.
109. Prototype Sea Fury shows that neat installation of the extending sting-type arresting hook.

108

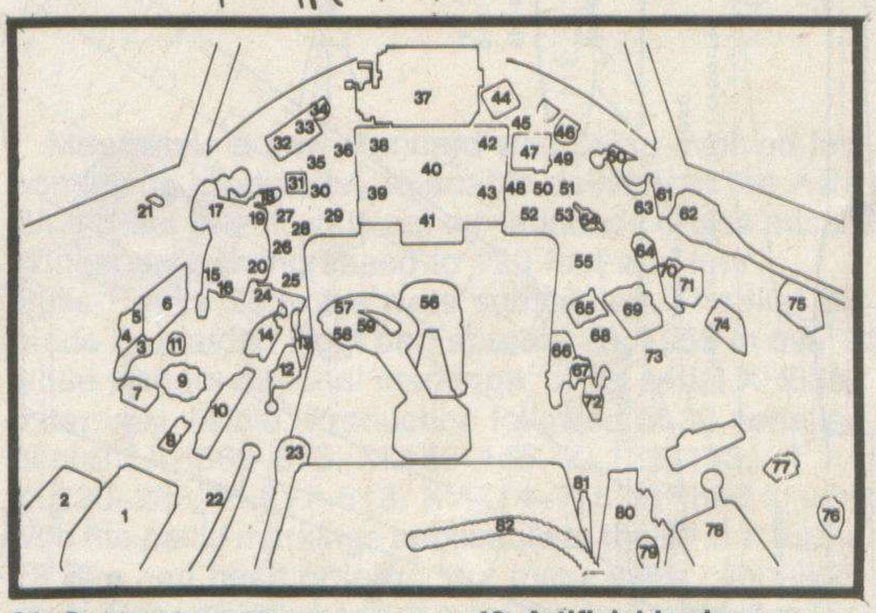
109



SEA FURY COCKPIT DRAWN BY P COOKE.

COCKPIT KEY
(The colour indications are for TF956 but are believed to be common.)

1 IFF control.
2 IFF selector unit.
3 Flare doors warning lights.
4 Flare doors operating switch.
5 Camera container master switch.
6 Rockets and bombs fusing and selection panel.
7 RATOG jettison push button.
8 Bomb rack jettison control.
9 Rudder trimming handwheel.
10 Elevator trimming handwheel. (Brown bakelite).
11 Cockpit (port) lamps dimmer switch.
12 Undercarriage control.
13 Arrester hook control.
14 Flaps selector unit. (White knob).
15 Supercharger gear change control.
16 Fuel cut-off control. (Dark red knob).
17 Throttle lever.
18 RPM control lever.
19 RATOG firing button.
20 Throttle and RPM controls friction nut.
21 Canopy locking control.
22 Hydraulic handpump.
23 Sanitary bottle.
24 Arrester hook indicator light.
25 Starter re-indexing control.
26 Undercarriage position indicator.
27 Undercarriage position indicator switch.
28 Ignition switches (magnetos).
29 RI compass indicator.
30 Supercharger warning light.

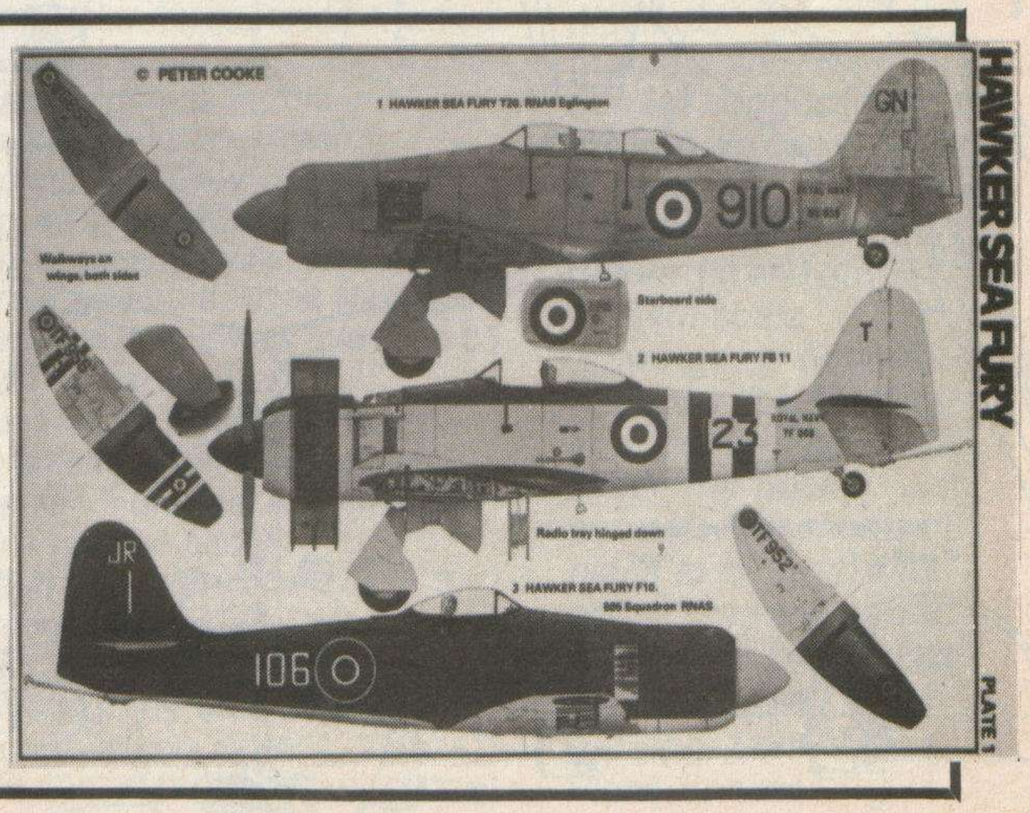


31 Contacting altimeter switch.
32 Gyro gunsight selector dimmer control.
33 Ventilating louvre.
34 Gyro gunsight skid indicator.
35 Contacting altimeter.
36 Flaps position indicator.
37 Gyro gunsight.
38 Airspeed indicator.
39 Altimeter.
40 Artificial horizon.
41 Direction indicator.
42 Rate of climb indicator.
43 Turn and bank indicator.
44 Guns/RP selector switch.
45 Generator failure warning light.
46 Windscreen de-icing pump.
47 Oxygen regulator. (Lever in black and yellow stripes).
48 Oil pressure gauge. (Yellow case).
49 Engine cooling shutters control.
50 Oil temperature gauge. (Yellow rim).
51 Boost gauge. (Dark red rim).
52 Cylinder temperature gauge.
53 Engine speed indicator.
54 Canopy jettison control (black and yellow diagonal striped handle.)
55 Triple pressure gauge.
56 P11 compass.
57 Press-to-speak switch.
58 Firing button.
59 Parking brake lever.
60 Sliding canopy control.
61 Safety harness locking control.
62 ZBX control unit.
63 'Window' launcher speed control unit.
64 'Window' launcher override control unit.
65 Main fuel cock.
66 Flaps and undercarriage emergency selector levers (black and yellow striped knobs). Remove locking pins to operate.
67 Cockpit heating control. (Dark red handwheel).
68 Fuel tank air pressure gauge. (Pale brown rim).
69 Drop tanks jettison and selection levers. (Red and orange knobs respectively).
70 Mixer box.
71 VHF control unit.
72 Tailwheel locking control.
73 Engine starting buttons.
74 IFF auxiliary control unit.
75 Clock.
76 Fuel pump ammeter test socket.
77 Oil dilution pushbutton.
78 Air intake heat control.
79 Wing folding control lever.
80 Map case and chart board container.
81 Seat adjusting lever.
82 Pilot's oxygen tube.

KEY TO PLATE 1. SEA FURIES BY P B COOKE

1. *Royal Navy Historic Flight SEA FURY T20 in colour scheme representative of the typical training colours worn when part of the station flight, RNAS Eglington, 1954–55. Overall Aluminium with* Trainer Yellow *(*Methuen *(4–5)A8) bands on fuselage and wings.*
2. *Royal Navy Historic Flight SEA FURY FB11 in late standard scheme of* Dark Sea Grey *(*Methuen *21E3) over uppersurfaces and* 'sky' *(*Methuen *30(B-C)2) lower surfaces. Aircraft wears the black and white stripes of its Korean War service.*
3. *Royal Navy SEA FURY F10 of 805 Squadron in early standard scheme – colours as above. The plate depicts the aircraft as it was whilst working-up from HMS* Eglington *in 1948 prior to joining the Royal Australian Navy aboard HMAS* Sydney.

Note: Uppersurface view. Aircraft serial reads from the front of the wing on the starboard side.



A.L.BENTLEY 1978

1/144th SCALE DRAWINGS

3000

VICTOR K.2. Tanker

Pods, underwing tanks and wing fences omitted from this view for clarity

Prototype nose details

External skin reinforcing plates K.2. only

Theoretical section

R

Flaps retracted

T

Take off flap

Landing flap

Outer

Inner

W

U

X

V

40% Chord line

Y

Z

Dingy stowage

Starboard wing root at stn. 54·5 showing A.R.U. with intake extended.

All aircraft

K.2. only

Camouflage demarcation line between upper and lower surfaces

Static ground line

Free hanging position of wheels

Hose Drum Unit (H.D.U.) retracted

DRO

Port side

Starboard side

Detail of wing refuelling pods and pylons. Note that the pod and pylon are not handed.

Toe in 3°

Leading edge line for prototype and initial production standard wing

Fairing over outer wing attachment joint

Wing fences

Boundary layer bleed outlet

Fairing over inner wing attachment joint

Expansion joints over U/C bay

Initial B.Mk.2 fin root intake

Ram Air Turbine at all times except when power is switched off, or cut, off

Fin root intake on prototype

Air outlet blanked off on K.2

Areas reserved for squadron codes when required

Prototype tip outline

Position of serial number

Camouflage demarcation line

Wing tip B/SR and Blue Steel

Intakes on prototype aircraft
Note central splitter plates in each intake and lack of oil cooler intake

Style of upper wing used up to 1967

'Window' pods were not fitted to prototypes and early production aircraft

Fairings over flap tracks

Position of flaps when fully extended

Top surfaces of flaps are camouflaged to match top wing schemes.

Ram air turbine Outlet

Intake

COLOUR KEY

B	BLACK	
S	SILVER	
DRO	DAYGLOW RED ORANGE	
Y	YELLOW	
NM	NATURAL METAL	
LAG	LIGHT AIRCRAFT GREY	
MSG	MEDIUM SEA GREY	
DG	DARK GREEN	
B	BLUE	
W	WHITE	
R	RED	

Walkway areas at wing roots and on tailplane are outlined by a continuous 1/4" thick yellow line with a fringe of red stripes.

Details of crew entry door

Closed

Open

Inner surface

Ram air turbine extended

A.A.P.U. intake shown extended

Oil cooler intakes

Leading edge datum line

Camouflage demarcation line

Wing fences omitted for clarity

Fuselage datum line

VICTOR K.2.

Scale in feet 0 5 10 15

HANDLEY PAGE VICTOR Mk.2 Sheet 1

HANDLEY PAGE VICTOR

The immortal 'V' Bomber described by B Robertson

The Handley Page HP80 Victor, the third of the RAF's three V-bomber types, was evolved to Air Ministry Specification B35/46. Powered by four Amstrong Siddeley Sapphire Sa7 turbojets, the Victor B1 had a range of 6000 miles, a maximum speed of Mach 0.95 and could carry a maximum bomb load of 78000 lbs. An outstanding feature was its crescent wing, spanning 110 feet. A crew of five was carried.

Two Victor prototypes were built; the first, WB771, made its maiden flight on December 24, 1952 in natural metal finish, but for the 1953 SBAC display it was painted silver-grey with a matt black fuselage sporting a red trim line; it crashed the following year. The second prototype, flying from September 11, 1954, was similarly painted until 1956 when it was repainted overall blue.

Production orders placed from 1952 led to 50 Victor BIs being produced in batches, serialled XA917–941, XH587–594, XH613–621, XH645–651, and XH667. The first four aircraft were finished in RAF standard light-weight aluminium overall, but with XA921, and subsequent production aircraft, an overall white anti-flash paint, designed to reflect the intense heat flash radiated from a nuclear explosion, was adopted. Serials were marked large in black on each wing undersurface and on fuselage sides, initially in black but later in pale blue. Similarly, roundels, in bright colours on fuselage sides and wing uppersurfaces only, were later made pallid as shown in our colour plates. The Victor B1 first entered service with No. 232 Operational Conversion Unit at Gaydon in November 1957 and reached No. 10 Sqn. in April 1958 followed by Nos 15, 55 and 57 Sqns.

Modifications were progressively introduced on production, and retrospectively on those in service, so that eventually 24 were to a new B1A standard incorporating flight refuelling probes, drooped wing leading edges, modified cabin layout and a reshaped tail cone to embody the new tail-warning radar. Six were later converted for a dual bomber/tanker role as Victor B(K)1s and finally the Mk 1s existed solely as three-point tankers with 10 original B1s converted to K1 tankers and 14 B1As to K1A tankers. They served in the Tanker Training Flight which became No. 232 Operational Training Unit and Nos. 55, 57 and 215 Sqns. Motifs on the fin, above the flash, identified each unit.

Meanwhile a new standard was being evolved for continuing production, to enable delivery of the Avro Blue Steel thermo-nuclear air-launched cruise missile. Wingspan was increased to 120 feet and four Rolls-Royce Conways were substituted. The first B2 made its maiden flight on February 20, 1959 in overall white without national markings, or its serial XH668, externally visible. Production followed of 33 serialled aircraft: XH669–675, XL158–165, XL188–193, XL230–233, XL511–513, XM714–718 finished in white with the pallid markings applicable to the B1s. A further 28 B2s had been ordered, but these were cancelled when plans were in hand to increase force effectiveness with Douglas Skybolt and Avro Blue Steel missiles. The American missile was cancelled before acquisition, but there was much experimentation with Blue Steel missiles recessed under the fuselage of the B2s.

Victor B2s served first in a trials unit, renamed the Victor Training Flight, and entered squadron service at Wittering where No. 139 Sqn. reformed in February 1962 and No. 100 Sqn. the following May. The last B2 was delivered in May 1963 but, again, there were a series of modifications and, in all, 21 Victors were withdrawn from service to facilitate their carrying of Blue Steel, revised avionics, and incorporating aerodynamic improvements to B2R (R for Retrofit) standard. A radical change in finish was heralded at the beginning of 1964 when a Victor B2R returned from its retrofit in a disruptive-pattern camouflage of *Dark Green* (BS381C–641) and *Medium Sea Grey* (BS381C–637) with only the undersurfaces in glossy white, consistent with a changed low-level approach tactic, and the later conventional bombing role when the Royal Navy took over the nuclear deterrent role. In this new role up to 35 1000 lb. HE bombs could be carried.

With the Victor Training Flight joining the two squadrons at Wittering to form a Wing introducing central servicing, the limited individual unit markings gave way to the station's red lion badge.

Nine B2s were modified from 1965 onwards to SR2 standard for strategic reconnaissance, with increased range and photo-mapping equipment, entering service with No. 543 Sqn. at Wyton. They were finished in the green/grey camouflage with serials (XH672, XH674, XL161, XL165, XL193, XL230, XM715, XM716, XM718)

110

110. A Victor SR2 at RAF Wyton. The Victor has enjoyed a lengthy career in the RAF and is one of the most requested subjects for plastic kit reproduction. If current suggestions are true we can expect at least one injection-moulded kit before the end of 1982. 1/144th scale drawings on opposite page, by A L Bentley, form part of Plan Pack 3000. The pack contains four sheets of plans to both 1/144th and 1/72nd scales and is priced at £4.00, plus 40p. post and packing, from MAP Plans Service.

in black. Roundels were conventional, but the wing display was limited to port-wing uppersurface only.

The final requirement was for the Victors to provide an improved tanker force to facilitate rapid overseas deployment of fighters. The B2/B2R bombers were withdrawn by the end of 1968 and the SR2s were superseded by Vulcans in 1975, giving a good reserve for the 24 required for the new Victor K2 modification programme during the 1970s to provide a tanker force throughout the 80s. The grey/green camouflage, as applied to the K1s, was used but this time with red and blue roundels and flashes to avoid white compromising the camouflage. There were no markings on the white undersurfaces other than red and black 'line-up' lines for fighter refuelling and the wing roundel display was again restricted to the port wing uppersurfaces only. Serials in black appeared large on the rear fuselage. Unit motifs for the squadrons equipped with K2s, Nos 55 and 57 Sqns, appeared on the fins, as did the circled arrow motifs of No. 232 Operational Training Unit. Victors concerned in this conversion were XH669, XH671–673, XH675, XL158, XL160–164, XL188–192, XL231–233, XL511–513, XM715, XM717.

HANDLEY PAGE VICTOR

Available models (non-flying)

Model	*Manufacturer*	*Scale*
HP Victor K2	RAREplanes (Vacform)	1/72nd

CONSULTED REFERENCES

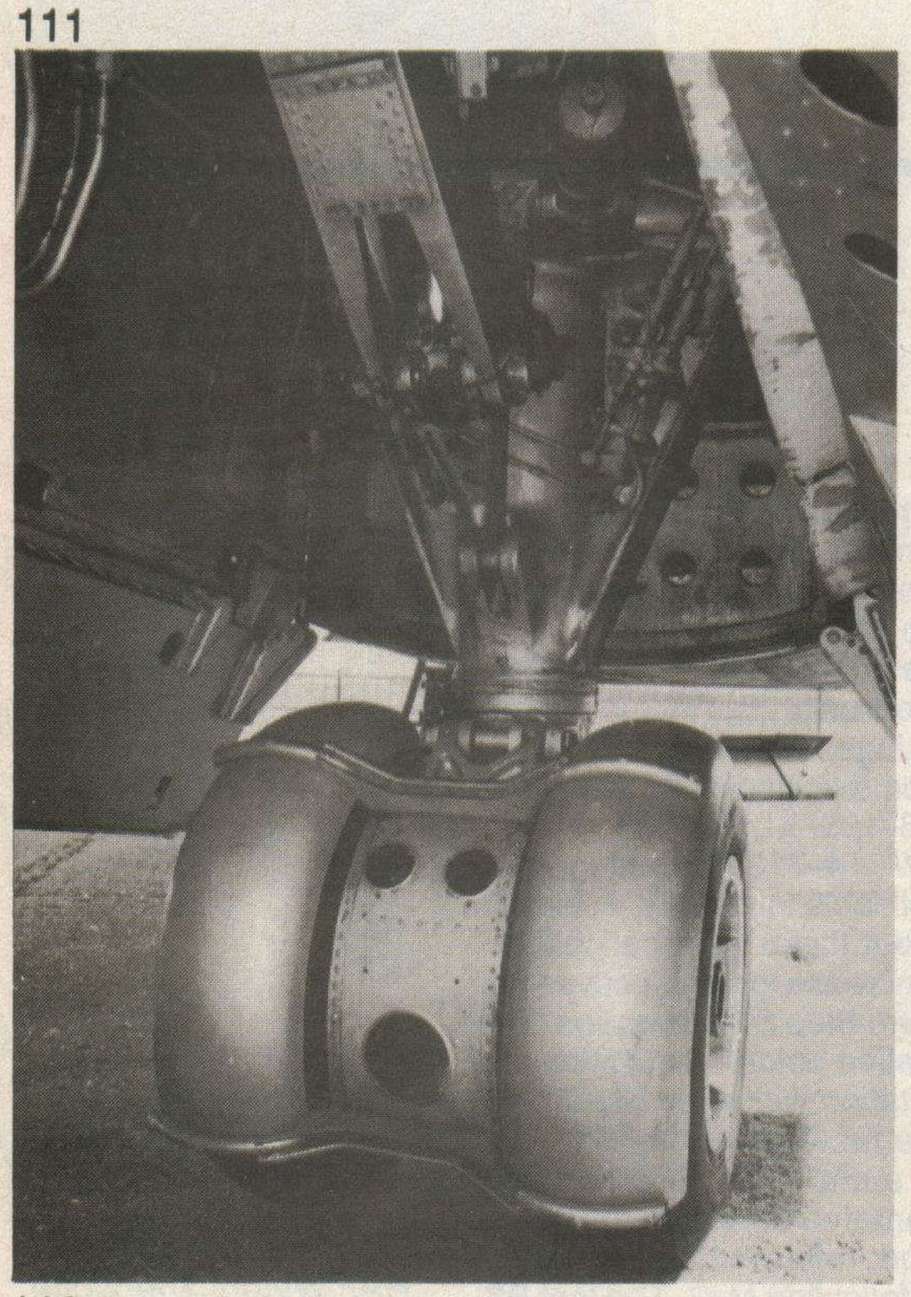
Books

Bombing Colours, 1937–1973 by M J F Bowyer. Patrick Stephens Ltd.
Handley Page Aircraft Since 1907 by C H Barnes. Putnam.
Handley Page by D C Clayton. Ian Allan.

Magazines

Air Pictorial. September 1971.
Air International. December 1976.
Handley Page Victor K2. 1/72nd scale drawings.
Aviation News (7/3).
RAF Flying Review. November 1953; June 1959; July 1962.
SCALE MODELS. October and November 1978.

111



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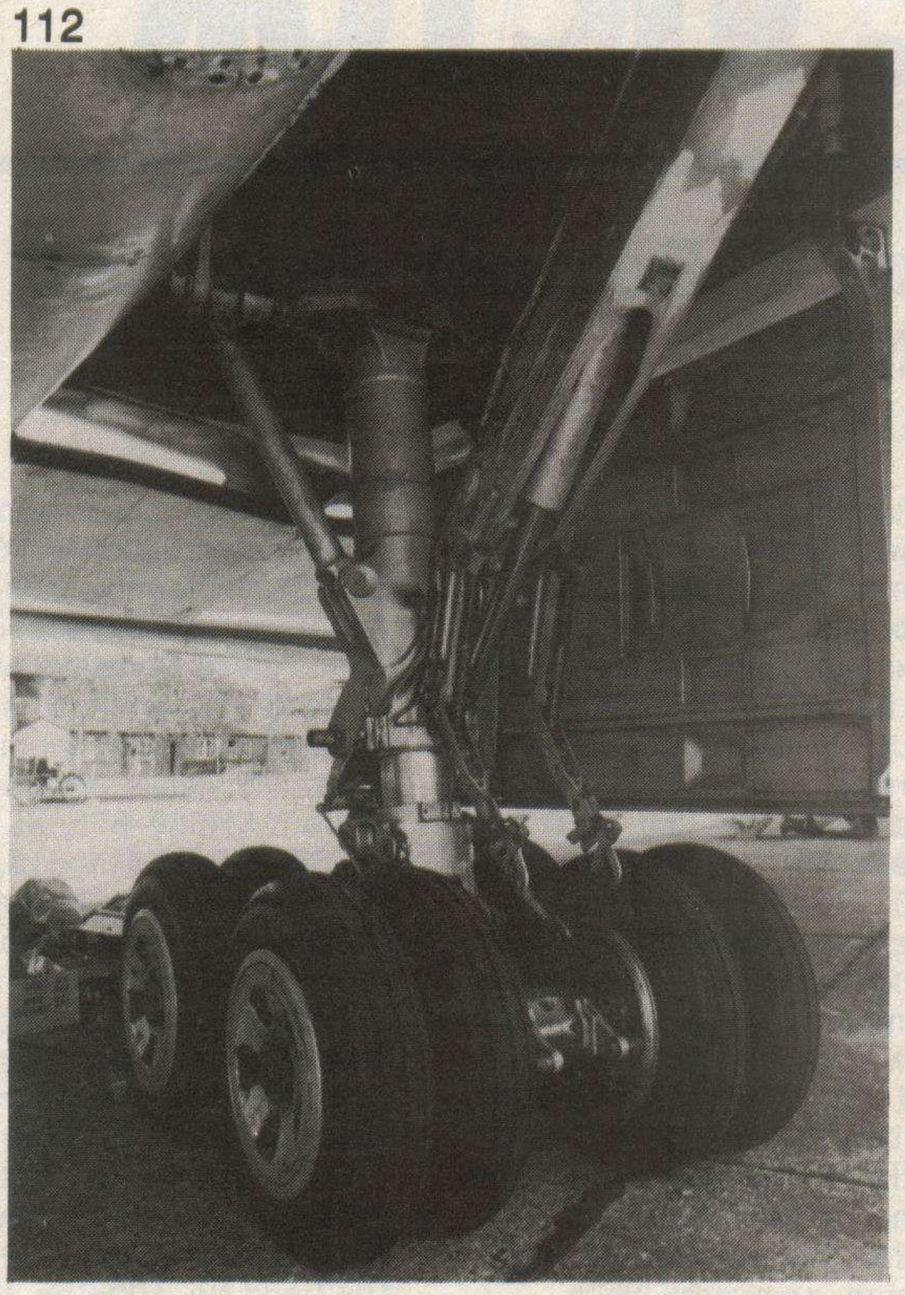
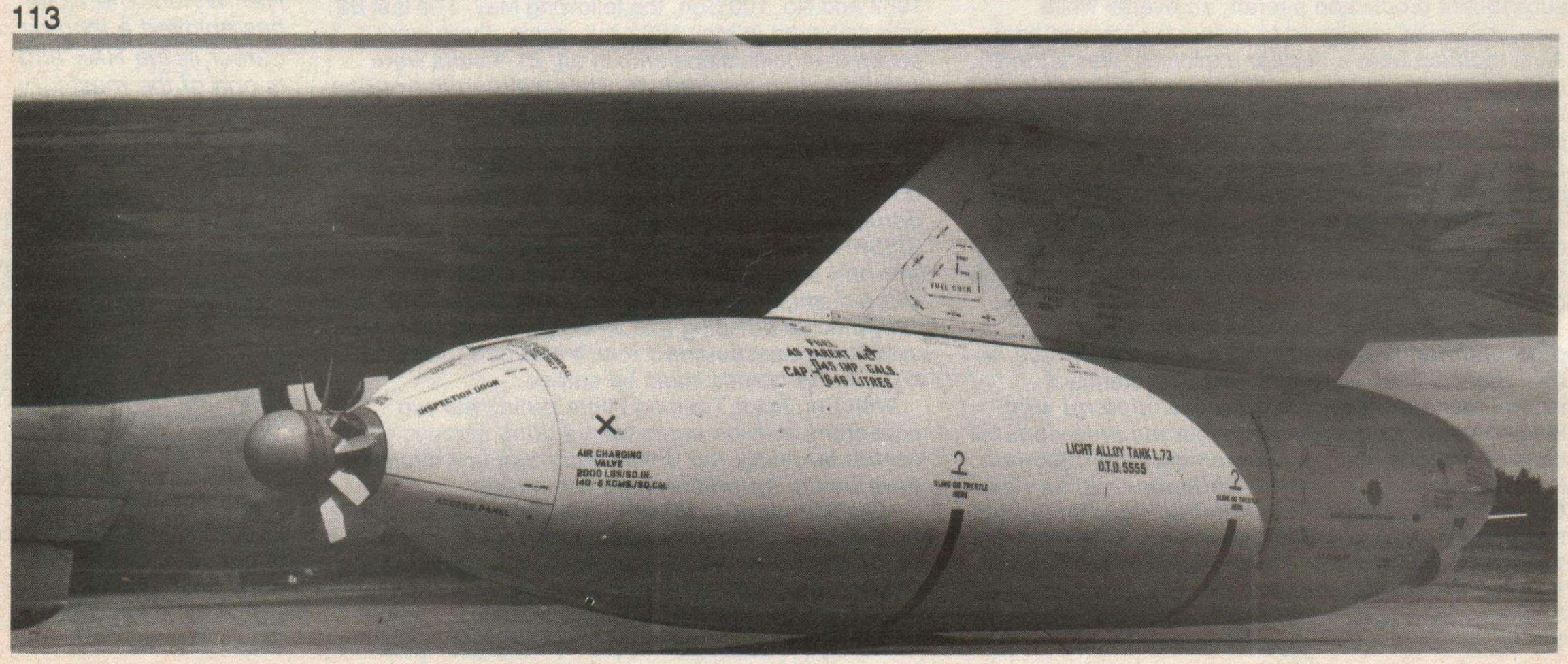


111. Rear view of Victor K2 nose wheels and sturdy mudguards. This is the preserved aircraft at the IWM Collection, Duxford and the editors of 'WARPLANE' would like to thank the staff of the museum for their efforts in preparing the aircraft for our photographer.
112. Front view of the port main undercarriage unit – a really massive chunk of machinery. Style of tyre tread and wheel 'spoking' are noteworthy.
113. Plenty of stencil detail on this Mark 1's 145 gallon refuelling pod. It should be noted that on K2 aircraft, there are only two blades on the nose. All stencil lettering is black on overall gloss white finish with the exception of the red 'hoist' markings.
114. (Opposite). Cockpit detail of the Duxford machine. This particular layout is basically that of the bomber version. The only difference is the addition of two pod isolation cock switches on the coaming.

113



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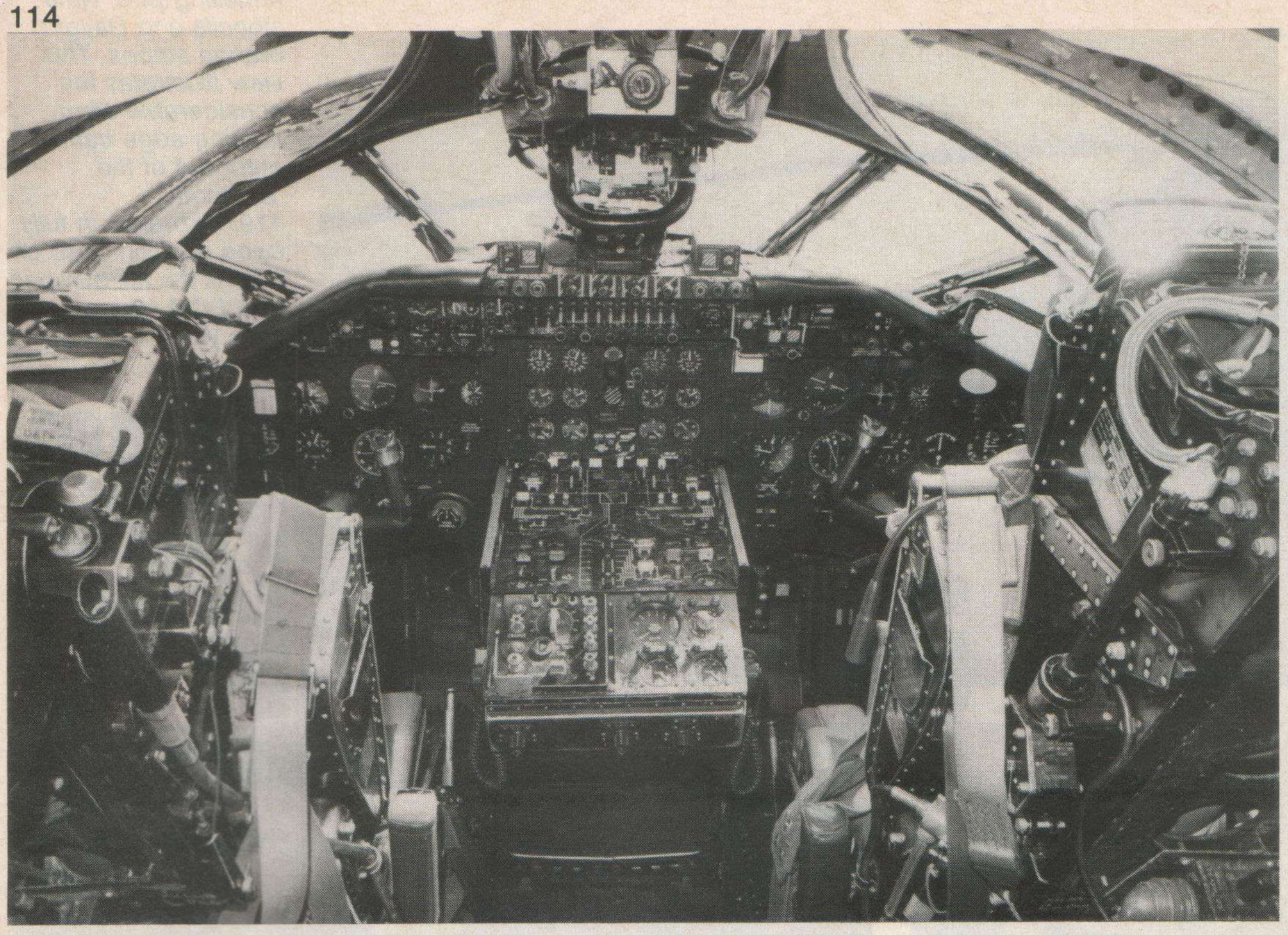

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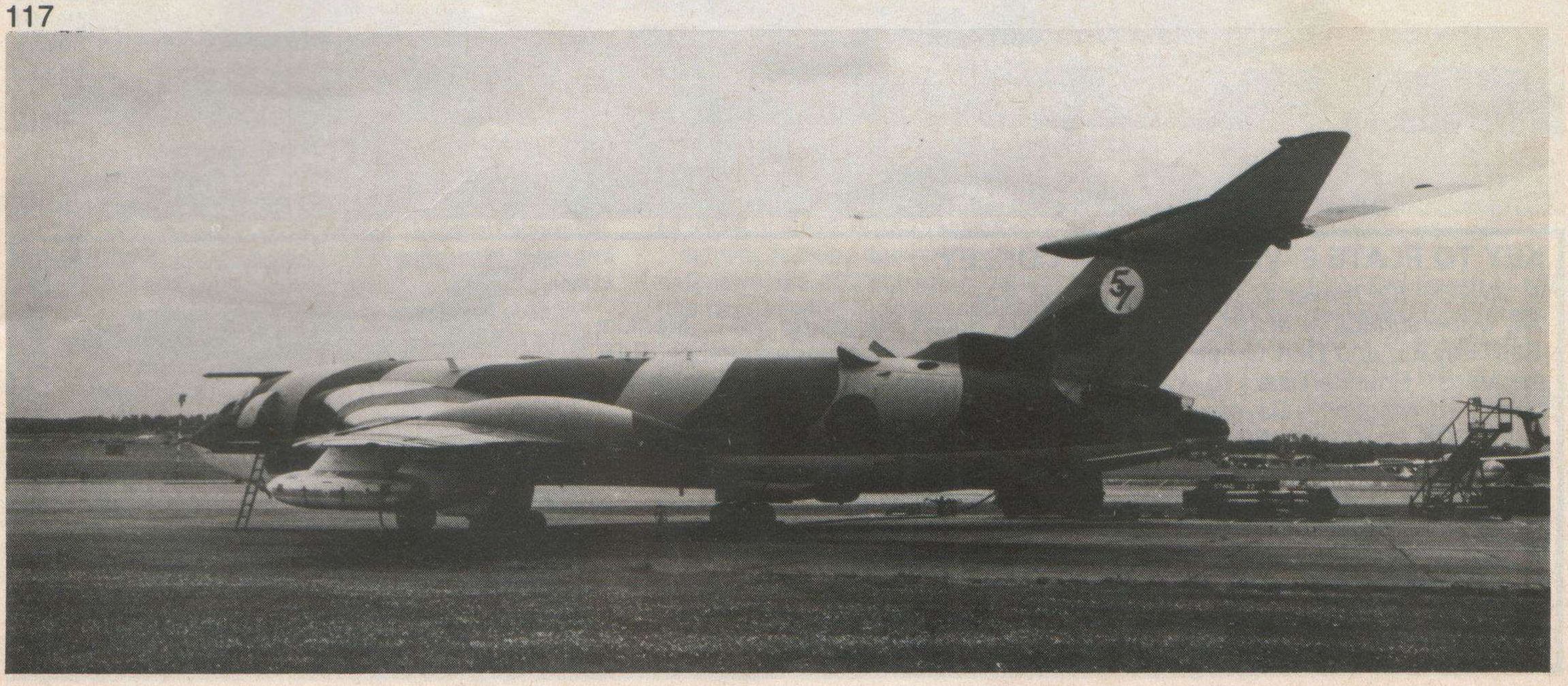
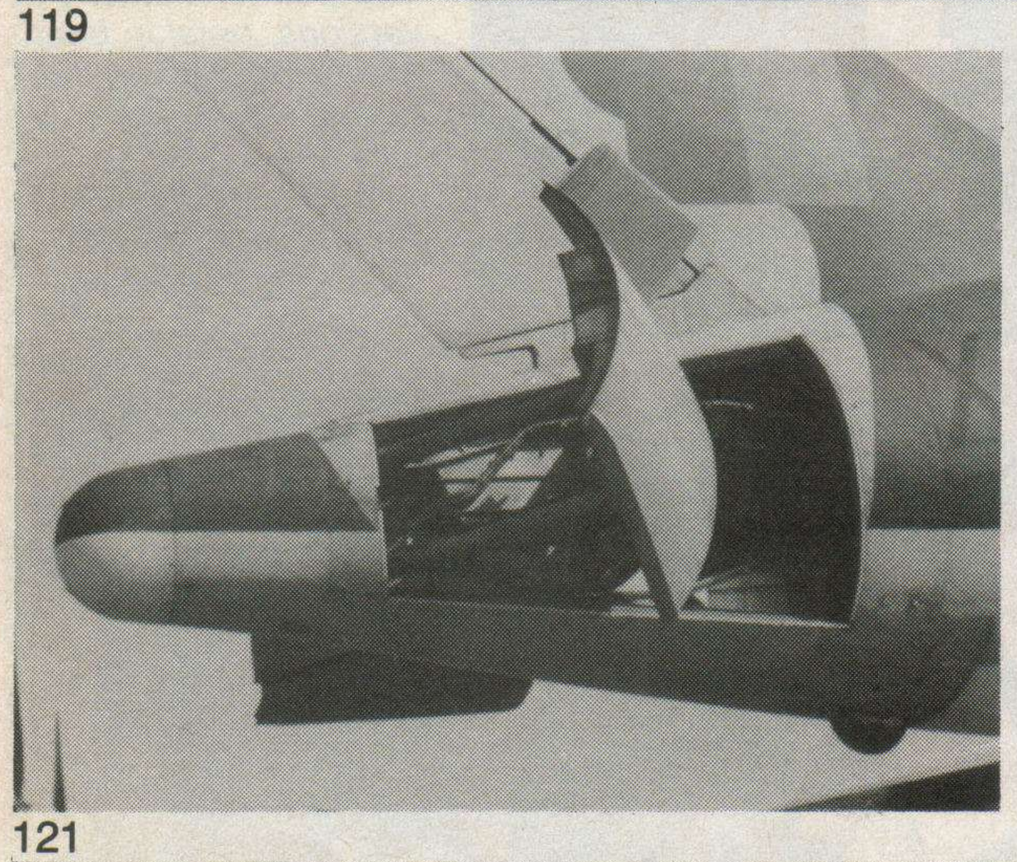


115. Front view of the nose undercarriage – note the small clearance between tyres and mudguards.
116. Bomb bay detail. Note the two fuel tanks – standard for the 'two-pointer' tanker versions, petal in front of bay to break up the airflow and the flaps in fully down position.
117. Victor K2 of 57 Squadron in standard camouflage scheme – all colours are matt.

118

118. Starboard flight refuelling pod. Note stencils and Dayglo orange stripes. This view illustrates the considerable wing leading edge camber outboard of the 'sawtooth'.
119. Airbrakes in fully open position. Also of note is the tail bumper and ECM fairing.
120. Victor of 214 Squadron, undergoing maintenance, provides clear view of the airbrake position with internal details.
121. Victor B2 XL163 in standard camouflage but note soft demarcation between upper colours.

119



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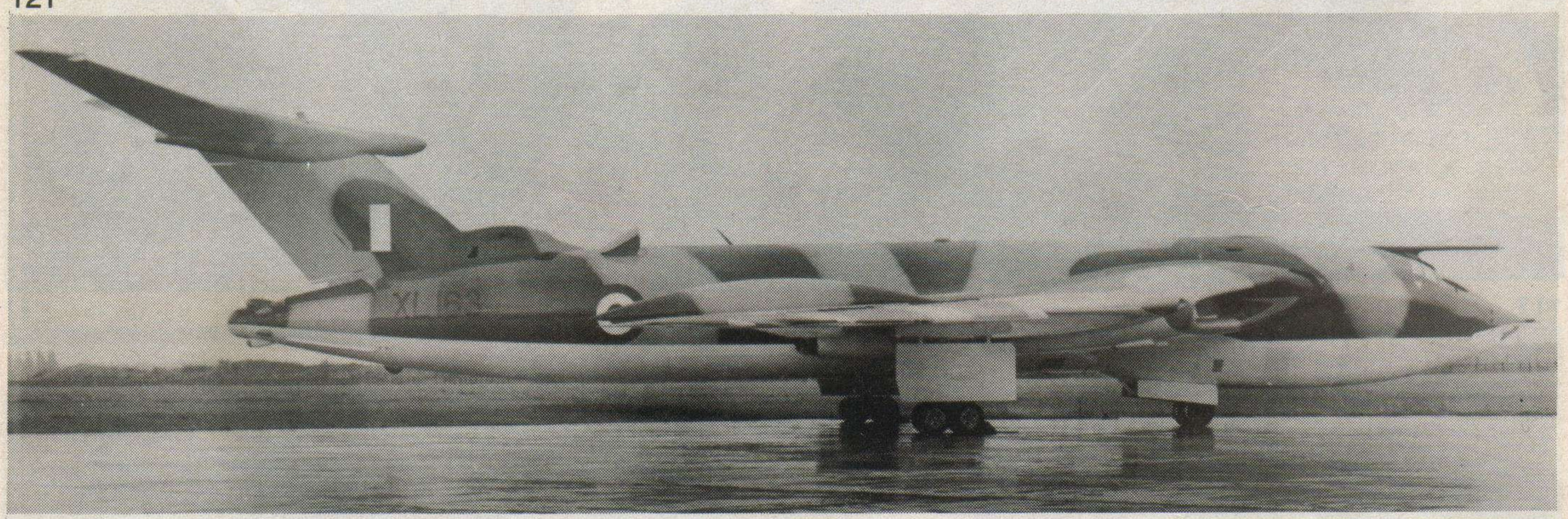
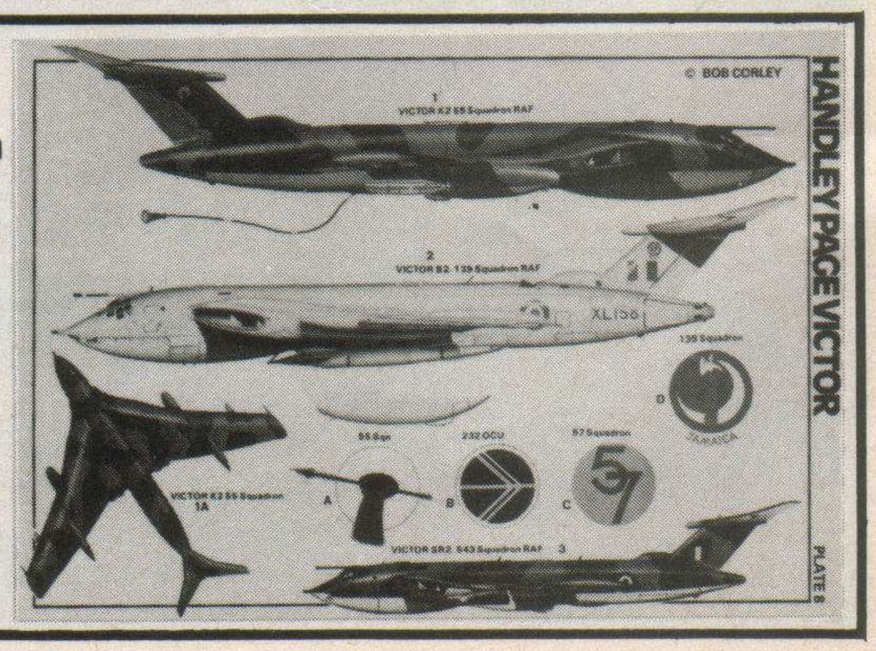


KEY TO PLATE 8. VICTORS BY R CORLEY

1. VICTOR K2 Tanker XL191, 55 Squadron RAF.
1A. Uppersurface of XL191. Camouflage from British Standards 381C: Medium Sea Grey 637 *and* Dark Green 641 *uppersurfaces and* White *undersurfaces. RAF markings –* Roundel Blue 110, *White and* Post Office Red 538. *Flashes on refuelling pods and wingtips – Dayglow Orange.*
2. VICTOR B2 XL 158, B9 Squadron, RAF, carrying Blue Steel stand-off bombs. Depicted after having visited Jamaica for that country's independence celebrations in 1962. RAF Insignia in pale anti-radiation paint.
3. VICTOR SR2 XM716 of 543 Squadron, RAF. Colours as for K2.
A. Badge, 55 Squadron. Spear faces forward both sides.
B. Badge, 232 OCU. Arrow faces forward both sides.
C. Badge, 57 Squadron. On some machines, circle was white.
D. Badge, 139 Squadron. Badge uses pale colours of roundels.



GENERAL DYNAMICS F16

The fabulous 'Fighting Falcon' described by T Lynch

The F-16 resulted from the lightweight fighter research programme that was implemented in the early 1970s to bring back some rational ideas in aircraft design and curb the uncontrollable cost overruns that had plagued military budgets for aircraft in the 1950s and 60s. Fighters, with the F-4 and others of the period, had become too complicated, heavy, cumbersome and expensive and in 1970 the US Secretary of Defense announced a new policy of 'fly before buy', where two or more companies would compete with an aircraft of their design against one or more competitors, but all within guidelines laid down in the originating specifications. This was new to North American aerospace industries, especially having to project costs and not being allowed cost overruns. Aircraft produced for these run-offs would be designated 'YF'.

In February 1972, five companies were in the LF competition, but through eliminations, Northrop and General Dynamics were chosen to make fly-offs to decide on the winner. Final selection took place in January 1975, with the YF-16 being chosen, largely because of weight/cost per unit considerations. $417 million was awarded to build six 'A' models and two two-seater 'B' models, the first being delivered in December 1976. An initial order for 650 for the USAF was followed by the announcement, on June 7, 1975, by a European consortium of Norway, Holland, Belgium and Denmark that they had selected the F-16 as the replacement for their ageing F-104s. Initial orders were for 306, with an option on 42 others. General Dynamics entered into a co-production contract with Belgium and Holland aerospace industries, which gave both a hearty slice of their own aircraft production and attendant technical know-how, as well as a portion of other aircraft for countries that entered after the deal was closed. Although oft-criticised, GD has lived up to the letter of the contract.

The F-16 aircraft is notable for its small size and lightweight, yet hearty, construction plus advanced aerodynamics and high reliability in adverse conditions. The fuselage has a flared side strake which blends with the cropped delta-wing platform. This flare provides significant body lift at high angles of attack, provides great frame rigidity and allows greater internal fuselage volume for fuel and equipment. The wings have a 40 degree sweep-back and are fitted with a single piece leading edge device and trailing edge flaperon. The high-lift devices are controlled automatically as a function of angle of attack and Mach speed. The flaperon acts as an aileron for rolling movements and a flap for manoeuvring aid or landing. The tailerons of the horizontal tailplane are fabricated of graphite epoxy over an aluminium honeycomb core, are super-lightweight but strong and interchangable from side to side. Speed brakes are fitted either side of the engine exhaust, inboard of the tailplanes, and consist of four segments when deployed. All flight controls are 'Fly-by Wire' via a four-channel redundant system.

The engine is the Pratt and Whitney F100-PW-100 unit, developing 15000 lbs./thrust dry, 25000 lbs./thrust with full afterburn. It is a twin spool design, with a three-stage fan section and is 46½ ins. in diameter, 191 ins. long and has its intake on the underside of the fuselage. It weighs 3000 lbs.+ and burns 0.68 lbs. per hr. at dry setting and 2.55 lbs. per hr. at afterburner. Fuel capacity is 6934 lbs. of fuel, both internally and externally.

The weapons system consists of one M-61 20 mm GE Gatling gun with a 500-round drum and a weapon capacity of 10500 lbs. on nine store stations. 15200 lbs. can be lifted with a reduction in fuel load. Close-in defence is handled by the AIM-9 Sidewinder on wingtip stations. (Later F-16s are equipped with the 9L, the newest). Various missile/bomb loads are available and the F-16 is capable of lifting and launching any of the HOBOS or PAVEWAY precision-guided weapons.

Norway is being equipped with 60 F-16s, in a purely defensive role. 332 Squadron, defunct for several years, has been recommissioned and equipped with the first F16s. They are based at Rygge and act as a conversion unit. 331 (F-104s) and 334 at BODO and 338 (F5s) at Orland will convert in stages. (Norwegian F-16s have a braking 'chute in a fairing at the base of the vertical rudder).

Denmark – with 58 on order – will be fully equipped by next year for 727 and 730 Squadrons at Skrydstrup. Each squadron is split into a F-16 conversion unit and a F-100 unit until enough aircraft have been delivered to fully equip the second unit. (Denmark has had an identification light added to the nose radome).

The Netherlands squadrons will close down as

(Continued on page 86)

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122. The fourth F-16B delivered in August 1977. This aircraft, 75-0751, was re-vamped in the 'Wild Weasel' role. The 'Fighting Falcon' has inspired scores of model kits, flying and non-flying, and in all possible scales. Even more are to follow so no-one can complain of a lack of choice . . .

GENERAL DYNAMICS F16A FIGHTING FALCON

Cutaway perspective by Jeremy C. Cave, ASAI

TECHNICAL SPECIFICATION

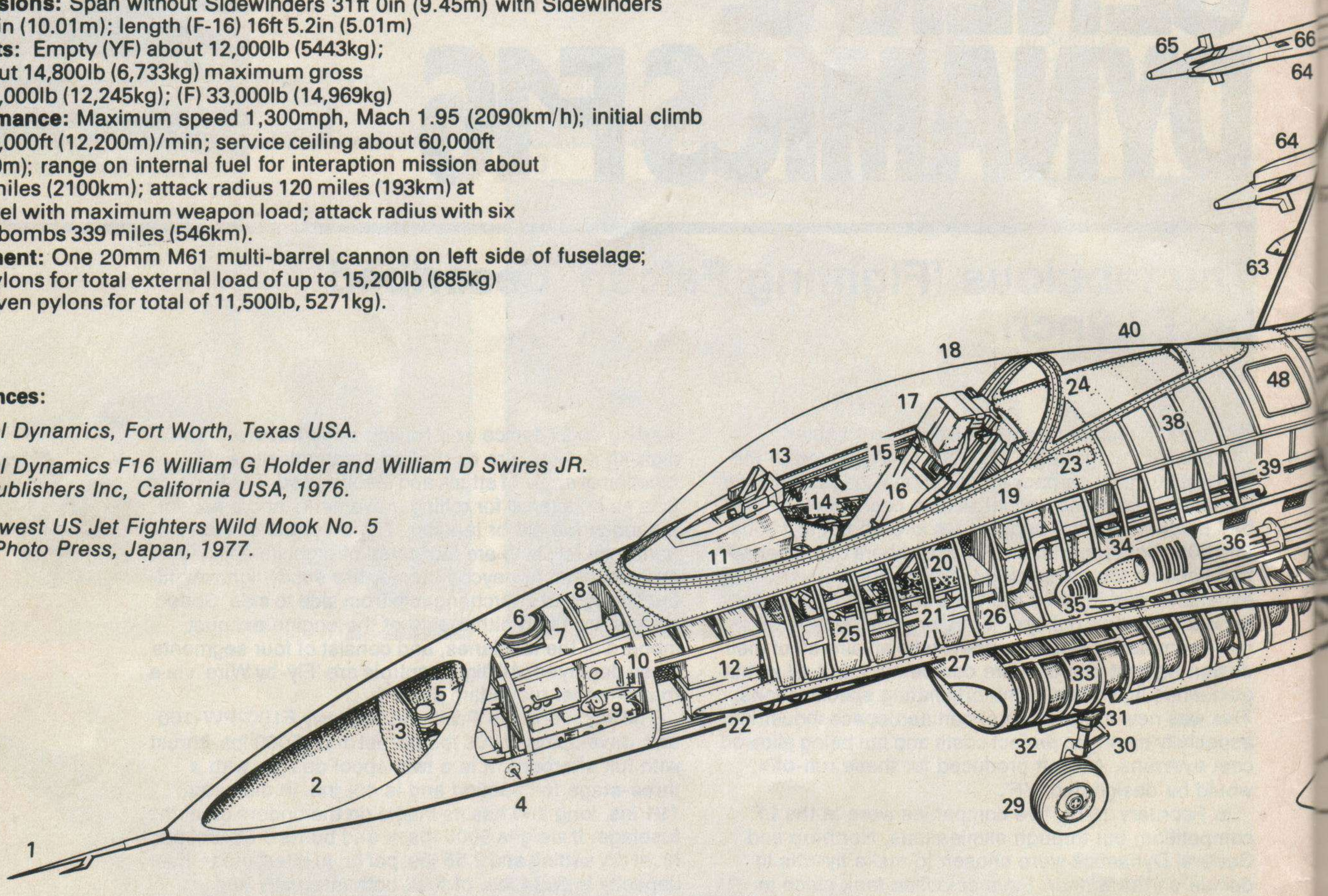
Type: Single-seat fighter bomber (B) operational trainer.
Engine: One 24,000lb (10,885kg) thrust Pratt and Whitney F100-PW-100 two-shaft afterburning turbofan.
Dimensions: Span without Sidewinders 31ft 0in (9.45m) with Sidewinders 32ft 10in (10.01m); length (F-16) 16ft 5.2in (5.01m)
Weights: Empty (YF) about 12,000lb (5443kg); (F) about 14,800lb (6,733kg) maximum gross (YF) 27,000lb (12,245kg); (F) 33,000lb (14,969kg)
Performance: Maximum speed 1,300mph, Mach 1.95 (2090km/h); initial climb (YF) 40,000ft (12,200m)/min; service ceiling about 60,000ft (18,300m); range on internal fuel for interaption mission about 1,300 miles (2100km); attack radius 120 miles (193km) at low level with maximum weapon load; attack radius with six MK 82 bombs 339 miles (546km).
Armament: One 20mm M61 multi-barrel cannon on left side of fuselage; nine pylons for total external load of up to 15,200lb (685kg) (YF, seven pylons for total of 11,500lb, 5271kg).

References:

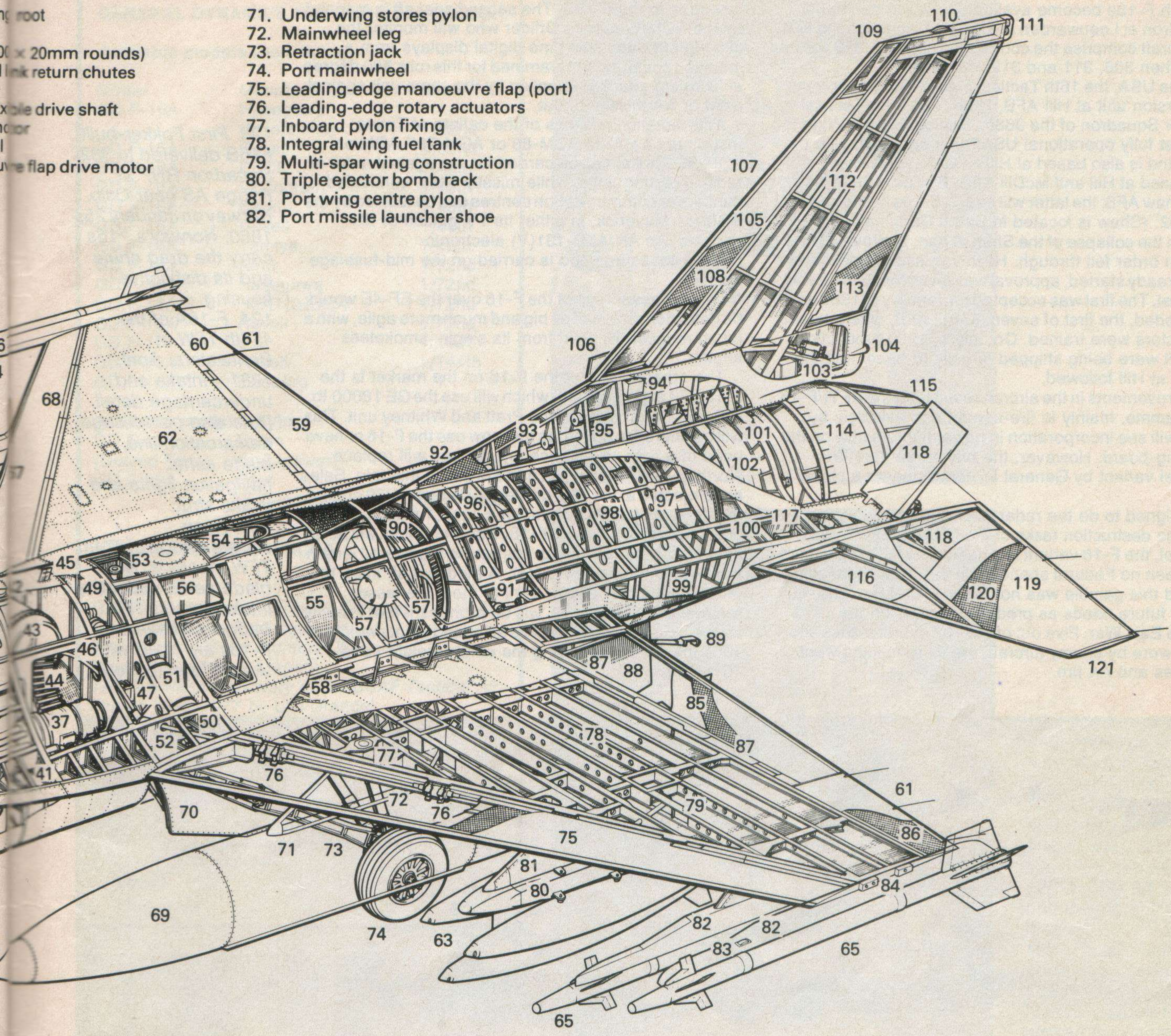
General Dynamics, Fort Worth, Texas USA.

General Dynamics F16 William G Holder and William D Swires JR. Aero Publishers Inc, California USA, 1976.

The Newest US Jet Fighters Wild Mook No. 5 World Photo Press, Japan, 1977.



1. Air Data Probe
2. Radome
3. Planar Radar Scanner
4. Angle-of-Attack Transducers
5. Scanner Drive Motors
6. ADF Antenna
7. Battery and front electronics equipment bay
8. Air-data converter
9. Forward warning antenna
10. Cockpit front bulkhead
11. Instrument panel shroud
12. Missile control electronics
13. Marconi-Elliot head-up-display unit
14. Starboard instruments console
15. Lightweight ejection seat
16. Pilot's safety harness
17. Headrest
18. Frameless bubble canopy
19. Canopy fairing
20. Port instrument console
21. Cockpit frame construction
22. Fuselage forebody strake fairing
23. Canopy hinge
24. Cockpit canopy seal
25. Throttle
26. Cockpit rear bulkhead
27. Boundary-layer splitter-plate
28. Fixed geometry air intake
29. Aft retracting nosewheel
30. Shock absorber scissor link
31. Retraction strut
32. Nosewheel door
33. Air inlet duct
34. Gun gas suppression nozzle
35. Cooling louvres
36. Cannon barrels
37. General Electric M61 20mm
38. Forward fuselage fuel tanks
39. Air conditioning system
40. Canopy aft glazing
41. Forebody blended win
42. TACAN aerial
43. Ammunition drum (50
44. Ammunition feed and
45. Antenna
46. Ammunition drum flex
47. Hydraulic gun drive m
48. Fuel tank access panel
49. Leading edge manoeu
50. Hydraulic service bay
51. Hydraulic reservoir
52. Leading edge control s
53. Centre fuel tank panels
54. Flight refuelling recept
55. Intake duct
56. Centre fuselage fuel ta
57. Wing mounting bulkhe
58. Wing attachment fittin
59. Starboard flaperon
60. Fixed trailing edge sec
61. Static discharges
62. Starboard wing
63. M.K. 82 500-16 (227-Kg
64. Missile launcher shoe
65. Aim-9L Sidewinder mis
66. Starboard navigation li
67. Leading-edge monoeu
68. Leading-edge flap hing
69. Port underwing tank, 3
70. Mainwheel door



71. Underwing stores pylon
72. Mainwheel leg
73. Retraction jack
74. Port mainwheel
75. Leading-edge manoeuvre flap (port)
76. Leading-edge rotary actuators
77. Inboard pylon fixing
78. Integral wing fuel tank
79. Multi-spar wing construction
80. Triple ejector bomb rack
81. Port wing centre pylon
82. Port missile launcher shoe

83. Port navigation light
84. Wingtip missile launcher fixing
85. Aluminium–honeycomb flaperon
86. Aluminium–honeycomb fixed trailing edge section
87. Flaperon hinges
88. Ventral fin, port
89. Runway arresting hook
90. Pratt and Whitney F100–PW–100 turbofan (23,500lb) 10,650Kg with maximum afterburner
91. Flaperon servo–actuator
92. Fin root fairing
93. Antenna
94. Anti-collision light power supply
95. Flight control system hydraulic accumulators
96. Front engine mounting
97. Rear fuselage frame
98. Main (aft) fuselage fuel tank
99. Fuselage sidebody fairing
100. Chaff and plane dispenser
101. Rear fuselage bulkheads
102. Afterburner tailpipe
103. Radar warning power supply
104. Tail navigation light
105. Graphite–epoxy fin shims
106. Starboard tailplane
107. Steel leading edge strip
108. Aluminium honeycomb leading edge construction
109. Antenna
110. Anti-collision light
111. Tail radar warning antenna
112. Fin construction
113. Aluminium honeycomb rudder construction
114. Nozzle sealing fairing
115. Fully variable exhaust nozzle
116. Titanium tailplane spar
117. Tailplane servo-actuator
118. Split trailing–edge airbrake
119. Graphite–epoxy tailplane shims
120. Aluminium honeycomb construction
121. Port tailplane

Paste-up by Stefano Mazzeo.

(Continued from page 83)

enough F-16s become available to equip each. 322 Squadron at Leeuwarden are the first, although the first 12 aircraft comprise the conversion unit first. 323 will be next, then 306, 311 and 312 at Volkel.

In the USA, the 16th Tactical Fighter Squadron is the conversion unit at Hill AFB, Utah. The 34th Tactical Fighter Squadron of the 388th Tactical Fighter Wing is the first fully operational USAF unit equipped with the F-16 and is also based at Hill AFB. Seventy-five F-16s are based at Hill and McDill AFB, Florida, 108 at Nellis and Shaw AFB; the latter will see 72 F-16s by the middle of 1982. (Shaw is located in South Carolina).

With the collapse of the Shah in Iran, approval for the Iranian order fell through. However, since production had already started, approval was given for 75 to be sold to Israel. The first was accepted on January 1, 1980 and proceeded, the first of seven, to Hill AFB, where Israeli instructors were trained. On July 1, 1980 production aircraft were being shipped directly to Israel and the seven at Hill followed.

Improvements in the aircraft result from the AFTI/F-16 Programme, mainly in fire-control and avionics, but most will see incorporation in newer fighters now on the drawing-board. However, the private-venture Wild Weasel variant by General Dynamics bears a closer look.

Designed to do the radar-suppression/anti-aircraft defence destruction tasks of the USAF's EF-4E Wild Weasel, the F-16 variant is a gamble by GD, since there has been no Federal spending in this area. Reasoning behind this gamble was not present USAF needs, but rather future needs as predicted, based on the 1973 Middle East War. Five out of the 102 Israeli planes shot down were by enemy aircraft; the 97 remaining went to missiles and AA fire.

To this end, radar frequency antenna receiver pods were fitted to the wing-tips, giving a near-360 degree coverage to the F-16B. The second seat aft is manned by the ECM/Weapons Officer who will monitor the situation through real-time digital displays from a modified computer programmed for this role; 360 degree air warning attack is supplied by the same unit against SAM or AA missile threat.

Anti-radiation missiles of the calibre of Texas Instrument's HARM AGM-88 or AGM-78F ARM or AGM-45 Shrike, can be carried for use against radar or radar-directing units, while missile sites, concealed bunkers or communication centres can be tackled by the AGM-65 Maverick, in either its TV-guided or IIR variants. An AN/ALQ-131(V) electronic counter-measures pod is carried on the mid-fuselage station.

Largest advantage of the F-16 over the EF-4E would be detection size; half as big and much more agile, with a much reduced IR yield from its single, smokeless engine.

The other variant of the F-16 on the market is the F-16/J79 export variant, which will use the GE 18000 lb. J79-GE-17X in place of the Pratt and Whitney unit. This will be offered to countries that now use the F-16 or have need of a new air defence aricraft and will replace Northop F-5s, early F-4s and F-104s in this role. Sales are projected at the 500-unit level. Using the J79 engine, the fly-away cost will plummet a cool £1 million per unit over the cost of a regular F-16. Visual changes will be an extended fuselage fairing, increasing the overall length from 45.56 feet to 48.02 feet. A modified air inlet, to reduce airflow by 25 per cent to meet the lesser requirements of the J79, will be prominent too. Penalty for the big dollar saving will be an added empty weight of 1300 lbs., which will bring the empty weight up to 16165 lbs.

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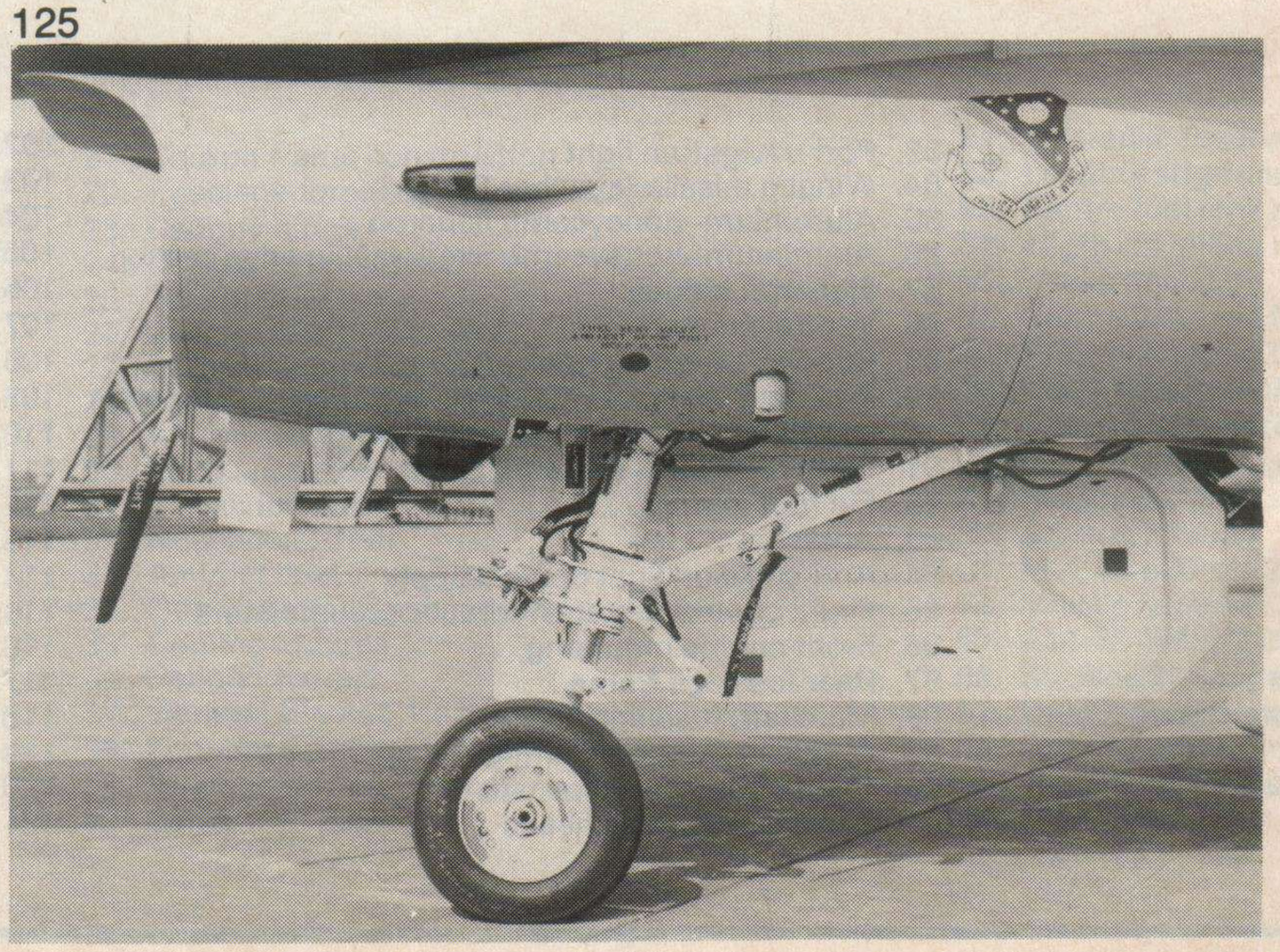

123. First Fokker-built F16B delivered to 332 Squadron RNF at Rygge AS near Oslo, Norway on January 25, 1980. Norway's F16s carry the drag chute and its distinctive housing.
124. F-16A of the 474th TFW at Bentwaters, April, 1981 – intake and undercarriage detail. Note also camouflage demarcation line, blade aerial, navigation lights and intake strut.
125. Nose undercarriage of 474th TFW machine. Note blade aerial under the intake lip and TFW badge. (All service F-16s are fitted with 'Aces 2' ejector seats.)

GENERAL DYNAMICS F-16 FIGHTING FALCON

Available models (non-flying)

Model	*Manufacturer*	*Scale*
GD F-16A	Hasegawa (2 versions)	1/32nd
GD F-16A	Revell	1/32nd
GD F-16A	ESCI	1/48th
GD F-16A	Monogram	1/48th
GD F-16A	Otaki	1/48th
GD F-16A	Revell	1/48th
GD F-16A	Tamiya	1/48th
GD F-16A	Airfix	1/72nd
GD F-16A	Hasegawa	1/72nd
GD F-16A/B	"MATCHBOX"	1/72nd
GD F-16A	Revell	1/72nd
GD F-16A	L S	1/144th
GD F-16A	Revell	1/144th
GD F-16A	Lindberg	?

Available models (flying)

GD F-16A (Ducted Fan)	Byron (R/C-power)	47 in. span
GD F-16A	Pilot (R/C-power)	36 in. span

CONSULTED REFERENCES

Books

General Dynamics F-16 by W G Holder and W D Swires Jnr. Aero Publishers Inc.
The Newest US Jet Fighters (Wild Mook No. 5). World Photo Press. (Japan).
TAC – A Pictorial History of the USAF Tactical Air Forces 1970–1977 by Lou Drendel. Squadron/Signal.

Magazines

Aerospace. March 1975.
Aircraft Illustrated. June 1974.
Air Fan. January and August 1981.
Aviation Magazine. January 1 and March 1, 1975.
Born in Battle, No. 18.
Flaps, No. 189.

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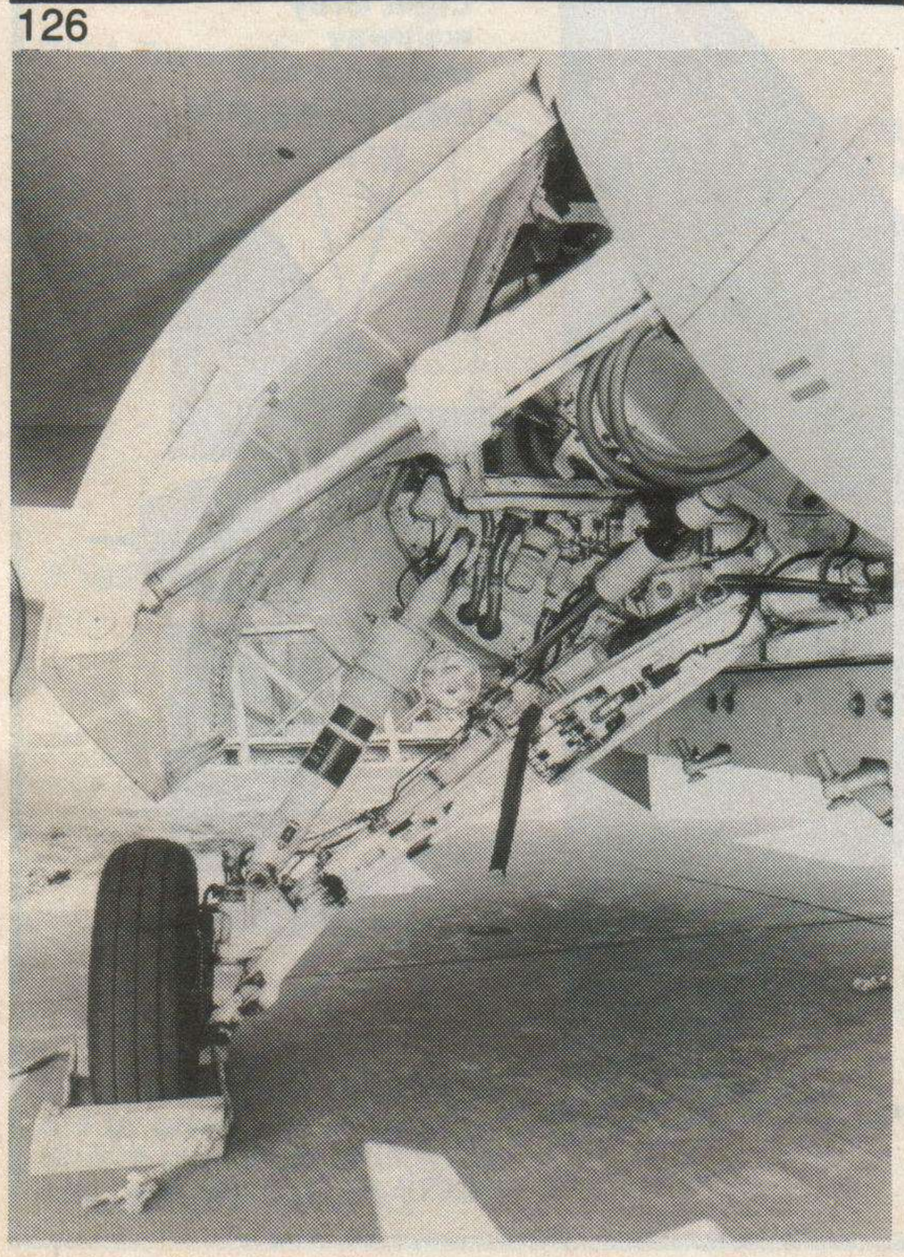

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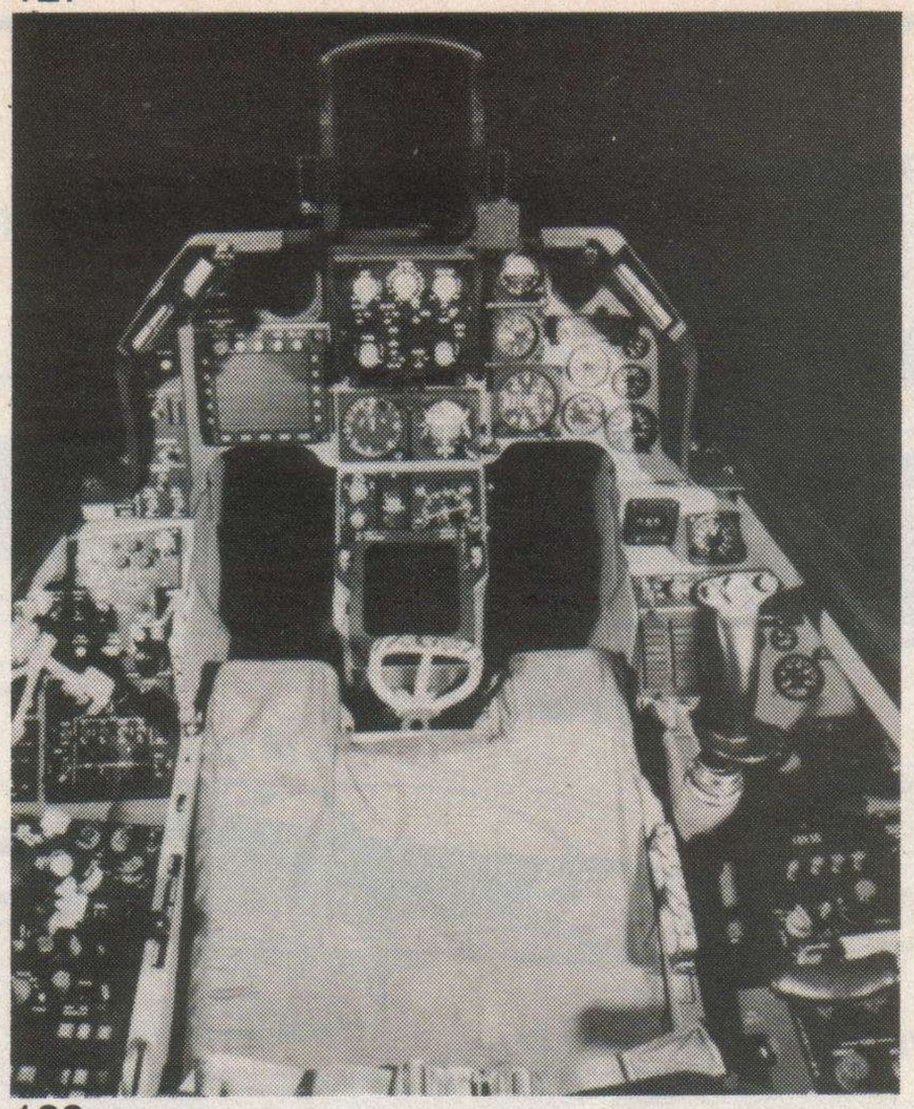

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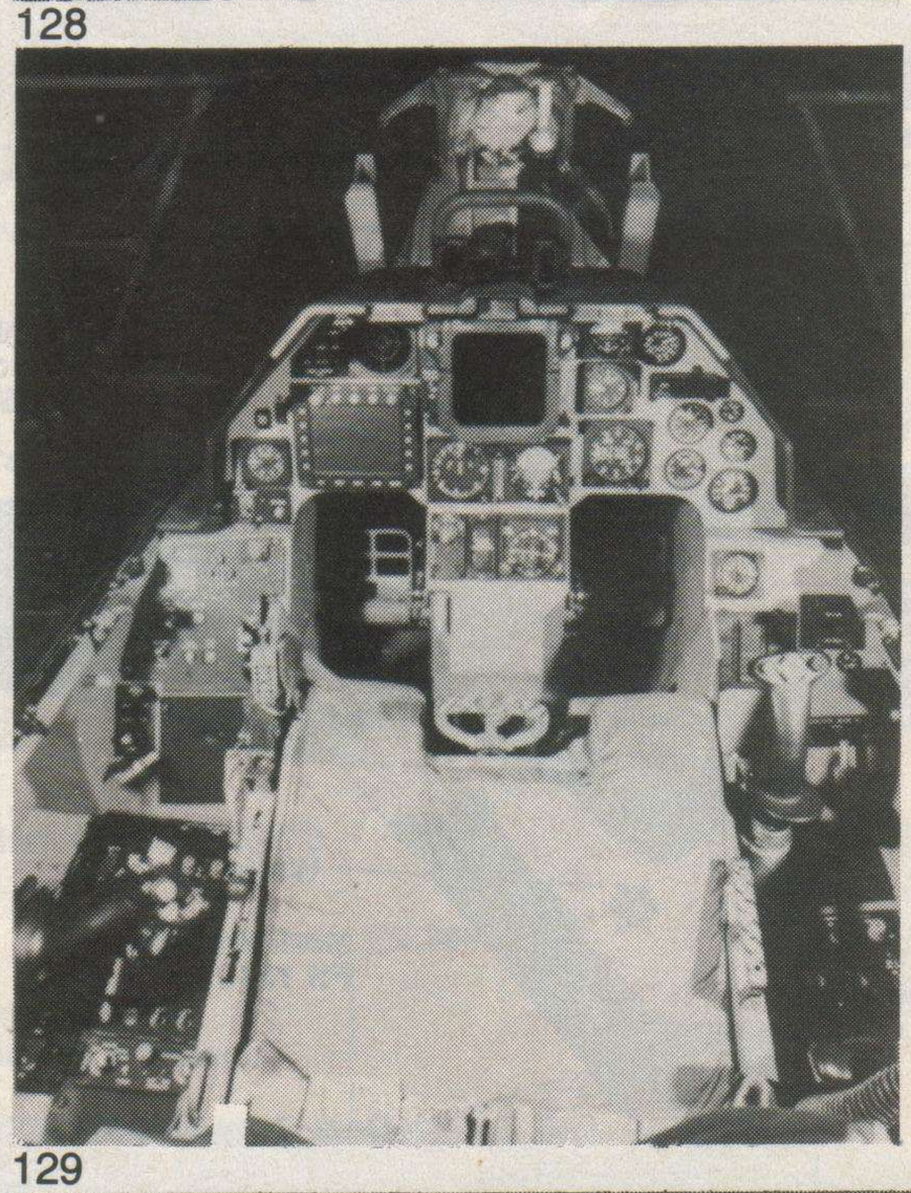

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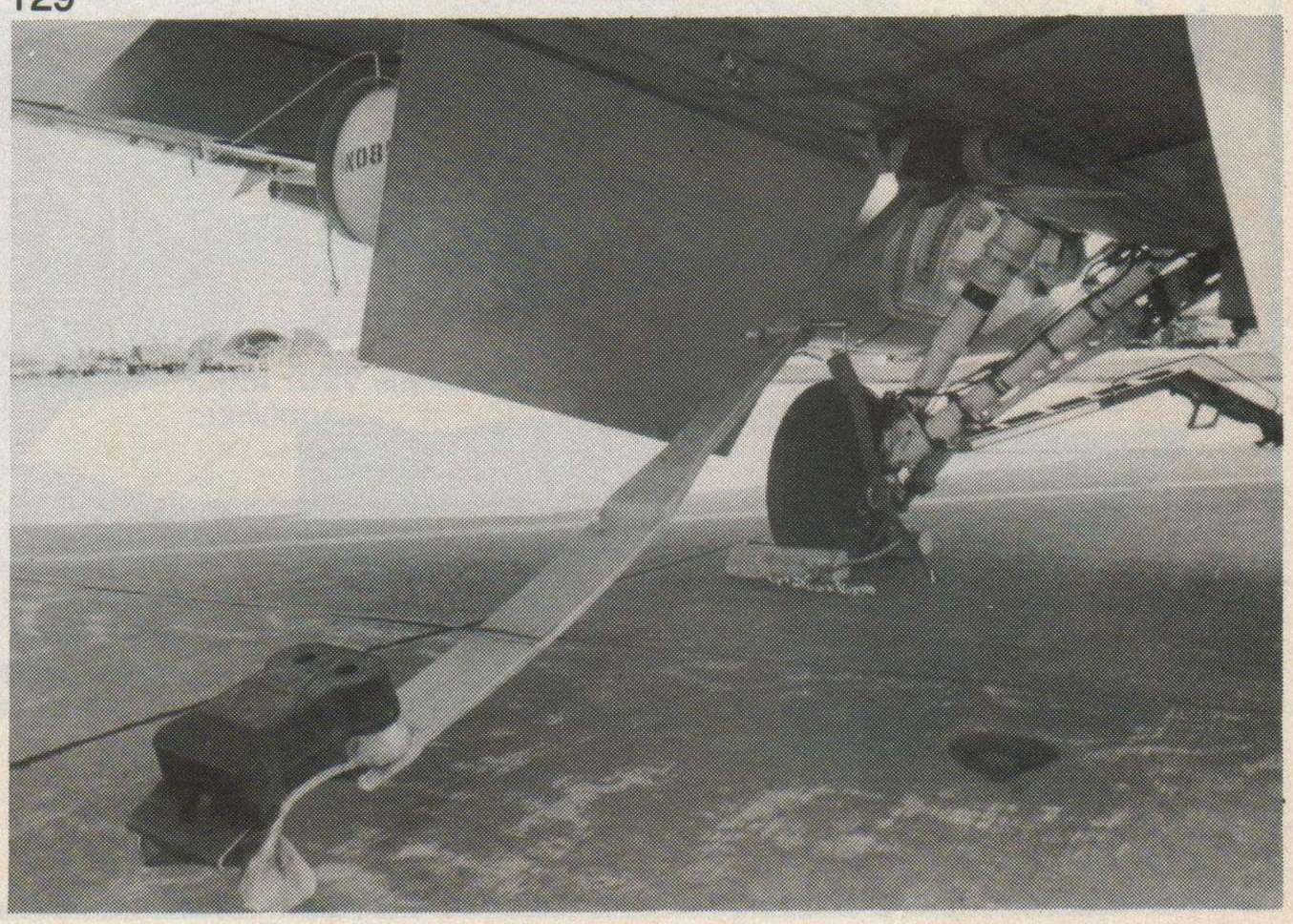
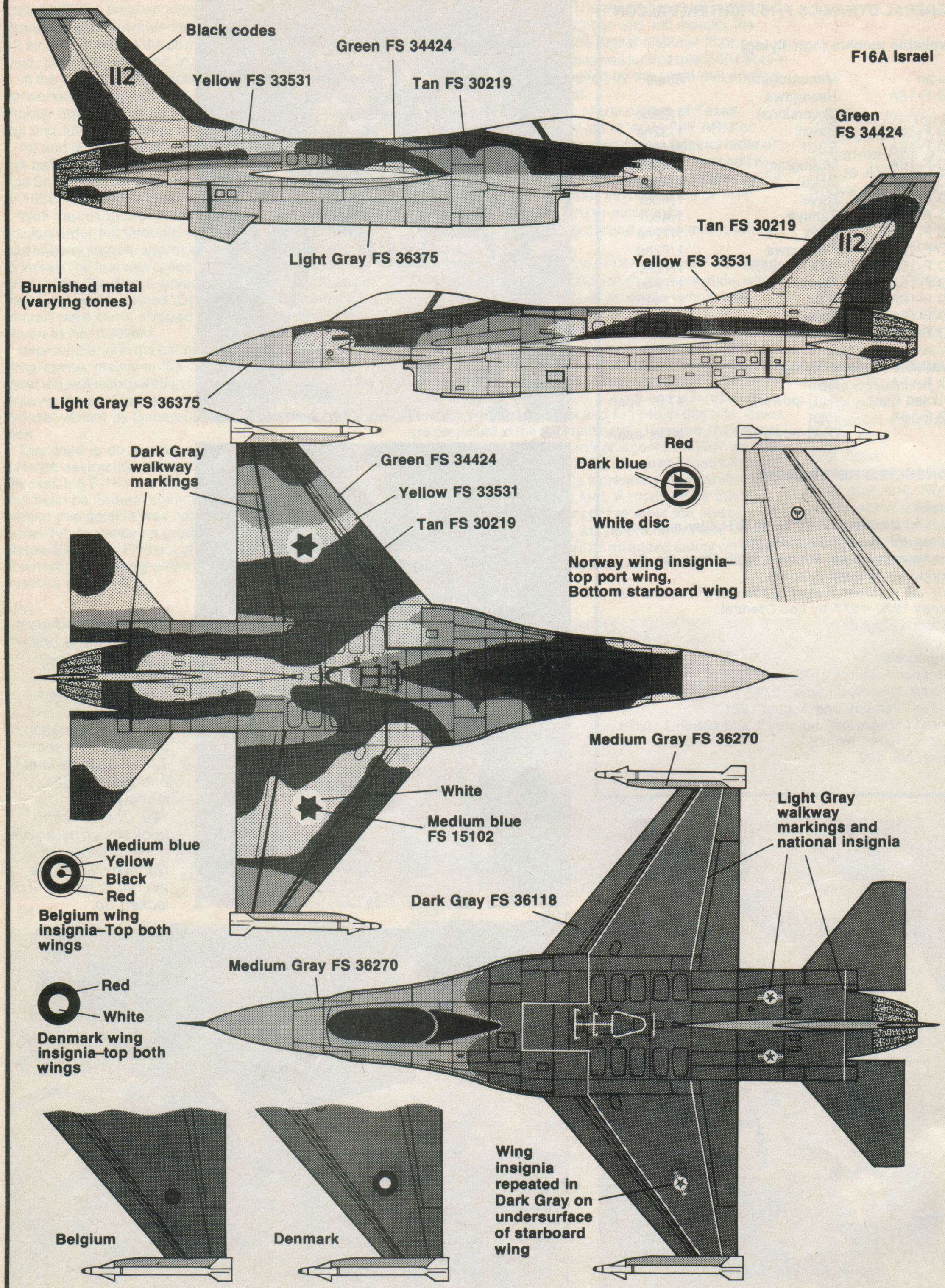


126. Starboard main undercarriage unit – note landing lamp between struts.
127. Cockpit layout applicable to F16A and forward station of the F16B two seater.
128. F-16B aft seat and instrument display.
129. The arresting hook shown here in the down position. Normally when the aircraft is parked it is locked up.


F16A Israel
Black codes
Green FS 34424
Yellow FS 33531
Tan FS 30219
Light Gray FS 36375
Burnished metal (varying tones)
Green FS 34424
Tan FS 30219
Yellow FS 33531
Light Gray FS 36375
Dark Gray walkway markings
Green FS 34424
Yellow FS 33531
Tan FS 30219
Red
Dark blue
White disc
Norway wing insignia–top port wing, Bottom starboard wing
White
Medium blue FS 15102
Medium Gray FS 36270
Light Gray walkway markings and national insignia
Medium blue
Yellow
Black
Red
Belgium wing insignia–Top both wings
Dark Gray FS 36118
Medium Gray FS 36270
Red
White
Denmark wing insignia–top both wings
Wing insignia repeated in Dark Gray on undersurface of starboard wing
Belgium
Denmark
© Steve Archibald

F16B USAF 56th Tac. Ftr. wing

Dark Gray FS 36118

Medium Gray FS 36270

Yellow

White

Black codes

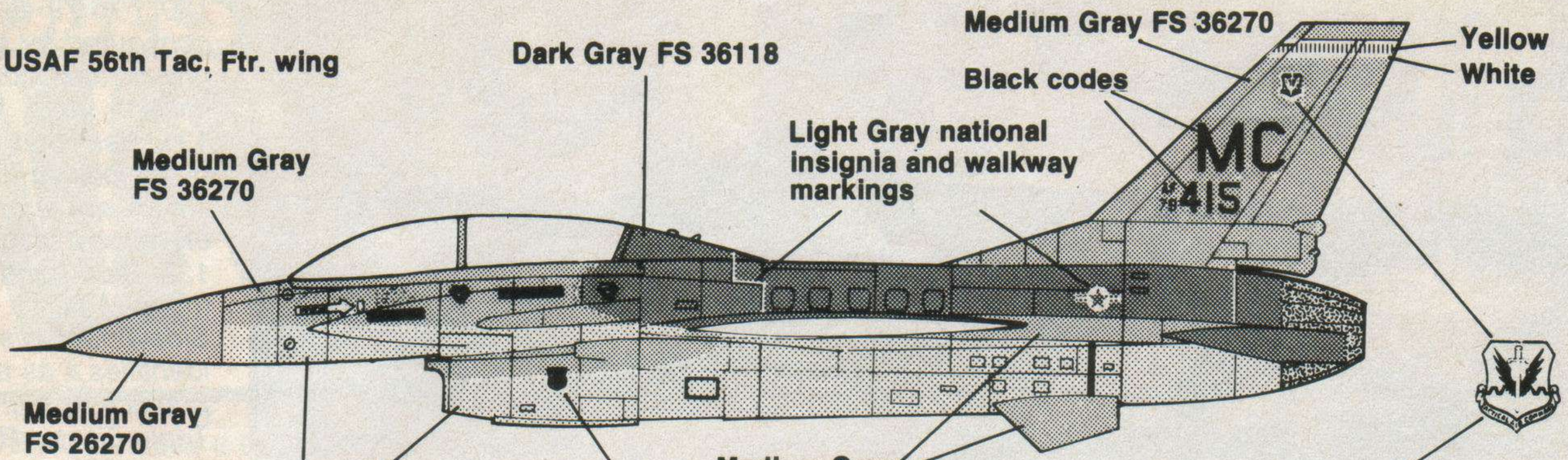
Light Gray national insignia and walkway markings

Medium Gray FS 36270

Medium Gray FS 26270

Light Gray FS 36375

Medium Gray FS 36270



F 16B. USAF 16th Tac. Ftr. Tng. Sq.

Black codes

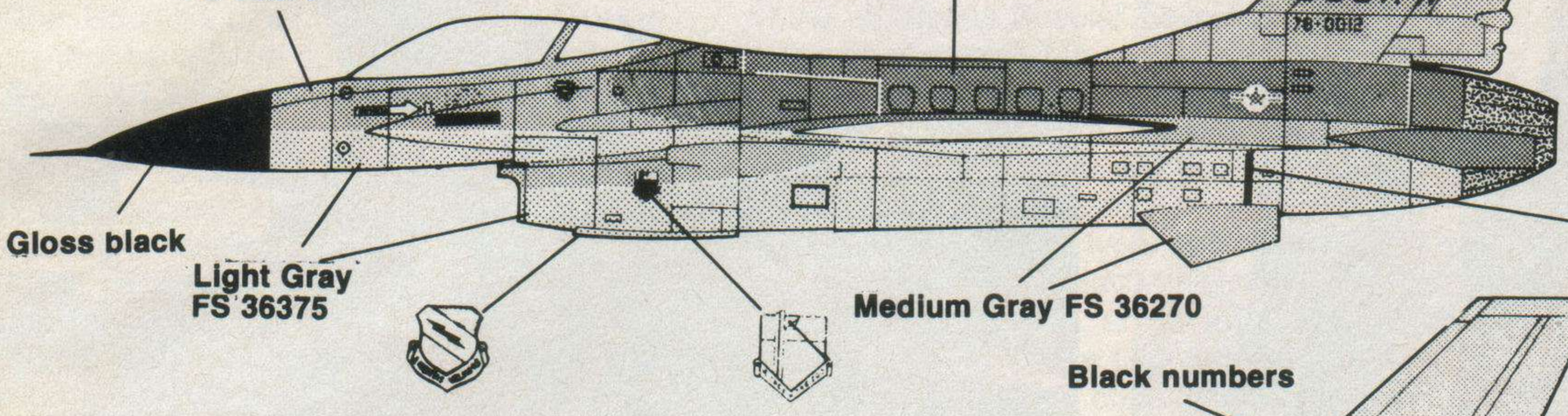
Dk blue

Red

Yellow

Medium Gray FS 36270

Dark Gray FS 36118



Gloss black

Light Gray FS 36375

Medium Gray FS 36270

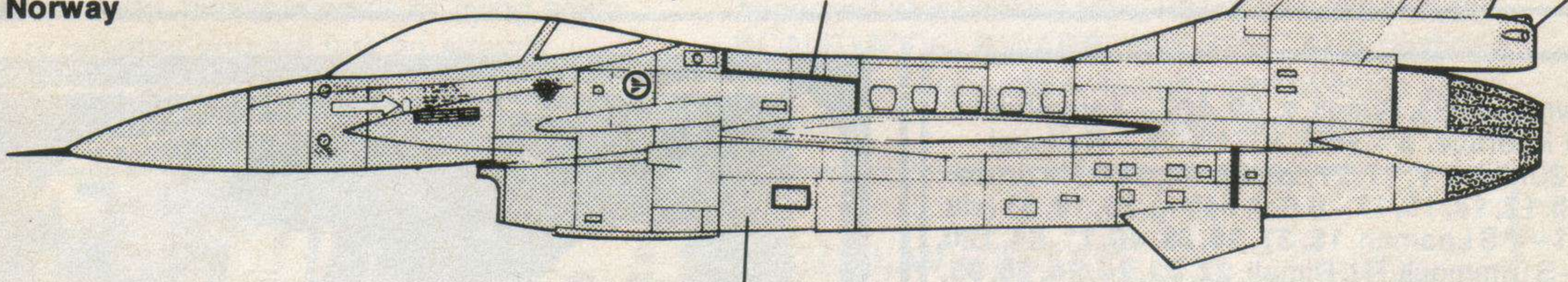
Orange stencil

Black numbers

Note drag chute housing

F16A Norway

Dark Gray walkway markings



Overall Medium Gray FS 26270

F16A Denmark

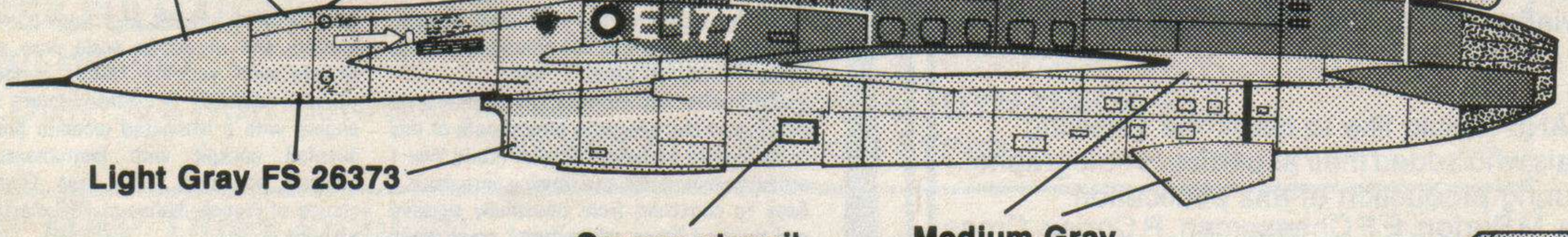
Dark Gray FS 26132

Red flag

White cross

Medium Gray FS 26270

Light Gray codes and walkway markings



Dark Gray numbers

Light Gray FS 26373

Orange stencil

Medium Gray FS 26373

F 16B. Belgium

Medium Gray FS 36270

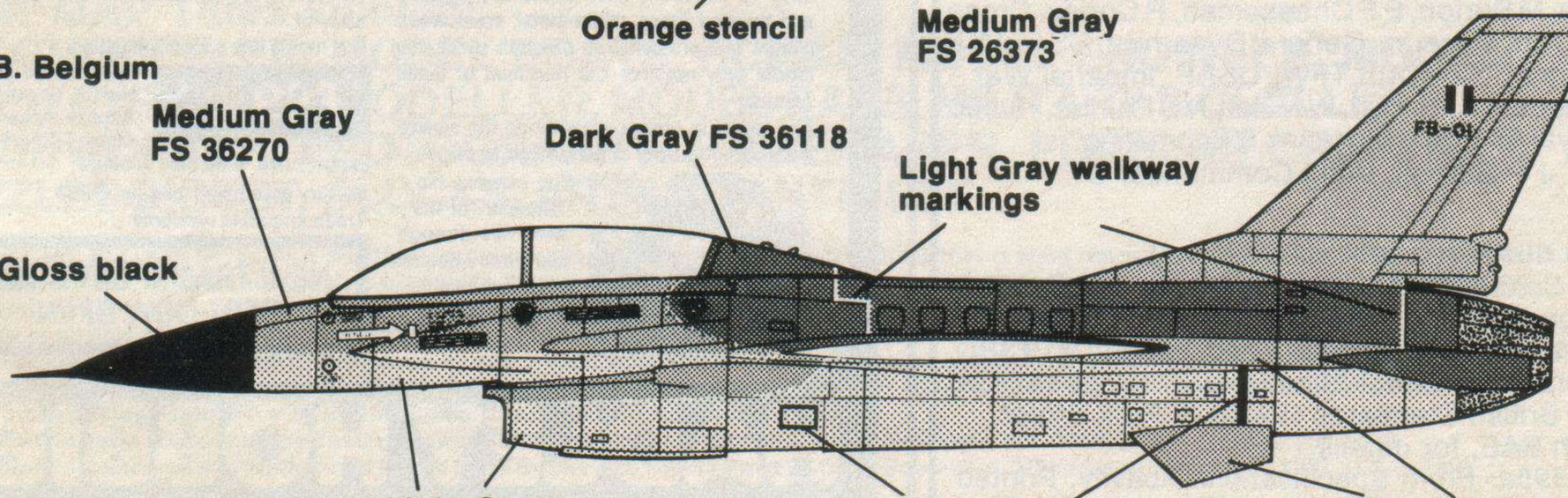
Dark Gray FS 36118

Light Gray walkway markings

Black

Yellow

Red



Gloss black

Light Gray FS 36375

Orange stencil

Medium Gray FS 36270

Note: all stencil markings are in black and white. Safety markings (triangles etc.) are orange (FS 32356)

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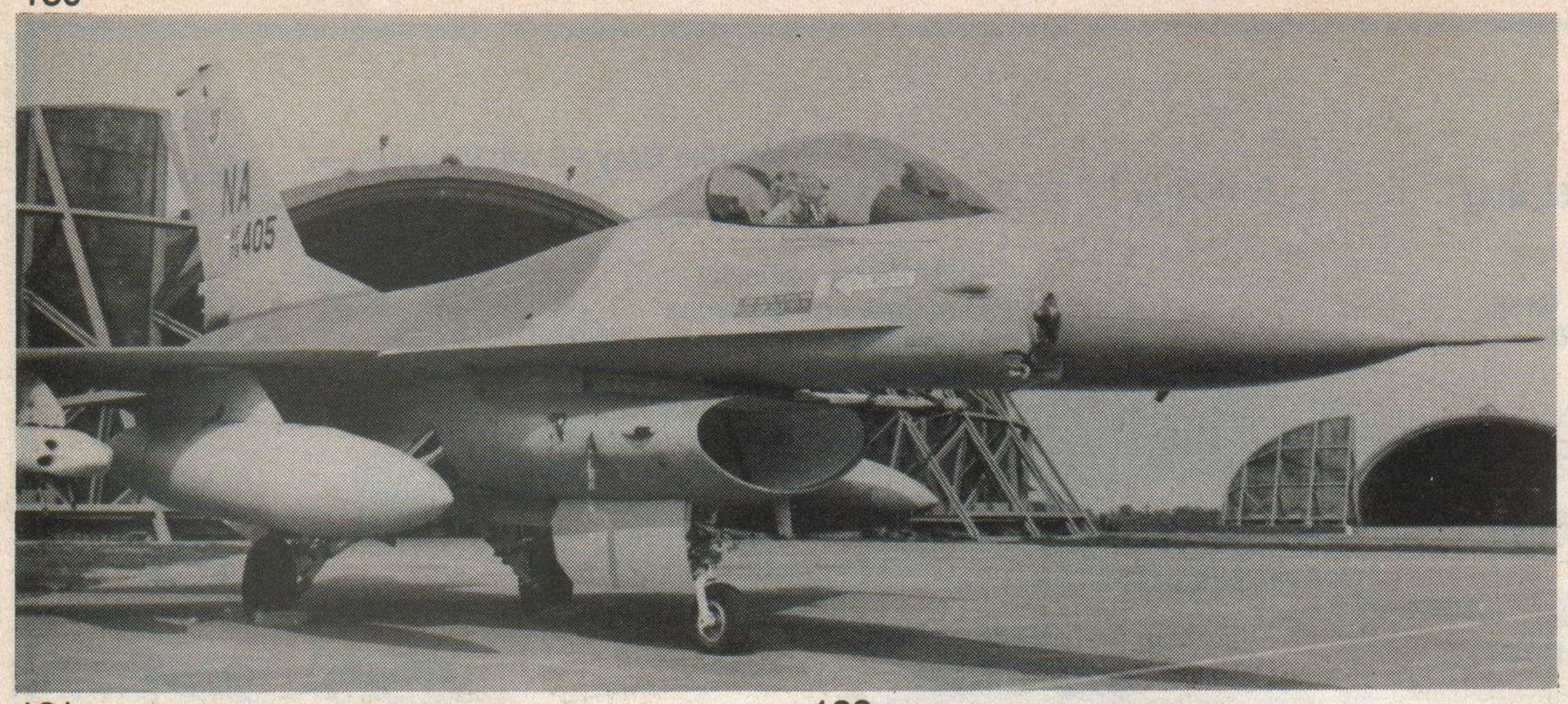
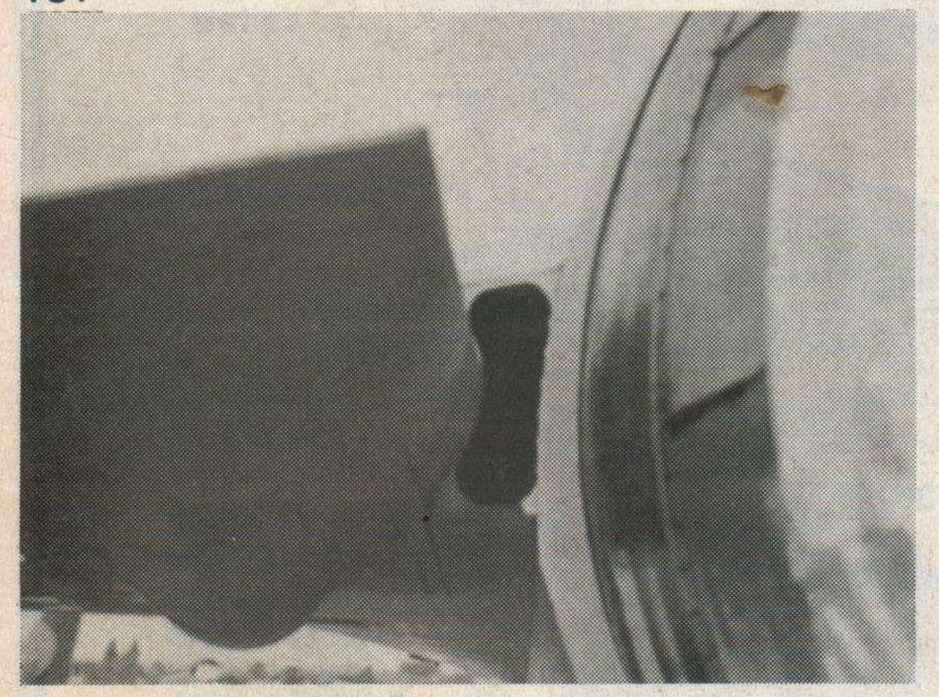


130. F16 79-405 configured for the ground attack practice mission, April, 1981.
131. Rear port tail detail looking forward – note slot at root, an oft-missed feature.
132. Blue bands on this AIM-9L Sidewinder missile identifies it as a practice round. A Triple Ejector Rack is mounted in the outer underwing pylon.

131



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Colour References as quoted in text
'Methuen Handbook of Colour' published by Methuen and Co. Ltd., 11 New Fetter Lane, London, EC4. New edition just reprinted. Try Beaumont Aviation Literature, 656 Holloway Road, London N19 3PD.
'Colours for Specific Purposes'. British Standards 371C: 1964 (ADC 5366) is available from British Standards House, 2 Park Street, London, W1. Write, with SAE, for details.
Federal Standards No 595a. From Specifications Activity, Printed Materials Supply Division, Building 197, Naval Weapons Plant, Washington DC 20407, USA. Also, American Information Retrieval Service, 22 Roland Gardens, London, SW7 3PL. (Enclose SAE with enquiry letter.)

US unit emblems – from left to right: 388 TFW, 4 TFS, 34 TFS and 421 TFS. Below, 78-0010, one of the earliest F16s supplied to the 388 TFW, seen at Hill AFB, June 1979. *Photos: USAF official via T Lynch.*

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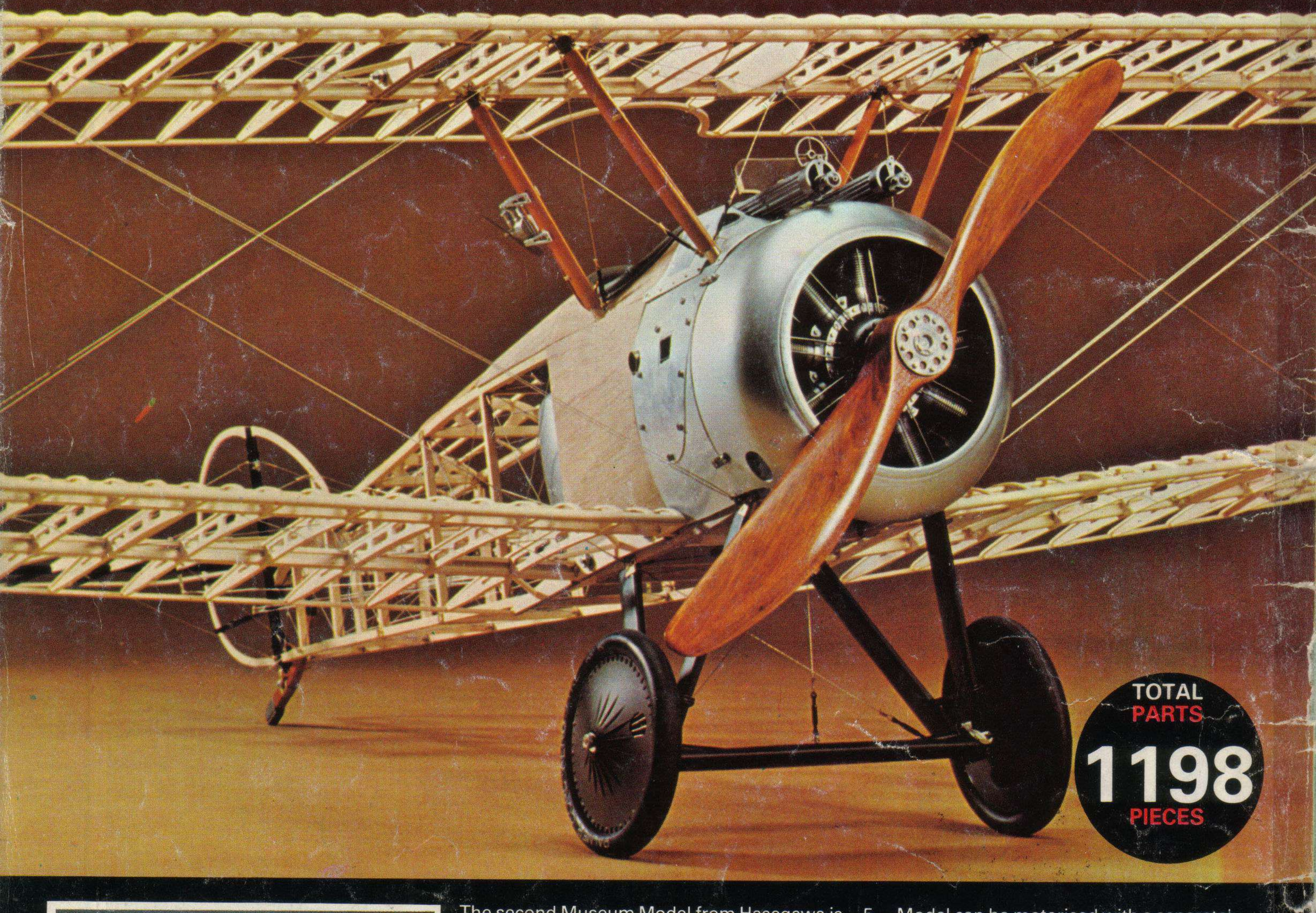

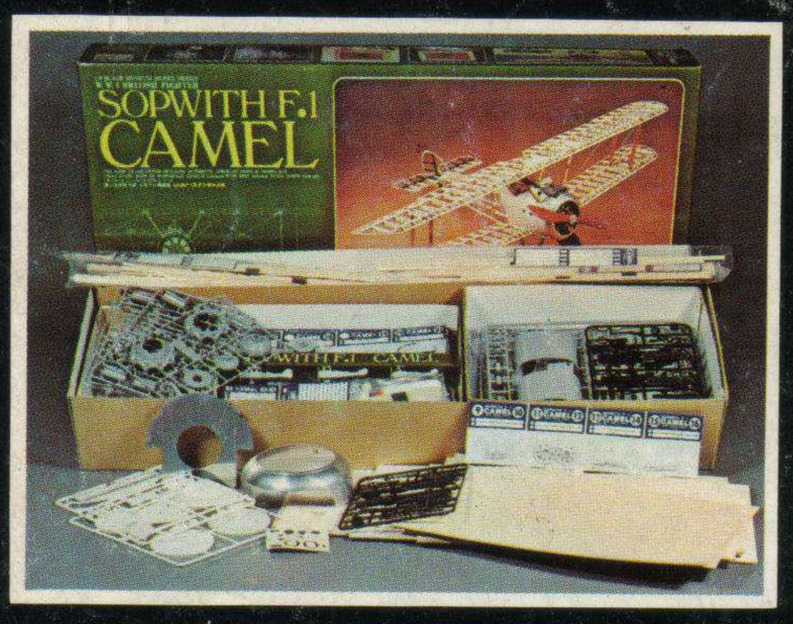

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