

Research Notes on the
Supermarine Spitfire
Compiled by John Griffin
Part 3/3

Version 1.0 – 20 June 2026

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1 Canadian Air Division

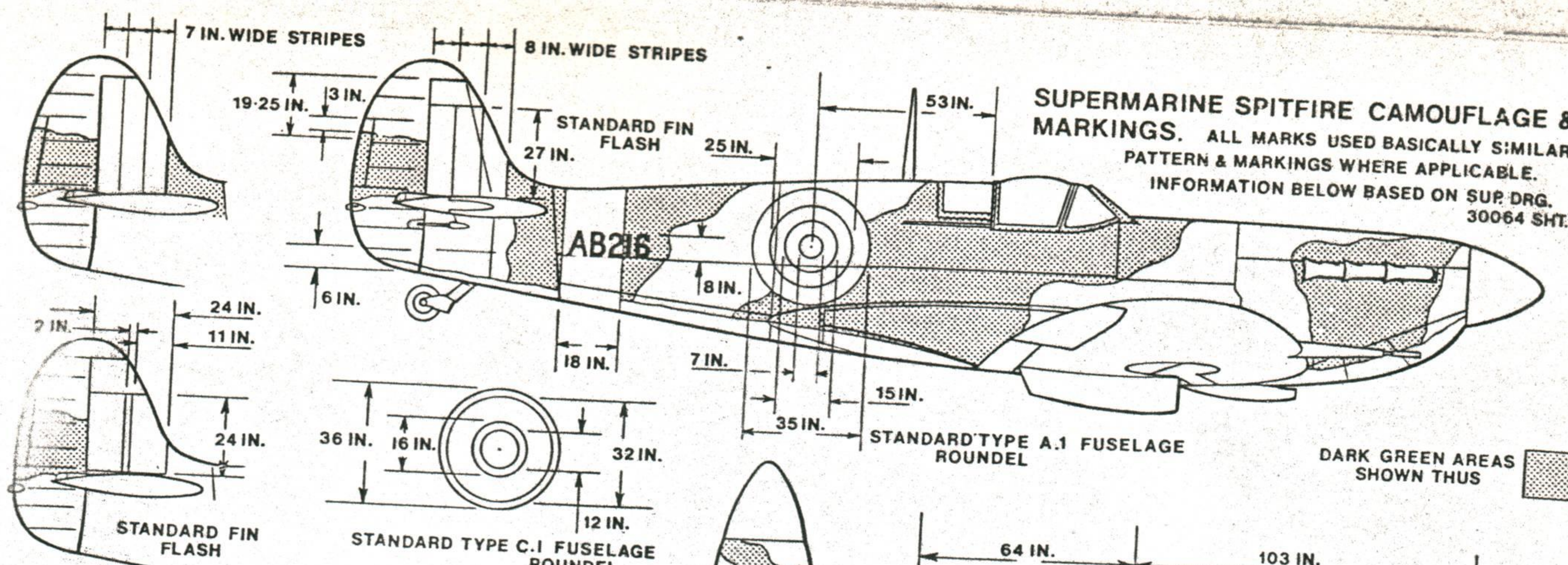
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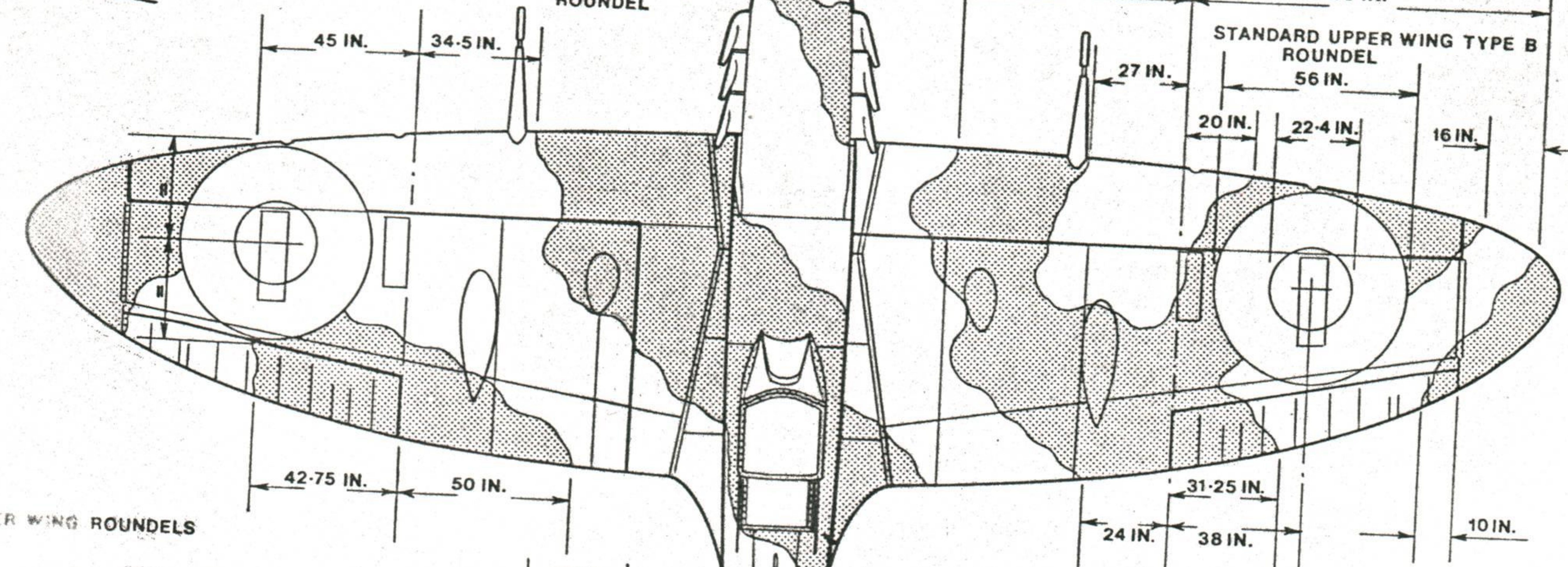
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supermarine
Spitfire

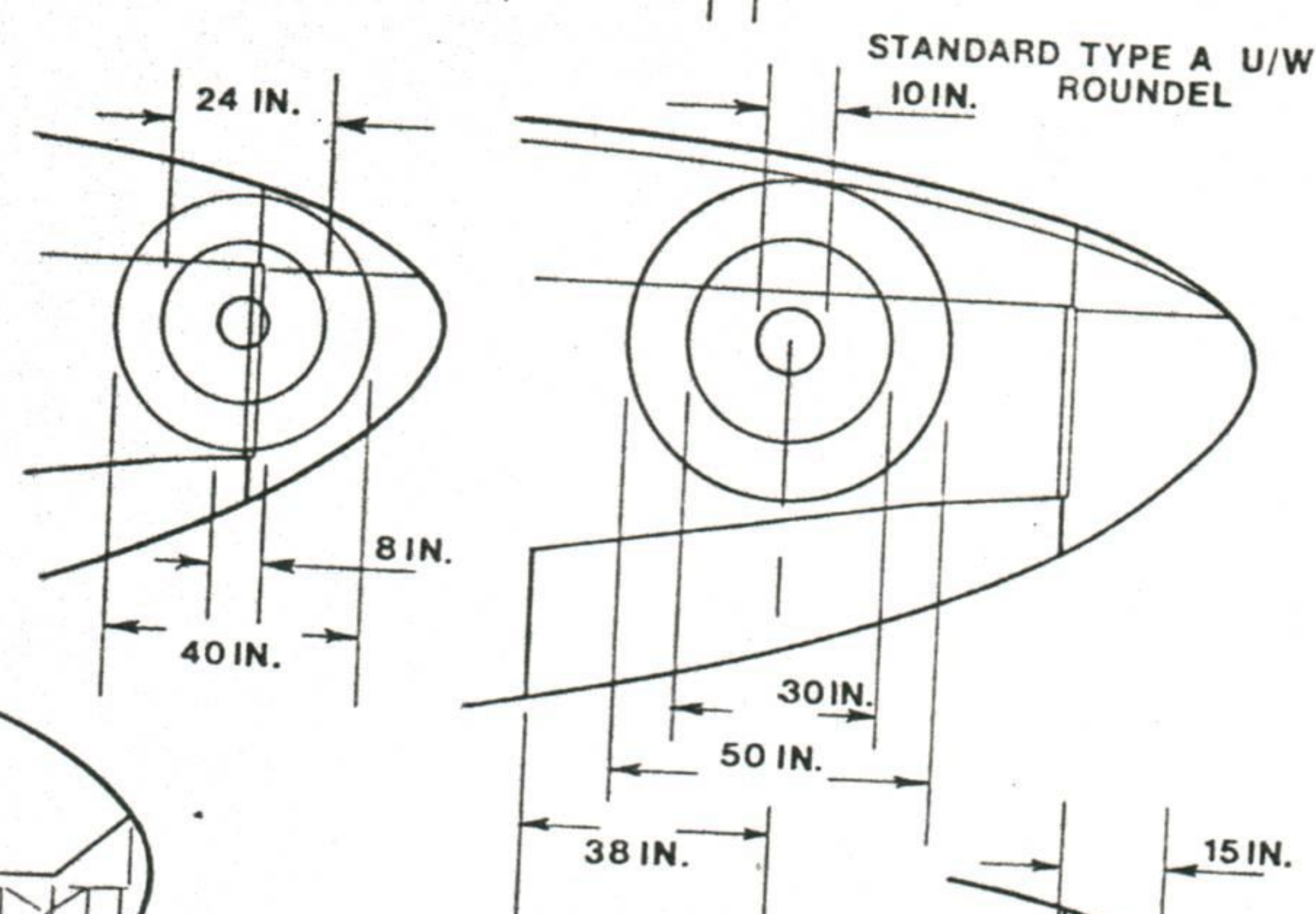
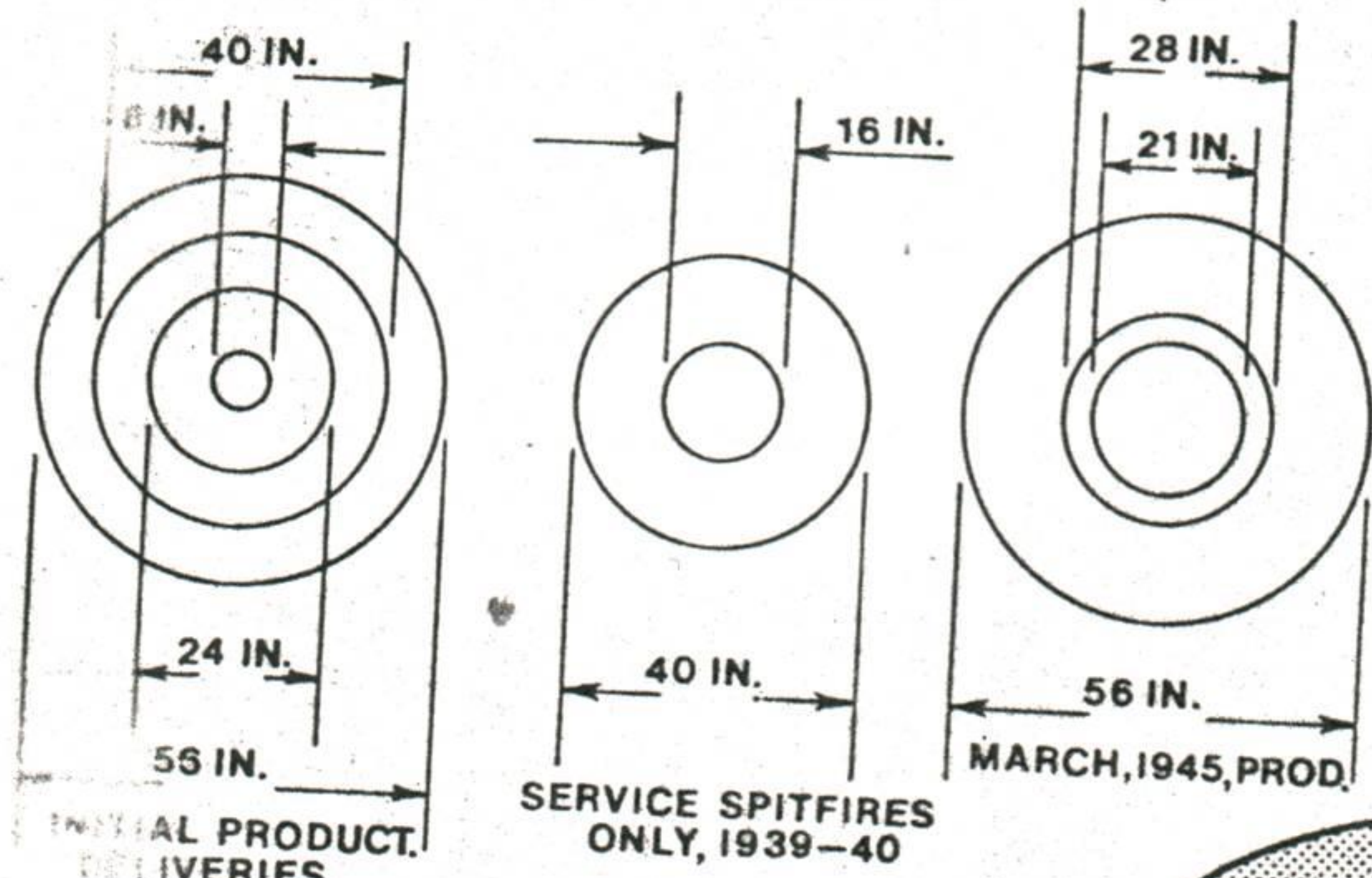
SUPERMARINE SPITFIRE CAMOUFLAGE & MARKINGS. ALL MARKS USED BASICALLY SIMILAR PATTERN & MARKINGS WHERE APPLICABLE. INFORMATION BELOW BASED ON SUP. DRG. 30064 SHT. 17 G



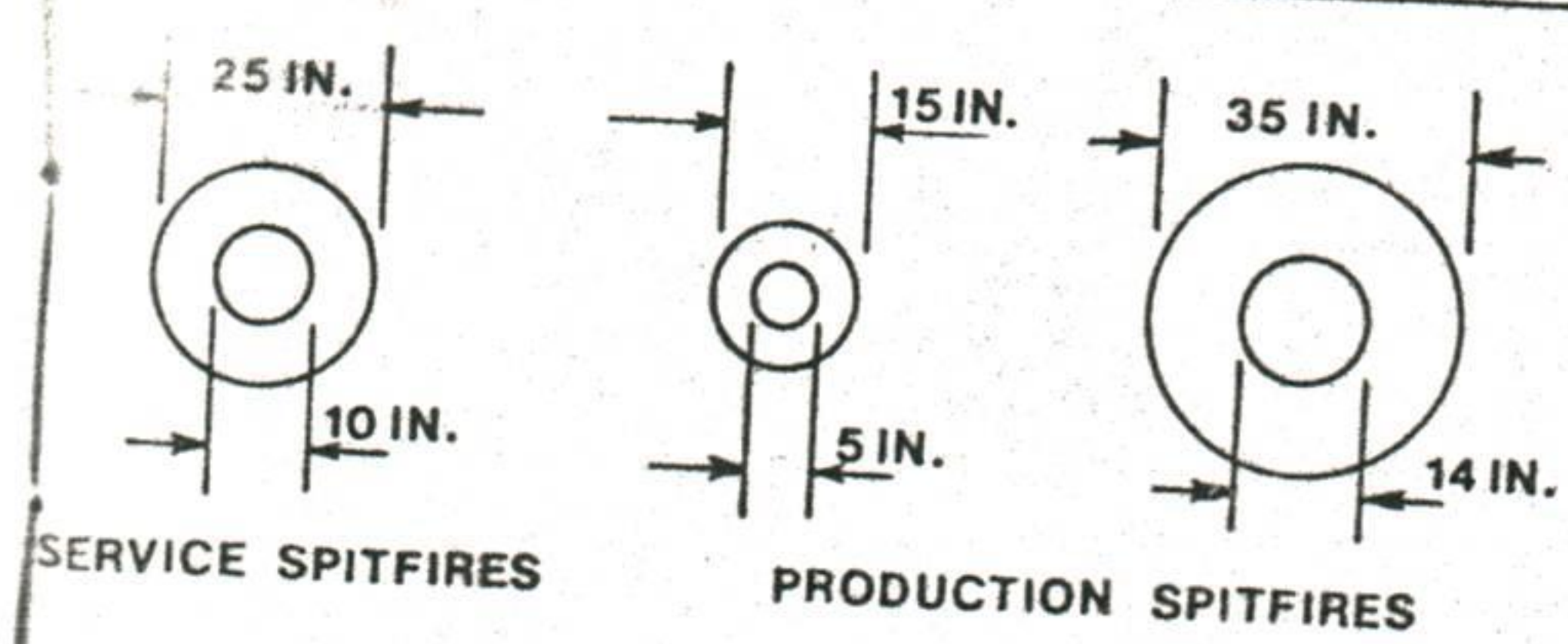
DARK GREEN AREAS SHOWN THUS



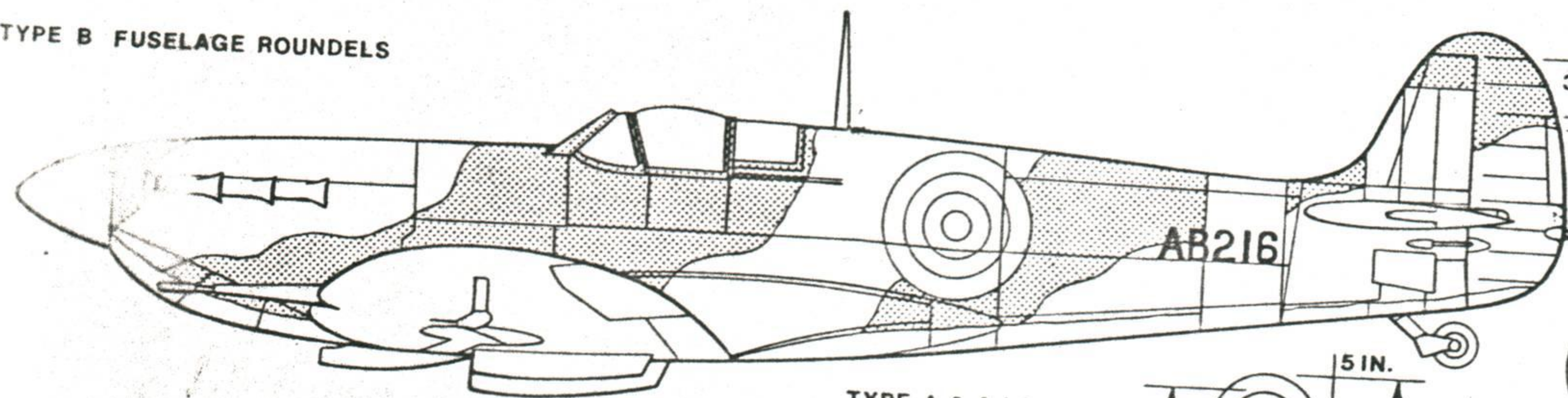
UPPER WING ROUNDELS



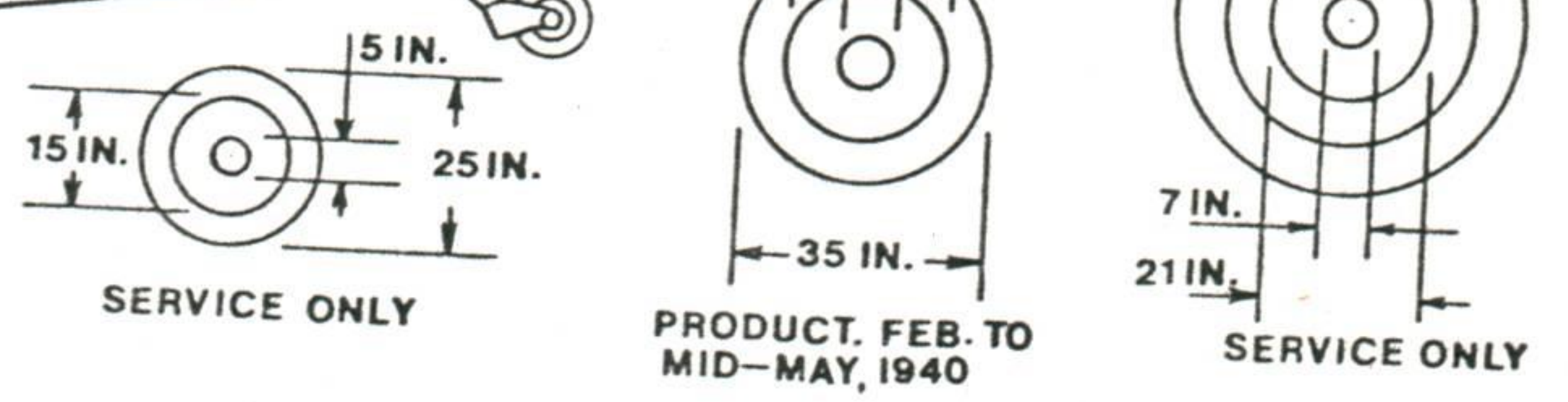
EXAMPLES OF UNDERWING ROUNDELS

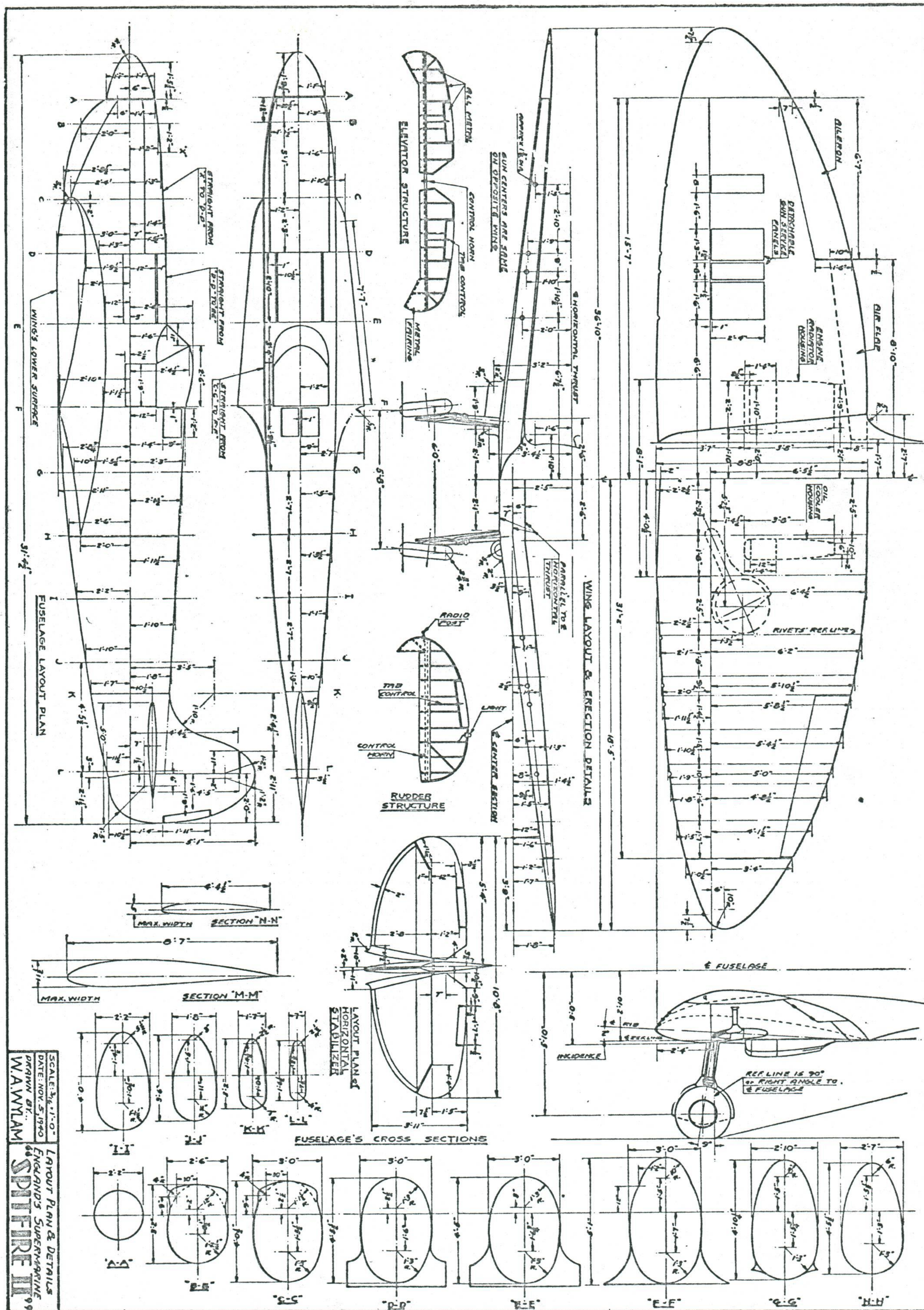


TYPE B FUSELAGE ROUNDELS



TYPE A & A.1 FUSELAGE ROUNDELS





SCALE: 1/4" = 1'-0"
 DATE: NOV. 5, 1940
 DRAWN BY: W.A. WILAM
 LAYOUT PLAN & DETAILS
 SPITFIRE II
 ENGLAND'S SUPERMARINE

SUPERMARINE SPITFIRE IS ONE OF THE GREAT AIRPLANES OF ALL TIME. A TOTAL OF 20,351 PLANES OF THIS TYPE WERE BUILT BY THE SUPERMARINE, CASTLE BRONCH AND WESTLAND FACTORIES. THESE FIGHTERS WERE FLOWN BY THE U.S.A.F. AND OTHER ALLIED NAVAL AIR FORCES IN THE LAST YEARS OF THE SPITFIRE WERE KNOWN AS THE SEAFIRE OF WHICH 2,408 WERE BUILT.

PRODUCTION SUMMARY

MARK NO.	NO. OF PLANES
I.	1,583
II.	220
III.	229
IV.	6,479
V.	100
VI.	140
VII.	1,638
VIII.	5,663
IX.	15
X.	471
XI.	100
XII.	957
XIII.	1,054
XIV.	300
XV.	225
XVI.	122
XVII.	278
XVIII.	54

SEAFIRES

II.	372
III.	30
IV.	1,220
V.	340
VI.	232
VII.	50
VIII.	50
IX.	24
X.	90

LEADING PARTICULARS

NAME	SPITFIRE FVB.
TYPE	FIGHTER SINGLE SEAT.
WING SPAN	36'-10"
LENGTH	29'-11"
HEIGHT TO PROPELLER TIP	11'-5"
GROUND TO CL. STATIC LOAD	11.5'
LANDING ANGLE	11.5°
MEAN AERODYNAMIC CHORD	7'-1"
TAIL SURFACE SPAN	10'-6"
AIRFOIL	N.A.C.A. 2200
WING ANGLE OF INCIDENCE	2°
WING DIHEDRAL ANGLE	5°
WING AREA	242 SQ. FT.
WING FLAPS	18.9 SQ. FT.
WING FLAPS	15.6 SQ. FT.
TAIL PLANE ANGLE OF INCIDENCE	2°
TAIL PLANE AREA	31.46 SQ. FT.
ELEVATOR AREA	13.86 SQ. FT.
TRIM TABS	0.76 SQ. FT.
VERTICAL STABILIZER	4.61 SQ. FT.
RUDDER	8.23 SQ. FT.

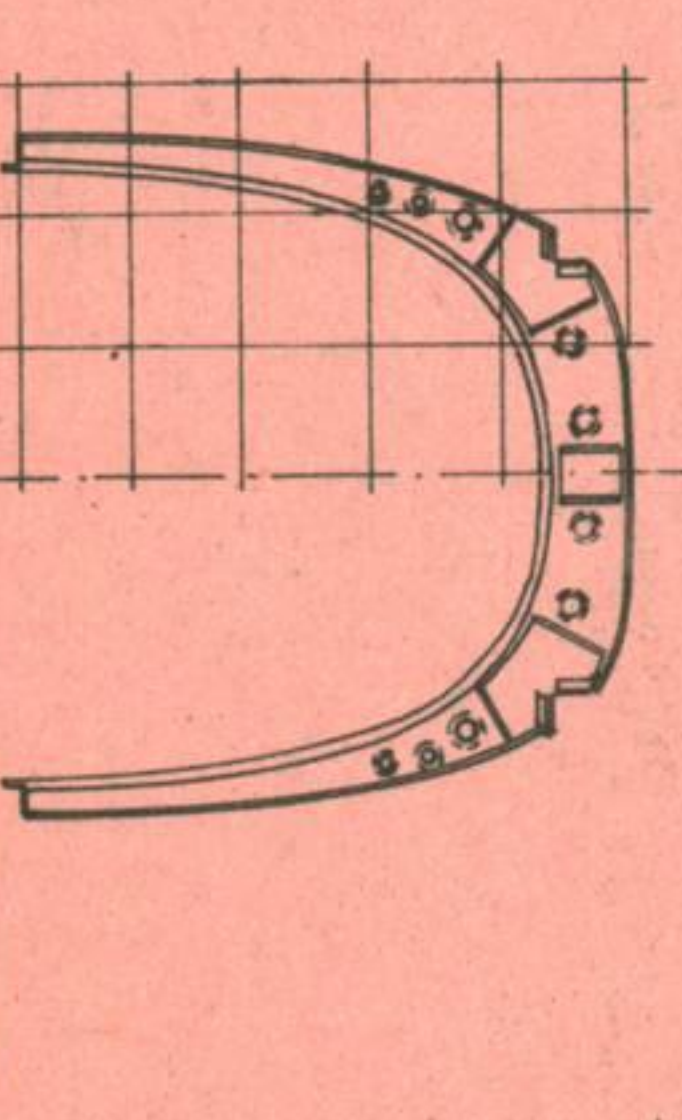
THE SPITFIRE MK. II TYPES VA AND VC ARE SINGLE PLACE FIGHTERS. LOW WING MONOPLANES, POWERED BY ROLLS-ROYCE MERLIN ENGINES (45, 46, 50 AND 50A ON "F" VERSION PLANES). "F" VERSION PLANES ARE HIGH ALTITUDE FIGHTERS WHEREAS ROLLS-ROYCE MERLIN 45M, 50M OR 55M ENGINES, SPITFIRE VA AND VC DIFFER ONLY IN ARMAMENT. THIS CHANGE BEING MADE BY USE OF DIFFERENT MAIN PLANES. THE VC TYPE COULD ACCOMMODATE ANY OF THE ARMAMENT INSTALLATIONS.

THE SPITFIRE FIGHTER WAS THE DESIGN CREATION OF R.J. MITCHELL, CHIEF ENGINEER OF THE SUPERMARINE WORKS OF VICKERS-ARMSTRONG IN RESPONSE TO THE AIR MINISTRY SPECIFICATION F37/34 ISSUED IN 1935. THE FIRST PROTOTYPE K5054 FLEW AT R.A.F. PAGEANT AT HENDON IN 1935. THE FIRST PRODUCTION PLANE, K9787, WAS COMPLETED IN 1938. PLANE, K9789, WAS THE FIRST PLANE TO ENTER SQUADRON SERVICE OF THE R.A.F. IN 1938.

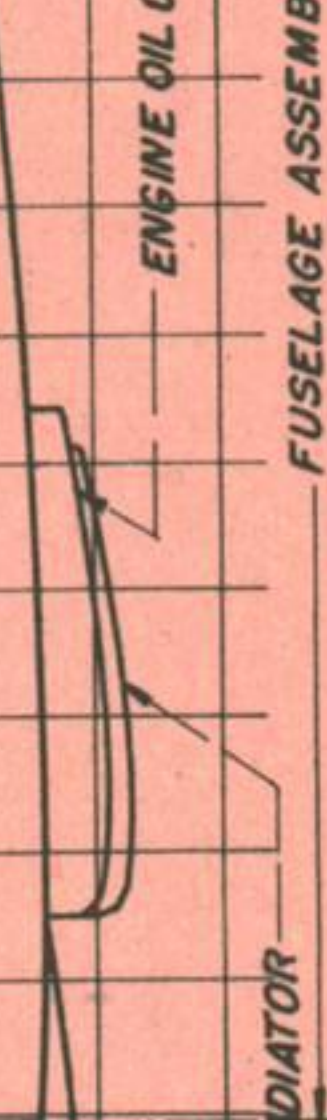
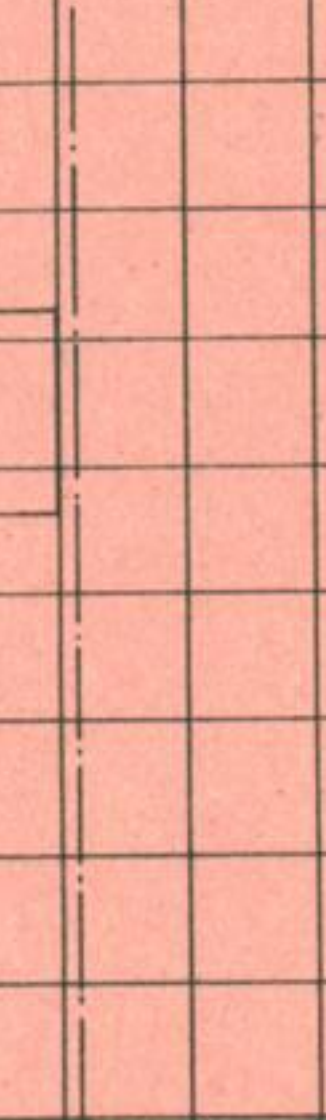
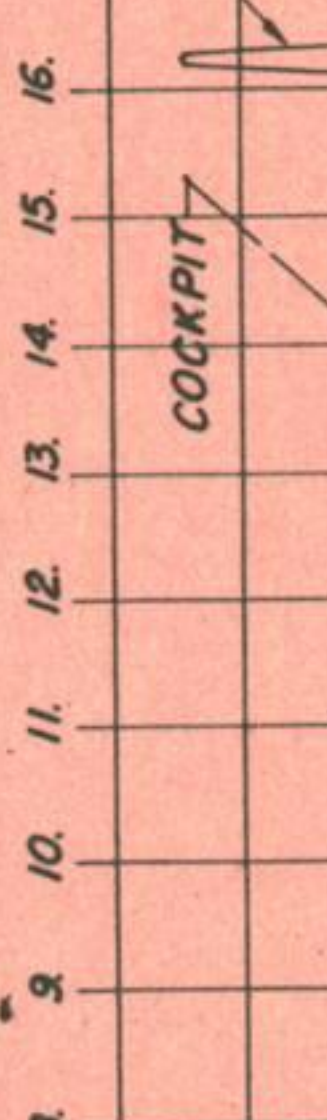
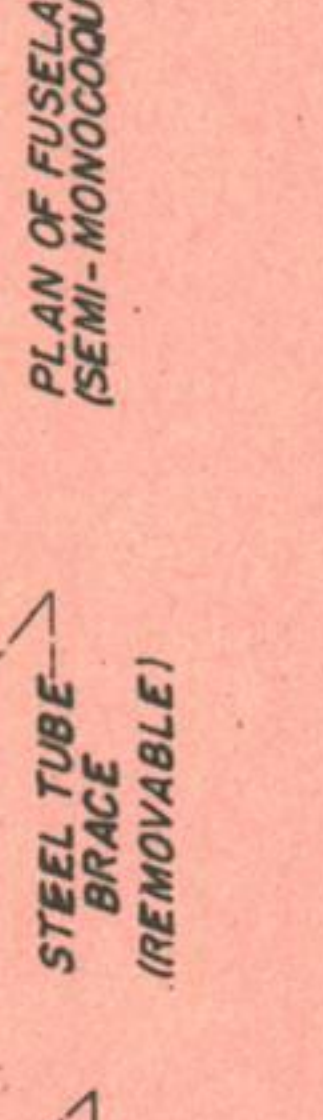
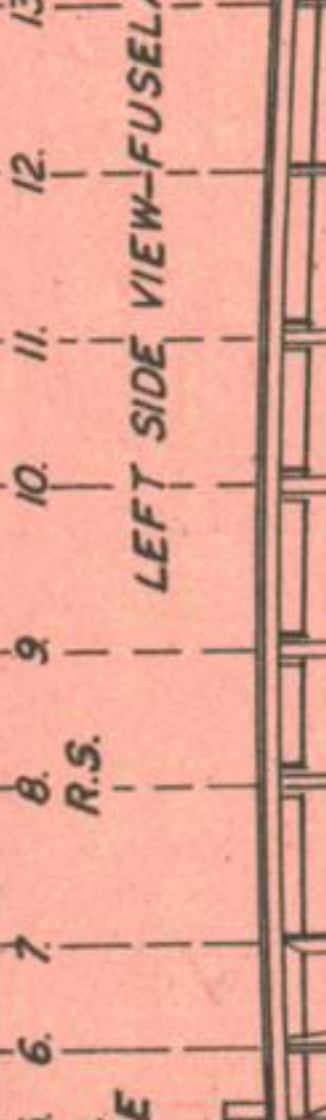
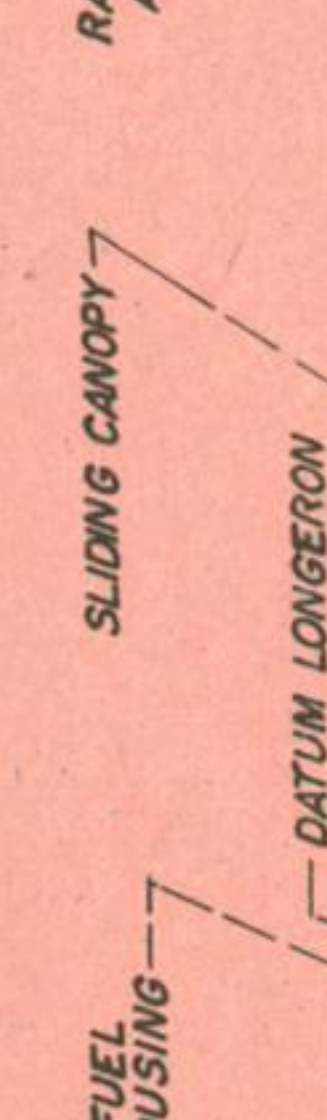
R.A.F. SQUADRONS 71, 121 AND 133 WERE EAGLE SQUADRONS AND LATER WERE TRANSFERRED TO 4TH FIGHTER GROUP OF U.S.A.A.F. 8TH AIR FORCE. 600 SPITFIRES WERE DIVERTED TO U.S.A.A.F. BY THE END OF 1943. THE FIRST FIGHTER GROUP OF THE U.S.A.A.F. THE FIRST AMERICAN AIR COMBAT UNIT IN EUROPE IN 1942, WAS EQUIPPED WITH SPITFIRES.

BRITAIN SUPPLIED 1331 SPITFIRES TO THE RUSSIAN AIR FORCE IN WORLD WAR II. PLUS MANY OTHERS TO ALLIED NATIONS.

NOTE: ALL OF THE RIVETS USED TO ATTACH THE SKIN PLATING TO THE UNDER SIDE OF THE FUSELAGE, SIDE PLATING THROUGH THE FRAMES, LONGERONS AND INTERCOSTALS FORWARD OF FRAME 11 TO FRAME 5 ARE LIGHT ALLOY COUNTERSUNK HEAD TYPE. AFT OF FRAME 11, DE BERGUE LIGHT ALLOY RIVETS ARE USED EXCEPT AT LAP JOINTS. POP TYPE COUNTERSUNK HEAD RIVETS ARE ALSO USED.

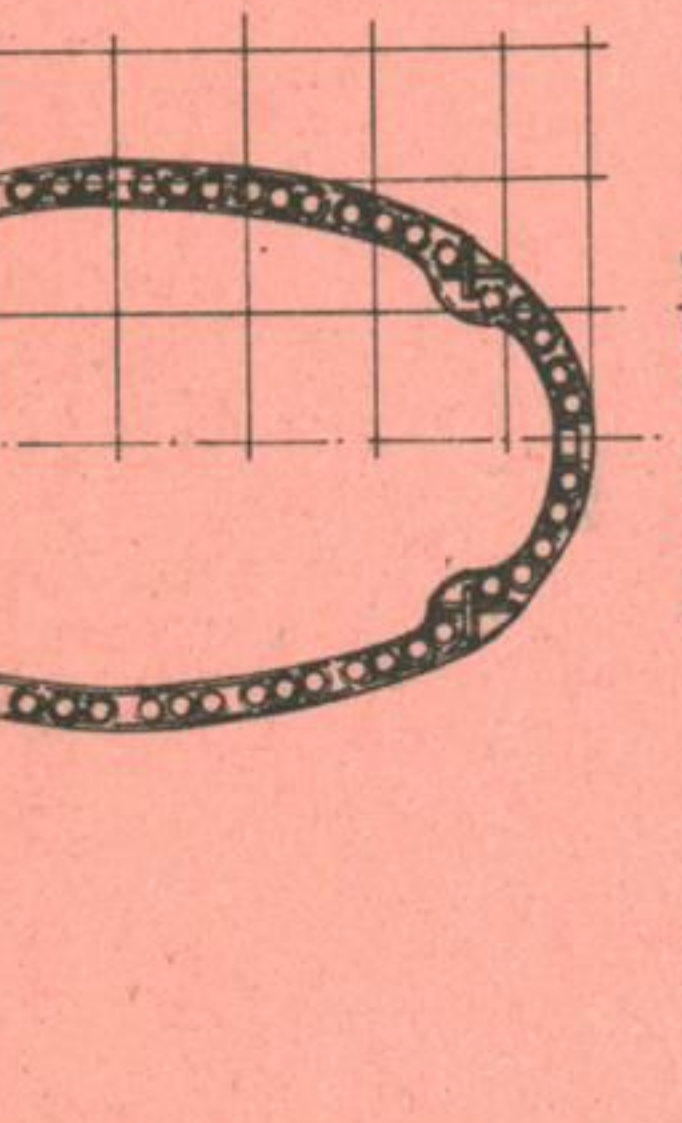


NOTE: LIGHTENING HOLES ARE BEADED AROUND THE EDGES FOR STRENGTH.

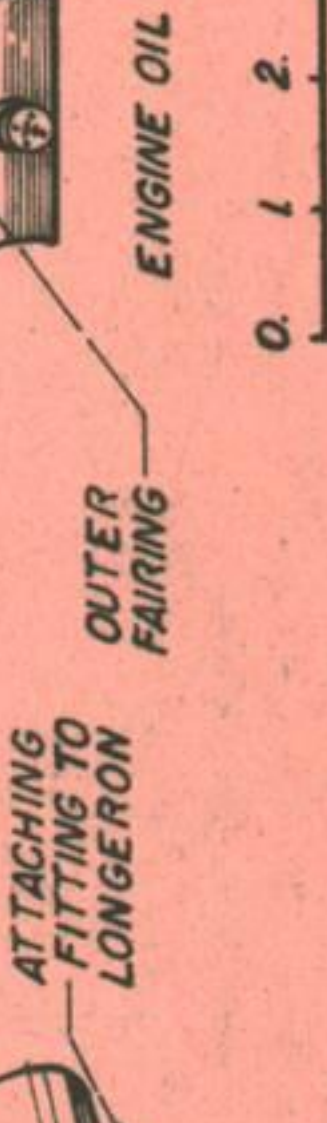
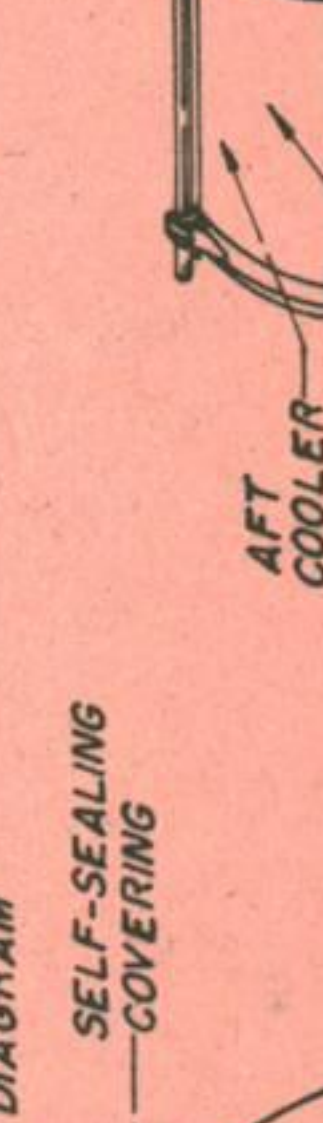
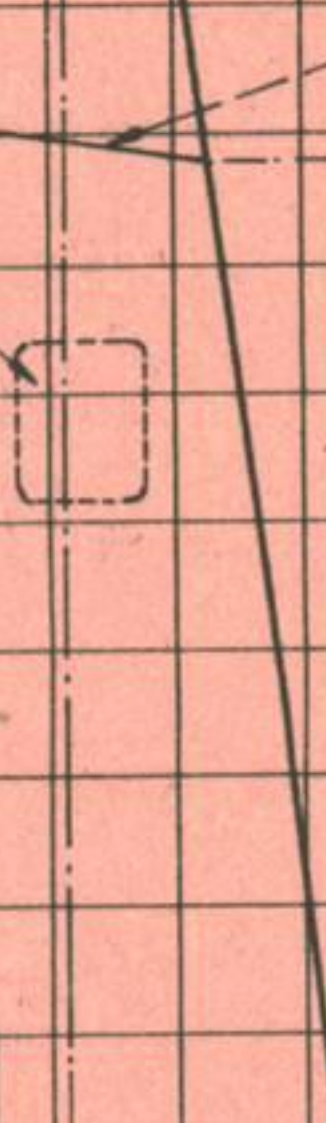
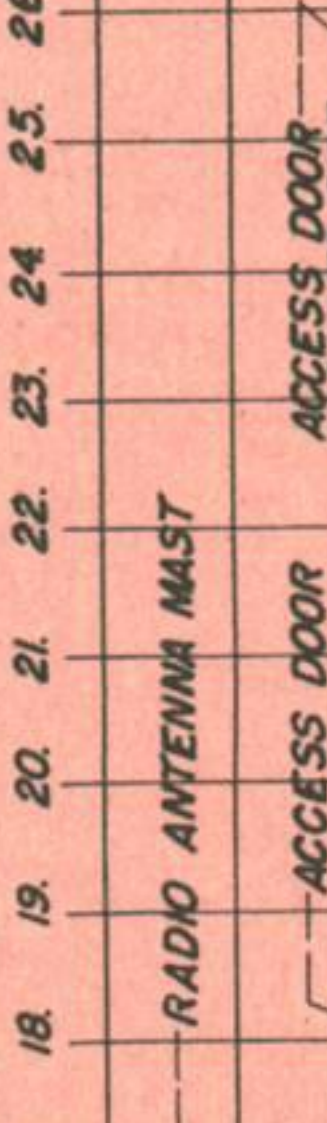
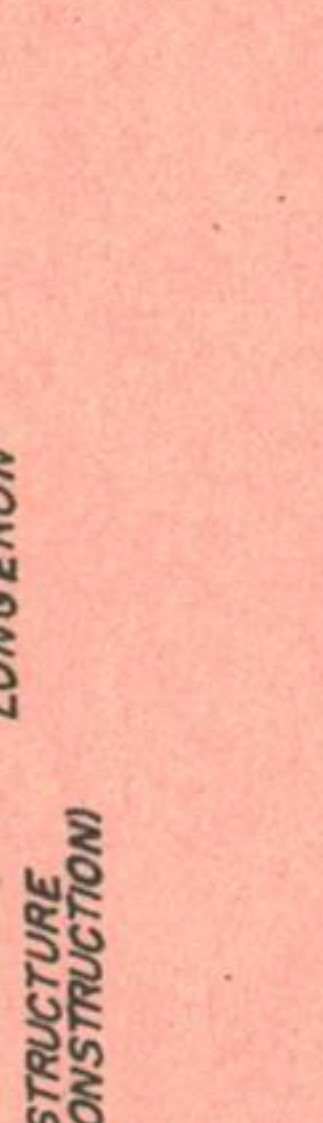
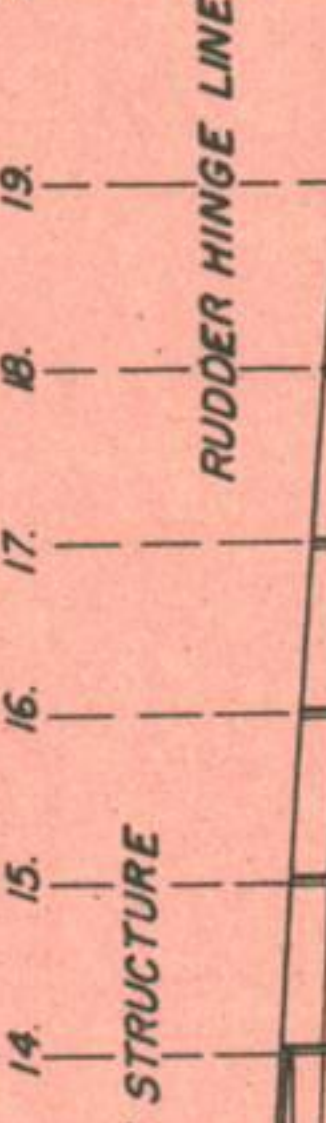
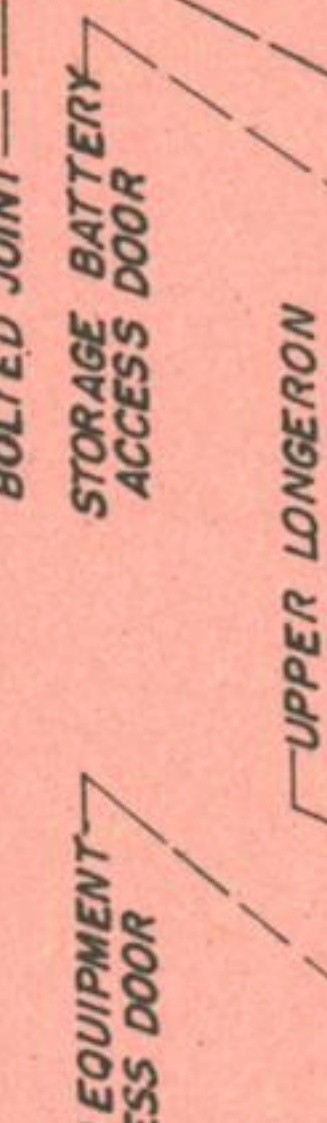


NOTE: THE WING PANELS ARE ATTACHED TO THE FUSELAGE AT THE MAIN SPAR BY MEANS OF THREADED BOLTS SECURED BY SAFETY NUTS. CONTROL CABLES, SUPPLY LINES AND ELECTRIC WIRES HAVE DISCONNECT FITTINGS AT THE WING ROOTS.

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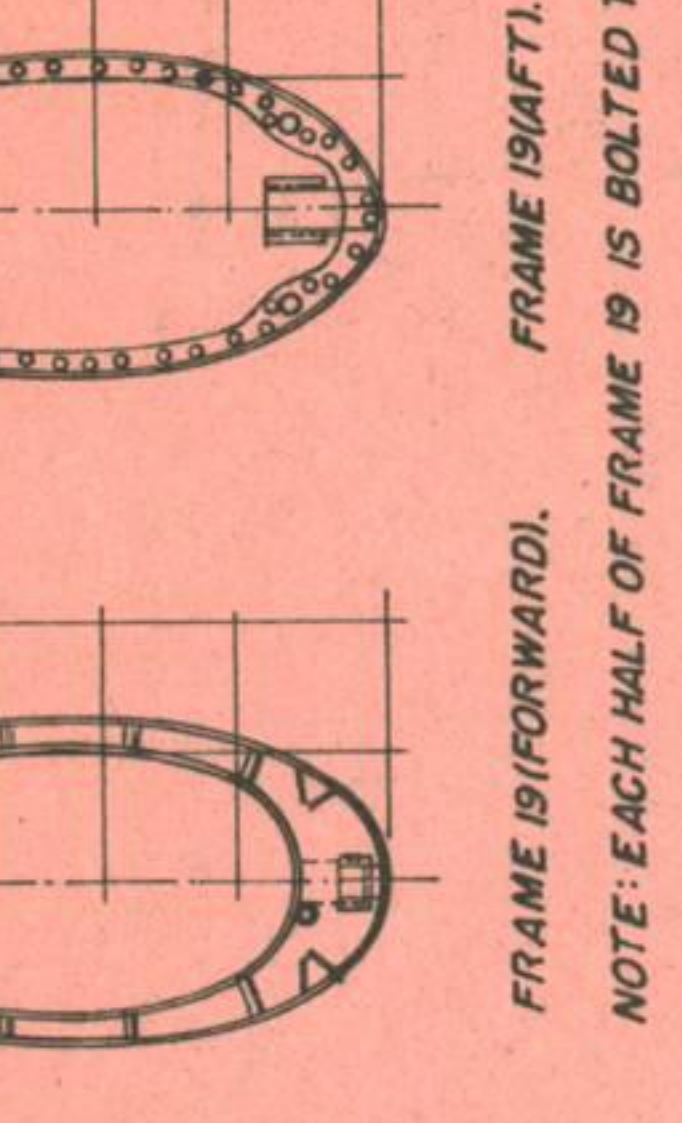


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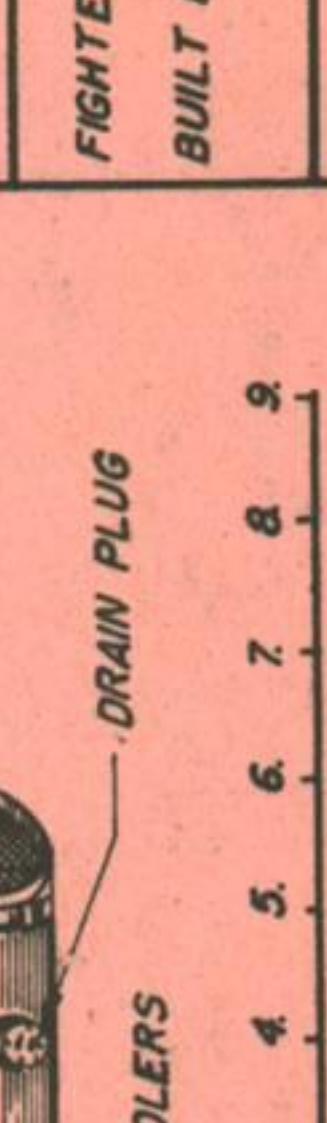
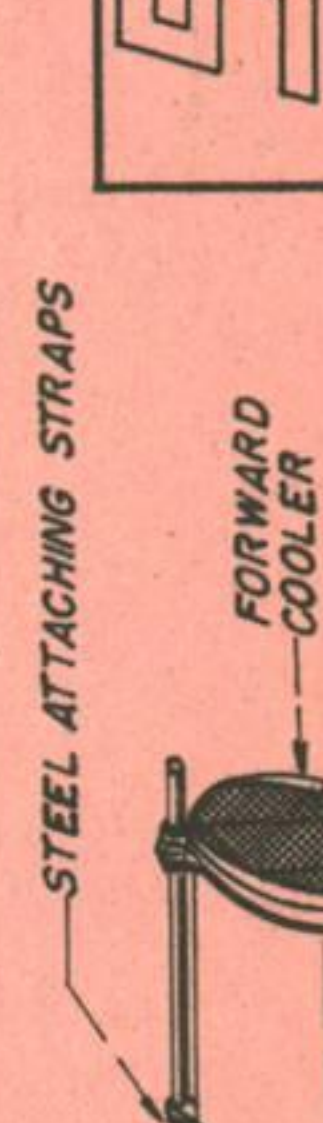
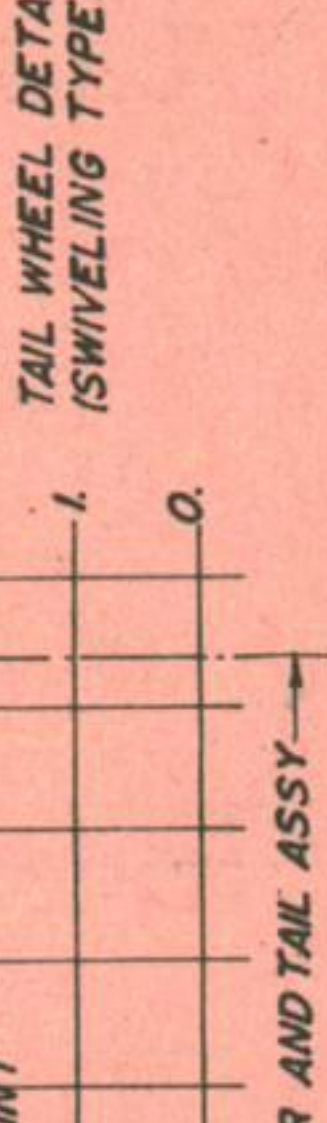
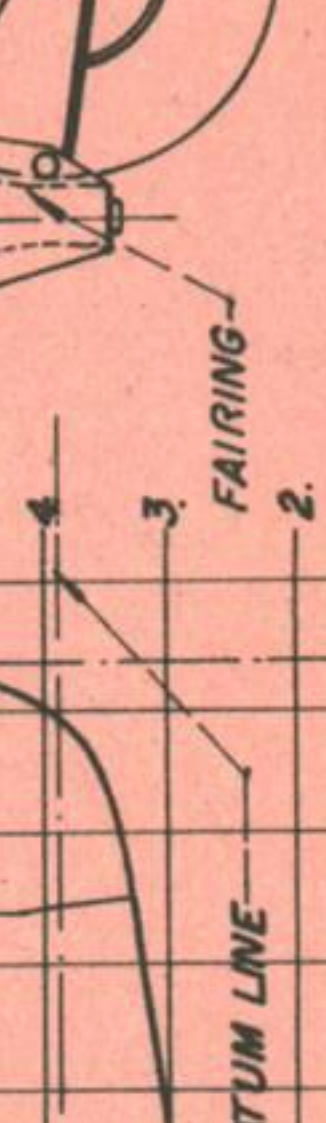
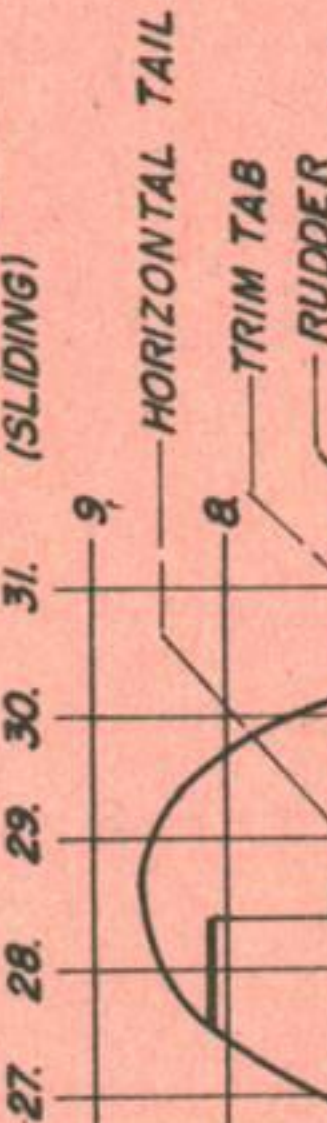
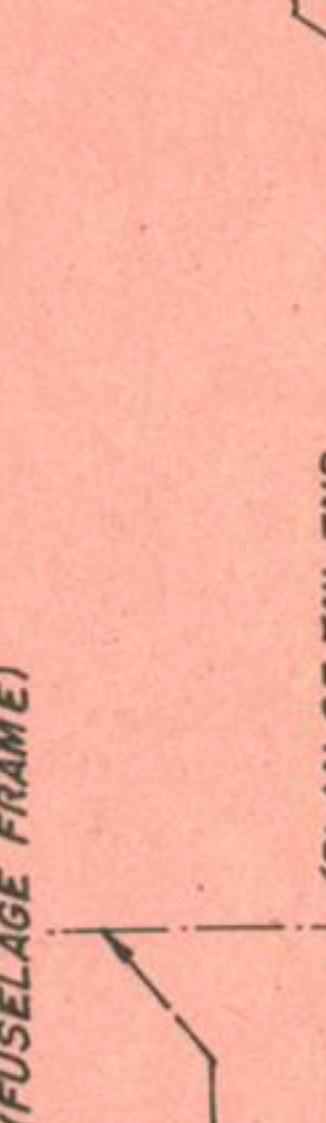
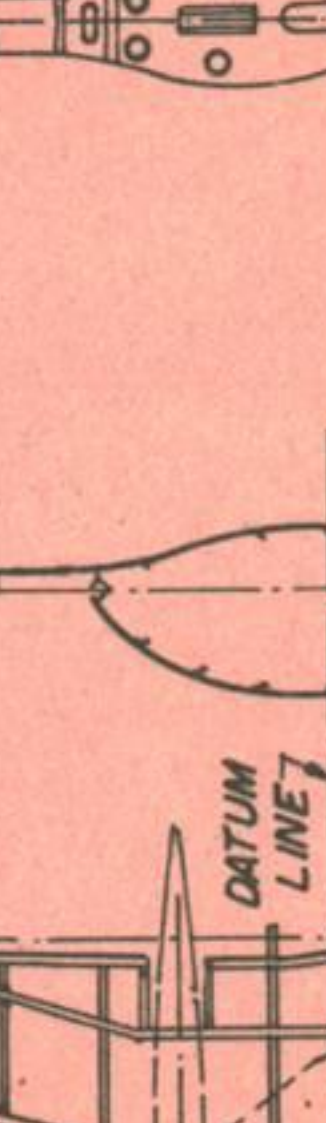


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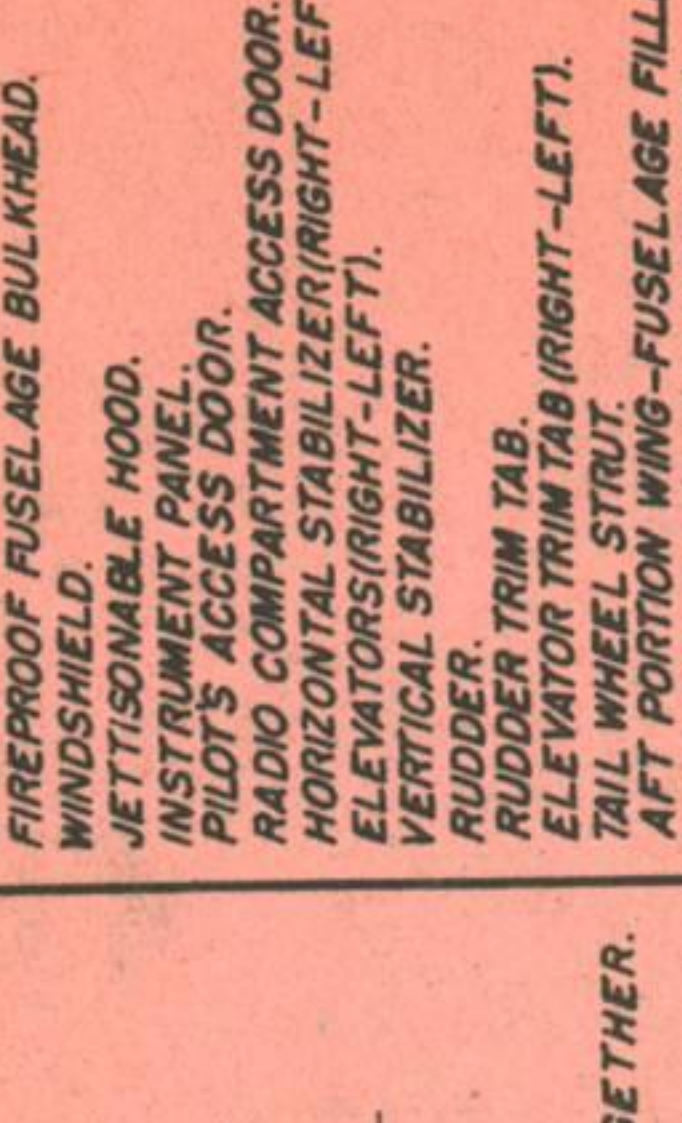


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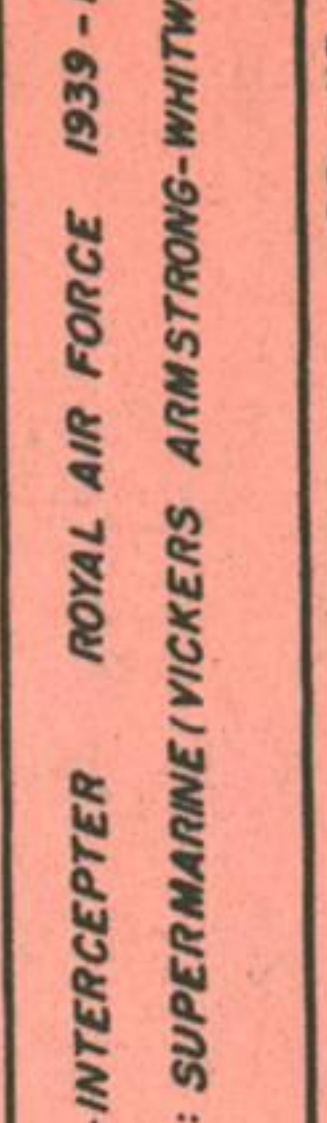
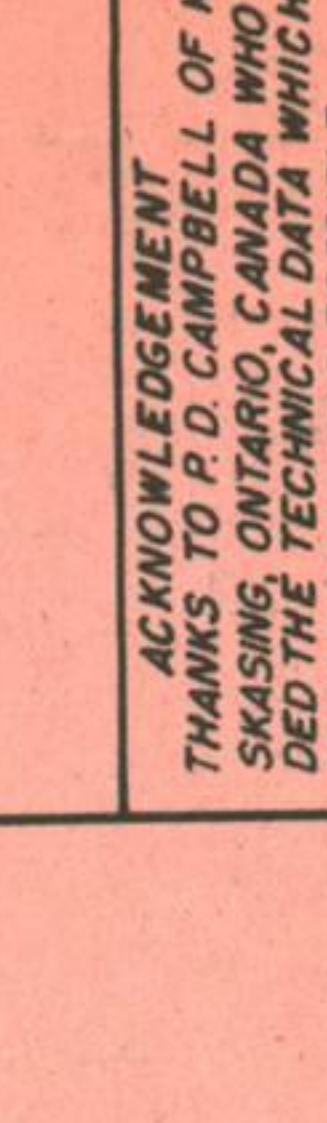
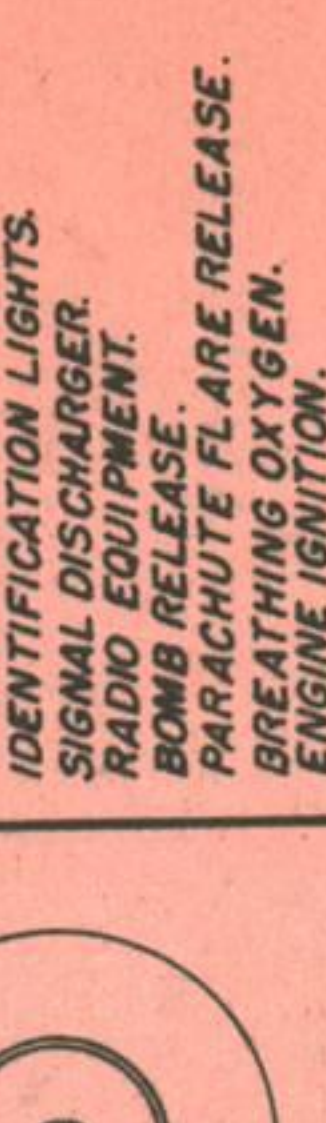
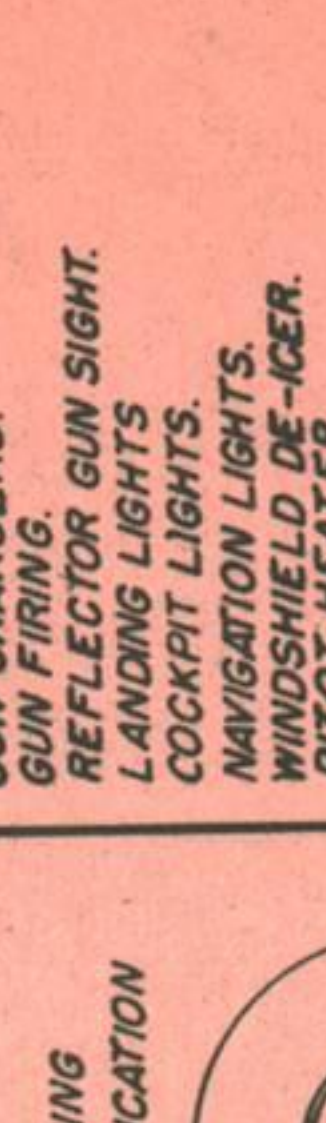
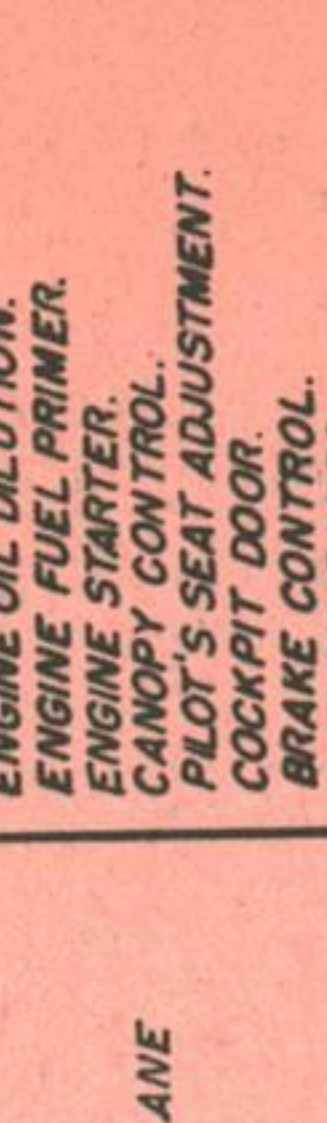
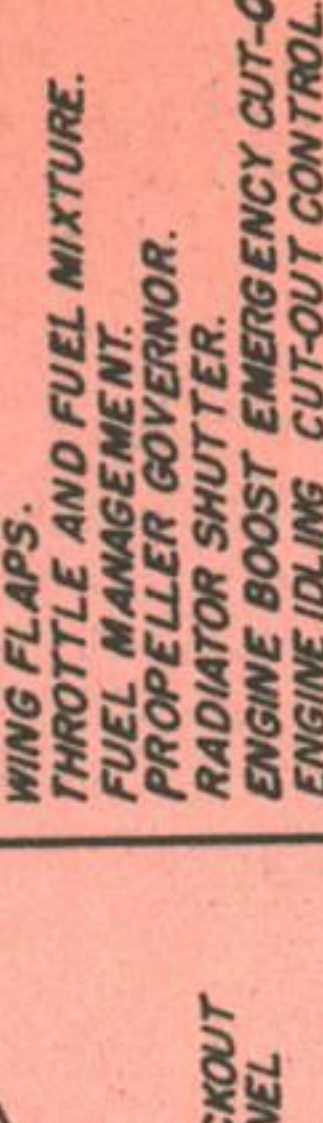
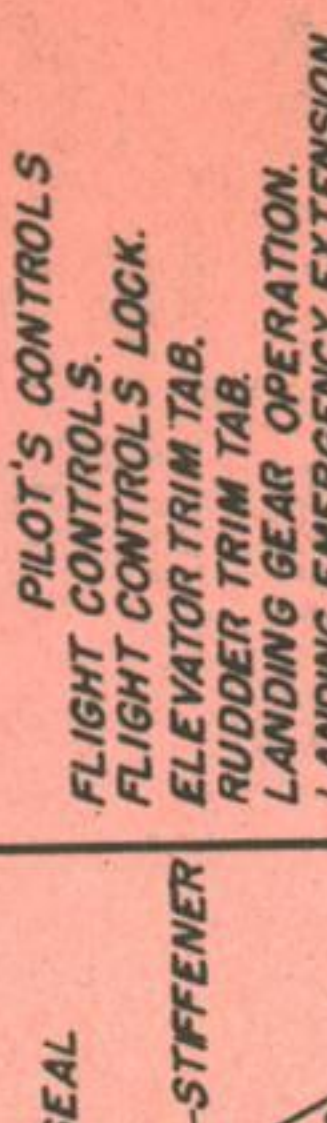
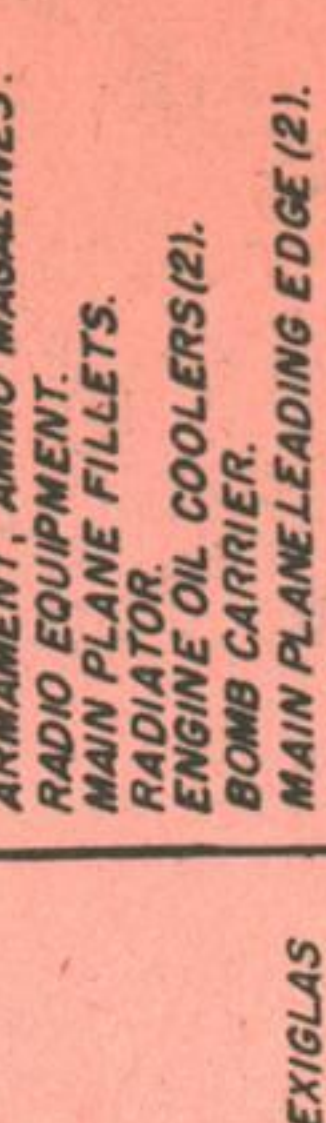
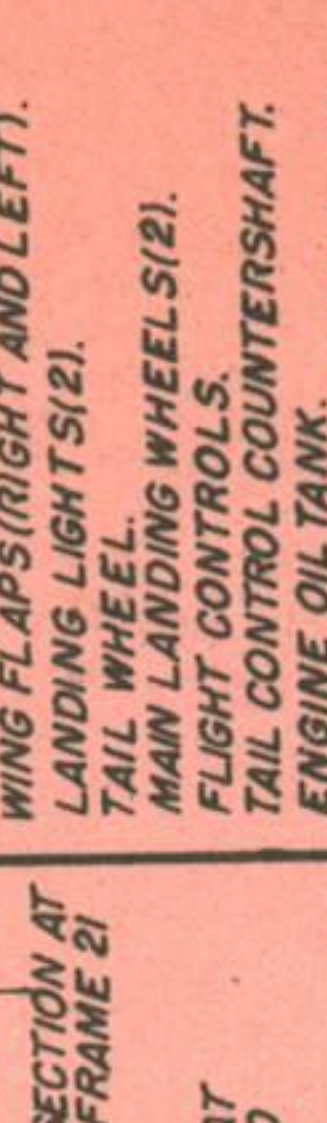
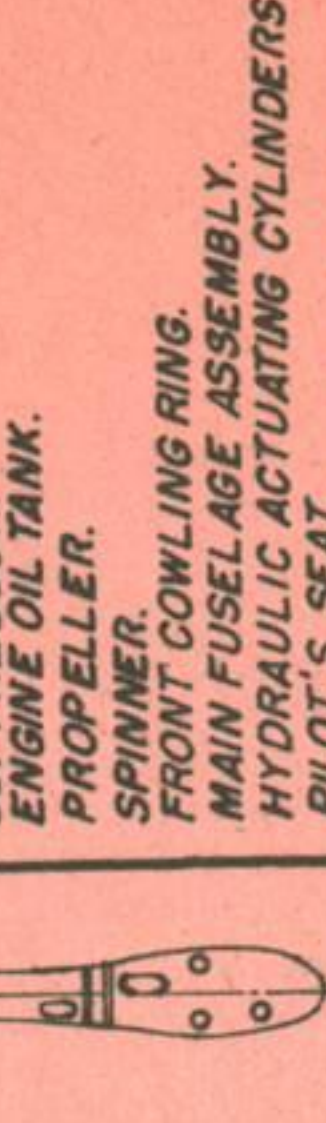
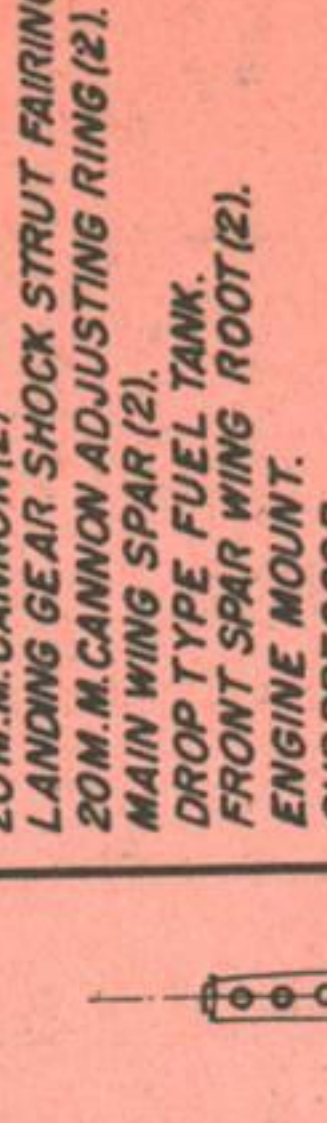


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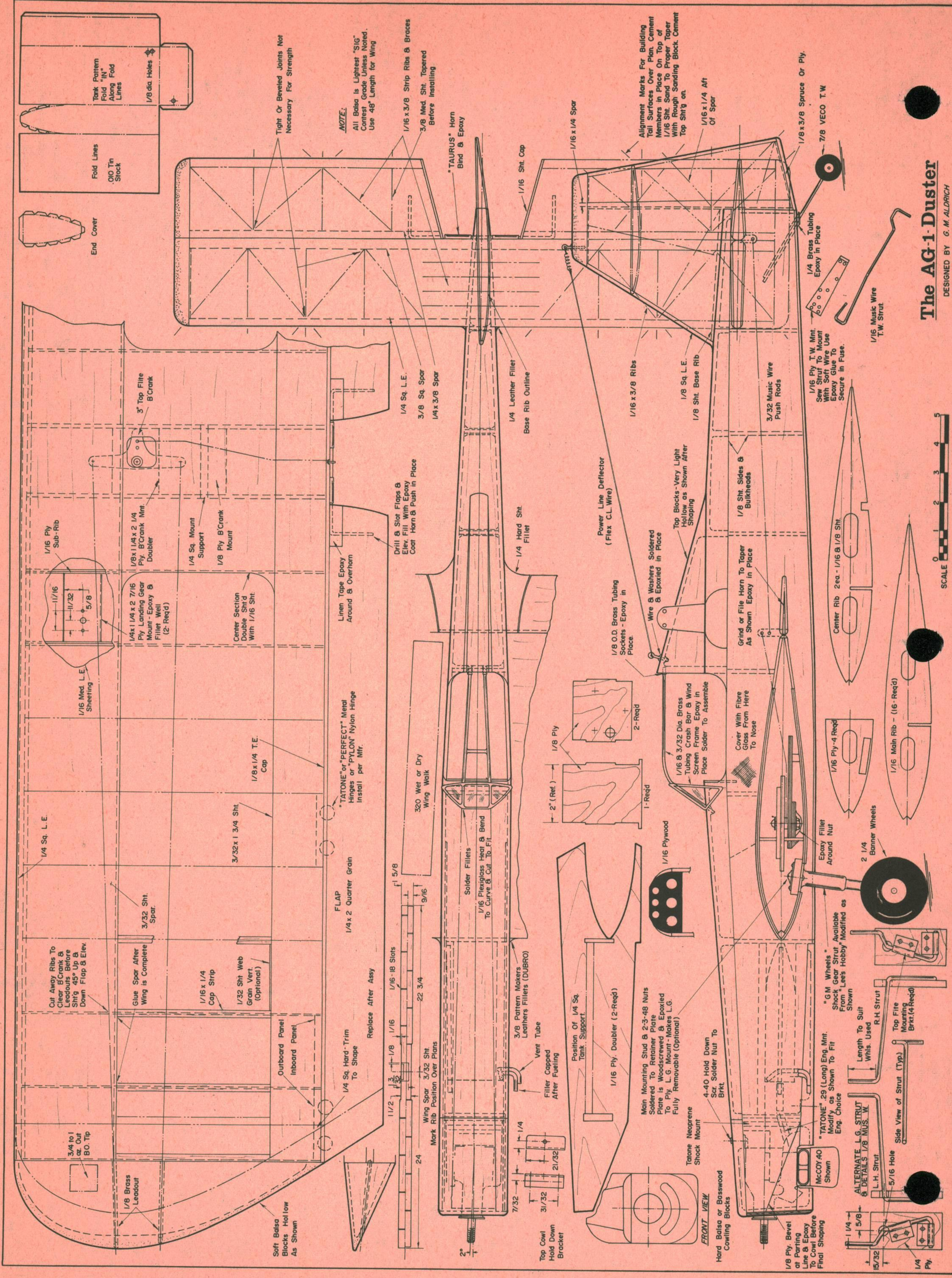
MAJOR COMPONENTS OF SPITFIRE
WING TIPS (RIGHT-LEFT)
AILERONS (RIGHT-LEFT)
MAIN PLANE (RIGHT-LEFT)
HEAD TANK
ROLLS-ROYCE MERLIN ENGINE
ENGINE EXHAUST MANIFOLD (2)
ENGINE-DRIVEN GENERATOR
UPPER FUEL TANK
LOWER FUEL TANK
ENGINE BRACE STRUTS
FIREPROOF FUSELAGE BULKHEAD
WINDSHIELD
JETTISONABLE HOOD
INSTRUMENT PANEL
PILOT'S ACCESS DOOR
RADIO COMPARTMENT ACCESS DOOR
HORIZONTAL STABILIZER (RIGHT-LEFT)
ELEVATOR TRIM TAB (RIGHT-LEFT)
VERTICAL STABILIZER
RUDDER
RUDDER TRIM TAB (RIGHT-LEFT)
ELEVATOR TRIM TAB (RIGHT-LEFT)
TAIL WHEEL STRUT
AFT PORTION WING-FUSELAGE FILLET
MAIN PLANE AFT SPAR FITTING (2)
20 IN. M. GUN BAY (2)
MAIN LANDING GEAR (RIGHT-LEFT)
MAIN LANDING GEAR SHOCK STRUT (RIGHT-LEFT)
20 IN. M. CANNON ADJUSTING RING (2)
20 IN. M. CANNON ADJUSTING RING (2)
20 IN. M. CANNON SHOCK STRUT (2)
WING WING SPAR (2)
FRONT TYPE FUEL TANK
FRONT SPAR WING ROOT (2)
ENGINE MOUNT
ENGINE SCOR
ENGINE OIL TANK
PROPELLER
SPINNER
FRONT COUPLING RING
MAIN FUSELAGE ASSEMBLY
HYDRAULIC ACTUATING CYLINDERS
PILOT'S SEAT
WING FLAPS (RIGHT AND LEFT)
LANDING LIGHTS (2)
TAIL WHEEL
MAIN LANDING WHEELS (2)
FLIGHT CONTROL COUNTERSHAFT
ENGINE OIL TANK
ARMAMENT, AMMO MAGAZINES
RADIO EQUIPMENT
MAIN PLANE FILLETS
RADIATOR
ENGINE OIL COOLERS (2)
BOMB CARRIER
MAIN PLANE LEADING EDGE (2)
PILOT'S CONTROLS
FLIGHT CONTROLS LOCK
ELEVATOR TRIM TAB
RUDDER TRIM TAB
LANDING GEAR OPERATION
LANDING GEAR EXTENSION
WING FLAPS
THROTTLE AND FUEL MIXTURE
FUEL MANAGEMENT
PROPELLER GOVERNOR
RADIATOR SHUTTER
ENGINE BOOST EMERGENCY CUT-OUT
ENGINE IDLING CUT-OUT CONTROL
ENGINE OIL DILUTION
ENGINE FUEL PRIMER
ENGINE STARTER
CANNOPY CONTROL
PILOT'S SEAT ADJUSTMENT
COCKPIT DOOR
BRAKE CONTROL
GUN CHARGERS
GUN FIRING
REFLECTOR GUN SIGHT
LANDING LIGHTS
COCKPIT LIGHTS
NAVIGATION LIGHTS
WINDSHIELD DE-ICER
PITOT HEATER
IDENTIFICATION LIGHTS
SIGNAL DISCHARGER
RADIO EQUIPMENT
BOMB RELEASE
PARACHUTE FLARE RELEASE
BREATHING OXYGEN
ENGINE IGNITION



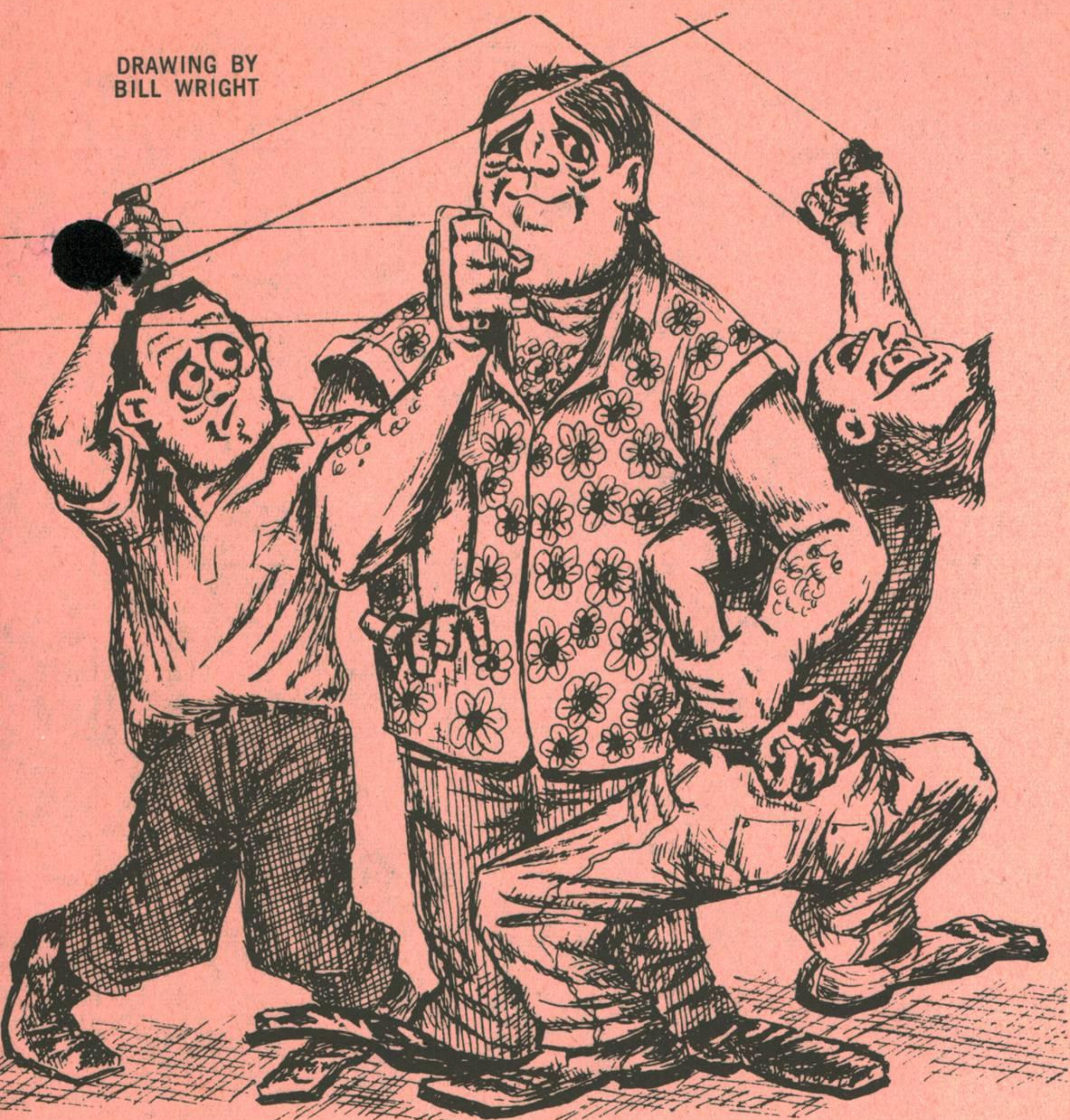
NOTE: EACH HALF OF FRAME 19 IS BOLTED TOGETHER.



NOTE: EACH FUSELAGE FRAME IS OF CHANNEL SECTION.



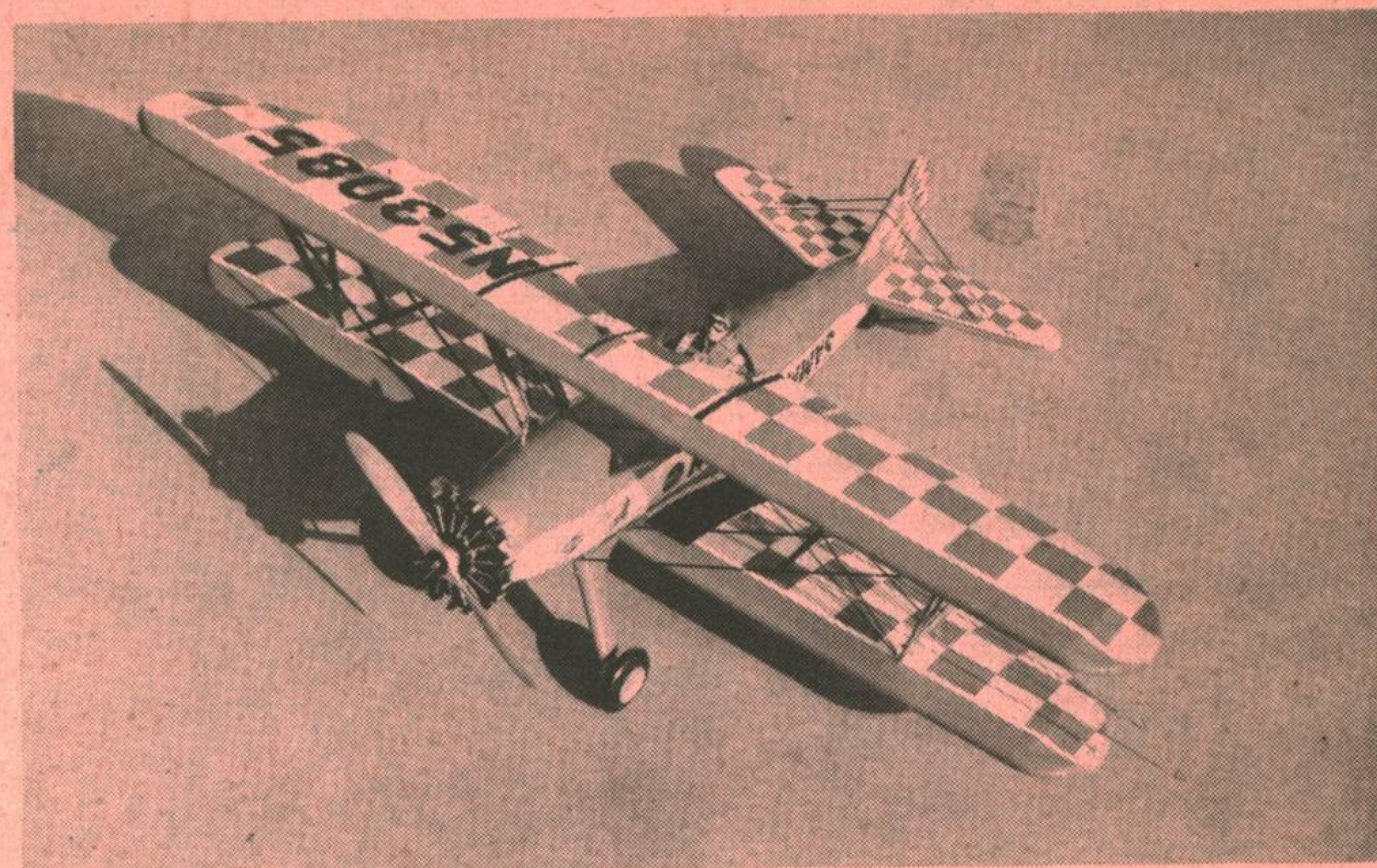
DRAWING BY
BILL WRIGHT



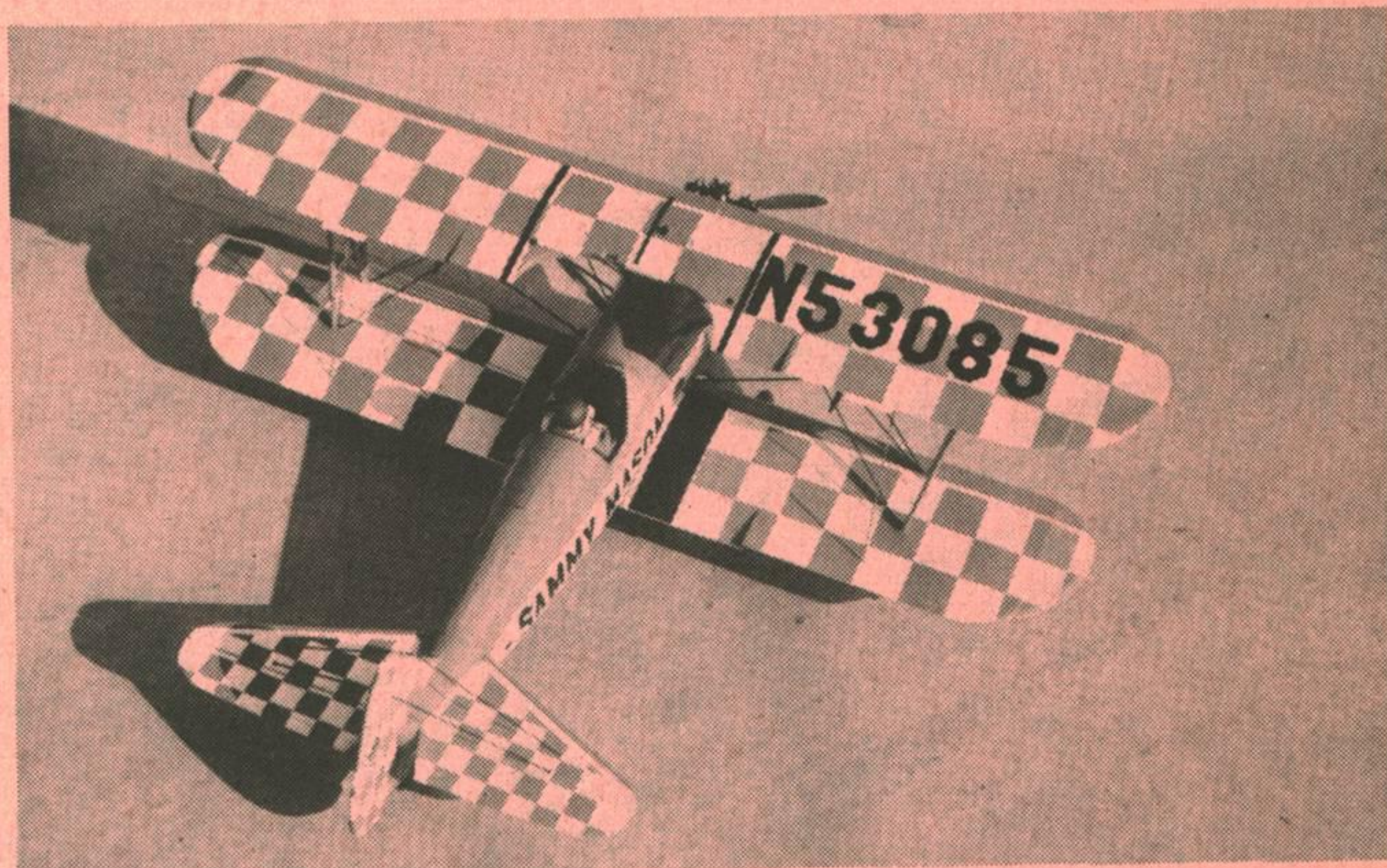
Combat — Speed — Slow Combat — Stunt — Racing

ROUND & ROUND

By PETER SOULE



Modified Monogram Models plastic engine hides O.S. .49RC. GI Joe pilot plays Sammy Mason as "Checkers" is ready for another airshow.

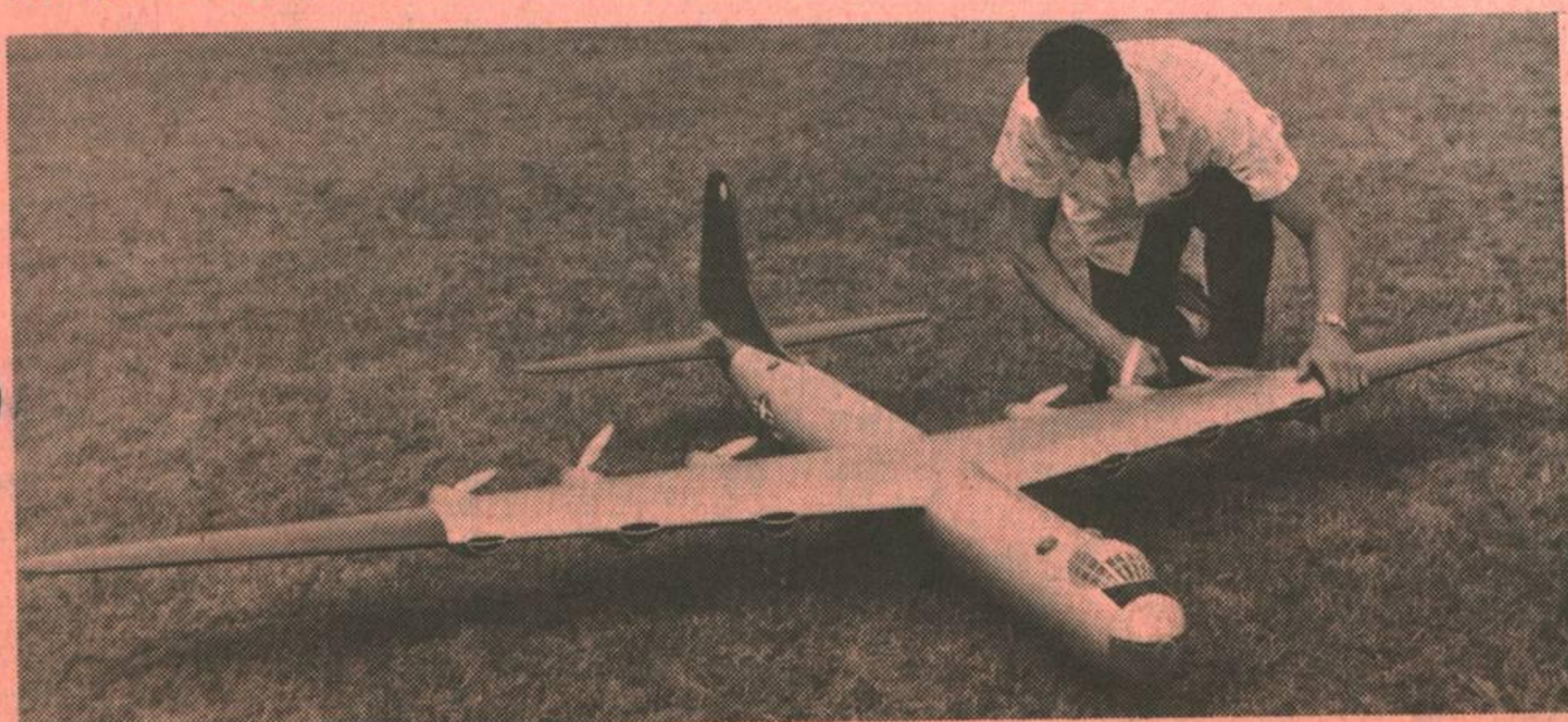


Sammy Mason's four-and-a-half Stermen, as modeled by Ken Wilson of Evansville, Ind. Third line control is used for the RC engine up front.



Happy group of Hot Dogs. Panarisi, Theobald and Schauer, all from the Valley Circle Burners. 35 laps in 1:20 from cold start, have done 1:13.

Bob Goyette getting one sixth of the Veco 19's started in his 18.5-lb., Convair B-36A. Bob uses Babcock radio control to operate engine throttles.



Johnny Clemens, in cap, and Claude Graves with two of the WWI models they will fly in actual dog fight at '66 Nats as part of Aviation show.

► If you're old enough to have seen an airshow right after the end of World War II, you will understand the tremendous nostalgic appeal of the Stearman model Ken Wilson of Evansville, Indiana, has built. If you're not that old—well, you missed something, but listen anyway. Ken's airplane is built from a combination of old Miniature Aircraft kit (remember?) and MAN Stearman plans to make a 1 3/8" to the foot scale model. The real story, however, is in the research Ken performed in his effort to make a model of a specific airplane.

Along with quite a few others, Ken was a Sammy Mason

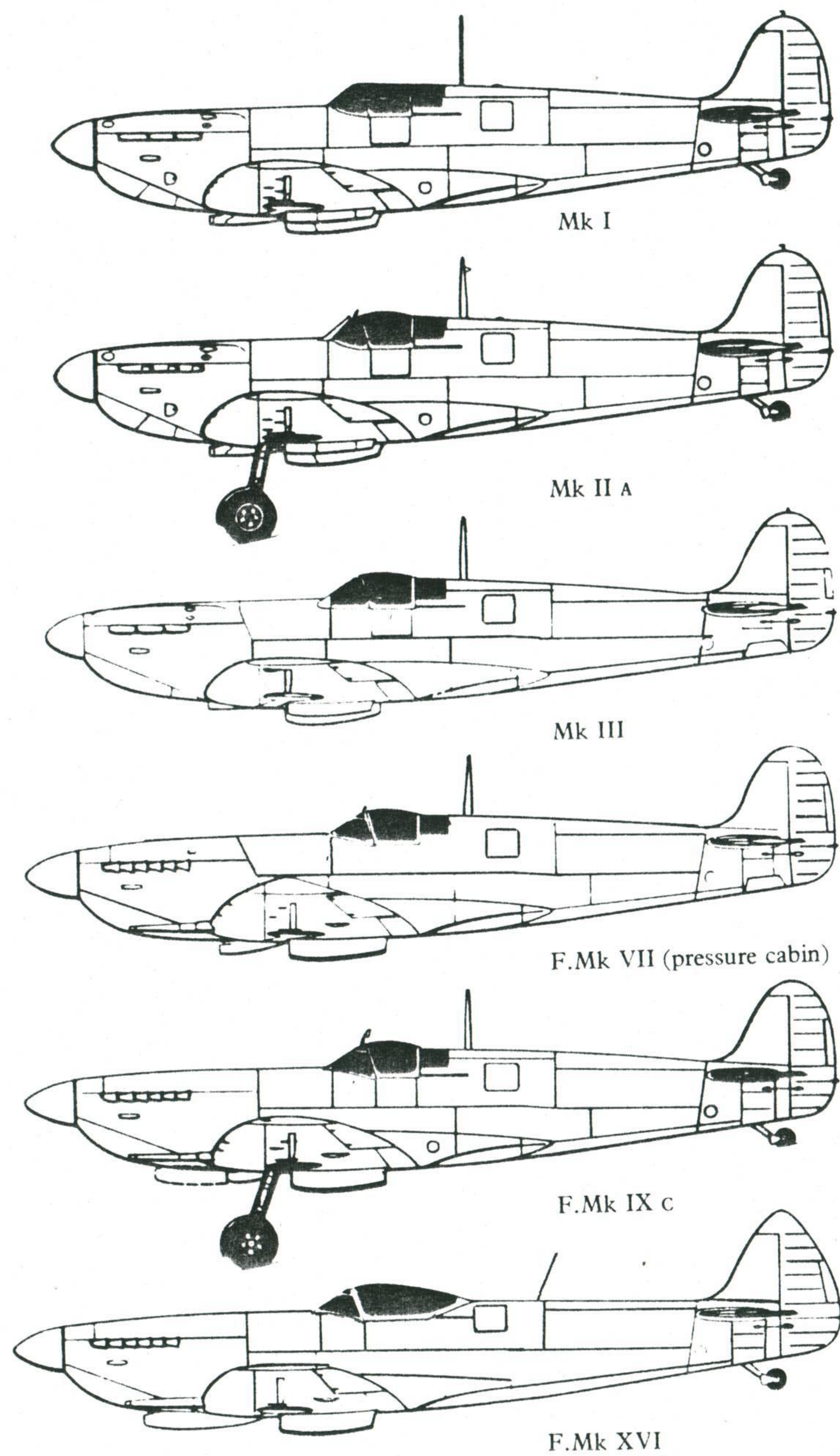


Fig. 3 Merlin-Engined Spitfires

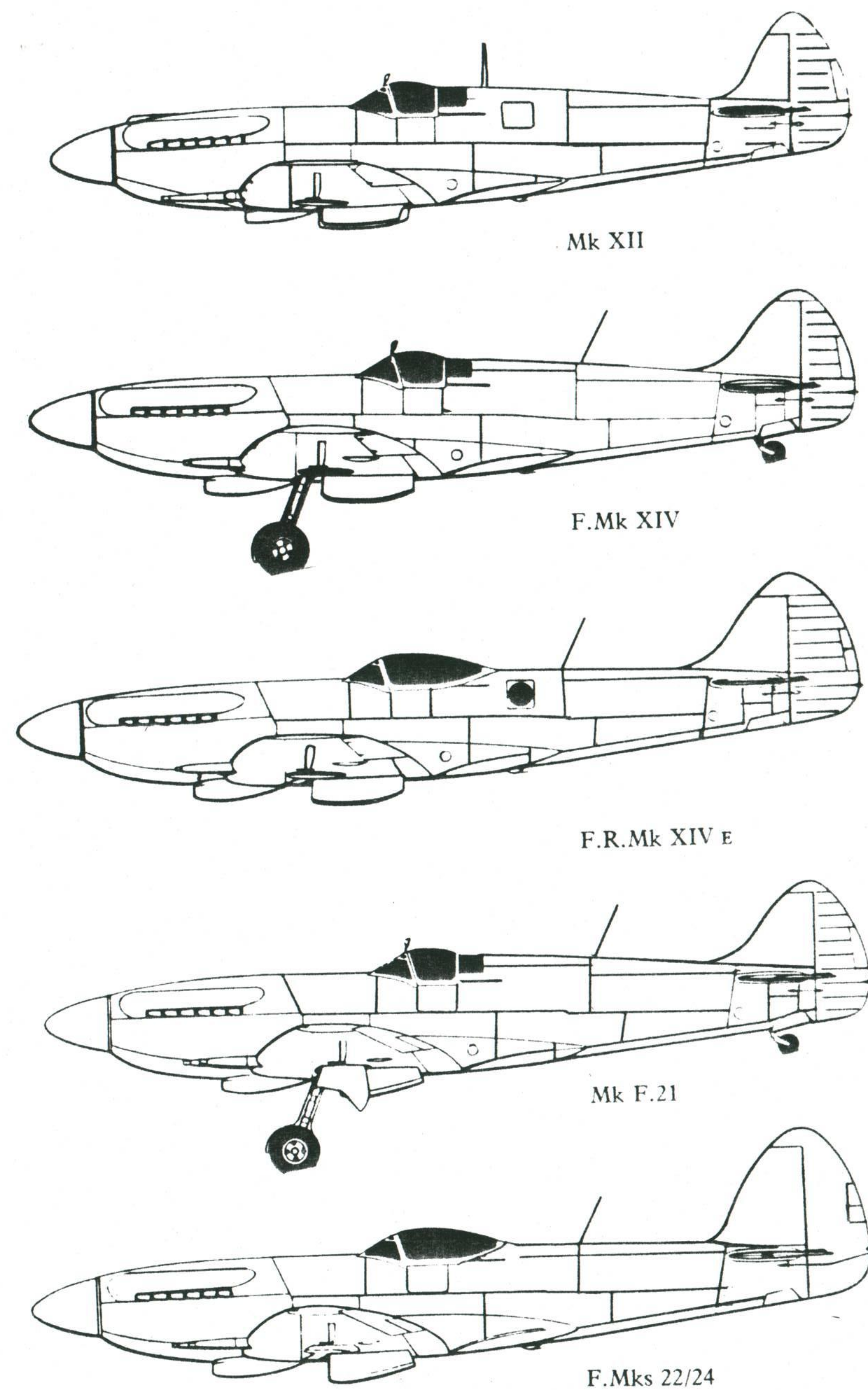


Fig. 4 Griffon-Engined Spitfires

APPENDIX 4

Spitfire and Seafire Operational Marks

SPITFIRES: FIGHTERS

Mk IA	1030 hp R.R. Merlin II, III	8 × .303 machine guns
Mk IB	1030 hp R.R. Merlin III	Armed initially with 2 × 20 mm cannon only; later 2 × 20 mm plus 4 rcmg
Mk IIA	1175 hp R.R. Merlin XII	Produced at Castle Bromwich
Mk IIA (L.R.)	1175 hp R.R. Merlin XII	Fitted with 30 gal. long range fuel tank under port wing
Mk IIB	1175 hp R.R. Merlin XII	Mk II with 'B' Wing – 2 × 20 mm plus 4 rcmg
Mk IIC	1175 hp R.R. Merlin XII	Later designated ASR II (Air Sea Rescue)
Mk VA	1470 hp R.R. Merlin XLV (45)	8 rcmg
F.Mk VB	1470 hp R.R. Merlin 45 1415 hp R.R. Merlin 46	'B' Wing Engine with higher rated altitude
L.F.Mk VB	1585 hp R.R. Merlin 45M	Lower altitude rating engine
F.Mk Vc	1470 hp R.R. Merlin 45, 50, 50A, 55, 56 1415 hp R.R. Merlin 46	'C' Universal wing
L.F.Mk Vc	1585 hp R.R. Merlin 45M, 50M, 55M	Lower altitude rating
Mk VI	1415 hp R.R. Merlin 47	Pressure cabin (PC)
Mk VII	1710 hp R.R. Merlin 64	PC & 2-speed, 2-stage Merlin
F.Mk VIII	1565 hp R.R. Merlin 61 1565 hp R.R. Merlin 61 1650 hp R.R. Merlin 63 1710 hp R.R. Merlin 63A	
L.F. Mk VIII	1580 hp R.R. Merlin 66	
H.F.Mk VIII	1475 hp R.R. Merlin 70	
F.Mk IXc	1565 hp R.R. Merlin 61 1650 hp R.R. Merlin 63 1710 hp R.R. Merlin 63A	

Appendices

L.F.Mk IXc	1580 hp R.R. Merlin 66	
H.F.Mk IX	1475 hp R.R. Merlin 70	
F.Mk IXE	R.R. Merlin 61, 63, 63A	'B' Wing 2 × 20 mm mgs + 2 × 0.5 in. mgs
L.F.Mk IXE	1580 hp R.R. Merlin 66	
H.F.Mk IXE	1475 hp R.R. Merlin 70	
Mk XII	1735 hp R.R. Griffon III, IV	
Mk XIVc	2035 hp R.R. Griffon 65	'C' Wing
F.Mk XIVE	2035 hp R.R. Griffon 65	'E' Wing
F.R.Mk XIVE	2035 hp R.R. Griffon 65	Rear-view fuselage. Oblique camera in rear fuselage
L.F.Mk XVI	1580 hp Packard R.R. Merlin 266	'C' Wing
L.F.Mk XVIe	1580 hp Packard R.R. Merlin 266	'E' Wing
Mk 21	2035 hp R.R. Griffon 61	

SPITFIRES: PHOTO RECONNAISSANCE

Type 'A'	1030 hp R.R. Merlin III	No extra fuel
Type 'B'	1030 hp R.R. Merlin III	Extra 30 gal. tank in fuselage behind pilot
Type 'C'	1030 hp R.R. Merlin III	As 'B' with additional 30 gal fuel tank under port wing
Type 'D'	1030 hp R.R. Merlin III	Special long range. Leading edge wing tank, + 30 gal. fuselage tank
{ Type 'F'	1030 hp R.R. Merlin III	{ As 'B' with additional 30 gal. tank under each wing
{ (PR Mk VI)	1470 hp R.R. Merlin 45	
{ Type 'G'	1030 hp R.R. Merlin III	{ Armed low level
{ (PR Mk VII)	1470 hp R.R. Merlin 45	{ PR Aircraft
P.R. Mk IV	1470 hp R.R. Merlin 45 1415 hp R.R. Merlin 46	Production version of Type D, fitted with Merlin 45/46
P.R. Mk X	1475 hp R.R. Merlin 77	P.C. 2-stage, 2-speed s/c
P.R. Mk XI	R.R. Merlin 61, 63, 63A, 70	
P.R. Mk XIII	1645 hp R.R. Merlin 32	Armed low level P.R. produced by conversion
P.R. Mk XIX	2035 hp R.R. Griffon 65, 66	All except first 22 with PC
F.Mk VI (P.R.)	1415 hp R.R. Merlin 47	6 Mk VI fighters sent to ME in 1942 for P.R. work

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SEAFIRES

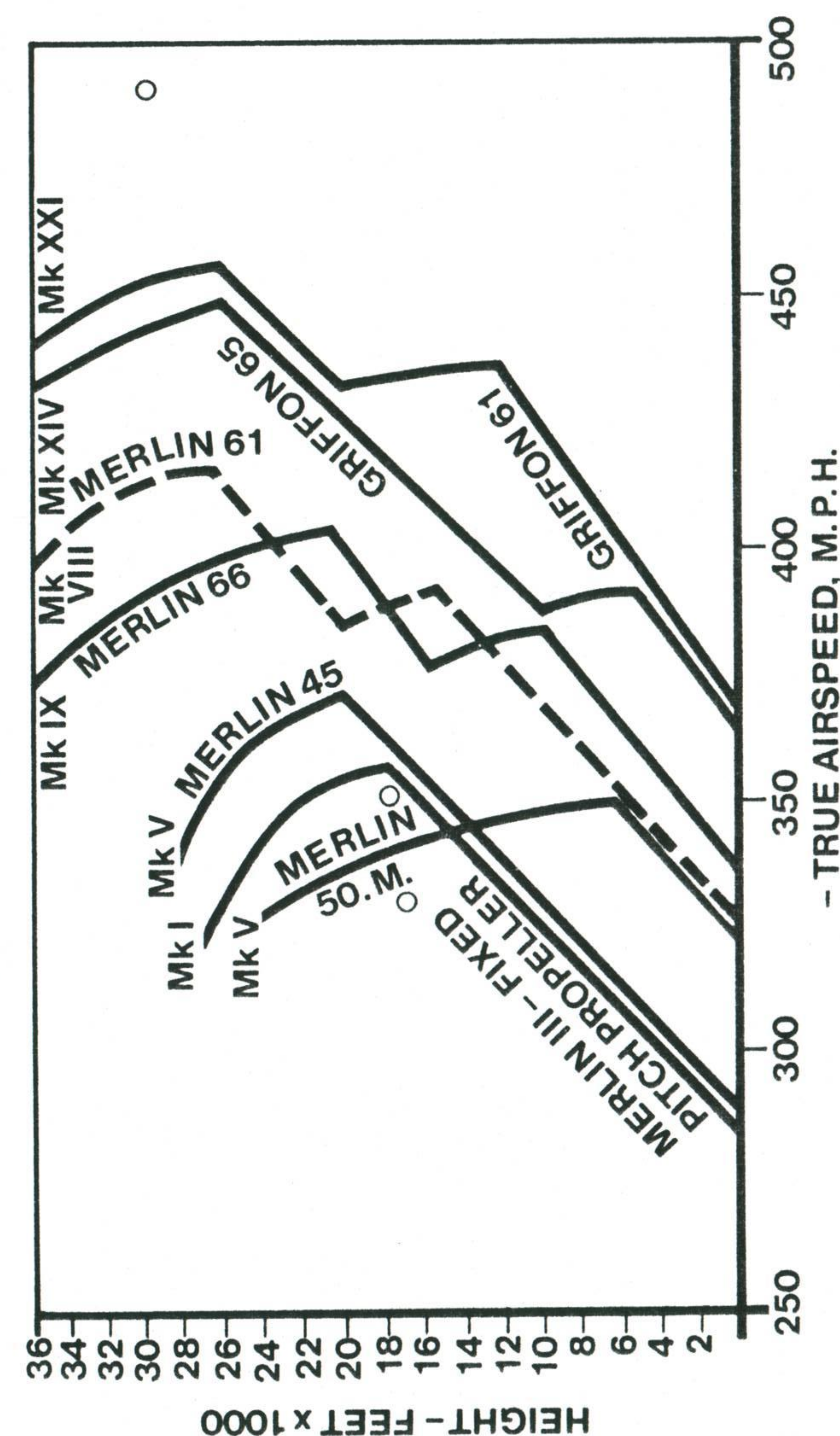
Mk Ib	1470 hp R.R. Merlin 45	Produced by conversion from Spitfire Vb
	1415 hp R.R. Merlin 46	
Mk IIc	1470 hp R.R. Merlin 45, 50A	'C' Wing
	1415 hp R.R. Merlin 46	
Mk L.IIc	1645 hp R.R. Merlin 32	
Mk L.R. IIc	1645 hp R.R. Merlin 32	F.R. version of L.IIc
Mk L.IIc (Hybrid)	1585 hp R.R. Merlin 55M	26 basic Mk IIIs produced by Westlands with fixed 'C' Wing
		Folding 'C' Wings
Mk F.III	1470 hp R.R. Merlin 55	
Mk L.III	1585 hp R.R. Merlin 55M	
Mk F.R. III	1585 hp R.R. Merlin 55M	
Mk XV	1815 hp R.R. Griffon VI	
Mks F & FRXVII	1815 hp R.R. Griffon VI	
Mks F & FR 47	2145 hp R.R. Griffon 87	
	2350 hp R.R. Griffon 88	

NOTES

- 1 Spitfire Mk IIA (L.R.) is an unofficial designation, but is a convenient way of distinguishing the IIA with the extra under wing fuel tank from the standard IIA. Approximately 100 were produced.
- 2 Spitfires F & F.R. Mk XVIII and Mk 22 did not become operational in the Royal Air Force until after the cessation of hostilities.
- 3 Spitfire 'P.R. Type E': There was only one known example and I have omitted it from the list.
- 4 Spitfire F.Mk VI (P.R.). This again is an unofficial designation. These aircraft were soon relegated to communications duties, but two operational sorties took place with 680 (P.R.) Squadron in 1943: one in April to Crete, the other in May to Crete and Piraeus.
- 5 Seafire XV. This aircraft received its Service Release in April 1945.
- 6 The Seafires Mk XVII and 47 entered Squadron Service after the cessation of hostilities. The Mk 47 was operational in the Korean War.

APPENDIX 5

Spitfire Level Speed Performance



This diagram illustrates the growth in level speed performance of the Spitfire from the Mk I to the Mk 21 (Boscombe Down figures)

$$\begin{array}{r} 7 \\ 110 \\ \hline \end{array}$$

$$\begin{array}{r} 117 \\ 5 \\ \hline 5.85 \end{array}$$

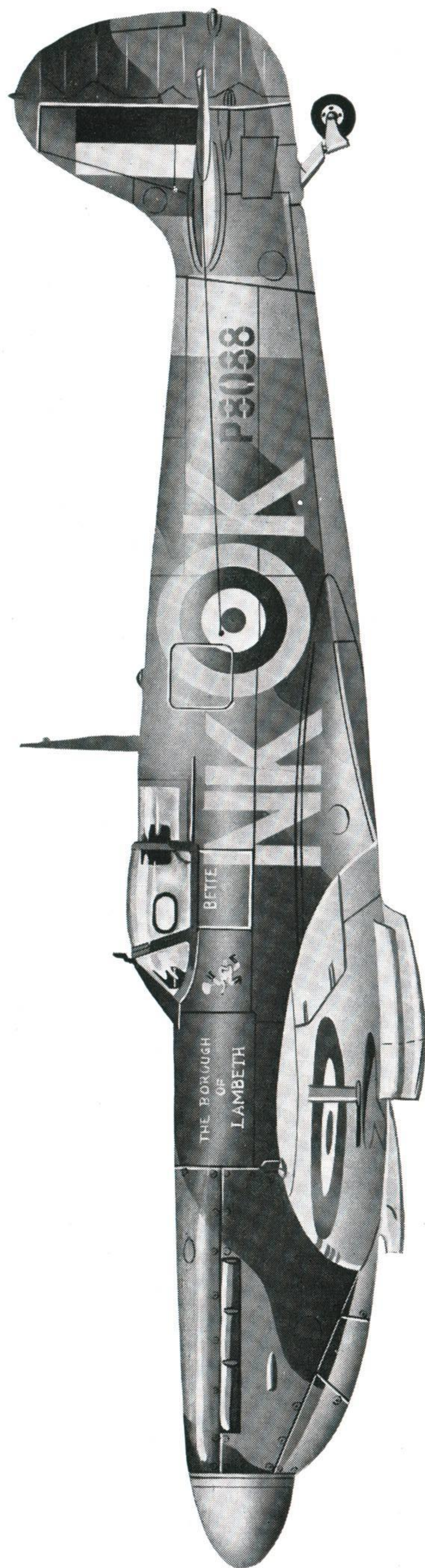
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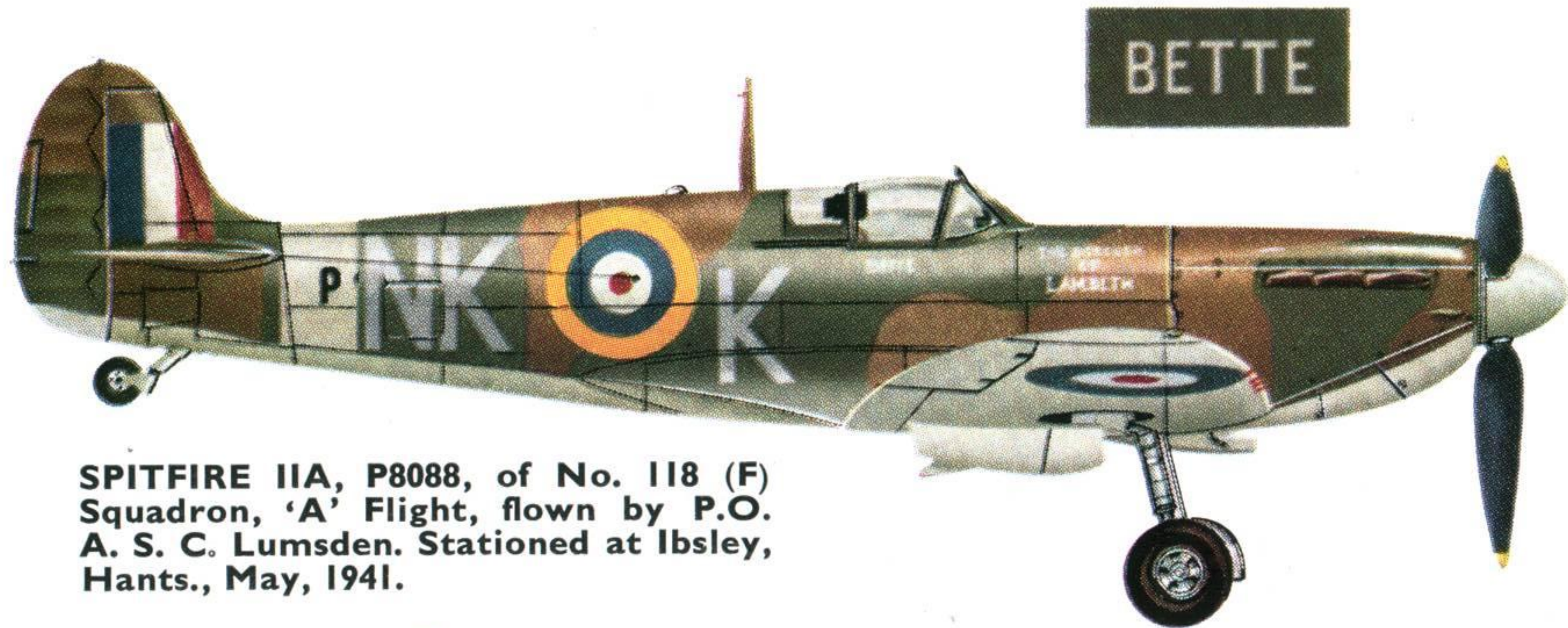
Molson
Spit
6173

**PROFILE
PUBLICATIONS**

The
Supermarine
Spitfire
I & II

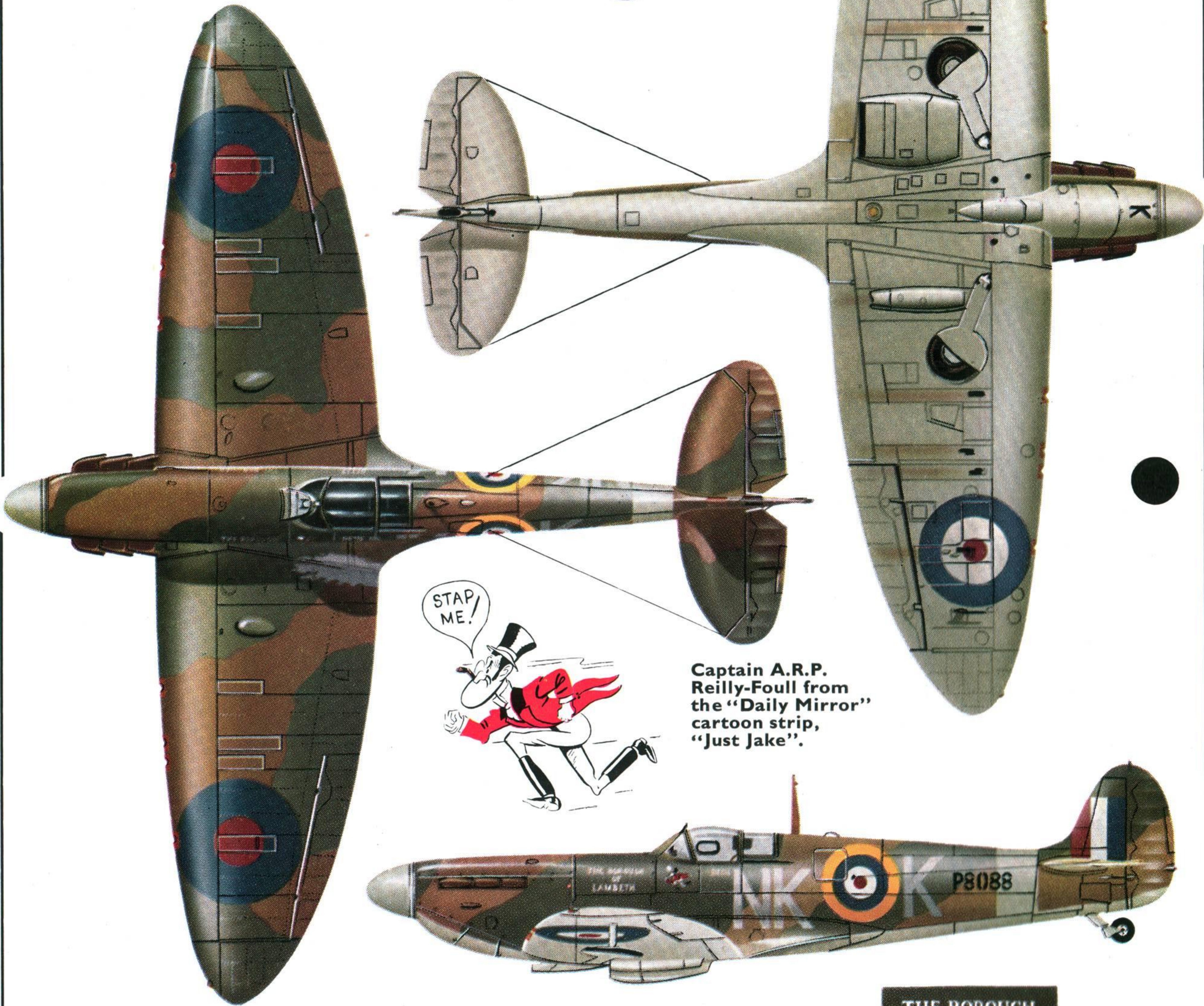
**NUMBER 41
TWO SHILLINGS**



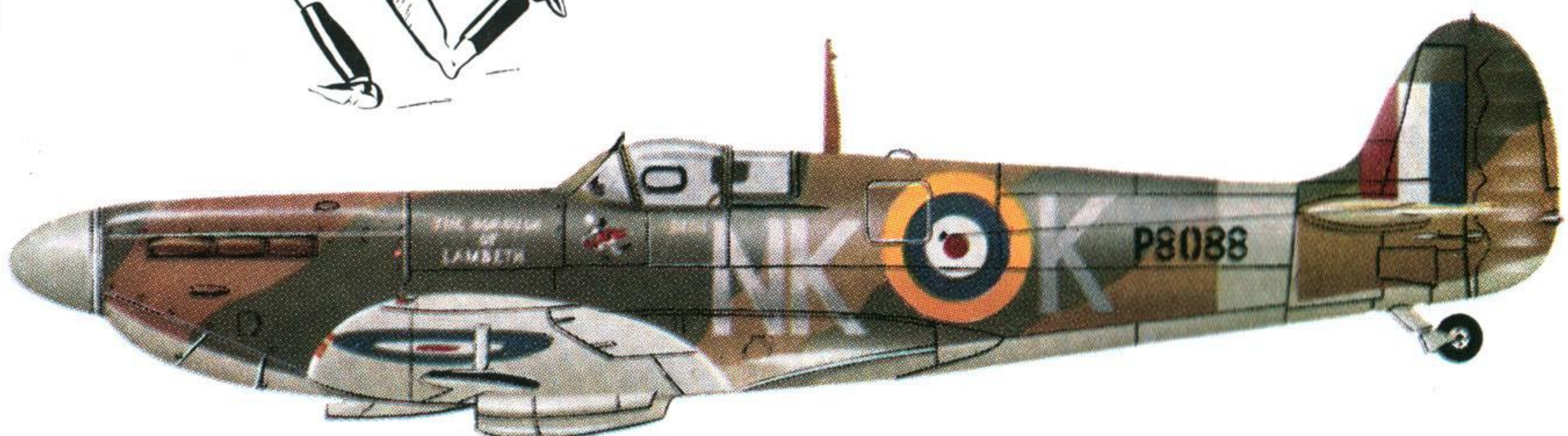


BETTE

SPITFIRE IIA, P8088, of No. 118 (F) Squadron, 'A' Flight, flown by P.O. A. S. C. Lumsden. Stationed at Ibsley, Hants., May, 1941.

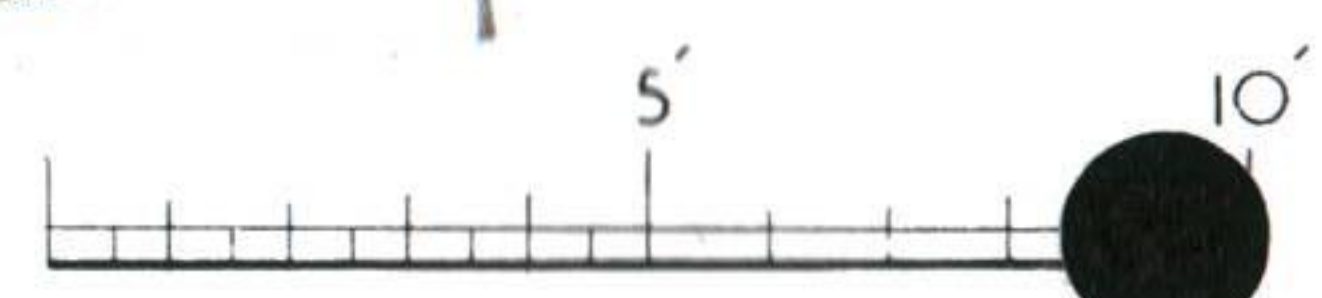
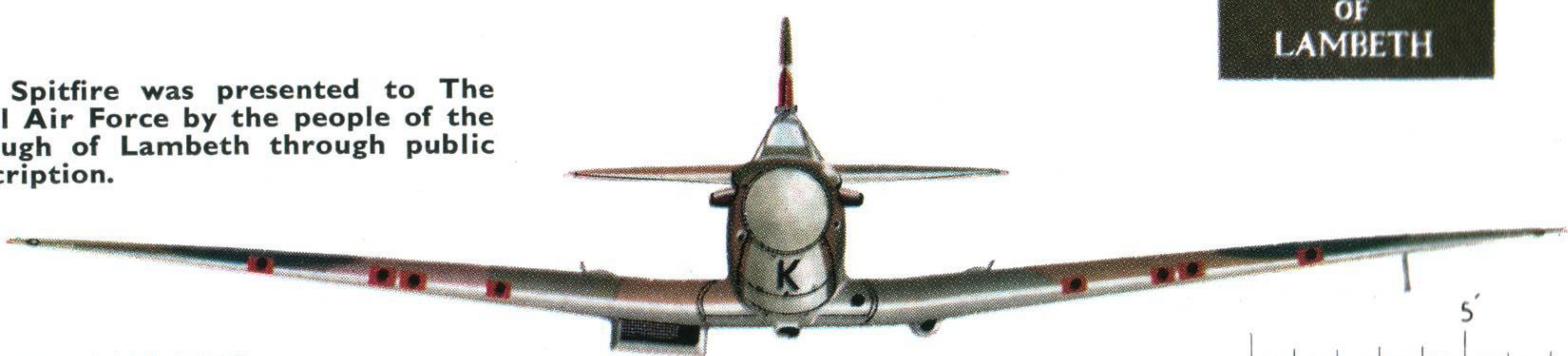


Captain A.R.P. Reilly-Foull from the "Daily Mirror" cartoon strip, "Just Jake".



THE BOROUGH OF LAMBETH

This Spitfire was presented to The Royal Air Force by the people of the Borough of Lambeth through public subscription.

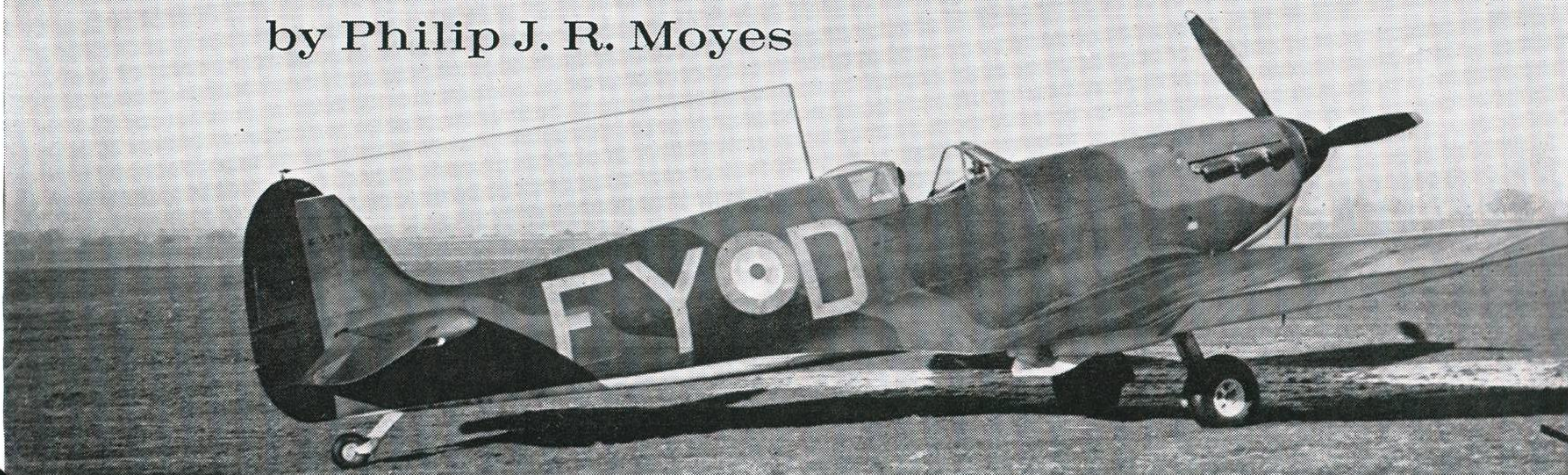


© JAMES GOULDING

A H.F. wire aerial was originally fitted to Spitfires, but later a V.H.F. aerial, utilising the existing mast only, was installed. P8088 had V.H.F. radio installed early in 1941.

The Supermarine Spitfire I & II

by Philip J. R. Moyes



Spitfire Is of No. 611 Squadron late in 1939 during the "phoney" war. The one on the ground is K9999, the serial being painted in minute figures on its fin.

The Spitfire was a fighter *par excellence*. It was a thoroughbred through and through, combining as it did sheer perfection of line with handling qualities that were second to none. It was a fighter pilot's dream plane—fast, deadly and docile.

The Spitfire obtained its first battle successes against the sporadic tip-and-run raiders in the "phoney" war, but the supreme trial of the "Spit." came during the Battle of Britain. Then it was that, alongside the more numerous Hurricanes, the Spitfire Is and IIs won imperishable fame by smashing the awesome contrailing formations of *Luftwaffe* bombers and their fighter escorts until the onslaught faltered and ceased.

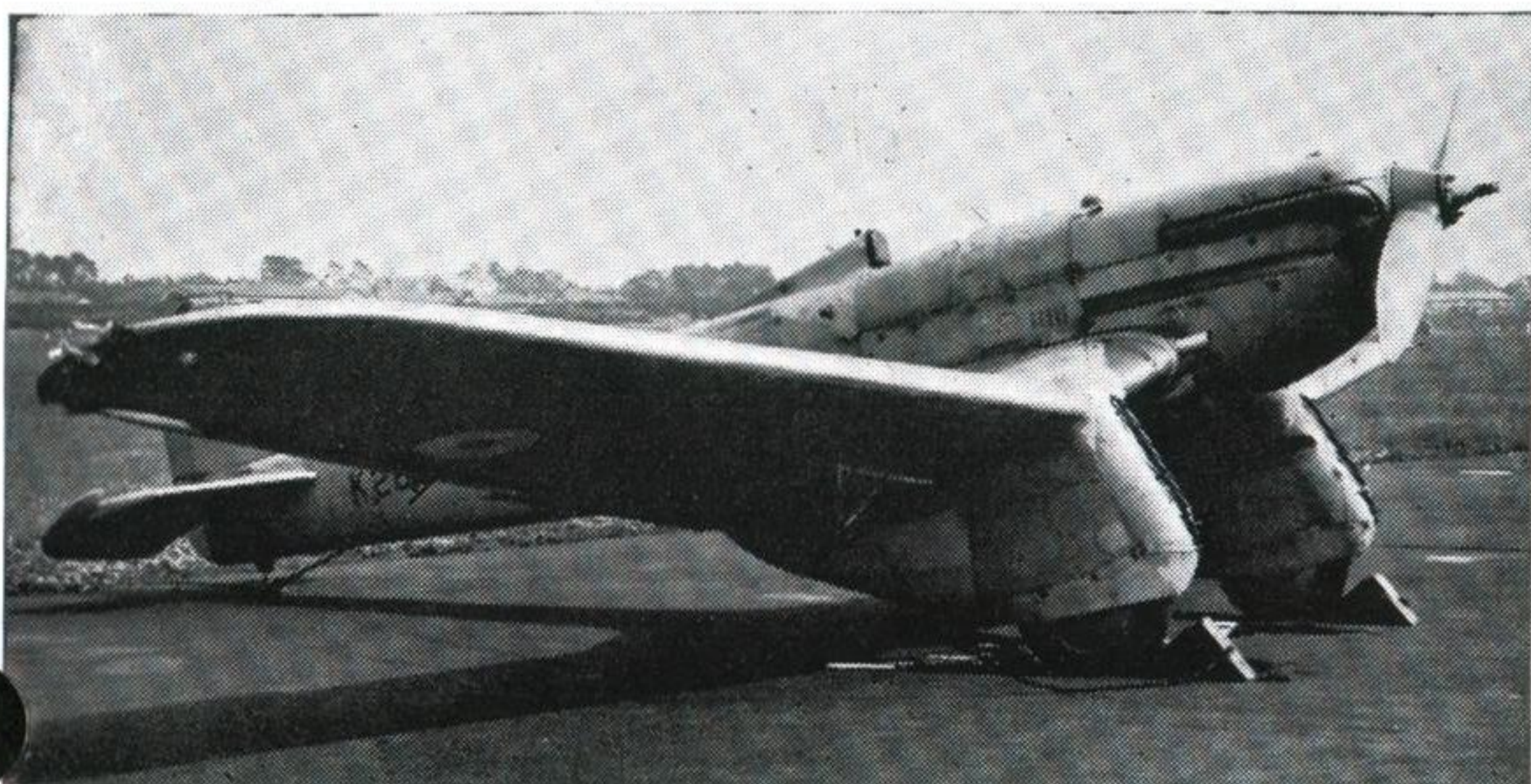
As the war progressed the Spitfire was continually modified and improved, and although the story of this development is outside the scope of this *Profile*, a few facts should, perhaps, be put on record. Most im-

portant of these are that the Spitfire remained a front-line fighter throughout the whole period of the war and, during that time, flew operationally on every front and took part in every major air action fought by the R.A.F. Other interesting facts concern production and performance: a total of 20,351 Spitfires was manufactured as well as 2,408 Seafires (the naval version of the Spitfire which was developed from the standard Mark Vb Spitfire). From the advent of the prototype in 1936 to the Mark XXII in 1945, Spitfire speeds increased from 349.5 m.p.h. to 450 m.p.h., rate of climb from 2,500 feet per minute to 4,800 feet per minute and fire power from 4 to 12 lb. per second.

ORIGIN

The Spitfire was the creation of that quiet, calm genius Reginald J. Mitchell who, beginning in 1925, had evolved a series of high-speed seaplanes as contenders in the Schneider Trophy Races,* culminating in the superb S6B* which, in 1931, won the trophy outright for Great Britain at an average speed of 340.8 m.p.h. (and which, two weeks later, raised the world's speed record to 407 m.p.h.). The immediate predecessor of the Spitfire, in so far as actual hardware was concerned, was the Supermarine Type 224 (K2890), a single-seat monoplane fighter built to meet the requirements of Air Ministry specification F.7/30, and having a cranked (inverted gull) wing, an open cockpit, a fixed "trouser" undercarriage, and a 600-h.p. Rolls-Royce Goshawk steam-cooled engine. The Type 224 was not a success, mainly because the

The Supermarine F.7/30, unofficially named "Spitfire".



*See Profile Number 39.

specification was too tightly drawn and consequently gave Mitchell very little scope.

Even before it flew Mitchell was dissatisfied with the Type 224 and started work on a new design as a private venture. The original basic design, although incorporating an enclosed cockpit and a retractable undercarriage, envisaged the use of the Goshawk engine, but two further developments resulted in extensive redesign: first came the advent of the sensational Rolls-Royce PV-12 liquid-cooled engine (later to become famous as the Merlin); and, secondly, the issue by the Air Ministry of specification F.5/34

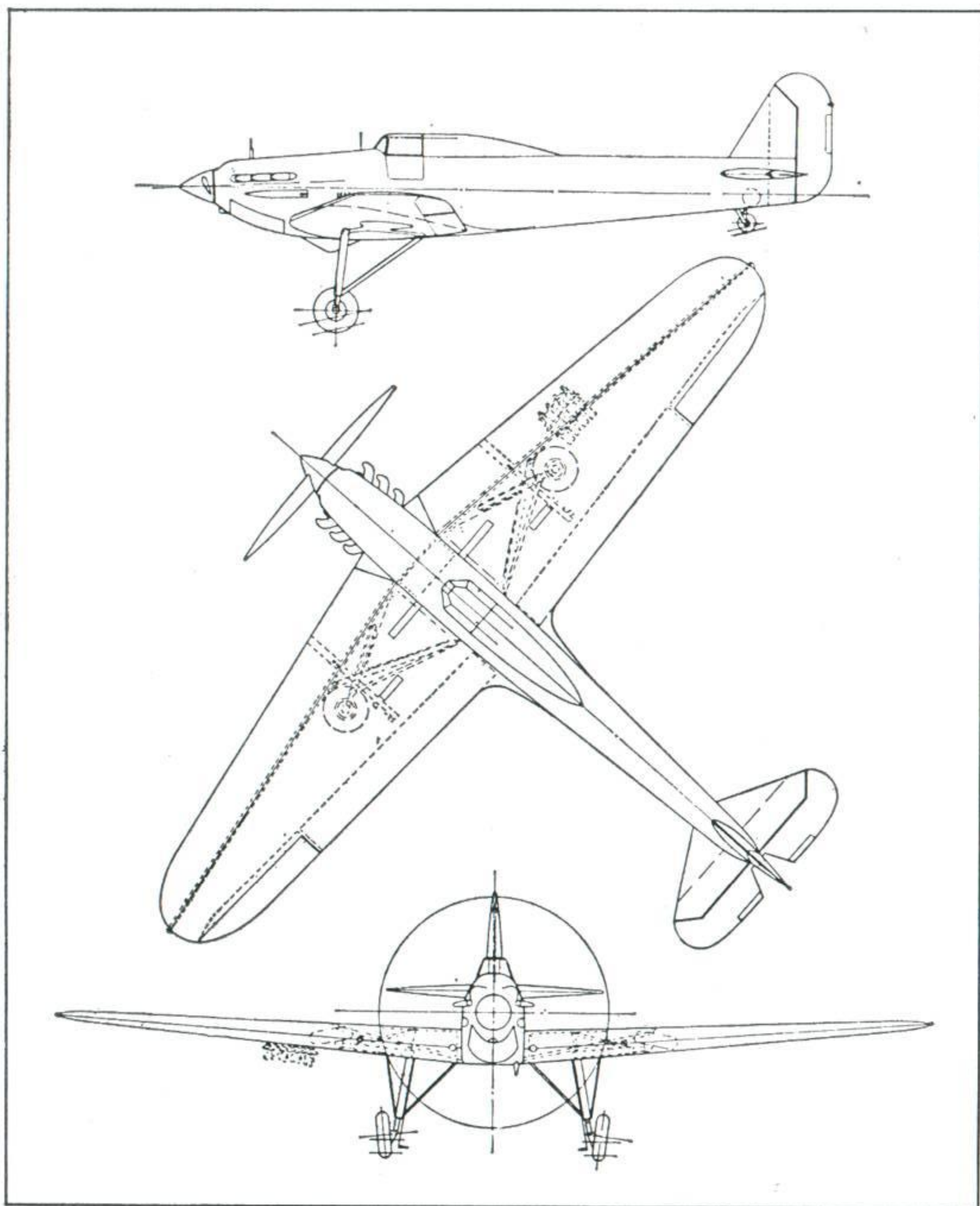
calling for the installation of eight, instead of four machine guns.

The Supermarine Type 300, as the final design was known, actually went far beyond F.5/34 and in January 1935, it was accepted by the Air Ministry for construction in prototype form to specification F.37/34, the latter being virtually written round the design for contractual purposes. The final mock-up conference was held at Woolston on 26th March 1935, and less than a year later, on 5th March 1936, the prototype Spitfire, K5054, powered by a 990-h.p. Rolls-Royce Merlin "C" took off on its maiden flight from Eastleigh airfield, Southampton, with J. "Mutt" Summers at the controls. Summers was chief test pilot for Vickers (Aviation) Ltd., which had acquired the entire share capital of the Supermarine Company in 1928.

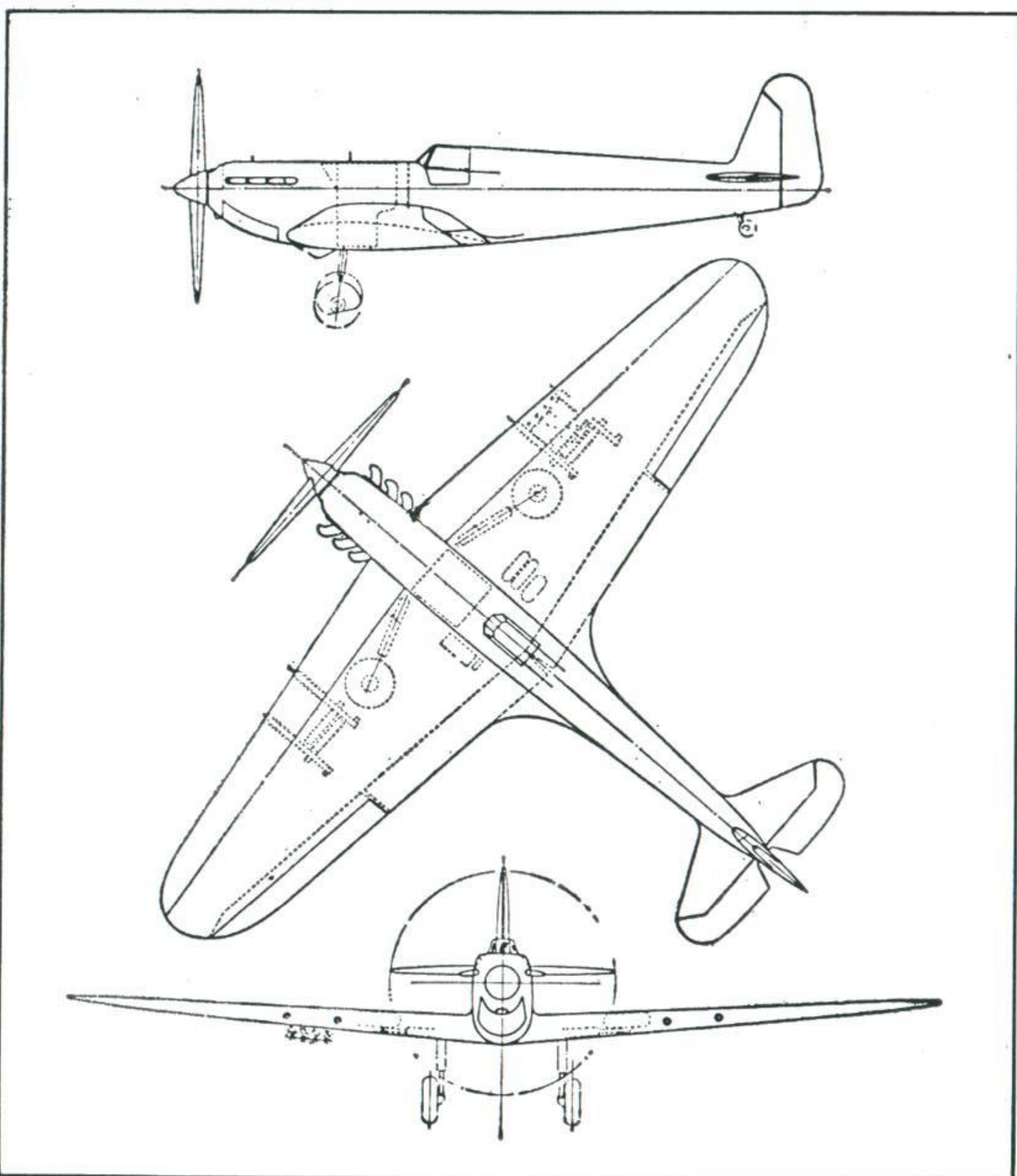
STRUCTURE OF THE SPITFIRE

The Spitfire was in essence the smallest and neatest fighter which could be designed round the engine, pilot and eight-gun armament. An all-metal, stressed skin, low-wing, cantilever monoplane, it was characterised by its graceful elliptical wing (a design feature inspired by the similarly-shaped—but thicker in section—wing of the Heinkel He 70) the aerodynamic advantages of which far outweighed the production problems that it presented. The wing was thin (giving good high-speed handling qualities) and had, at 25 per cent of the chord, a single spar comprising tubular flanges and a plate web. Forward of the spar the wing was covered with heavy-gauge Alclad which formed, in conjunction with the spar web, a stiff, strong torsion box. Besides giving an excellent form to the nose portion of the wing this type of construction had very good anti-flutter characteristics. Aft of the spar, the thinner gauge skin was supported by girder ribs and a false spar, to which latter the split flaps and fabric-covered ailerons were attached.

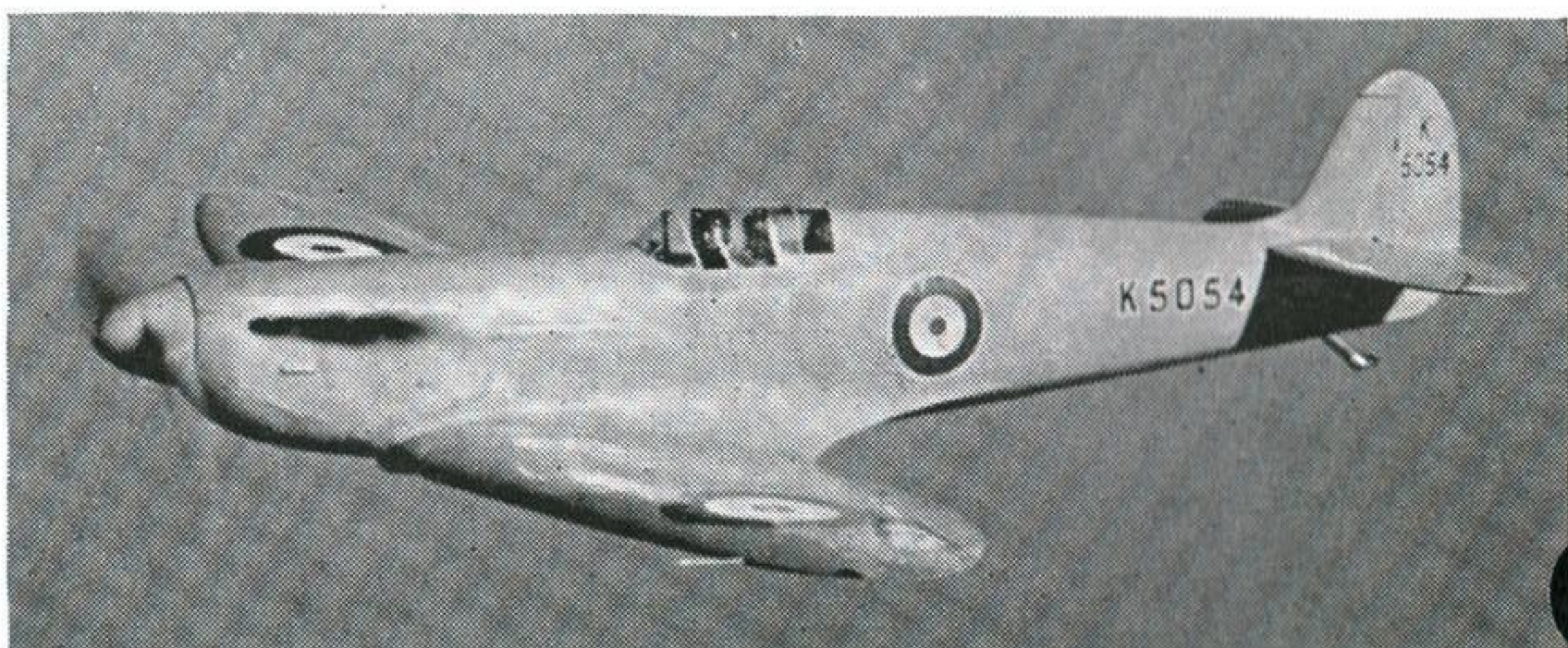
The fuselage was built in three sections. The forward part, which formed the engine mounting, was of tubular construction. Aft of this was a monocoque

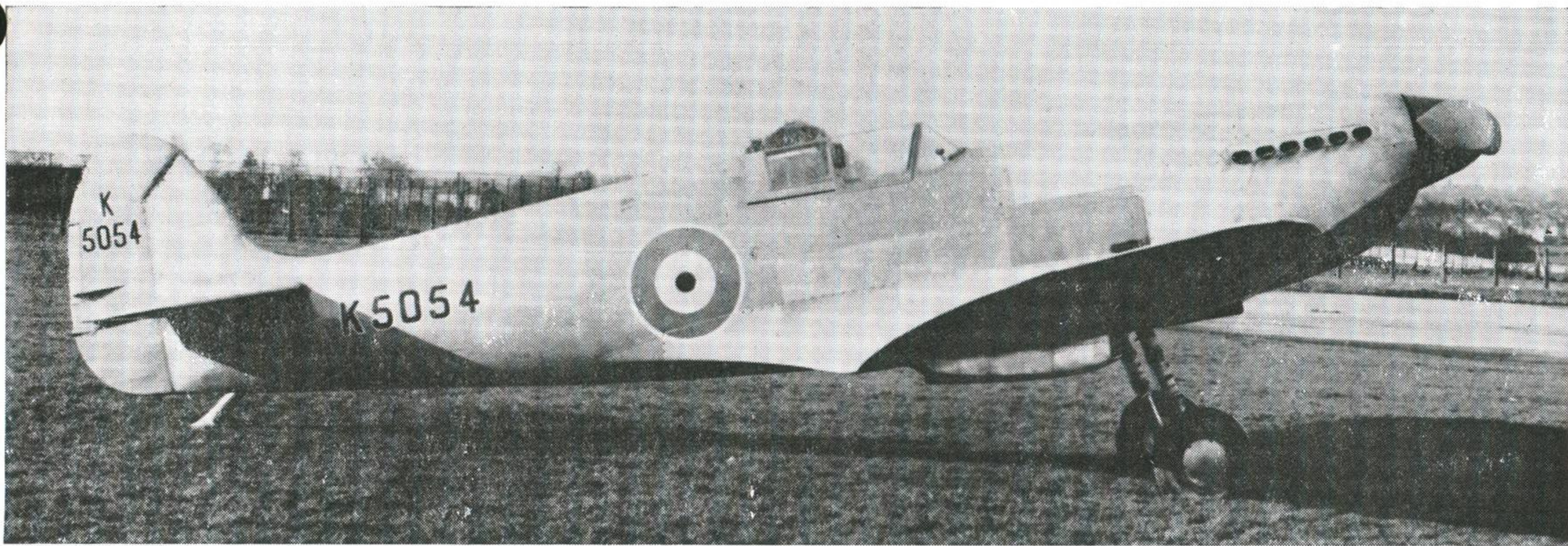


Above and below: Two of the many Supermarine F.7/30 development projects which preceded the Type 300 Spitfire. Both these projects had R-R Goshawk engines, four guns and carried four small bombs beneath the starboard wing.



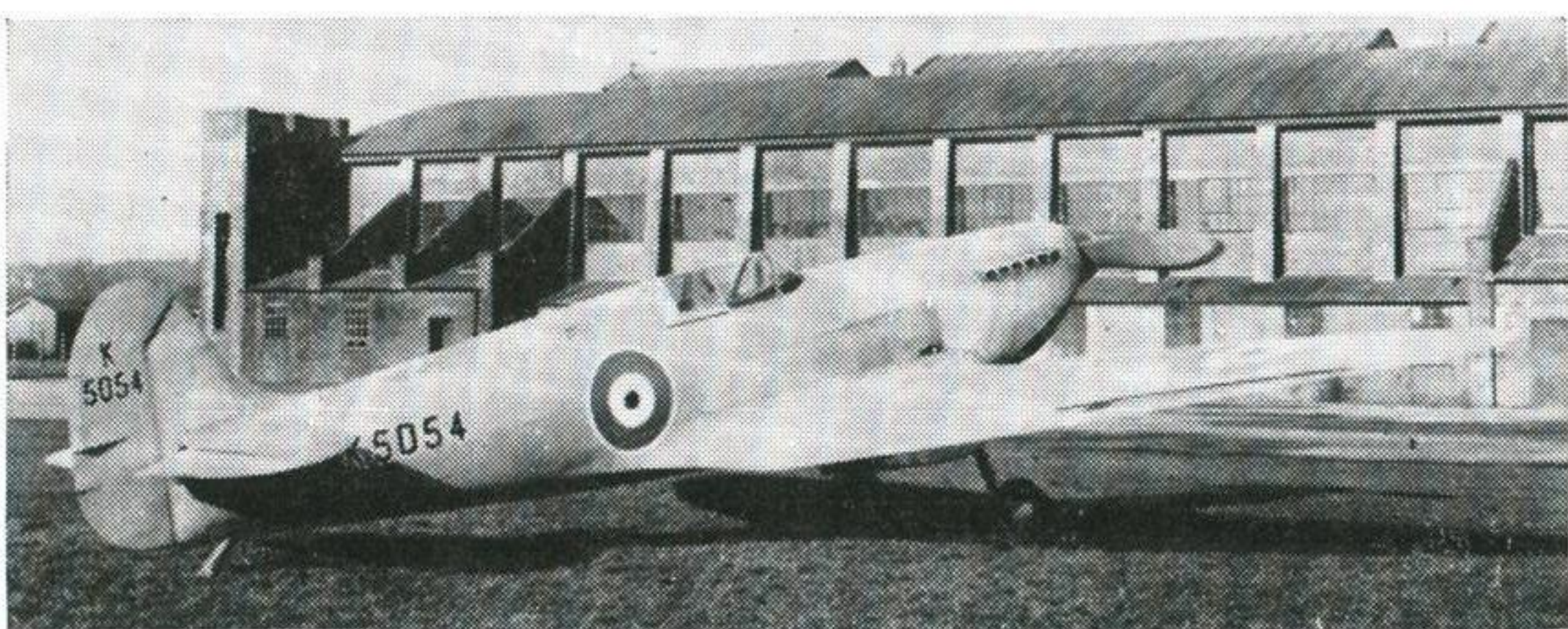
The sleek Heinkel He.70 (actually the example used by R-R as a Merlin test-bed) and (below) the prototype Type 300 Spitfire whose design the German aircraft greatly influenced.





Above and below: *The prototype Type 300 Spitfire (K5054) with original fin and rudder. This aircraft was unpainted when first flown but was subsequently finished in a high-gloss pale blue—not cream or grey as has often been reported elsewhere.*

(Photos: Imperial War Museum)



section built up on transverse frames, the longitudinals being intercostal except for the four main longerons. The foremost frame of this portion formed a fireproof bulkhead and built into it was the centre portion of the main wing spar (there was no conventional wing centre-section, for the wings butted on to the fuselage side). The tail portion of the fuselage was likewise of monocoque construction and incorporated the fin. This whole section was detachable.

The tailplane was an all-metal structure while the elevator and rudder were metal framed with fabric covering.

PRODUCTION AND EARLY SERVICE

From the outset of its official trials at Martlesham Heath the Spitfire proved a winner and specification

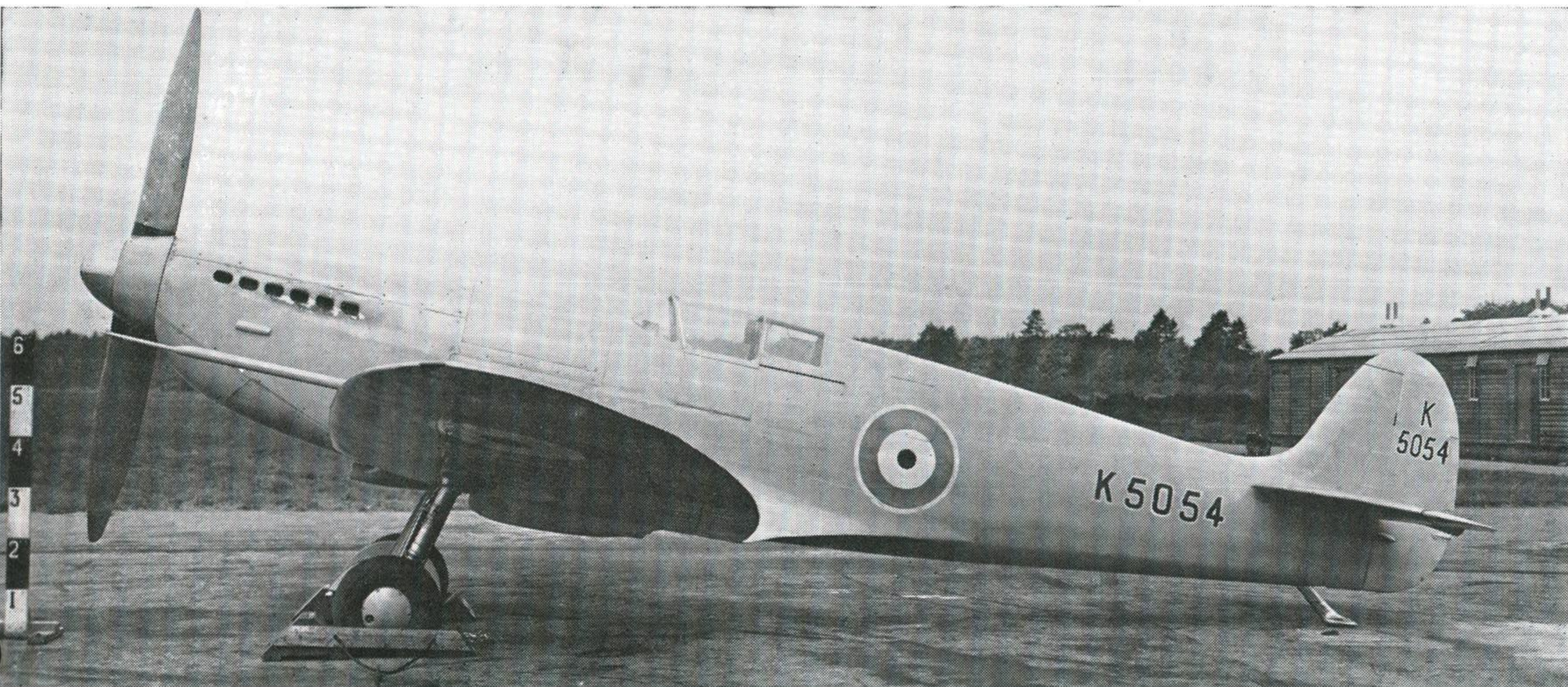
F.16/36 was drawn up to cover the further development and production of the fighter. On 3rd June 1936 (shortly after the name Spitfire had been officially adopted) the Air Ministry placed an initial order for 310 Spitfires. This presented Supermarine with a colossal task; they had never before received such a large order. However no time was lost in reorganising the Woolston Works on a production basis; the design and construction of jigs and tools in hitherto unheard of quantities was rapidly proceeded with, and the labour force expanded with men and women of all trades.

Production proper began in March 1937, and at first Supermarine undertook the construction of fuselages only, together with the assembly and testing of the aircraft. Later they built wings too. The rest of the construction was widely sub-contracted, the main sub-



Above right and below: *K5054 seen after its fin and rudder had been redesigned.*

(Photos: Imperial War Museum)





The ninth production Spitfire I, photographed while serving with No. 19 Squadron before the war.

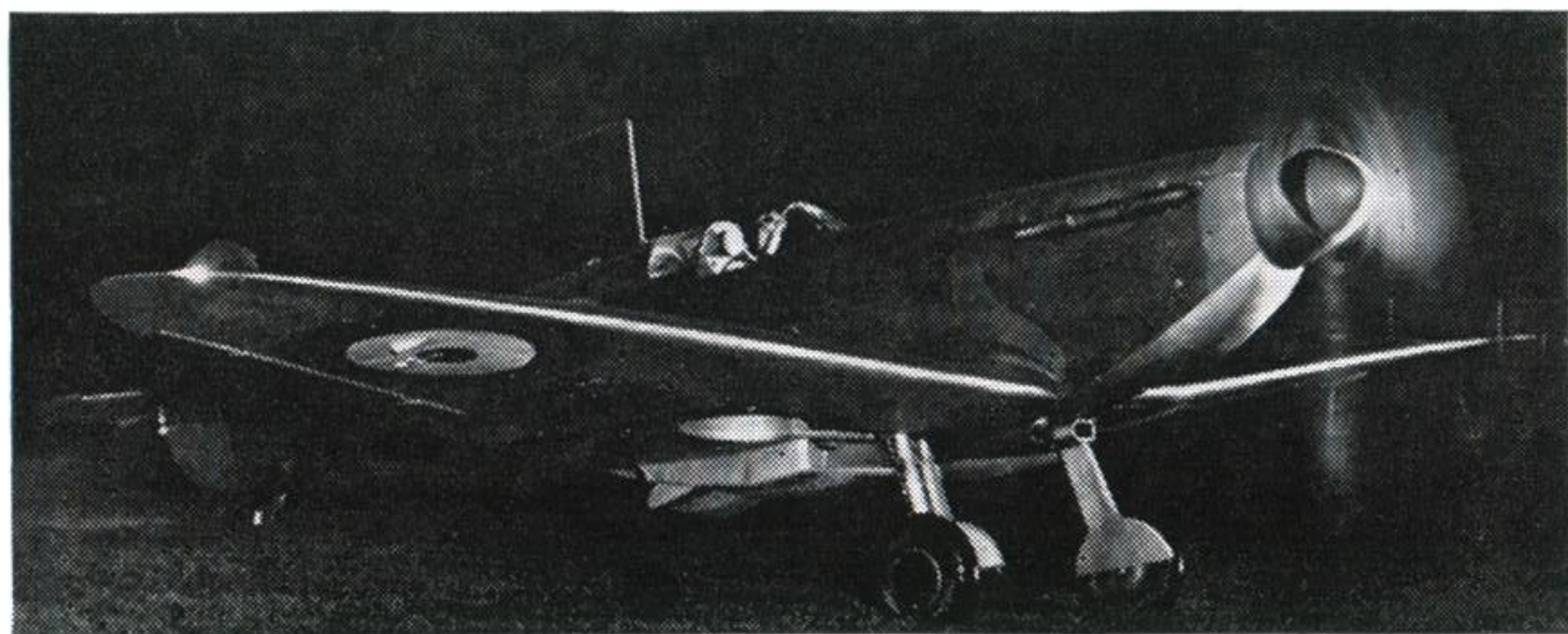
(Photo: Imperial War Museum)

contractors in the early days (they were later joined by many other well-known firms) being General Aircraft Ltd. and Pobjoy Airmotors and Aircraft Ltd. (wings), Aero Engines Ltd. (ailerons and elevators), Singer Motors Ltd. (engine mountings), Folland Aircraft Ltd. (tail end), General Electric (wing tips), J. Samuel White & Co. Ltd. (fuselage frames), The Pressed Steel Co. Ltd. (wing leading edge section), G. Beaton & Son Ltd. and Westland Aircraft Ltd. (wing ribs).

The initial Spitfire production contract was due for completion in March 1939, but early manufacturing problems delayed this until August. Meanwhile, in 1937 the original contract was followed by an order for a further 200 machines. Also in that year Reginald Mitchell, who had been seriously ill for many months, died at the early age of 42. He was succeeded as chief designer at Supermarine by Joseph Smith who was subsequently to be responsible for the development of the Spitfire through numerous marks and variants.

On 12th April 1938, the Nuffield Organisation was contracted to build 1,000 Spitfires at a new "shadow" factory planned for erection at Castle Bromwich, near Birmingham. In the following year further contracts

K5054 after being brought up to Mk. I standard, seen during pre-war night-flying trials. Because of its narrow track undercarriage the Spitfire proved unsuitable for night operations except in bright moonlight.



were placed with Supermarine—on 29th April for 18 Spitfires, and on 9th August for 450—so that at the outbreak of war 2,143 Spitfires were already on order.

The first production Spitfire, K9787, was completed in July 1938, and both it and the second machine were retained for extensive handling trials. The third, K9789, was delivered on 4th August to No. 19 Squadron at Duxford, other Spitfires following at intervals until 19th December by which time the unit (which had previously flown Gauntlets) was completely re-equipped. With a view to obviating teething troubles, arrangements were made at Duxford for a programme of intensive flying to be done on K9789. Some 300 hours flying was completed within an extremely short period, and corrective action taken on a number of defects which came to light.

As production got into its stride, more squadrons were issued with Spitfires, and at the outbreak of war in September 1939, nine squadrons of the R.A.F.,† Nos. 19, 41, 54, 65, 66, 72, 74, 602 and 611 were fully armed with Spitfires and two more, Nos. 603 and 609, were in the process of conversion.

On 16th October 1939, Spitfires of Nos. 602 and 603 Squadrons engaged German bombers over the Firth of Forth and each squadron destroyed a Heinkel He.111, the honour of shooting down the first one going to No. 602. This was the first occasion when Spitfires fired their guns in action, and their victims (which fell into the sea) were the first enemy aircraft to be shot down over Great Britain since 1918. On 28th October 1939, Spitfires of the same two units shared in the destruction of a Heinkel He.111 which crash-landed close to the village of Humbie, on the Lammermuir Hills near Dalkeith. This was the first German aircraft to be brought down on British soil in W.W.II.

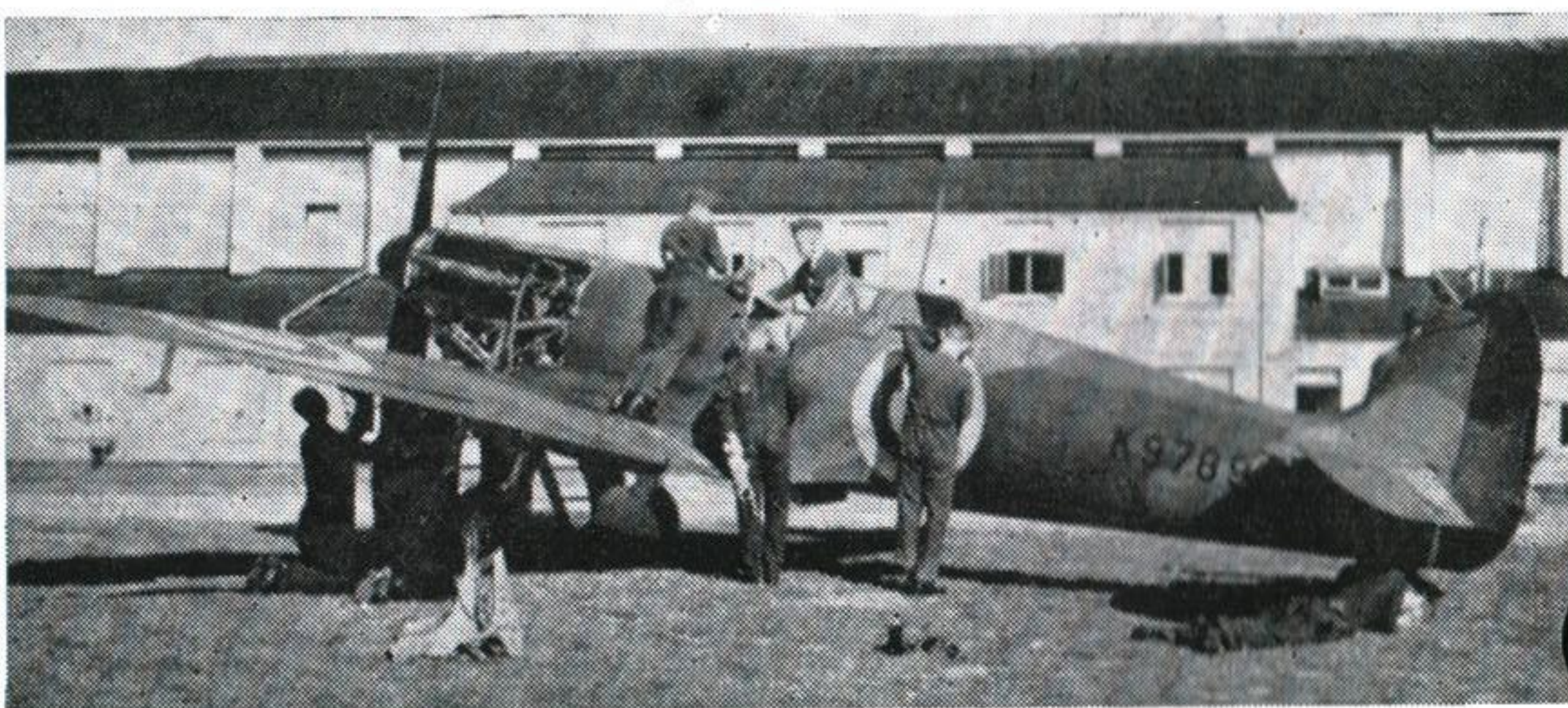
When the Battle of Britain began in early July 1940, there were 19 Spitfire squadrons in Fighter Command's order of battle and a list of these appears on page 12.

In outline, the early production Spitfire Is were similar to the prototype as originally completed,‡ but there were many detail differences. For example the semi-circular wheel fairing doors hinged to the bottom of the undercarriage leg fairings were deleted, the flush exhausts replaced by triple ejector exhausts and the tailskid replaced by a castoring tailwheel. A Merlin II rated at 1,030 h.p. was installed in the first 174 aircraft (K9787–K9960), and the Airscrew Company's Weybridge two-blade, fixed-pitch wooden airscrew (which was similar to the prototype's de Havilland two-blader) gave place, from the 78th aircraft onwards, to

†Until 1st September when they had been embodied in the R.A.F. some—those in the 600 series—had been Aux. A.F.

‡This qualification is necessary because the prototype was eventually brought up to Mk. I standard (and camouflaged).

The first Spitfire in service, K9789, undergoing maintenance at Duxford in 1938.



three-blade, two-speed de Havilland airscrew; the latter increased the maximum speed by 5 m.p.h.—from 362 to 367 m.p.h. A domed cockpit hood was introduced during early 1939 and examples of both types of hood can be seen side-by-side in the 19-Squadron line-up below. Three somewhat later modifications were the introduction of (a) a redesigned aerial mast, (b) a bulletproof windscreen (made by fixing externally to the front of the windscreen a 1 $\frac{3}{4}$ -in. thick bulletproof panel), and (c) 6 m/m armour plate behind the pilot's head.

Standard armament of the Spitfire in what became known as the type "A" wing was eight .303-in. Browning guns with 300 rounds per gun. Although this was good for its time, the need for greater hitting power soon became apparent and towards this end, in June 1939, an early production Spitfire (*L1007*) was experimentally fitted with two 20 m/m Hispano can-

non, with 60 rounds each in drum-type magazines, in place of the four inboard Brownings. This aircraft became the prototype for the Spitfire IB (the "B" suffix indicated what eventually became known as the type "B" wing—the wing carrying four Browning guns and two Hispano cannon), 30 of which were delivered in the summer of 1939 to No. 19 Squadron for operational trials. In service the IBs were disliked owing to persistent cannon stoppages caused by unreliable feed and ejector mechanisms, and soon the aircraft were withdrawn.

From the 175th Spitfire I onwards, the Merlin III was installed. This powerplant, although of similar output to the Merlin II, had a standardised shaft for de Havilland or Rotol three-blade airscrews. The latter (two-position, metal) became available late in 1939 and 22 aircraft in the "N" serial range were specially fitted on the production line at Woolston for No. 19 Squadron which received the first of them on 1st November. By the end of the year these aircraft had been transferred to No. 54 Squadron. Between late June and early August 1940, all de Havilland airscrews on Spitfire Is at fighter stations were converted to constant speed units by de Havilland service engineers (except in the case of cannon-armed aircraft which received C.S. airscrews on production). The reason for this was that although the two-position airscrews fulfilled their original purpose of improving take-off, they were inadequate for climb and ceiling. The resulting improvement in performance did much to help smash the massive attacks of the *Luftwaffe* in the Battle of Britain.

A total of 1,583 Spitfire Is was built, including 50 by Westland. Before the outbreak of war several foreign governments planned to buy Spitfires, and export versions were designed for Estonia (Type 332), Greece (Type 335), Portugal (Type 336) and Turkey (Type 341). Foreign Office sanction to export these aircraft was withdrawn when war became imminent and only three were exported. They were *P9566*, *P9567* and *L1066*. They all went to Turkey, the last one having been originally consigned to Poland and diverted to Turkey after the Polish collapse.

Several experimental variants of the Spitfire I were produced and one which can be singled out for mention here was *R6722*, first of the Spitfire floatplanes. Originally a standard Spitfire airframe, *R6722* was

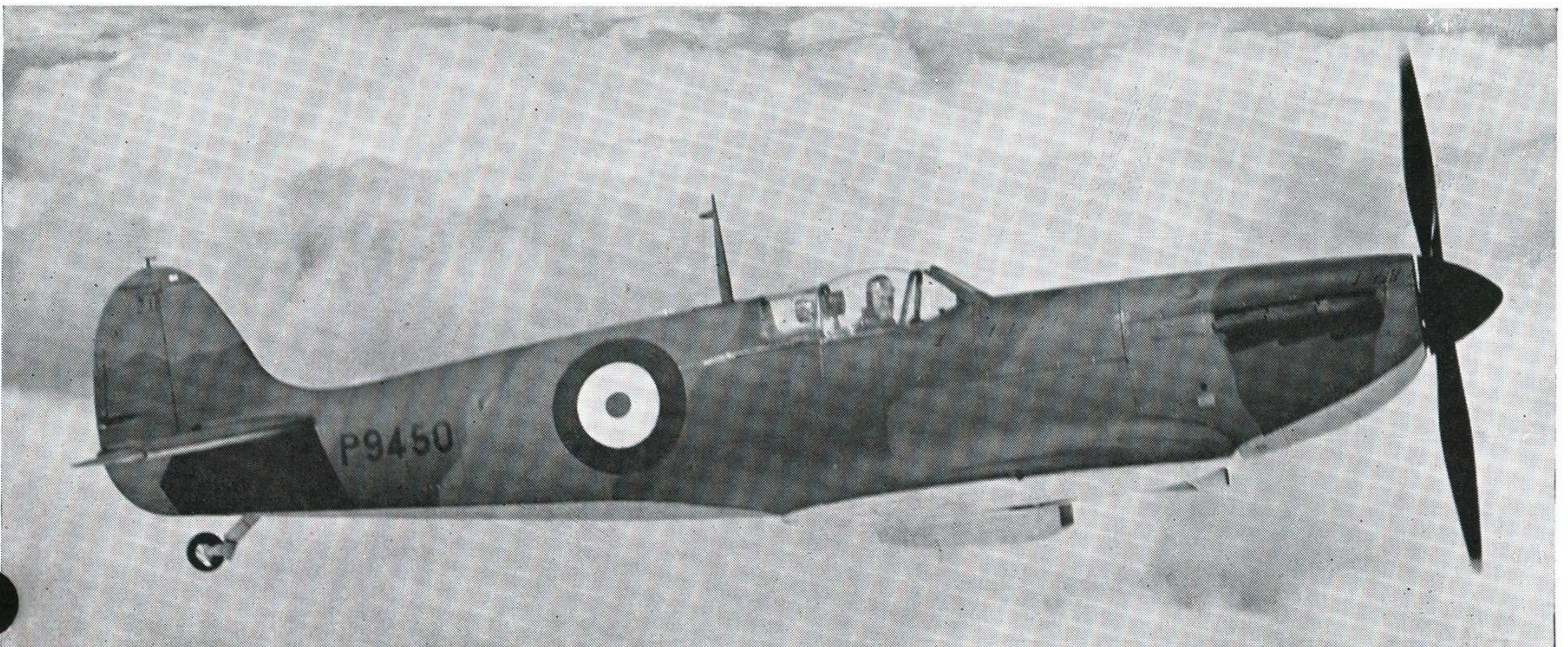


Trial installation of a de Havilland three-blade V.P. airscrew on K9793 early in 1939. (Photo: Imperial War Museum)



Spitfire Is of No. 19 Squadron at Duxford during a Press visit on 4th May 1939. (Photo: "The Aeroplane")

P9450, the 601st Spitfire on acceptance trials in the spring of 1940, flown by Supermarine test pilot George Pickering.





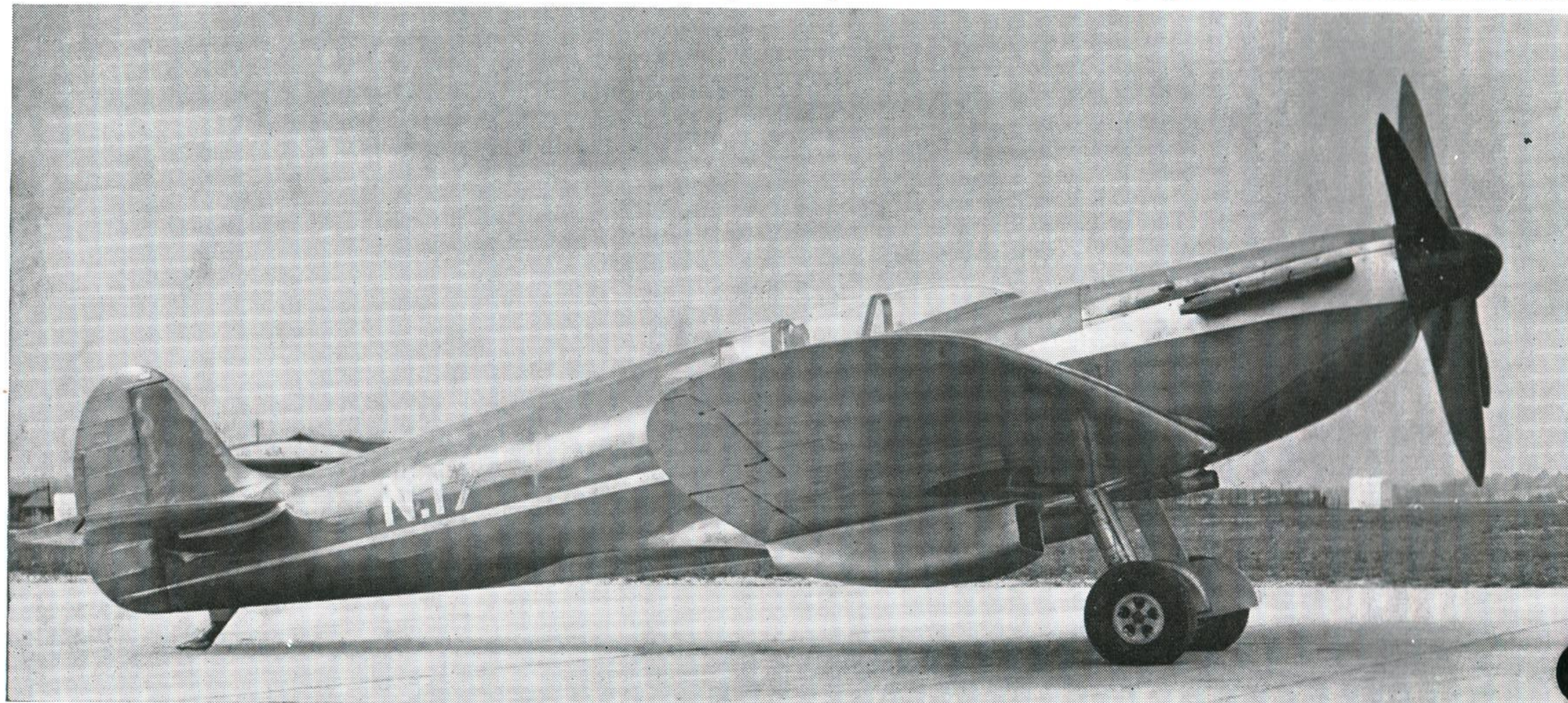
Above: Spitfire I P9386 of No. 19 Squadron being re-armed, September 1940.
Below: One of the few air-to-air shots of Spitfires taken during "the Battle". Aircraft are from No. 610 (County of Chester) Squadron, and although their serials seem to have been censored, that of DW-K is known to have been N3029. (Photos: Imperial War Museum)

hurriedly fitted with a pair of Blackburn Roc floats during the Norwegian campaign; however it was never flown in this form (which was known as the Type 342) and after the Norwegian campaign it was reconverted to standard.

The 48th Spitfire airframe from the initial Supermarine batch, K9834, was completed to a special standard (Type 323) and renumbered N.17 for an attempt on the world air speed record in 1938. The windscreen was specially streamlined, wing span reduced by 3 ft. 2 in. to 33 ft. 8in., flush riveting was

used and a high-gloss finish applied. Further modifications were a larger radiator and oil cooler, and the replacement of the tailwheel by a skid. Powerplant was a strengthened Merlin III using 100-octane fuel, giving 2,160 h.p. and driving an Airscrew Company four-blade, fixed-pitch airscrew. It was hoped that N.17 or the Speed Spitfire as it became known would achieve 420 m.p.h., but before any attempt could be made, the world air speed record was raised to 463.92 m.p.h. by the Heinkel He.100 V8, this record being further increased immediately afterwards to

The Speed Spitfire, N17, seen at Eastleigh in 1939. This aircraft had a flush-riveted skin and a superfine blue and gold high-gloss finish.





Another view of the Speed Spitfire. During the war N.17 was converted to a P.R. aircraft and on D-Day Air-Cdre. J. N. Boothman flew it over the Normandy beaches.

469·22 m.p.h. by the Me.209 V1. Further work on N.17 as a potential record-breaker was abandoned and later, after being converted to approximately Mk. II standard, it became one of the first photographic-reconnaissance Spitfires.

SPITFIRE II

The Spitfire Mk. II (Type 329) was basically a Mk. I built exclusively at Castle Bromwich and powered by a 1,175-h.p. Merlin XII (fitted with a Coffman starter and running on 100-octane fuel) driving a Jablo Rotol three-blade C.S. airscrew. It incorporated Mk. I

refinements from initial production in the first half of 1940 and whereas the Mk. I had armour plating added in service, the Mk. II had it installed on production. There was 73 lb. of armour in all, some of it providing protection behind the pilot's seat and head, and the rest providing forward protection for the glycol header tank and the top fuel tank.

Deliveries of Spitfire IIs to the R.A.F. began in June 1940 (beginning with P7260 on 6th June) in time for the Battle of Britain, but it was not until the following winter that re-equipment of the squadrons flying the Mk. I began in earnest. By 1st April 1941, 650 Mk. IIs had left the Castle Bromwich factory and the change-over was complete, most of the Mk. I being relegated to a training rôle at O.T.U.s.

The Spitfire II was used in Fighter Command's early offensive sweeps (*Rhubarbs*) over Europe, the first of these missions being flown by two aircraft of No. 66 Squadron operating from Biggin Hill on 20th December 1940.

The Spitfire was, of course, designed as home defence interceptor fighter. Its fuel capacity of 85 gallons only allowed for take-off, a climb to altitude, 1·65 hours cruising and 15 minutes combat at full bore. In an effort to increase its operational range and give it a distinctly offensive capability a number of experiments were conducted. One of these experiments—using a Spitfire IA—introduced an overload

Right and below: Spitfire IIA P8088 of No. 118 Squadron, Ibsley, 1941. Named "The Borough of Lambeth" after its honors, this aircraft is the subject of the five view drawing on page 2.

(Photos: Alec Lumsden).





A Spitfire IIA—believed P7665 of No. 65 (East India) Squadron which was equipped with Spitfires financed by the East Indian Fund for British War Services.
(Photo: Imperial War Museum)

fuel tank under one wing and an oil tank under the other. The tanks were fitted flush-up against the wings just outboard of the undercarriage wheel wells between the inboard and three outboard machine guns in a fashion similar to that later employed for the long-range tanks on the Mosquito. Other experiments involving the installation of overload tanks were conducted with the Spitfire IIA, and in 1941/42 a few IIAs, each fitted with a 40-gallon long-range fuel tank under



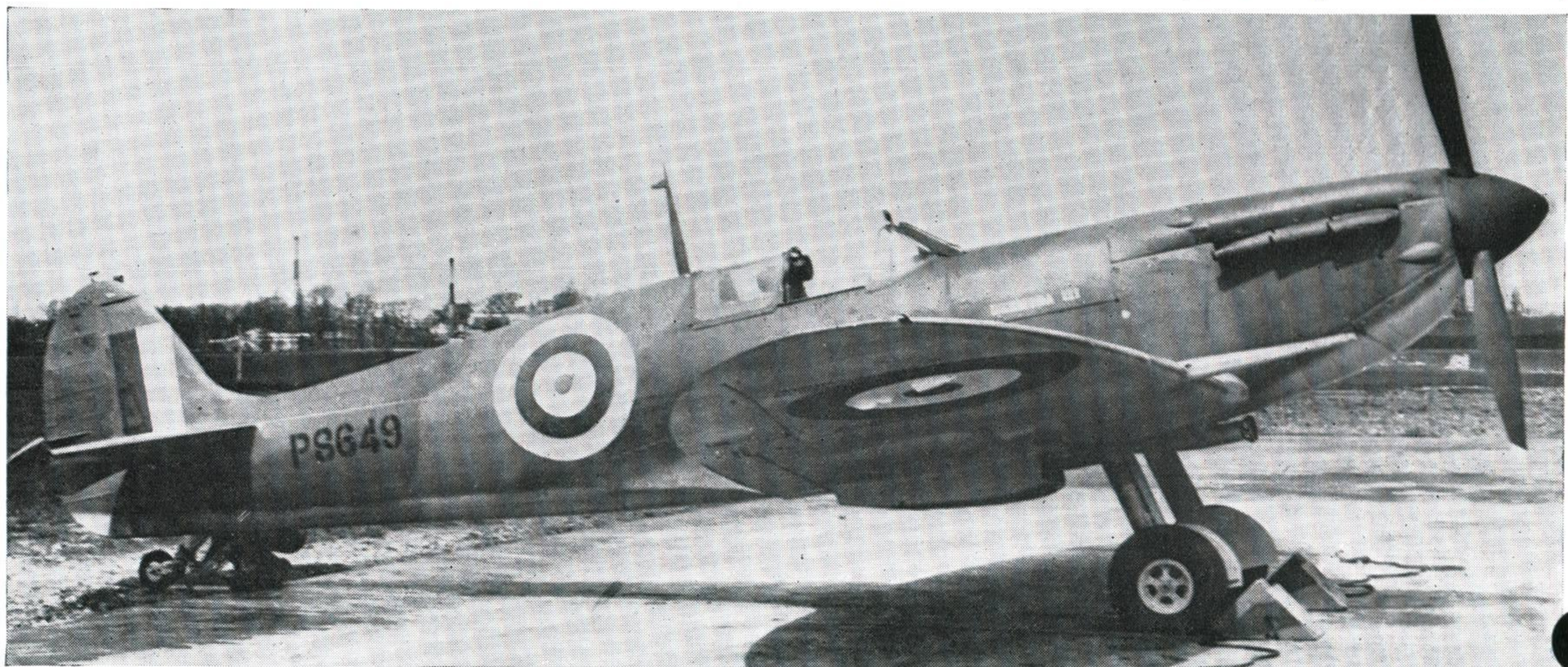
Spitfire IIA P9565 with a 40-gallon long-range fuel tank on the port wing (Type 343).

the port wing (Type 343), served with Nos. 66, 118 and 152 Squadrons.

Production of the Spitfire II totalled 920 aircraft—all within the "P" serial range—of which 750 were built as Mk. IIA, and 170 as Mk. IIBs. A few surplus or salvaged Merlin XII engines were fitted to Mk. I airframes, thereby converting them to Mk. IIs. Before production of the Mk. II began Merlin XIIs were tested in Mk. Is K9788 and K9830 which, in effect, became prototypes of the Mk. II.

During 1942 a service modification of the Spitfire II to meet a requirement in an air-sea-rescue rôle appeared as the Spitfire IIC. This version was fitted with a small rack for two smoke bombs under the port wing inboard of the oil cooler and two flare chutes in the fuselage just aft of the cockpit, housing a small dinghy and a metal food container. The designation "C" was adopted because the "C" or universal wing, although then in general use (on the Spitfire VC) had not been fitted to Mk. II Spitfires and "C" was the logical means of distinguishing it from the existing

Below: Spitfire IIB P8649 "Bermuda III" one of four Spitfire IIBs presented to the R.A.F. by the Bermuda War Fund.
(Photo: Imperial War Museum)



054 Prototype Spitfire in original and only colour scheme, Hendon New Type Park Number 2, Hendon 1936.

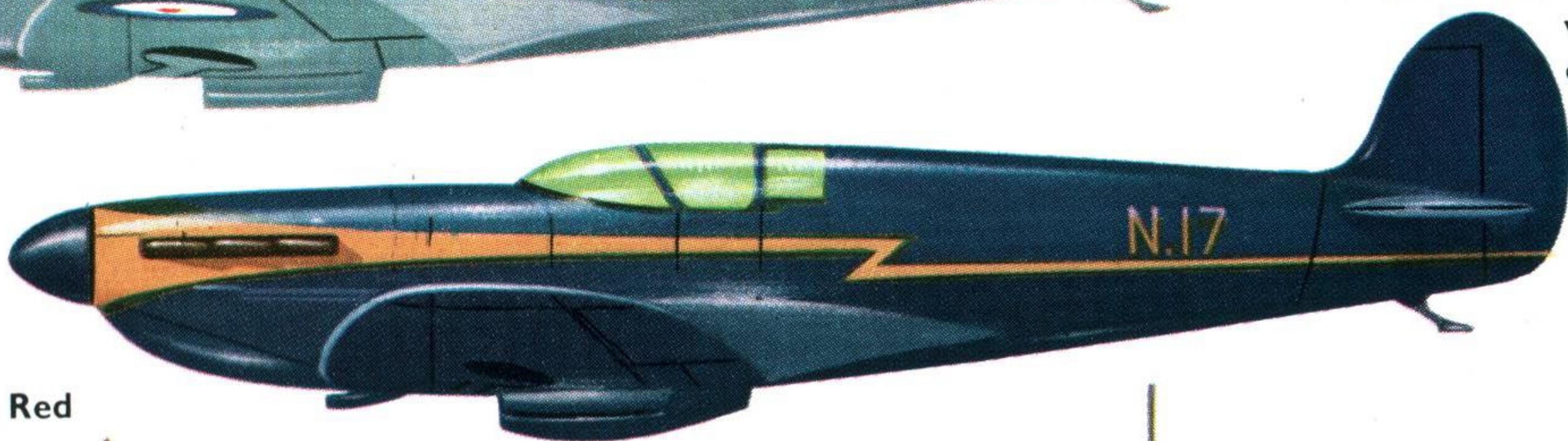


Spitfire Mk. I, K9834 modified as N.17 for attempt on the World's Speed Record powered by special Merlin III with + 27 lb. boost producing 2,160 h.p. at sea level. Subsequently rebuilt to Mk. II standard and camouflaged through which the gold stripe eventually appeared.

No. 19 Squadron, Red 'A' Flight, White 'B' Flight.



Spitfire Mk. I, No. 19 Squadron, Duxford, U.K., 1938. Note serial number under wings.



Spitfire Mk. I, No. 66 Squadron, Coltishall, U.K., 1939. Port undersurfaces black, stbd. side white or silver. Colour division was usually through the centre line of the fuselage though sometimes the wing only was black.



Spitfire Mk. I, No. 603 'City of Edinburgh' Squadron, R.Aux.A.F., Dyce, Hornchurch and Montrose during the Battle of Britain, 1940.



Spitfire Mk. I, No. 19 Squadron, Duxford, U.K., Battle of Britain, 1940.



Spitfire Mk. I, No. 610 'County of Chester' Squadron, R.Aux.A.F., Biggin Hill, U.K., Battle of Britain, 1940.



Spitfire Mk. II, No. 65 'East India' Squadron, Tangmere, U.K., 1941. Legend under cockpit reads East India Squadron.





P8131, a converted Spitfire IIA, redesignated IIC. No. 276 Squadron. (Photo: "The Aeroplane")

Mk. IIA and IIB versions with their "A" and "B" armament. Later, when rôle prefixes were introduced, Mk. IIC became A.S.R.II. About 50 Spitfire IIs were converted to IICs and the type served in the six A.S.R. squadrons controlled by Fighter Command, viz., Nos. 275, 276, 277, 278, 281 and 282.

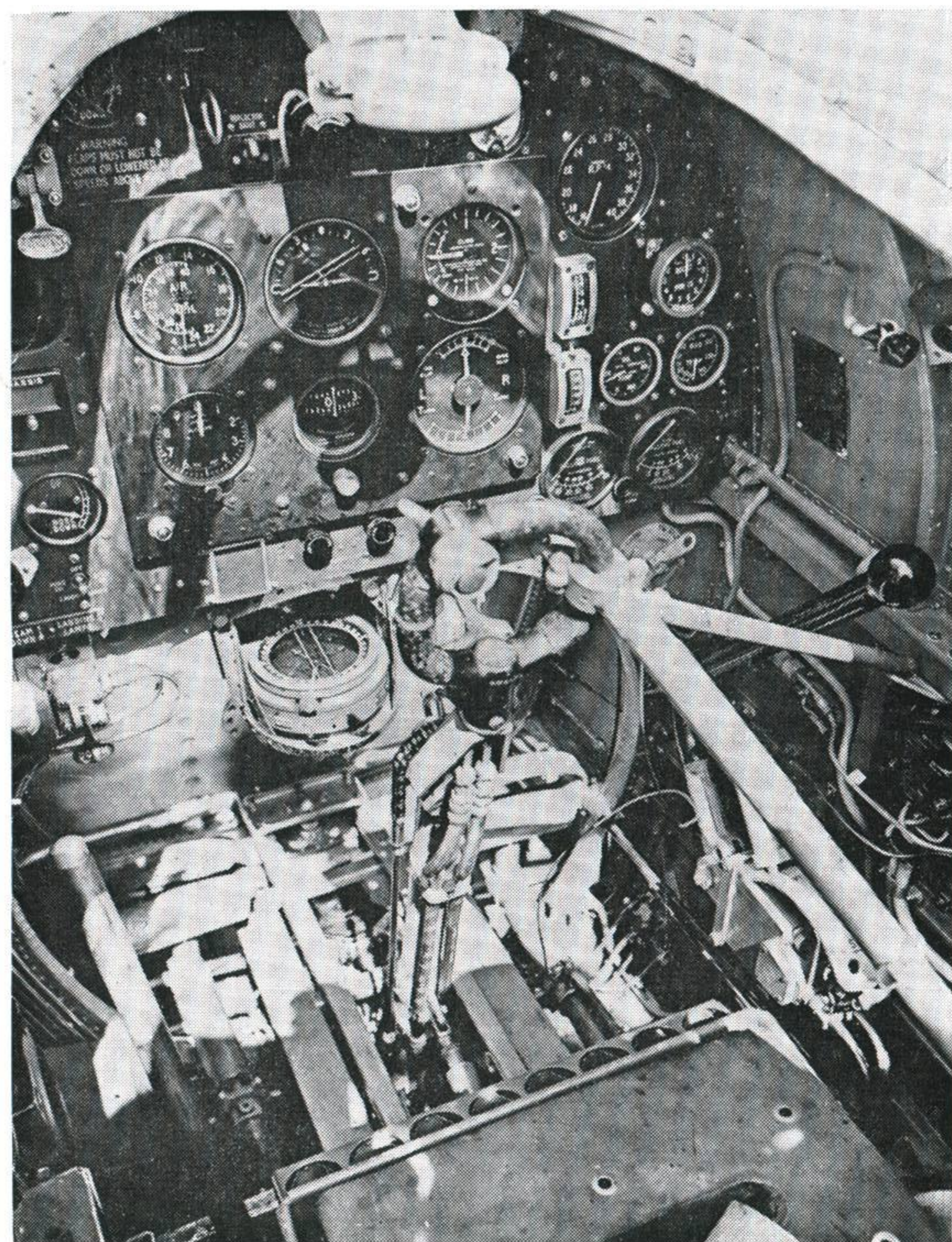
Not long after re-equipment of the squadrons of Fighter Command with Spitfire IIs had been completed, re-equipment with Mk. Vs began. Following their withdrawal from the squadrons, Mk. IIs continued to serve in various units chiefly at home and, at first, mainly in O.T.U.s. Late in the war Mk. IIs could be found in such units at the Central Gunnery School and Technical Training Command Communication Flight. Others were used by the Air Fighting Development Unit to form "Circuses" (i.e. instructional teams in air-fighting techniques) which were attached to various Groups of Bomber and Coastal Commands and also to 2nd T.A.F.

SPITFIRE HANDLING NOTES

In the air the Spitfire I, in comparison with other types of the period, was incredibly "light" in every way, as well as being exceptionally fast—so fast that, on a cross-country flight, the maps were, so to speak, left behind, the pilot arriving at a destination at least ten minutes before any mentally-calculated E.T.A. War-

Spitfire cockpit.

(Photo: Imperial War Museum)



time ferry and test pilot, Mr. H. A. Taylor, writing of the Spitfire under the nom-de-plume "Indicator" in *Flight* in 1946 recalled that early production models of the Spitfire I had no engine-driven hydraulic pump and the undercarriage was operated by means of a long hand pump on the right. "Not only had one to change hands in order to select 'up' after take-off," he wrote, "but while flying with the left hand, this pump had to be worked vigorously and, with no previous experience of the type's very sensitive elevator control, departure was made in a series of fore-and-aft over-corrective pitchings. Later on, pilots learned to be very ambidextrous and to be in good control of muscular reflexes, so that the inevitable 'hunt' could be reduced to an amount which, at least, did not give them away to any watchers on the ground." Taylor went on to explain that in the early marks the throttle damper was not very effective unless tightened with a pair of pliers, it being necessary sometimes to stop pumping the undercarriage while changing hands yet again in order to deal with "the sudden extraordinary silence as the ivory-handled throttle vibrated quietly back".

Another little difficulty which occurred with many of the early Spitfires concerned the way in which the undercarriage selector would occasionally jam irrevocably in the half-way position when selecting "down". For one reason or another the "up lock" pins had become immovable, and it was necessary to take the weight off the retracted legs if any further landing progress was to be made. Since, of course, the only way of doing this was to invert the aircraft, Spitfires might occasionally be seen on their backs during the circuit. An alternative method of freeing the selector was to push the nose down violently while, at the same time, giving the lever a sharp tug.

© P. J. R. Moyes, 1965.

SPECIFICATION

(Relates to Spitfire IA, figures in brackets relating to Mk.IIA).

Powerplant: One 1,030 (1,175)-h.p. Rolls-Royce Merlin III (XII) 12-cylinder 60° Vee liquid-cooled engine.

Dimensions: Span 36 ft. 10 in.; length (thrust line horizontal) 29 ft. 11 in.; height 8 ft. 10 in. (12 ft. 3 in. over airscrew disc); wing area (gross) 242 sq. ft.

Weight: Normal loaded 6,200 lb. (6,275 lb.).

Performance: Max. speed 362 m.p.h. (370 m.p.h.); rate of climb 2,530 ft./min. (2,600 ft./min.); combat range 395 mls.; ceiling 31,900 ft. (32,800 ft.).

Armament: Eight 0.303-in. Browning machine guns with 300 (350) r.p.g.

SPITFIRE SQUADRONS IN FIGHTER COMMAND ORDER OF BATTLE, 7th JULY 1940

No. 11 Group (H.Q. Uxbridge)

- 54 Sqn. Rochford.
- 64 Sqn. Kenley.
- 65 Sqn. Hornchurch.
- 74 Sqn. Hornchurch.
- 92 Sqn. Pembrey.
- 234 Sqn. St. Eval (1 section at Hullavington).
- 609 Sqn. Warmwell.
- 610 Sqn. Biggin Hill.

No. 12 Group (H.Q. Watnall)

- 19 Sqn. Duxford.
- 66 Sqn. Coltishall.
- 222 Sqn. (converting) Kirton-in-Lindsey.
- 266 Sqn. Digby.
- 611 Sqn. Digby.

No. 13 Group (H.Q. Newcastle)

- 41 Sqn. Catterick.
- 72 Sqn. Acklington.
- 152 Sqn. Acklington.
- 602 Sqn. Drem.
- 603 Sqn. Dyce ("B" Flt. det. to Montrose).
- 616 Sqn. Leconfield.

PROFILE

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SUPERMARINE SPITFIRE MK. IX



Aircraft Profile Check List

1 S.E.5A
2 Boeing P-12E
3 Focke-Wulf FW 190A
4 Hawker Hunter 6
5 Vickers Vimy
6 Bristol Bulldog
7 P-47D Thunderbolt
8 P-51D Mustang
9 Albatros DV
10 Gloster Gauntlet
11 Handley Page
Halifax III
12 Gloster Meteor 8
13 Sopwith Pup
14 Boeing P-26A
15 Heinkel He 111H
16 Fiat CR.42
17 SPAD S.XIII
18 Hawker Fury 1
19 Consolidated B-24
J Liberator
20 N. American F-86A
Sabre
21 Bristol F. 2b Fighter
22 Fiat CR 32
23 Messerschmitt Bf 110
24 Hawker Hurricane IIC
25 Fokker D.VII
26 de Havilland D.H.4
27 Boeing F4B-4
28 Macchi C.202
29 Junkers Ju 88A
30 N.American F-100
Super Sabre
31 Sopwith Camel
32 Westland Wapiti
33 Gloster Gamecock
34 Fairey Battle
35 Curtiss P-40
36 SAAB J-29
37 Curtiss JN-4
38 Fokker Monoplanes
39 Supermarine
S4-S6B
40 Messerschmitt
Bf 109E
41 Supermarine Spitfire
I & II
42 N.Am. FJ Fury
43 Pfalz D.III
44 Fairey III F
45 Curtiss Army Hawks
46 Nakajima Ki-43
47 Vought F4U-1 Corsair
48 D.H. Vampire 5 & 9
49 Nieuport 17
50 Sopwith Snipe
51 Gee Bee Racers
52 D.H. Mosquito I to IV
53 Grumman Wildcat
54 E.E. Canberra 1 to 4
55 Fokker D.R.I
56 Fairey Flycatcher
57 Hawker Hart
58 Handley Page
Hampden
59 B-25 Mitchell N.Am.
60 Douglas Skyraider
61 Ansaldo Scouts

62 de Havilland D.H.9
63 Fokker D.XXI
64 Macchi MC.200
65 Lancaster I
66 Vickers Valiant
67 Fokker D VIII
68 Thomas Morse
Scouts
69 Henschel Hs 129
70 Nakajima Ki-84
71 Hawker Seahawk
72 Vickers Viscount 700
73 Sopwith Triplane
74 Short 184
75 P.Z.L P-11
76 Junkers Ju 87A & B
77 Boeing B-17E & F
78 Gloster Meteor IV
79 Nieuport 28
80 Curtiss Hawk 75
81 Hawker Typhoon
82 Mitsubishi Ki-46
83 Boeing B-47
84 Short C-Class Boats
85 R.E.8
86 Schuckert DIII/IV
87 Fokker C.V
88 Ilyushin IL2
89 Savoia S.M.79
90 L.T.V. Crusader
91 de Havilland D.H.2
92 Grumman F 3F
93 Bristol Blenheim I
94 FW 190D/TA 152
95 Republic F-84F
96 Douglas DC-3
97 American D.H.4
98 Gloster Gladiator
99 Focke-Wulf FW 200
100 N. Am. P-51BIC
Mustang
101 Boeing B-29
102 Douglas A-4
Skyhawk
103 S.E.5
104 P.Z.L. P-23
105 Kawasaki Ki-45
106 Lockheed Lightning
P-38J-M
107 Grumman F8F
Bearcat
108 de Havilland Comet
1-4
109 Hanriot HD1
110 Fiat B.R.20
111 Hawker Hurricane I
112 Martin B-26B C
Marauder
113 Messerschmitt
Bf 109 G
114 E.E. Lightning 1
115 Gotha G.I-G.V
116 Curtiss Navy Hawks
117 Boulton Paul Defiant
118 Kawasaki Ki-61
119 Fiat G.91
120 Lockheed
Constellation
121 Sopwith 1½ Strutter

122 Polikarpov I-16
123 Reggiane RE 2000
124 Curtiss SB 2C-1 Helldiver
125 Vickers Wellington I & II
126 Hawker Sea Fury
127 Albatross DI-III
128 Curtiss Shrike
129 Mitsubishi A6M2 Zero
130 Messerschmitt Me 262
131 Lockheed
F-104G/CF-104
132 de Havilland Tiger Moth
133 B.E.2 2a & 2b
134 Fokker G-1
135 Dewoitine D.520
136 Curtiss P-40 Kittyhawk
137 Bristol Beaufighter
I & II
138 SAAB J-21
139 Bristol Scouts C & D
140 Hawker Audax
141 Nakajima B5N "Kate"
142 Short Stirling
143 Dassault Ouragan
144 de Havilland Rapide
145 de Havilland D.H.10
146 S. Marchetti S.M.81
147 M. Saulier M.S.406
148 Junkers Ju 88
Night Fighters
149 Lavochkin La 5 & 7
150 F4U-4 to F4U-7 Corsair
151 Aviatik D.1
152 Avia B.534
153 A.W. Whitley
154 Commonwealth
Wirraway
155 North American T-28
156 Ford Tri-Motor
157 Breguet 14
158 Ryan PT ST Series
159 Westland Lysander
160 Mitsubishi G3M "Nell"
161 Messerschmitt Me
210/410 Series
162 Avro Vulcan
163 Roland C II
164 Dornier Do 17E-Z
Series
165 Bell P-39 Airacobra
166 Supermarine Spitfire V
Series
167 Hawker Hunter
2 Seaters
168 Avro York
169 Sopwith Dolphin
170 P.Z.L. P-24
171 Douglas TBD Devastator
172 Mitsubishi Ki-21
173 Liore et Olivier LeO 45
174 de Havilland Hornet
175 Phoenix Scout
176 Fokker T.VIII
177 Junkers Ju 52 Series
178 Commonwealth
Boomerang
179 Gloster Javelin 1-6
180 Sud Caravelle 3 & 6
181 de Havilland D.H.5

182 Handley Page Heyford
183 Consolidated PBY
Catalina
184 Messerschmitt Bf 109F
185 Yak 9 Series
186 Canadair Sabres
187 Junkers Monoplanes
188 Fiat G.50
189 Short Sunderland
190 Mitsubishi A6M3
Zero-Sen
191 Westland Whirlwind
192 Boeing 707
193 Bristol M1 A-D
194 Curtiss SOC Seagull
195 Potez 63 Series
196 Douglas SBD
Dauntless
197 Hawker Tempest I-VI
198 Hawker P.1127 &
Kestrel
199 Pfalz D.XII
200 Martinsyde Elephant
201 Bloch 151 152
202 Douglas A-20 Series
(7a to Boston III)
203 Heinkel He 162
204 Lockheed P2V
Neptune
205 Boeing B-17G Flying
Fortress
206 Supermarine Spitfire
Mark IX variants
207 Messerschmitt Bf 110
Night Fighters
208 McDonnell/Douglas
F-4 Phantom variants
209 de Havilland Mosquito
Mark IV variants
210 Mitsubishi G4M "Betty"
and Ohka Bomb
211 Junkers Ju 87D variants
212 Fairey Swordfish
213 Kawanishi N.1K Shiden
"George"
214 Grumman TBF/Eastern
TBM Avenger
215 Arado Ar 234 Blitz

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The invasion of Southern France, D-Day plus 4 of "Operation Dragoon" on August 19, 1944, at the hastily-bulldozed vineyard forward landing strip at Ramatuelle. The first two R.A.F. fighters to call were Spitfires from the base at Calvi, N.W. Corsica, piloted by Group Capt. Duncan Smith in charge of No. 324 Wing and his "No. 2." Prince (then F/Lt.) Emmanuel Galitzine i/c No. 72 Squadron. Depicted is the latter's Castle Bromwich-built Spitfire L.F. Mk. IX C (MH763: RN-S). In accordance with prevailing Tactical Air Force instructions, both the duck-egg blue spinner and rear fuselage band have been darkened. Non-standard artistry includes the white outlining of the fuselage code letters and the unorthodox retention of the pre-war white spearhead device containing No. 72(F)'s squadron badge. Ultimately, Prince Galitzine flew no fewer than 11 different marks of Spitfire. (Photo: I.W.M.)

Supermarine Spitfire Mk. IX

PETER MOSS and LEN BACHELOR

JUST as the Vickers-Armstrong Supermarine Type 349 Spitfire Mark V (see Profile No. 166) was evolved as a "stop-gap" for the Mk. III, so too did the Mk. IX serve the same purpose for the Mk. VIII.

It was on September 27, 1941, that Royal Air Force pilots reported the presence of a new radial-engine fighter during a daylight sweep over German-occupied Northern France. The superior speed and ceiling of this new *Luftwaffe* fighter, known to be the Focke-Wulf FW 190A-1, made it an urgent priority for the British to produce quickly and in quantity a fighter equal to this new threat.

To meet this requirement, the Spitfire Mk. VIII was evolved from the Mk. VII. But as this variant was a complete redesign, production re-tooling would take time to accomplish. This factor was appreciated by the Air Staff planners and a decision was arrived at with urgency.

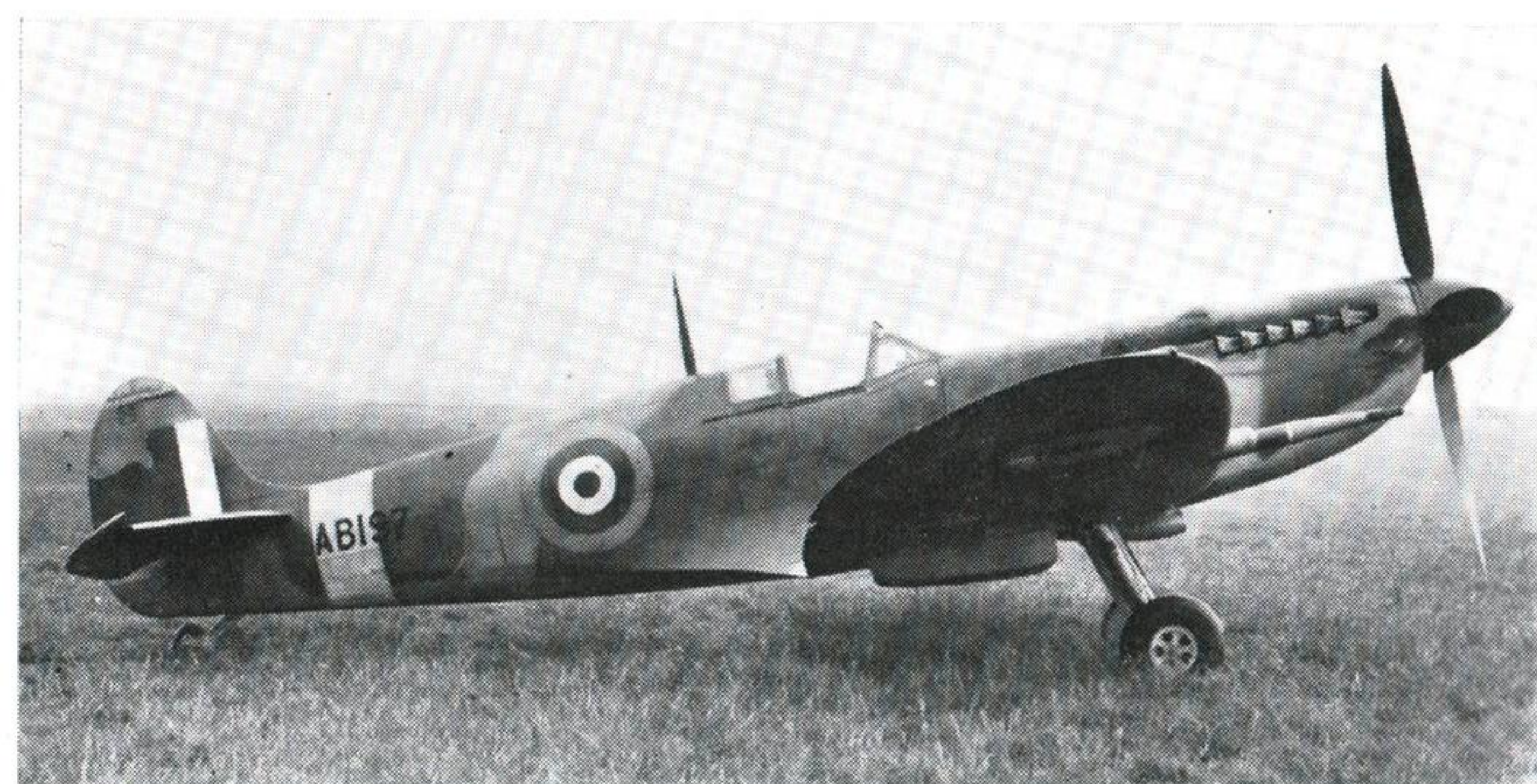
Cover picture: Superbly detailed underside view of a No. 1 Squadron, S.A.A.F. Spitfire Mk. IX, in 1947, revealing the attachment points for rocket projectiles and the bomb carriers. (Photo: S.A.A.F. via Ken Smy, Air-Britain)

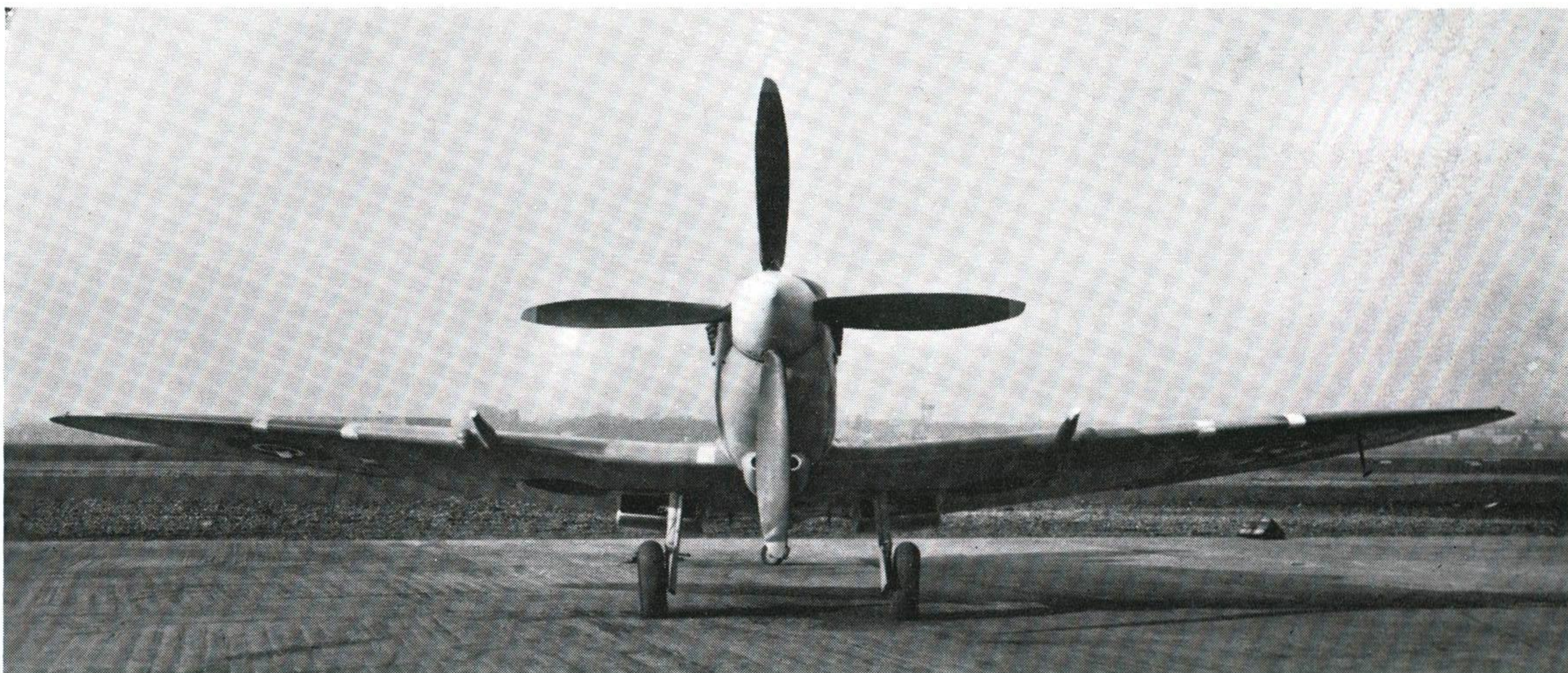
Left: The second of two definitive Mk. IX prototype conversions from Mk. V airframes by Rolls-Royce Ltd. in April 1941. AB197 was photographed at Boscombe Down in May 1942. Right: The experimental Mk. III Spitfire (W3297) with retractable tail wheel, modified to an interim Mk. IV; with Merlin 61, four-blade Rotol propeller and two radiators under the wings. Photo taken at the A. & A.E.E., Boscombe Down, Wiltshire, in October 1941. (Photos: I.W.M.)

Rolls-Royce Ltd., who designed and built the Spitfire's Merlin engine, was asked to convert two Spitfires to take the Merlin 60 (1,565 h.p.) and 61 (1,565 h.p.) as an experiment. Mk. III (R.A.F. serial number N3297) and Mk. I (R6700) airframes were selected and delivered to the Rolls-Royce test airfield at Hucknall, near Nottingham, in April 1941.

The Mk. III had its 1,390 h.p. Merlin XX removed and a Merlin 60 fitted and the Mk. V its Merlin 45 exchanged for the Merlin 61; both driving 4-blade propellers. Later the Mk. III also had the Merlin 61. In this form, the Mk. III—modified first flew on September 20, 1941; in October it was delivered to Boscombe Down, in Wiltshire, for Service evaluation trials.

Encouraged by the successful result of the Merlin 61 installation, the Air Staff ordered two Mk. V airframes (AB196 and AB197) to Hucknall and, with their fuselages strengthened to take the larger Merlin 61, they served as definitive prototypes. Officially known as the Mk. IX they had an additional radiator





Head-on view of an L.F. Mk. IX C, showing the two radiators under the wings and the in-board mounted cannon on the "C" wing, with stubs for two extra cannons. The "L.F." (Low Altitude Fighter) prefix referred to the mark of Merlin employed for best low-altitude performance and not to standard or "clipped" wing tips. (Photo: via Bruce Robertson)

under the port wing to house the intercooler and oil cooler. This extra radiator gave the Mk. IX a symmetrical appearance when viewed head-on, but it was not the first Spitfire variant to be so modified, having first appeared on the Mk. VII (that also featured the Merlin 61) and on the two interim models, N3297 and R6700.

The success of the Mk. V conversions resulted in Rolls-Royce receiving a contract for quantity conversions. The first (AB505) was delivered straight to the R.A.F. Air Fighting Development Unit at Duxford, south of Cambridge, on April 26, 1942, for 12 days of intensive evaluation. By the time retrofitment work ceased at Hucknall in March 1944, a grand total of 284 conversions had been made (see production list on page 36).

In addition to the conversions, existing contracts for Mk. V Spitfires were modified to include the completion of certain airframes to Mk. IX standard, at the Woolston (Southampton) and Castle Bromwich (Birmingham) factories, as Merlin 61s became available.

VARIATIONS ON A VARIANT

The armament carried by the Spitfire Mk. IX varied but consisted mainly of two 20-mm. British Hispano cannon and four 0.303-in. ("British calibre") Browning

machine-guns (Mk. IXc), or two 20-mm. cannon and two 0.50-in. ("U.S. caliber") Browning machine-guns (Mk. IXe). The early production variant (Mk. IXe) had provision for only two 20-mm. cannon and four 0.303-in. machine-guns, whereas the "c" and "e" wing had provision for two extra cannon in place of machine-guns; they also had attachment points for wing-mounted bomb racks. The "A" wing was not used—this being eight 0.303-in. Brownings.

The Mk. IX was flown in a variety of rôles and, from 1942 onwards, the mark number was prefixed by a letter or letters to denote the primary rôle. The following applied to Spitfire IXs: **F.**—Fighter; **L.F.**—Low Altitude Fighter; and **H.F.**—High Altitude Fighter. In later years, Mark IXs also played limited rôles as: **F.B.**—Fighter Bomber; **F.R.**—Fighter Reconnaissance; **T.T.**—Target Towing; and **MET**—Meteorological.

The F, L.F., and H.F. rôles depended upon the altitude rating of the Merlin fitted (see data section) and did not affect the wing span length which could be "clipped" in the F. and L.F. rôles.

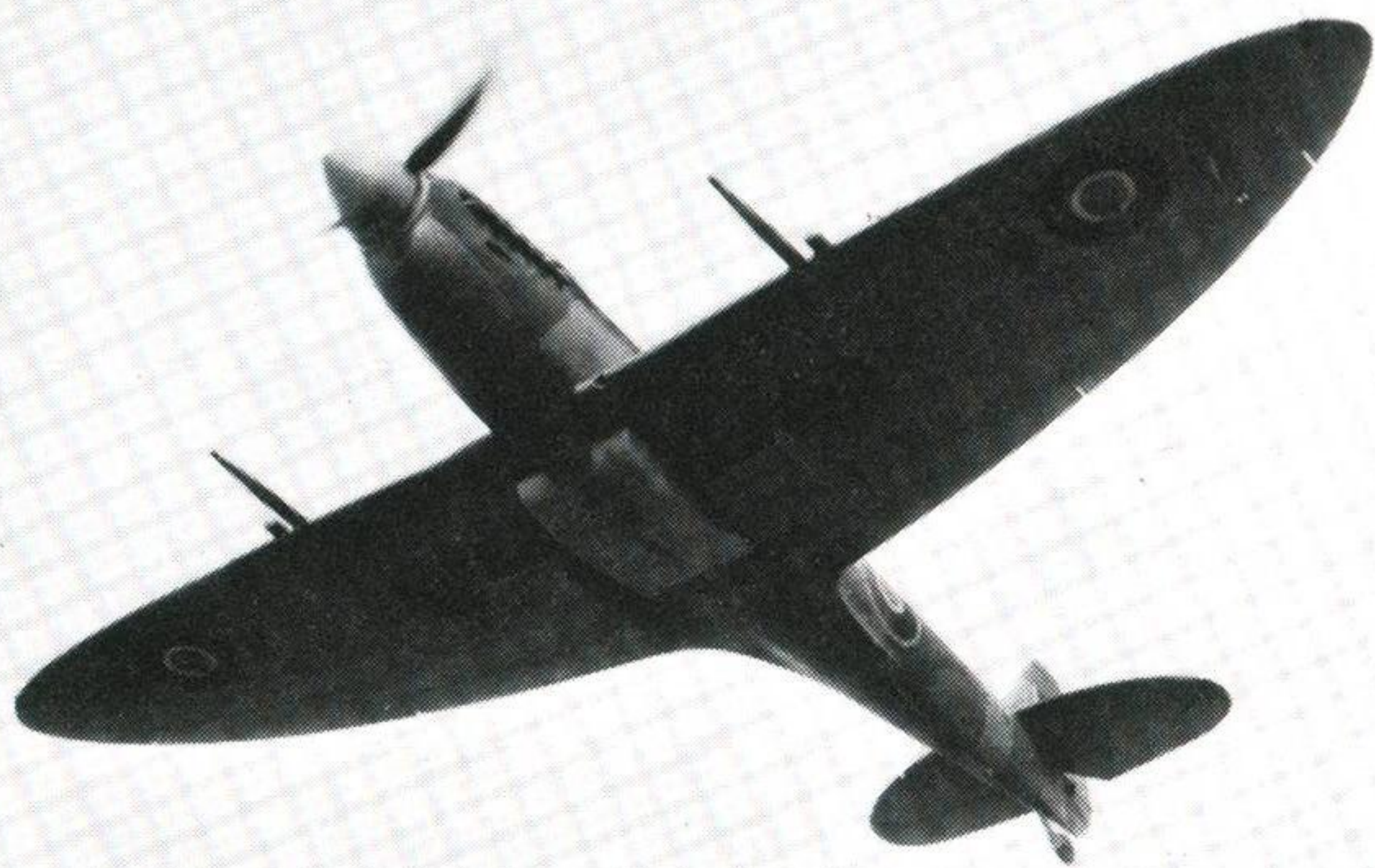
Early Mk. IX production Spitfires retained the original rounded fin and rudder, but in late-series production, a broad chord and pointed tip rudder was

Close-up of the armament arrangement in a "C" wing. Aircraft is BS538, an F. Mk. IX C, of No. 341 (Free French) Squadron, coded NL-B. Note the Cross of Lorraine insigne near cockpit door. (Photo: I.W.M.)



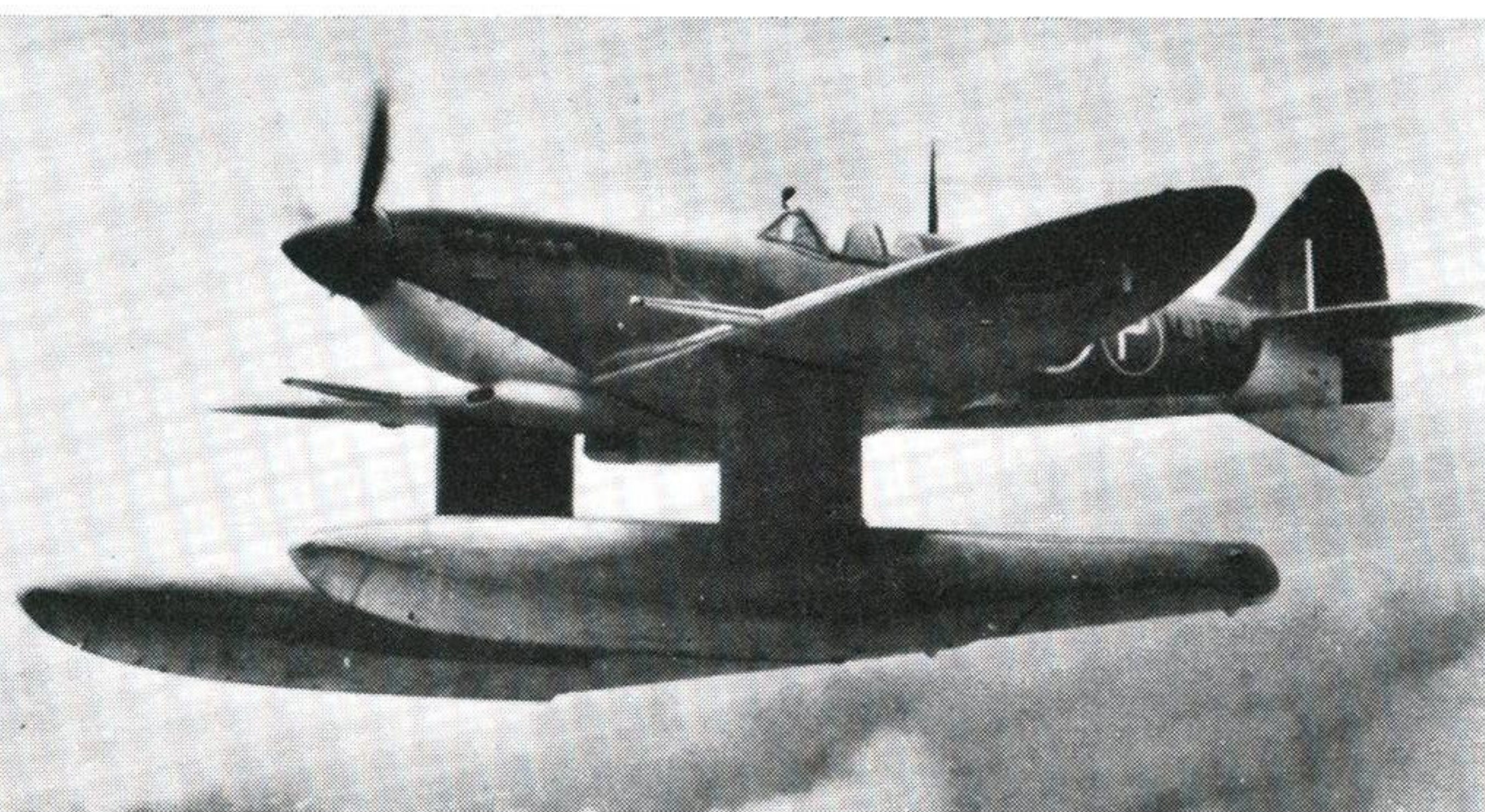
Spitfire Mk. IX Es awaiting collection at the Castle Bromwich factory in 1944. Aircraft in the front row include (right to left): NH432, NH311, NH419, NH45 and NH425. Some cowlings, wing fillets, ailerons and tailplanes require final camouflage. (Photo: via Bruce Robertson)





One of the four Mk. IX conversions with incorrectly painted serial identity—BF274. This Spitfire was sold to the Royal Netherlands Air Force as H-68 on March 23, 1948.

(Photo: via Bruce Robertson)



The experimental floatplane Mk. IX B (MJ892) on a flight from Hamble in 1943. Note revised tail unit.

(Photo: via Bruce Robertson)

introduced and some early models were also converted. The rear-view (shallower) fuselage and "tear-drop" cockpit hood was introduced after a favourable report from the Air Fighting Development Unit at Wittering, on a Mk. VIII so modified in August 1943.

The Spitfire's range to cope with increasing penetration of Occupied Europe was a continual problem. Although a series of jettisonable, flush fitting, auxiliary drop-tanks became standard, they were not entirely satisfactory and experimentation continued. During evaluation it was found that the "slipper" tank did not always drop away cleanly, and either struck the tail-plane or flapped in the slip-stream. A solution was

S/Ldr. G. R. S. McKay's Spitfire F. Mk. IX E (NH346) while he was C.O. of No. 87 Squadron in Italy 1944-45.

(Photo: G. R. S. McKay)



found by allowing the tank, on release, to slide back to stops so that the "slipper" leading-edge would drop to release the suction and allow gravity to do the rest. Even so, R.A.F. fighter squadrons experienced mishaps; No. 65 Squadron, for example, was not impressed with auxiliary tanks for during take-off they could drop off. This happened to one of their Mk. IXs (MH358) when its tank became dislodged during take-off, was up-ended and became wedged between the ground and the fuselage, causing considerable damage to the Spitfire.

Other difficulties were experienced with drop-tanks. On a number of occasions accidents occurred as the result of engine fuel starvation following failure by the pilot to switch over from wing tanks.

Sgt/Plt Dickerson of No. 64 Squadron had switching trouble while flying his Mk. IX (BR605) on a sortie during August 1, 1942. He crashed into the sea but was rescued with only minor injuries. Earlier that day four Mk. IXs from the same squadron had returned to base because of similar trouble.

The procedure laid down was for take-off to be on main wing tanks to 2,000 ft. when, if carrying an auxiliary tank, the pilot would switch over to the drop-tank. The 2,000 ft. height limit was necessary as the Stromberg carburettor fitted was not gravity-fed, as was the SU type fitted to other marks, and required priming by hand pump that took some five laborious seconds to carry out. Another difficulty was that the auxiliary tank did not have a gauge to show the state of fuel consumption.

Other experiments were carried out: On EN314 with a streamlined, bomb-shaped tank of some 200 Imperial gallons; while, in the U.S.A., MK210 had two wing mounted drop-tanks from a North American P-51 Mustang. Neither installation was found satisfactory enough for production purposes and a final choice was made on a 50 Imp. gallon cigar-shaped tank slung under the fuselage and used for long-range bomber escort duties from 1943.

For Spitfires alone, more than 300,000 drop-tanks of varying shape and capacity were produced.

The internal fuel capacity of the Spitfire was increased with larger forward (nose) fuel tanks to hold 95 Imp. gallons, by two 18 gallon Mareng fabric cells in the wings, and by a 72-gallon tank behind the pilot's cockpit. The first Spitfire to carry the rear tank was a Mk. IX (ML186) in which Supermarine Chief Test Pilot Jeffrey Quill flew from High Post (near Boscombe Down) to Scotland and back non-stop in 1942.

At Wright Field, Ohio (now Wright-Patterson Air Force Base, a major Research & Development Centre) MK210 was modified to take 500 gallons of fuel for a non-stop flight across the Atlantic from Newfoundland to Northern Ireland. This became the longest Spitfire flight on record. To accommodate such a large quantity of fuel, the aircraft had to be drastically stripped of military equipment.

A modification that is known to have been carried on at least one Mk. IX (MJ197) was the fitting of an oblique camera behind the pilot's cockpit. This made it an F.R. Mk. IX, but as the modification was unofficial it was not recognised as such.

The target-towing Mk. IX was also a rarity and included PT753 (coded 7B-G) of No. 595 Squadron. A

variation of the T.T. rôle was that of NH403, used by the Royal Aircraft Establishment, South Farnborough, Hampshire, to tow the Me 163 (VF241) in 1945.

The two-seat trainer variant was not used by the R.A.F., but surplus Mk. IXs were converted from 1946 onwards by Supermarine at their factory at South Marston, near Swindon (Wiltshire), to Type 509 configuration for export. Conversion to two-seat layout involved a second cockpit raised above and behind the front cockpit which was moved forward 13½ inches.

SPITFIRE XVI

No account of Mk. IX variants would be complete without some mention of the Mark XVI. To boost production of the Spitfire IX, a decision was reached in 1943 to include one of the Merlin 61-series engines in the production plans of the Aircraft Engine Division of the Packard Motor Car Company, Detroit, Michigan. Chosen for this purpose was the low-rated Merlin 66 (1,705 h.p.) which was produced by Packard as the Merlin 266.

Exported to the U.K. from 1944 onwards, the engines were installed in Mk. IX airframes, thereby officially incurring a change in mark number to XVI—a distinction made because the U.S.-built engines were to metric measurements and therefore differed from the Merlin 66.

Initially, both Mark IXs and XVIs were built simultaneously on a mixed production line at the Castle Bromwich factory. There is no external feature to distinguish the two variants and only the Service (R.A.F.) serials can provide positive identification*.

The Mark XVI was built as the C and E sub-series (according to the wing armament) and in the L.F. rôle. The majority had the “clipped” wing of 32 ft. 2 in. and, in late production, the rear fuselage was lowered for the “teardrop” or “bubble” cockpit hood, introduced as standard on the Mk. XVIe.

Major experiments were conducted with the Mk. XVI in connection with rocket projectiles (R.P.s) and zero-length, Mk. VIII rocket launchers. Various combinations were tried, with up to four R.P.s with 25-lb. or 60-lb. warheads beneath each wing, in both single and two-tier arrangements.

THE Mk. IX IN ACTION

The arrival of the Spitfire IXs to R.A.F. fighter squadrons operating outclassed Mk. Vs came as a tonic to dissatisfied pilots. No. 43 Squadron, serving in Sicily, had to wait until the late summer of 1943 before six Mk. IXs were taken on charge in mid-August. No. 43's enthusiasm is reflected in this comment by J. Beedle, the Squadron's historian:

“The arrival of six Mk. IX Spitfires . . . was greeted enthusiastically by the pilots and not without reason, for gleeful entries in log books like—‘reached 39,000 ft.’; ‘aerobatic at 32,000 ft.’—were not to be disregarded lightly in the pre-jet era. Henceforward, the usual Squadron formation consisted of two sections of four Mk. Vs with a top cover of four Mk. IXs. The increased performance of the Mk. IX came none too soon, for the tropical

*See Spitfire Mks. IX and XVI production lists on page 36.



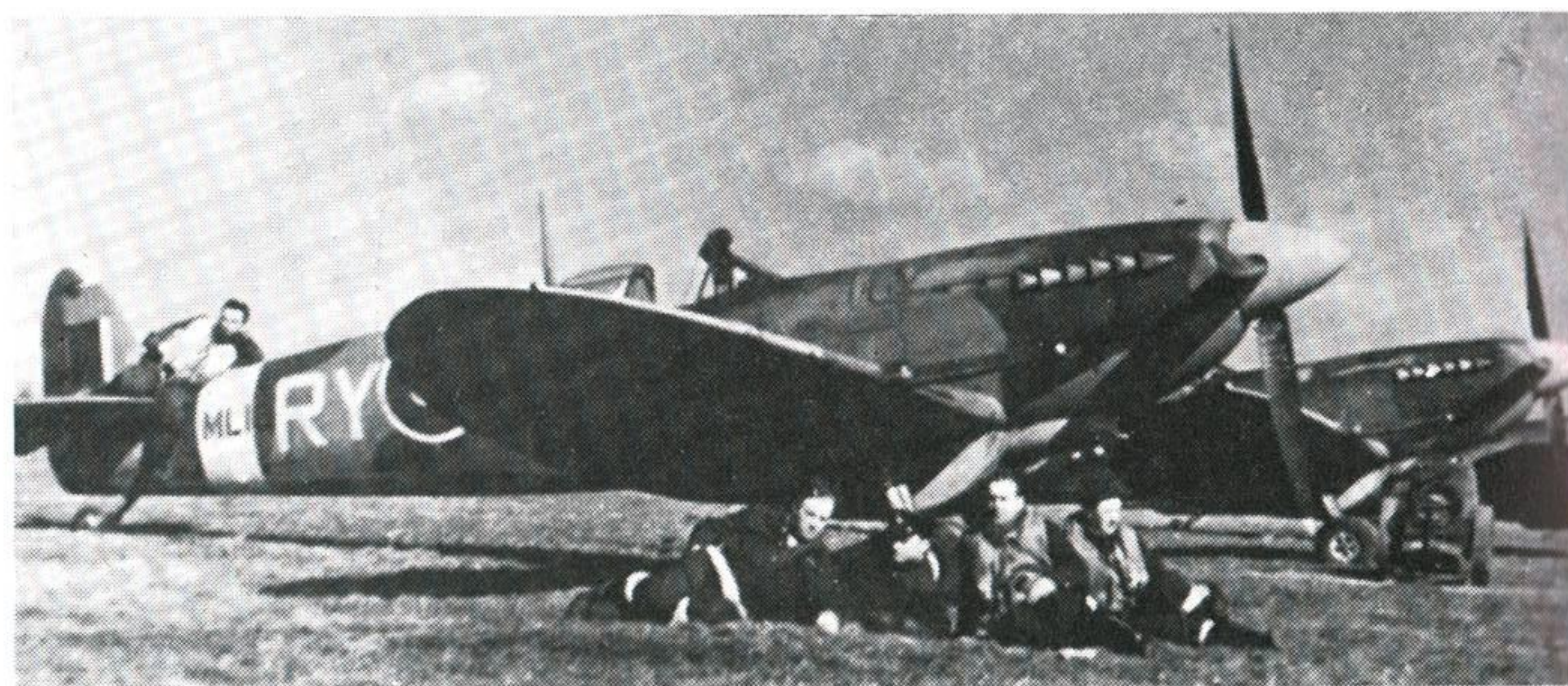
Formation of H.F. Mk. IX E Spitfires of No. 124 Squadron from Hutton Cranswick on June 20, 1945. The broad chord fin and rudder that featured some late production Mk. IXs. The first three aircraft are: ON-B (PV303), ON-C (SM515) and ON-T (RR252). (Photo: B. R. Murphy)

Mk. V had long been outspeeded and outclassed by Me 109 and FW 190 alike. . . .”

The first R.A.F. squadron to receive the Mk. IX was No. 64 at Hornchurch, Essex. Re-equipment began on July 6/7, 1942 and by the 12th they had 13 on strength. Formation flying was first tried on the 19th and the Squadron became operational on the 28th.

This event was celebrated by taking part in a Rodeo* along with Nos. 81, 122 and 154 Squadrons, but there was no contact with the enemy that day and No. 64 had to wait until July 30 before F/Lt. Kingaby (flying BS105) destroyed their first FW 190 during an attack on nine 190s. Later that same day, while on an evening Ramrod*, the Squadron successfully bounced

*Rodeo was a fighter sweep over enemy-held territory: Ramrod was target elimination by fighter-protected bombers.



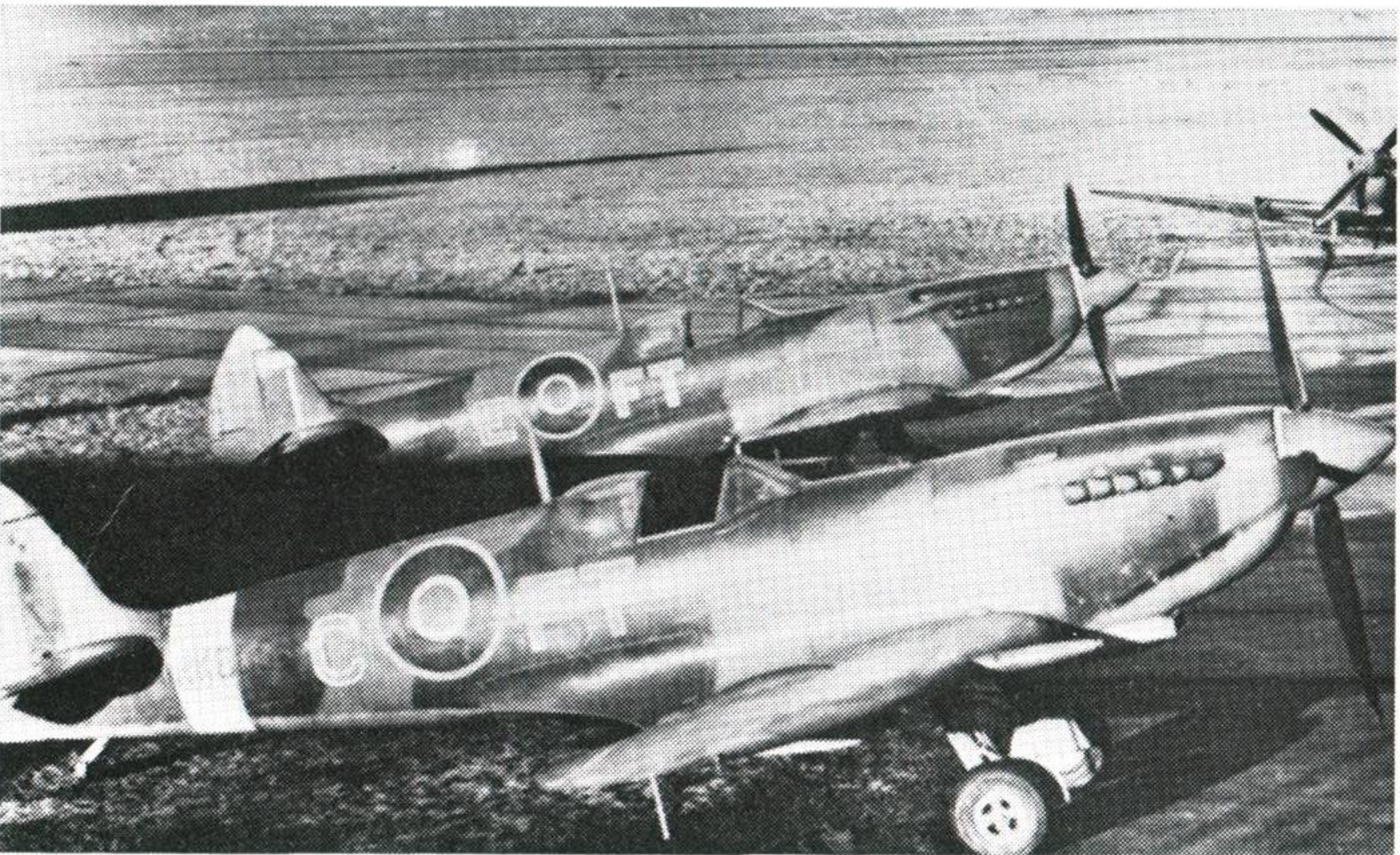
Czech pilots of No. 313 Squadron awaiting and relaxing before a sweep over France in preparation for D-Day 1944. Note 90-gallon drop tanks. (Photo: K. Zokhar)

A Spitfire Mk. IX of No. 313 Squadron with broad chord fin and rudder and 90-gallon drop tank, flying above cloud base in 1944. (Photo: K. Zokhar)





Spitfire Mk. IXCs of No. 349 (Belgian) Squadron on a snow-covered airfield during the winter of 1943-44. (Photo: I.W.M.)



Two 2nd T.A.F. Mk. IXE Spitfires of "A" Flight, No. 43 Squadron, at Zeltweg, Austria, in 1946. Note Squadron marking on the fin of C-FT (RK855), while only a blank space appears on E-FT (TB546) as it was a "new" aircraft from No. 93 Squadron. (Photo: 43 Squadron Association)

The experimental Spitfire Mk. IXC (MK210) at Wright Field, U.S.A., between May and June 1944, showing the underwing carriers for tests on auxiliary drop-tanks to improve range. (Photo: via E. N. Hooten)



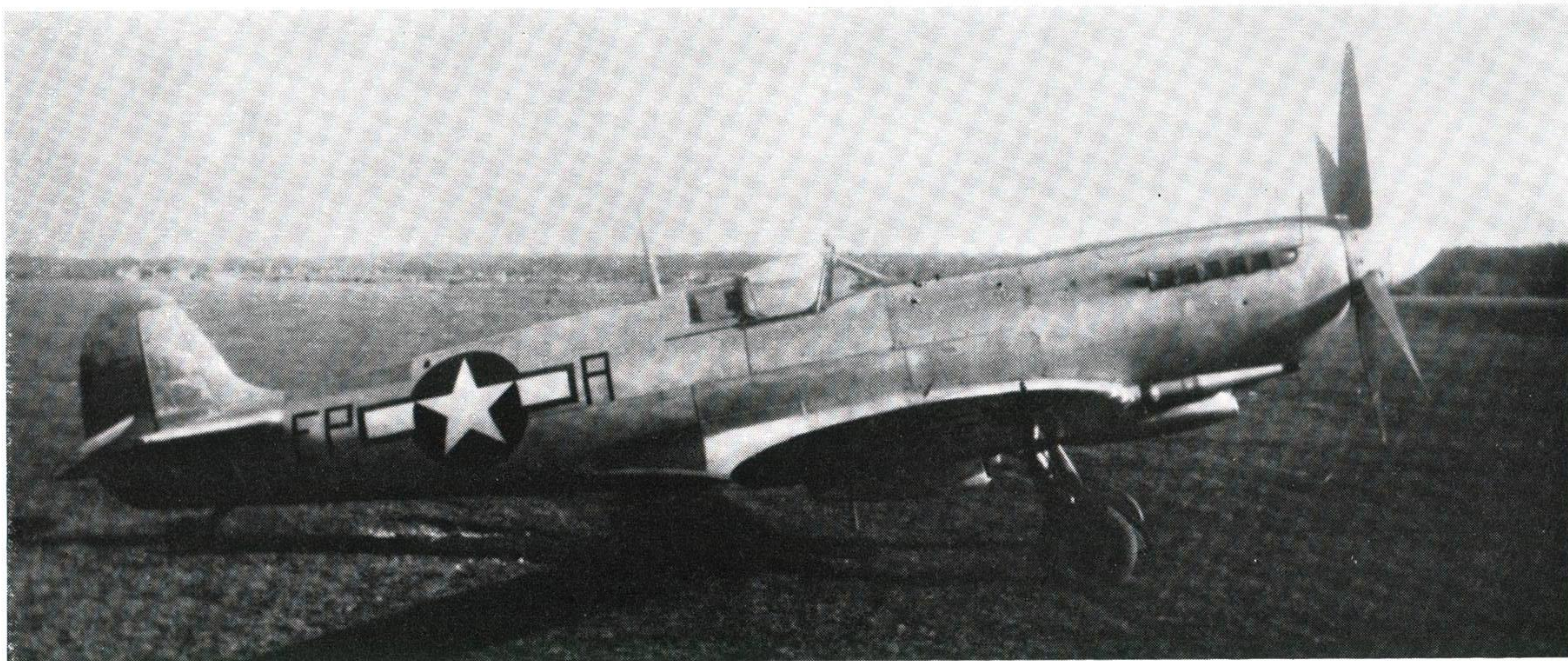
15 FW 190s—destroying three and damaging another. Then, on the way home, they bagged a fourth.

No. 92 Squadron was serving in the Middle East when it began to re-equip with Mk. IXs in 1943. S/Ldr. Neville Duke recalls, in his book *Test Pilot*, that when the Squadron was only partially re-equipped in July, four of their Mk. IXs acted as top cover to eight Mk. Vs from No. 145 Squadron. After attacking enemy transport aircraft they were jumped by FW 190s and Bf 109s. He writes:

"Just as I was about to attack another Savoia, I glanced back and found an FW 190 on my tail. And then suddenly the air seemed to be filled with Focke-Wulfs . . . with the engine flat out I flew low over the sea . . . turning, dodging, gaining a bit of confidence when I found that my Spit IX could turn inside the Focke-Wulf, nearly blacking-out sometimes with high G. Finally, in desperation and to get more height to fight, I put the aircraft into a steep climb and after what seemed a lifetime found myself alone again."

As the then commander of the Biggin Hill (Bromley, Kent) Wing, Group Captain Alan C. Deere, D.S.O., O.B.E., A.F.C., has since recounted in his book, *Nine Lives*:

"I was now all set to renew my acquaintance with the formidable Focke-Wulf, but this time I was better equipped. The Biggin Hill squadrons were using the Spitfire IXB (Merlin 66) a mark of Spitfire markedly superior in performance to the FW 190 below 27,000 ft. Unlike the Spitfire IXA, with which all other Spitfire IX Wings in the Group were equipped, the IXB's supercharger came in at a lower altitude and the aircraft attained its best performance at 21,000 ft. or at roughly the same altitude as the FW 190. At this height it was



This particular Spitfire Mk. IXC was obtained by Lt.-Col. E. P. Allen, Assistant A-3, XIX T.A.C., who traded in his P-51 Mustang to the British in France during 1944. (Photo: W. T. Larkins)

approximately 30 m.p.h. faster, was better in the climb and vastly more manoeuvrable. As an all round fighter the Spitfire IXB was supreme, and undoubtedly the best mark of Spitfire produced...

The Biggin Hill Wing was considered the *élite* of R.A.F. Fighter Command and were fortunate to have L.F. Mk. IXCs (*not IXBs—Authors*). With the menace of the FW 190 awaiting them on the other side of the English Channel, they now felt confident to meet it.

But there was a staggering blow awaiting No. 133 (Eagle) Squadron, of Biggin Hill, on September 26, 1942 over Brest when 11 of their new Mk. IXs were lost. This calamity removed the Spitfire IX from the Secret List, and when the Squadron re-formed it was equipped with Mk. VBs.*

When the Wing claimed its 1,000th German aircraft destroyed on May 25, 1943, there followed a

*The Spitfires were part of the fighter cover for a U.S.A.A.F. 97th Bomb Group (B-17 Flying Fortresses) mission against Morlaix airfield (near the Channel port in Finistere). Exeter Control sent the Spitfires hotfoot after the 97th BG who had left the rendezvous too early. The target was hidden by cloud, the bombers got lost and the Spitfires were carried 100 miles out into the Bay of Biscay "riding on a 200 m.p.h. jetstream" tail wind. When, eventually, all broke cloud they were over Brest Harbour. The 97th BG immediately headed for home but the luckless Spitfires had no fuel reserves. Ten of No. 133 Squadron's Mark IXs decorated the Brittany peninsula while a more fortunate eleventh managed to make the Cornish coastline and "glided ashore."

Spitfire Mk. IXC, FN-C (PT934) of No. 331 Squadron undergoing maintenance at Kjevik AFB, Norway, circa 1945. (Photo: Audun Sjurseike)



memorable party at Grosvenor House, in London's Park Lane, W.1, with three bands providing music, a free bar, and exotic table dressing that included three large lobsters labelled *Hitler*, *Göring* and *Mussolini*.

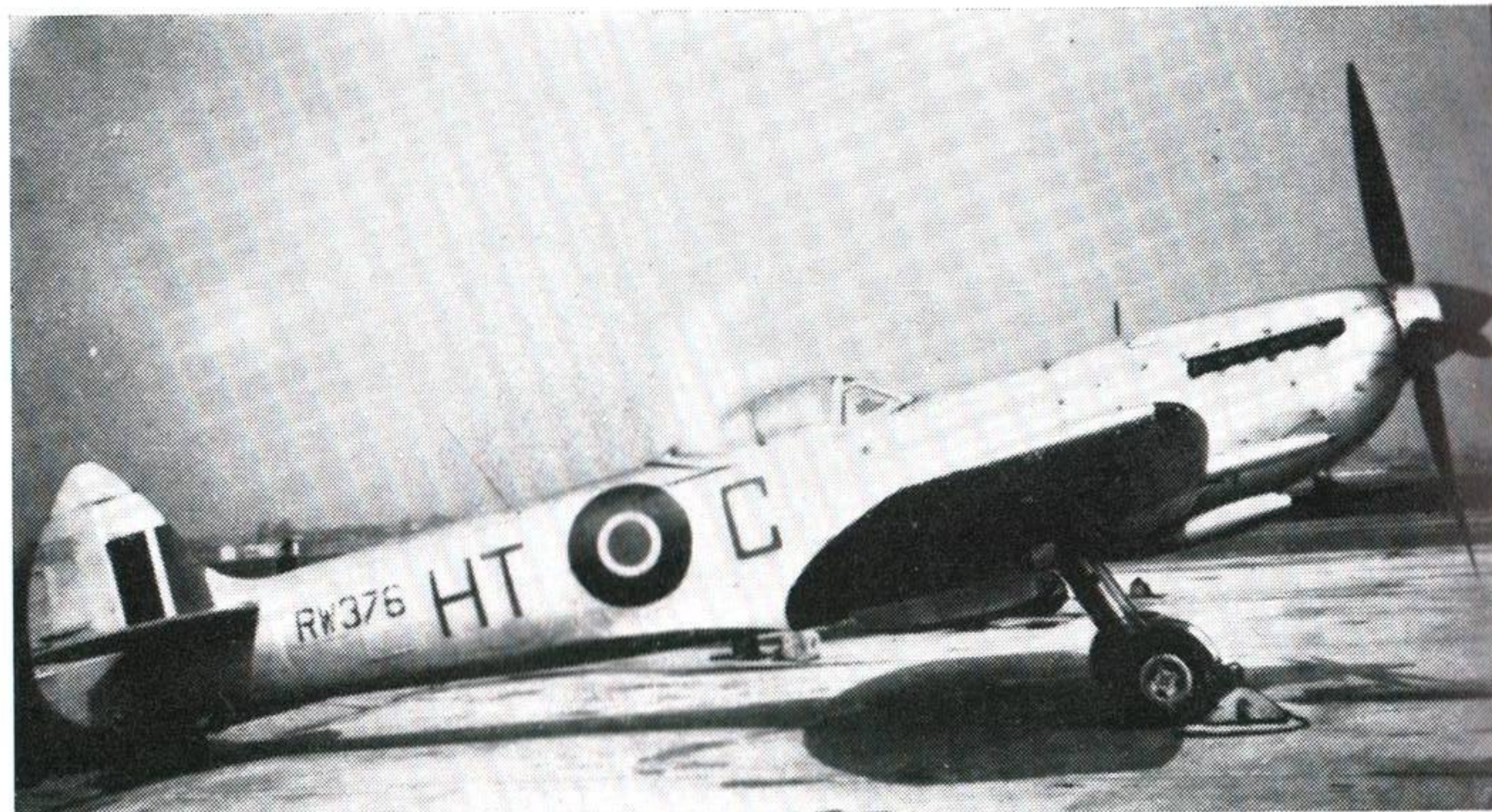
After Germany's defeat in North Africa, the Allies invaded Sicily on July 10, 1943. The first fighters to land on Sicilian soil were the Spitfire Mk. Vs and IXs of No. 92 Squadron, at Pachino on the 14th.

On September 3, the British Eighth Army crossed the Straits of Messina and, by July 1944, they were through Rimini and advancing to Ravenna on the Adriatic coast. No. 601 Squadron took part in the all-out assault on road and rail bridges. One pilot, who flew a Mk. IXc (MK551, coded UF-T) on July 26, recorded in his log book:

"Sortie 1. Bombing railway bridge at Ravenna (four aircraft)—two hits on railway. No flak over target, but some on way home. **Sortie 2.** Bombing road/railway south of Ravenna (four aircraft)—two near misses on bridge. One (bomb) hang-up. No flak. **Sortie 3.** Bombing 1st Parachute Division H.Q., S.E. of Florence, also strafed it (eight aircraft). Direct hits on building, six other bombs in area. Hits all over building with cannon fire. Heavy, medium and light flak. No losses."

An example of the Spitfire Mk. XVI that closely resembled the Mk. IX in its final form. HT-C (RW376) was attached to No. 601 (County of London) Squadron in 1946.

(Photo: via P. W. Moss)





One of the 76 Spitfire IXs that were transferred to the Czech Air Force in 1946. This Spitfire (A-717) was used by the Military Pilot School.
(Photo: via Bruce Robertson)

In Europe, the Allies were preparing to invade. Softening-up daylight assaults from the air were carried out by squadrons of the Allied Expeditionary Air Force (A.E.A.F.) throughout May 1944. Characteristic of the Spitfire's rôle at this time is a fragment from the operational history of one particular Spitfire (MK356), a Canadian squadron Mk. IX that survived World War 2 and is still extant. MK356 served with No. 443 Squadron, R.C.A.F., during the period March 11 to August 6, 1944 and the following sorties were made in May. The hours quoted are for take-off:

"May 5—Sweep into Belgium 06.55 hrs. led by Wg. Cdr. J. E. Johnson. Four FW 190s claimed as destroyed during the sweep. **May 7**—Close escort to thirty B-25s 19.05 hrs, bombing Cambrai area. **May 10**—Escort to Bostons and Mitchells 09.00 hrs., bombing near Charleroi. **May 13**—Dive-bombing bridge north of Cleres 11.15 hrs. **May 23**—Sweep into Paris area 07.00 hrs. **May 24**—Dive-bombing huts at Bailley-en-Riviere 11.25 hrs. **May 25**—Dive-bombing marshalling yards at Mons with 500-lb. bombs 11.25 hrs. **May 27**—Dive-bombing Noball* target in Abbeville area

*Noball was low-level attack on V-I flying bomb and V-2 rocket sites, storage depots and manufacturing centres.

An example of an instructional Spitfire IX (6237M) with its original serial (ML171) still under the wing.



One of the Mk. IXs used by the E.C.F.S. Hullavington was MJ216 coded FCW-F.
(Photo: J. D. R. Rawlings)

11.15 hrs. **May 28**—Sweep over Cambrai to Denain area 11.30 hrs: Sweep to Creil in Paris area 15.45 hrs."

With the preparations for D-Day, the Spitfire IX squadrons—in common with all aircraft of the A.E.A.F.—had been liberally decorated with black and white stripes around the fuselage and wings by dawn on June 4. This marking was for instant Allied recognition that the aircraft was "friendly" to trigger-happy troops and airmen alike.

On June 6 the invasion of Europe took place. Nine Spitfire squadrons provided the initial cover as the first troops landed in the early hours of that historic morning. The first Spitfire Mk. IX (MJ339) to land in Northern France did so inadvertently when P/O D. L. Kidd of No. 602 Squadron was forced to make a wheels-up belly landing in the restricted bridgehead area because of engine failure.

By June 10 No. 144 Wing, comprising Nos. 441, 442 and 447 Squadrons, R.C.A.F., was operating from the lodgement area. Three weeks after D-Day, 30 squadrons were based in France. But an unforeseen crisis arose when the limestone dust of the temporary landing grounds began to clog the Merlin's air induction system. The Spitfires had to be quickly fitted with tropical Vokes filters; and, at Hucknall, Rolls-Royce carried out further air filtration tests with a Mk. IX (MA357).

The menace of the V-1 pilotless jet-propelled flying bomb (oddly nicknamed *Doodle-bug*) was realised on June 13. In nine days over 2,000 were launched against London and the scale of attack was to be increased.

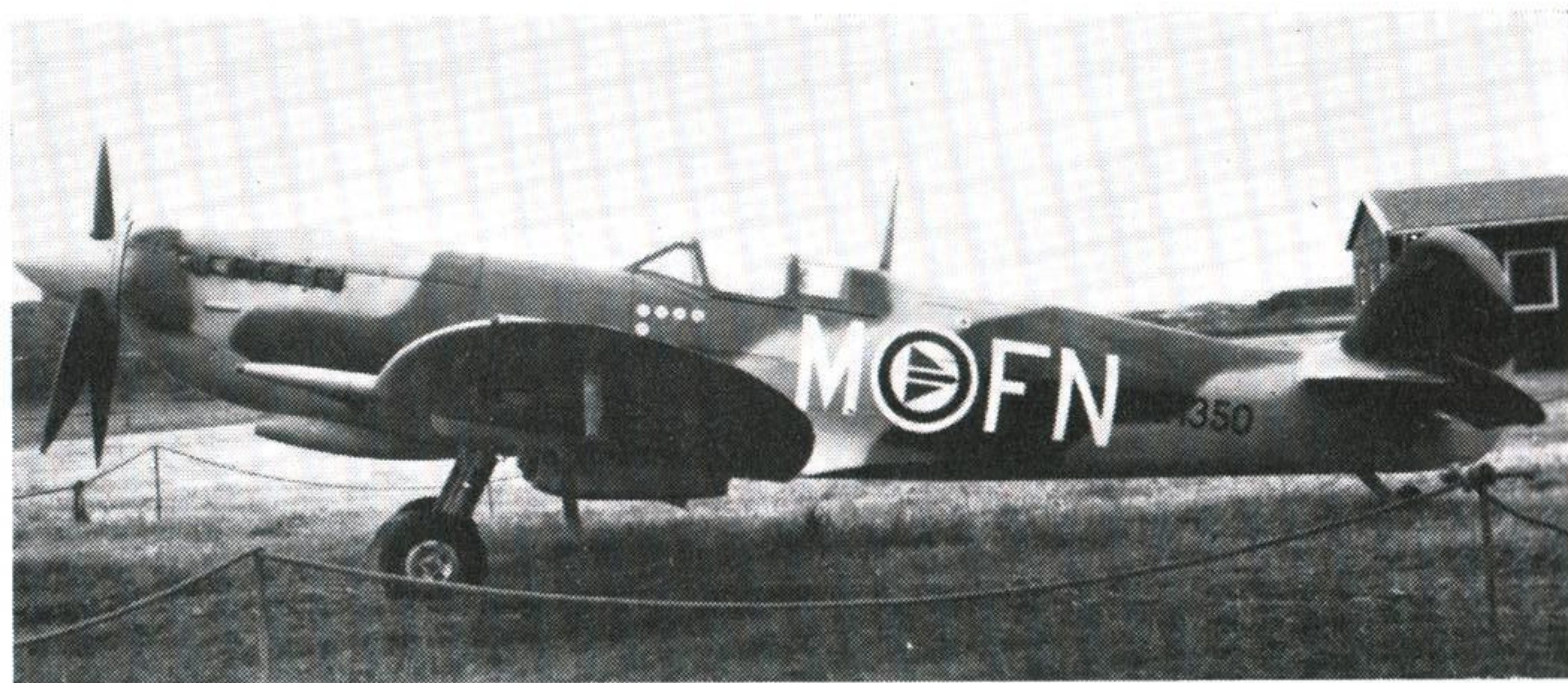
Anti-aircraft guns, balloon barrages and fighter squadrons were deployed to destroy them as they crossed the Channel. The fighter squadrons of the Air Defence of Great Britain (A.D.G.B.) consisted of Mosquito night-fighters and Mustang, Tempest, Typhoon and Spitfire day-fighters; but they were hard put to achieve a 400-m.p.h. interception. The Spitfire IX, in particular, had to be stripped of armour and paint, the surfaces had to be highly polished and 150-octane fuel boost specified to give it extra speed.

Shooting down the V-1 (Fieseler Fi 103) was also a hazard to fighter pilots. To approach it closer than 100 yards before opening fire meant that the attacker would also be blown up. But a solution was tried out on June 23 when a Spitfire pilot flew alongside a V-1 and manoeuvred himself until the wing of his aircraft was under that of the V-1's and he then simply banked away, causing the V-1 to fall out of the sky.

With the declining resistance of the *Luftwaffe*, the Spitfire was used more and more for ground attack work. But the Germans had, by September 1944, brought their new Messerschmitt Me 262 twin-engined jet fighter into service. Sightings were made and on October 6 the Spitfire IXs of No. 401 Squadron, R.C.A.F., encountered one of them in the Dutch air space of Nijmegen, near the famous Arnhem battle area and at a lower altitude. Making use of his superior height, the Canadian squadron leader dived and opened fire with a long burst from some 250 yards range, and the Me 262 spun into the ground.

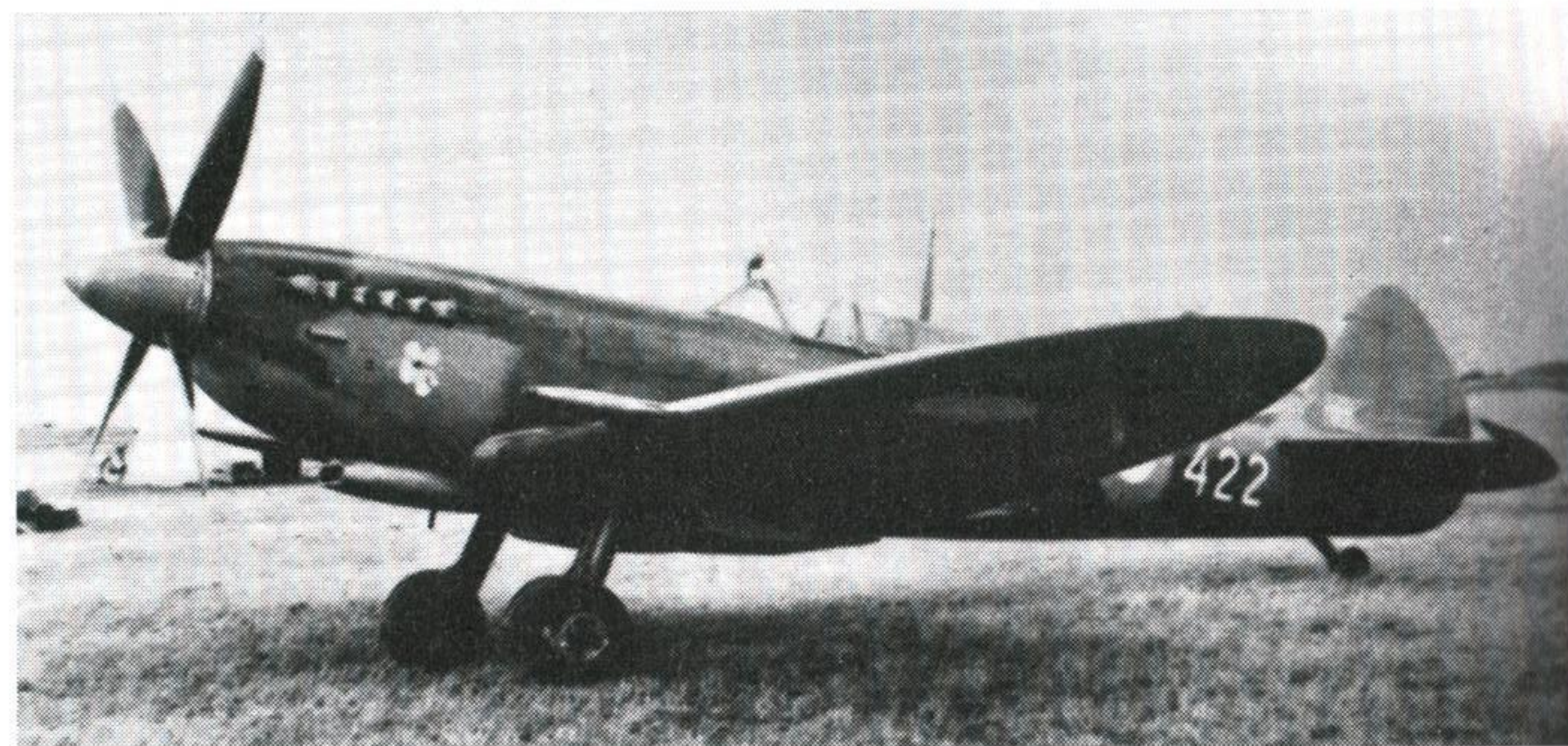
Other encounters with the incredibly fast but not so manoeuvrable Me 262 resulted in further killings. But with VE-Day on May 8, 1945, the Spitfire IX's combat career came virtually to a close, only to see brief action again in the 1948 Arab-Israel "War of Liberation" when it served in both the Egyptian and Israeli air forces.

S/Ldr. G. R. S. McKay's Spitfire Mk. IX E (TE215) of No. 130 Squadron at Odiham in 1946. AP-A was one of the few Mk. IXs to have the tear-drop cockpit canopy fitted.



Preserved at Bodo, Norway, is this Mk. IX E (MH350). Note victory swastikas under cockpit window.
(Photo: Royal Norwegian A.F.)

One of the 36 H.F. Mk. IXEs sold to Denmark in 1946 to become 422 (ex RR252) in the Danish Air Force. It was scrapped in 1952.
(Photo: via N. Kranklin)



EXPERIMENTAL Mk. IXs

For comparative trials against a captured Focke-Wulf FW 190, a Spitfire Mk. IX (BS980) went to the R.A.E. Farnborough in August 1942.

The British Royal Navy was interested in the Mk. IX and had BS390 fitted with an arrester hook for trials at R.N.A.S. Crail, Fifeshire, Scotland.

For calibrating engine and propeller efficiency, EN409 was used by the R.A.E., Farnborough, from September 1943 to January 1944. The test equipment included: A pitot static head designed for high speeds with large bore tubes to reduce lag; a comb of pitot



Ex-I.D.F./A.F. Spitfire Mk. IX Es of the Union of Burma Air Force with rocket launch points—three to each wing. Period early 1955. (Photo: Capt. A. P. Bishop)

Civilian Spitfire Mk. IX C operated by COGEA as OO-ARC until it was sold to W.W.2 Spitfire pilot, John N. Paterson of Canada, in 1961. It first flew as CF-NUS on January 13, 1962, and is now painted up in wartime camouflage with the code letters AU-H. (Photo: via J. M. G. Gradidge, Air-Britain)



heads to determine the propeller efficiency up to Mach 0.89; a set of differential pressure gauges modified from rate of climb indicators; an underwing electrical thermometer connected to a Tinsley marine-type, reflecting galvanometer giving lagless readings to within $\frac{1}{2}^{\circ}\text{C}$; and a desynn-type propeller pitch indicator giving pitch to within a $\frac{1}{4}^{\circ}$ accuracy.

Four Mk. IX airframes (MA587; MH 874; JL349 and AA873) are known to have been used by Rotol Ltd. for propeller tests. The first (MA587) was fitted with a 4/6 size counter-rotating six-blade propeller and flown for 230 flying hours between October 24, 1944 and April 21, 1945. MA587 underwent, additionally, a 30-hour oiling test period for the translational bearings, which were satisfactory. MH874 was similarly fitted in February 1944 and had a Merlin 63A specially adapted to take the Merlin 71 reduction gears. The third Mk. IX (JL349) was tested between April 18 and July 14, 1944, when the translational bearings failed after 48.45 flying hours. The fourth Mk. IX (AA873) was used by Rotol Ltd. but there is no information available on the type of tests carried out.

THE SPITFIRE IX SEAPLANE

As an extension to the floatplane experiments carried out by Folland Aircraft Ltd. at Hamble, near Southampton, in 1942 on three Mk. Vs (W3760, EP751 and EP754), one Mk. IXB (MJ892) was similarly converted. Modifications involved fin-area increase by a ventral stabilizer fin to off-set the additional side area of the floats (inner track, 10ft.) and, extensions to the fin leading-edge and rudder area.

The conversion work was not considerable and, apart from the modifications to fin and rudder, only the undercarriage unit and mechanism had to be stripped out and a tropical radiator fitted with a special air scoop designed to deflect sea spray on take-off.

The seaplane Spitfire handled well, with only 30 m.p.h. to separate it from the landplane counterpart. Although the seaplane had a tendency to "patter" from float to float on take-off and landing, its manoeuvrability was well up to combat standard.

A small batch of Mk. IX seaplane conversions was planned at Hamble, but the contract was cancelled when the efficiency of Japanese fighters was appreciated—the "Zero" (Navy: Mitsubishi A6M Zero-Sen) in particular—and the Seaplane Spitfire with reduced performance would have been useless.

STRUCTURAL FAILURE

Six accidents involving structural failure of the wing were reported, four of them in the first six months of 1943. With the Mk. IX, the all-up weight increased by about 600 lb. over the Mk. V. Experience showed that when structural failure took place, the break would occur either in the centre-section or in the main spar. Modification No. 842 served to strengthen the centre-section, but it was recommended that a more fruitful line of attack would be to improve the Spitfire's flying characteristics. The Mk. IXs involved in the structural failures in 1943 were: BS251 on January 30 during a dive (No. 332 Squadron); BS404 on February 2 during a dive (No. 306 Squadron); BR627 on May 12 during a spin (No. 332 Squadron), and BS385 on May 19 during a dive (No. 421 Squadron).

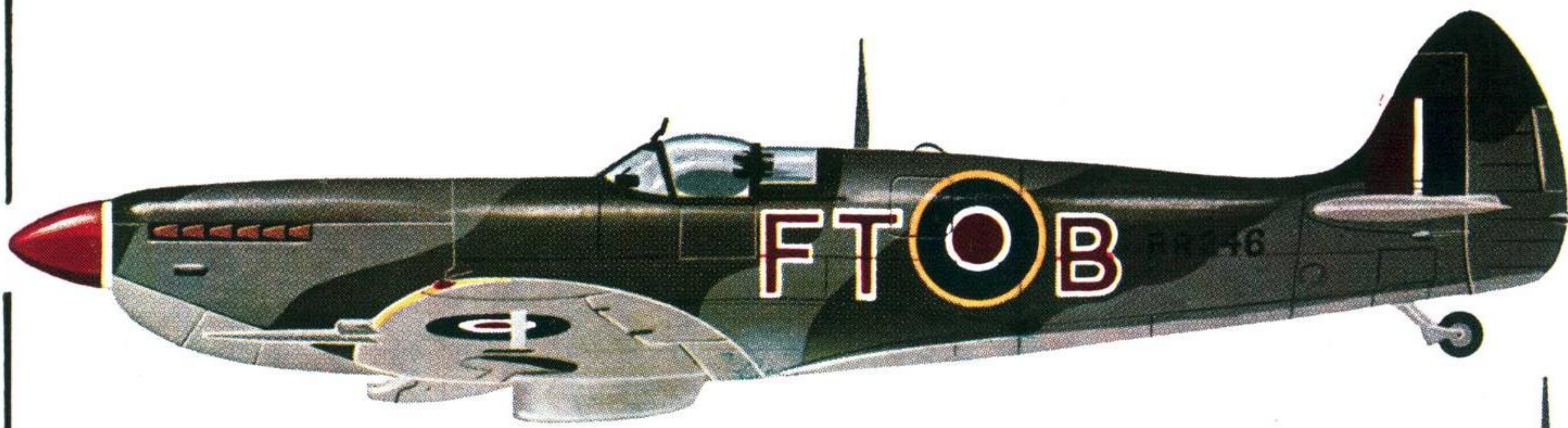
Later it was found that, with the "E" wing (where an external bomb load had been carried), wing buckling had occurred in the bay containing the outboard-mounted cannon with the bomb attachment point. Where this happened new wings had to replace them, as it was thought that these two factors were responsible for the wing buckling.

FOREIGN AIR FORCE SERVICE

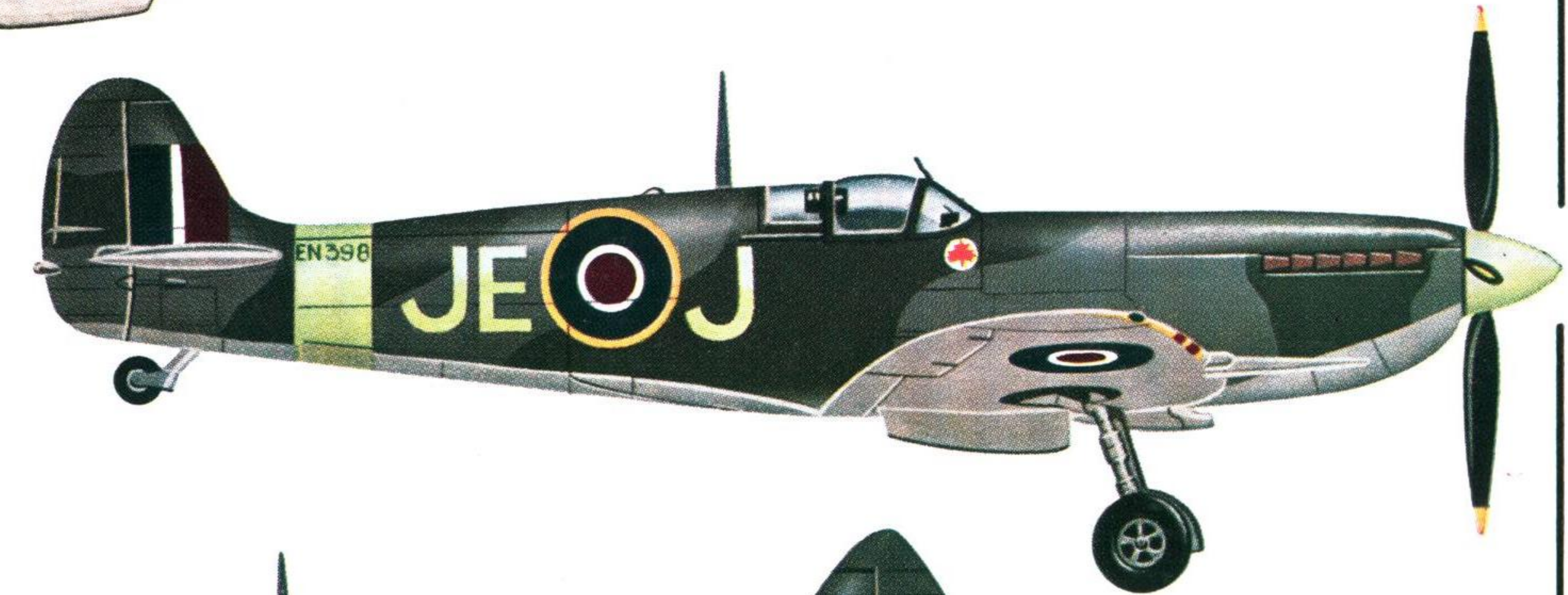
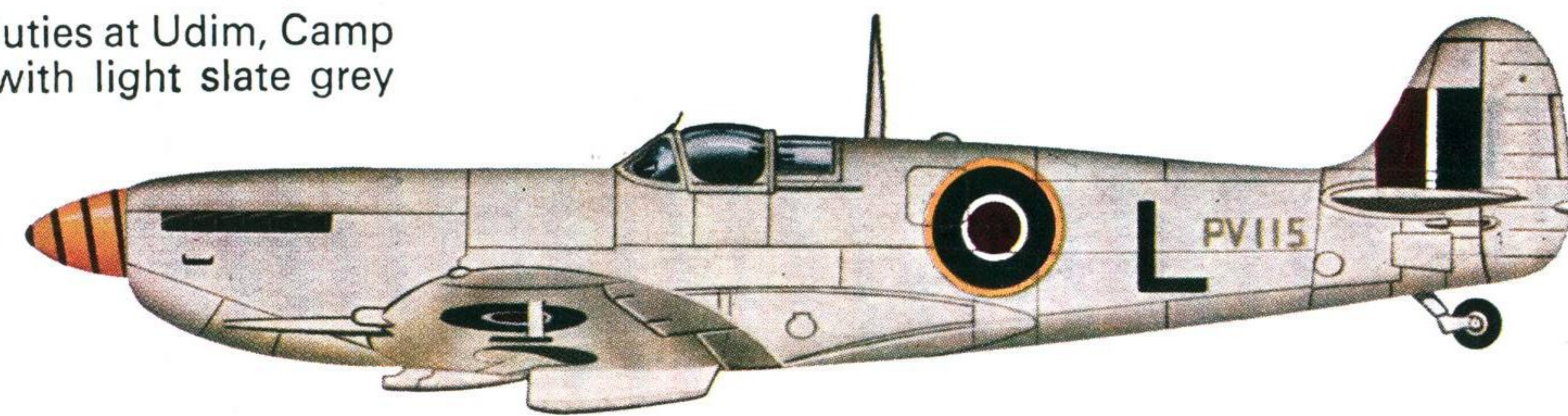
From mid-1944 until April 1945, the U.S.S.R. received no fewer than 1,188 Spitfire IXs under the Aid to Russia programme. Turkey received approximately

W/C A. G. Page, D.F.C. and Bar, in his personal Spitfire with initials AGP under the spinner. Photo taken after D-Day in Normandy 1944. It can be clearly seen that with the "E" wing both cannon and bomb carrier are in line, a factor thought to have caused wing buckling. (Photo: I.W.M.)

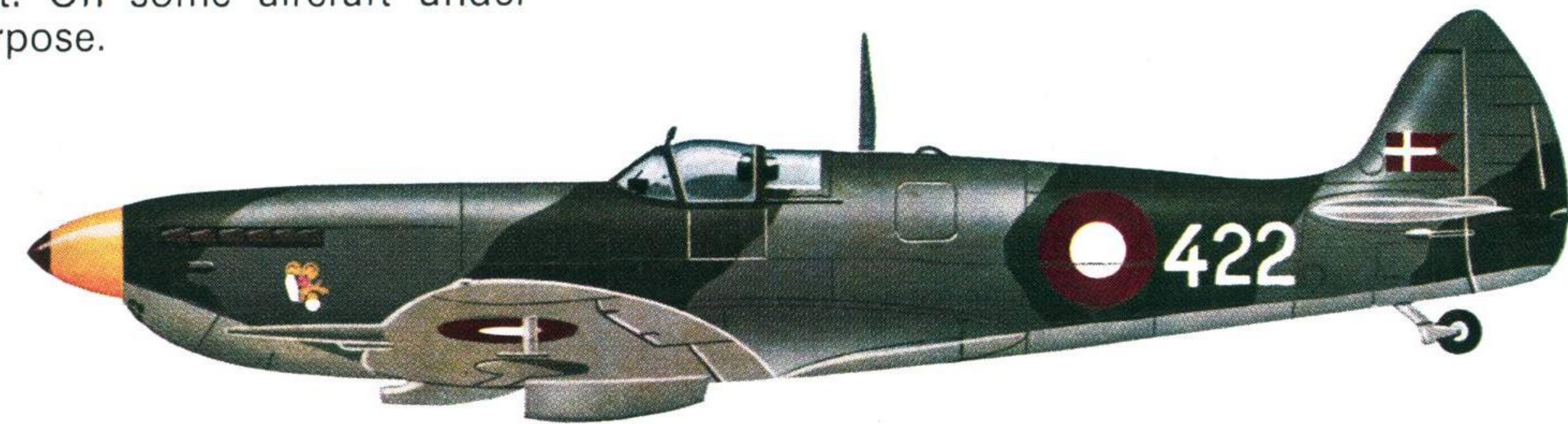




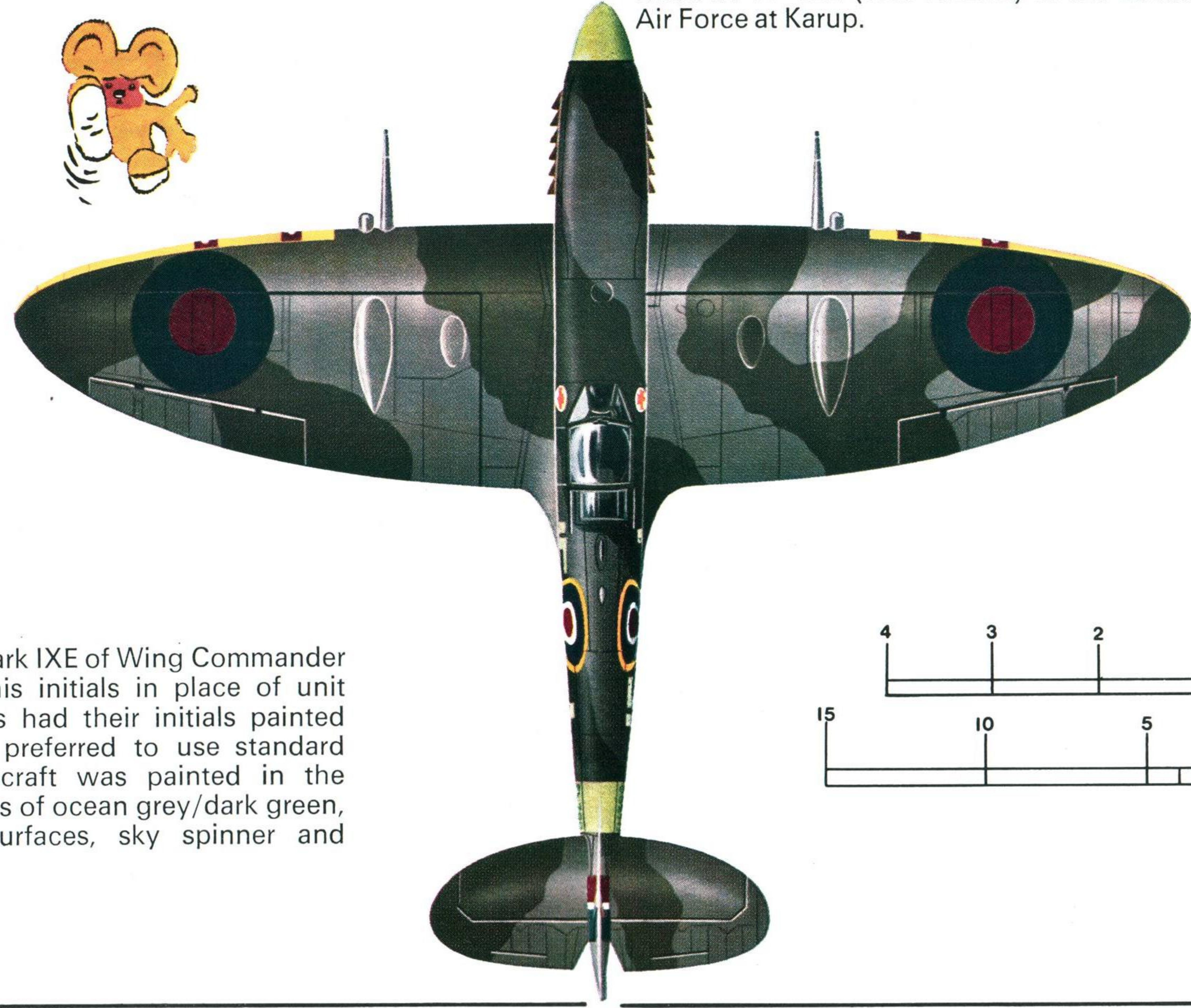
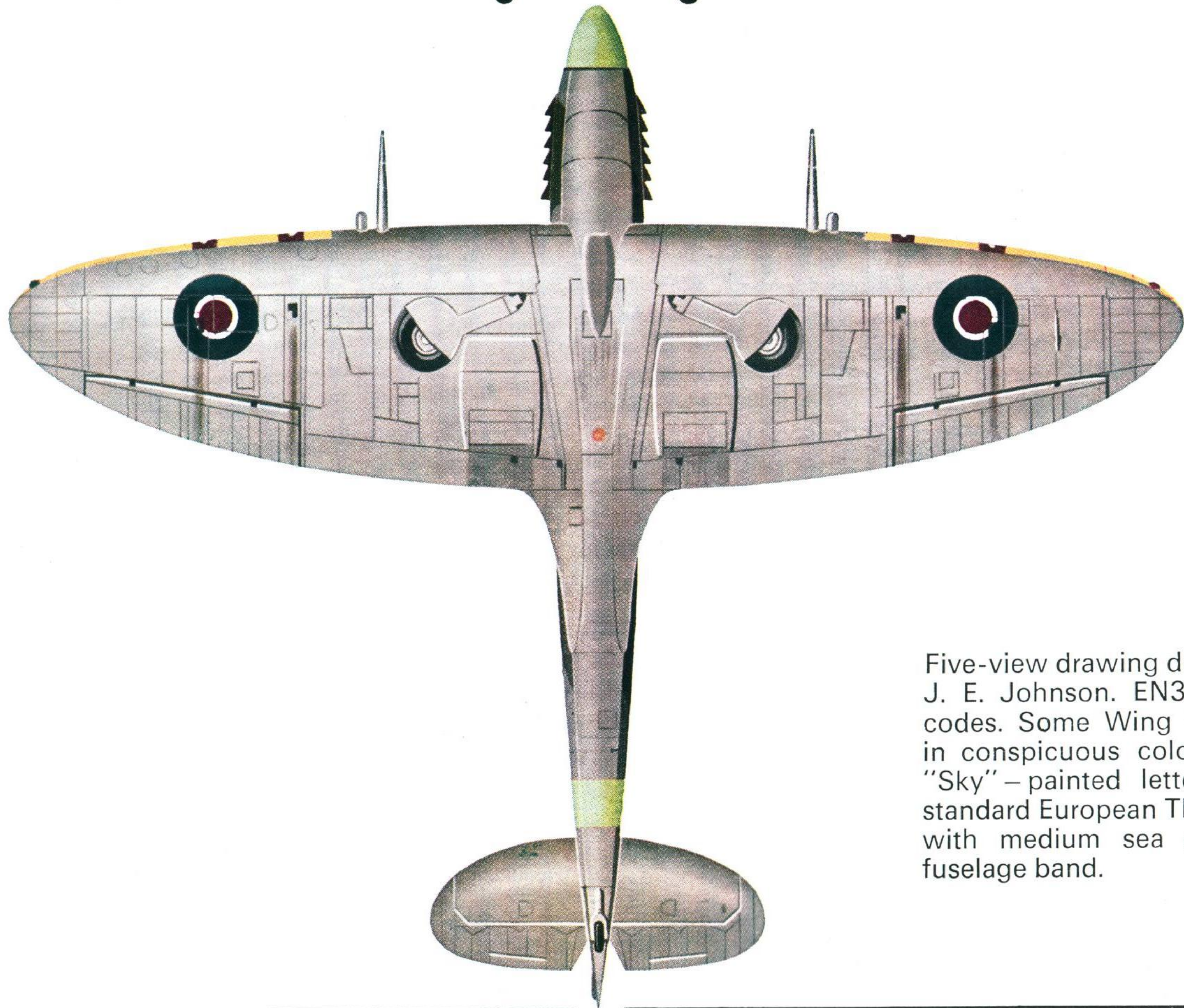
Mark IX, PU115, used for photographic duties at Udim, Camp Fordo, or Laverno, Italy. White overall with light slate grey serials.



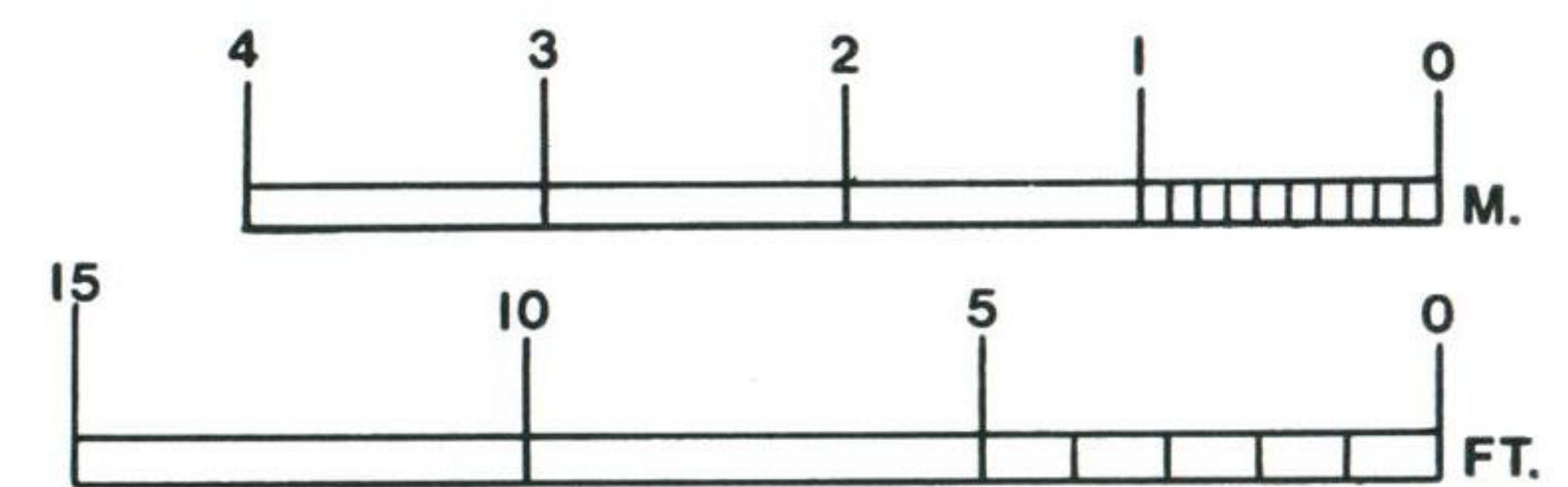
RR246 of No. 43 (F) Squadron "A" Flight, circa 1945. "B" Flight had blue codes and aircraft letter. Type C upper wing roundel. Sky band painted out. On some aircraft under-surface grey was used for this purpose.



Mark IX 41-422 (was RR252) of the Eskadrille 725, Danish Air Force at Karup.



Five-view drawing depicts the Mark IXE of Wing Commander J. E. Johnson. EN398 carried his initials in place of unit codes. Some Wing Commanders had their initials painted in conspicuous colours; others preferred to use standard "Sky" – painted letters. This aircraft was painted in the standard European Theatre colours of ocean grey/dark green, with medium sea grey undersurfaces, sky spinner and fuselage band.





Pre-dawn take-off of a MET. Mk. IXC attached to the first R.A.F. Met. Flight to operate on the Continent, circa 1945.
(Photo: I.W.M.)

44 L.F. Mk. IXs. The U.S.A.A.F. in Britain during 1943-4 had 16 transferred from the R.A.F.

Surplus R.A.F. Mk. IXs were made available for export from May 1945. France signed an agreement on November 24, 1945, for the transfer of 207 H.F. and L.F. Mk. IXs. Some of these were later shipped by France to Algeria and French Indo-China (now Viet-Nam).

To form the initial equipment of the re-constituted Czechoslovakian Air Force, an agreement to supply 76 F. Mk. IXEs was signed on February 19, 1945, and ultimately they were flown by Czechoslovak pilots across Europe to Prague.

Norway signed an agreement to receive 68 L.F. Mk. IXEs on September 27, 1946.

Under the terms of the Italian Peace Treaty of 1947, Italy received 110 L.F. and H.F. Mk. IXs.

The Royal Netherlands Air Force received 54 F., L.F. and H.F. Mk. IXs between September and December 1946. Twenty were operated in the Netherlands East Indies (Indonesia) until independence. Three were civilianised as PH-NFO, 'NFP, 'NFR. Three T. Mk. 9s were exported on March 23, 1948, as H-97, '98 and '99 (ex-MK715, BF274, BS147) and later flew as 3W-20, 3W-21 and 3W-22. H-99 was civilianised as PH-NFN for Schreiner & Co. as a target-tower.

The Egyptian Air Force received 21 L.F. Mk. IXs, delivered August to September 1946, and these were used against Israel in the 1948 "War of Liberation". Egypt also bought one T. Mk. 9 that was ferried out from Britain as G-ALJM in March 1950.

The Israel Defence Forces/Air Force had at least 30 L.F. Mk. IXs and XVIIs obtained from Czechoslovakia and ferried via Yugoslavia in 1946. They were subsequently refurbished by Bedek at Lod (Lydda) Airport and sold to the Union of Burma, in 1954-5, with U.B.A.F. serials in the UB420 range.

Greece received 77 L.F. and H.F. Mk. IXs, although deliveries were not completed until 1949.

Belgium received a number of Mk. IXs, along with Mk. XVIIs, that were numbered in the series SM-1 to SM-48. They were used by the Fighter School at Coxyde. Six were later civilianised for target-towing.

Denmark received 36 H.F. IXs and four instructional L.F. Mk. IX airframes, the former being given Royal Danish Air Force serials 401 to 436.



One of ten Spitfire Mk. IX two-seat trainers sold to the Indian Air Force circa 1946.
(Photo: Hawker Siddeley)

South Africa ordered 139, mainly in the H.F. rôle, and these were delivered by ferry pilots of No. 46 Group, Transport Command, R.A.F., from April 1947. On arrival they were considerably modified and re-designated Mk. IXA, IXB and IXC. They were also re-numbered in the S.A.A.F. series from 5501 onwards.

Only one H.F. Mk. IX (PL194) was delivered to the Argentine Air Force in mid-1947. It was later civilianised as LV-NMZ.

Yugoslavia had an unknown quantity supplied, including EN135 and SM147.

Other export orders for the T. Mk. 9 conversions consisted of six to the Irish Air Corps with the serials 158 to 163. The first two (158 and 159) and 163 later returned to the U.K. as G-ASOZ, 'VAV and 'WGB. The Indian Air Force bought 10 Mk. 9s. Cancelled orders were for ten from the Argentine and six from Iraq.

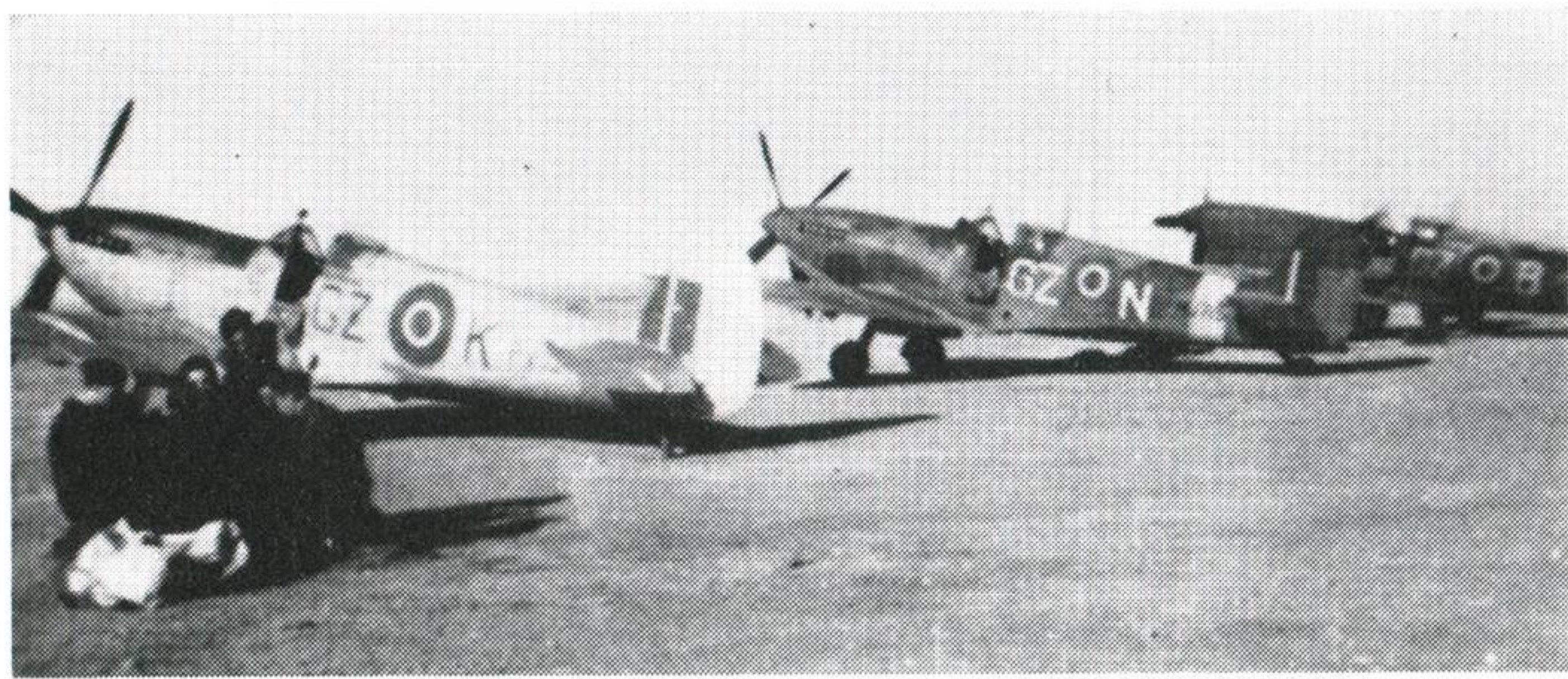
SPITFIRE IX & XVI—FILM STARS

Happily, the Spitfire in various marks has managed to maintain a relatively high survival rate and, around the world, devotees can track down specimens of the Marks IX and XVI in museums and elsewhere. The transient ones are the "film stars" and other privately-owned examples which may be put up for sale at short notice.

Darryl F. Zanuck's D-Day wide-screen movie, *The Longest Day* featured the Spitfire Mk. IX although the abbreviated flying sequences eventually screened are a tribute to the magisterial dispassion of the film editor. For this epic, Belgium's COGEA Nouvelle (contractors for gunnery target-towing) supplied three of its six for-sale. H.F./L.F. IX BCs. These were combat-

The Turkish Air Force had at least 44 Spitfire L.F. Mk. IXEs supplied to them in 1945. This example retains its R.A.F. serial PV140 and long-range tank.
(Photo: J. D. R. Rawlings)





Three Spitfire L.F. Mk. IXs of No. 32 Squadron on detachment at Shallufa in 1946. GZ-N is MJ715. (Photo: J. Old)

painted to represent aircraft of No. 340 (Free French) Squadron Spitfires: "GW-O" (civil-registered OO-ARB; ex-R.Bel.A.F. SM-43; ex-MH729); "GW-R" (OO-ARD; SM-40; ex-MH415) and "GW-D" (OO-ARF; SM-37; ex-MK923). These, together with OO-ARA (SM-41); OO-ARC (SM-39) and OO-ARE (SM-36) all formerly operated from Ostend's Raversijde aerodrome.*

The Autumn 1969 premiere of *The Battle of Britain* (shot in Spain and East Anglia's Duxford, Cambridgeshire, aerodrome where 30 years before the first Mk. I Spitfires entered R.A.F. service with No. 19(F) Squadron), probably marks this Harry "James Bond" Saltzman and J. Benjamin Fisz production in the same classic mould as the fabulous *Hell's Angels* (Sept. 1931: United Artists, director, Howard Hughes).

No fewer than 30 Spitfires of various marks were brought together by Spitfire Productions Ltd. and the Hamish Mahaddie Partnership. Twelve actually flown included four Mk. IXs and two Mk. IX two-seat trainers (MH415 and 434; and trainers MJ772 and TE308) together with "taxying only" and static Mk. IX and XVI.

HANDLING THE SPITFIRE F.IX

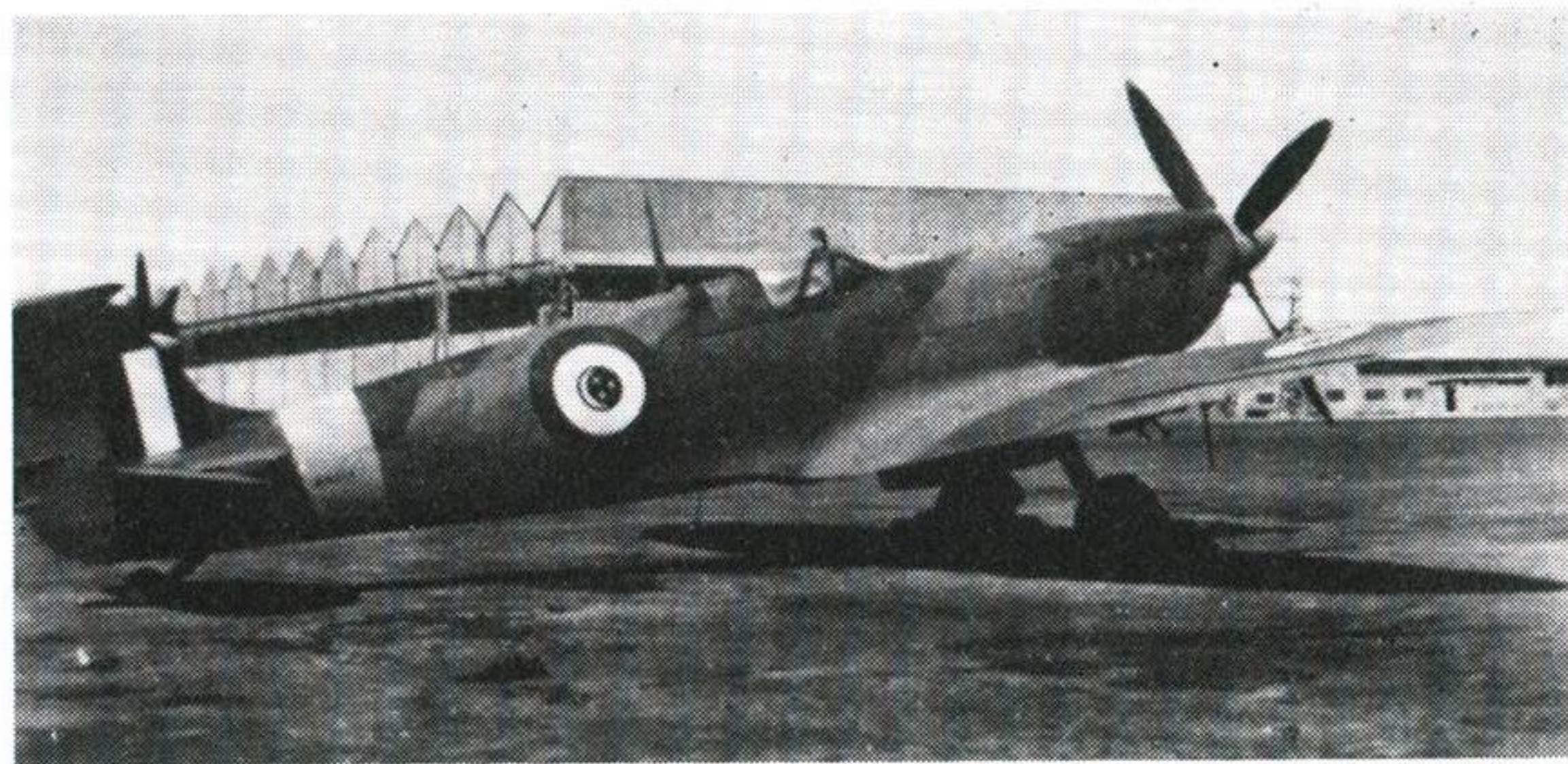
(Merlin 61 or 63)

The pilot, on approaching the Spitfire IX he is about to fly, should ensure that the wheel chocks are in

* H.F. Mk. XC (SM-36, 39 & 43); H.F. Mk. IX B (41); L.F. Mk. IX B (40) and L.F. Mk. IX C (37).

Two L.F. Mk. IXEs of the I.D.F./A.F. with clipped wings and Israel military markings.

(Photo: Air-Britain archives, via Charles W. Cain)



An Egyptian Air Force Spitfire Mk. IX C (EN314) at No. 107 M.U., Kasfareet, in May 1947. (Photo: D. A. Wylds)

position and that the ground immediately below the propeller is clear of small stones or rubble.

On entering the cockpit check the fuel gauge and, if an auxiliary tank is fitted, ensure that the cock is "OFF". Then check that the undercarriage selector lever is down (and that the "DOWN" indicator shows green). Control-column and rudder bars are moved about to ensure that ailerons, rudder and elevators are free to move.

The pilot is now ready to start the Merlin and warm it up by setting the fuel cock at "ON", pushing the throttle half-an-inch open; ensuring that the propeller control is fully forward and the carburettor air-intake is "OPEN" (except when tropicalised and take-off is from a sandy or dusty airfield, when position is "CLOSED").

Now work the priming pump until the fuel reaches the priming nozzles which can be judged by the sudden increase in resistance. By switching-on the ignition and pressing the starter and booster coil buttons, the propeller and engine are permitted to turn-over for a period not exceeding 20 seconds.

If the engine fails to fire first time, wait 30 seconds before a second attempt. By working the priming pump as vigorously as possible while the engine is turning, it should start a cold engine after three strokes at +30°C, seven at +10°C and twelve at 0°C. At temperatures below freezing it will undoubtedly be necessary to continue priming after the Merlin has fired and until it picks up on the carburettor.

As soon as the engine starts, the starter and booster-coil buttons must be released. With the engine running satisfactorily, screw down the priming pump and open up the engine to 1,000 r.p.m. to warm it up. During the warm-up, check temperatures and pressures, pressing the radiator test push button so that the ground crew can check that the shutters open.

Before further tests the pilot signals for three men on the tail and one on the starboard wing-tip to hold the aircraft down as he opens-up the engine to +4 lb./sq. in. boost to test the two-stage, two-speed supercharger by operating the test push button. The r.p.m. should fall as the "S"-ratio is engaged and the red light comes on. At the same boost, check the operation of the constant-speed propeller and, with the control fully back, the r.p.m. should fall to 1,800. Then, with the propeller control fully forward, open-up the throttle to the gate to check that the take-off boost and static r.p.m. is at 3,000.

When satisfied with this test, throttle back to +9 lb./sq. in. boost and test each magneto in turn,

noting that the drop does not exceed 150 r.p.m. Before taxiing for take-off position, check brake pressure is at 80 lb./sq. in. and pneumatic supply pressure is at 220 lb./sq. in.

With everything functioning well, the pilot signals to the tail and wing "human weights" that their task is over; and the chocks are removed from the wheels. With a burst of power the Spitfire rolls forward to take up position for take-off. Taxiing has to be carried out with caution for, with the tail down, the long nose blocks the pilot's forward vision. Only by peering out of the cockpit sides and gently fish-tailing can he see his way forward.

Prior to actual take-off, check that the trimming tabs on the elevator are half-a-division, nose-down; that rudder is fully right and propeller control is fully forward. Check the state of the lower main tank; that the drop-tank cock is "OFF"; the electric booster pump (if fitted) is "ON"; the rear fuselage tank cock (if fitted) is "OFF"; the flaps are "UP"; the supercharger over-ride switch is at "AUTO" (and the red light is out) and that the carburettor air intake is "OPEN" or "CLOSED", according to the conditions already related.

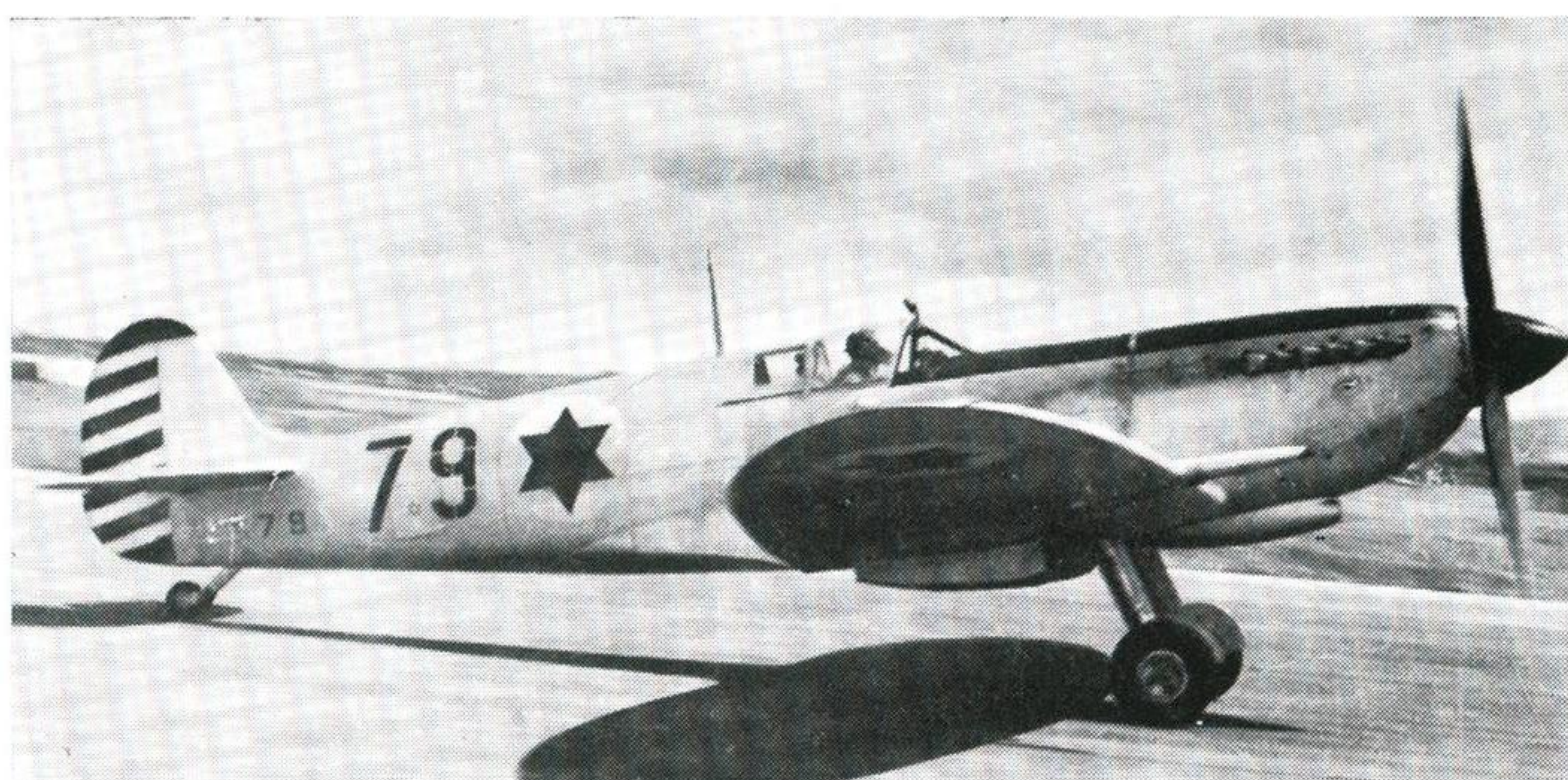
On closing the cockpit hood, the pilot is now ready to take-off by opening the throttle slowly until a boost of +7 lb./sq. in. is reached, or to the gate if needed. Any tendency to swing can be corrected by the rudder. Once airborne raise the undercarriage, making sure the red indicator "UP" comes on. At 160–180 m.p.h., start to climb at the maximum rate from sea level to 26,000 ft.

The fuel tank pressure cock should normally be kept "OFF", but must be turned "ON" if the fuel pressure warning light comes on with a drop in pressure.

The pilot converting from the Mk. V to Mk. IX will notice that the Mk. IX has more longitudinal stability in flight. At around 22,000 ft., the two-stage supercharger cuts in and there is a marked improvement in performance at higher altitudes.

For aerobatics, here are the recommended speeds: 280–300 m.p.h. for a loop; 220–260 m.p.h. for a roll; 320–350 m.p.h. for a half-roll off a loop; and 330–380 m.p.h. for an upward roll. Flick manoeuvres are not permitted and spins are restricted to two turns.

When preparing to land, reduce speed to 160 m.p.h.; open the cockpit hood; lower the undercarriage; select flaps down; check that the propeller control is



A superb shot of an I.D.F./A.F. Spitfire L.F. Mk. IX E taxiing. Note miniature repeat serial 79 and national marking between large 7 and 9.

(Photo: Air-Britain Archives, via Charles W. Cain)

fully forward; also that the supercharger's red light is out, the carburettor air-intake is adjusted to conditions and that the brake and pneumatic supply pressures are still functioning correctly.

Since the Spitfire IX is nose-heavy on the ground, care must be taken when applying the brakes. The flaps must be raised for taxiing. To stop the engine on parking, the engine is allowed to idle for half-a-minute at 800–900 r.p.m. before pulling the slow-running cut-out and holding it out until the engine stops. Now turn-off the fuel cock and switch-off the ignition.

ACKNOWLEDGEMENTS

The co-authors wish to express their appreciation of the co-operation given by senior members of the M.O.D. Air Historical Branch (Air) by granting access to Official Records for the purpose of confirming previously arrived at assumptions and permitting the correction of certain previously published historical misconceptions. The authors also wish to thank the staff of the Photographic Library at the Imperial War Museum for their help with photographs. Our thanks are also extended to expert Bruce Robertson (author of Harleyford's *Spitfire—The Story of a Famous Fighter*) for the use of unpublished material, and his fellow Air-Britain members Dave Birch and Bruce Rigelsford, the latter for his help with colour schemes.

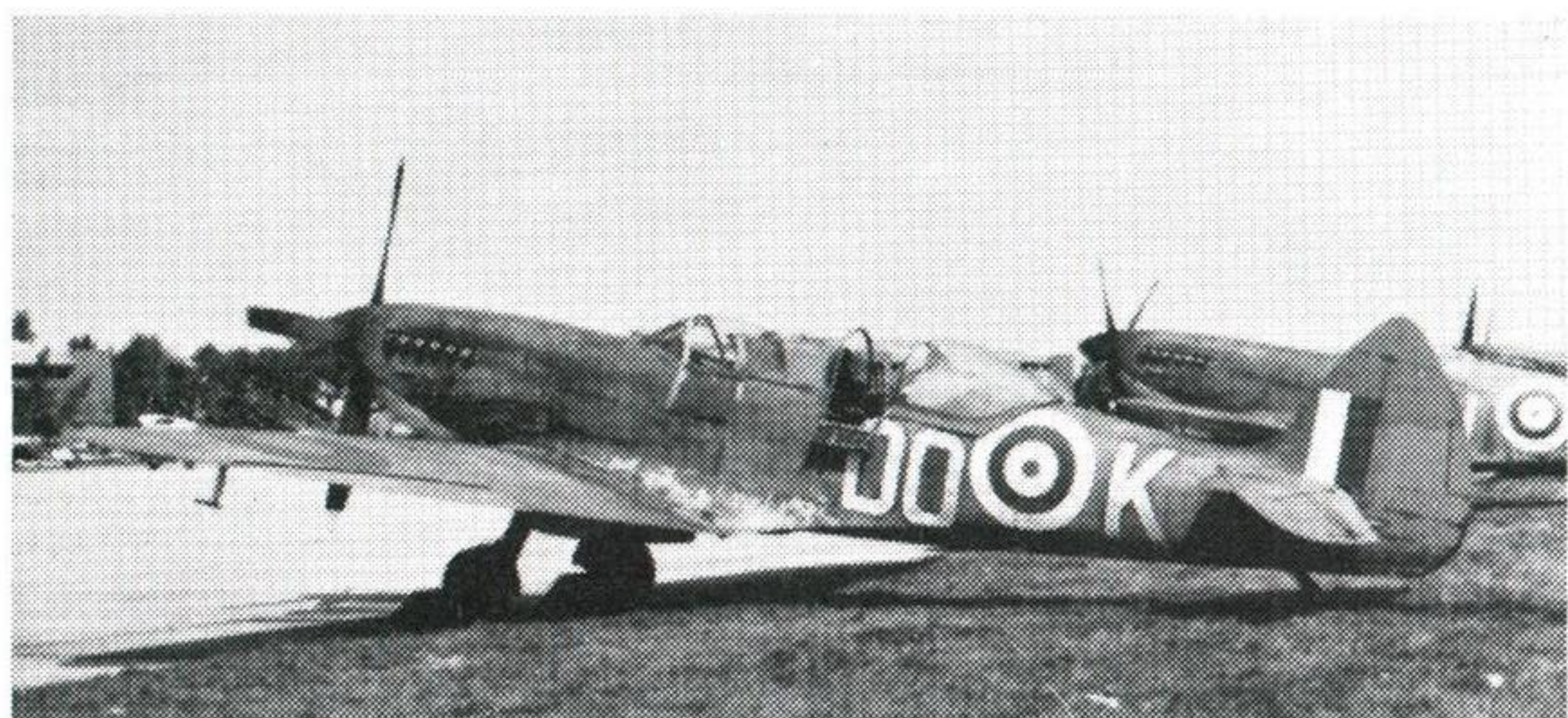
PWM & LJB.

The Mk. IX C two-seat trainer G-AWGB (formerly Irish Air Corps 163, ex-R.A.F. TE308) at Baldonnel, Eire, on May 8, 1969, prior to its flight to Henlow, Buckinghamshire, in order to participate in The Battle of Britain film. Pilot was F/Lt. Armstrong.

(Photo: T. Kearns)

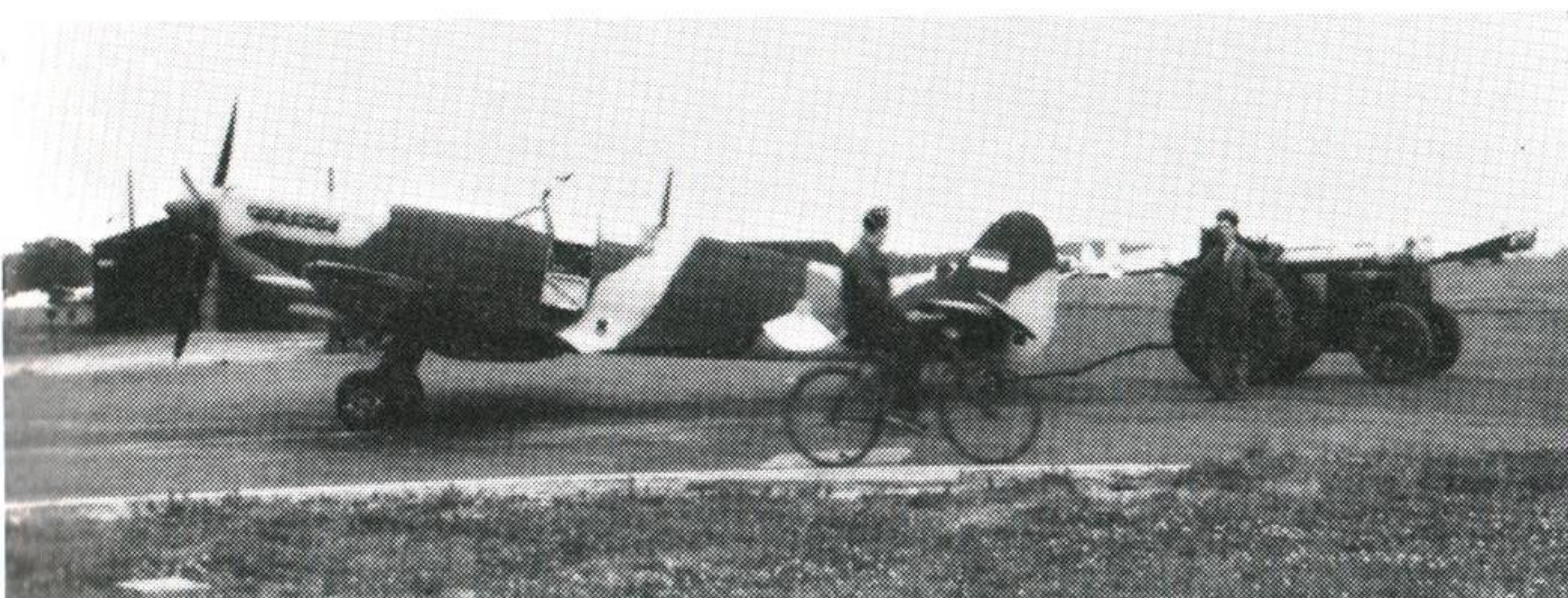
A view of G-AWGB in its film rôle disguise (The Battle of Britain) at R.A.F. Duxford, Cambridgeshire, in 1969.

(Photo: R. W. Cranham)

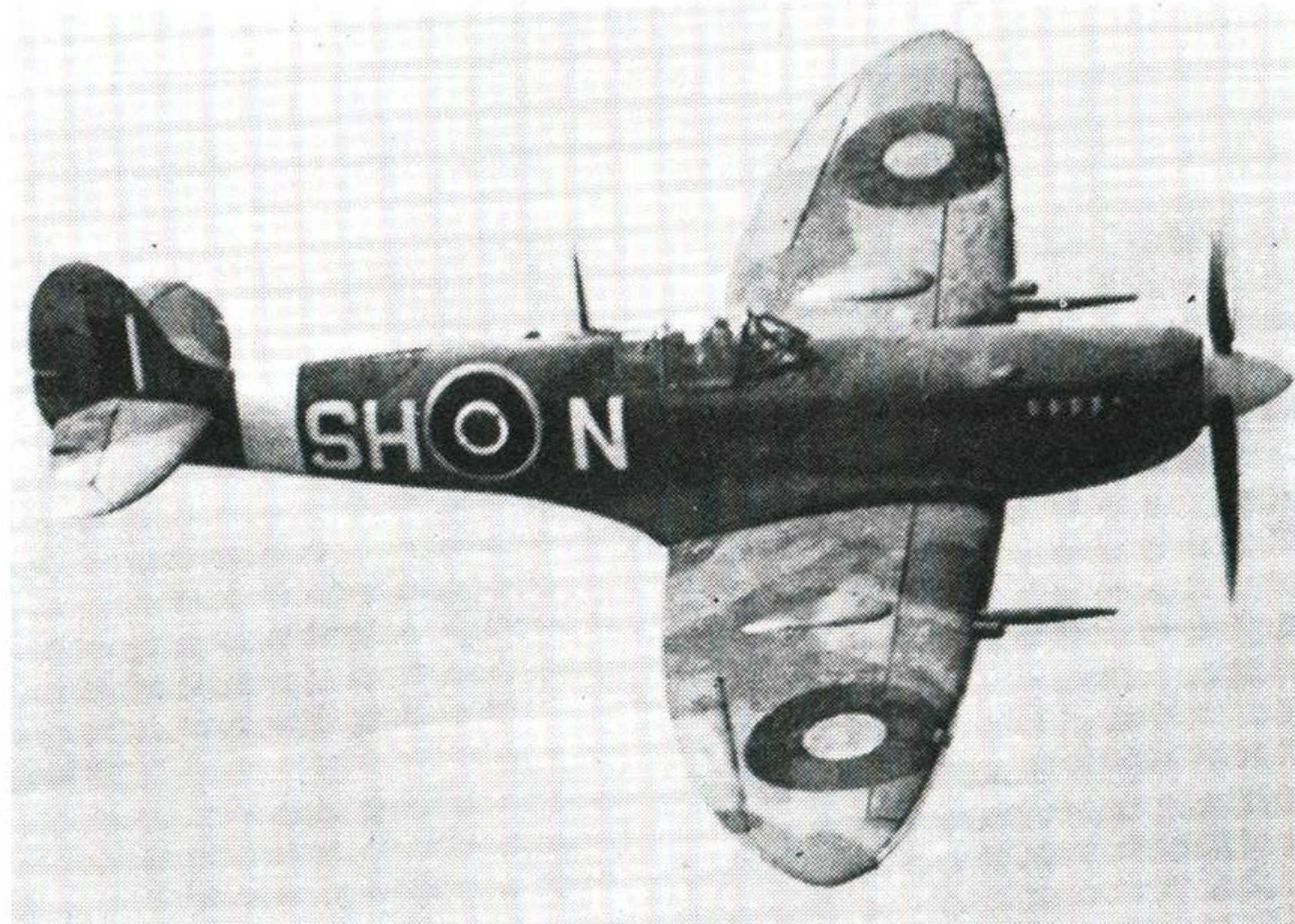




One of the few airworthy Mk. IXs left, G-ASJV is seen taxiing at R.A.F. Coningsby in 1963. Note Civil Air Ensign on the fin. (Photo: via Bruce Robertson)



The Spitfire Mk. IX (MK188) in Dutch military markings at R.A.F. Colerne. (Photo: K. Rutherford)



This photograph of July 1942 shows an example of an F. Mk. IX C of No. 64 Squadron—the first unit to receive Mk. IXs. Along each outboard wing leading-edge is the yellow strip which was adopted (like the yellow-tipped propeller blades) to assist ground crews when working around Spitfires in the pre-dawn darkness. Note also the larger cannon blisters in place of the more familiar narrow-chord, tear-drop blisters. (Photo: via M. Garbutt)

SPECIFICATION

LEADING DATA

Engines

F. Mk. IX	1 × 1,565 h.p. Rolls-Royce Merlin 61 or
	1 × 1,650 h.p. Rolls-Royce Merlin 63
L.F. Mk. IX	1 × 1,580 h.p. Rolls-Royce Merlin 66
H.F. Mk. IX	1 × 1,475 h.p. Rolls-Royce Merlin 70
L.F. Mk. XVI	1 × 1,580 h.p. Rolls-Royce (Packard built) Merlin 266

Engine installation

Mounted on steel tubular cantilever members pin-jointed at four points to the firewall. 7.5 Imperial gallon oil tank under the engine mounting. Engine weight: 1,640 lb.

Propeller

Merlin 61 with four-blade, constant-speed Rotol 35°-pitch range of Types R3/4F5/2 or R3/4F5/3, made of Dural metal. Alternatively, with Type R5/4F5/4, made of Jablo (a compressed wood) or Hydulignum. **Merlin 63, 66 and 70** with four-blade, constant-speed Rotol 35°-pitch range of Type R12/4F5/4 made of Jablo or Hydulignum. Diameter: 10 ft. 9 in.

Fuel tanks

Two forward of the cockpit, the top of 48 Imperial gallons and the lower of 37 gallons (self-sealing). Auxiliary drop-tanks of 30, 90 or 170 gallons capacity optional, fitted flush with the fuselage underside. Later, a 50-gallon cylindrical auxiliary tank became standard. On some aircraft a secondary, 26-gal. tank was fitted in the rear fuselage for use with the 170-gal. auxiliary drop-tank on reinforcing flights. Experimental fuel tanks have been discussed on page 23. Later aircraft were fitted with a 41- or 33-gal. tank behind the cockpit.

Radiators

Two Morris QCP coolants, each of 1.24 sq. ft., fitted underwing, with a Morris QCR intercoolant of 0.72 sq. ft. within (starboard) and a Morris QCO oil cooler of 0.6 sq. ft. within (port). Tropicalisation of air intake by Vokes 1943 Aero Vee filter.

Flying limitations

- Maximum speeds:

Diving		450 m.p.h.
Undercarriage down		160 m.p.h.
Flaps down		160 m.p.h.
- Restrictions:
 - Spinning not permitted with bomb load.
 - Violent manoeuvres with bomb load to be avoided.
 - The angle of dive with bomb load not to exceed 40°.
 - Straight flying only with drop-tanks greater than 30 gal.

Construction

Fuselage of stressed skin monocoque construction comprising one dorsal and one each fuselage side on top section longerons, plus two lower Vee-section longerons. Oval channel formers with flush-riveted Alclad skin. Main wing spar built into front fireproof bulkhead. Tail unit bolted on the rear fuselage and comprising an integral fin of stressed-skin construction. Tailplane in port and starboard halves and bolted to the fin. Control surfaces of metal construction and fabric covered (although the elevators of later aircraft were metal covered). The wing main spar booms constructed as a closed telescope with sheet webs. Main spar and leading-edge forms torsion box Dee-spar. Ribs built-up of light alloy plain angle: light channel section rear spar carrying split flaps and Frise ailerons. Light alloy Alclad stressed-skin covering. The wings attached by seven bolts at the main spar (three top, four bottom) and one at the rear spar. The main undercarriage comprising two Vickers cantilever, oleo-pneumatic shock-absorber legs retracted hydraulically. Fixed tail wheel with Mk. IX and early Mk. XVI; but retractable in late production Mk. XVI with rear-vision fuselage.

Dimensions

Wing span: Normal 36 ft. 10 in. 242 sq. ft. area
 Clipped 32 ft. 2 in. 231 sq. ft. area
 Length: Normal rudder 31 ft. 1 in. Broad chord rudder 31 ft. 4½ in.
 Tail span: 10 ft. 6 in. Area 31.46 sq. ft.
 Height: 11 ft. 5½ in. (or 12 ft. 7¼ in. tail down)
 Wheel track: 5 ft. 8½ in.

Weights

Maximum permissible take-off: 9,500 lb.
 Maximum for normal flying: 7,900 lb.
 Normal take-off: 7,343 lb.
 Total removable military load: 1,046 lb.
 Total expendable load: 981 lb.
 Tare (empty) condition: 5,634 lb.
 Fuel and oil (no auxiliary): 672.5 lb.
 Armour: 200 lb.
 Pilot and parachute: approx. 200 lb.

Performance

Maximum level speed: F. Mk. IX 408 m.p.h. at 25,000 ft.
 H.F. Mk. IX 416 m.p.h. at 27,000 ft.
 L.F. Mk. IX 404 m.p.h. at 21,000 ft.
 Normal cruising speed: 324 m.p.h. at 20,000 ft.
 Rate of climb: 3,950 ft./min. Climb to 20,000 ft. in 5.7 minutes.
 Service ceiling: 43,000 ft.
 Stalling speed: Undercarriage and flaps up 94 m.p.h.
 Ditto and flaps down 84 m.p.h.
 Range: 434 miles with 85 Imperial gallons
 980 miles with 175 gallons

SPITFIRE Mk. IX TRAINER CONVERSION

Engine Installation

One Rolls-Royce Merlin 66 of 1,580 h.p.
Propeller: Rotol Type R12/4F5/4 four-blade, constant-speed, 35°-pitch range.

Fuel Tank Capacities

Total internal capacity 94 Imperial gallons.
Auxiliary jettisonable tank 30 gals.

Dimensions

Wing span: 36 ft. 10 in. Length: 31 ft. 4½ in.
Other dimension same as for the F. Mk. IX.

Weights

Normal all-up weight: 7,300 lb.

Performance

Maximum speed fully supercharged: 386 m.p.h. at 20,000 ft.
Maximum speed moderately supercharged: 360 m.p.h. at 9,000 ft.
322 m.p.h. at sea level.

Rate of climb: 3,970 ft./min.

Service ceiling: 41,500 ft.

Range: At average cruising speed of 228 m.p.h.—234 miles
With 30-gal. drop-tank—413 miles.

Accommodation

Pupil in front cockpit, itself moved forward 13½ inches to allow a second cockpit for the instructor behind and slightly above it.

SPITFIRE L.F. Mk. XVI

Apart from the U.S. Packard-built Merlin 266 engine, details are as for the Mk. IX. Armament was also the same with "C" or "E" wing design, "clipped" or "unclipped." The 20 mm. cannon each fired 120 rounds and the machine-guns each fired 350 rounds. Late production Mk. XVI Spitfires had rear-view fuselages when the front lower fuel tank was usually of 47 Imperial gallons (instead of 37). Additional rear fuselage tanks could be fitted for ferrying or long-range escort operations: 75 gallons in standard fuselages, 66 gallons in rear-view fuselages. Auxiliary drop-tanks of 30, 45 or 90 gallons could be carried under the fuselage.

SPITFIRE Mk. IX AND Mk. XVI PRODUCTION

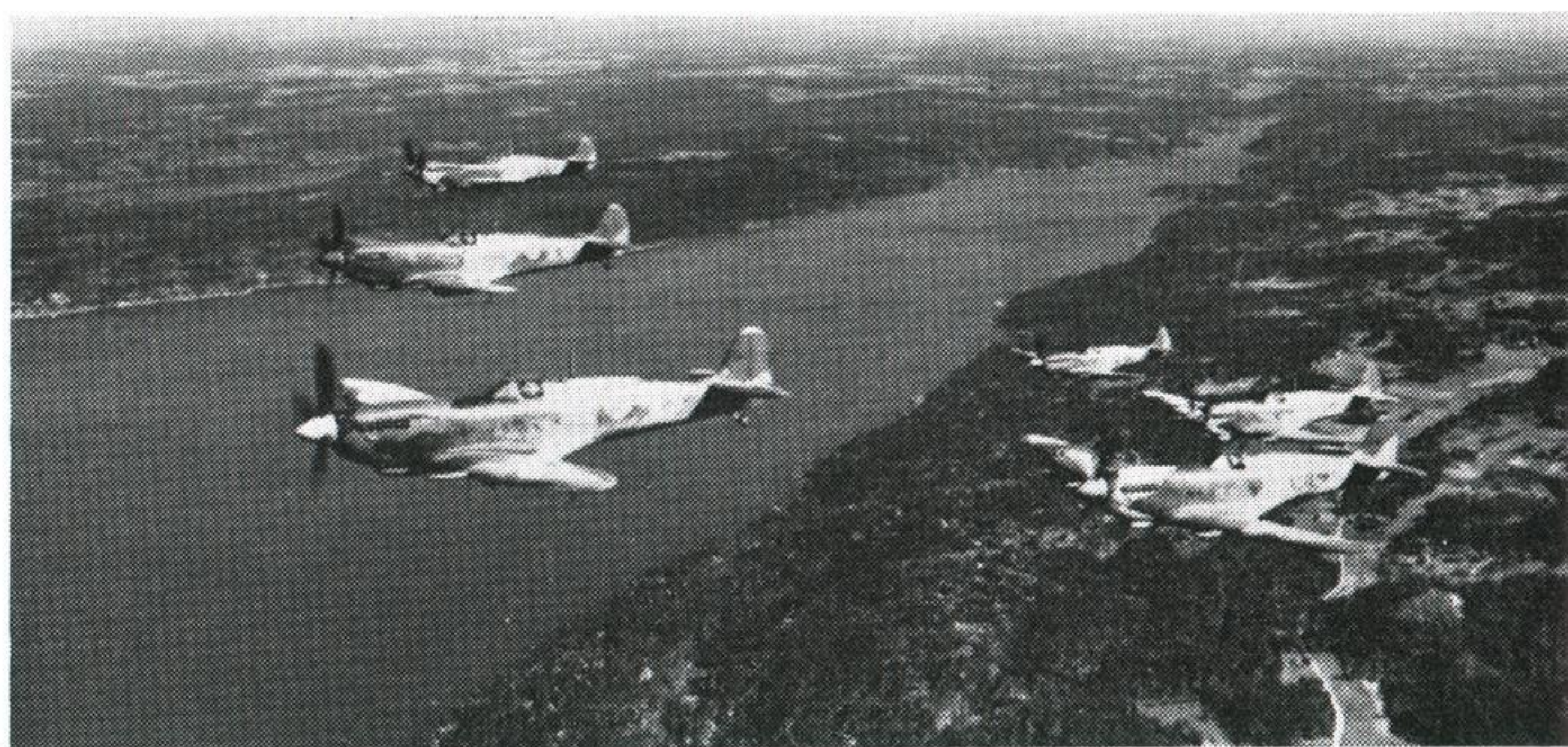
Serial Numbers

These were allocated by the Contracts Branch (C.30A) of the Air Ministry during the war years. Wherever possible, throughout the text, serial numbers have been quoted to give positive authority for personal identification of individual aircraft. Reference to serial numbers permits the reader to check the true identity of Spitfires either mentioned or illustrated in other publications.

Production totals have been arrived at by an exhaustive study of official records. The Vickers-Armstrong figure of 5,104 Mk. IXs built at Castle Bromwich, Birmingham, cannot be substantiated. The official total of 5,665 Mk. IXs built at all factory production lines is, therefore, incorrect.

The co-authors gratefully acknowledge the researches of Dave Birch, of *Air-Britain*, for the complete breakdown of Mk. V conversions at the Rolls-Royce factory at Hucknall, Nottinghamshire.

Production included the following sub-variants: F. Mk. IXb; F. Mk. IXc; F. Mk. IXe; L.F. Mk. IXb; L.F. Mk. IXc; L.F. Mk. IXe; H.F. Mk. IXc; H.F. Mk. IXe; L.F. Mk. XVIc and L.F. Mk. XVIe.



Six Spitfire Mk. IX Es of the Royal Norwegian Air Force.

(Photo: I.W.M.)

Conversions by Rolls-Royce Ltd, Hucknall.

Two interim prototypes: N3297 arrived at Hucknall in April 1941 with Merlin XX installed; removed for Merlin 60 and finally had a Merlin 61 with which it first flew on September 20, 1941. R6700 arrived at Hucknall on October 13, 1941 with a Merlin III installed. First flew with a Merlin 61 on January 6, 1942 and was delivered to Vickers-Armstrong at Worthy Down that same day.

Two definitive prototypes: AB196 despatched to Vickers at Worthy Down. AB197 despatched to the A. & A.E.E. Boscombe Down.

Five development aircraft: AA873 and AB507 despatched to A.F.T.U., Hornchurch, Essex; AB499 and AB501 retained by Rolls-Royce for development; and, AB505 despatched to the A.F.D.U. at Duxford.

Production of Mk. V conversions to Mk. IX: Not in chronological order (as BR142 was first): AB456 to 460, 508, 511, 522 and 525. BR138 to 143, 369-371 and 621-640. BF273, 274, 335 and 336 (prefix letters BF applied in error for BS and only two serials had the F changed to S, i.e.: BS335 and BS336). BS271-272, 275-290, 337-354 and 530-559. EN112-121, 239-258, 351-370, 515-534, 551-583 and 628-637. ES107 and 291. JK429, 463, 535, 620, 659, 668, 762, 769, 795, 840, 860, 880, 949 and 979. JL106-107, 109-111, 132, 159, 163, 165, 172, 217, 223, 234, 239, 347, 349, 351, 353-356, 359, 361, 364, 366, 369-370, 372-373, 385 and 395. MA298, 329, 357, 645-646, 648, 651, 655 and 657. Total: 284 (not including N3297 and R6700).

Built by Supermarine Aviation (Vickers) Ltd at Woolston.

As Mk. IXs: BR600-605, 977-978, 980-982 and 985-986. BS104-105, 107, 109-110, 112-113, 116, 118-120, 122-123, 125-132, 135-140, 143-149, 150-152, 157, 159, 167, 170, 172, 176, 177, 179-180, 183, 185, 189, 192, 194-196, 198, 200, 202, 227, 239-244, 246-252, 254-255, 292, 294, 296-297, 299, 301-304, 306-319, 335-336, 383-411, 421-426, 428-435, 438-441, 443-447, 449-452, 454-459 (BS454 crashed on company test flight), 461-464, 466-471, 473-474 and 506-515. EN122-148, 152, 156, 171-175, 177, 179-

No. 1435 Squadron, R.A.F., at Brindisi, Spring 1944. Common squadron code letter (usually double letters) is a singular "V". Photograph taken at Brindisi, Italy. Nearest Spitfire Mk. IX (EN199) was built at the Vickers-Armstrong Supermarine factory. Extreme left is a Spitfire Mk. VB (Trop.) behind which is a Special Duties Handley Page Halifax II. Cowling of second nearest Mk. IX carries a shield containing the Maltese Cross.

(Photo: via Bruce Rigelsford, Air-Britain)





Yet another No. 1435 Squadron Spitfire Mk. IX at Brindisi in early 1944. Central figure is believed to be a Major Nicholson of the S.A.A.F. Below the windshield is painted an "enemy aircraft destroyed" German cross symbol. The hasty obliteration of the rear fuselage duck-egg blue band has resulted in a confusion of stencilled serial numbers. Under the squadron code letter "V" is the "M" of the smaller restencilled "MH6", the last two digits being hidden by the tailplane.

(Photo: via Bruce Rigelsford, Air-Britain)

188, 190-191, 193-207, 259, 261, 265-270, 286-296, 298-309, 311-315, 329, 333-336, 339-340, 344-345, 349-350, 390, 392-394, 397-406, 408, 410-411, 444-456, 458-464, 466-469, 471-476, 478-483, 490-493, 498, 500-502, 510 and 513-514. Total: 358.

Built as Mk. Vs, but later converted to Mk. IX standard during major repair or overhaul: **AD366, BR581, 589, 592, 594 and 596.**

Built by Vickers-Armstrongs Ltd at Castle Bromwich.

As Mk. IXs: **JG722** and **739. JK395, 611, 641, 650, 770, 796, 881, 883-884 and 980. JL134-138, 177-180, 226-230, 252-256, 375-377 and 383-384. LZ831-833, 836-843, 861, 889-892, 894-899, 915-925, 947-956 and 989-998. MA221-260, 299-315, 369, 398-428, 443-487, 501-546, 559-601, 615-643, 683, 705-713, 726-767, 790-819, 831-849 and 878-879. MB807. MH312-336, 349-390, 413-456, 470-512, 526-563, 597-599, 601-604, 606-626, 635-636, 647-678, 691-740, 750-800, 813-856, 869-912, 924-958 and 970-999. MJ114-156, 169-203, 215-258, 271-314, 328-369, 382-428, 441-485, 498-536, 549-589, 602-646, 659-698, 712-756, 769-801, 814-858, 870-913, 926-967 and 979-999. MK112-158, 171-213, 226-268, 280-326, 339-379, 392-428, 440-486, 499-534, 547-590, 602-646, 659-699, 713-756, 769-812, 826-868, 881-926, 939-969 and 981-999. ML112-156, 169-216, 229-232, 236-277, 291-323, 339-381 and 396-428. NH148-158, 171-218, 230-276, 289-326, 339-381, 393-438, 450-496, 513-558 and 570-611. PK991-998. PL123-169, 185-227, 246-288, 313-356, 369-408, 423-466 and 488-499. PT335-380, 395-436, 451-498, 523-567, 582-627, 639-683, 697-738, 752-795, 818-859, 873-915, 929-970**

A mixed bag of South African Air Force Spitfire Mk. IXs with the old- and new-type cockpit hoods. Photographed "somewhere over the Union", these Mk. IXs of No. 1 Squadron, S.A.A.F., still carry their wartime code letters AX. Note the variations in size and positioning of wing and fuselage blue-white-orange roundels and fin flashes.

(Photo: S.A.A.F., via Ken Smy, Air-Britain)



and 986-999. **PV115-160, 174-215, 229-270, 283-327 and 341-359. RK798-819, 835-868 and 883-926. RR181-211, 228, 231-232, 235, 237-239, 241, 244, 246, 251-254, 258-260, 262 and 264. SL625-635 and 648-665. SM135-150, 170-177, 441-462 and 517-548. TA738-780, 793-840, 850-888, 905-948 and 960-999. TB115-129, 133-135, 142-150, 168-193, (N.B.: TB194 was cancelled from Contract), 195-197, 213-243, 249-251, 253, 393, 413-450, 464-474, 477, 479, 482-491, 499-500, 503, 516-518, 523-524, 527, 529-548, 563-571, 575-577, 579, 584, 586-587, 591-598, 638, 640-659, 674, 676-712, 717-718, 736, 740, 771-809, 824-827, 830, 837-857, 901-918, 920, 924-925, 938-959, 971-988, 992 and 994. TD155, 175, 178-183, 192-213, 287, 290-292, 294-315, 352-368, 370-371, 373-374, 378-379, 395-399, 952-958 and 970-999. TE115, 117-118, 121-158, 197, 205, 211-213, 215, 230-234, 236, 238, 289-290, 292-299, 301, 303-309, 312-313, 315, 329, 331, 333, 336-337, 343, 493-535 and 549-579. Total: 5,085.**

Built as Mk. Vs, but later converted to Mk. IXs during major repair or overhaul: **JK882. LZ816 and 893. MA687, 690 and 860.**

As Mk. XVI: **RR212-213, 226-227, 229-230, 234, 236, 240, 242-243, 245, 247-250, 255-257, 261, 263 and 265. RW344-359 and 373-396. SL541-579, 593-625, 666-690 and 713-745. SM178-213, 226-258, 273-316, 329-369, 383-427, 463-488, 503-516, 563-597, 610-648 and 663-671. TB130-132, 136-141, 252, 254-256, 269-308, 326-349, 352-392, 394-396, 475-476, 478, 480-481, 492-498, 501-502, 515, 519-522, 525-526, 528, 572-574, 578, 580-583, 585, 588-590, 613-637, 639, 675, 713-716, 733-735, 737-739, 741-759, 828-829, 831-836, 858-868, 883-900, 919, 921-923, 989-991, 993 and 995-999. TD113-154, 156-158, 176-177, 184-191, 229-267, 280-286, 288-289, 293, 316-325, 338-351, 369, 372, 375-377 and 400-408. TE116, 119-120, 174-196, 198-204, 206-210, 214, 228-229, 235-237, 273-288, 291, 300, 310-311, 314, 328, 330, 332, 334-335, 338-342, 344-359, 375-384, 386-408, 434-471 and 473-480. Total: 1,054.**

A grand total of 5,739 Mk. IX and 1,054 Mk. XVI Spitfires is therefore arrived at. The breakdown of Mk. IXs is as follows: Rolls-Royce, 284; Supermarine, 358 plus 6 Mk. V conversions; Castle Bromwich, 5,085 plus 6 Mk. V conversions = 5,739.

Mk. IX Conversions to Two-seat Trainer by Supermarine Southampton: **MJ627 and 772, MK721, ML407, PV202, TE308** for the Irish Air Corps in 1951. Became I.A.C. Nos. 158, 159, 160, 161, 162 and 163 respectively.

Ten to the Indian Air Force; R.A.F. serials not known.

One to Egypt, ferried out as G-ALJM in March 1950.

NOTE ON FACTORY FINISH, 1944

Aircraft received from the Castle Bromwich factory in 1944, both new and repaired, had a very high quality finish that gave the aircraft additional speed by some 20 m.p.h.

R.A.F. SQUADRONS USING THE Mk. IX AND Mk. XVI

Sqn. No.	Code	Example	Period of use
1	JX	MK172 (JX-M)	Apr.-Nov. 44
5	7B	SL600 (7B-E)	Feb. 49-Sep. 51
6	JV		Dec. 45-Dec. 46
16		MK915	July-Aug. 44 and Dec. 45-Mar. 46
17	UT	SM406 (UT-H)	Feb. 49-Mar. 51
19	QV	MH355	Aug. 43-Jan. 44
	QV	TE458 (QV-J)	Mar.-Oct. 46
20	TH	TD264 (TH-U)	Feb. 49-Oct. 51
28	BF		Aug.-Sep. 45
32	GZ	MA862 (GZ-V)	Apr. 43-June 47
33	5R	PV202	Apr.-Dec. 44
34	4M		Feb. 49-Mar. 51
43	FT	EN140 (FT-10)	Aug. 43-May 47
56 "Punjab"	US	LZ816 (US-V)	May-July 44
63	UB		Sep. 46-Apr. 48
64	SH	MK805 (SH-B)	July 42-44
65 "East India"	YT	MH376	Sep.-Oct. 42 and Aug.-Dec. 43
66	LZ	MK297	May 43-Apr. 45
	LZ	RR263 (LZ-B)	Sep. 46-Mar. 47
72 "Basutoland"	RN	MA444 (RN-B)	Feb. 43-Dec. 46
73	TP	MJ341 ("C")	1944-7
74 "Trinidad"	ZP	PV147 (ZP-M)	1942-Mar. 45
80	W2	EN172 (W2-P)	1944
81	FL	EN120 (FL-P)	Mar. 43-July 43
87 "United Provinces"	LK	NH346 (LK-M)	Aug. 44-Dec. 46
91 "Nigeria"	DL	MJ691	Aug. 44-Apr. 45
92 "East India"	QJ	EN446	July-Sep. 43
93	HN	PV124	Oct. 43-Sep. 45
94			Apr.-July 44 and Feb.-Apr. 45
111	JU	EN138 (JU-M)	July 43-Jan. 47
118	NK	MH488	Jan.-Mar. 44
122 "Bombay"	MT	MH375	1943-Feb. 44
124 "Baroda"	ON	PV303 (ON-B)	July 44-Apr. 46



Another of No. 1435 Squadron's Mk. IXs (MH660), from Castle Bromwich factory, shows the crudely painted-out duck-egg blue rear fuselage band and, similarly, the spinner as far as the back retaining plate. Below the wind shield is the squadron's unofficial emblem, an open-jawed dragon's head painted in green with white teeth and red "flaming" tongue. Above the fin flash is a circular emblem believed to be No. 1435's unofficial crest. (Photo: via Bruce Rigelsford, Air-Britain)

R.A.F. SQUADRONS USING THE Mk. IX AND Mk. XVI

153		MK950	Aug.-Sep. 44
126	5J	MK126 (5J-G)	Sep.-Dec. 44
127	9N	MH417	Apr. 44-Jan. 45
129 "Mysore"	DV	MK777 (DV-T)	1943-Apr. 44 and Jan. 45-Sep. 46
130 "Punjab"	AP	BS434 (AP-A)	Aug. 44-45
131	NX	MA834 (NX-A)	Sep. 43-Mar. 44
132 "Bombay"	FF	MH737 (FF-Y)	Sep. 43-Jan. 45
133 "Eagle"	MD	BR640 (MD-V)	Aug.-Sep. 42
152 "Hyderabad"	UM	MA454 (UM-V)	1942-Dec. 43
154	HT	MJ689	Aug.-Sep. 44
164 "Argentine" British"	UB	SM391	May 45-Aug. 46
165 "Ceylon"	SK	MH381 (SK-U)	Oct. 43-Dec. 44 and June 45-6
185	GL	MA464 (GL-B)	Feb.-July 44 and Oct. 44-Aug. 45
208	RG	PV117 (RG-E)	Mar. 44-46
213	AK	MA676	Feb.-June 44
222	ZD	MH413 (ZD-M)	Apr. 43-Nov. 44
225	WU	JL132	June 44-July 46
229	GR	MH907	1943-4
232	EF	MA581	1942-4
232	EF		1942-4
234	FX	TD310 (FX-C)	1946
237	DV	MH541	Nov. 43-Oct. 45
238	FM	MA455	1943-Oct. 44
241	RZ	MA425 (RZ-R)	June 43-May 45
242	KY		1944-Nov. 44
243		MJ712	Feb.-Sep. 44
249	GN	MA392 ("T-V")	Apr. 43-45
253	SW	LZ836 (SW-D)	1944-Apr. 47
256			Mat-Aug. 44
274	JJ	BS227 (JJ-Q)	Apr. 44-Aug. 45
283			1944-5
287		TB652 (KZ-A)	June 45-June 46
288	RP	SL669 (RP-K)	1944-5
601 "County of London"	UF	MK551 (UF-T)	Jan. 44-Aug. 45 May 1946
602 "City of Glasgow"	ZT	MJ339	Oct. 43-Nov. 44
603 "City of Edinburgh"	9R		Jan.-Aug. 45
604 "County of Middlesex"	XT/RAJ	E347 (RAJ-A)	May 46-June 48
	NG/	RW386	May 46-Nov. 49
	RAK		
607 "County of Durham"	RAN		May 46-July 47
609 "West Riding"	PR	RW359 (PR-G)	..
	RAP	RW378	.. Apr. 48-51
		(RAP-B)	..
611 "West Lancashire"	FY	BS387 (FY-Y)	July 42-June 43 and July 44-Mar. 45
612 "County of Aberdeen"	8W	SL674 (8W-H)	May 46-June 48
	RAS	SL674 (RAS-H)	
614 "County of Glamorgan"	RAU		May 46-July 48

R.A.F. SQUADRONS USING THE Mk. IX AND Mk. XVI

631	6D	SL614 (6D-A)	June 45-Feb. 49
667	U4	TB392	July-Dec. 45
682		EN422	Feb. 43-May 45
691	5S	TB993	Aug. 45-Feb. 49
695	4M/ 8Q	TE450	1945
1435	V	MH660 ("Y-V")	Mar. 43-May 45

ALLIED SQUADRONS UNDER R.A.F. FIGHTER COMMAND

302 (Polish)	WX	MH869 (WX-R)	Oct. 43-Jan. 45
303 (Polish)	RF	MA814	1943-5
306 (Polish)	UZ	BS184 (UZ-K)	Sep. 43-Mar. 44
308 (Polish)	ZF	ML407	Oct. 43-Aug. 44
310 (Czech)	NN	TE572 (NN-U)	Sep. 43-Feb. 46
312 (Czech)	DU	MK244	Sep. 43-Feb. 46
313 (Czech)	RY	MK694 (RY-E)	Oct. 44-Feb. 46
315 (Polish)	SZ	BS514	Oct. 42-Mar. 44
316 (Polish)	PK	EN186 (PK-J)	1943-Aug. 44
317 (Polish)	JH	BS302 (JH-B)	1942-5
318 (Polish)	LW	PL353	Oct. 44-46
322 (Dutch)	3W	MJ642 (3W-11)	
326 (Free French)	9I		Dec. 43-Nov. 45
327 (Free French)		MJ133	1944-Nov. 4 5
328 (Free French)	S8	MA912	1944-Nov. 45
329 (Free French)	5A	PT455 (5A-C)	Jan. 44-Nov. 45
331 (Norwegian)	FN	PL187 (FN-Z)	1943-Nov. 45
332 (Norwegian)	AH	BS249 (AH-R)	1943-Nov. 45
340 (Free French)	GW	BS129 (GW-B)	Sep. 42-45
341 (Free French)	NL	BS538 (NL-B)	Mar. 43-45
345 (Free French)	2Y	MJ241 (2Y-F)	1944-5
349 (Belgian)	GE	MJ360 (GE-H)	Mar. 44-Jan. 45
350 (Belgian)	MN	MJ150 (MN-G)	Dec. 43-Jan. 44

COMMONWEALTH SQUADRONS

Royal Canadian Air Force:

401	YO	MH911	Aug. 42-Jan. 43 and Oct. 43-May 45
402	AE	BM526 (AE-X)	Aug. 42-Apr. 43 and July-Aug. 44
403	KH	BR630	Jan. 43-Dec. 44
411	DB	EN574 (DB-S)	Oct. 43-Sep. 44 and Nov. 44-May 45
412	VZ	MJ452 (VZ-L)	Nov. 43-May 45
414	RU		Aug. 44-Apr. 45
416	DN	BS127	Mar. 43-June 43 and Jan.-Dec. 44
417	AN	LZ923	Apr. -June 45
421	AU	NH183 (AU-K)	May 43-Dec. 44
441	9G	MJ627	Mar. 44-Apr. 45
442	Y2	MK181	1944-Apr. 45
443	21	MK356 (21-V)	1944-Apr. 45

Royal Australian Air Force:

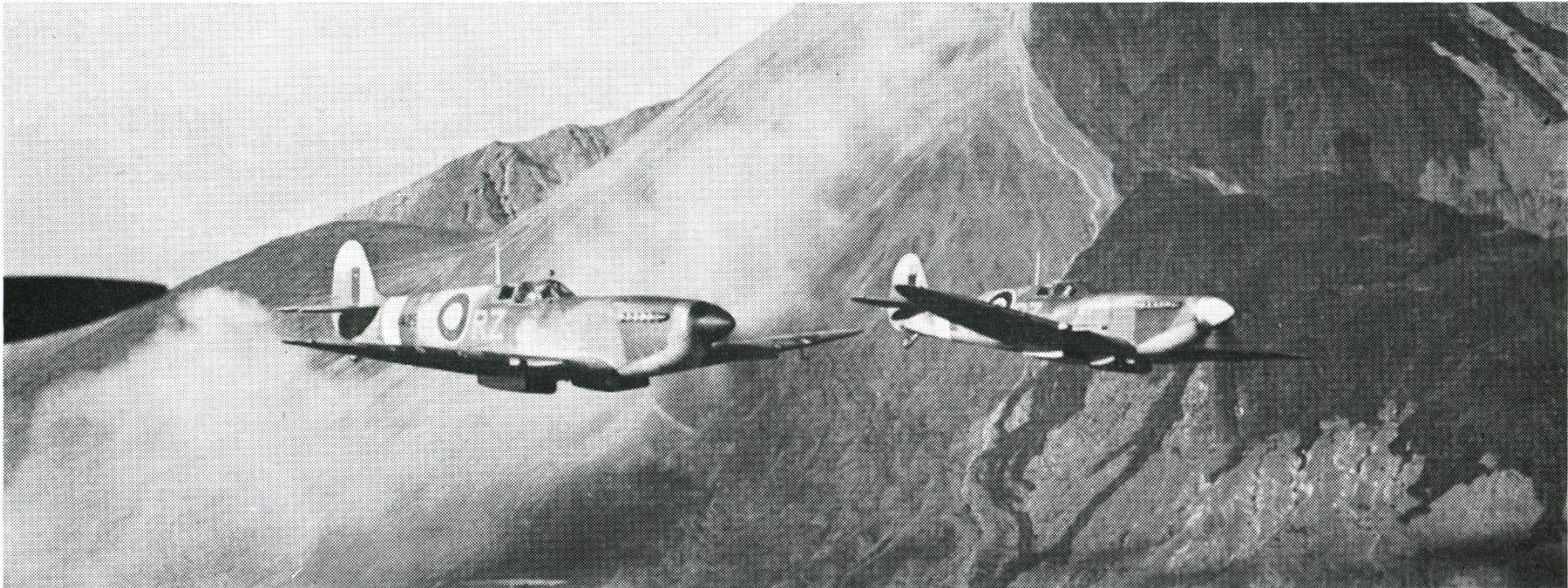
451	NI	MJ135	Dec. 43-45
453	FU	BS441 (FU-T)	Apr. 43-Nov. 44
457	BP		July 43-45

Royal New Zealand Air Force:

485	OU	ML407	July 43–Aug. 45
501 "County of Gloucester"	GD	MJ311 (SD-3)	June 43–July 44
504 "County of Nottingham"	TM	PL256 (TM-L)	Jan. 44–Mar. 45
518			Sep. 45–Oct. 46
521	50		1943–45
567	14	SL614	1944
567	14	SL614	July 44–June 46
577	3Y	SM511	June 45–June 46
587	M4		July 45–June 46
595	7B	PT753 (7B-G)	July 45–Feb. 49
595	7B	PT753 (7B-G)	1945-6



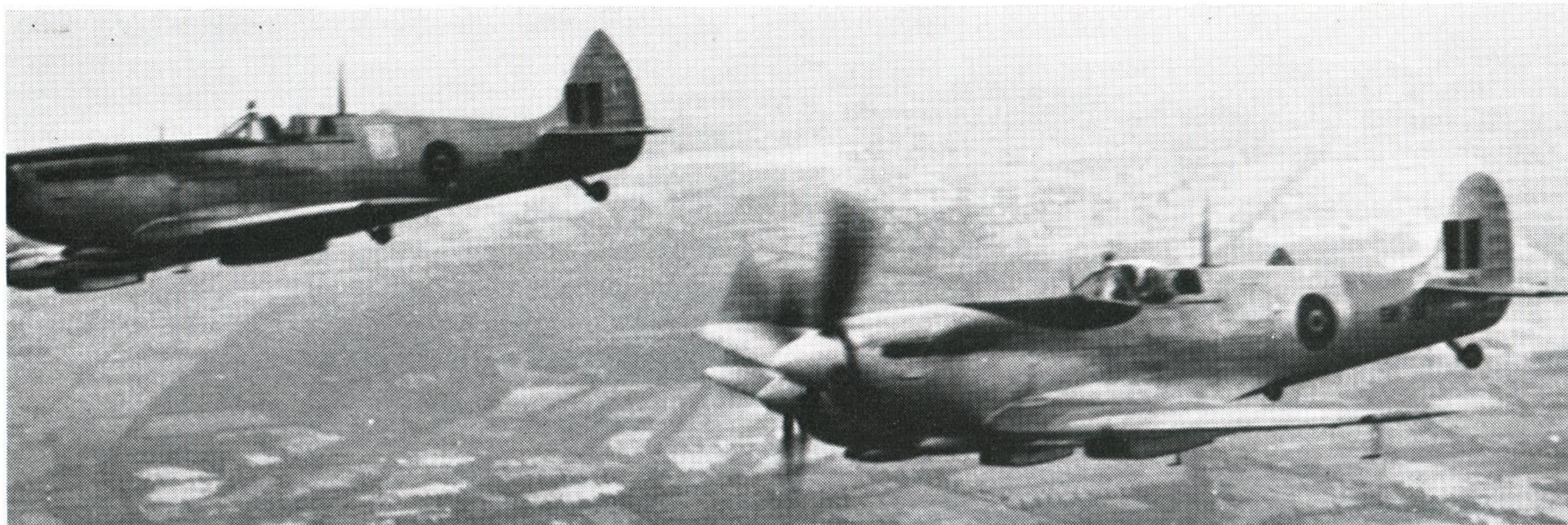
The South African Air Force Spitfire IX, W5581 (ex TD213) on display at Waterkloof Base, Johannesburg.
(Photo: Hans B. Andersen)



Spitfires all—natural and man-made. Two Mk. IXC Spitfires of No. 241 Squadron passing near Mt. Vesuvius, an active volcano, on their return to a base near Naples after covering the Anzio beach-head in 1944. The lead aircraft with black spinner is SM425, coded RZ-R.
(Photo: I.W.M.)

The only R.A.F. squadron to have a four-digit number, No. 1435 Squadron was formed out of dire necessity as No. 1435 Flight in 1941 during the Battle of Malta with Hurricane IIs. Disbanded in Spring 1942, it was again reformed with "surplus" No. 603 Squadron pilots in July 1942 and, by the end of 1943, what had now become No. 1435 Squadron exchanged its Mk. V Spitfires for Mk. IXs. Photograph shows squadron personnel whose pilots hailed from as far away as New Zealand, Canada and South Africa, as the latter's army-type headgear confirm. From the beginning of 1944 until the war's end, No. 1435 Squadron spent most of its time engaged in ground-support sorties, first from Sicily and then through Italy. This photograph was taken at Brindisi in early 1944.
(Photo: via Bruce Rigelsford, Air-Britain)





Four Spitfire Mk. IXs of the Belgian Air Force with armament removed.

(Photo: Amilpress, Brussels)

Surviving Spitfire Mk. IXs and XVIs:

R.A.F. serial	Mk. No.	Painted as	Owner	Location
BS464	F. Mk. IXc	BS464 (GW-S)	Musée de l'Air	Paris, France
MH350	F. Mk. IX	MH350 [R.Nor.A.F.(FN-M)]		Bodo, Norway
*MH415	L.F. Mk. IXb	G-AVDJ	Wilson C. Edwards	Harlingen, Texas, U.S.A.
*MH434	H.F. Mk. IXb	G-ASJV	—	Bovingdon, Herts., U.K.
MH727	Mk. IX	—	—	—
MJ289 (?)	Mk. IXc	MJ289 [R.Neth.A.F.(VL-V)]	—	Eindhoven, Netherlands
MJ383	L.F. Mk. IX	SM-15	R. Bel. A.F. Museum	Brussels, Belgium
MJ627	L.F. Mk. IXc (Tnr.)	G-ASOZ (ex-Irish A.C. 158)	jointly T. A. Davies & J. S. Fairey	Bossington, Hants., U.K.
MJ755	Mk. IXc	MJ755	R. Hellenic A.F.	Greece
*MJ772	L.F. Mk. IXc (Tnr.)	G-AVAV (to be sold)	N. A. W. Samuelson	Elstree, Herts., U.K.
MK297	H.F. Mk. IXc	"N1882" (spurious)	Confederate A.F.	Harlingen, Texas, U.S.A.
*MK356	L.F. Mk. IXc	(ex-"M5690")	Ministry of Defence	Henlow, Beds., U.K.
MK732	F. Mk. IXc	—	ex-R.A.F. Gütersloh, W. Germany	St. Athan, Glam., U.K.
			now No. 4 Sch. of Tech. Tng.	
LK912	L.F. Mk. IXc	MN-P	R. Bel. A.F.	St. Truiden (St. Trond), Belgium
LK923	F. Mk. IXc	Civil N521R	C. Robertson	California, U.S.A.
ML407	Mk. IX	(ex-Irish A.C. 162)	N. A. W. Samuelson	London, U.K.
ML427	L.F. Mk. IXc	ML427 (ST-A)	Birmingham Mus. of Sc. & Inds.	Birmingham, U.K.
NH188	H.F. Mk. IXc	NH188 (AU-H)	Nat. Mus. of Canada	Ottawa, Ontario, Canada
NH238	H.F. Mk. IXc	—	T. H. Pasteur	Newark, Notts., U.K.
NH417	H.F. Mk. IXe	41-401 R. Dan. A.F.	R. Arsenal Mus.	Copenhagen, Denmark
PV202	Mk. IX	(ex-Irish A.C. 161)	N. A. W. Samuelson	London, U.K.
RR263	L.F. Mk. XVIe	(ex-R.A.F. Kenley: TB597 GW-R)	l'Armée de l'Air	Tours, France
*RW382	L.F. Mk. XVIe	—	Ministry of Defence	R.A.F. Henlow, Beds., U.K.
RW386	L.F. Mk. XVIe	"RF114"	Ministry of Defence	R.A.F. Halton, Bucks., U.K.
RW388	L.F. Mk. XVIe	"AB917 The Inspirer"	Ministry of Defence	R.A.F. St. Athan, Glam., U.K.
RW393	L.F. Mk. XVIe	RW393	Ministry of Defence	R.A.F. Turnhouse, Scotland, U.K.
SL542	L.F. Mk. XVIe	SL542 (SH-N)	Ministry of Defence	R.A.F. Coltishall, Norfolk, U.K.
*SL574	L.F. Mk. XVIe	(ex-R.A.F. Bentley Priory)	Ministry of Defence	R.A.F. Henlow, Beds., U.K.
SL674	L.F. Mk. XVIe	—	Ministry of Defence	R.A.F. Biggin Hill, Kent, U.K.
SL721	L.F. Mk. XVIe	SL721 (JM-R)	W. D. Ross	Chicago, Ill., U.S.A.
*SM411	L.F. Mk. XVIe	SM411 (ex-R.A.F. Wattisham)	Ministry of Defence	R.A.F. Henlow, Beds., U.K.
TB252	L.F. Mk. XVIe	TB252	Ministry of Defence	R.A.F. Boulmer, Northumbld., U.K.
*TB382	L.F. Mk. XVIe	TB382	Ministry of Defence	R.A.F. Henlow, Beds., U.K.
TB752	L.F. Mk. XVIe	TB752	Ministry of Defence	R.A.F. Manston, Kent, U.K.
TB863	L.F. Mk. XVI	TB863	Bill Francis	Southend, Essex, U.K.
TD135	L.F. Mk. XVIe	TD135 (NG-U)	P. Sheppard	Hereford, Herefordshire, U.K.
TD248	L.F. Mk. XVIe	TD248 (DW-A)	Ministry of Defence	R.A.F. Sealand, Flints., U.K.
TE184	L.F. Mk. XVIe	TE184 (ME-M)	Ministry of Defence	R.A.F. Finningley, Yorks., U.K.
TE288	L.F. Mk. XVIe	TE288	Brevet Club of Canterbury	Christchurch, S. Island, N.Z.
*TE308	L.F. Mk. IXc (Tnr.)	G-AWGB	N. A. W. Samuelson	Elstree, Herts., U.K.
*TE311	L.F. Mk. XVIe	(ex-R.A.F. Tangmere)	Ministry of Defence	R.A.F. Benson, Oxon, U.K.
TE330	F. Mk. XVIe	TE330 (ex-R.A.F. Biggin Hill)	U.S.A.F. Museum	Wright-Patterson A.F.B., Dayton, Ohio, U.S.A.
TE353	L.F. Mk. XVIe	TE353	R.C.A.F.	Rockcliffe, Ontario, Canada
*TE356	L.F. Mk. XVIe	(ex-R.A.F. Bicester)	Ministry of Defence	R.A.F. Kemble, Glos., U.K.
*TE384	L.F. Mk. XVIe	TE384	Ministry of Defence	R.A.F. Henlow, Beds., U.K.
TE392	L.F. Mk. XVIe	(one-time "VZ477")	Ministry of Defence	R.A.F. Wellesbourne Mountford, Warwickshire, U.K.
TE456	L.F. Mk. XVIe	TE456 (Code: 43)	Auckland Inst. & Mus.	Auckland, N. Island, N.Z.
TE462	L.F. Mk. XVIe	TE462 (RAN-B)	Ministry of Defence	R.A.F. Ouston, Durham, U.K.
*TE476	L.F. Mk. XVIe	TE476	Ministry of Defence	R.A.F. Henlow, Beds., U.K.
TE565	L.F. Mk. IXe	(NN-N)	Nat. Tech. Museum	Prague, C.S.S.R.

Identifying R.A.F. serials unknown:

—	F. Mk. IX	HS543	Indian A.F.	Palam, New Delhi, India
—	L.F. Mk. IXe	UB-431	Union of Burma A.F.	Mingaladon A.F.B. Rangoon, Burma
—	L.F. Mk. IXc	(3W-1)	Nat. Avn. Mus.	Schiphol, Netherlands
—	F. Mk. IXe	(TA-26)	—	Delfzijl, Netherlands
—	F. Mk. IX	5501	S.A.A.F. Mus.	Johannesburg, S. Africa
—	H.F. Mk. IXe	As W5518	S.A.A.F.	Waterkloof, S. Africa
—	F. Mk. IXc	—	—	Italy
—	F. Mk. IX	5630	S.A.A.F.	S. Africa
—	L.F. Mk. IXe	57 (gloss black overall)	I.D.F./A.F. Mus.	Israel

* See page 33 — Battle of Britain film stars.

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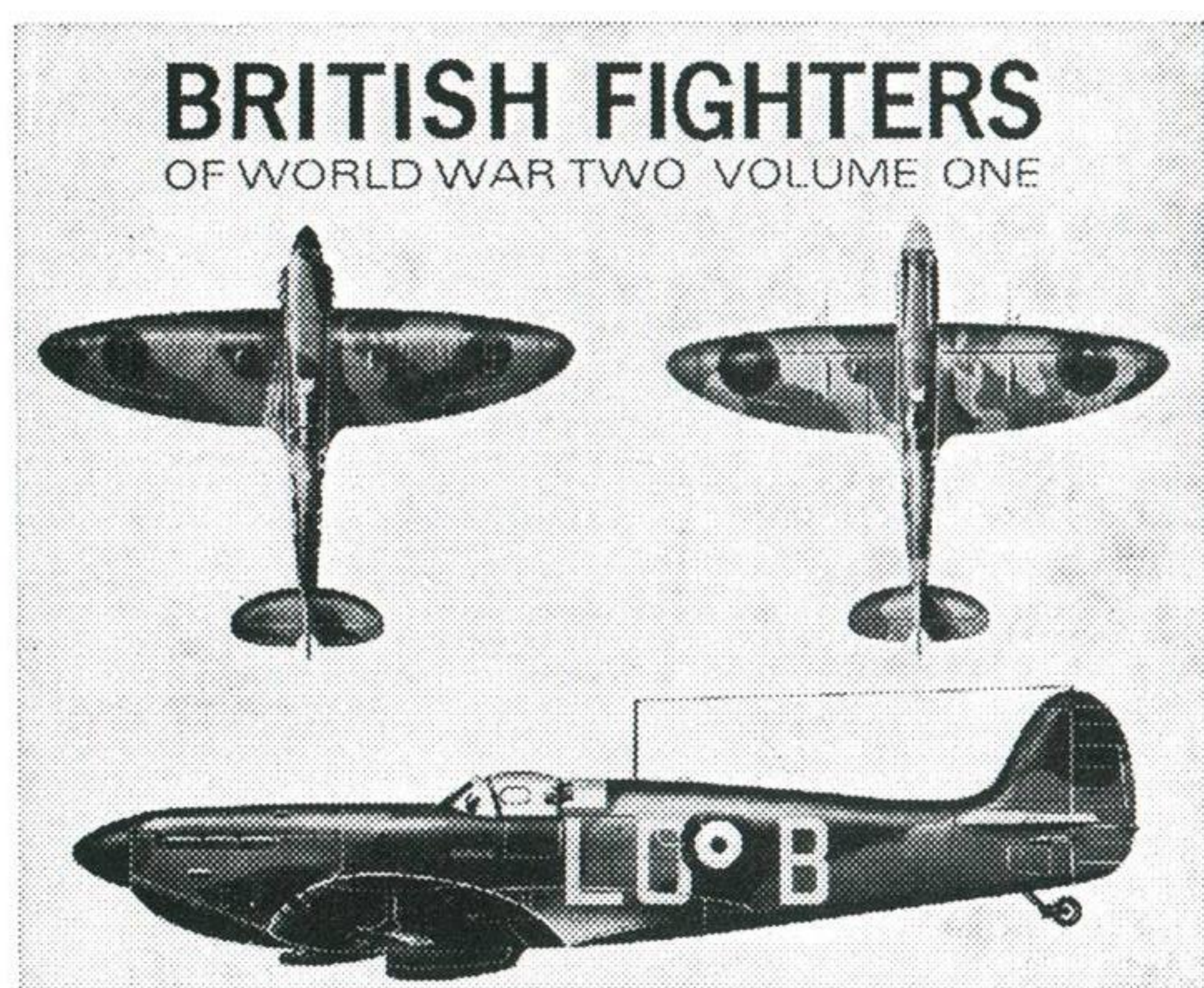
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P. NH-188 at NAM

P TE 308 Don Plumb MK IXC dual.

4 April 2000

1940-47

Rockcliffe R7143
X 4555
X 4492

R7143 (bare metal
(was at Stadacona.)

JG 480 (4th Spit to
ex Winter experimental establish
to be cut up at Boundary Bay

Inv Card
required

PB332

Spitfire II B

also
NH188

C = card. P = photo

- C 1 P Mk I L1090 May 40 - Test upland with XP 40 FL 472 CMA
- C 2 P 116 PB332 Jan 1942 became A-166 Borden (CMA) CMA
- C 3 P VII X4555 spring 1943 (was with 92 Sq. Acute) CMA X
- C 4 P VII R7143 " " To ± 13 Sq. Rockcliffe X X
- C 5 P VI X4492 Photo lunar eclipse 44 & 45. X
- 6 ER824 } En route to N. Africa & Storms drove it to Nfld. Xmas '42
- 7 ES117 }
- 8 ER ??? } Scrapped Torbay (3 Spits assembled into 1 & it flew)
- C 9 P JG-480 ^{also A517} in 1945 flew with WEE Flight Ont & Alberta X
- C 10 P TZ-138 surplus to RCAF July 46 & scrapped in 1949 CMA
1946 Travelled with RCAF, tested with WEE
- 11 VN332 - never tested - Not TOC RCAF.
- TE2A -

(CMA)

P. NH-188 at NAM

P. TE 308 Don Plumb MK IXC dual.

4 April 2000

1940-47

Rockcliffe R7143

X 4555

X 4492

R7143 (bare metal) was Pink for high altitude work
(was at Stadacona.) before leaving England.

JG 480 (4th Spit to RCN in July 46

ex Winter experimental establishment, new CO. ordered it
to be cut up at Boundary Bay

C = card. P = photo

- | | | | | | | | |
|------|---|------|--------|---|--|------------|-----|
| C 1 | P | Mk I | L1090 | May 40 | - Test upland with XP 40 | FL 472 CMA | |
| 2 | P | 11b | P8332 | Apr 1942 | became A 166 Borden | (CMA) CMA | |
| C 3 | P | VII | X4555 | Spring 1943 | (was with 92 Sqn. Ayrton) | CMA | X |
| C 4 | P | VII | R7143 | " " | To #13 Sqn Rockcliffe | | X X |
| C 5 | P | VI | X4492 | Photo lunar eclipse | 44 & 45. | | X |
| 6 | | | ER824 | En route to N. Africa & Storms drove it to Nfld. Xmas '42 | | | |
| 7 | | | ES117 | | | | |
| 8 | | | ER ??? | | | | |
| | | | | Scrapped Torbay (3 Spits assembled into 1 & it flew) | | | |
| C 9 | P | | JG-480 | also A517 | in 1945 flew with WEE Flight Ont & Alberta | | X |
| C 10 | P | | TE-138 | surplus to RCN | July 46 & scrapped in 1949 | CMA | |
| | | | | 1946 Travelled with RCAF, tested with WEE | | | |
| 11 | | | VN 332 | - never tested - Not TOC RCAF. | | | |
| | | | | TE 2A - | | | |

(CMA)