

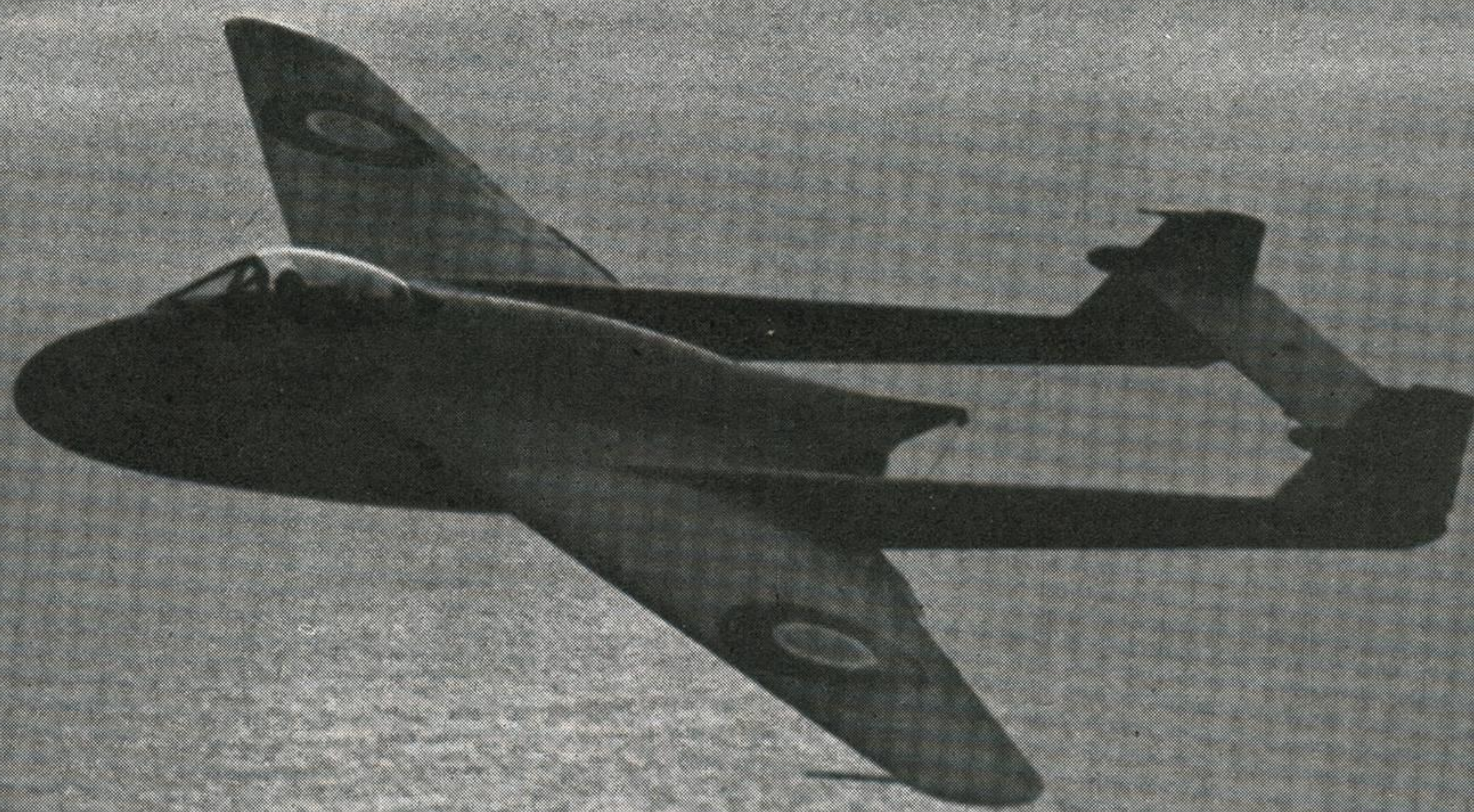
THE INTER



SERVICES

AIRCRAFT RECOGNITION

Journal



NAVAL AIR ARM NUMBER

New Series

SEPTEMBER 1946

Volume I. No. 3

AIRCRAFT

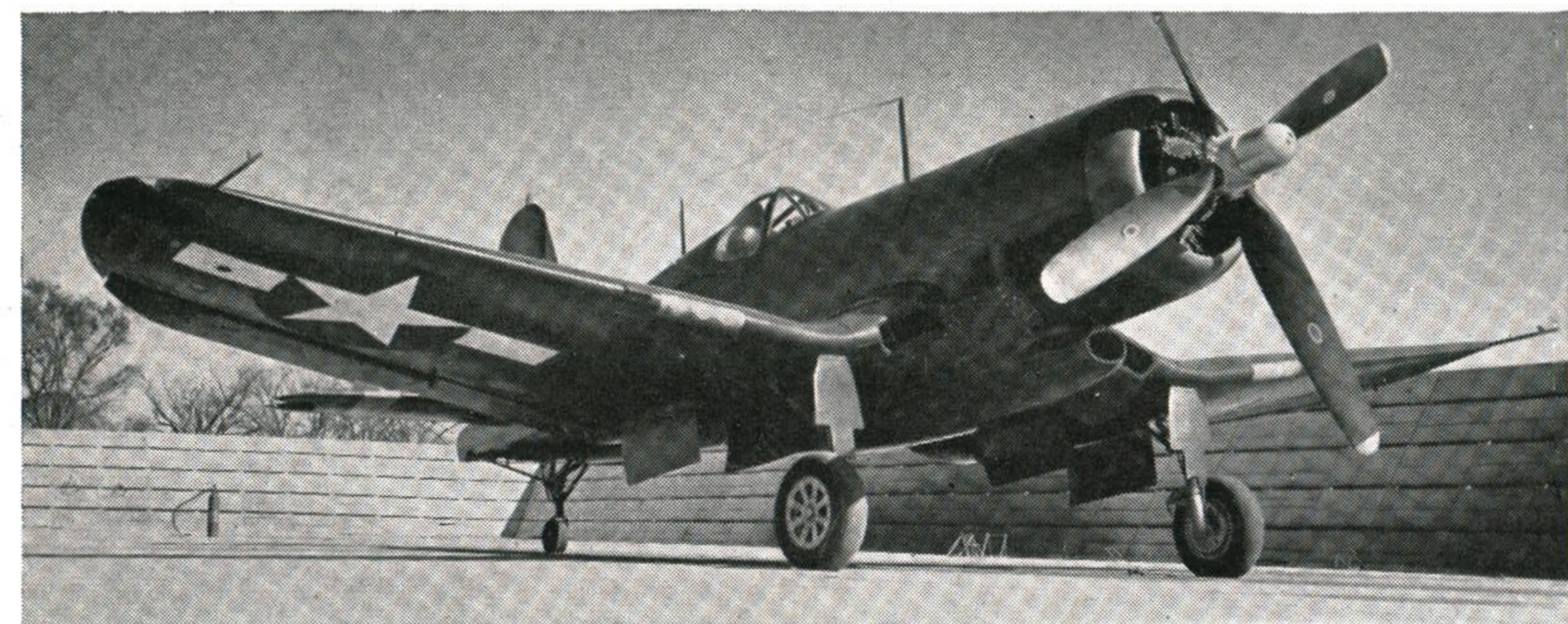
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NEWS

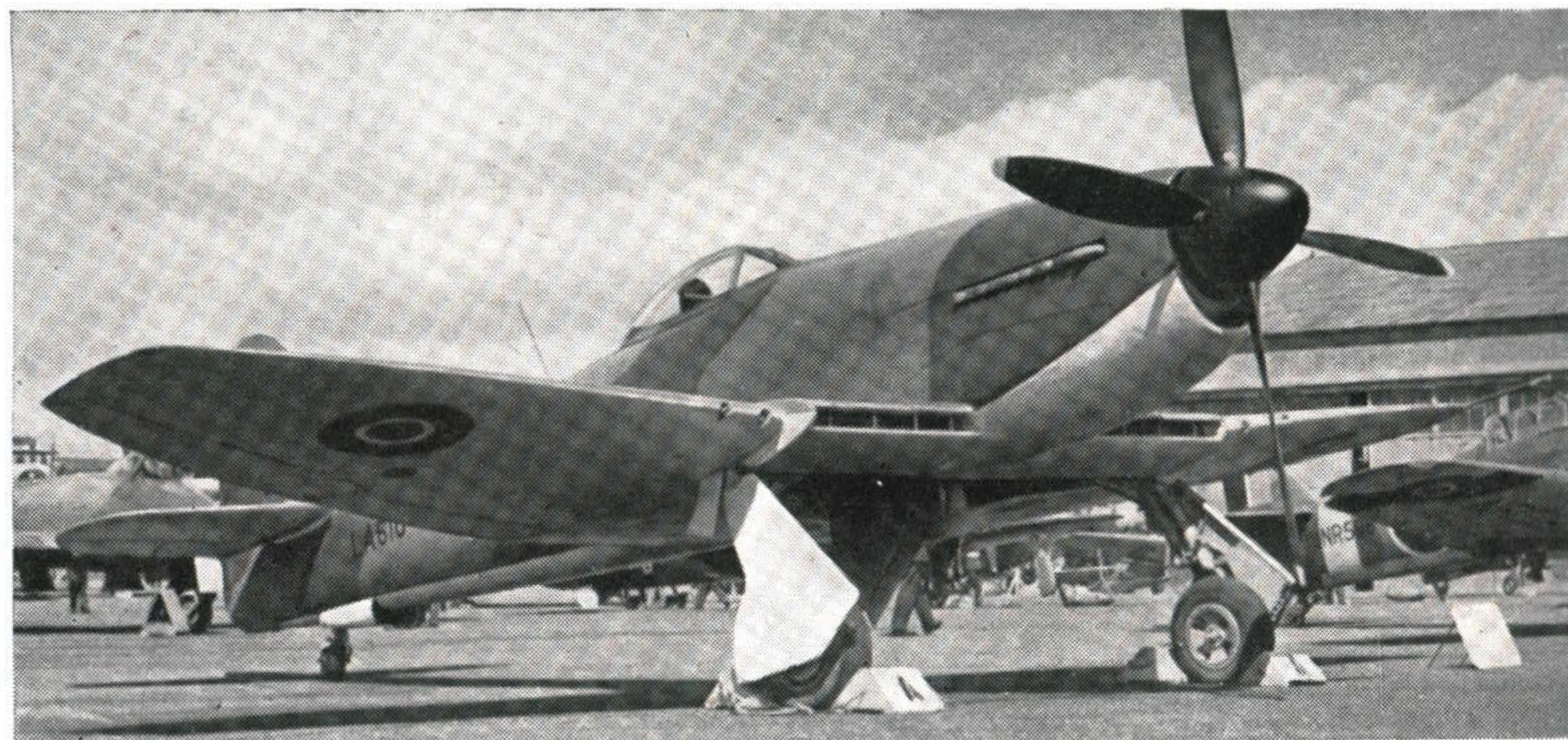
PERCIVAL PRENTICE STEPS OUT—The rear fuselage of this new 3-seat elementary trainer is shallower than that of the Proctor, so the fin and rudder area is greatly increased.



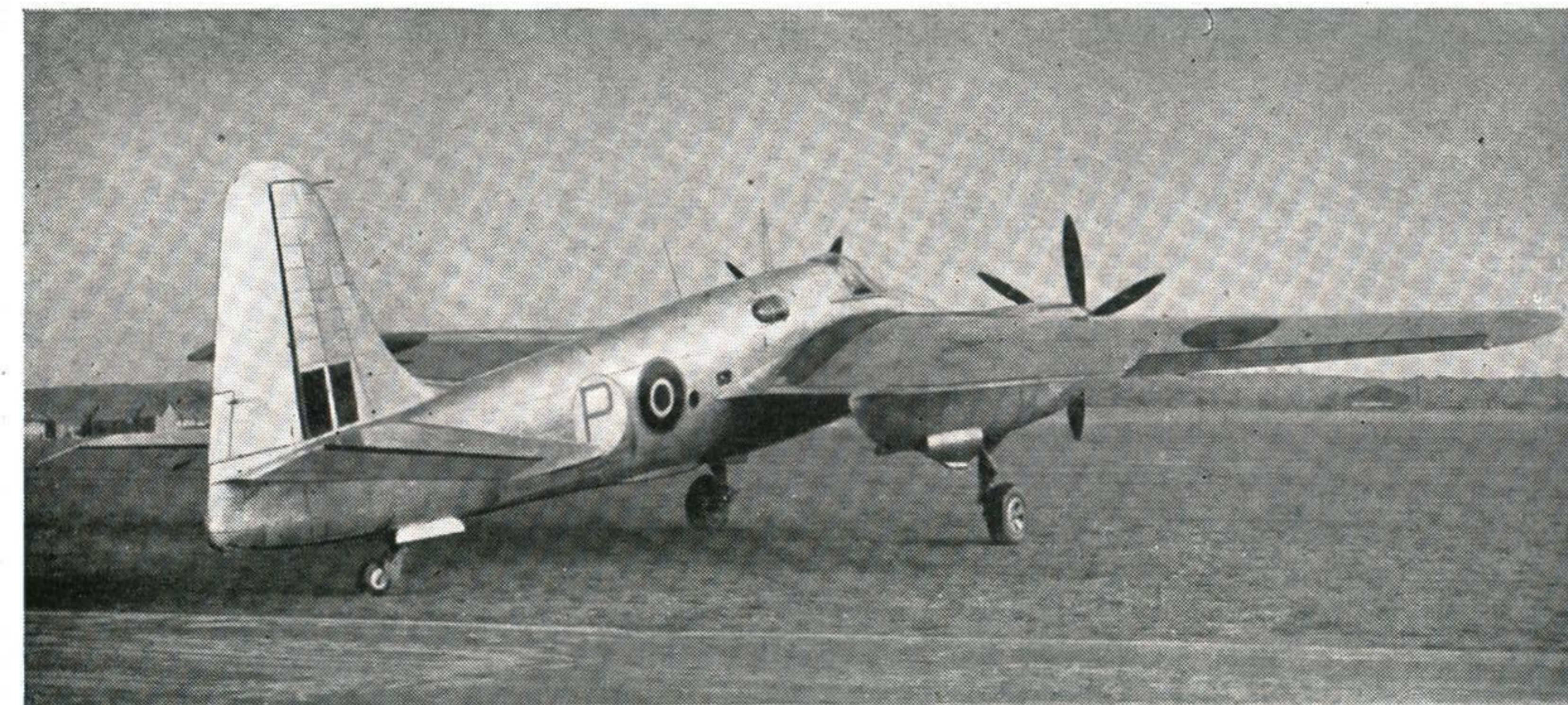
Seen at Farnborough



MORE AIR FOR THE CORSAIR—The turbo-supercharger air intake for the Double Wasp can be seen under the cowling of this XF4U-3 Corsair of the U.S. Navy. Operational ceiling is over 40,000 feet.



HANDLEY PAGE HALTON—Here is the first of twelve for B.O.A.C., named the "Falkirk." Although the turrets have gone and the finish and markings are civilian, the Halifax appearance is still there.



SHORT STURGEON—Something different from Short's is this 2-seat Naval aircraft, designed for reconnaissance. Note the camera window, the neat hook stowage and the Merlins' contra-props.



BRITISH AND BEST.—(Top) Another Hawker Fury variant with a neatly cowled Napier Sabre VII liquid cooled engine—water-methanol injection gives 3,000 h.p. and 485 m.p.h. (Middle) A Spitfire 24 displays an assorted war-load of cannon, R.P., 500lb. bomb and 50-gallon drop tank. The Griffon 61 gives a 460 m.p.h. maximum. (Bottom) A trim dual-control trainer is the Reid and Sigrist Desford, with 130 h.p. D.H. Gipsy Majors. The low wing has blunt tips, moderate taper and prominent flaps.

THE INTER



SERVICES

AIRCRAFT RECOGNITION JOURNAL

(NEW SERIES)

Foreword

by

Rear Admiral G. N. Oliver, CB · DSO
Admiral (Air)

IN those earlier years of the war at sea, all hands soon learnt the vital importance of instant and accurate aircraft recognition. Radar and I.F.F. were non-existent, or else novelties that only sometimes worked.

The following words come to my mind, spoken on the bridge while escorting a straggler to Malta in 1941 :

Lookout : " Group of aircraft, Red 50, closing."

P.C.O. : " I think they are the Beaufighters from Malta."

Lookout : " They may be Beaufighters, Sir, but they've got yellow noses and black crosses on their tails."
(They were *not* Beaufighters.)

And so it went on. For final judgment, we relied, as we must ever rely, on the trained human eye.

Nor was it only a knowledge of enemy types that was necessary. As our own aircraft became more and more numerous, only an intimate knowledge of every type prevented more frequent tragic cases of mistaken identity.

We must keep alive the high standard of recognition achieved during the war, upon which the safety of our ships and aircraft may one day again depend. I wish particularly to bring the importance of this subject to those junior officers and men who are now embarking on permanent careers in the Royal Navy.

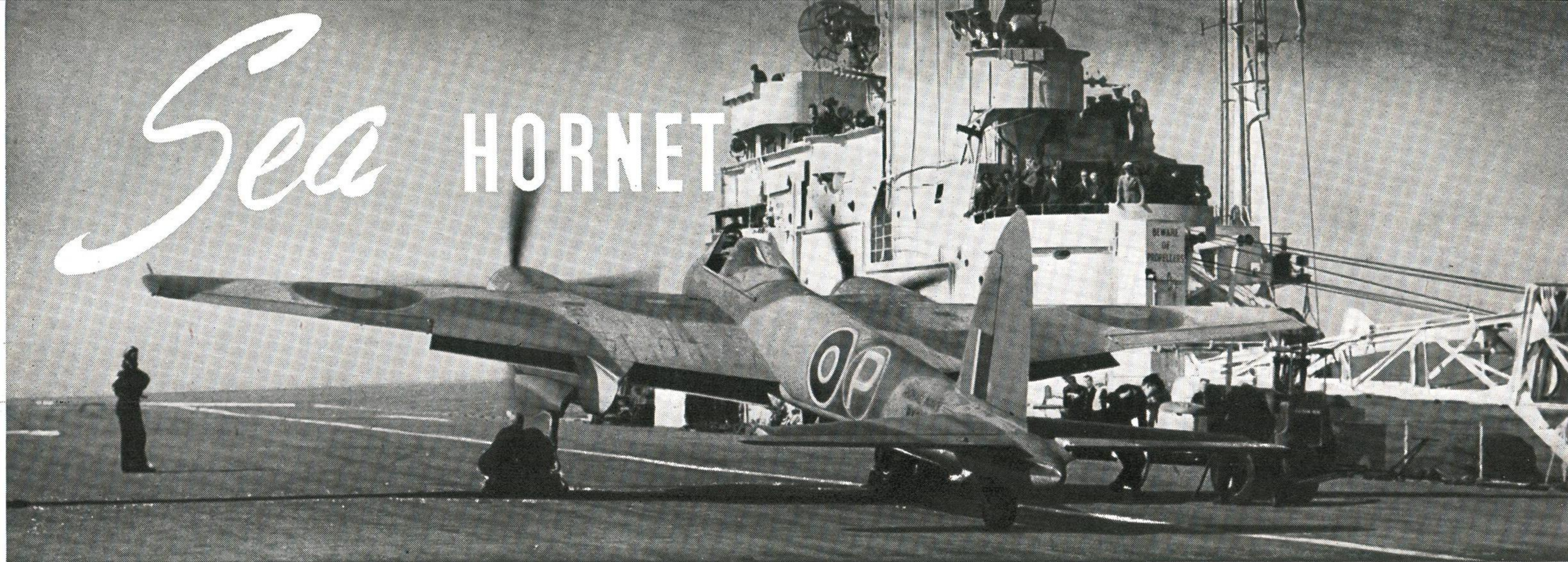
A Central Naval School of Recognition has recently been established in the Air Command for the purpose of training instructors in Recognition. The School is not restricted to Naval Aviation, but is available to the whole of the Royal Navy.

This issue of the Journal is devoted primarily to Naval Aircraft and it is therefore appropriate to remark here that the Central School of Recognition will welcome suggestions from the Fleet for the future development of Recognition Training.

Lee-on-Solent,
August, 1946.



Sea HORNET



By Flight Lieutenant C. E. Sargeant



ON 10th August, 1945, the "landing on" of the prototype Sea Hornet inaugurated the Carrier trials of the first twin-motor Navy fighter. These trials proved successful and production now goes ahead.

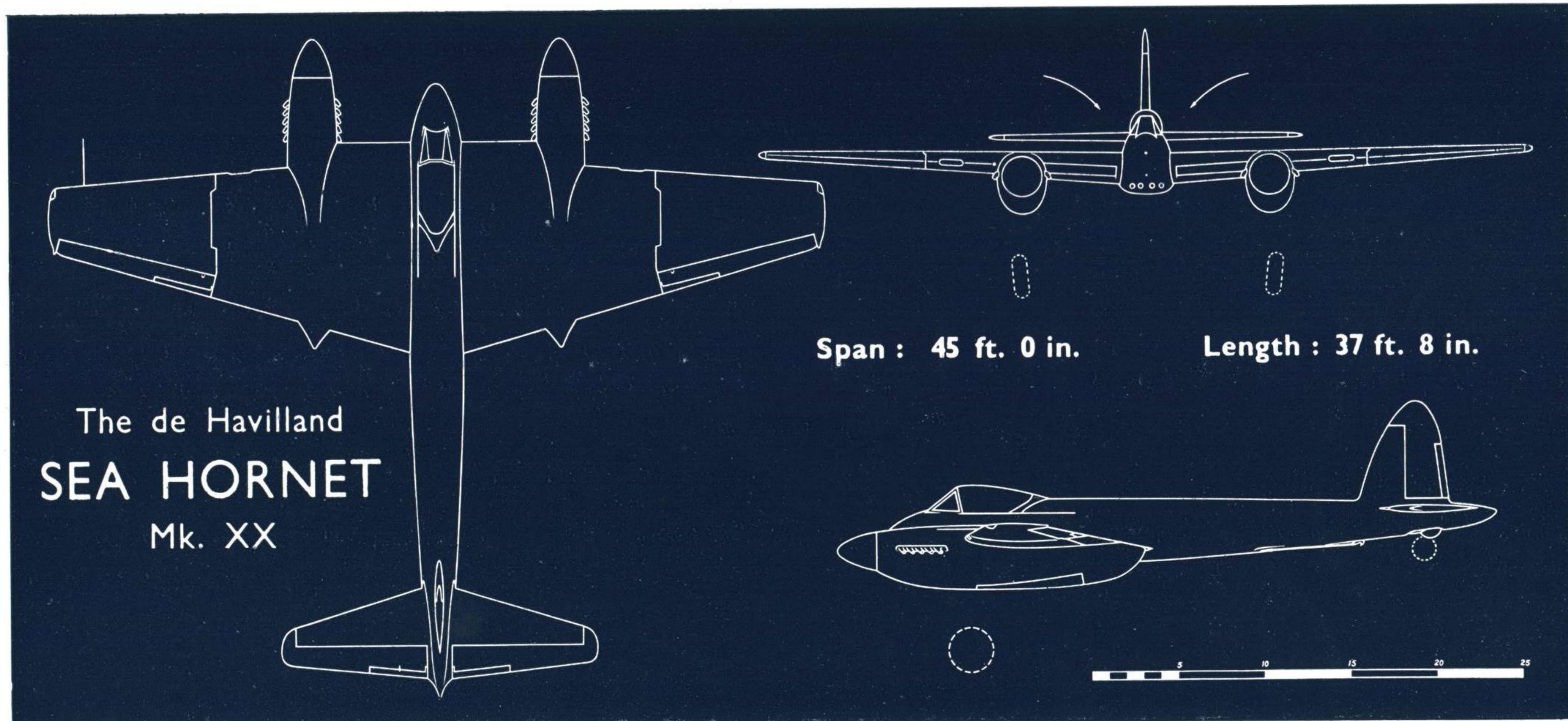
Designed to Air Ministry Specification F.12/43, the D.H.103 was projected as a fighter and photo-reconnaissance type for the R.A.F. and called the Hornet. It flew for the first time on 28th July, 1944—just a year from the official word "go" by M.A.P.—although it had been on the drawing board since 1942, as a private venture.

The Royal Navy, with a sea-eagle eye on long range among other things, added a "hook" to its belly, power-folding gear to its wings and both rocket and deck accelerator gear, together with other items of Naval equipment, and called it the Sea Hornet. The total weight of the carrier-operating gear is about 550 lb., so there is very little difference in performance as compared with the land-based Hornet fighter.

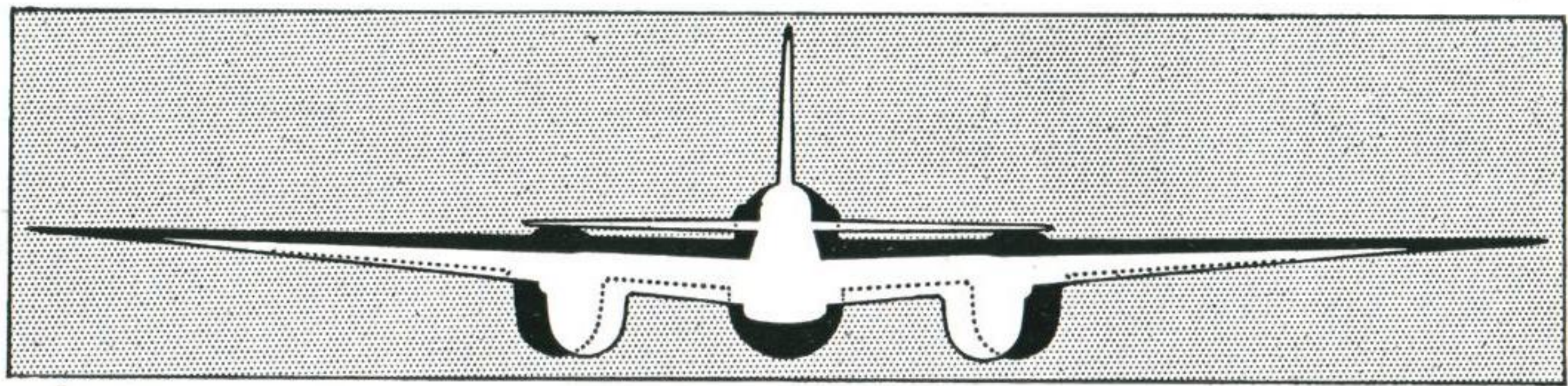
The two Merlin motors produce over 4,100 h.p. between them, while the two four-bladed propellers, being opposite rotating, eliminate torque. The motors fit snugly into two very long, close-fitting, underslung nacelles, the underslung giving a completely clear top surface to the wing. The motors project well ahead of the nose of the fuselage, in fact of the whole aeroplane, which is an excellent feature as far as spotting goes.

They have a large undercarriage to contain, and this—together with aerodynamic considerations—accounts for their great length. As a point of interest, they are actually half as long as the fuselage, in common with which they have an extremely neat and clean form and their rear ends extend slightly beyond the trailing edge of the wing. The radiators—main coolant and oil—the inter-coolers, and supercharger intakes for the motors are neatly contained within the slot-like intakes adorning the leading edge between motors and fuselage—thus avoiding the drag normally attendant upon the placing of these items in projecting excrescences.

The wing is straight-edged and square-cut at the tip. Of wood and metal two-spar construction, it tapers in plan and thickness. The top surface is of ply-wood whilst the lower is of alclad sheet. Root width is exaggerated by the projecting leading edge intakes. The wing is situated well forward on the fuselage, the tapers seeming to sweep it even further forward, whilst root depth minimises the effect of the mid-position. The taper in thickness accounts for most of the dihedral angle. Most of the extensive petrol tankage system is contained within the wings, the outer panels of which hinge upon a chordwise line where flap meets aileron. Recalling the Hurricane's span of 40 feet, and the wing span of the Hornet being only 45 feet, it will be appreciated that a tremendous amount of power and punch has been packed inside a relatively small airframe; the top speed is 472 m.p.h. at 22,000 feet.



In all aeroplanes where fineness of fuselage form exists, as it does in the Sea Hornet, a cockpit, however neatly designed and



Relative frontal areas of Hornet and Mosquito

snugly fitted, seems a necessary nuisance. Bearing in mind the long-range function of this aeroplane, it combines, as far as possible, efficiency with comfort. The rear-sliding hood is a one-piece moulding, whilst the 4½ in. thick, bullet-proof windshield slopes back to meet it, to make the whole structure conform as far as possible to the excellent fuselage lines. The pilot being situated high and in line with the leading edge of the wing and with only a very short length of fuselage nose in front of him, has an excellent view forward and down; most helpful for deck landings.

The fuselage itself is small and ovoid in cross-section. Built upon the same principles and of materials similar to that of the Mosquito, it consists of a wooden monocoque, made in two halves joined along top and bottom lines, of very good streamline form tapering to a point at the rear. The tail wheel retracts, almost completely, into the tail-cone. The skin covering is a sandwich of plywood/balsa/plywood, wooden bulkheads being inserted at intervals. One, sometimes two, petrol tanks are

carried in the fuselage, and the gun armament is situated beneath the cockpit floor. The "sting" type arresting-hook is fitted to the belly of the fuselage about half-way between wing trailing edge and tailplane.

The layout of the tail unit is characteristic of de Havilland design, with the half-ellipse of the fin and rudder in advance of the tailplane. The whole unit is of all-metal construction. The tailplane, adjustable for rigging, is a conventional two-spar aerofoil tapered back on the leading edge to small tips of blunt appearance. The effect of the tapers, in general, is to sweep the tailplane back.

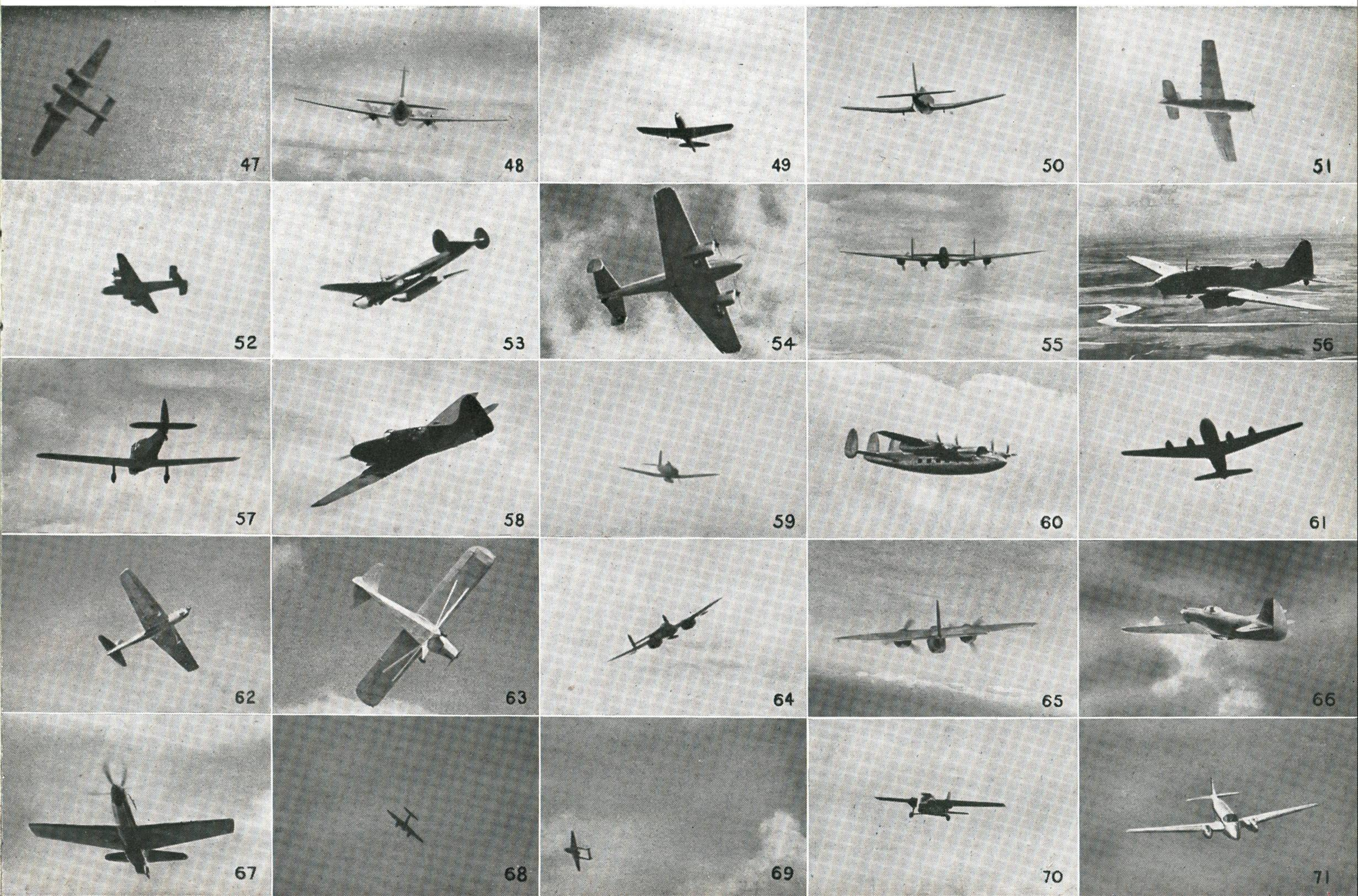
Equipment and Armament. Apart from the four 20 m.m. cannon in the fuselage firing forward through the nose, two bombs, each up to 1,000 lb., may be carried beneath the wings as an alternative to rocket projectiles or wing drop tanks (nacelle type). Wings can be spread or folded with the bombs in position. There is an extensive armour plate covering the head, shoulders and back of the pilot. A camera gun is installed in the nose and can be used dependently or independently of the guns.

Impressions and Prominent Features. The fin and rudder is obviously, by reason of shape and position, a clear indication of identity in a broad De Havilland sense. The extension of motors so far forward and the little snub nose lost between the two, is, perhaps, the biggest help in picking out this aeroplane at once. Squared-off wing tips and wing plan generally remind one of the Messerschmitt Me110 (of accursed memory) though there can now be precious little chance of confusion between the two. A generally fine performance is matched by a generally fine appearance.

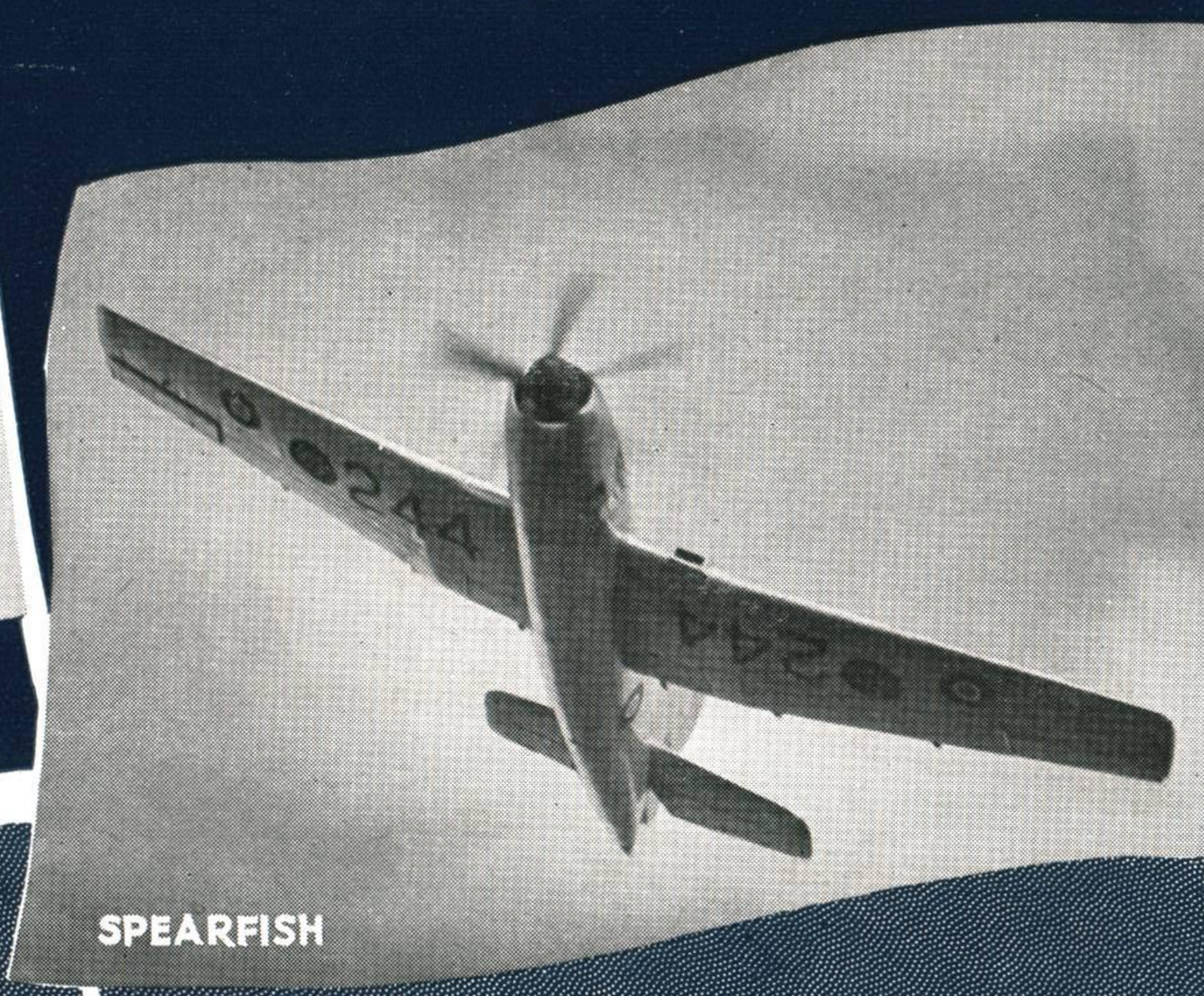
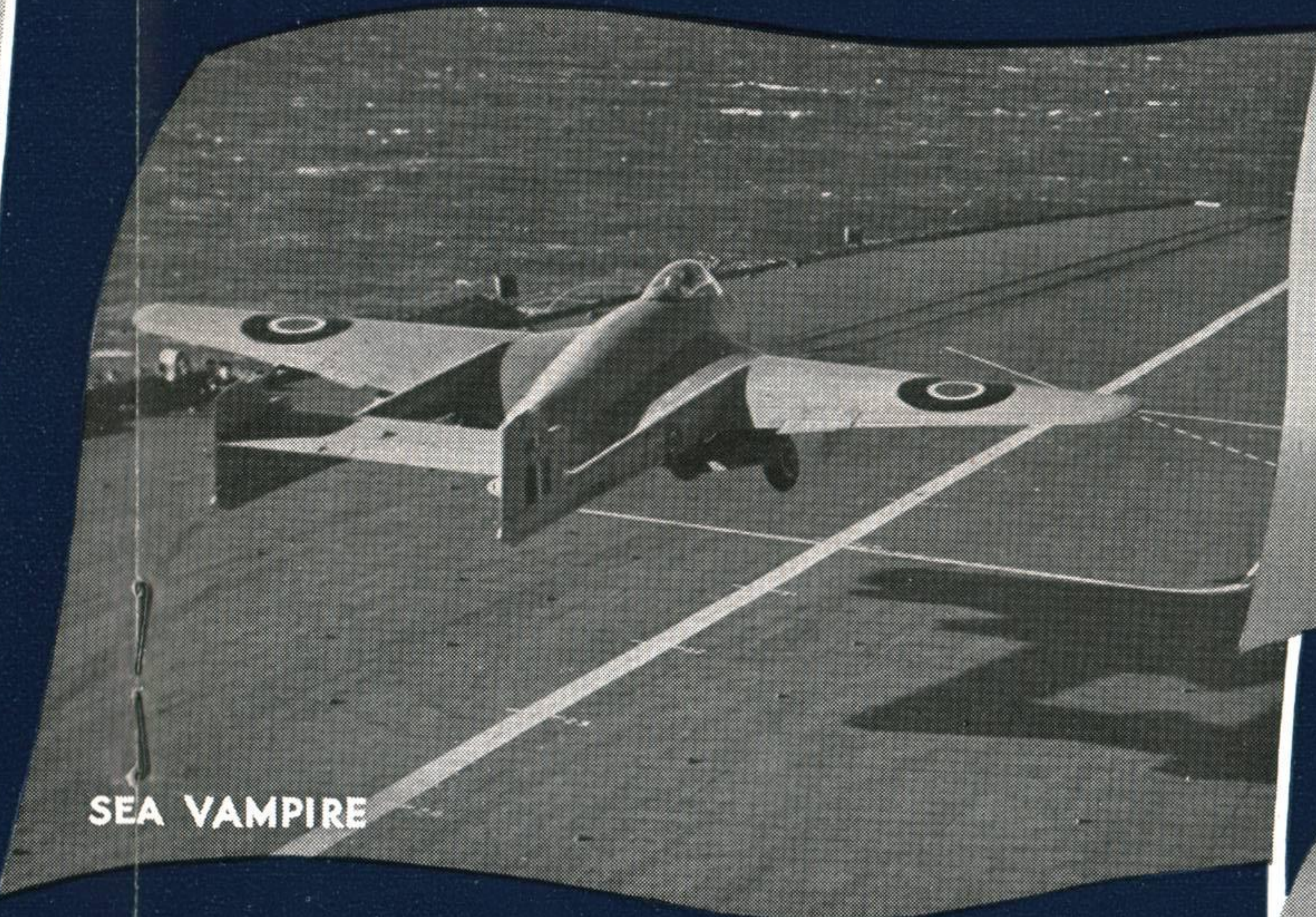
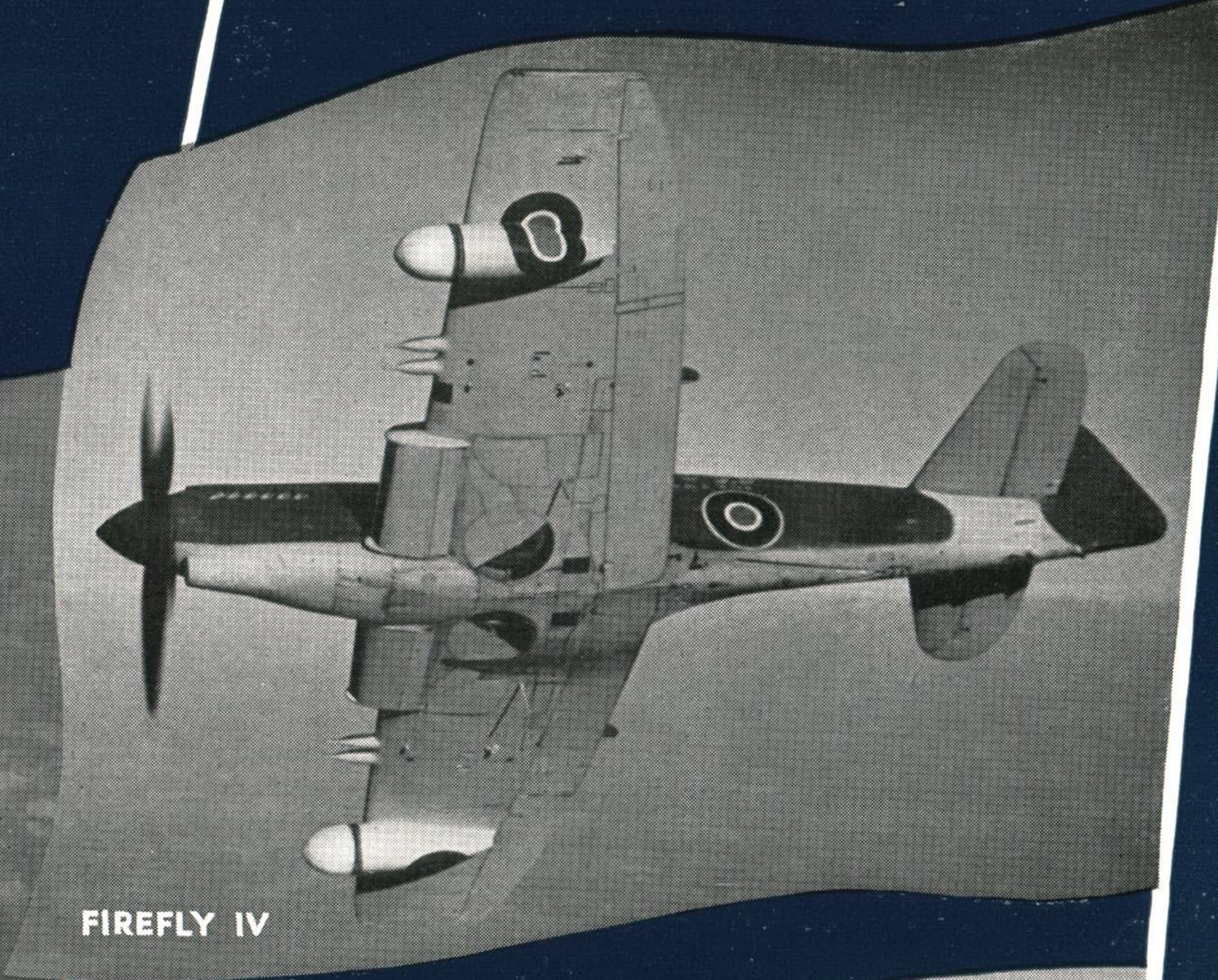
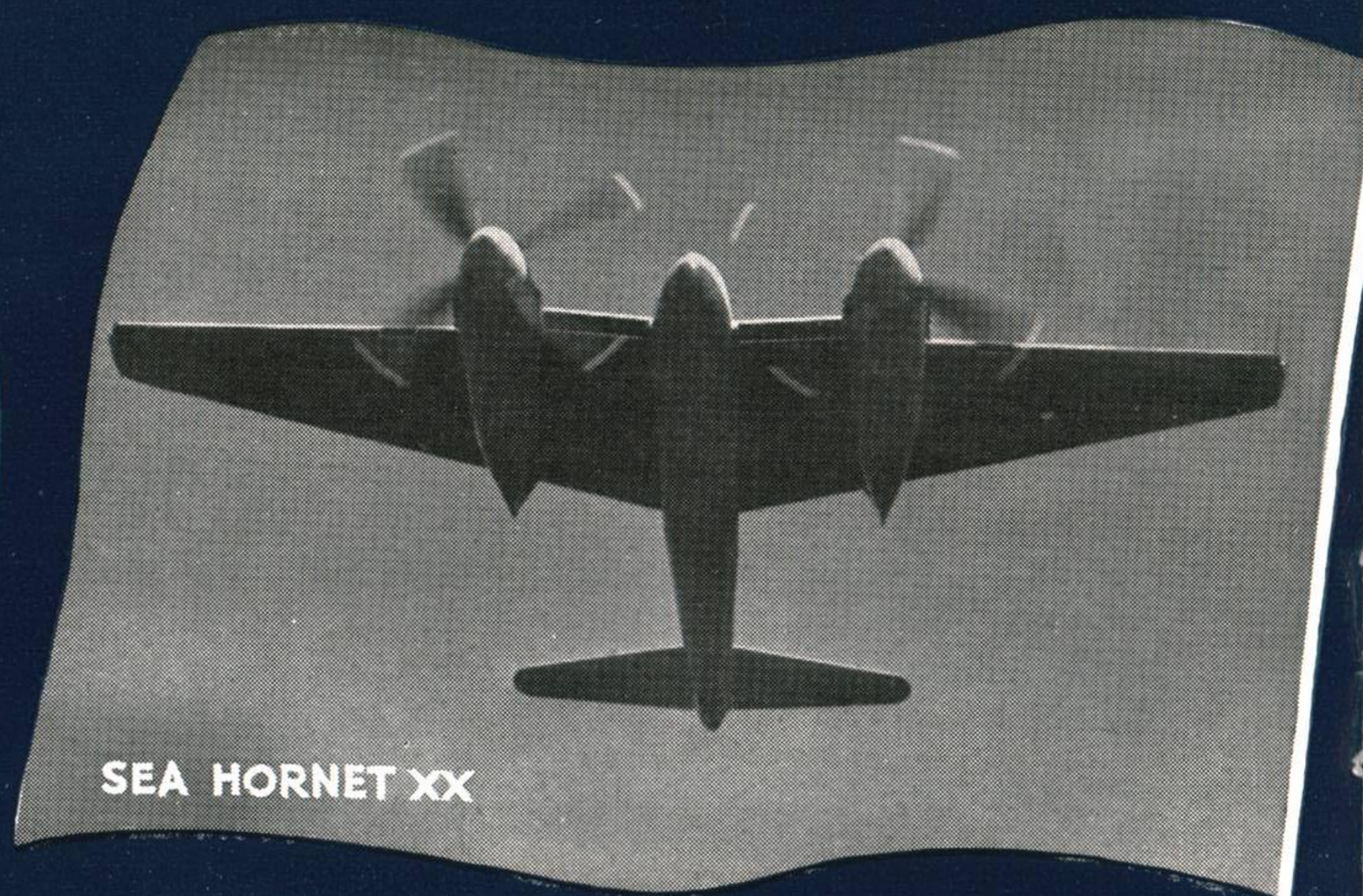


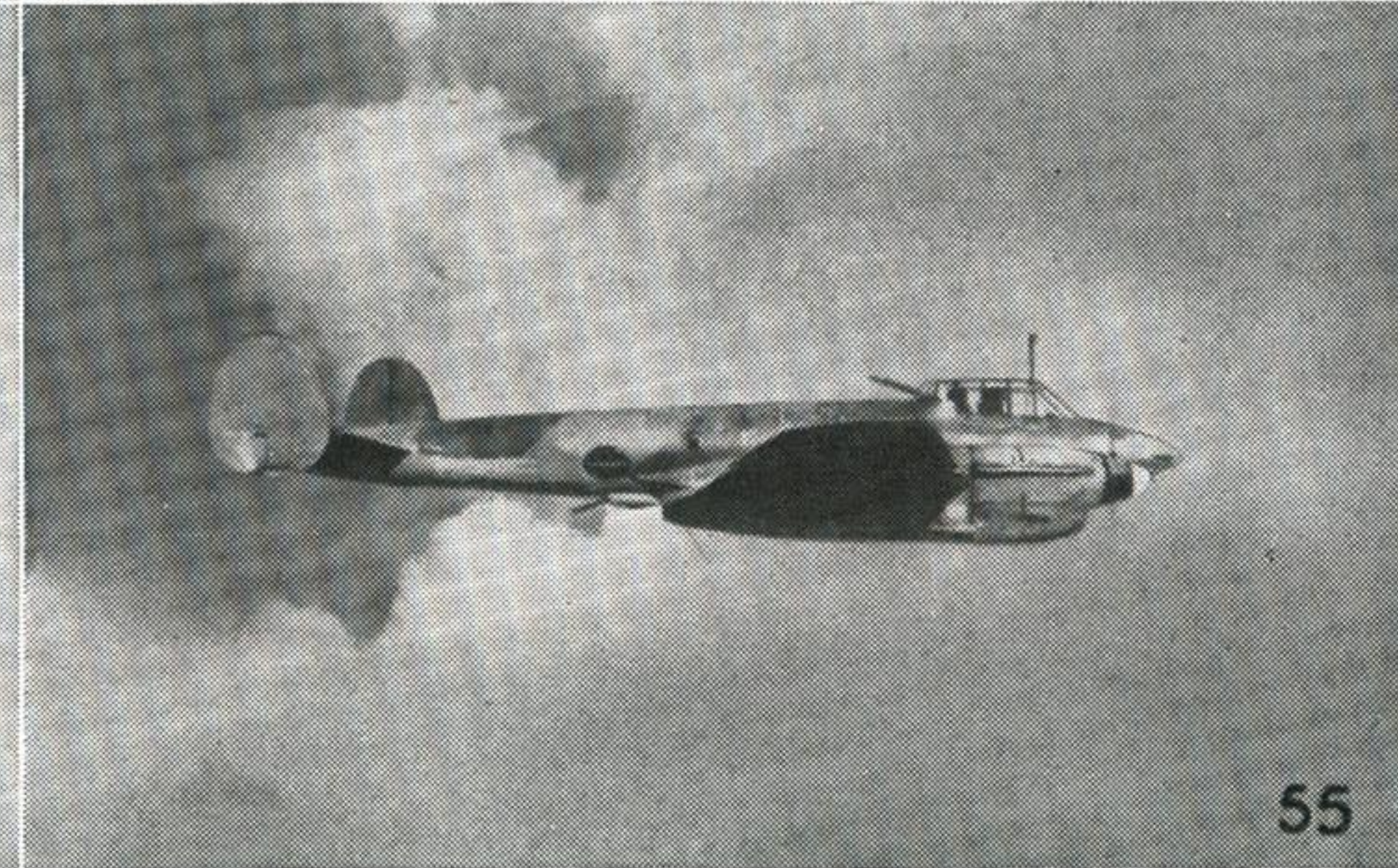
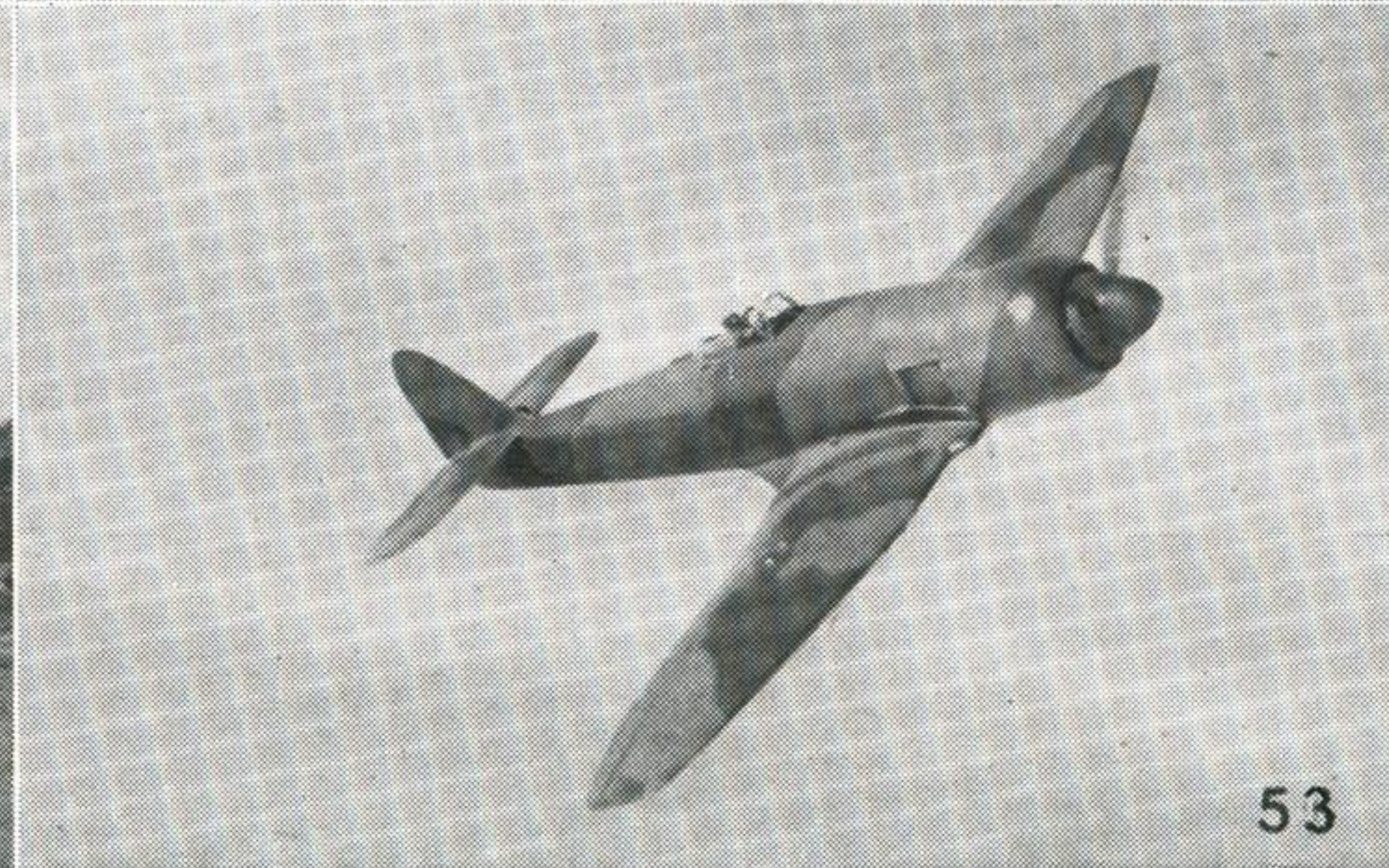
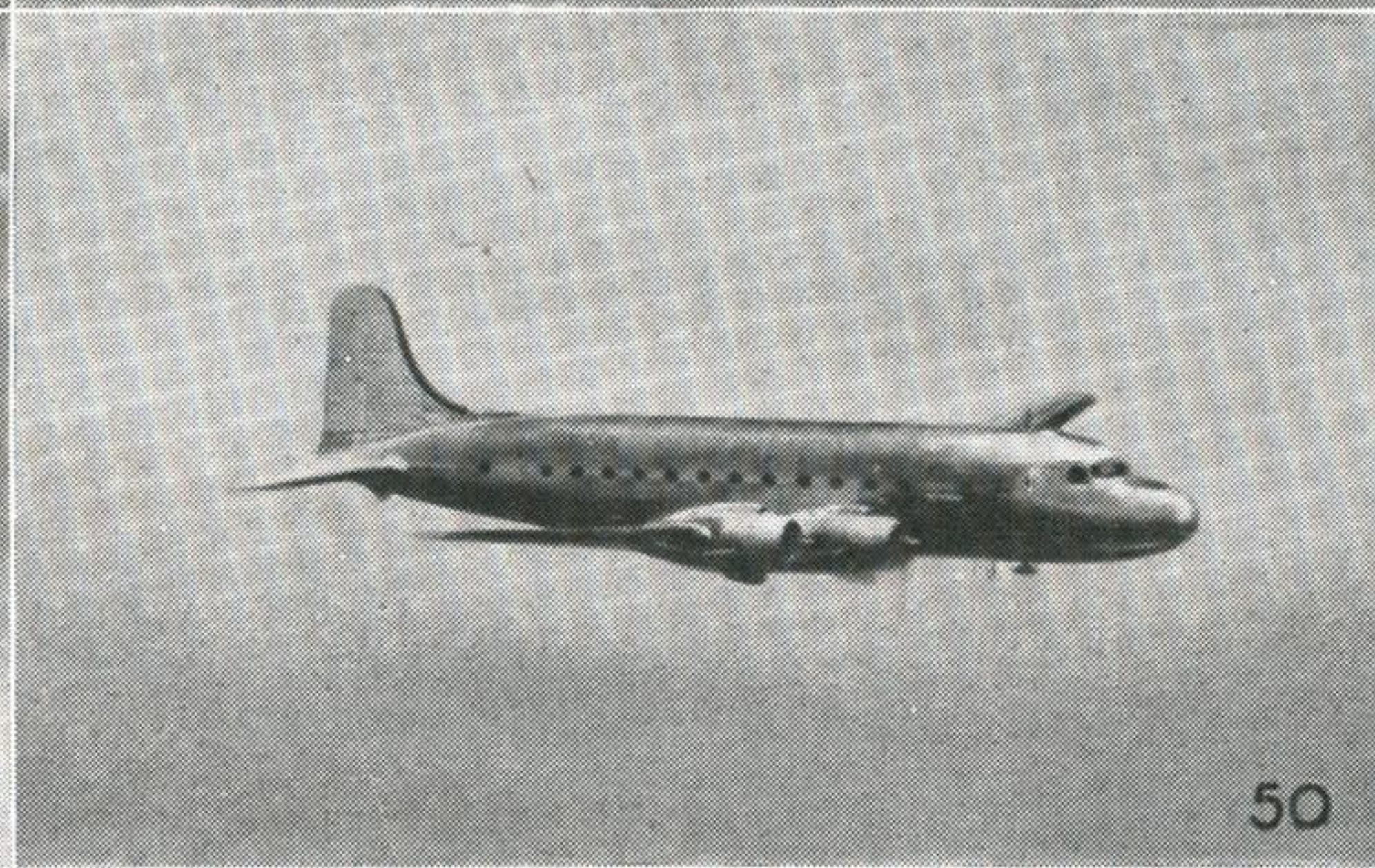
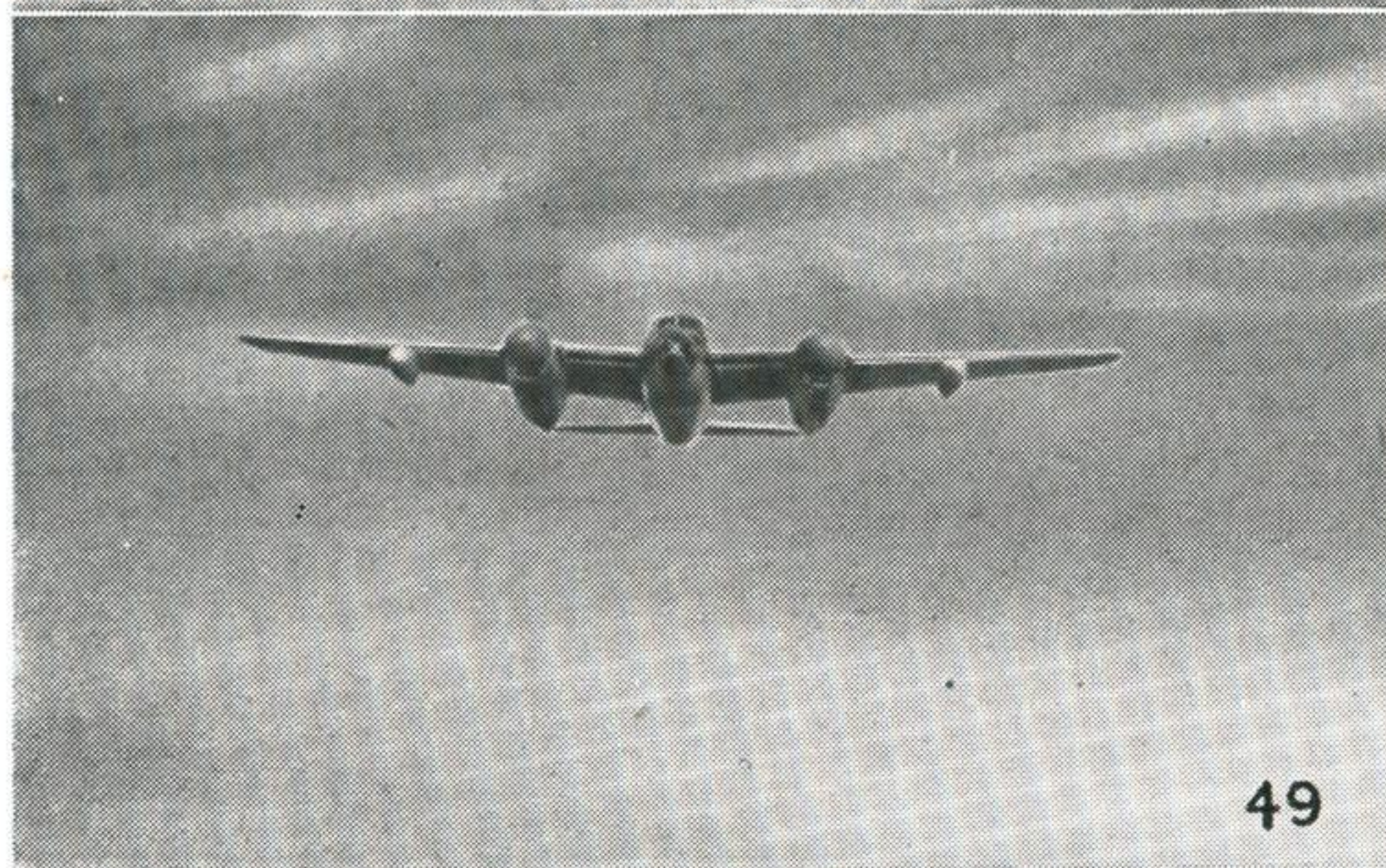
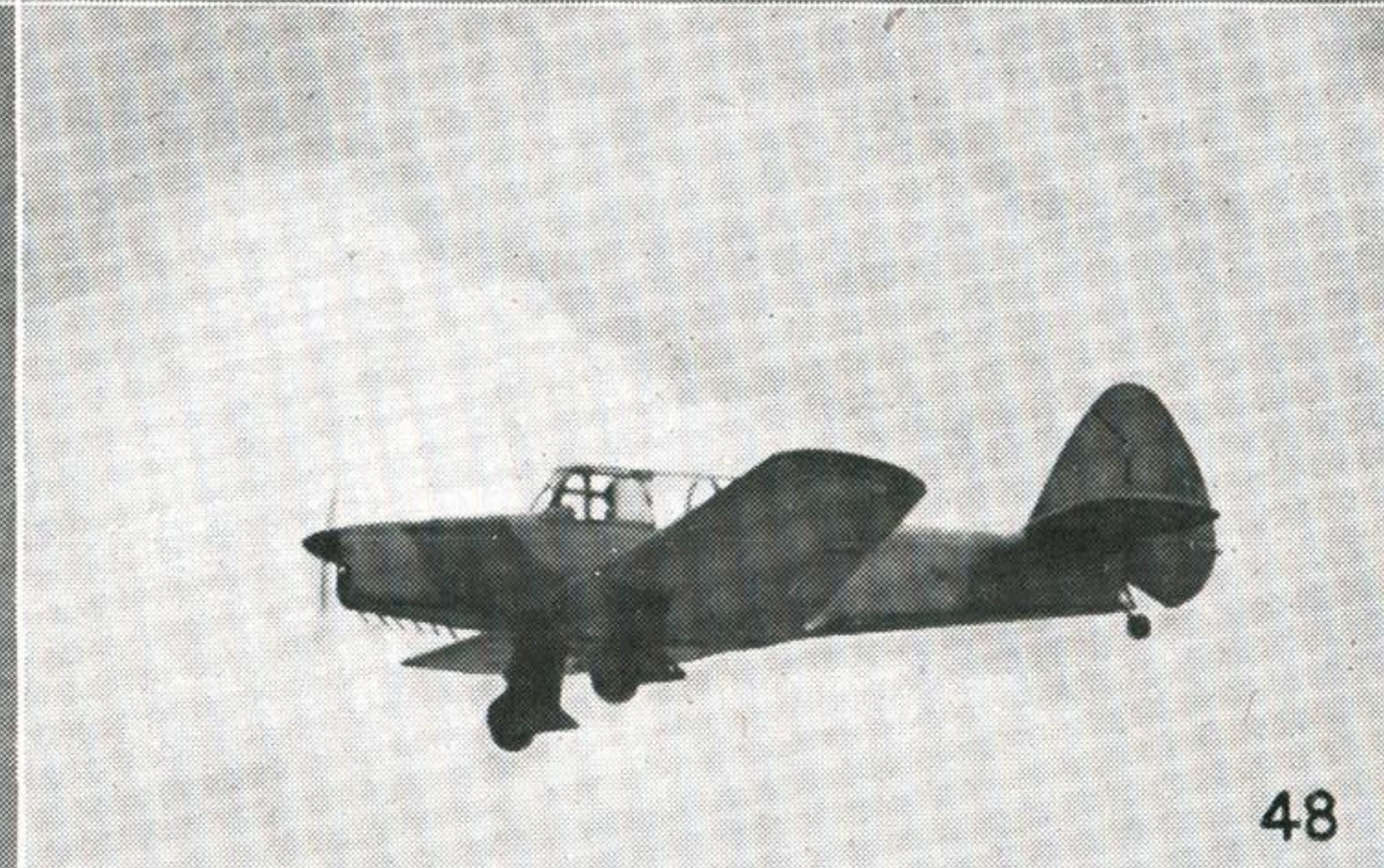
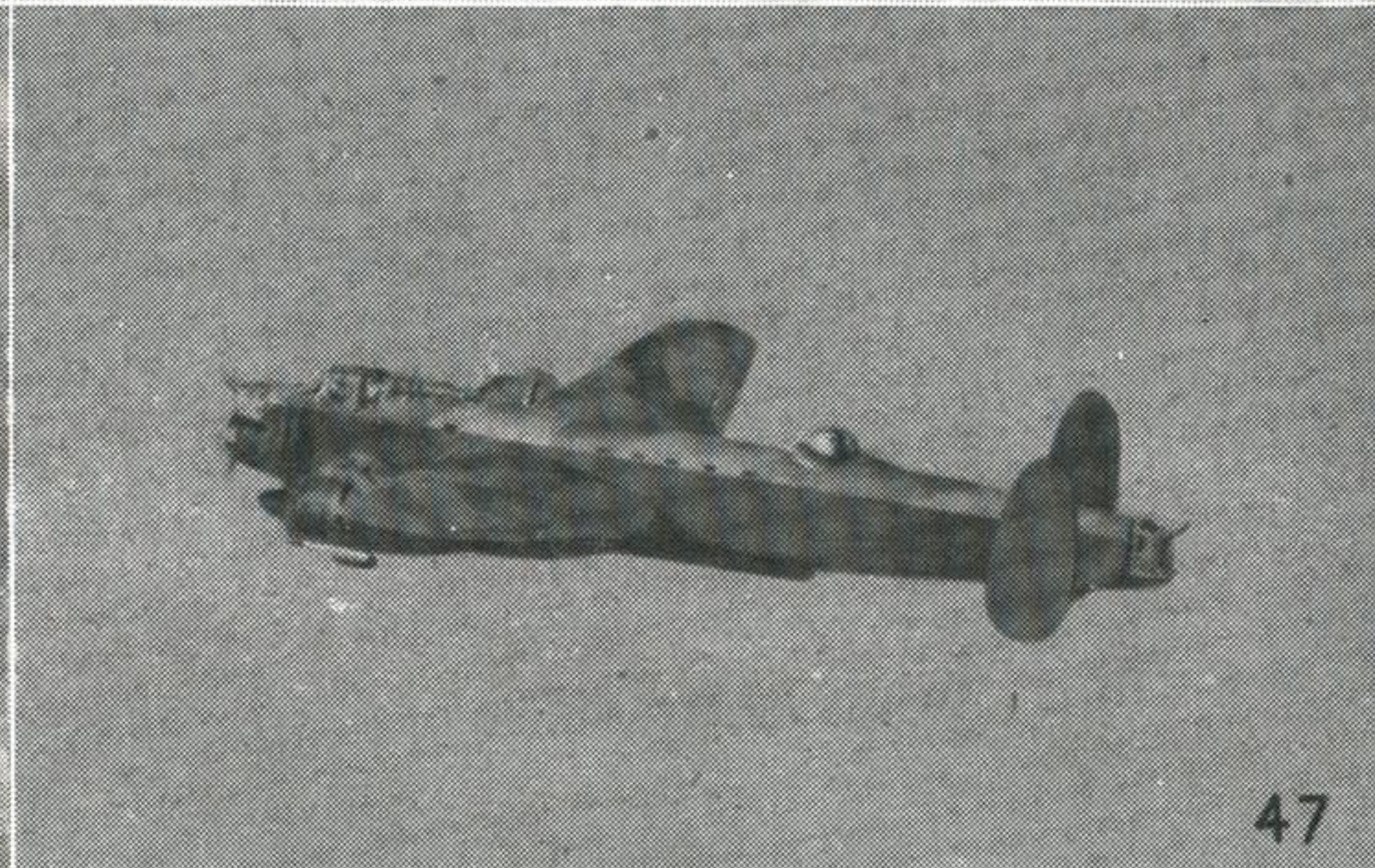
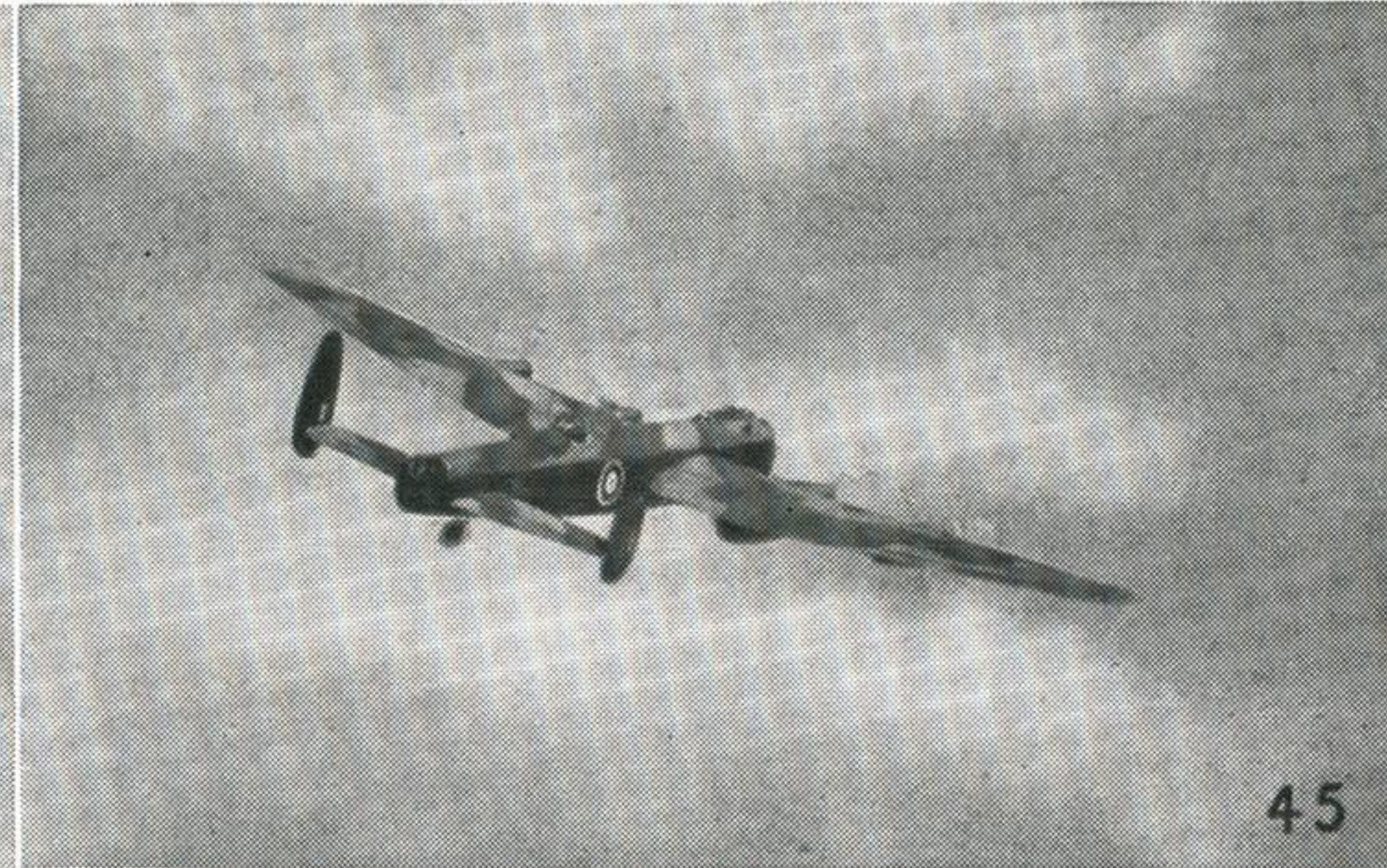
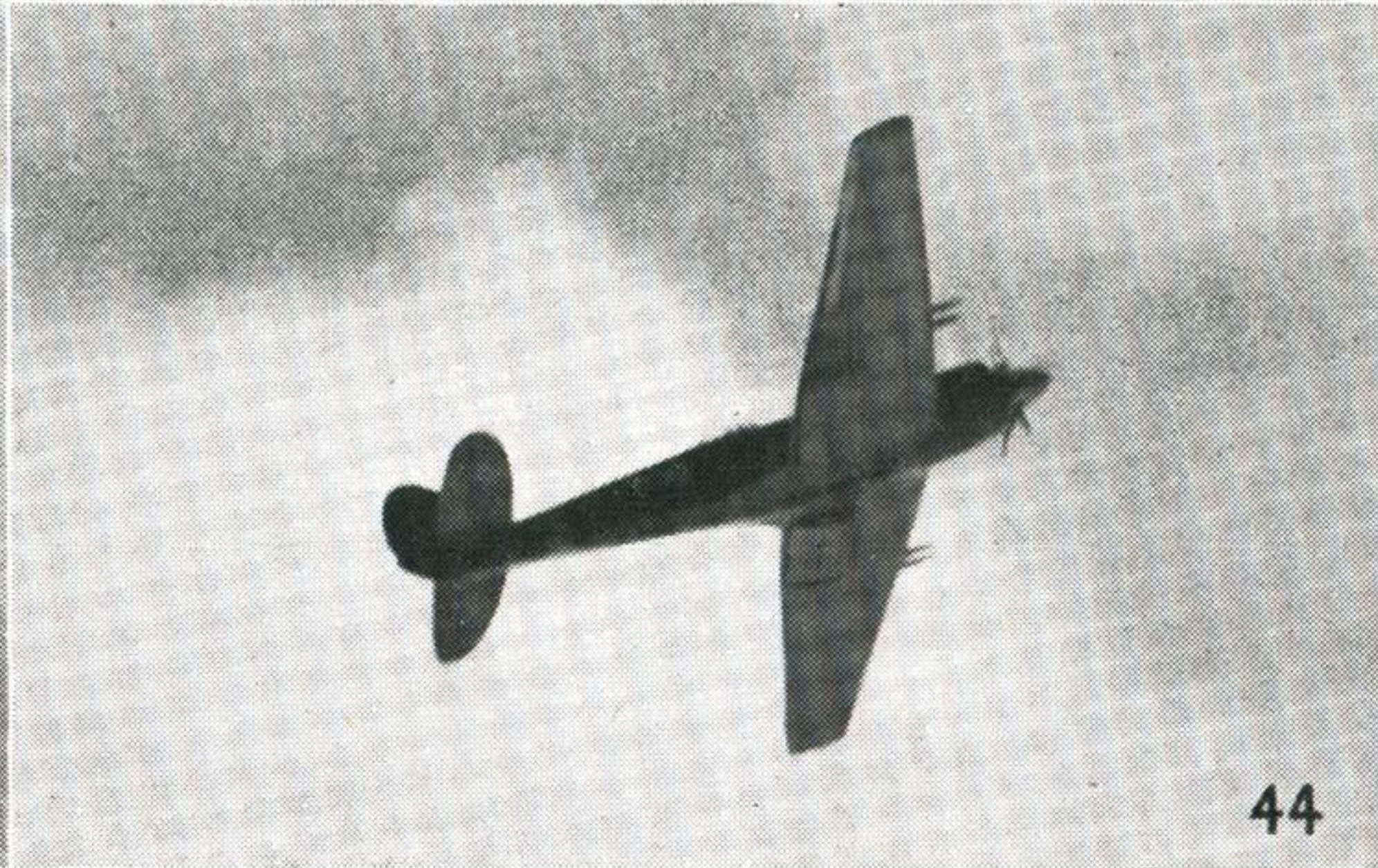
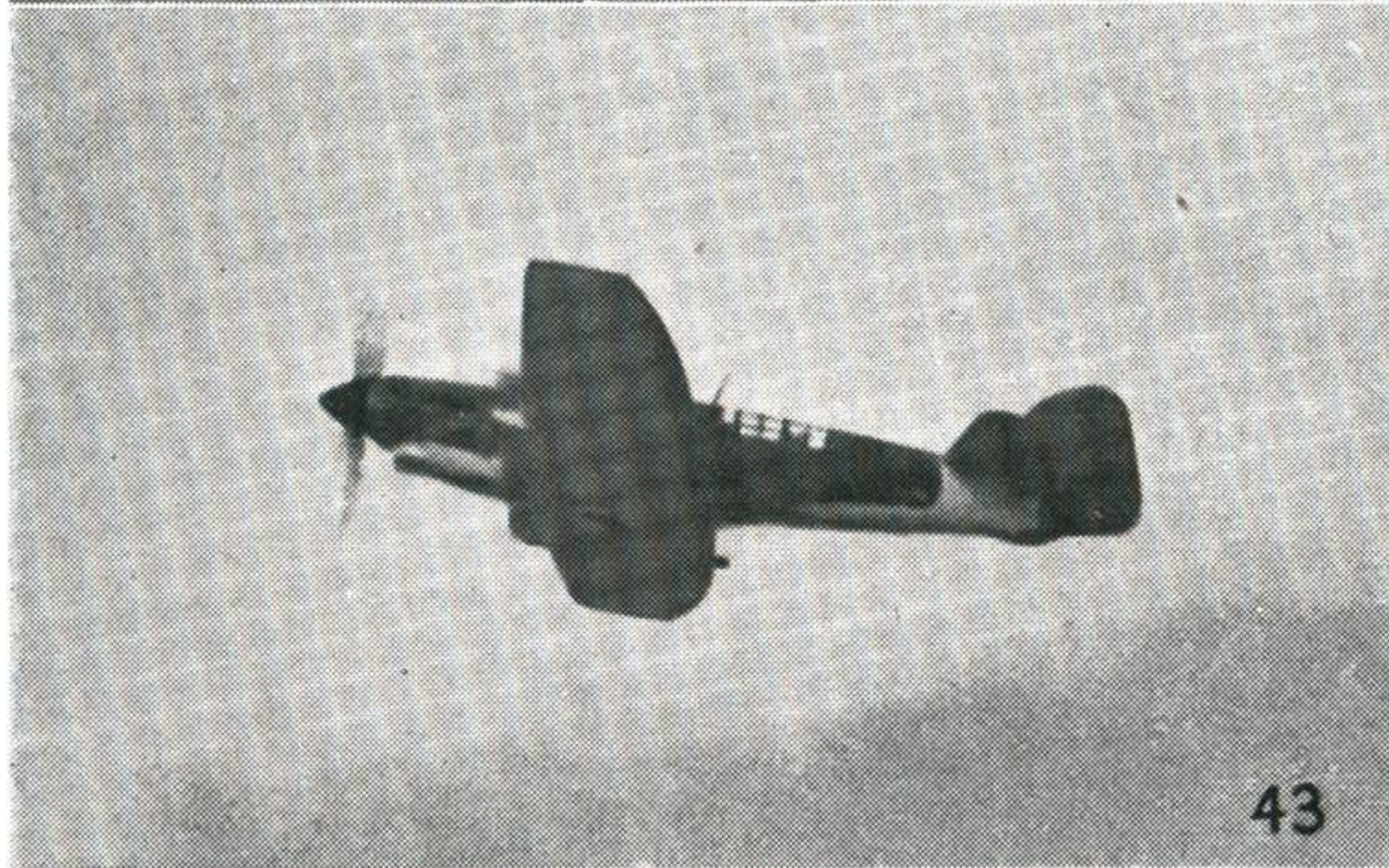
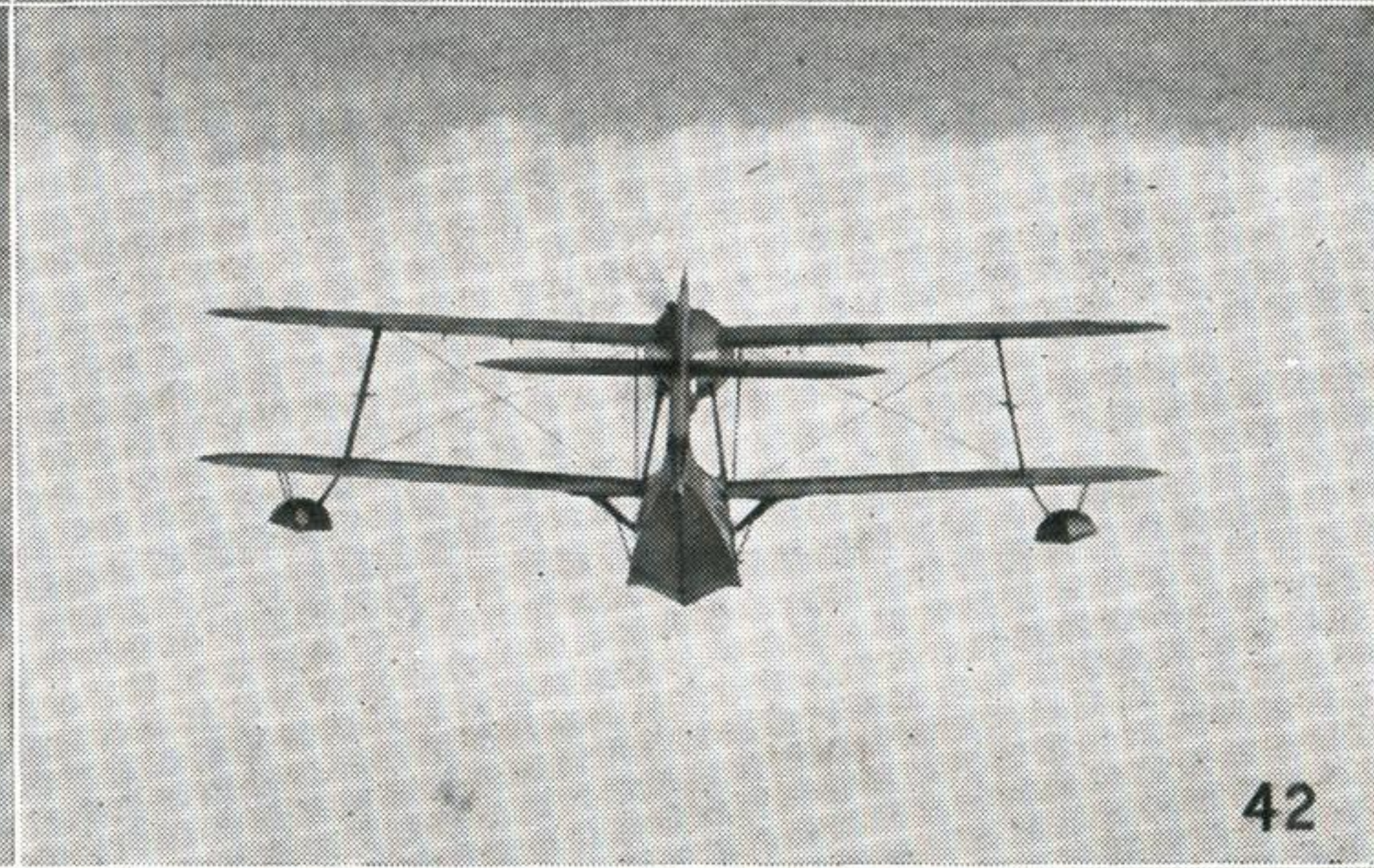
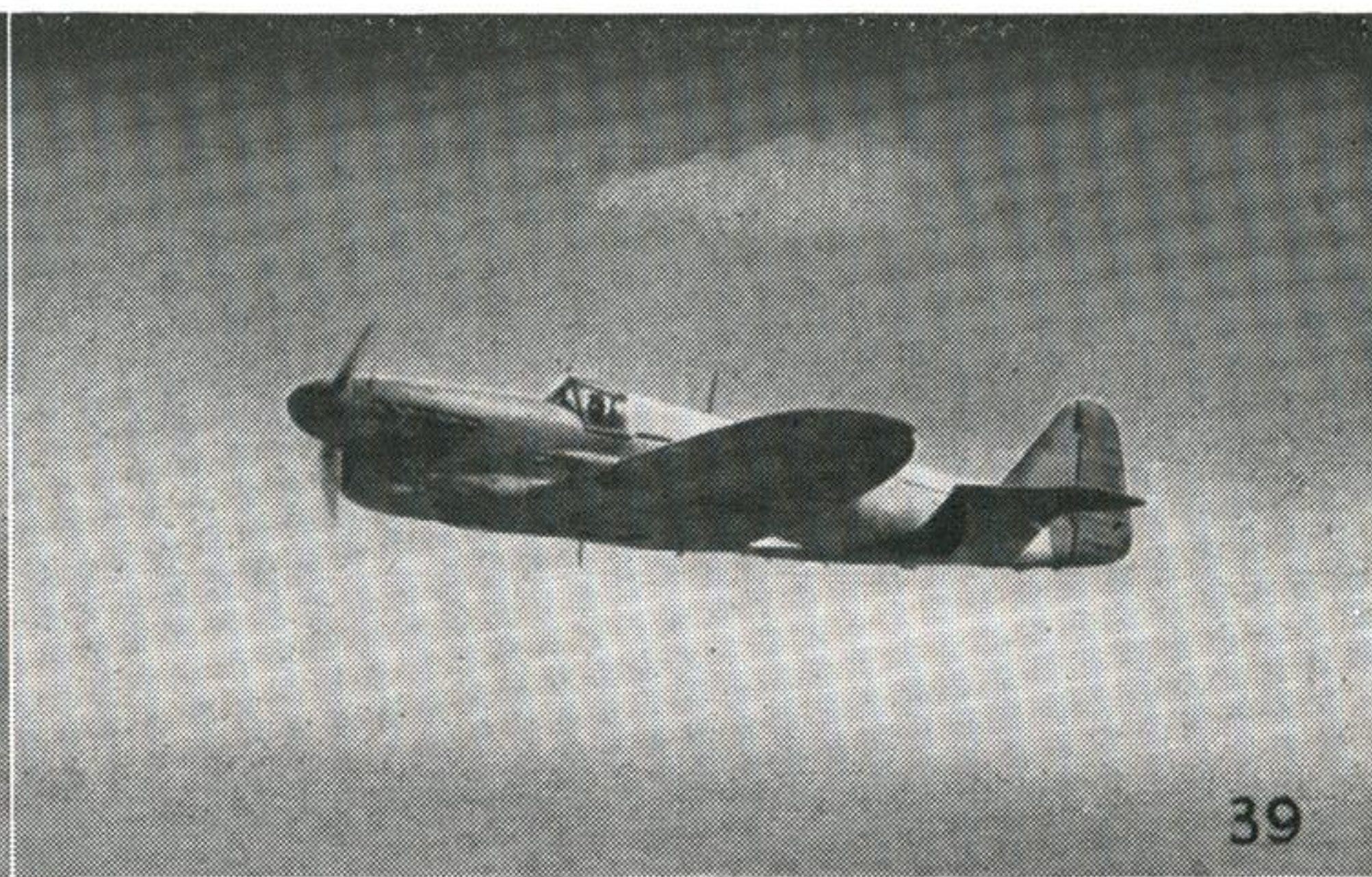
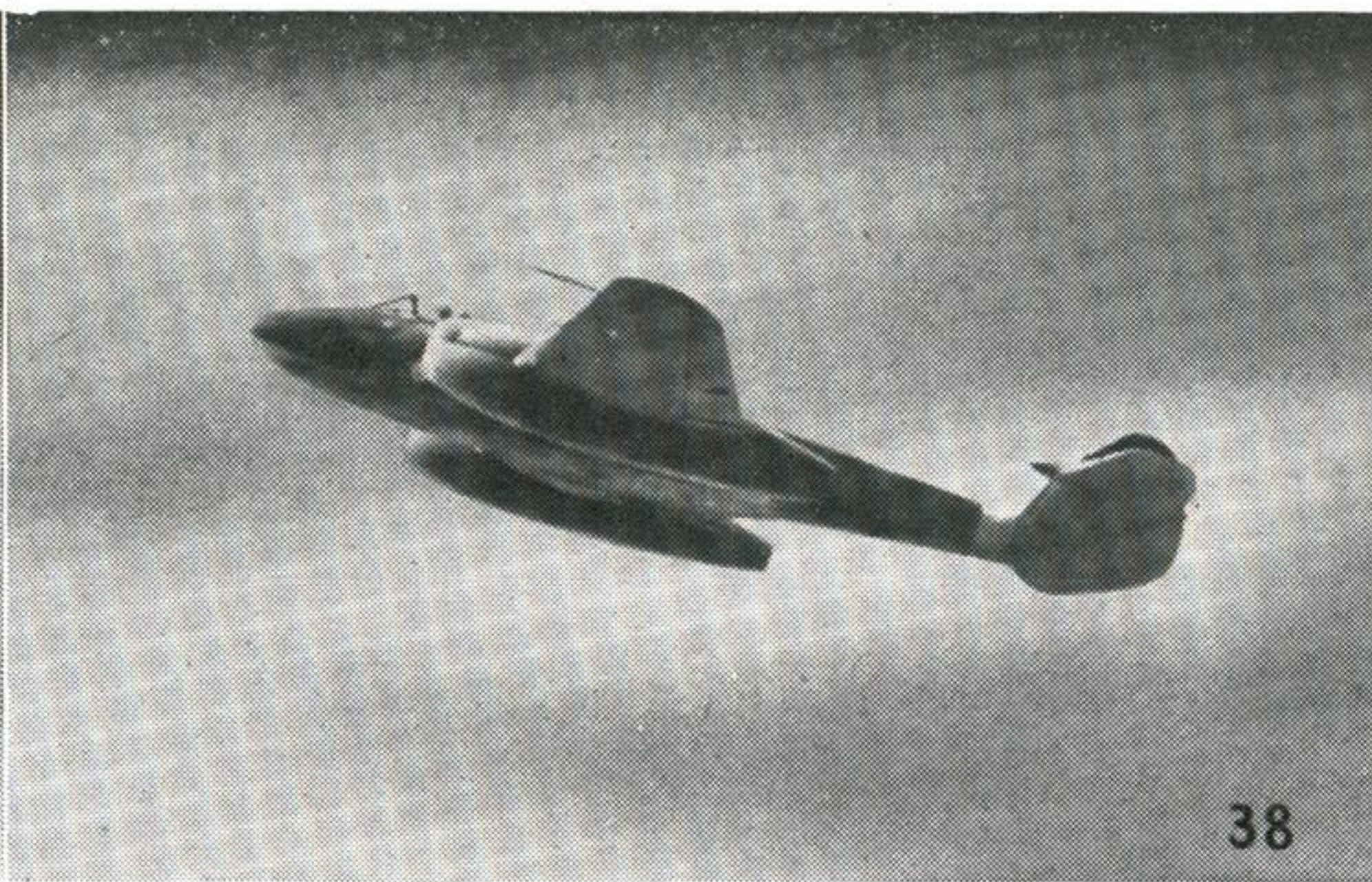
ADVANCED SPOTTING

Recognition Test No. 8



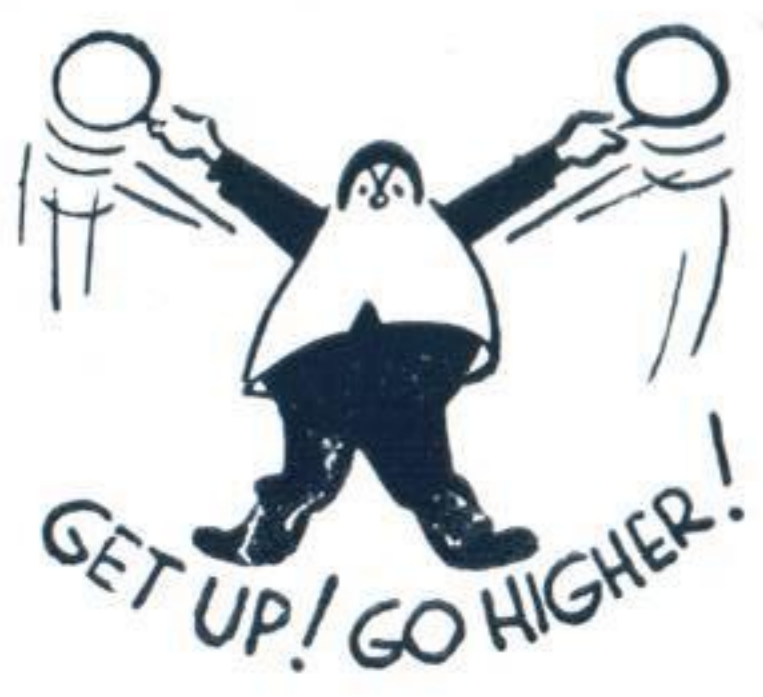
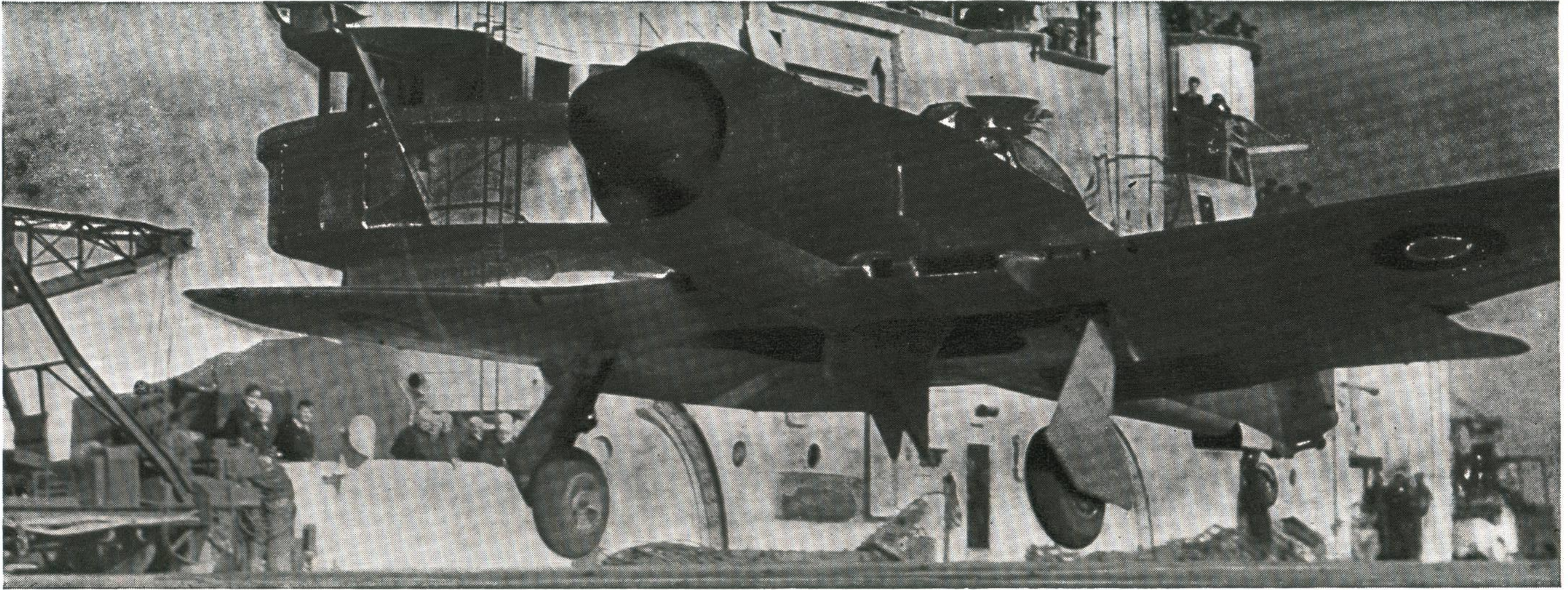

Aircraft
of the
NAVAL AIR ARM





ELEMENTARY SPOTTING

AIRCRAFT FOR THE NAVY



OF all specifications, those governing the design of naval aircraft are the most severe. In no other aircraft design and construction work is it necessary to achieve a compromise between so many variables.

Aircraft of the Navy must combine fighting and flying characteristics of a high order, with sturdiness of construction, and ease of servicing and maintenance not so rigorously necessary in other types. Add to these the requirements for wing-folding, deck-arresting gear and catapulting, the need for excellent control at low speeds, the fitting of flotation and salvage gear and a strong undercarriage—to name but a few of the items making a successful naval aircraft—and you have some idea of what the designer is up against.

Types and Functions

There are three main types of aircraft used in the Navy. These are the reconnaissance aircraft, the fighter aircraft and the strike aircraft. The reconnaissance aircraft locate and report the position of the enemy. Fighter aircraft are used for escorting either reconnaissance or strike aircraft and in defence of their own base. The strike aircraft are the flying "men-o-war" and it is their job to strike located targets with all the means at their disposal—bombs, torpedoes, guns and rocket projectiles.

Reconnaissance aircraft are usually two or three-seaters with good range and duration, and high cruising speed characteristics. They are moderately armed, to the extent that they can put up a good defence if attacked. Fighters in the Naval Air Arm are tough, formidable, usually single-seat aircraft—in general, larger and heavier than their shore-based counterparts. They can stand up to an immense amount of punishment both in the air and on the deck. The strike aircraft packs a tremendous punch and carries an assortment of the most effective forms of armament. Hitherto, it has usually been a two-seater, but the modern tendency is towards single-seaters.

Design Requirements

With few exceptions the wings of naval aircraft are designed to fold, because space saving and ease of handling, by means of the lift, are very important considerations. Overall "box" dimensions are laid down for the designer and he has to ensure that, when folded and trimmed for lift descent, no part of the aircraft protrudes from this imaginary "box". Apart from the mechanical ingenuity needed to arrive at reliable and simple wing-folding gears, the naval aircraft here pays the first penalty

by

JOHN A. SIZER

A.R.Ae.S. A.I.N.A.

in comparison with shore-based types, for once the continuity of a wing spar is broken, regaining its strength and jointing involves considerable weight. For many years, the popular way was to have a latch-pin through the front spar at the port and starboard wing roots. Folding was done by removing the pins and folding and rotating the wing about pivot points at the rear spar. In some designs, the wing finished up leading-edge

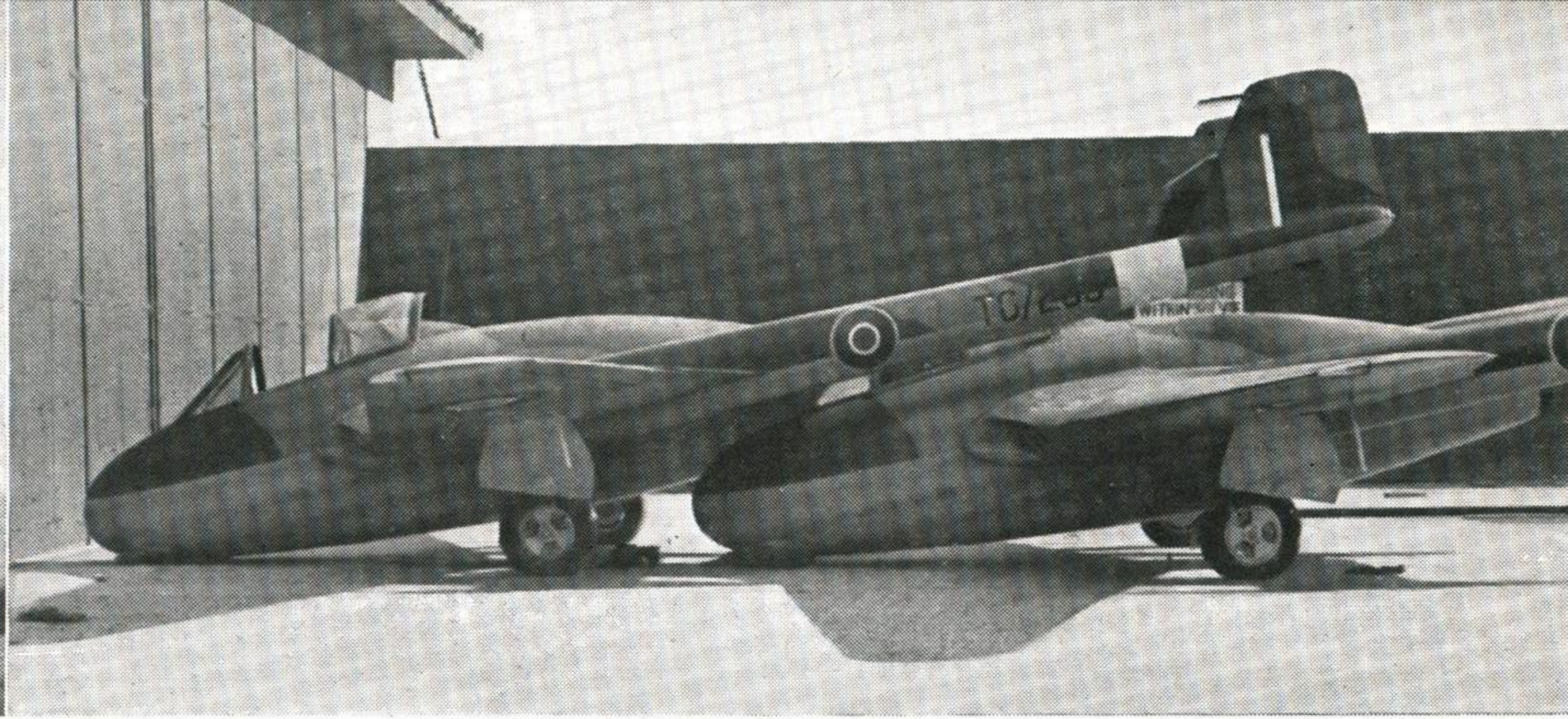
The Seafire 47 has a half-wing-fold.

Wing tip folding only is necessary in the Seafang F.R. Mk. 32.





Hook out, wheels out, flaps out—The Firebrand IV about to touch down.



The way they have in the Navy of stowing Sea Vampires.

downward, in others the trailing edge was downward. The trouble is that in almost every modern layout of aircraft, much control equipment passes from the fuselage to the wing. To avoid breaking these services, it is necessary to locate them close to the wing-folding axis, a problem usually involving compensating levers and gear, especially in the case of flying controls. Considerable thought has gone into this matter, and such methods, as in the Sea Fury, where the wings fold upwards and inwards—all at the pressure of a switch or the movement of a lever—are great strides in the solution of a difficult problem. Having folded the wings, it is necessary to lock them in position. Wings which fold backwards are usually anchored either to the rear fuselage or to the leading edge of the tail plane.

Cockpit Arrangement

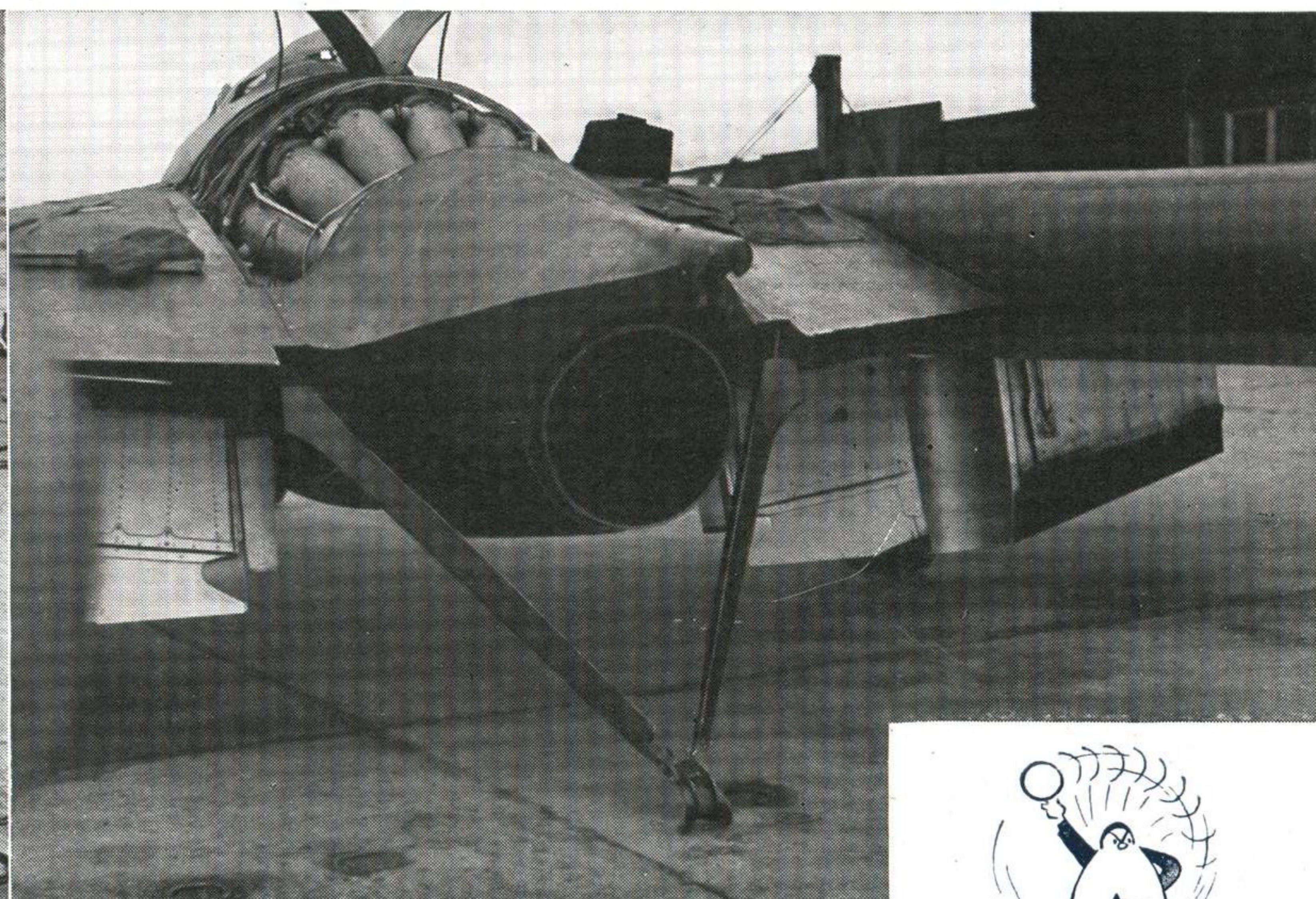
There is not room to discuss at length the other problems we enumerated at the beginning. One particular point is worth reference, though, and that is the need to provide the pilot with the best possible view ahead. This is not easy in normal single-engine aircraft, the radial engine is too fat and the in-line engine is too long. To obtain a good view over the nose of the aircraft the pilot has to be set up high, which means quite a deep fuselage round the cockpit. With a large engine in the nose the pilot does his best to squint all around its bulk. In the days of Ripons and Darts, a lever at the side of the seat, when pulled, elevated one some six inches or so. This was of great help in securing the best of view ahead. The advent of the closed

cockpit has put an end to this to a certain extent, the current design allowing only about a two-inch vertical adjustment. In any case, it would be unpleasant, if not dangerous, to push one's head out into the airstream at the approach speeds of most modern naval types. To alleviate this lack of view forward, the pilot is guided in by the deck control officer who waves "bats" about. Each position of the "bats" means something, and the pilot acts accordingly.

Wing Loading

We haven't said much about wing-loading. The best naval aircraft would be the one with low power-loading and low wing-loading. Both these features would give an aircraft a low alighting speed and a quick take-off, but they would ruin any chance of high speed flight. Such aircraft would be almost certainly possessed of great wing area. This would not help in easing the problems of stowage, etc. Nevertheless, the need for a very high lift coefficient is vital, and it is for this reason that naval aircraft have always embodied to the full any practicable high-lift devices. All these things make the naval aircraft considerably heavier, and help to reduce its performance, when compared with a similar class of shore-based aircraft.

Taken all round, the aircraft designer's task is not an easy one when he enters the naval aircraft sphere. Great credit, therefore, is due to those who have given us the magnificent aircraft of to-day's Naval Air Arm.

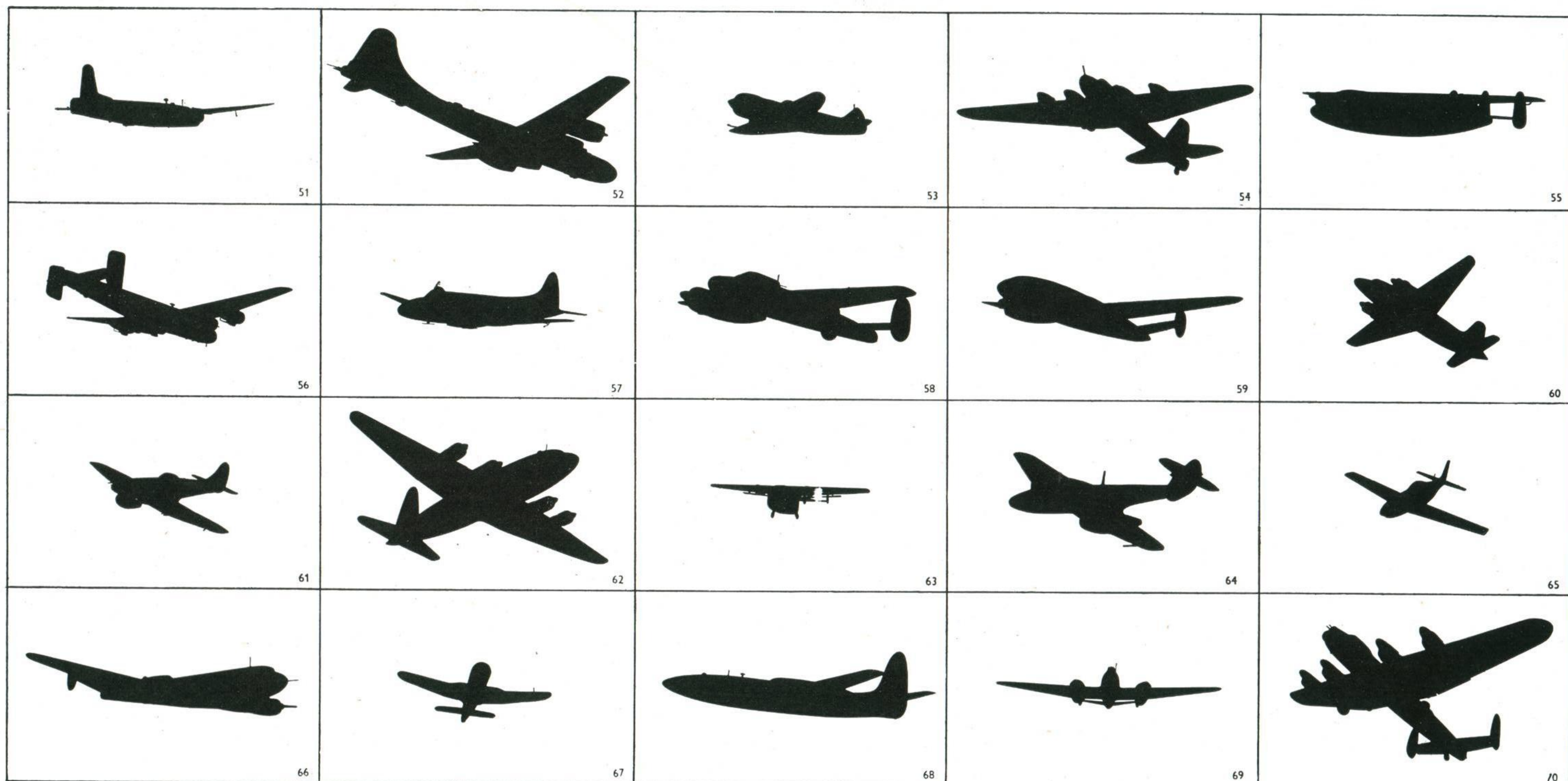


(Left) Ranging a Firefly I on H.M. Carrier Indefatigable and (Right) the deck-arresting arrangements of the Sea Vampire. The hook is stowed above the jet orifice.



SILLOGRAPHS

Recognition Test No. 9

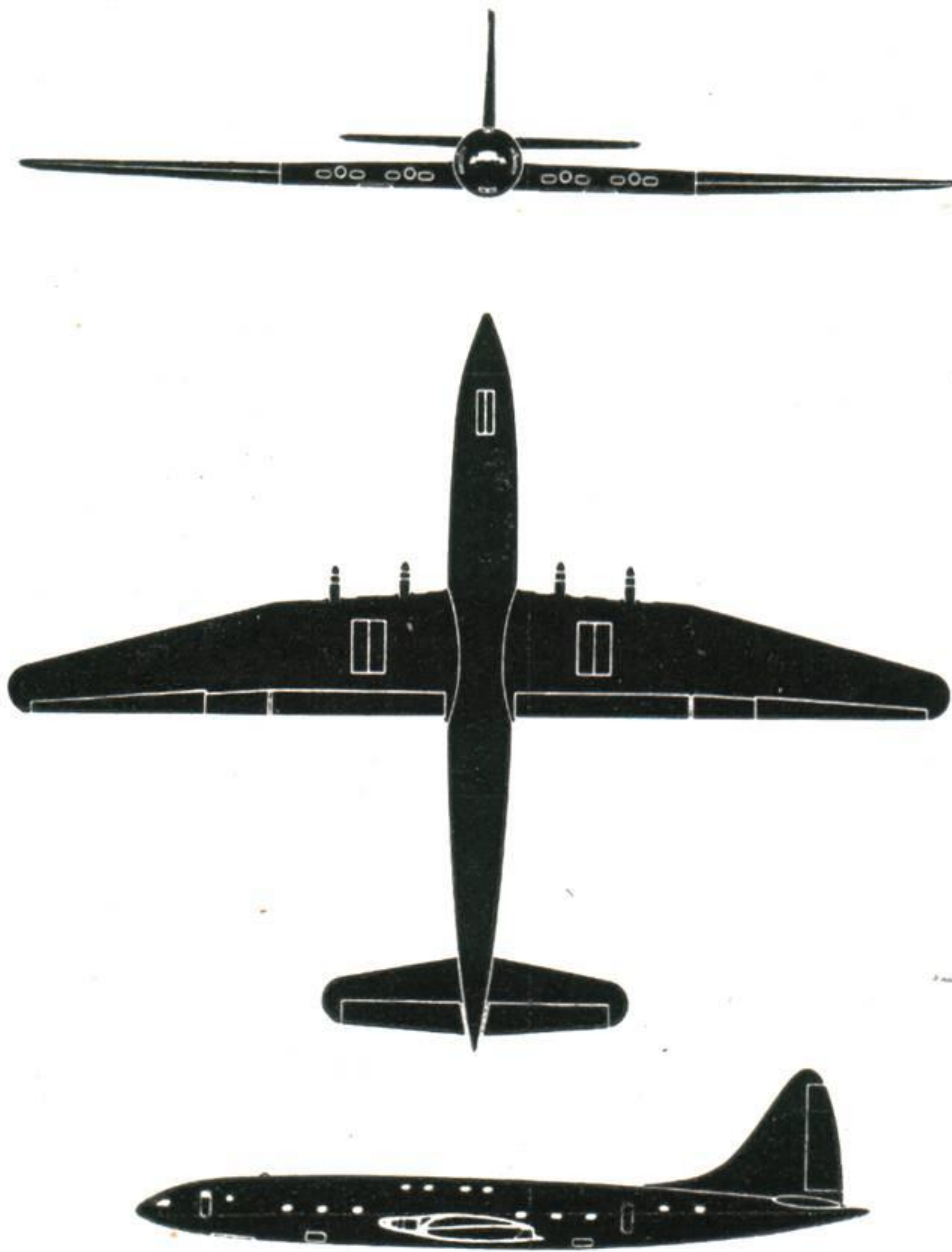


SILLY-GRAFS (Navy Mixture)

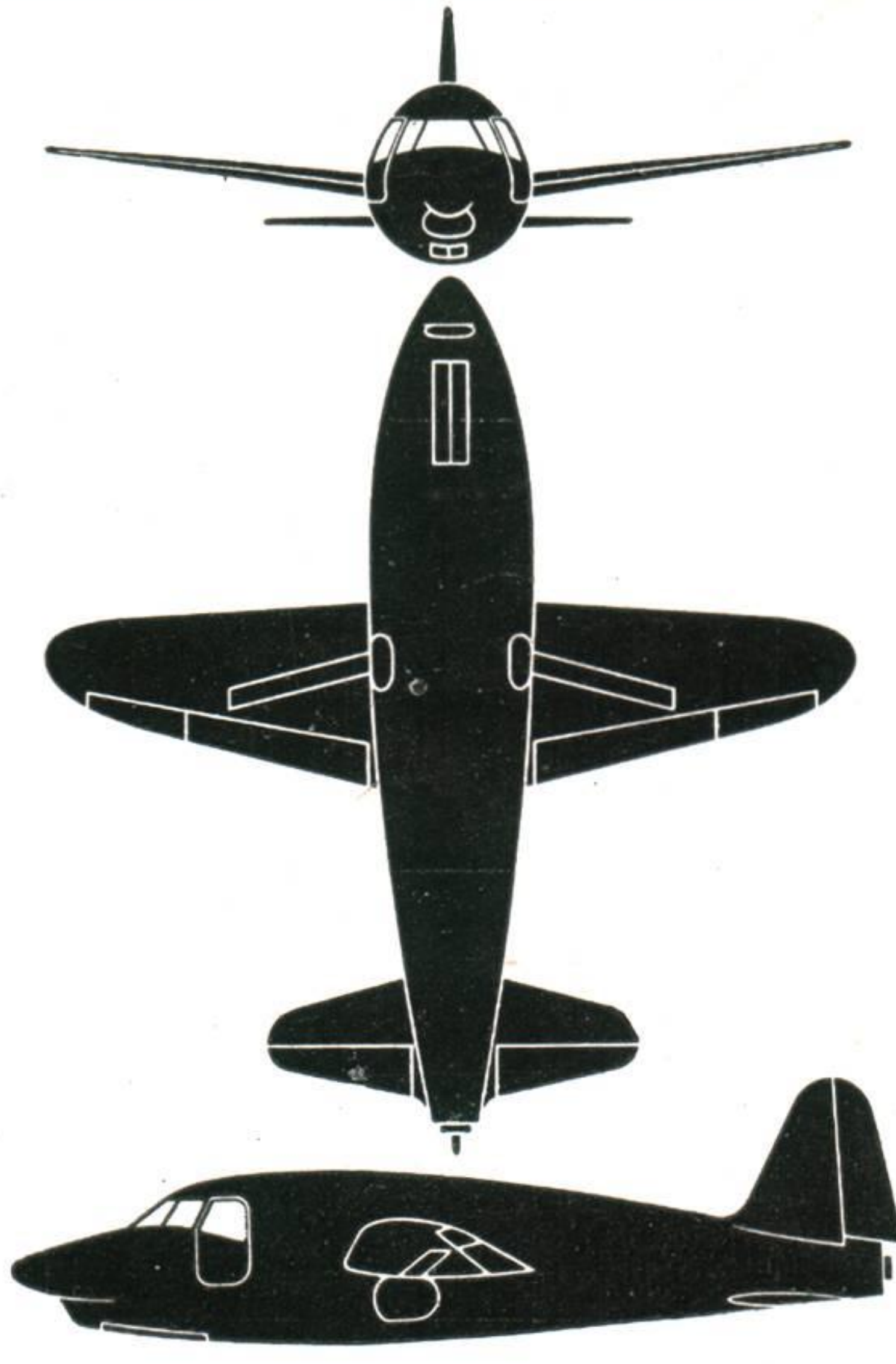
Recognition Test No. 10



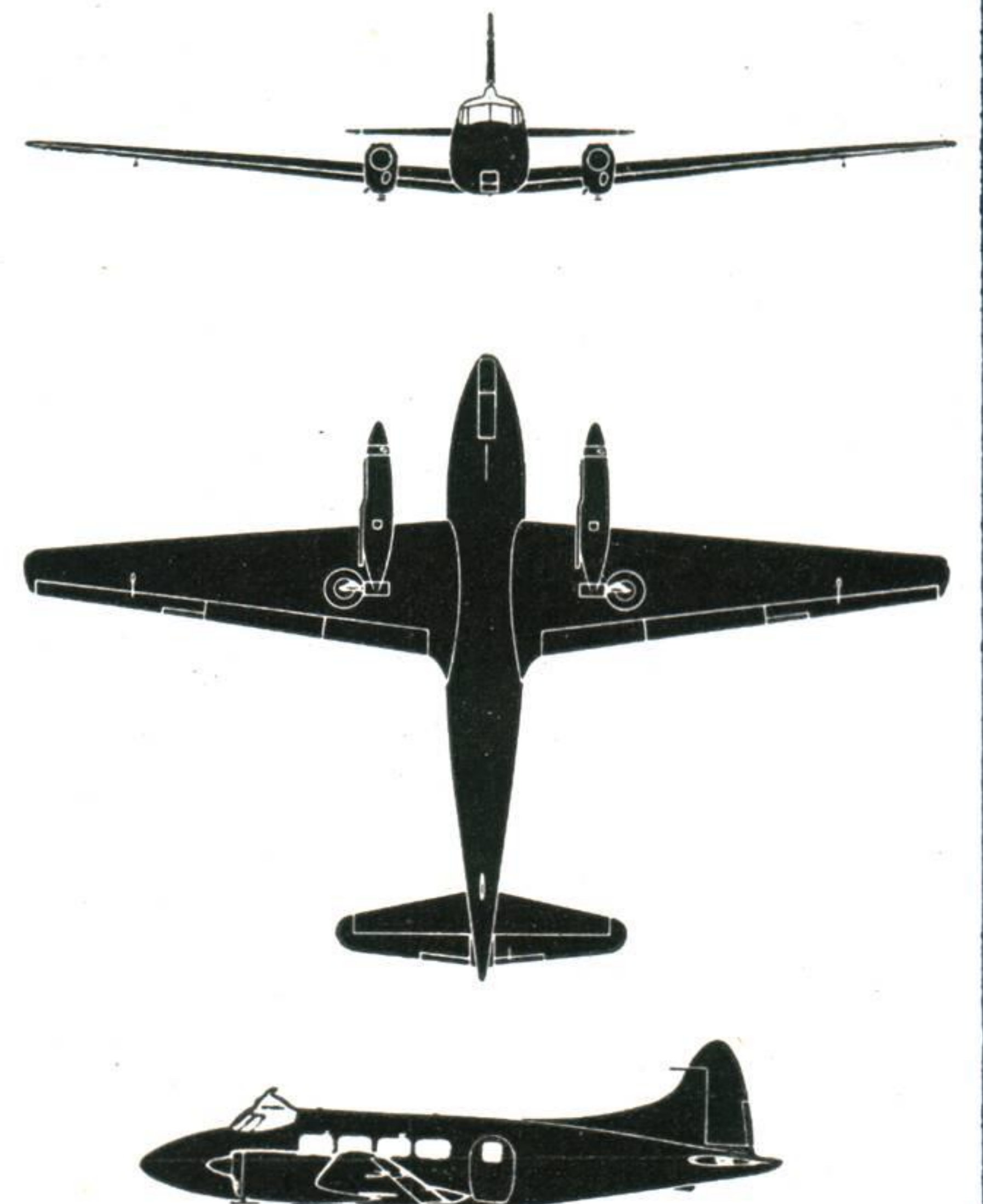
NEW and REVISED SILHOUETTES



BRISTOL 167
British Civil Transport
(8 Centaurus) Span 230 ft. 0 in.



S.O. 6000
French Experimental Jet
(Jumo 004) Span 30 ft. 5 in.



DE HAVILLAND DOVE
British Civil Transport
(2 Gipsy Queen) Span 57 ft. 0 in.

SOLUTIONS TO RECOGNITION TESTS IN THIS ISSUE :

No. 7 (ADVANCED SPOTTING) :

- | | |
|--------------------|-----------------------|
| 47. Brigand | 60. Marathon |
| 48. Viking | 61. DC-4 Skymaster |
| 49. PT-19A Cornell | 62. D.H.C. Chipmunk |
| 50. FR-1 Fireball | 63. Autocrat |
| 51. Spearfish | 64. Brigand |
| 52. Halifax C.VIII | 65. Monitor |
| 53. PE-2 | 66. YAK-3 |
| 54. Desford | 67. Martin-Baker MB-5 |
| 55. Lincoln I | 68. Hornet |
| 56. IL-4 | 69. Vampire |
| 57. Prentice | 70. Wayfarer |
| 58. Firefly IV | 71. Dove |
| 59. Firebrand IV | |

FRONT COVER : *Sea Vampire*

No. 8 (ELEMENTARY SPOTTING)

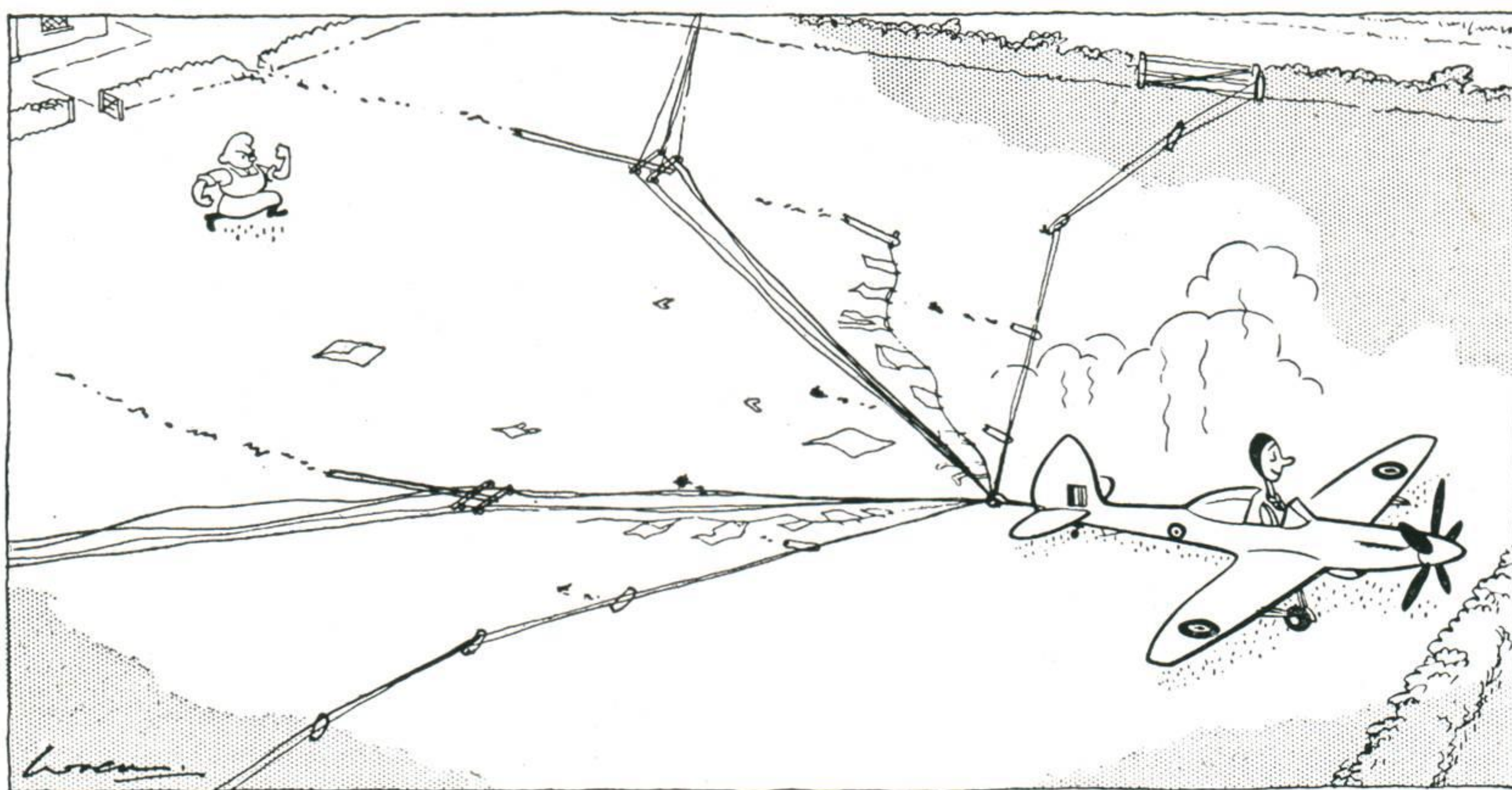
- | | |
|--------------------------|--------------------|
| 37. A-7 (Russian Glider) | 46. Seaford |
| 38. Meteor IV | 47. Lancaster II |
| 39. Firefly I | 48. Prentice |
| 40. Tudor II | 49. Mosquito XVI |
| 41. Lancastrian | 50. DC-4 Skymaster |
| 42. Sea Otter | 51. Wayfarer |
| 43. Firefly IV | 52. Dove |
| 44. Spiteful I | 53. Sea Fury X |
| 45. Lancaster III | 54. PE-3 |

No. 9 (SILLOGRAPHS) :

- | | |
|------------------------|-------------------------|
| 51. Warwick III | 61. Tempest VI |
| 52. B-29 Superfortress | 62. Hermes/Hastings |
| 53. LA-5 | 63. Aerovan |
| 54. PE-8 | 64. Meteor III |
| 55. Marathon | 65. P-51H Mustang |
| 56. Halifax C.VIII | 66. Bloch I61 Languedoc |
| 57. Dove | 67. FR-1 Fireball |
| 58. Brigand | 68. F-15 (Rainbow) |
| 59. S.O. 30R Bellatrix | 69. PE-2 |
| 60. Viking | 70. Lancaster III |

No. 10 (SILLY-GRAFS) :

1. Sea Vampire
2. Seafire 46
3. Sea Fury X
4. Sea Otter
5. Firefly IV
6. Spearfish
7. Sea Hornet XX
8. Kranich Glider
9. Barracuda V
10. Tiger Moth
11. Firebrand IV
12. Sea Mosquito 33



REQUEST DEPARTMENT — We find it necessary to remind our readers that the Editorial Staff is not directly concerned with the distribution of the Journal. If you have any queries on this subject, you must put them through the correct channels, not write to, nor phone, the Editorial Offices. Further, we are compelled once more to emphasise that this Journal is an official issue and is not for sale. We don't like devoting valuable space to this sort of announcement, so please don't write to us about the above matters. On the other hand we do want to receive your opinions on the Journal; contributions and suggestions will be welcome. Address them to The Editor, Aircraft Recognition Journal, Air Ministry, T.Lit., London, W.C.2.

FINGER TROUBLE — In Photographic Angles, August issue, we credited the Hastings with 553 m.p.h. top speed. It should have been 355 m.p.h.

ROYAL OBSERVER CORPS GAZETTE Solutions to the Post Views Recognition Test No. 1 in the August issue :

- | | |
|------------------|--------------------|
| 1. Hornet I | 9. Me 109 F |
| 2. Lincoln I | 10. PE-8 |
| 3. Spiteful I | 11. Warwick |
| 4. Mosquito 36 | 12. Catalina III |
| 5. Brigand I | 13. Heinkel He 177 |
| 6. Constellation | 14. C-46 Commando |
| 7. Siebel Si 204 | 15. Tempest V |
| 8. Beaufighter X | |

ACKNOWLEDGMENT — In this issue the following photographs are by Charles E. Brown:—COVER: *Sea Vampire*; AIRCRAFT IN THE NEWS: *Prentice*; SEA HORNET ARTICLE: *Heading photograph*; CENTRE PAGES: *Sea fang, Sea Vampire, Firebrand, Firefly, Seafire*; AIRCRAFT FOR THE NAVY ARTICLE: *Heading photograph of Sea Fury*.



The Inter-Services Aircraft Recognition Journal is a monthly publication, prepared and produced by Air Ministry, T.Lit., in collaboration with the Ministry of Supply, A.R.Mat. The subject matter is decided by an Editorial Committee consisting of the following members—AIR MINISTRY: T.Lit., Wing Commander G. G. N. Barrett, A.F.C. (Chairman) and Flight Lieutenant E. A. Wren (Secretary and Editor); T.O.5, Squadron Leader R. H. Adams, O.B.E., A.I.2(g), Flight Lieutenant J. L. Newton; ROYAL NAVY: Lieutenant (A) J. A. O'Dwyer, D.F.M., R.N.V.R.; ARMY: Captain F. B. Crosse, R.A.; MINISTRY OF SUPPLY: A.R.Mat., Mr. A. E. Dollery; ROYAL OBSERVER CORPS: Observer Commander R. R. Poole; AIR TRAINING CORPS: Mr. J. A. Coubrough, Civilian Instructor.