THE INTER SERVICES

AIRCRAFT RECOGNITION *Journal*

Vol. 3 MARCH 1949 No. 8

ELEMENTARY SPOTTING

Recognition Test No. 88


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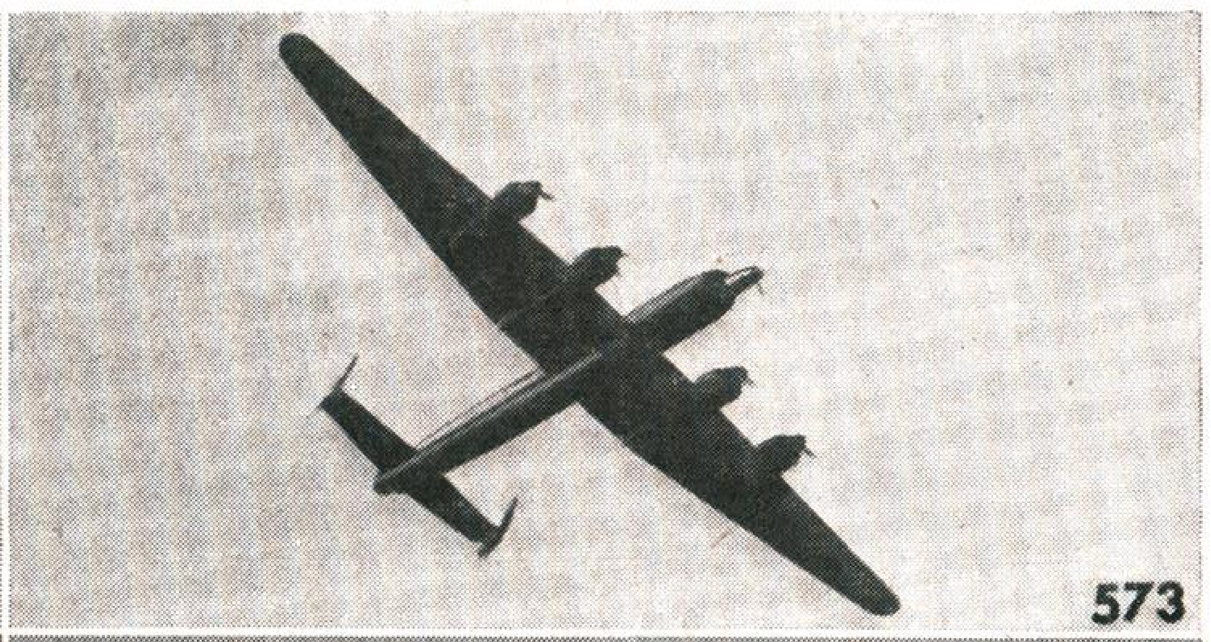
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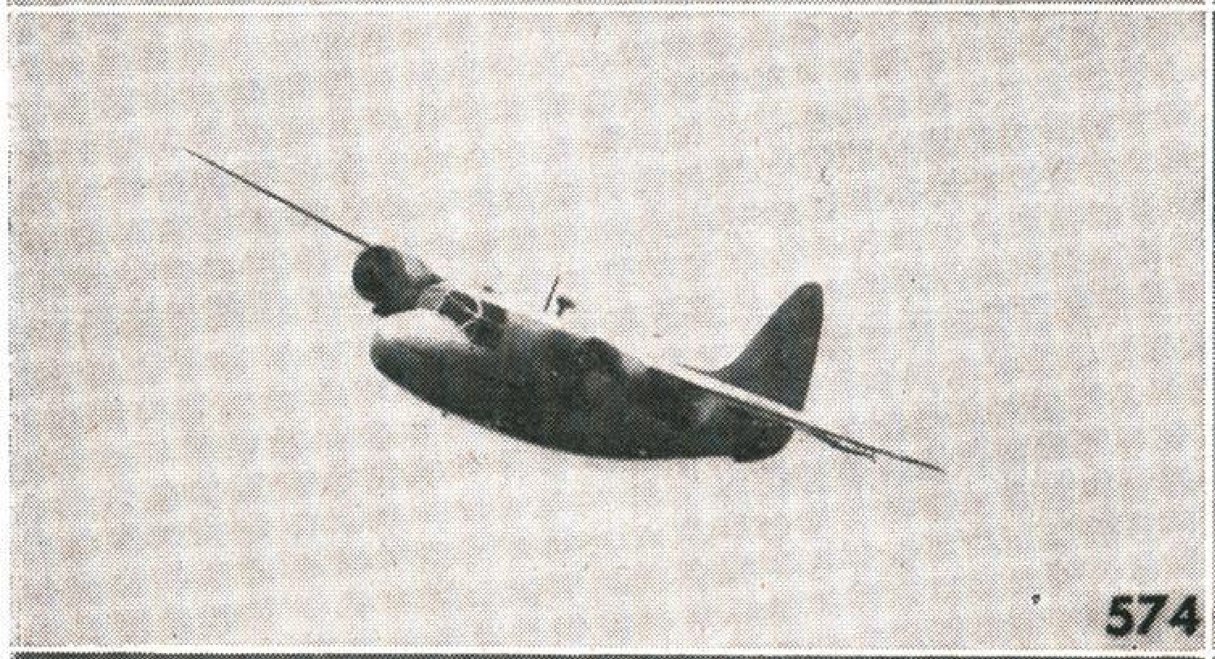
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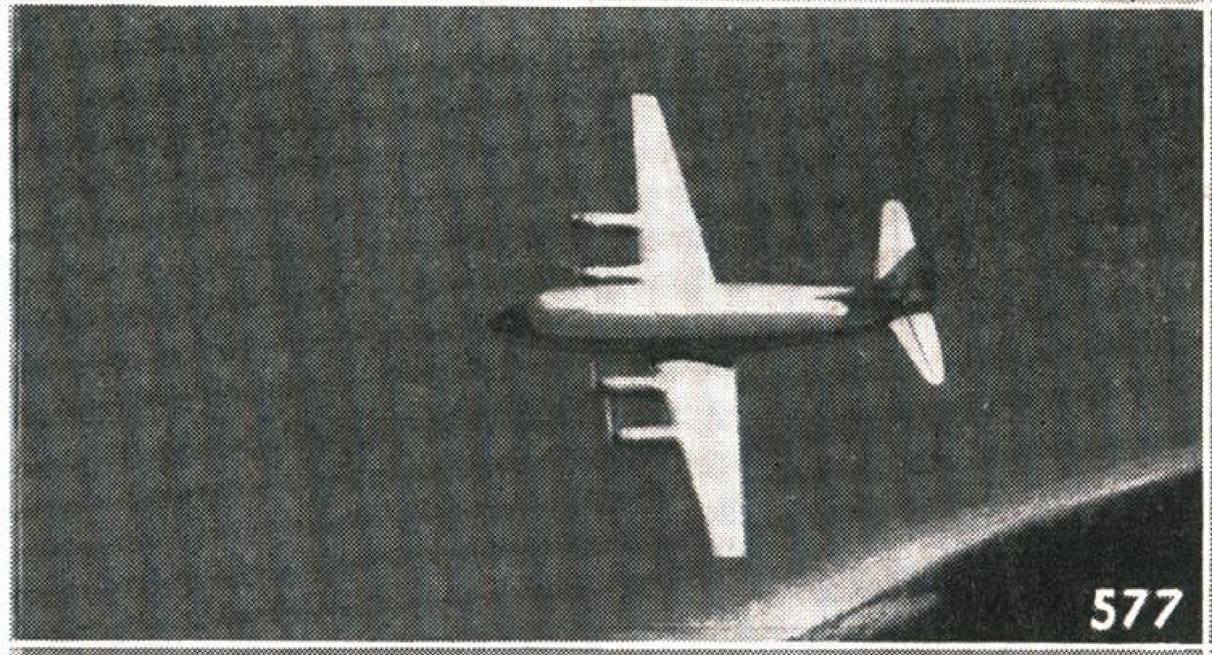
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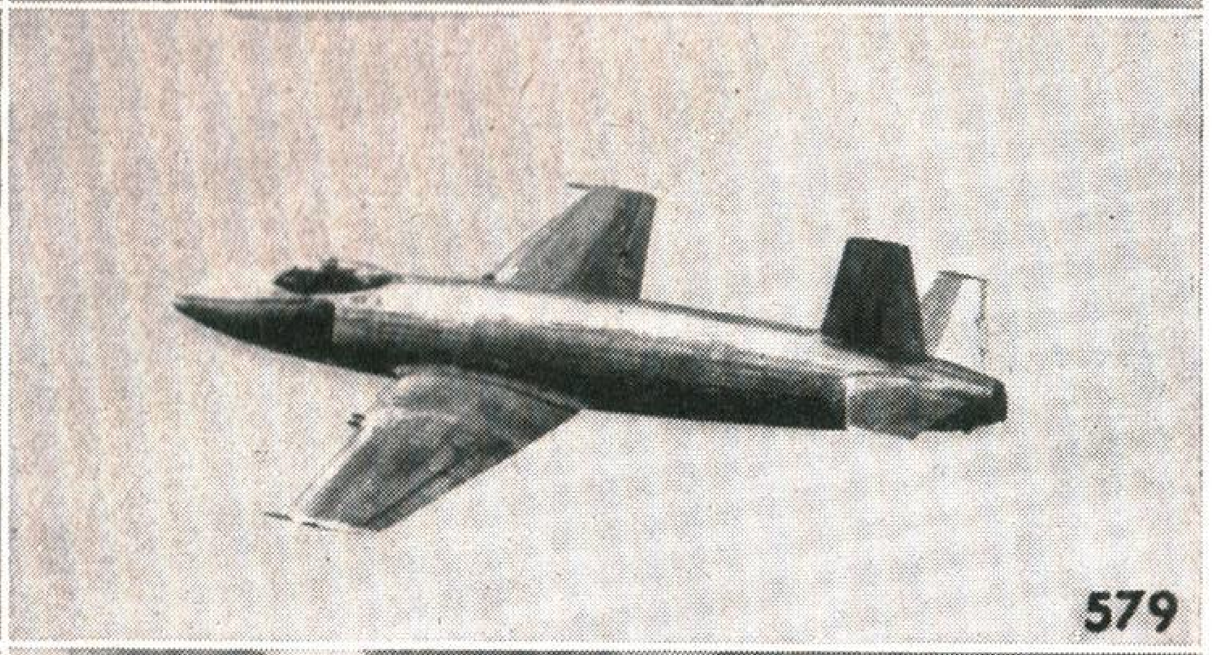
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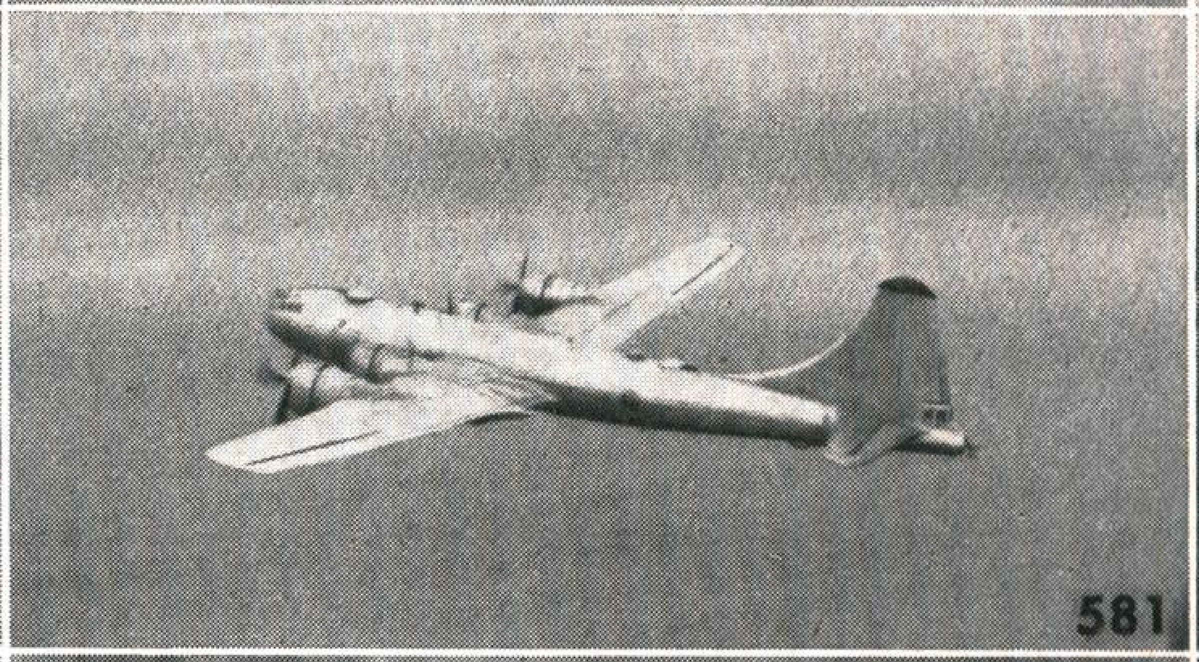
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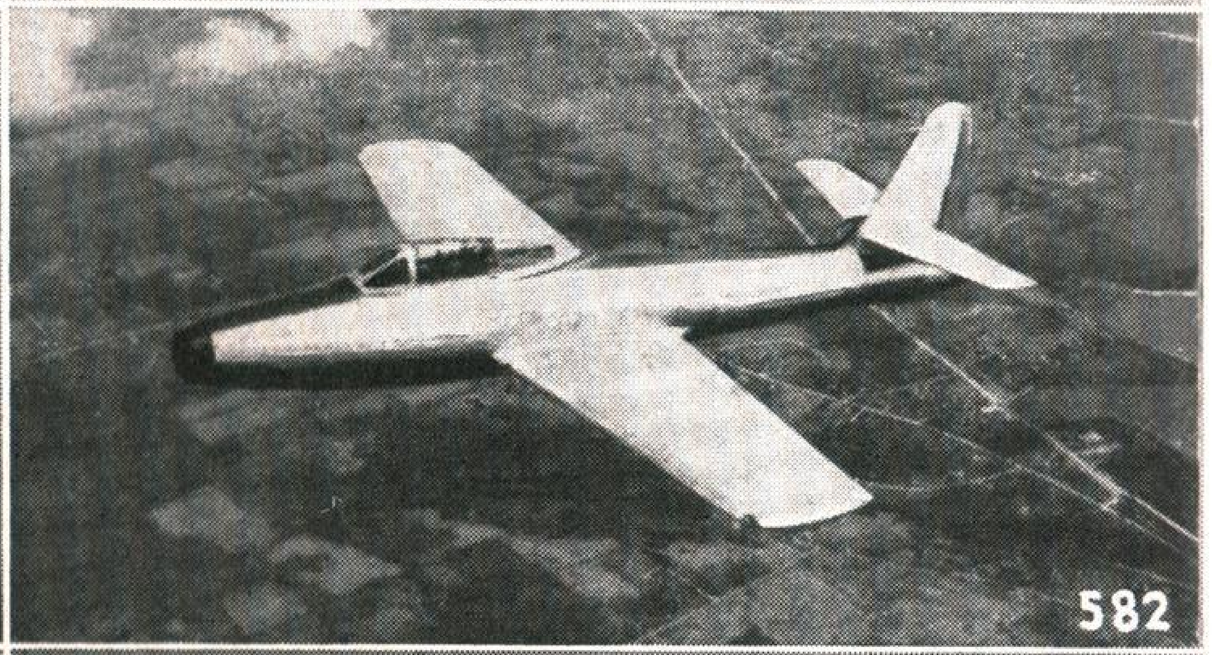
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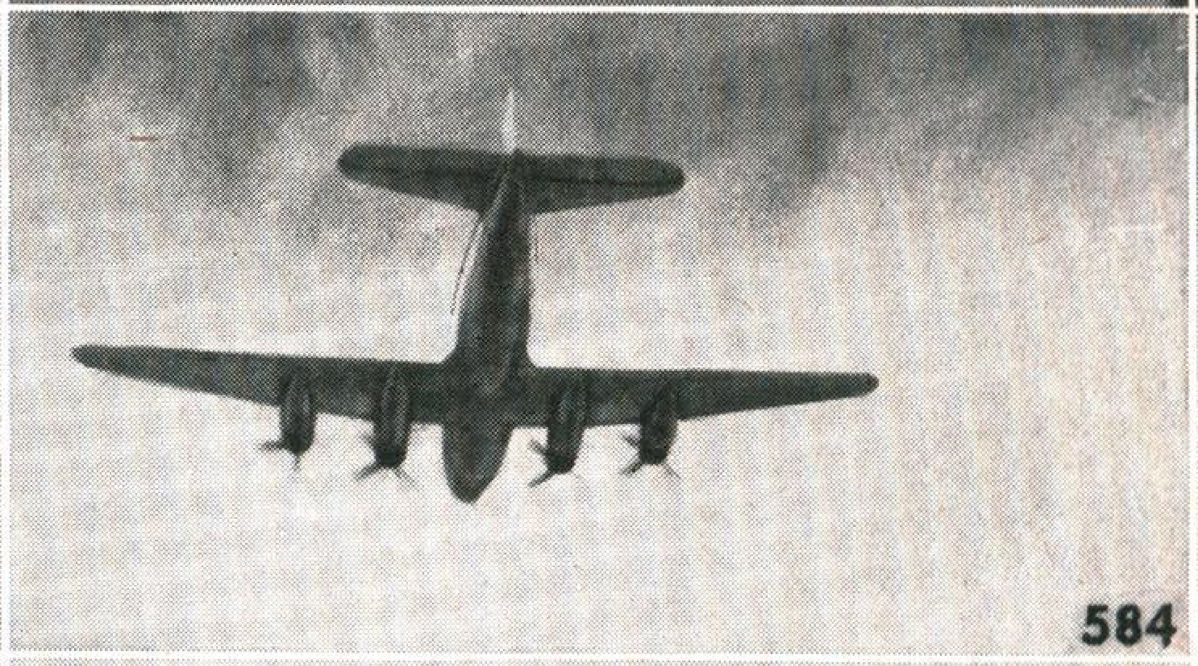
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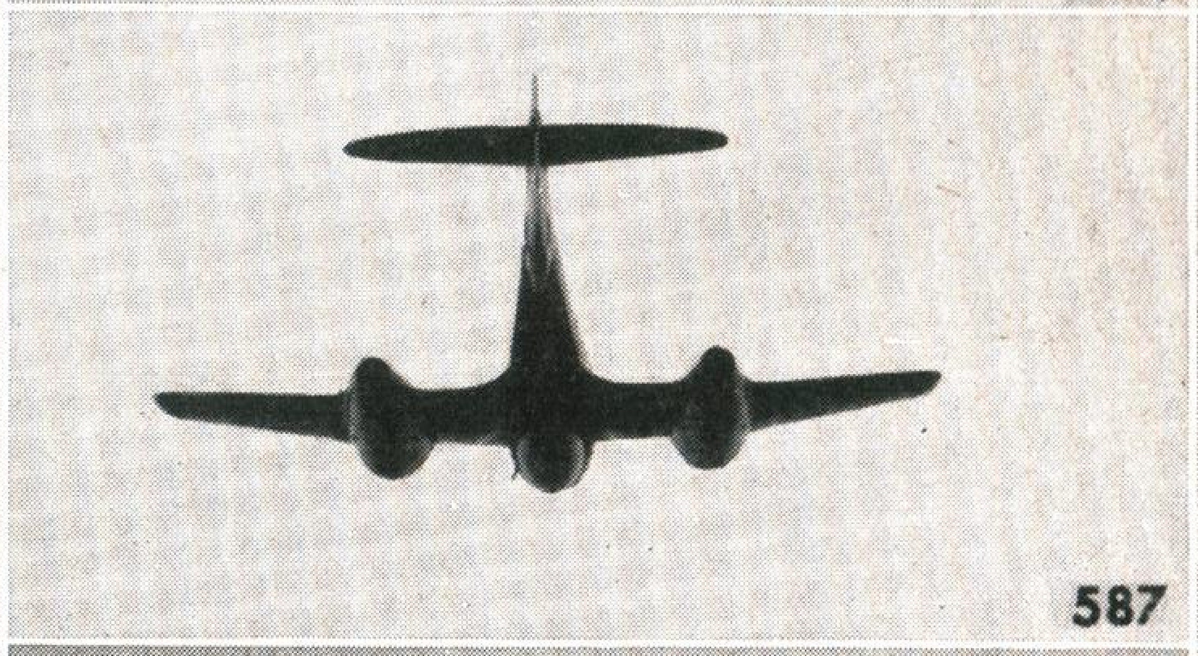
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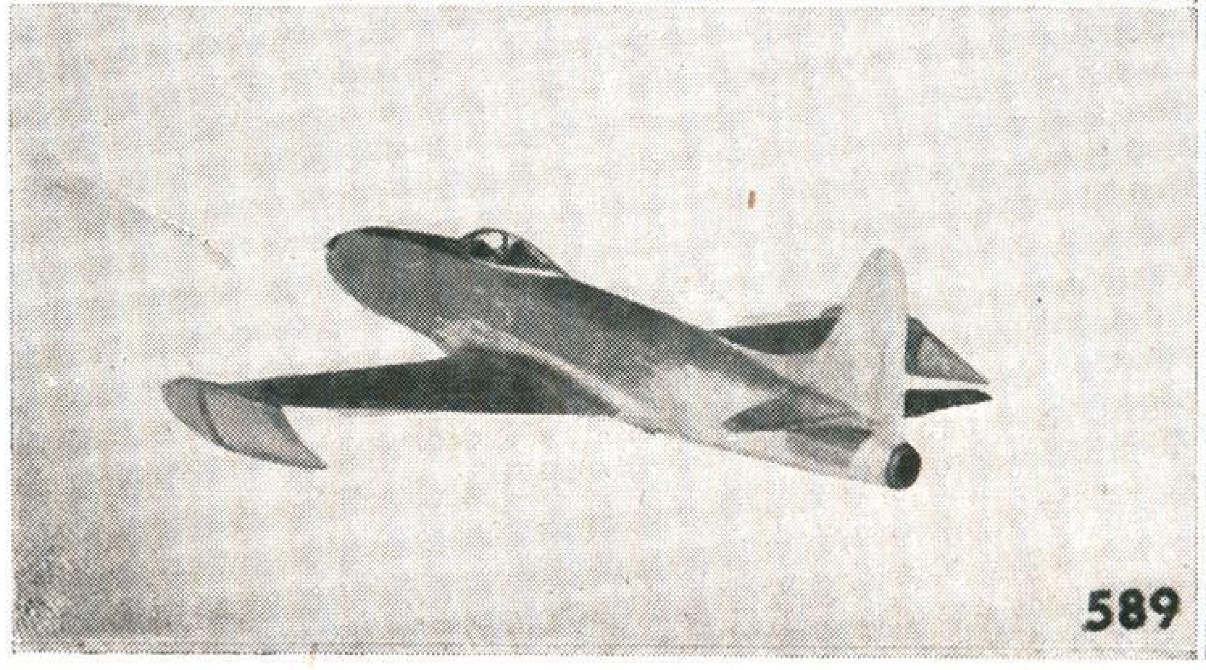
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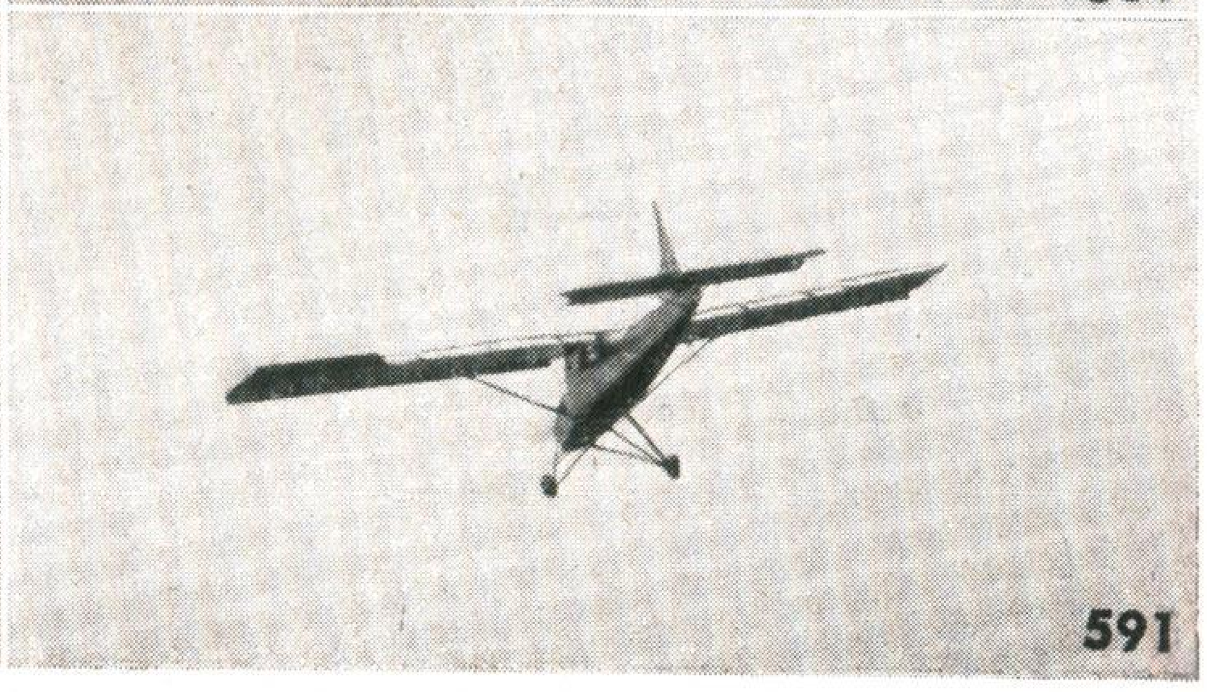
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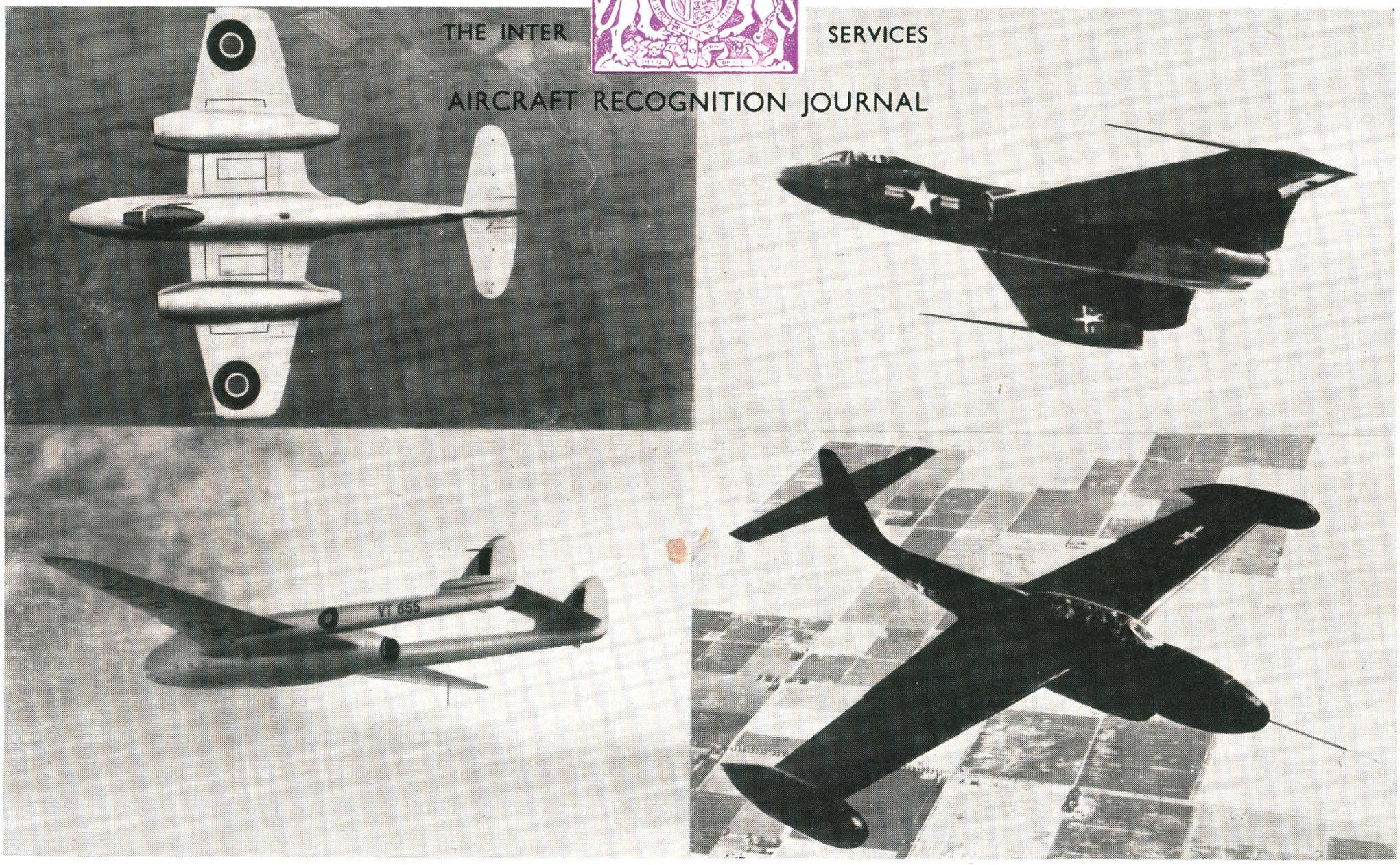
THE INTER SERVICES AIRCRAFT RECOGNITION JOURNAL



SIMPLE SELECTION : These views illustrate variety in fighter form and how the advent of the turbojet has aided aircraft recognition. The chances of confusing these types are small, and the recognition problem is simply to attach a name to each. This is easy and when achieved, your repertoire of recognizable types will have increased by four. (Round the clock from top lett) : Gloster Meteor F.Mk. 4 ; Chance Vought XF7U-1 Cutlass ; Northrop XF-89 ; and De Havilland Vampire F.Mk. 3.

FOR BEGINNERS

How to Start . . .

TAKE A GOOD LOOK at the first aeroplane you see in the sky, note some feature or other if possible, and then, in any way you can, track down its name. When you have established its name, start collecting all the pictures and information you can about it, paste them up on page one of your new gen-book—and you've started spotting. It may take you seconds, minutes or even hours to find out its name. It may even happen that you have to let that aeroplane escape forever unidentified. But when you have succeeded in finding out what it was, and if you persist in finding out more about it, you will certainly take far less time over recognizing it next time you see it. And the time after that you will be quicker still. Eventually, with practice, you will be able to spot that aeroplane instantly and afar off.

In our opening paragraph we have imagined that someone who has never before had anything to do with aeroplanes has to start spotting—it is hard to imagine that there is anyone who has not had some contact with them. If this someone (suppose it's you) were to start as we have suggested, and keep tabs on, say, ten aircraft at once (or less if desired), and if at the same time you were to enrich your mind with some light reading on what makes aeroplanes tick, and also something of the history or background about the aeroplanes you are currently spotting, you will soon acquire a small repertoire of recognizable aeroplanes, a good interest background, and some enthusiasm for the subject. Incidentally, one of the easiest methods of consolidating the accumulating knowledge of aeroplanes, is to go to an airfield and take a close look at them. This adds a good deal of interest to your study and to life in general, and makes spotting more worthwhile.

You will not have gone far before you realize the possibilities of confusing certain types of aircraft. Some aircraft of the single-seat fighter class are very confusable. The easiest way to tackle this problem is to get the offending pair side-by-side in silhouette form, so that differences are obvious. This is one of the most valuable attributes of the 3-view silhouette (much maligned during the war through wrong use), because it shows shapes exactly as they are—there is no foreshortening or illusion as there can be in photographs.

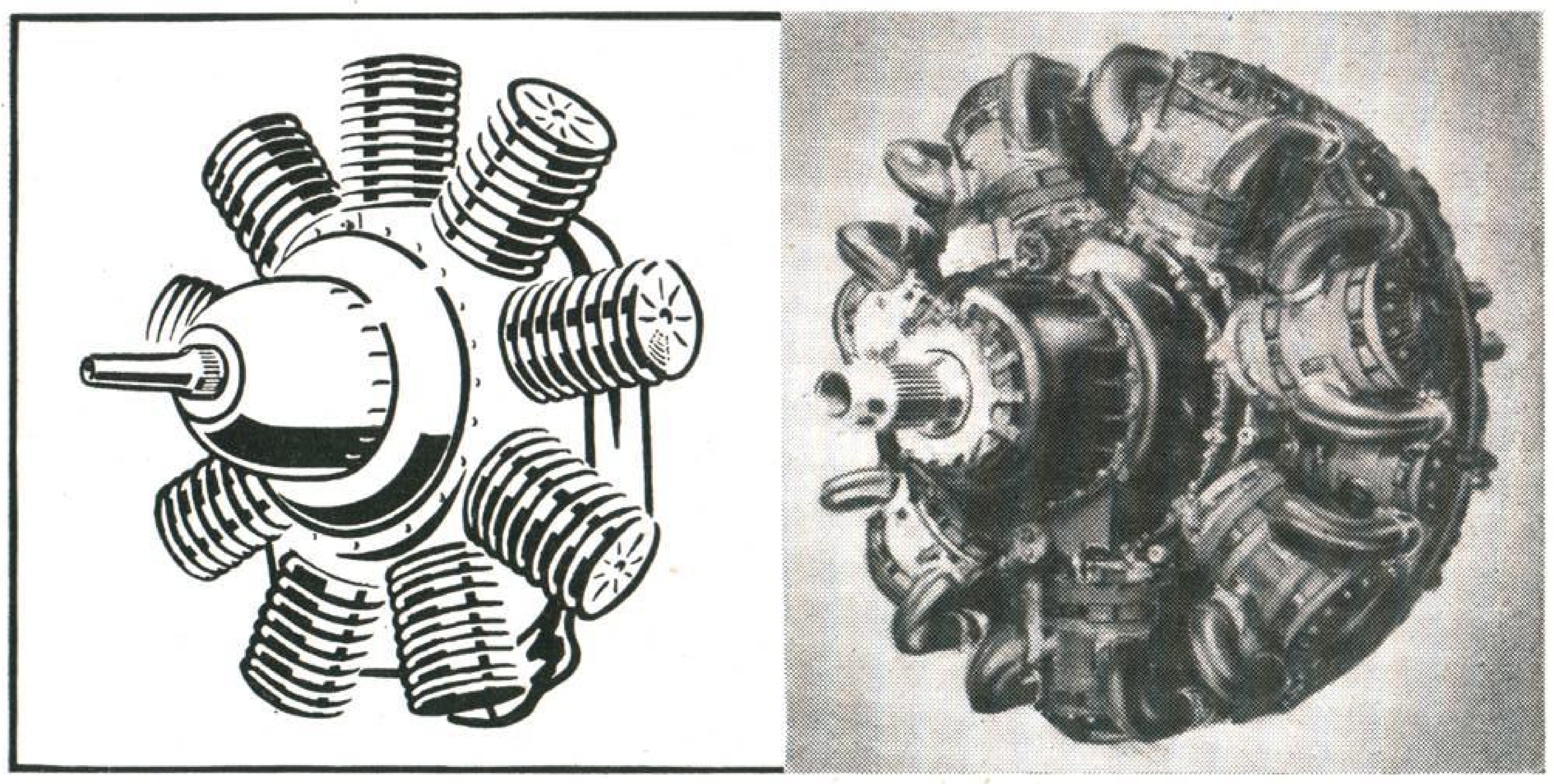
Among the many positive ways of learning something about aeroplane shapes is to model or sketch them, because these methods are creative. Articles on these two matters will be published soon. But of all the methods of helping yourself to spot, the best is to sail right in and keep on spotting. Some of you will probably have epidiascopes, flash-trainers and shadowgraphs available for synthetic spotting. So much the better. But, for those of you who have not, what we have described here are ways and means by which you can start off, acquire the right sort of knowledge, maintain your enthusiasm and keep in practice—for aircraft recognition cannot be kept in cold store, it must be kept going with constant practice. Once you have acquired a basic knowledge of, and interest in aeroplanes, subsequent additions to your score of recognizable types take less and less effort, and it is a fact that an experienced spotter has only to see a new aeroplane once to know it for always.

FIRST STEPS IN AIRCRAFT RECOGNITION

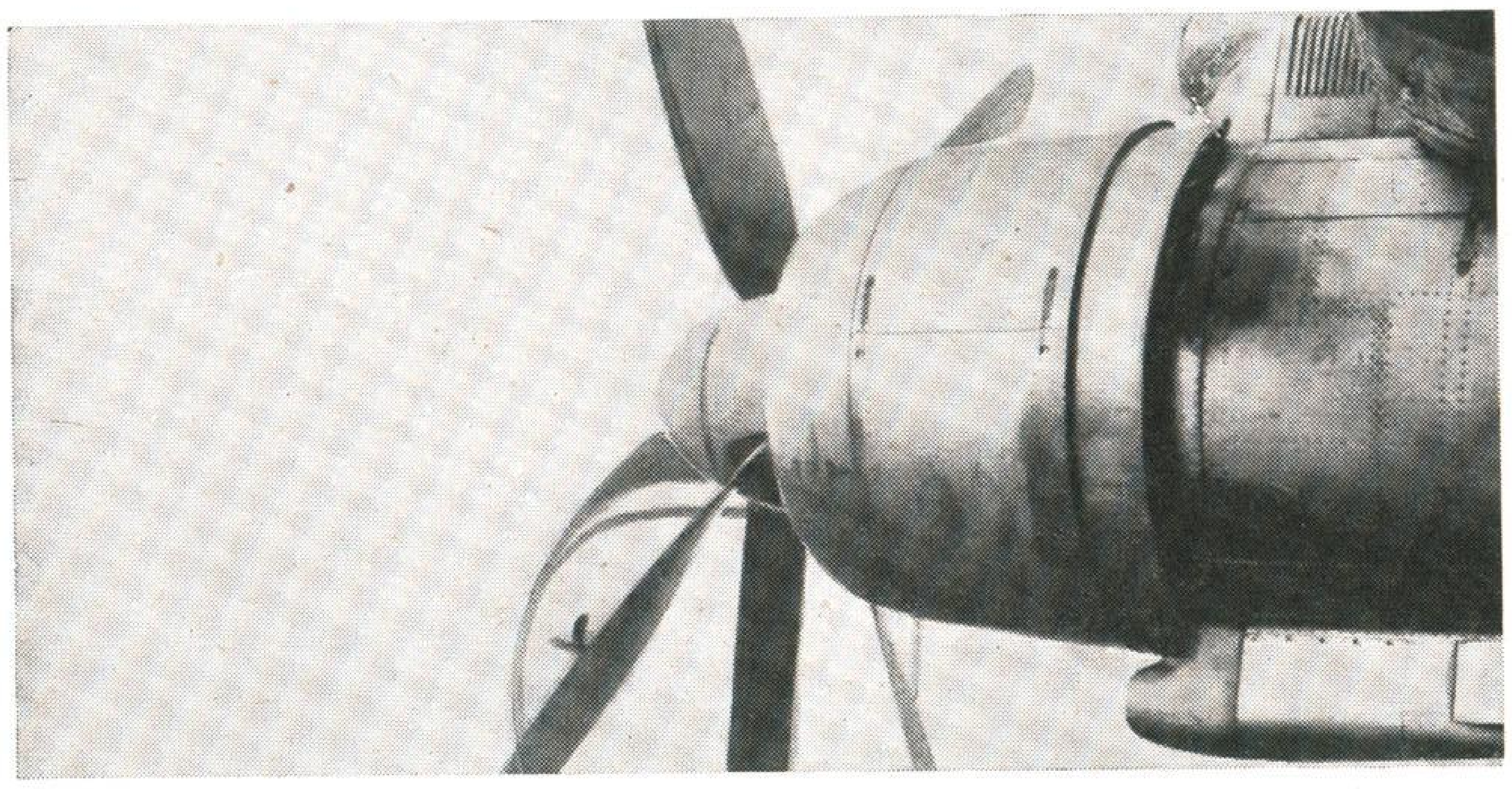
(PART TWO)

Hitherto, the number and arrangement of an aeroplane's engines aided recognition, if only for the reason that we were sometimes able to classify the aeroplane at a glance and thus narrow down the field of possible identities. This is still possible with the propeller-driven class but is not so of jet-driven aircraft, because designers have developed a habit of hiding two, or even more turbojets inside one housing or nacelle. They have also taken to packing them inside fuselages and, if we read the signs aright, turbojets will be disappearing completely inside wings at some time in the future. The part that engines play in assisting recognition at the present time is explained here.

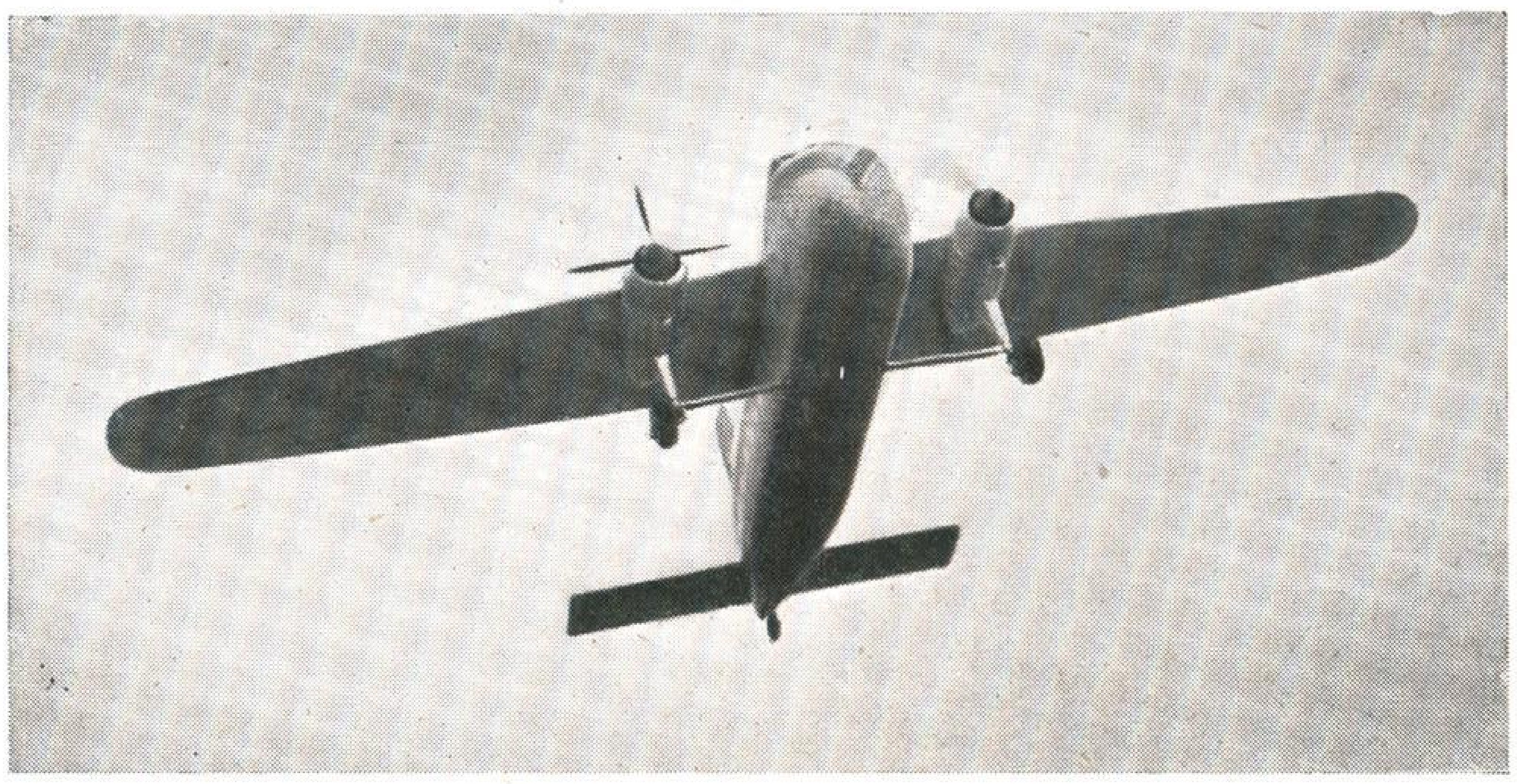
AERO-ENGINES



The radial-cylindered engine has its cylinders spaced out round a central crank-case so that air can circulate freely and cool them. When the covering (cowling) is fitted (see below) the appearance of the engine is completely altered. On the right is a photo of the Bristol Hercules sleeve valve radial.



Bristol Hercules radial engines are fitted to Bristol 170 Wayfarer and Freighter aeroplanes, and this is a close-up of the installation. The large rounded spinner almost fills the front opening of the engine. The exhaust "stubs" emerge at the rear of the cowling. There are intakes above (carburettor) and below (oil-cooler) at the rear of the engine.



This is a photograph of the new type Bristol 170 Freighter climbing with one engine stopped. The view shows a characteristic aspect of a radial engine and its nacelle. In this aeroplane the engines are close-set (to the fuselage.)

Types

Some idea of the kind of engine used is of value in recognition work from the point of view of interest, as well as for its effect upon the appearance of the aeroplane.

There are two main types of aero-engine in service today. They are the piston-engine and the gas-turbine. Piston-engines, for our purpose, may be sub-divided into two main classes, radial and in-line. The gas-turbines may also be sub-divided into two classes, propeller-turbines (turboprops) and pure jets (turbojets).

PISTON-ENGINES

Air-cooled Radials

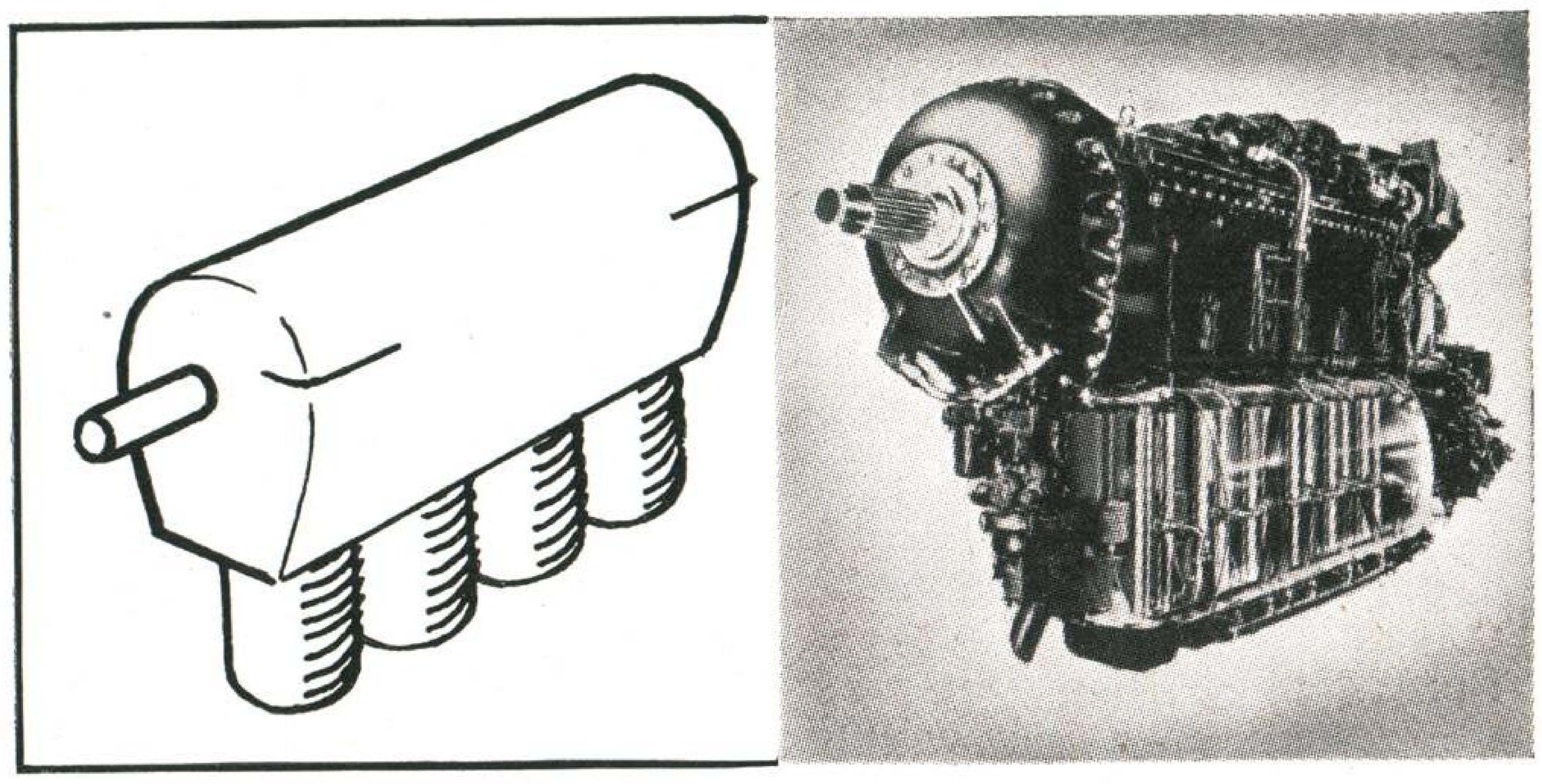
The most common type of air-cooled aero-engine in use today is the radial. So-called because its cylinders are spaced radially like the spokes of a wheel, they catch the airflow and are thus cooled (Fig. 1). Time was when these engines were completely uncowled for cooling purposes and were easily recognisable. They have, naturally, a wider frontal area than other engines, but today the radial engine is enclosed within a cylindrical covering, which usually has an open front end through which air enters to cool the cylinders. We usually associate radial engines with a certain bluntness of entry, though the careful streamlining of cowlings and the shaping of airscrew spinners has produced some elegant outer shapes for them and they are no less efficient than the in-line type we mention later. Even so, it is usually easy to distinguish a radial by its shape. A typical example of a radial-engine installation is seen in the illustrations on the left.

Air-cooled In-lines

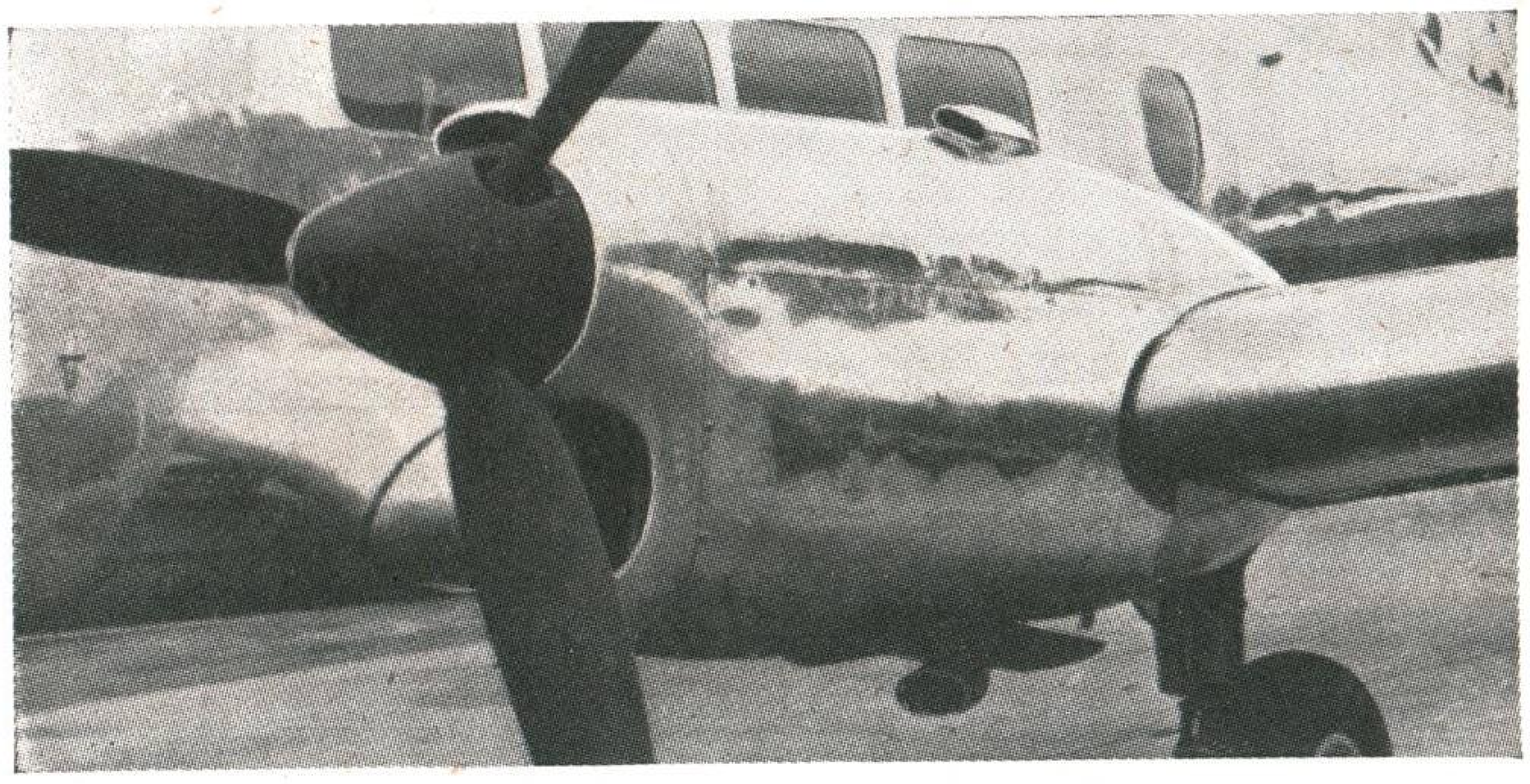
These engines have their cylinders arranged one behind the other in one or more rows. The air-cooled type (of which the de Havilland Gipsy series are good examples) is usually in the under-500 h.p. class and is fitted to the lighter types of aircraft. It is sometimes called an " inverted " engine because the crank-case is above the cylinders. In proportion the engine tends to be deep and narrow, having the spinner high up and a large gap or duct in the front cowling. We usually refer to this type of engine as the gipsy-type.

Liquid-cooled In-lines

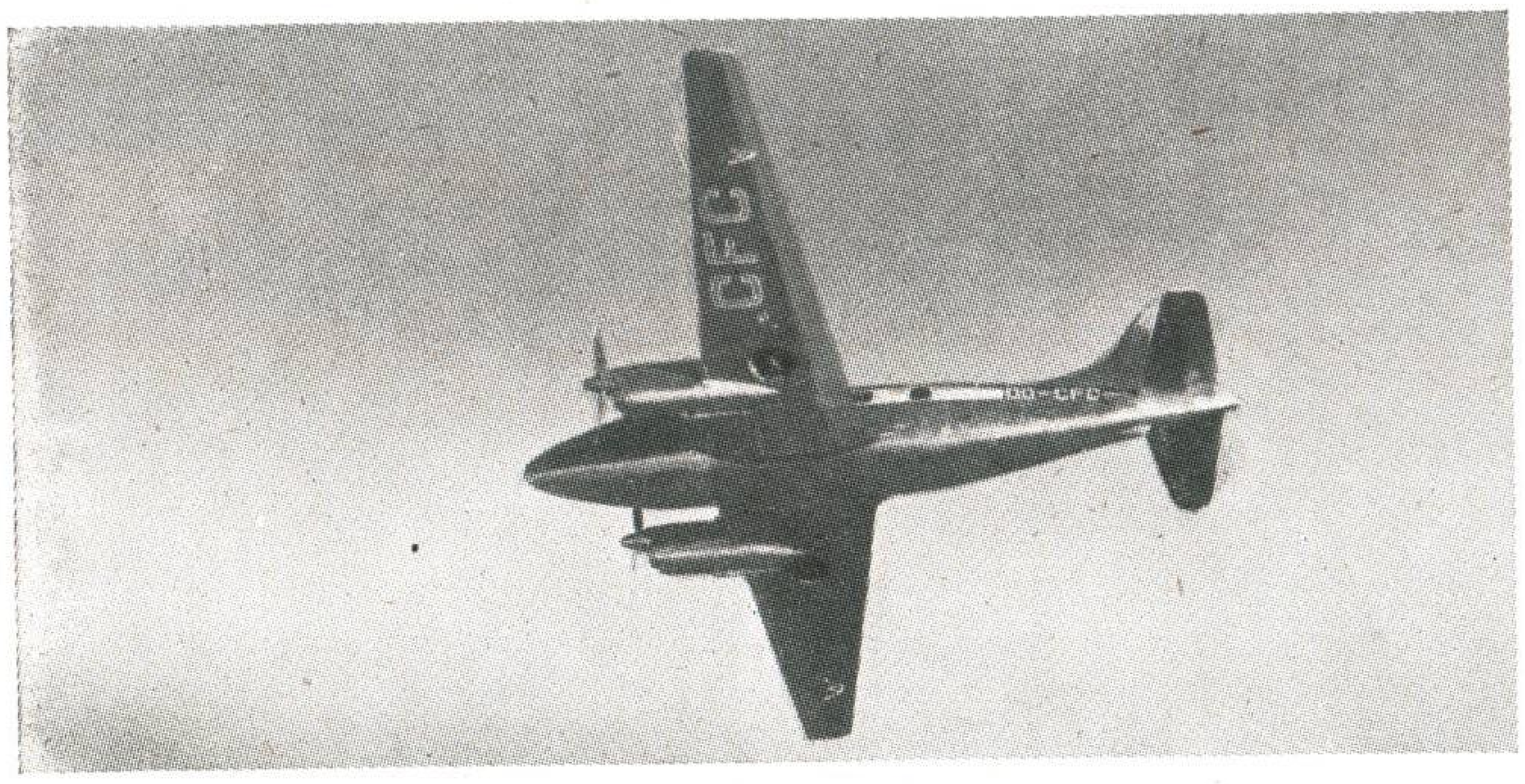
The usual form is two rows of cylinders making a " V ", though there are other arrangements such as the " H " type (so-called because its banks of cylinders form an " H "), though they are not common. These engines lend themselves very well to good streamlined cowlings and by using a pointed spinner on the airscrew a good aerodynamic shape to the whole engine can be formed. Our illustrations show various methods of installing the Rolls-Royce Merlin engine—a typical in-line type.



The air-cooled in-line engine has "finned" cylinders mounted in a row with the crank-case over them. Air, let in through the gap in the front cowling, is deflected round the cylinders to cool them. The engine shown on the right is one of the De Havilland Gipsy 70 series.



When completely cowled the Gipsy-type engine presents a small frontal area and is long and shapely. (This is a close-up of the Dove's installation.) The spinner is high, below it is the main cooling intake, above it is a smaller one (oil-cooler). Beneath the engine is the intake for the carburettor.



The Gipsy-type engine is recognisable by its high spinner and long slim form. In the De Havilland Dove the engines are rather high-mounted and extend well forward alongside the nose of the fuselage.

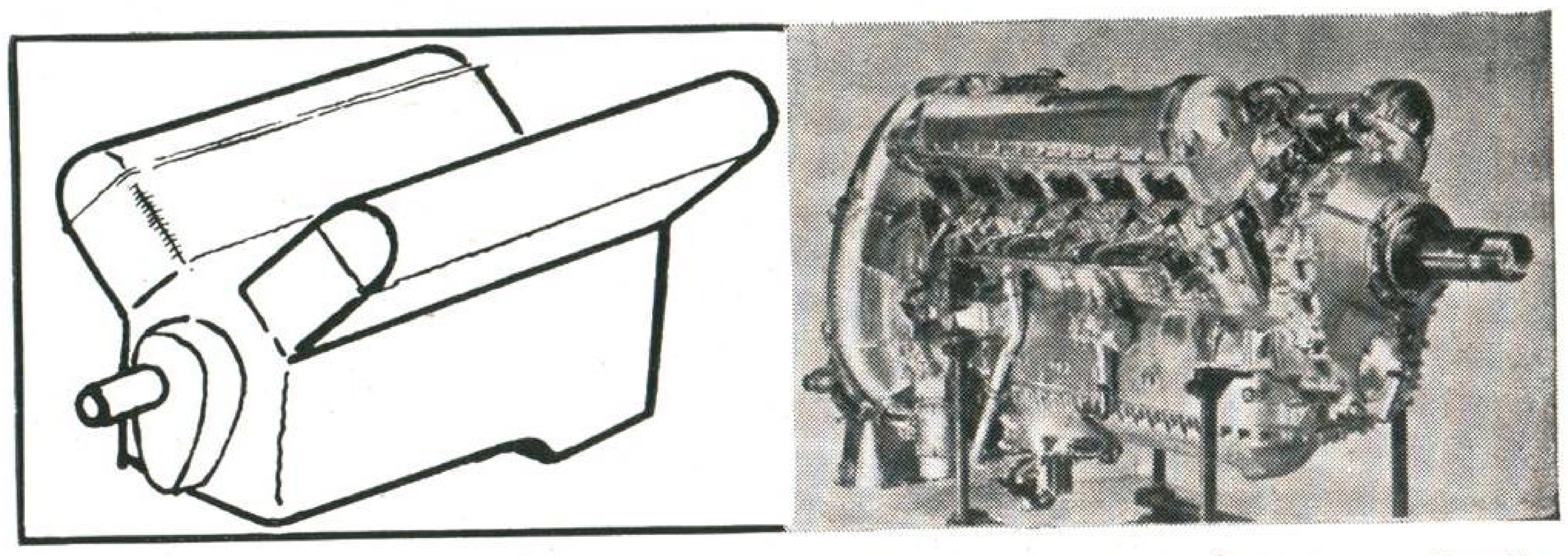
GAS-TURBINES

(See also *Journal* for May, 1947)

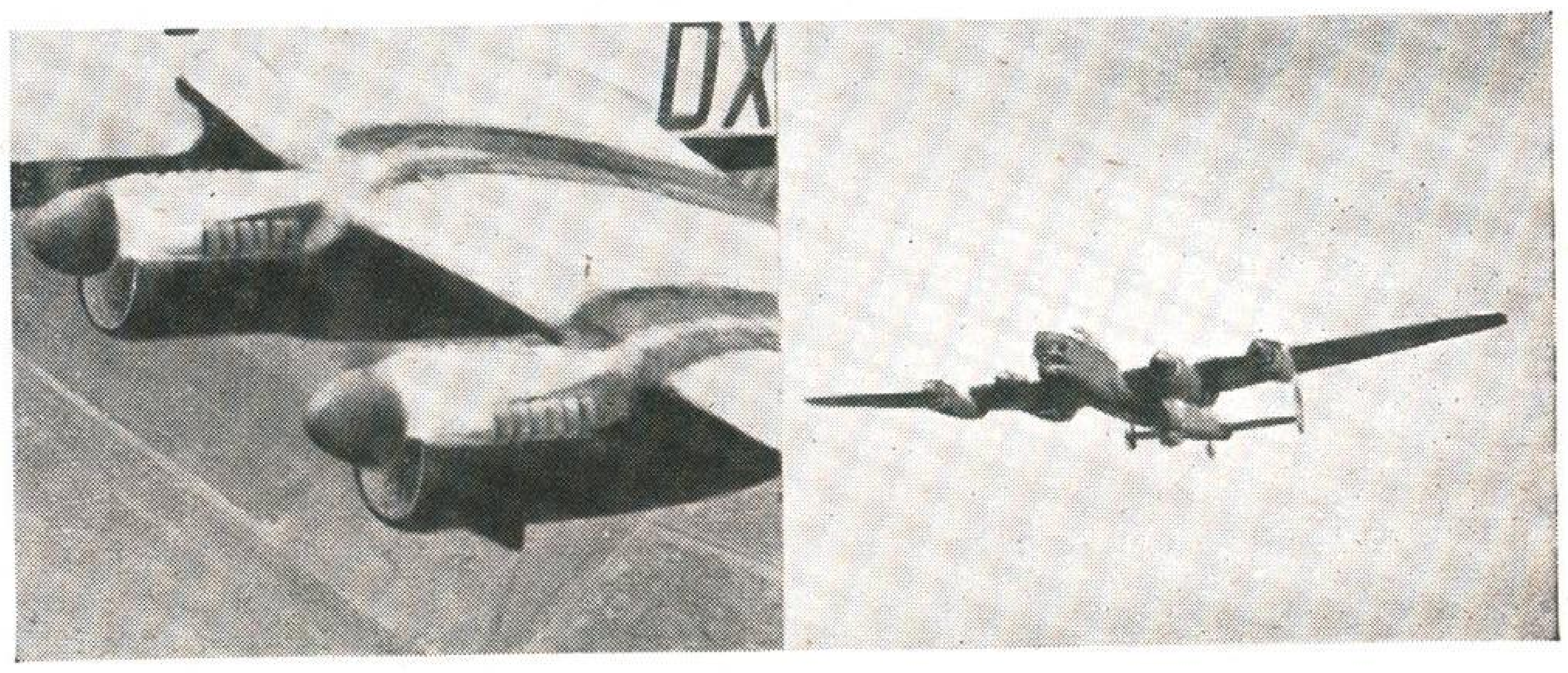
Propeller Turbines

Or, as they are familiarly called, turboprops, are offshoots of the turbojet. Instead of using jet-reaction as a means of propulsion, the hot gases are directed on to a turbine wheel which is connected to a propeller. The advantages of this type of engine are that it can have an extremely small frontal area and is easy to maintain. The present disadvantage is its high fuel consumption, though there seems to be the possibility of improvement in this respect as the engine is developed in service.

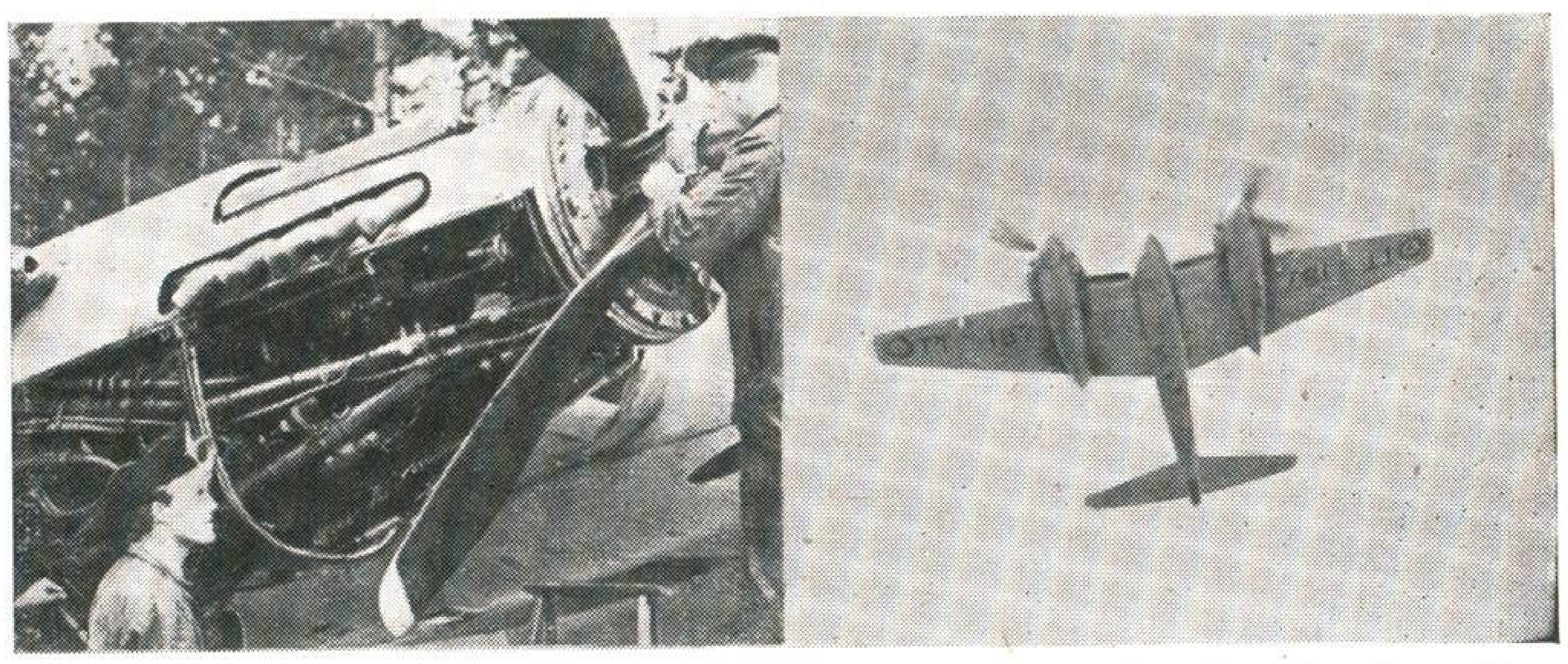
The Avro York has yet another shape of cowling to its Merlin, of which the chief characteristic is a large intake duct below the spinner. The exhaust system (also of the "stub" type) is mounted high. The York's engines do not extend as far as the nose of the fuselage. Here, too, the inner nacelles are large to accommodate the undercarriage. →



The Rolls-Royce Merlin in-line liquid-cooled engine (above) has two banks of cylinders mounted in a vee-form on the crank-case. As it is a liquid-cooled engine it requires a radiator. Radiators can be good recognition features. Various methods of installing them are illustrated below. They all aid recognition.

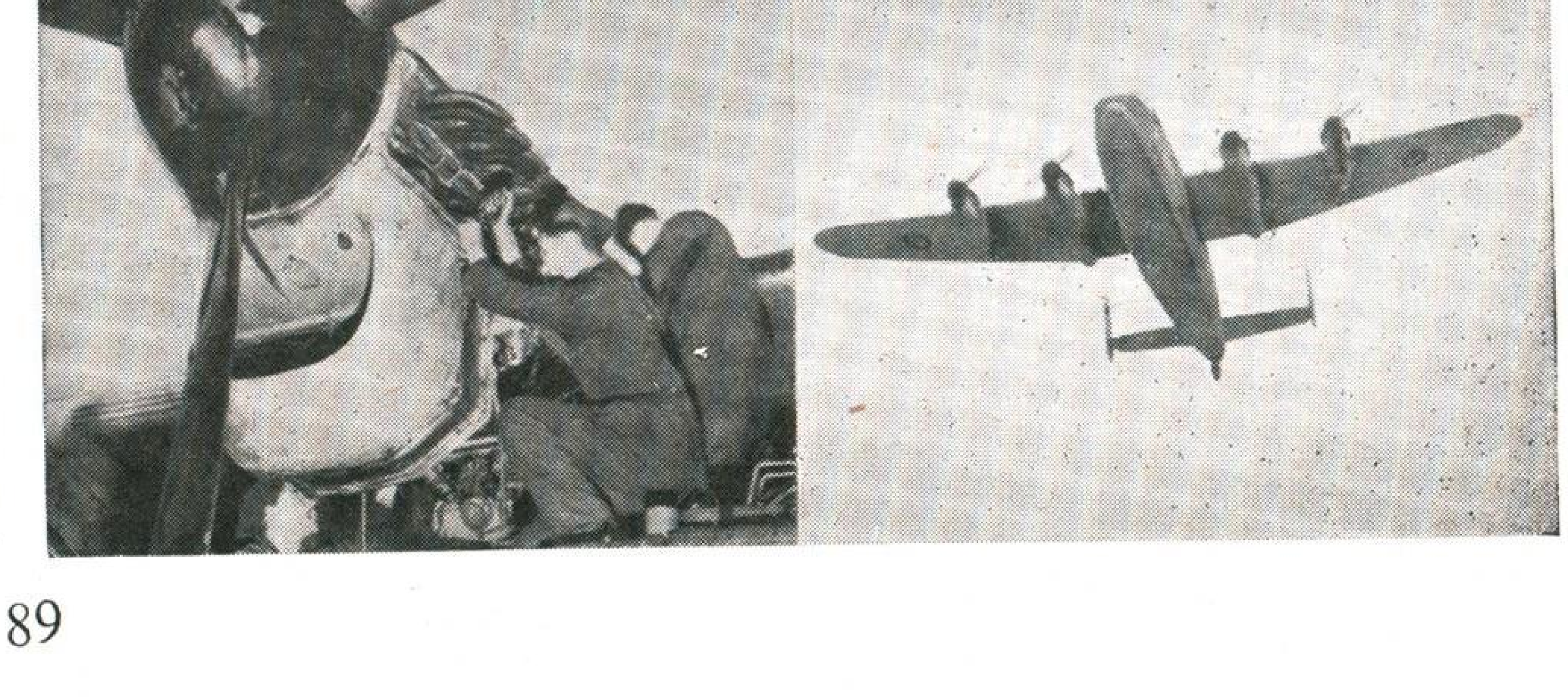


The Avro Lincoln's Merlins are housed in cylindrical cowlings which have something of the appearance of a radial engine except that the spinners are high set. There is a large opening in the cowling beneath the spinners in which are set the radiators. The inner nacelles of the Lincoln are made larger to contain the retracted undercarriage.



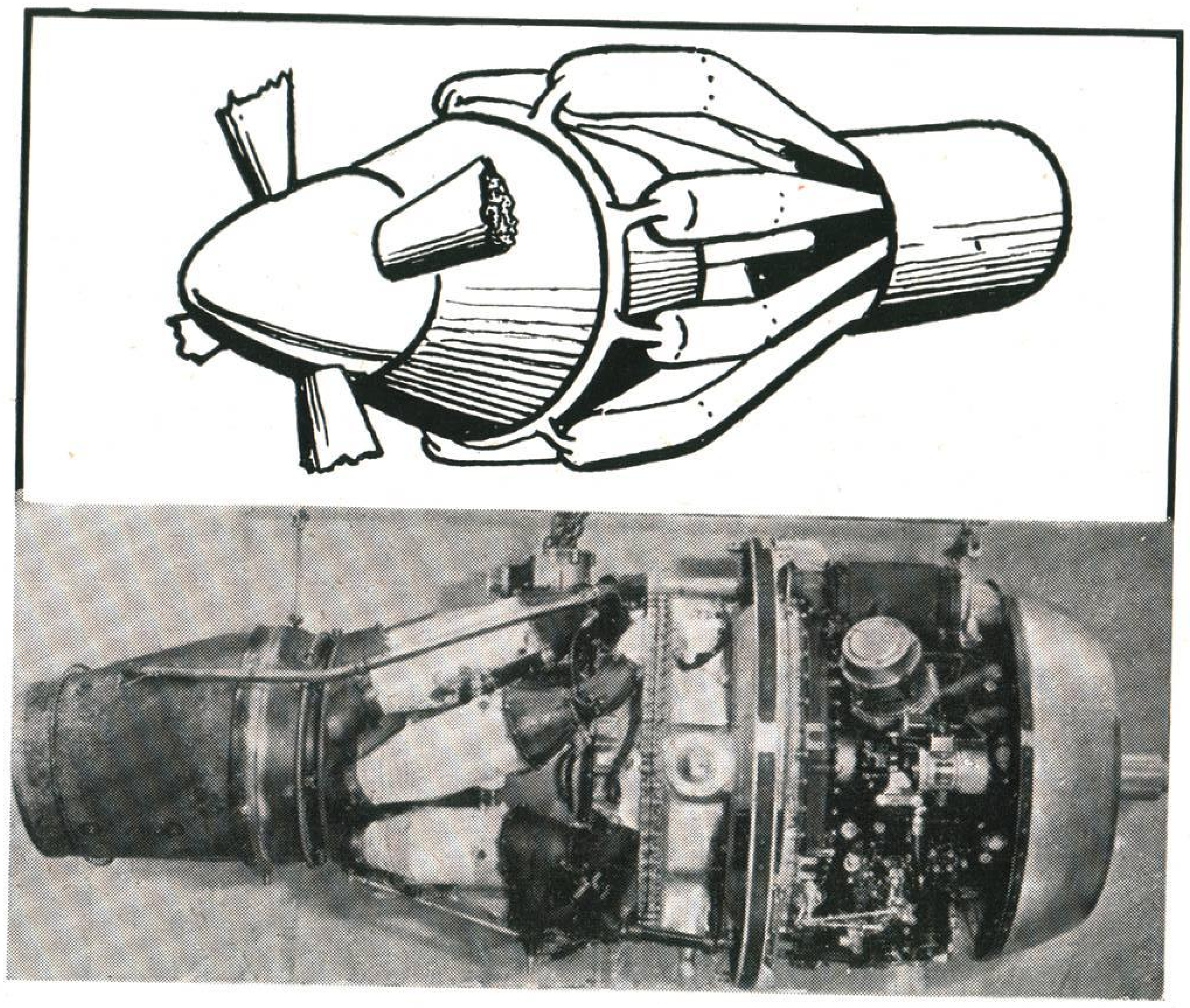
The De Havilland Sea Hornet has a very neat, streamlined engine installation. The intakes can clearly be seen (right) as long slots in the leading edge of the wing between engines and fuselage. The exhaust pipes (left picture) are of the "stub" type. Those in the right-hand photo are of the "muff" type which hide all exhaust glow for night flying. Notice that the engines extend ahead of the nose of the fuselage.

The Vickers Seafire 47 has a Griffon engine which is in form similar to the Merlin. It drives a contra-prop. The radiators for this engine are seen as "boxes" beneath the wing. The exhaust system ("stub" type) is high on the side of the shapely cowling. Behind and below the large spinner is the "lip" of another intake (carburettor) moulded to the cowling lines.



One of the best-known types of turboprop installation is that of the Rolls-Royce Dart as fitted in the Vickers Viscount which we illustrate.

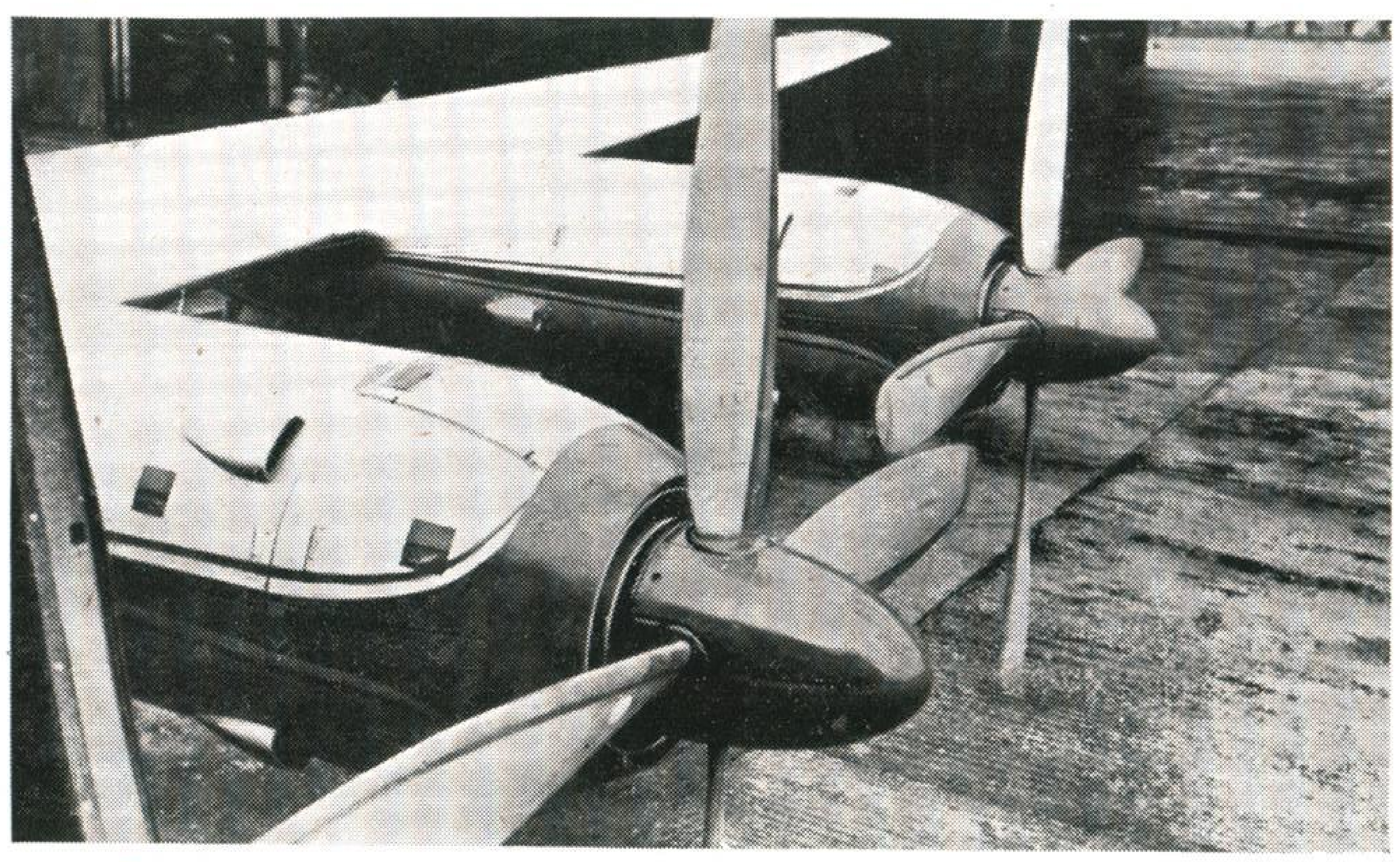
Because the turboprop engine employs a propeller to turn its power into thrust, however much the engine is " buried " inside the aeroplane's structure, there will always be some sort of " stem " for the propellers, which, from our point of view, would be almost as useful as an engine itself.



The turboprop engine consists of a number of "flame tubes" which produce a swift flow of hot gases which spin a turbine wheel and then go out of the tail-pipe to form a jet. The turbine wheel is connected to a propeller. This is a photograph of a Rolls-Royce Dart propeller-turbine. The fat, chrysalis-like flame tubes can be seen leading down to the turbine wheel and jet-pipe.

Pure Jets or Turbojets

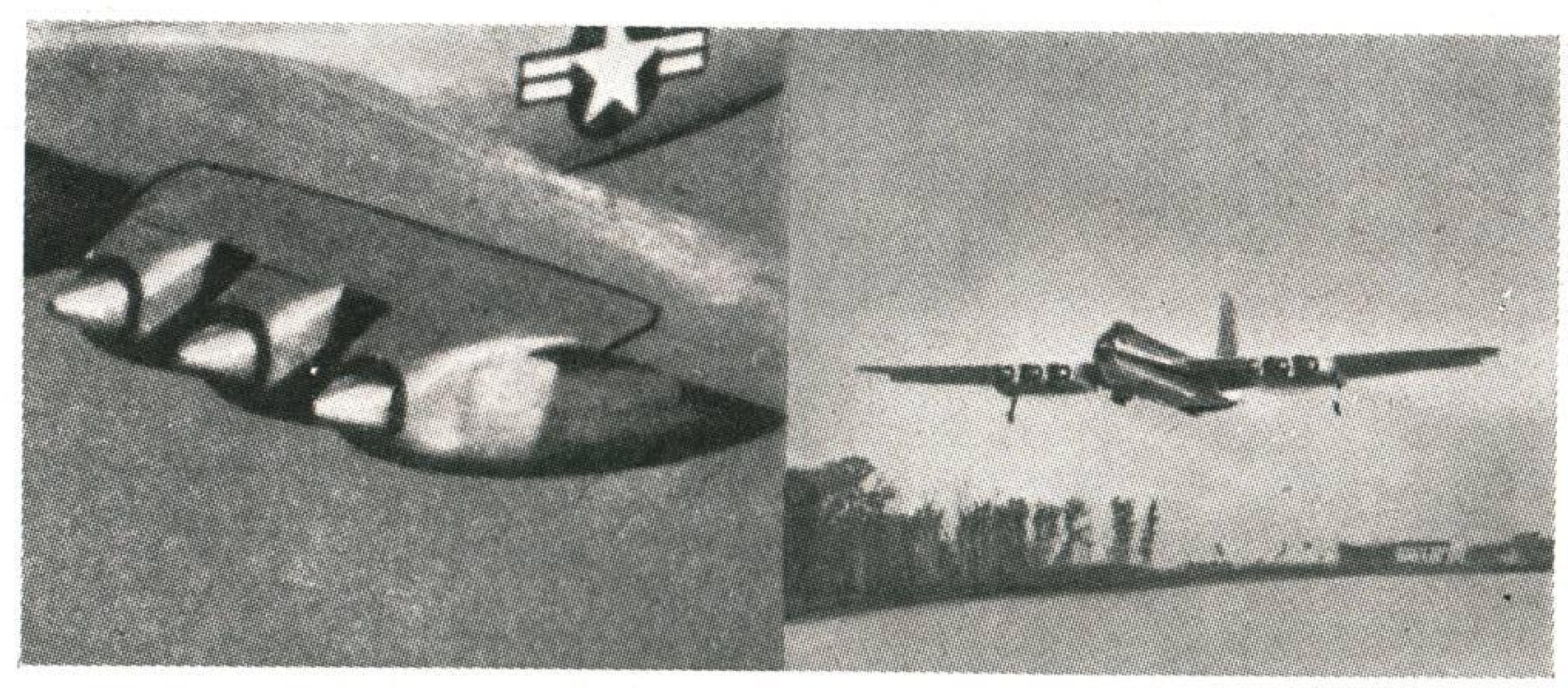
The principles of operation and construction of the turbojet are simple, and it can be tailored into an aeroplane design almost anywhere. We find them " buried " inside wings or hanging from them chrysalis fashion, or set out on long slender " stalks " beneath the wing ; they are tucked into wing roots or attached to wing-tips ; they are paired, tripled, and even quadrupled, in one nacelle. In fact, an aeroplane designer has so much licence in their positioning, that a race of aeroplanes is being born in which the variety of shapes introduced has made them much more interesting, and in many ways easier to recognize.



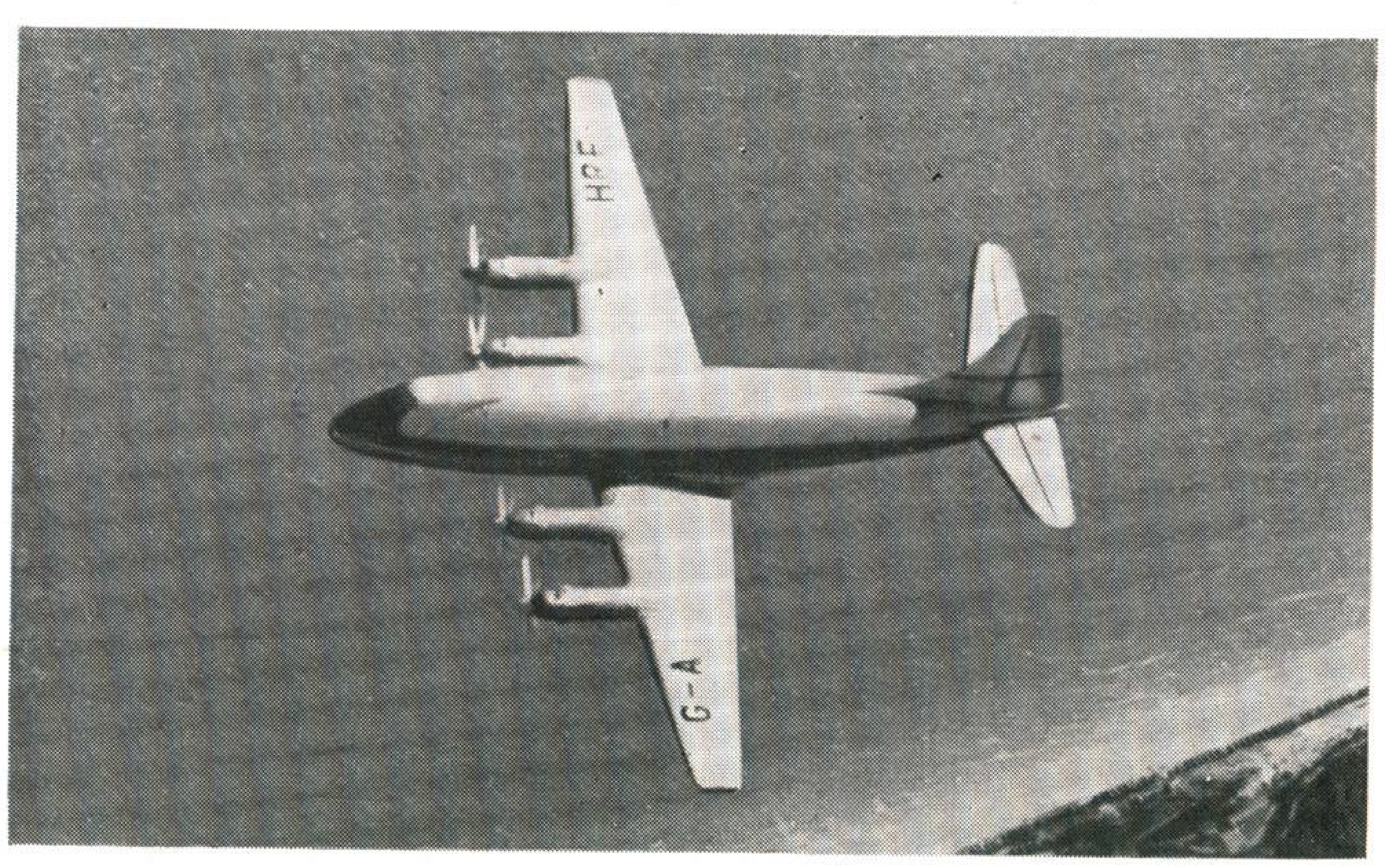
The Vickers Viscount (first turboprop airliner in the world) has four underslung Dart engines which are neatly enclosed inside a cylindrical cowling of very slim proportions. The annular openings of the air intake (kerosene and air burn together in the flame tubes) are seen immediately behind the propeller spinners.

Engine Details

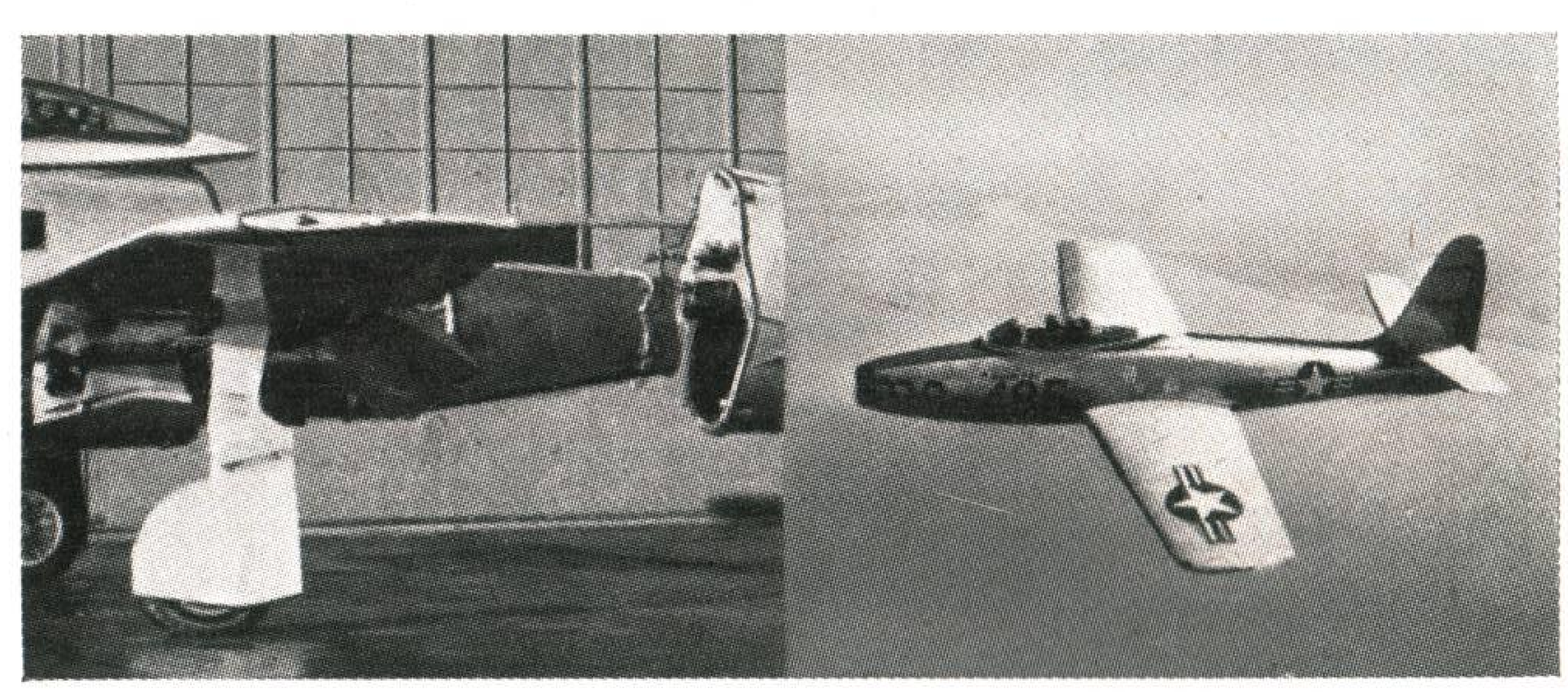
All types of aero-engines must " breathe ", " exhaust ", and " keep cool ". To do this effectively they are usually designed with a quota of scoops, ducts, radiators, and exhaust systems of one kind or another. There are in fact so many varieties of each of these items that it is impossible to detail them all. All of them are helpful in recognition (at some time or another), some more than others. We deal with them more fully, and show some examples of them later in this article.



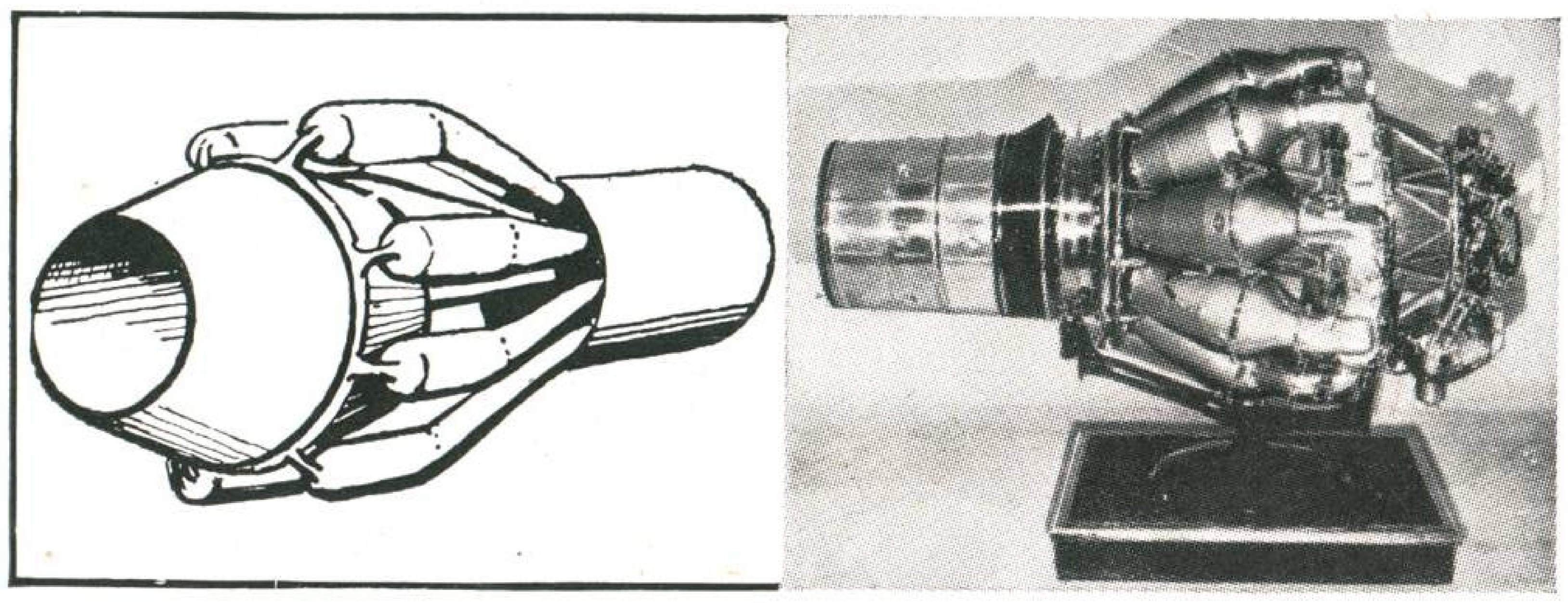
The Martin XB-48 illustrates a different method of installing jet-power ; " batteries " of three turbojets in single power-packs.



The distinctive "Dart" installation in the Vickers Viscount is shown clearly in this photo. The engines look like four rather thick pencils and have extraordinary length.

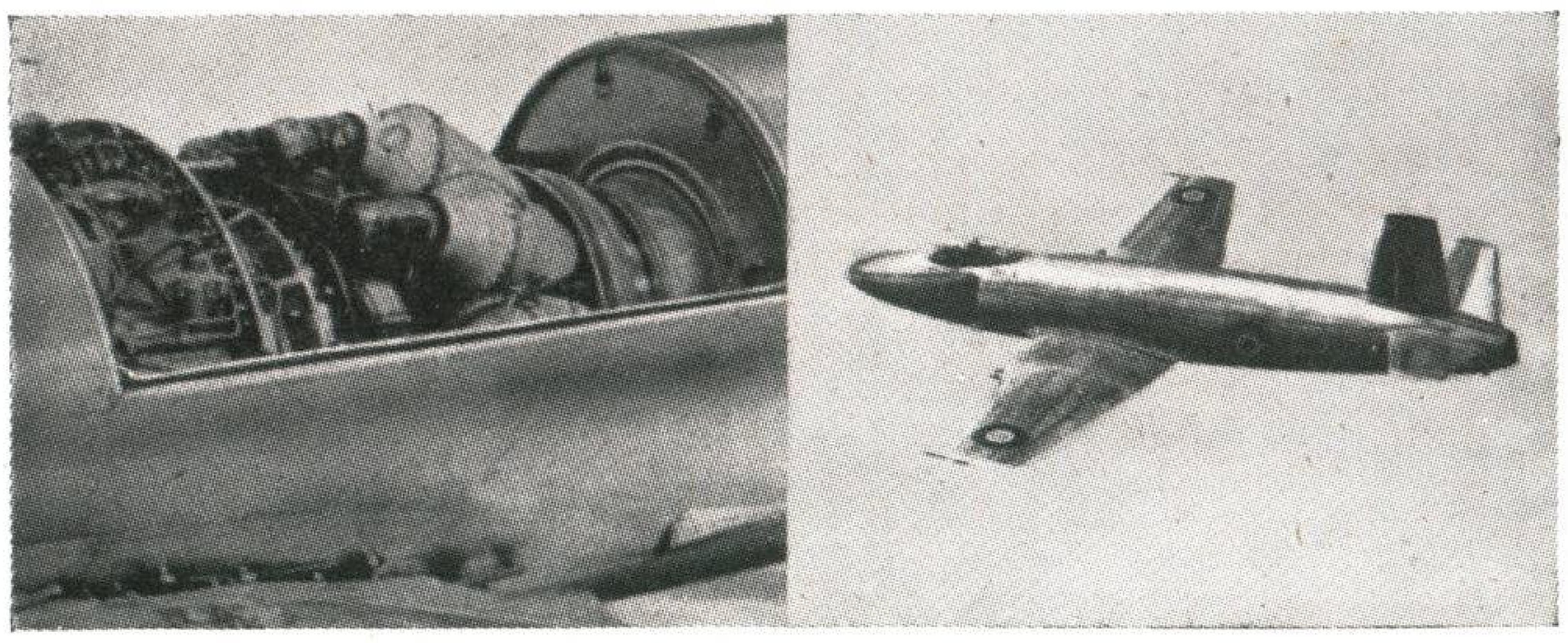


The Republic F-84 provides another example of the fuselage installation with the simplest (in appearance, at any rate) intake and exhaust arrangements, that is, nose intake and jet exhaust at rear end of fuselage. The fuselage, in fact, becomes a turbojet nacelle, in the top of which rides the pilot.

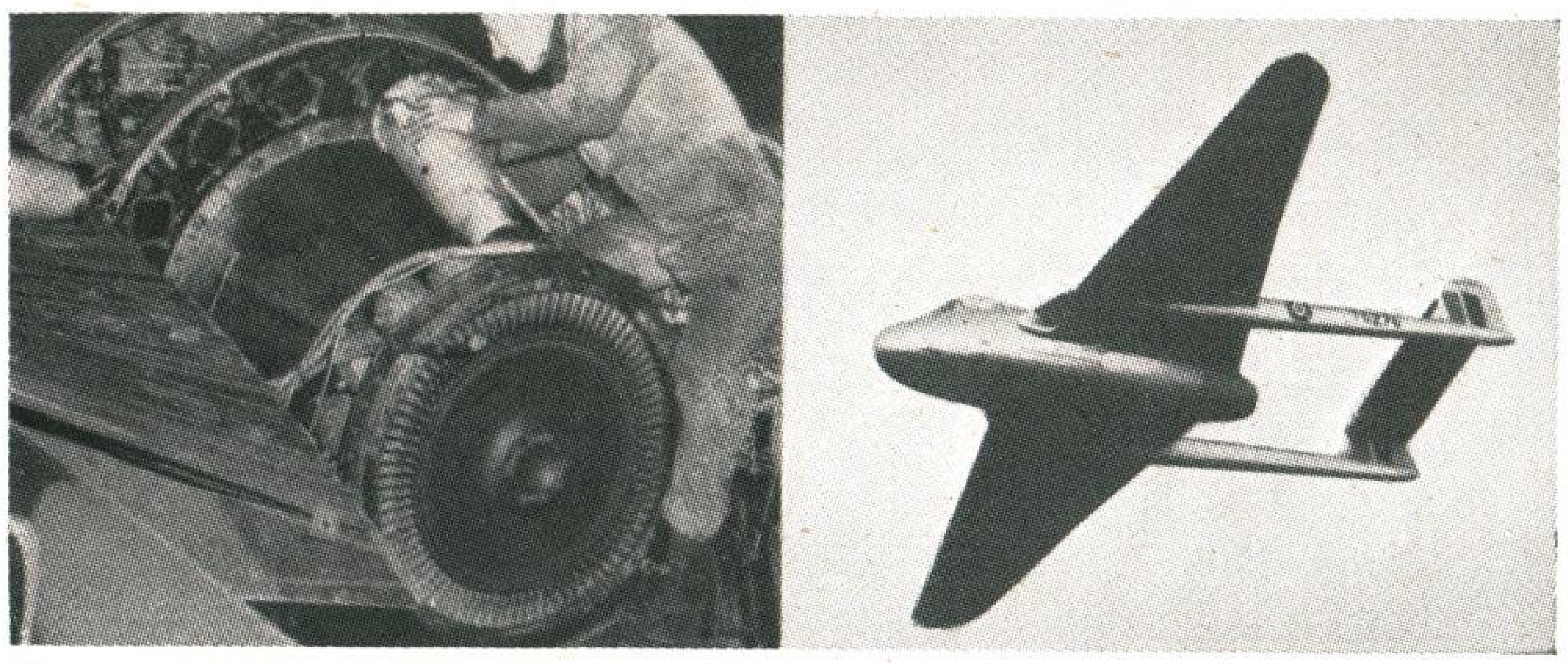


The turbojet's thrust comes from the reaction of hot gases escaping from a bank of flame tubes. The photograph is of a Rolls-Royce Nene turbojet, which is installed in many British and foreign high-speed aircraft. The turbojet burns a lot of air with its fuel and large intakes are necessary. The intakes sometimes form good recognition features, as do the jet-pipes.

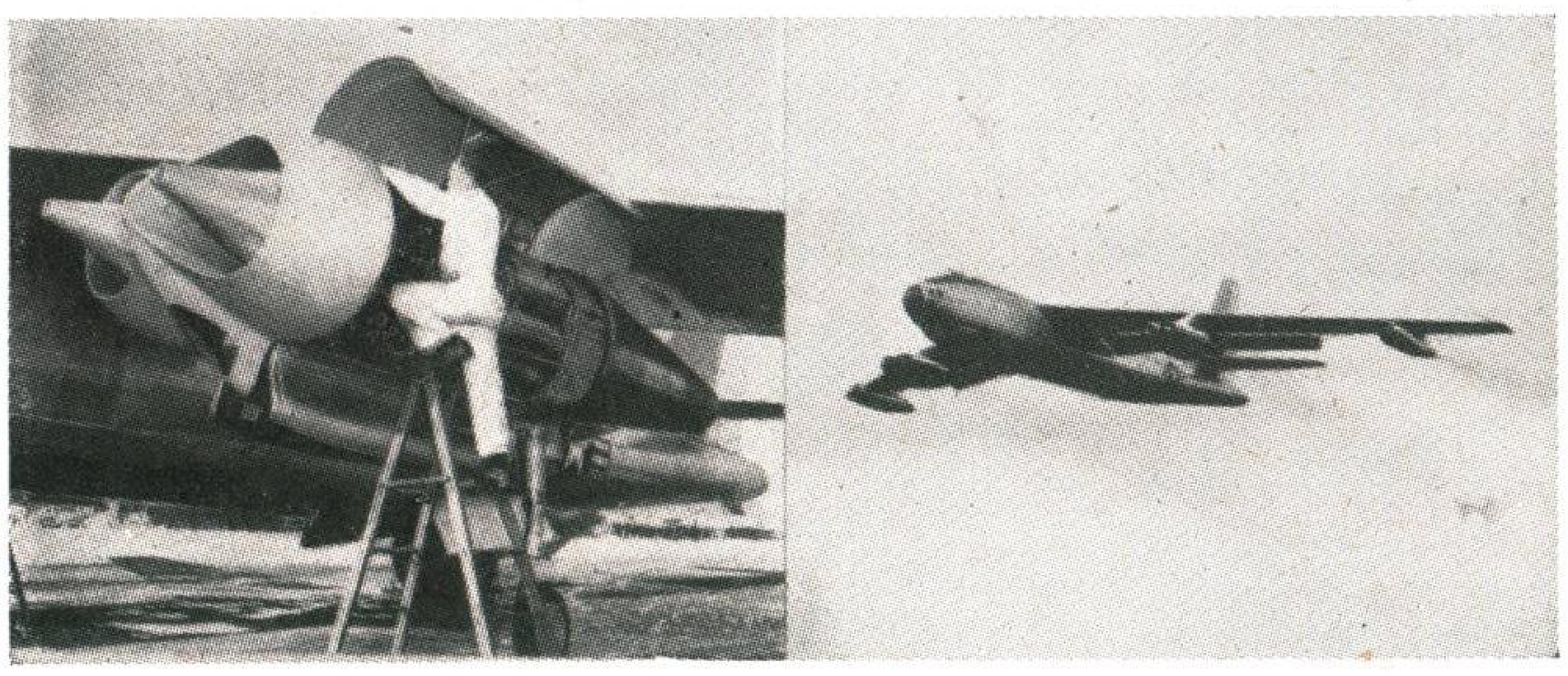
The photograph on the left shows an uncovered Rolls-Royce Derwent turbojet in the starboard engine nacelle of a Gloster Meteor Mk. 3. On the right is a view of the Meteor Mk. 4 showing the centrally-mounted turbojets.



The Nene turbojet of the Vickers Sea Attacker is installed about half way along the fuselage. Large air intakes are situated one each side of the cockpit, whilst the jet-pipe comes out at the rear of the fuselage.



The De Havilland Vampire's turbojet is installed in the central body or nacelle of the aeroplane. The air intake ducts are seen in the wing leading-edge roots. The jet gases escape at the rear of the nacelle. The photo on the right is of the Vampire Mk. I fighter. The tail is placed high to clear the jet efflux (exhaust).



The rather radical Boeing XB-47 jet-bomber has a novel six-jet installation. Four are mounted in pairs and suspended on "stalks" from the wing, the other two are underslung near the wing-tips (the cones in the intakes are for smoothing the air flow). This arrangement of turbojets illustrates another of the many ways of mounting this type of power-plant.

What to Look For

The points to observe specially about engines which may be visible on an aeroplane are : shape, type, position, and grouping. Shape gives a clue to type. Positions are at the nose of the fuselage, on the top of a pylon, on the back of, or slung beneath, the fuselage ; they sit upon, are sunk into, or hang on the wings (underslung) or are suspended from them on " stalks ". Engines may be set close together or well spaced out along the wing. They may be set out singly or in groups. Sometimes they extend only a short distance towards the length of the nose of the fuselage, sometimes in line with it, and occasionally beyond it.

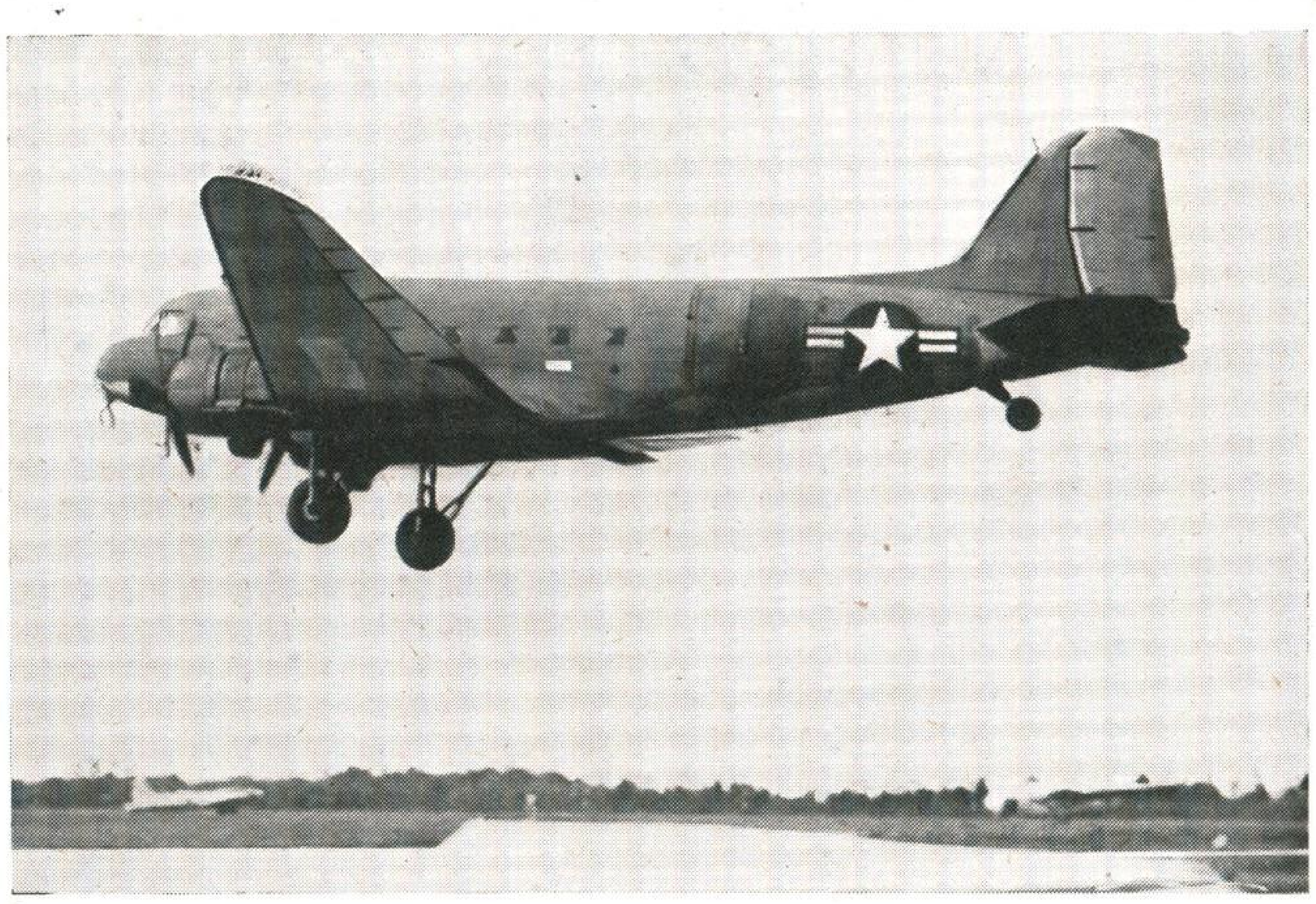
Thus we are not on very safe ground if we refer to the number of engines which an aeroplane has, when we discuss its recognition points. It would be much better to refer to the number of power-packs. In some cases, such as in the Bristol Brabazon 1, it would be better to refer to the number of propellers (counting a contra-prop as one).

UNDERCARRIAGES

Undercarriages are at once a necessity and a nuisance. Necessary for take-off and for alighting, they are useless in the air, taking up valuable space and cutting pay-loads. Many and varied have been the experiments to do away with them, but there is every possibility that wheeled undercarriages will be with us for a long time to come.

Its main parts are a set of shock-absorbing legs and pneumatic wheels. There are two types of undercarriage in use today : the bicycle and tricycle types. The bicycle type undercarriage has two main wheels and a small tail wheel or skid. The tricycle type has a steerable nose wheel and two main undercarriage wheels. The advantages of this type over the bicycle type are many, notably in taxying and ground manœuvring, and because the aeroplane is always at rest upon an even keel. The tricycle undercarriage is in fact almost universal.

There are a few aircraft with four-leg undercarriages, and in some very large aircraft it has been found necessary to replace each main landing wheel by a group of up to four separate and smaller wheels. Nose wheels are also frequently doubled.

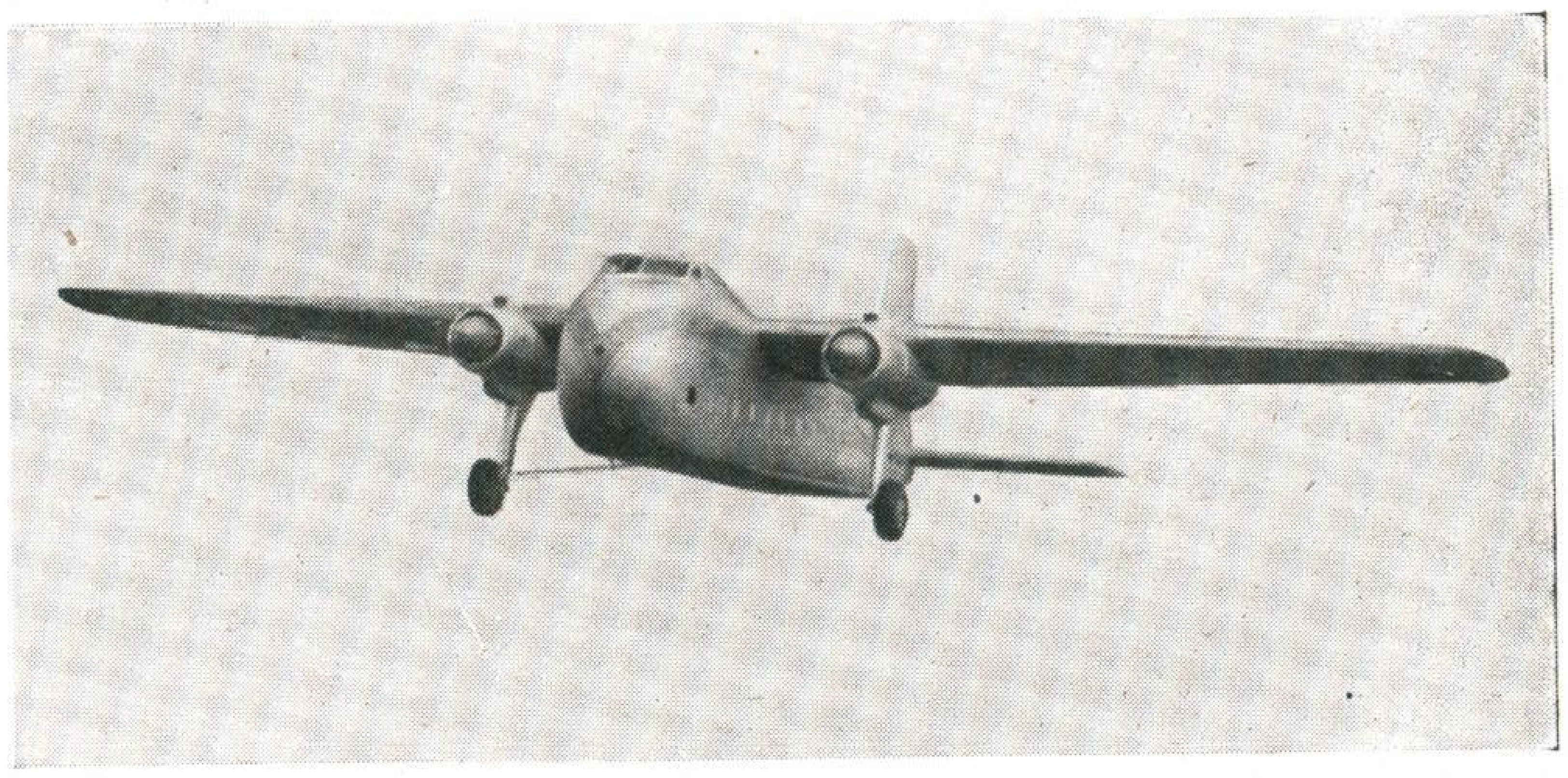


The Douglas C-47 Dakota has a "bicycle" undercarriage of the retractable type. Incidentally, this photograph shows very clearly the exaggerated (apparent) sweep-back of the wing, which has in fact a straight trailing edge. The illusion is due to sharp angle of dihedral in the wing.

The Lockheed Constitution has a multi-wheel tricycle undercarriage consisting of two pairs of main undercarriage legs each carrying four wheels, and double nose-wheels on a single leg.

Aircraft with fixed undercarriages are usually among the most easy to recognise; they are also in the low-speed scales and are thus not first-line military types.

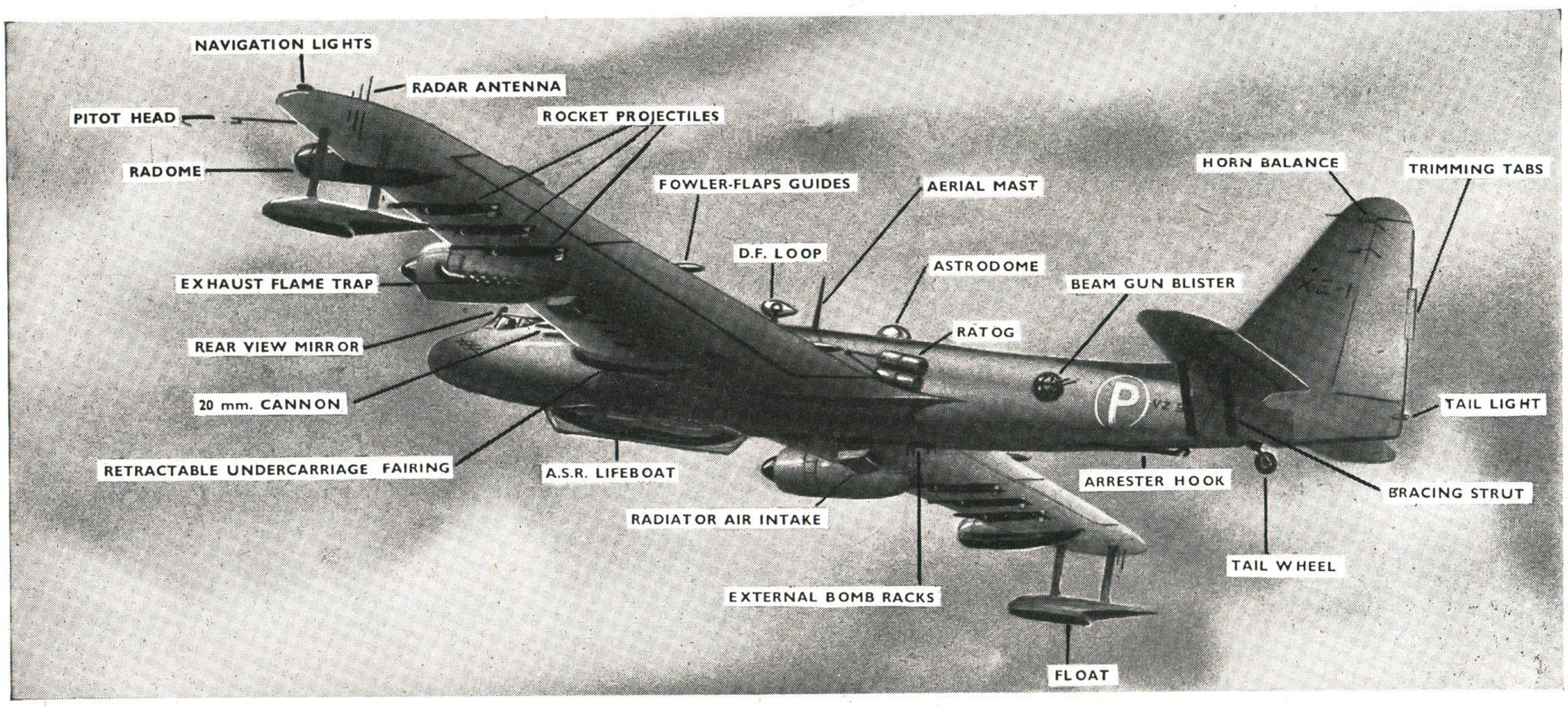
It is always necessary to be able to recognize any aircraft with its undercarriage extended, but if it can be recognized with wheels retracted there is usually no difficulty in spotting it when it has its wheels out. There is therefore no necessity to study this aspect of an aeroplane's appearance specially.



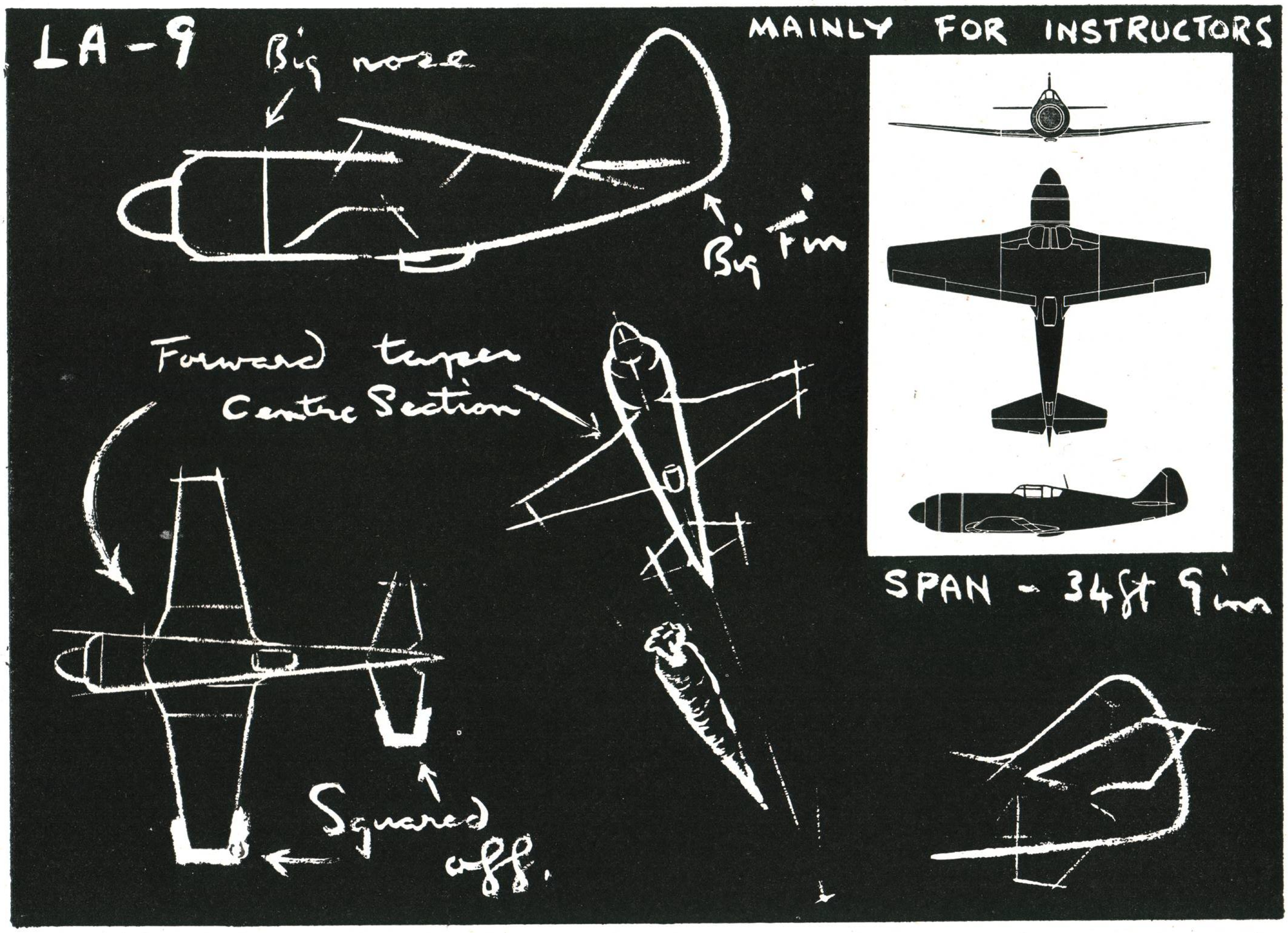
The Bristol Wayfarer (above) and the De Havilland Chipmunk (below) have fixed undercarriages of the bicycle type which are a distinct aid to recognition.

SMALL DETAILS

Or, as they are usually called, " gubbinses ". Our illustration shows just how much detail could adorn one aeroplane. As a rule detail is unimportant except in so far as it is part of the character of the whole aeroplane. Some of these details sometimes assume importance but it depends upon their size and positions and the circumstances in which they are encountered. The value of each must be judged by experience. It is, as a rule, unnecessary to spend a lot of time learning them and they are easily digested as familiarity with the aircraft grows. We illustrate these small features mainly to give them names.



This imaginary aeroplane has one of everything and two of many. If such an aeroplane really existed we feel a good name for it would be the Bustall Brickmaster.



LAVOCHKIN LA-9

In the early days of the war, when the Russians and Germans were friends, Semyon Lavochkin, co-operating with Gorbunov and Gudkov, produced a single-seater monoplane fighter of wood construction which was named the LAGG-1. This was quickly followed in 1940 by the LAGG-3 which was used to equip operational squadrons. In 1942, when Russo/German friendship was broken, the triumvirate also broke up, and Lavochkin went to work on his own producing a design which incorporated improvements from the two earlier models and which had an engine of greater power. The LA-5, as this aircraft was called, saw service at the battle of Stalingrad where its performance surprised the Germans, out-fighting and out-manœuvring their Me 109F's and Fw 190A's between ground level and 12,000 feet.

For this outstanding contribution to the war effort Lavochkin was made a Hero of Socialist Labour.

Shvetsov, the designer of the ASH series of engines, was producing improved power units, and by fitting these, Lavochkin improved the LA-5's performance. Eventually he produced a new model—the LA-7—which, with the Yaks, became the standard operational fighter and was in service in large numbers at the cessation of hostilities. For his LA-7, Lavochkin was awarded the Stalin prize of 100,000 roubles.

In 1946 there appeared a new design of Lavochkin aircraft bearing little resemblance to previous models and having a greatly improved performance. This was the LA-9, an all metal low-winged monoplane with an improved radial engine and greater fire power. Produced in large numbers, it replaced the "Sevens" already in service and is now a standard type in operational squadrons. In general appearance it bears a resemblance to the FW 190, though there is some doubt as to whether Lavochkin actually copied FW 190 features.

It has been reported that LA-9 aircraft have been seen with solid fuel rockets, used presumably for emergency bursts of speed. In addition, other reports indicate that aircraft of this type have also been fitted with what look like large athodyds (probably pulse-duct engines) under each wing; this implies that LA-9 fighters thus modified have a greatly increased top speed.

DETAILS:

Type: **Low-wing single-engine monoplane with single fin and rudder.**

Duties: **Fighter and Fighter-Bomber.**

Designer: **Semyon Lavochkin.**

Engine: **ASH-82 F.N.V. radial of 1,800 h.p.**

Performance: **Top speed : in excess of 400 m.p.h.**
Range : 600 miles (approx.).
Ceiling : Probably above 35,000 feet.

Wings: **Low, with slight dihedral on the centre-section, increasing in outer panels. In plan, straight tapered with a forward-built centre-section. Tips are squared-off.**

Engine: **A radial type with large spinner.**

Fuselage ; **Roughly " carrot " form, tapering to fine proportions at tail end. There is a small scoop beneath the fuselage at the wing trailing-edge.**

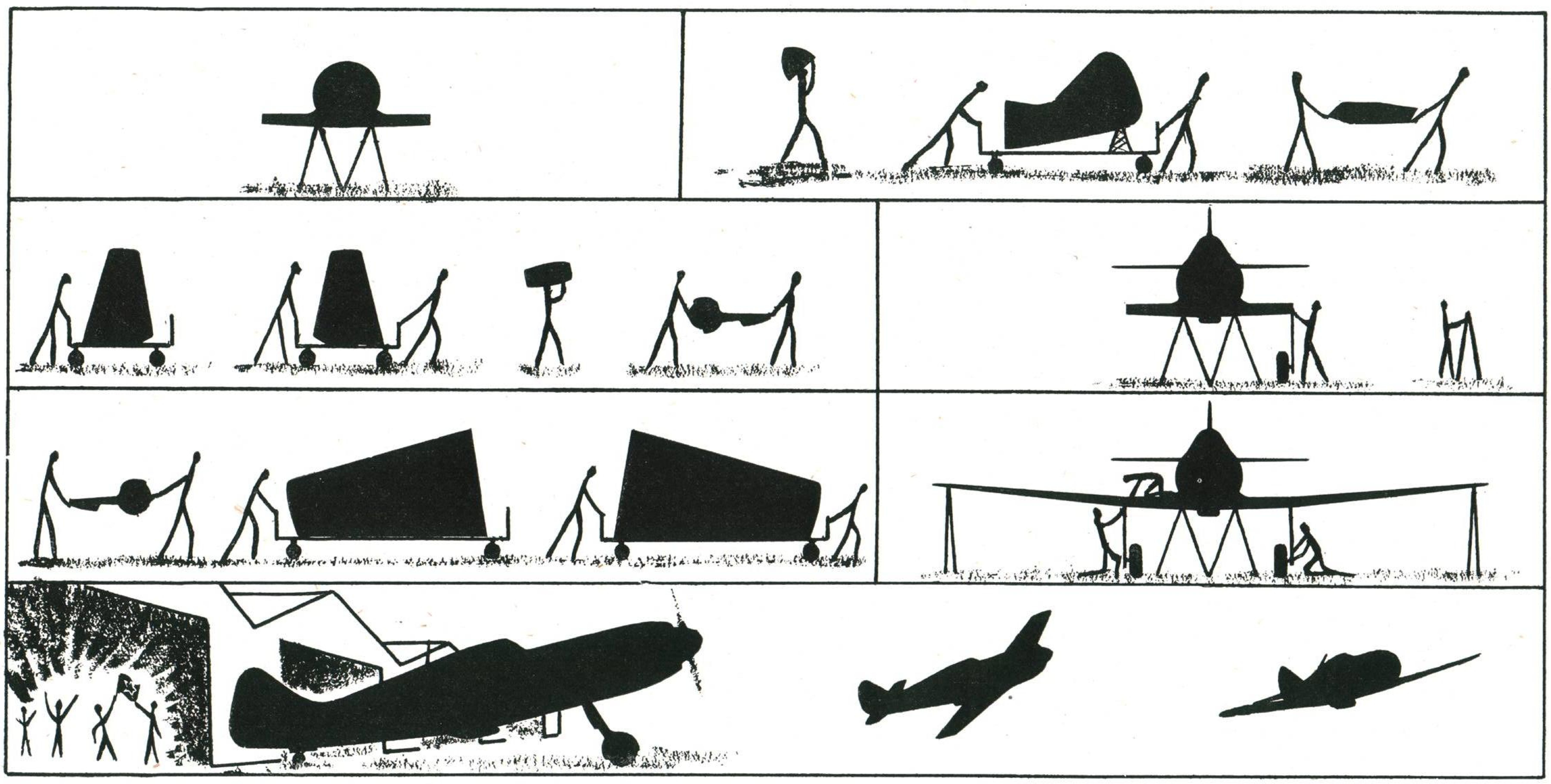
Tail-plane: **Unequal backward taper, small squared-off, with a small vee cut-out.**

Fin and rudder: **Large and triangular.**

Main features: **Large radial engine, squared-off wing and tail-plane surfaces, rear fuselage appearing to sweep up to large triangular fin and rudder. Nose heavy, tail high impression.**

Camera Press Photo.

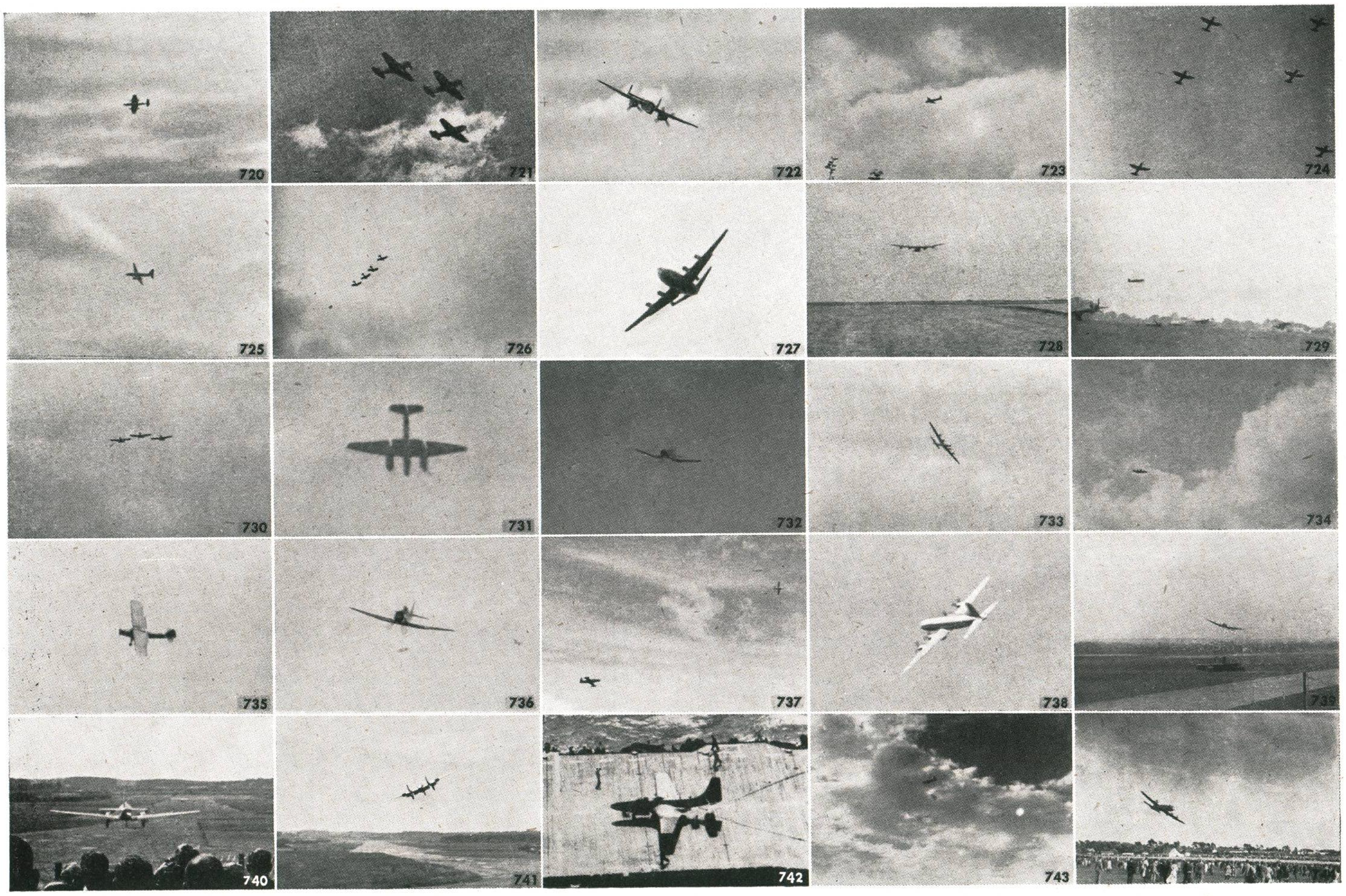
SHADOW FACTORY

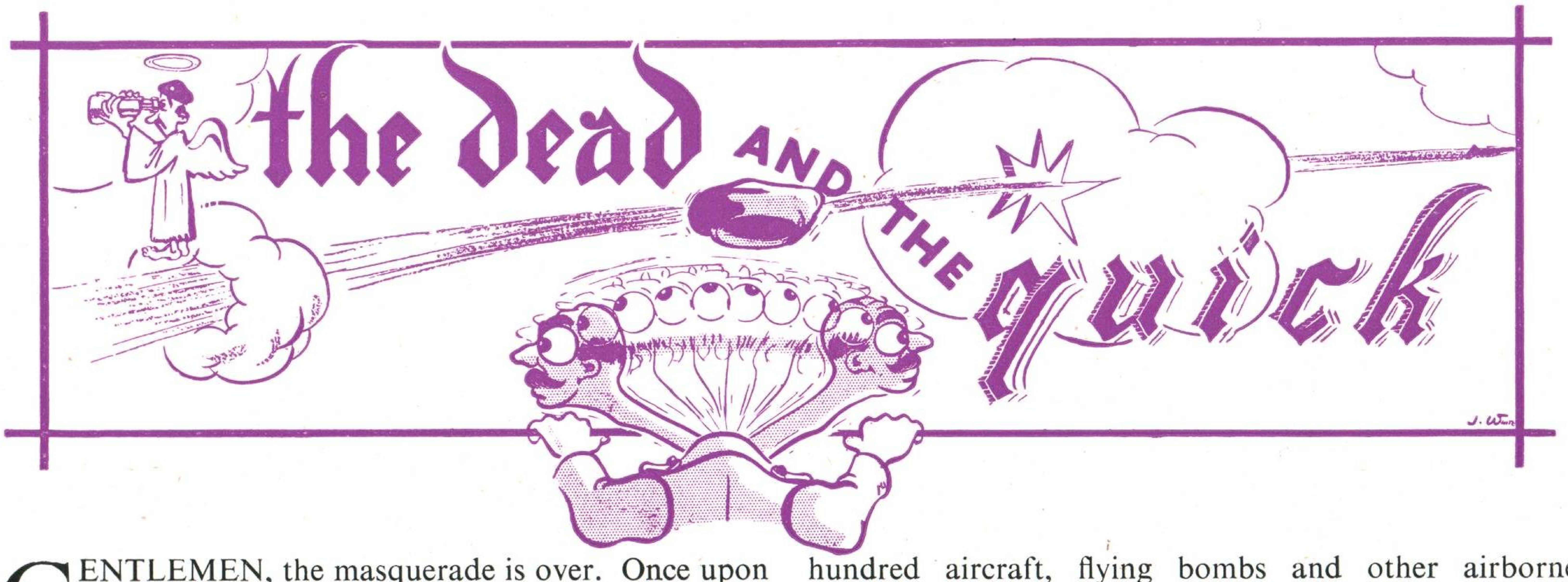


(*Solution on back cover*)

ADVANCED SPOTTING

Recognition Test No. 89





by C. H. GIBBS-SMITH

GENTLEMEN, the masquerade is over. Once upon a time you could lift the glasses to your eyes, take a look, pass them to Alfred (" Alfred, what do you make of that one ? "), hold an inquest and then report the presence and probable identity of the flying machine to whoever was interested in hearing about it. It was fun, gentlemen ; it still is. But *ce n'est pas la guerre*. For those remaining years during which recognition will remain a vital craft there must be other thoughts, other ways. Aircraft used to fly ; now they whizz. The dread words " science " and " professional " are on the march. Recognition is losing its amateur status, its pleasant air of tap-room informality. True, the preliminaries can still be conducted over a tankard, but the beer cannot accompany them further.

The first hurdle for instructors today, as ever, is psychological. How to persuade Alfred that the unaided use of his brains and binoculars is not enough. The solutions are many and must be adapted to every individual case ; but one of the best is simply to show Alfred by giving him tests that indicate what sort of a chance he will have at examining a jet aircraft at 1,000 feet on a drizzly day. Then you can get down to a bit of propaganda, and finally some instruction.

There are two quite distinct spheres of instruction. First there is the time-honoured necessity of knowing your aircraft intimately. Any device in this department is welcome, from drawing reclining nudities on the fuselage to learning about the designer and history of the aircraft. All this may or may not be necessary, according to the approach of the learner and his enthusiasm. There are any number of devices and dodges to make this game easier and, if the Editor will allow me, I will suggest some of these in a later article. This first job may be done carefully and taken piecemeal by the learner. If he is a spare-timer he will obviously have to go slower than the serviceman who has to do it as part of his military tasks. Speed here does not matter so long as he knows the basic and essential shapes of each plane, and (so essential) the quintessence or character of the machine as a whole—an achievement which will automatically spell recognition no matter at what angle or in what detail the thing may be seen. So much for this first phase. We will assume, no matter how long it takes, that we know a hundred aircraft, flying bombs and other airborne visibles. Examinations, helped on by loud whispers, broad hints and a wobbly epidiascope can be carried out without too much attention to speed of recognition. That is to say, candidates might be given 5 to 8 seconds (the time a new jet fighter takes to cover a mile) for each view test.

The next job is to speed up the actual process of recognition. All memorizing consists of three parts, learning, retaining and recalling (or from our point of view, recognition). We have briefly considered learning. We cannot do very much about retention. The human being's power of retention remains much the same during his life, but science has demonstrated (if you are interested) that retention can be aided to some extent by sleep, relaxation or change of activity immediately after learning. So the time-honoured practice of repairing to the pub right after an exhausting bout of recognition teaching has the support of the experimental psychologists.

Then we come to recalling or recognition. Here we are in a very different situation. For the speed at which we recognize something we already know can be increased to an amazing degree. Naturally the better you know an aircraft the quicker you can recognize it when you see it. But that is on a comparatively low level of speed. For our purposes we have not got to think in terms of one or more seconds, but in fractions of one second. Yes, let us take the plunge. In hundredths of one second. The speed we should aim at for the present in recognition is about one-hundredth of a second, fantastic as this might seem to some of our old timers. Let me hasten to add that such a feat is not at all extraordinary. It is not even difficult, if learnt properly. It has been shown, in purely experimental laboratory work, that some individuals can step up their recognition powers to the phenomenal speed of a two-thousandth of a second.

This facility for increasing the speed of recognition, whether it is numbers or aeroplanes, depends upon exercising those parts of our brain which convey messages from the retina and deal with them in the memory centres. It is quite similar to other speed training, be it shorthand or playing the piano. Except that in the case of recognition the training is much simpler and more mechanical, and does not depend on lengthy learning. We owe the whole elaboration of this new method (although based on many people's earlier work) to Professor Renshaw of Ohio State University, U.S.A. The practical result has been an instrument known to many of you, the Flash-Trainer. The business of the Flash-Trainer should first be to train one in the general speeding up process, and then turn to the specific problem of aircraft. The initial training consists of showing figures on a screen for a definite time. Then the time is shortened. Then the number of figures is increased. Then the time is shortened again. The learner can soon take in a long row at a single " flash " vision, which is so short that the eye has no time to " read " the line of figures. It learns to see them all together with " total " vision. When the student is proficient at this game, he can go on to silhouettes and photographs, until he only need see the aircraft for a fraction of a second in order to know and respond with lightning speed. Thus he has first learned his machines and then had his eye-brain co-ordination automatically speeded up without conscious effort.

What happens is similar to what occurs in learning to read. Having grasped the letters of the alphabet, we no longer have to read each letter to read a word. Students of Professor Renshaw's methods can soon learn to read a line, then a paragraph, with the same sweeping total vision that most of us can apply to single words or, at best, small groups of words. He taught one student to read at 1,185 words a minute (the average rate for magazine reading is 250 per minute) and another to reach 1,416 words a minute. What is more, the Professor has found that there is no diminution of ability to grasp the sense of the matter being read, no matter how fast the reader goes.

I am sure that future recognition training must follow some such lines as I have indicated here. With aircraft speeds of six and seven hundred miles an hour, it is clearly impossible to carry on with the limitations of the old hit-and-miss methods. Even the best natural learners are too slow, and the average learner is left out of it altogether. By the flash-trainer method, carefully graded and thought out, the average learner can become first class, and the fast learner brilliant. After all, it is the average learner we have to think of first, as there are far too many men and women needed in the recognition game to have them all drawn from the ranks of the brilliant. All training must be aimed at the average, and a recognition method which cannot make the average gazers into first-rate spotters is just not worth the paper it is written on. Gentlemen, and Alfred, I would suggest a Shakespearean motto for you :—

" The spirit of the time shall teach me speed "

(*King John*)

Read any good books lately?

WE HAVE ; and, as we feel that many of our readers may be interested in reading or acquiring them, we include details.

C. H. Gibbs-Smith has written a book called **Man takes Wings.** Written in his easy-to-digest style, with which our readers are familiar, **Man takes Wings** is of great use and interest to everyone who has the slightest interest in aircraft recognition, providing, as it does, a complete background of information so comprehensive that it is difficult to think of a branch of aeronautics which is not touched upon. From the earliest history it mentions man's various attempts to fly : it includes, amongst others, chapters on bird flight, theory of flight, supersonic flight, jet-propulsion and armaments. It contains a comprehensive glossary of aeronautical terms, and details how one can join the R.A.F., the R.Aux.A.F., or the W.R.A.F This comprehensive book is well illustrated with simple diagrams and good half-tones. It is contained within 58 pages and is published by H.M. Stationery Office, for the Air Ministry, at a low price of 1*s.* 6*d.*

The second book is called **Aircraft from Airships to Jet Propulsion, 1908-1945.** The editor is Bonner W. A. Dixon, General Manager of Vickers Armstrongs Aircraft Section, and, as you may have guessed, the book is a history of Vickers-built aeroplanes.

But it is something more than that because it illustrates how fine aeroplanes are bred. It illustrates the problems which have had to be faced during the first 40 years of flying, and it shows how they have been tackled and mastered. The book also illustrates how valuable is the pursuit of records in the development of high performance aeroplanes.

The book is well and profusely illustrated and starts off with a photograph of His Majesty's Airship No. 1 of 1911 and covers photographically almost all Vickers' flying machines up to and including the Viscount and the Sea Attacker. It costs 8s. 6d. and is published by the Naldrett Press.

The third book is the **Ian Allen Aircraft Manual.** This book, also richly illustrated, covers almost every branch of aviation activity from the " Importance of Spotting " to the " Story of Aviation Stamps " and from " Flight Refuelling " to " Backyard Flying " (helicopters). In another dimension it covers a little air history and considers the future of jets and rockets for civil and military purposes. As a broad survey of world civil and military aviation, it will provide a good background knowledge for anyone who is starting recognition training and wants something which is easy to read and to digest. It also provides an interesting and instructive book for everyone who is interested in any way at all in aeronautics. The editor is John W. R. Taylor, and the book is published by Ian Allen Ltd. It costs 7s. 6d.

SILLOGRAPHS

NEWS and VIEWS

Coal Heavers at Gatow. **Looking like a line of fat, sleek hogs these U.S.A.F. Airlift Douglas C-54 Skymasters are unloading coal at Gatow in the cold grey light of early dawn. These aircraft form the biggest part of the coal-heaving force flying on the Airlift. If the printer keeps his promise you should be able to see at the head of the line of Skymasters, a Handley Page Halifax, many of which also doing good service as colliers.**

Vickers Valetta C Mk. 1

VICKERS VALETTAS

Vickers Valettas C Mks. 1 are rolling off the production lines quite regularly. There are two types of Valetta flying at present. One (the earlier model) has the port tail-plane tip clipped off, as have a number of Vikings. This is the model which has fabric-covered elevators. The later model has a symmetrical tail-plane and its elevators are metal covered. The only difference in outline between the Viking and the Valetta is in the fuselage tail-cone. It is missing in the Valetta, giving the aeroplane a somewhat " sawn-off " aspect, in fact, a " parson's nose ".

GLOSTER METEORS

A mile a minute is the rate of climb averaged by a Beryl-Meteor (a Gloster Meteor Mk. 4 airframe fitted with two Metrovick Beryl axial-flow turbojets) to climb 7 miles. Actually it climbed two miles in the first minute and after 90 seconds was nearly three miles high : after three minutes it was five. With a standard Derwent engine the Meteor fighter takes about 11 minutes to reach 7 miles. The Beryl-Meteor is almost identical in appearance with the standard Mk. 4 fighter and it takes a keen eye to detect the slightly larger and differently formed nacelles of the Beryl-Meteor. Mentioning Meteors, the Royal Netherlands Air Force recently took delivery of eight Gloster Meteor Mk. 4 fighters (2 Rolls-Royce Derwent 5 turbojets). A formation of them bearing the R.N.A.F. markings is shown below.

Beryl-Meteor

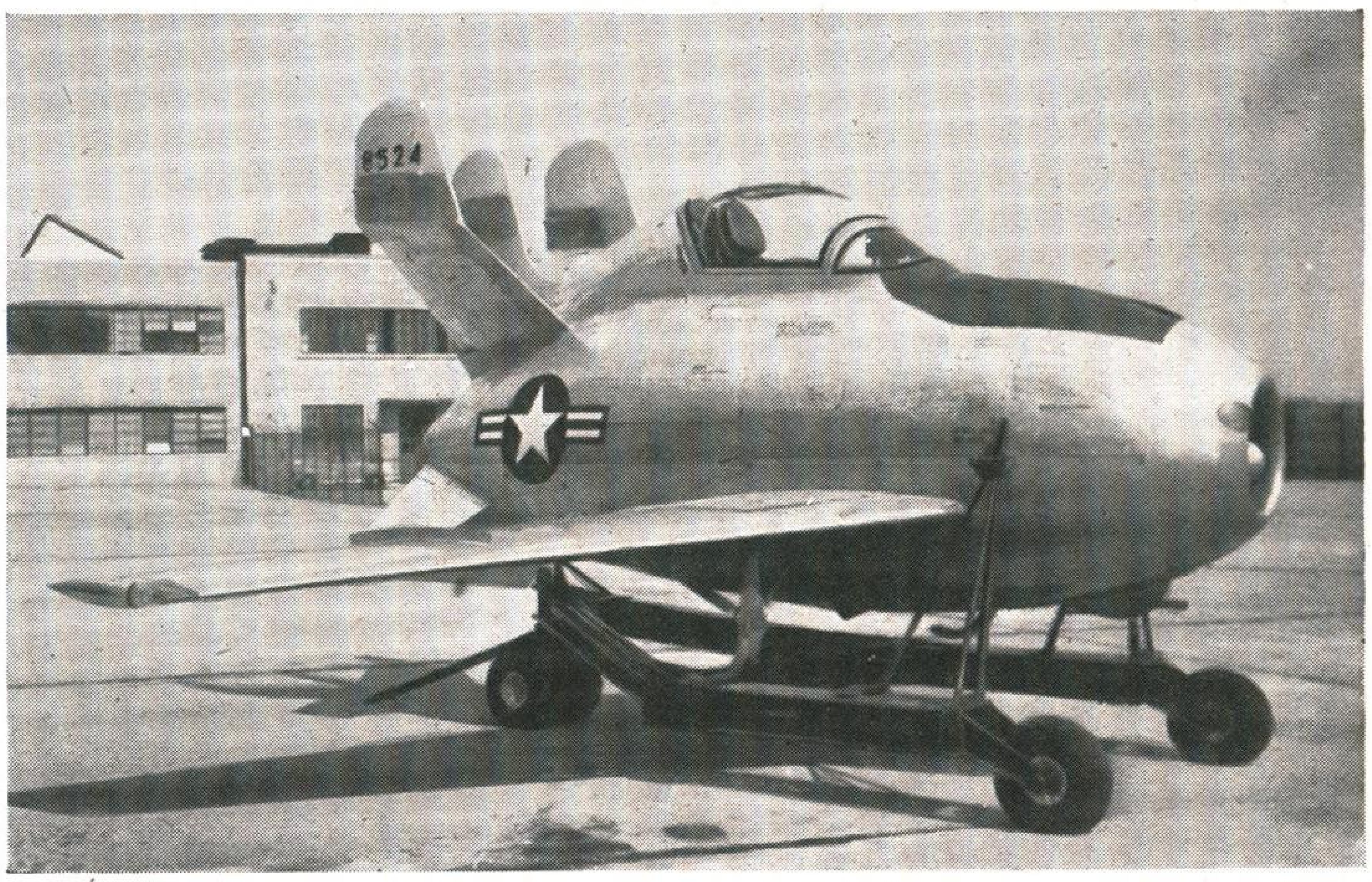
AVRO TUDORS

→

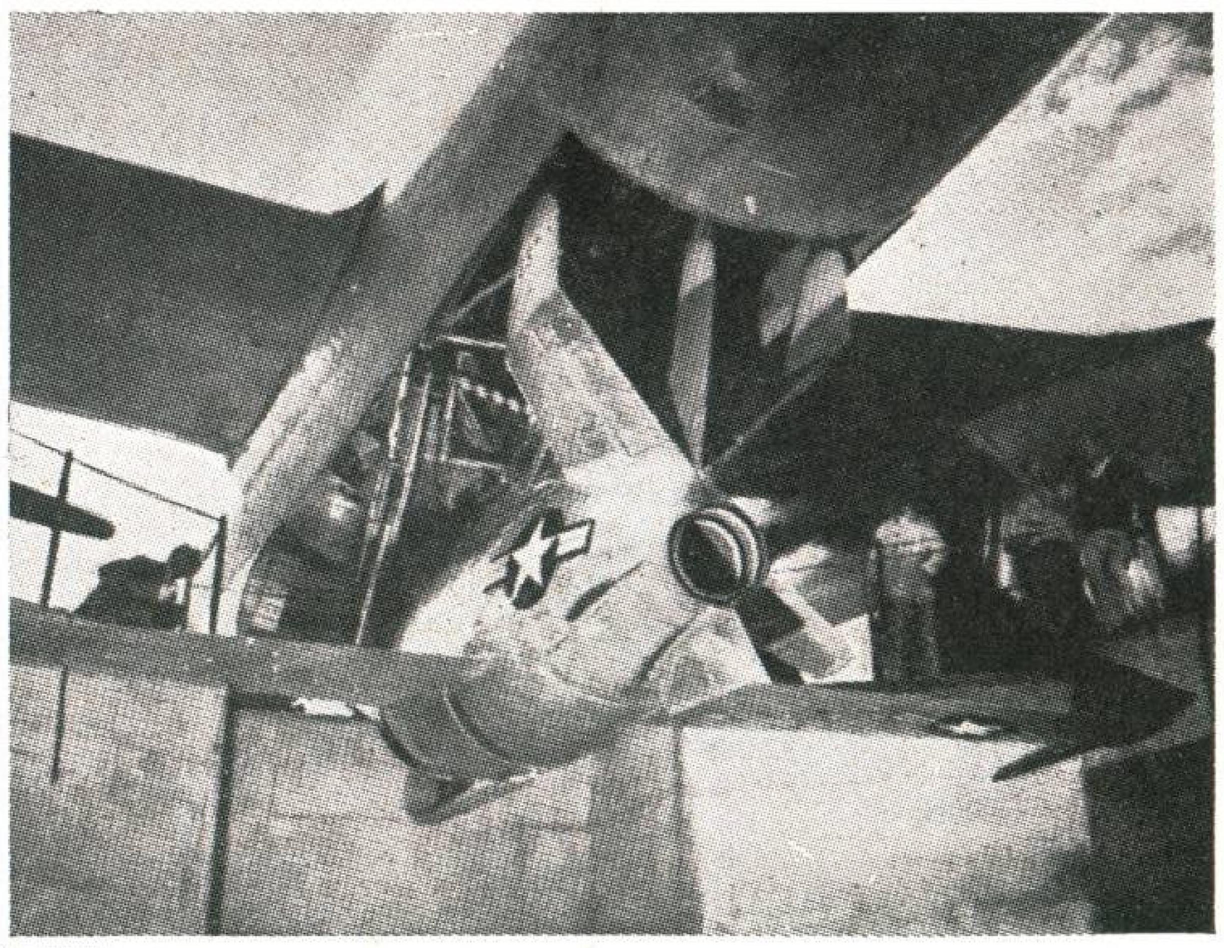
One of A. V. M. Bennett's Avro Tudor 5s unloading 20,000 lb. cargo of diesel oil at Gatow. The Tudor Mk. 5 tanker is distinguishable from the Mk. 2 only in the matter of having round windows (scuttles). There are also Tudor Mk. 2s fitted up as tankers. These two types each make up to six trips a day into Berlin. The Tudor's hauling freight on the Airlift now average a load of 26,000 lb. per trip. The Tudor's trade-mark, its fin and rudder, showing so prominently here, is no less conspicuous in the air.

There is news of a Tudor freighter but, so far as we can gather, although it will be something like the present race of Tudors, it will be an entirely new design and will probably have a nose-wheel undercarriage.

McDONNELL XF-85



The tiny jet-propelled McDonnell XF-85 parasite fighter shown here, in theory never touches the ground. That is not to say it is permanently airborne, but, having no undercarriage of its own it is either on a " dolly " or inside the hangar bay of its parent aircraft, the giant B-36. The body of this diminutive fighter is of almost pure egg-form, the cockpit " ridge " being a super-structure. The swept-wing has anti-flow vanes to prevent the span-wise flow of the airstream. Successful " fly-offs " and " recaptures " have already been accomplished with the aid of a B-29 " mother ". A complex stabilizing unit defies description but aids recognition. The XF-85 fighter is low on the confusability scale.



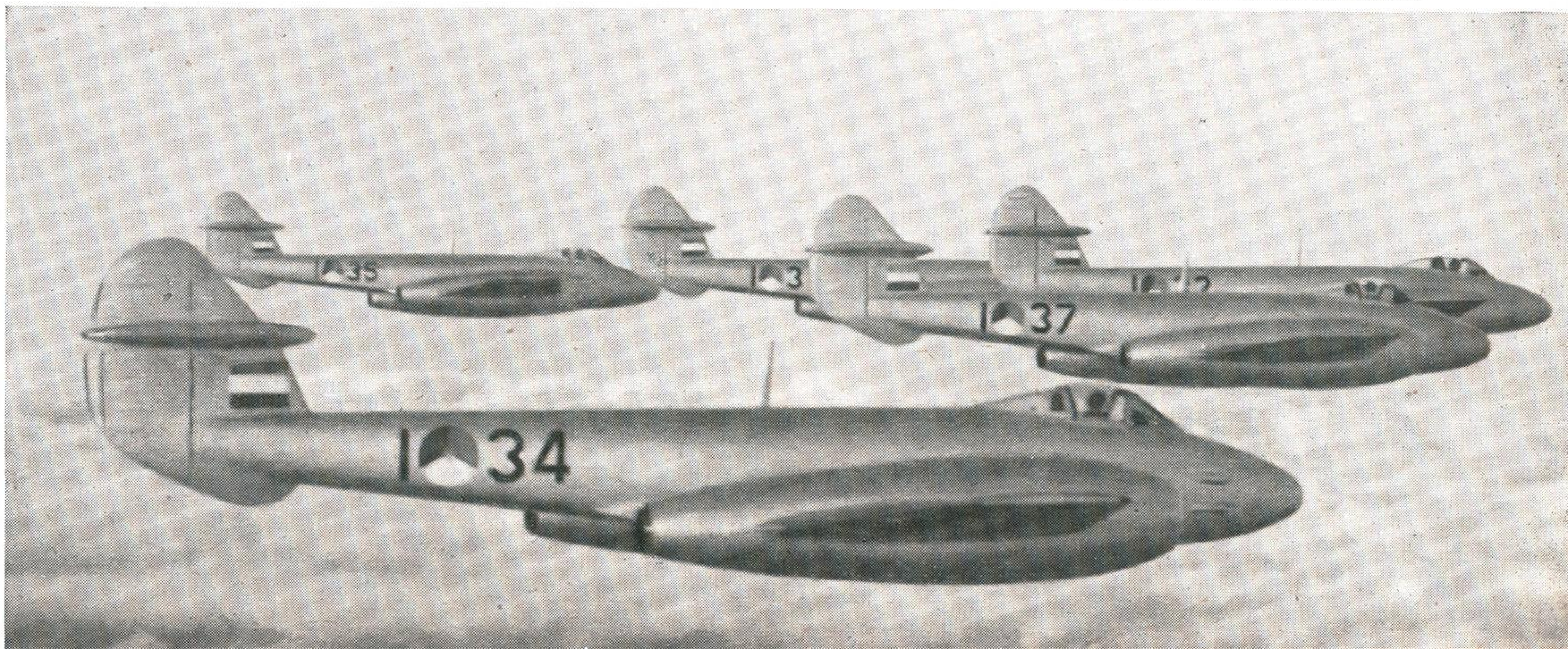
The XF-85 being hoisted into the belly of the B-29, its temporary and experimental parent aircraft.

BOULTON-PAUL BALLIOLS

Boulton-Paul (P.108) Balliols Mk. 2 are in production for test flying with the Royal Air Force says the Society of British Aircraft Constructors. This is the model fitted with the Merlin engine and we show it below. In a test recently undertaken to show up any possible weakness in the cockpit canopy, a Balliol Mk. 2 was dived at a speed in excess of 450 m.p.h. No weakness was discovered. The Mamba (propjet) model of the Balliol is still serving as a test bed for that engine. When it goes into production this fast and advanced trainer will be known as the Balliol Mk. 1. The differences between different Balliols so far produced are : prototype, fitted with Bristol Mercury radial is snub-nosed ; the Mk. 1 fitted with the Mamba has a conical nose and a small spinner ; the Mk. 2 fitted with a Merlin has a sharp-pointed nose with a large radiator beneath it. The shapes of the cockpit canopies of all three prototypes vary slightly. →

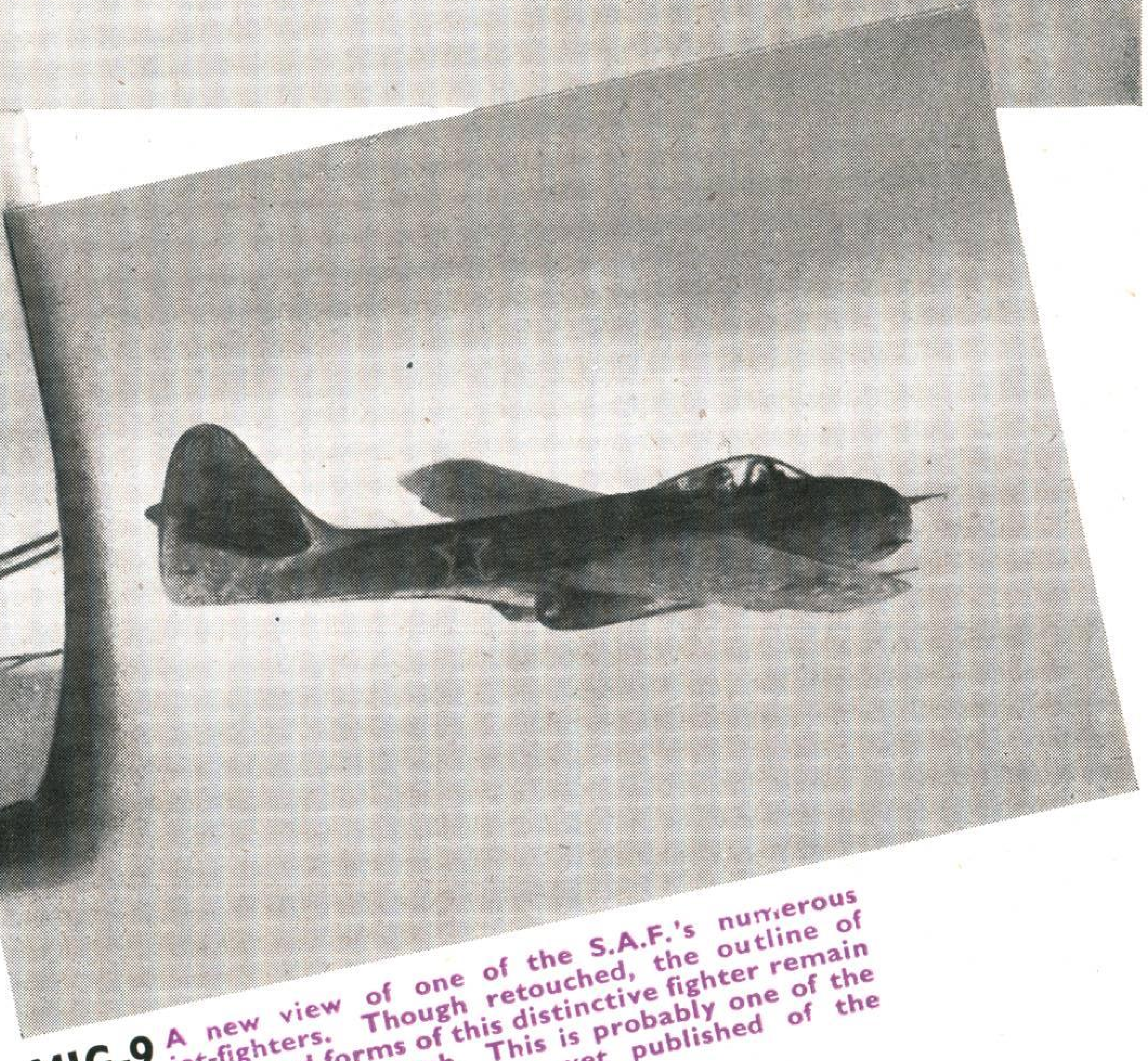
Beryl-Meteor

R.N.A.F Meteors



IRON CURTAIN AIRCRAFT
IN THE NEWS

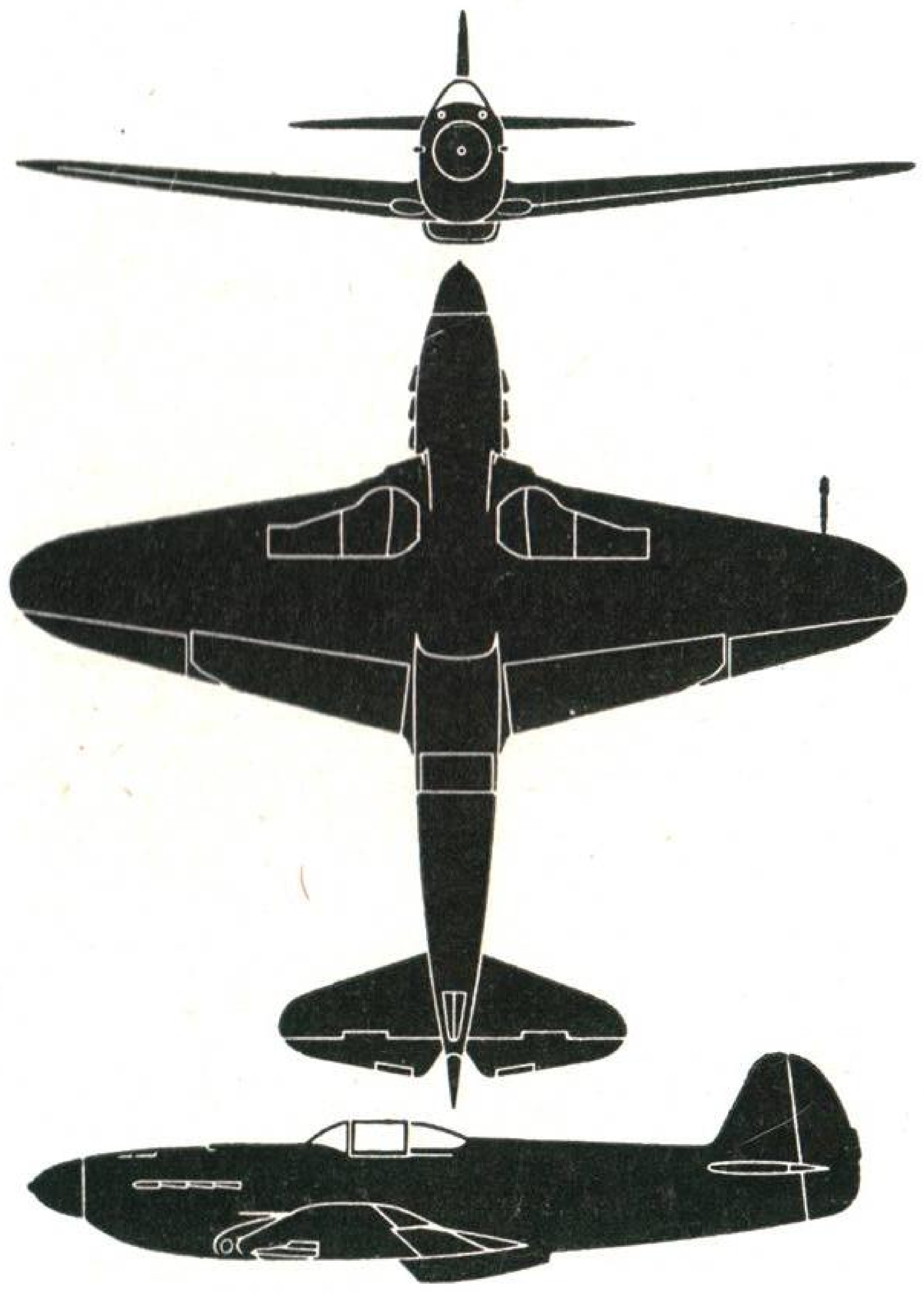
IL-2 There are, or were, two types of IL-2 Stormovik ground assault aircraft. The first type (top-most photo, launching rockets) has the radio mast aft of the cockpit. It is a single-seater. Most of this type were modified into two-seaters, as shown above, and fitted with rear-firing guns. The modified IL-2 is still in service with the S.S.A.F's. By the way, the pilot of this one seems a little undecided about his next step.



MIG-9 A new view of one of the S.A.F.'s numerous jet-fighters. Though retouched, the outline of the main shapes and forms of this distinctive fighter remain as in the original photograph. This is probably one of the best and most accurate pictures yet published of the MIG-9.

IL-12 A close-up of engine detail of the IL-12 showing intake behind and above the ASH-82 radial, and the connection from exhaust to leading edge of wing, presumably for de-icing. The length of the engine nacelle, of which the small-size knock-kneed spectator may be lost in admiration, is remarkable.

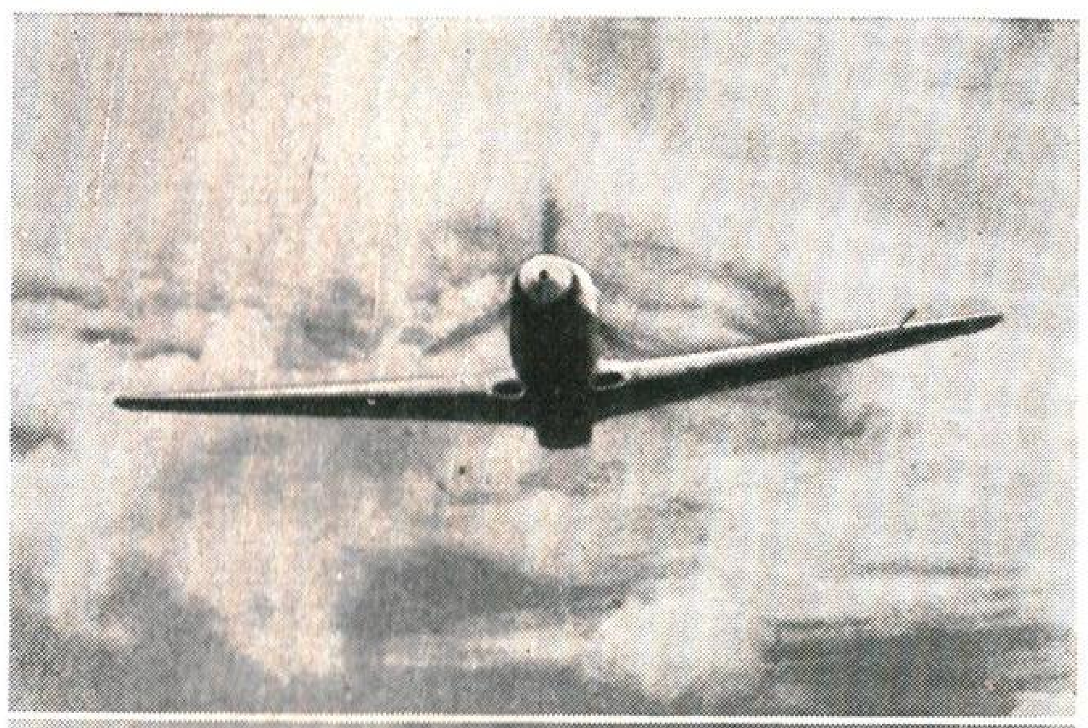
IL-4 Ilyushin family fin and rudder is clearly seen in these torpedo-carrying IL-4s. The small tanks behind the torpedoes are probably compressed air-bottles for same. In this outline view of the IL-4 the number of "gubbinses" is noteworthy. There are still many IL-4s in service, though they are being replaced by later designs of aircraft.

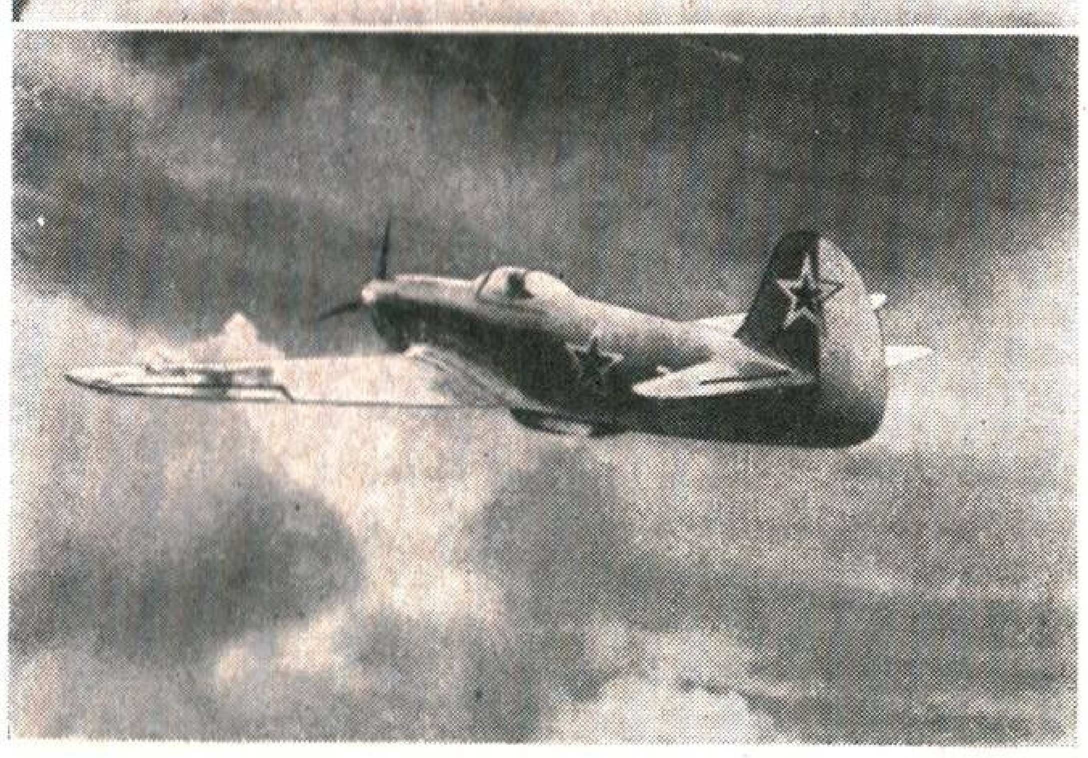


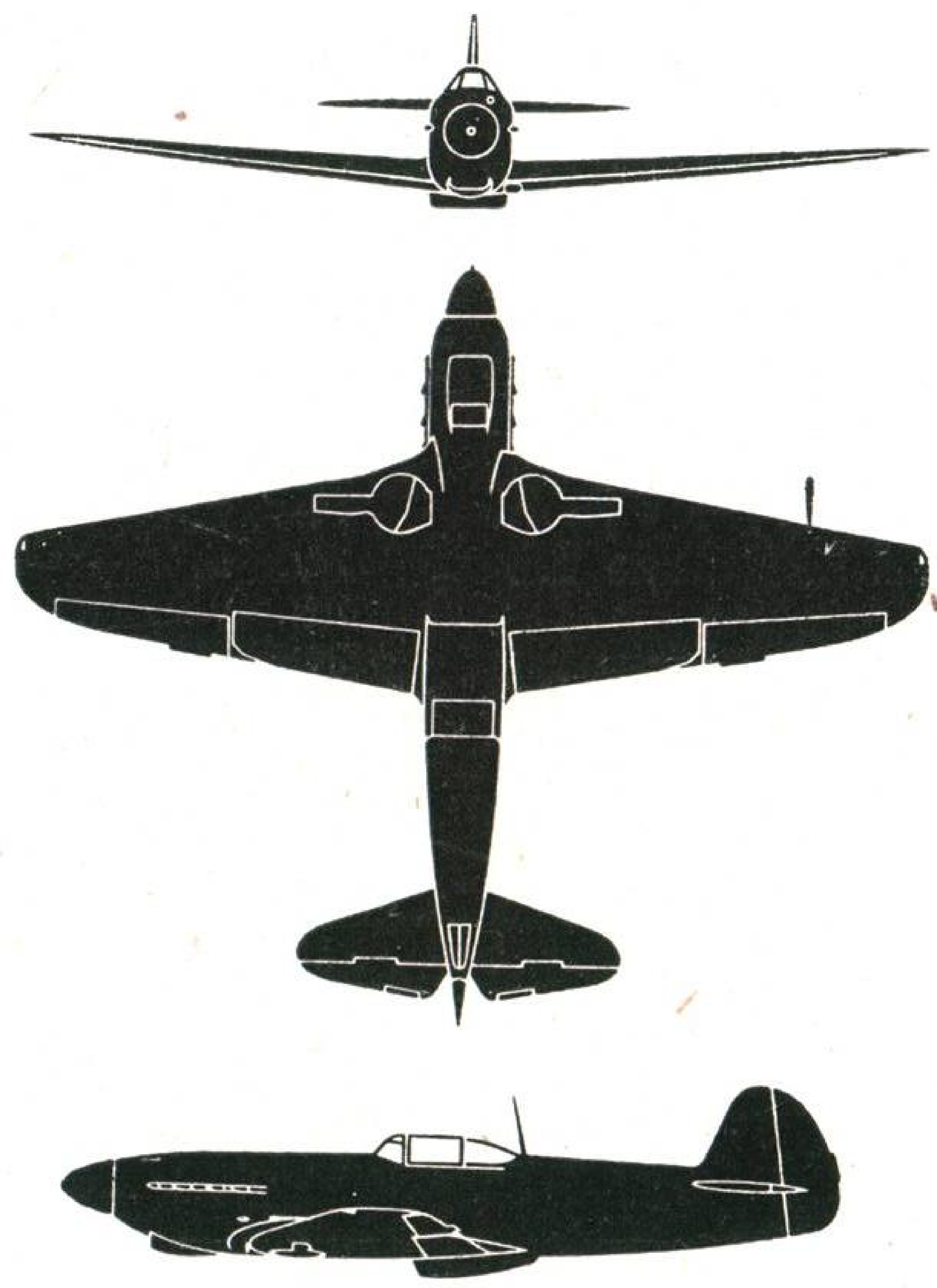
YAKOVLEV YAK-3

Russian Fighter
Engine : One VK-105 in-line
Span : 30 ft. 2 ins. Length : 27 ft. 9 ins.

In service in Soviet Air Force as a fighter.



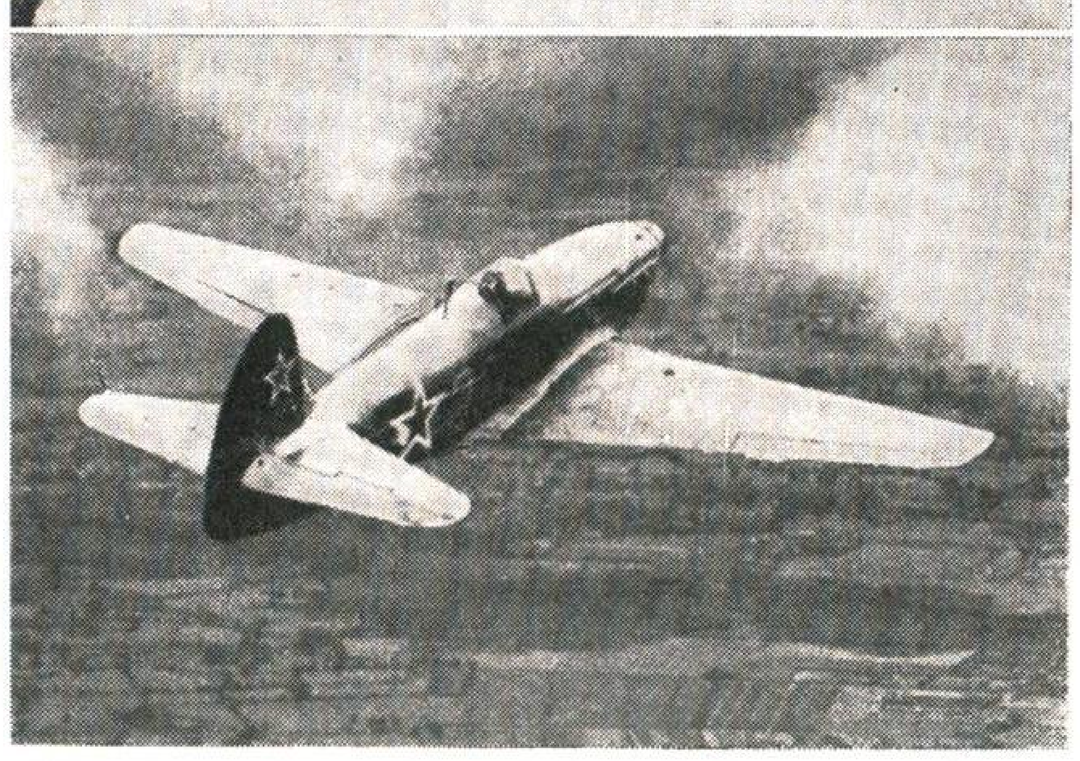


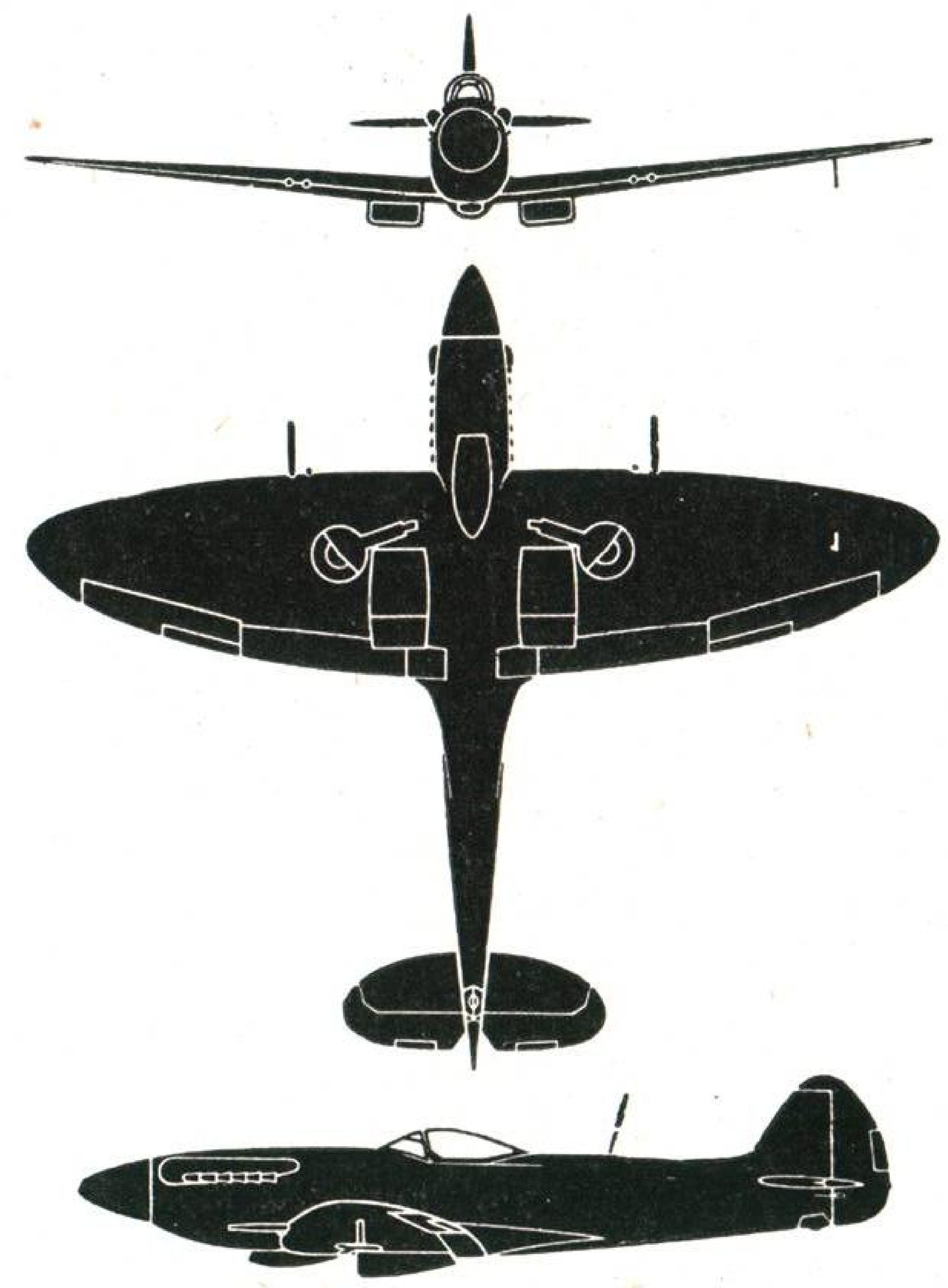


YAKOVLEV YAK-9

Russian Fighter
Engine : One VK-107 in-line
Span : 30ft. 10ins. Length : 27ft. 11ins.

In service in Soviet and Soviet Satellite Air Forces as a fighter.

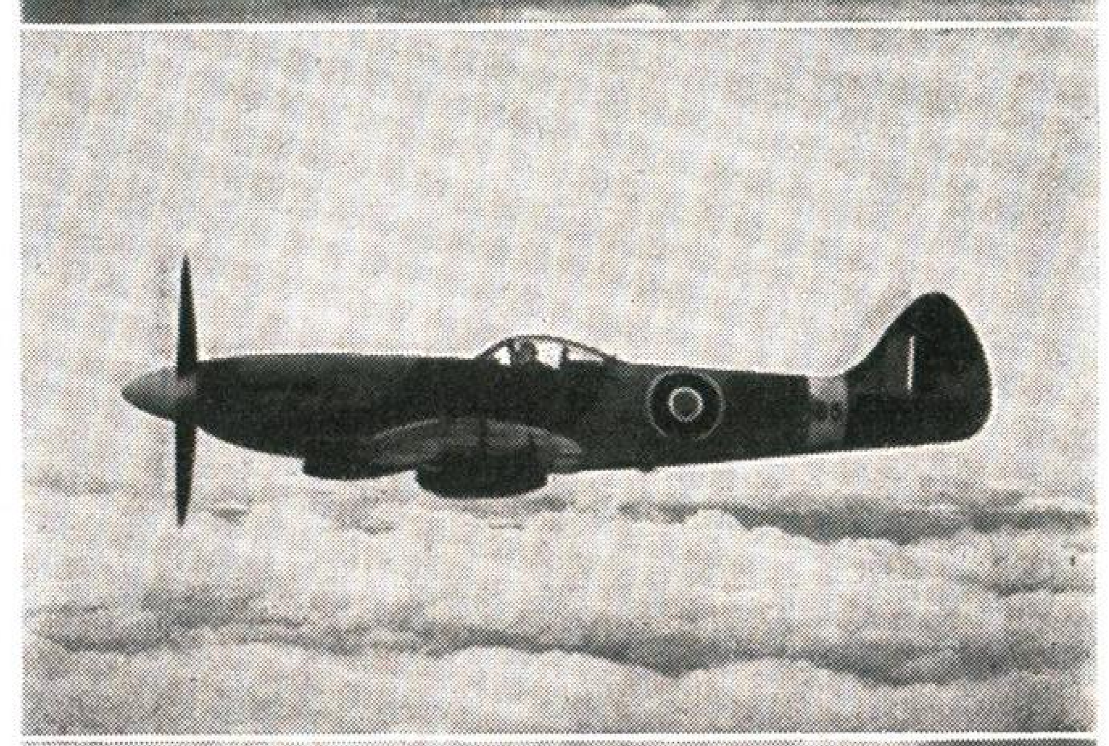




VICKERS SPITFIRE F. Mk. 14

British Fighter
Engine: One Rolls Royce Griffon 61 in-line
Span : 36ft. 10ins. Length : 32ft. 8ins.

In service in R.A.F., Dominion and foreign Air Forces as fighter and trainer.



SOLUTIONS TO RECOGNITION TESTS IN THIS EDITION :

FRONT COVER : *De Havilland Mosquito FB. Mk. 6*

SHADOW FACTORY (page 96) **:** *LA-9*

No. 88 (ELEMENTARY)

571. S.R./A.I
572. Macchi 205
573. Lincoln (with turboprop in nose)
574. Prince
575. Prentice T.I.
576. Vampire F.B.5
577. Viscount
578. Sealand
579. Sea Attacker
580. Sunderland G.R.5
581. B-29 Superfortress
582. F-84 Thunderjet
583. Tiger Moth T.2
584. Hastings C.I.
585. Viking IB
586. Tudor 4
587. Meteor F.4
588. Hawker P.1040
589. F-80A Shooting Star
590. Sea Hornet N.F.20
591. Prestwick Pioneer

No. 89 (ADVANCED)

720. Meteor 7
721. LA-9
722. Buckmaster
723. D.C.6
724. Thunderbolt
725. Tudor 8
726. Tiger Moths
727. Viscount
728. York
729. Sea Fury 10—on ground left to right, Halifax 8, Austin, Bristol 170 and Dominies.
730. Prentice
731. TU-2
732. Corsair
733. B-29 Superfortress
734. Meteor 4
735. Anson 6
736. Sea Fury 10
737. F-80A Shooting Stars
738. Hermes 4
739. Constellation
740. Dove
741. Vampire 5
742. Banshee
743. Viking (Nene)
744. Hastings

TRICKY TRIO VII

(Left to right), YAK-15 MIG-9, Republic F-84

No. 90 (SILLOGRAPHS)

486. A.W.52
487. Sea Hornet N.F.-21
488. S.R./AI
489. Hellcat
490. York
491. Tempest 6
492. AM-I Mauler
493. Bristol 170 Wayfarer/Freighter
494. Panther
495. Constitution
496. Mosquito B.16
497. Buckmaster
498. Piasecki HRP-I
499. Neptune P2V-I
500. Firefly F.4
501. Hawker P. 1040
502. Ambassador
503. Hastings
504. Dakota
505. Eon
506. Vampire Mk.3
507. Solent
508. Meteor Mk.4
509. Athena T. Mk.I
510. Prentice T. Mk.I
511. Viscount
512. Dove
513. B-29 Superfortress
514. Viking
515. F-80A Shooting Star

ONE WAY TO LEARN

A Letter we have received from The Bristol Aeroplane Company on the article "Air-bridge to Berlin" reads :—

"You refer to Bristol 170 Freighter II and in the Remarks say that the Freighters in use are Mark IIs 'having squared off wingtips.'

"This information is completely misleading since in the case of this aircraft the Mark No. is used to designate the application of the aircraft rather than the detail of its technical construction. Mark IIs were therefore stripped Wayfarers, only two of which were built back in 1946. Mark IIA was the completely furnished Wayfarer with the fixed nose. When we produced, at the beginning of last year, what we have called the New Bristol Freighter with the increased span of 108 feet and overall length of 68 feet 4 inches, we designated these Marks XXI, XXIA, XXIIA, etc. as shown on the weight table in the enclosed brochure. You will observe that this new Bristol Freighter in fact has rounded wingtips. It was the substitution of rounded for squared off wing-tips which in fact took place when we increased the span by some 10 feet.

"You will see, therefore, that you have given a mix-up of information on the old and the new Bristol Freighter and that the photograph you produce is of the obsolete aircraft.

"It is also, from our point of view, singularly unfortunate that you should give the payload as only 4 tons, since in the case of the cargo versions of the aircraft which were until this week being used on the Berlin Airlift the disposable load was 14,500 lbs."

And one from A. V. Roe & Company Ltd., reads :—

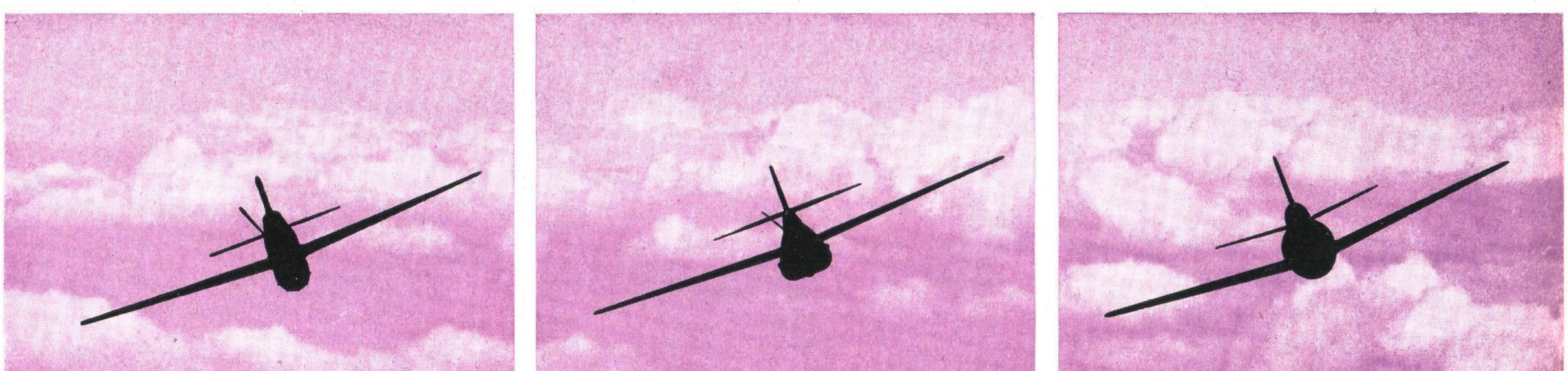
"I have just been looking through the January issue of 'Aircraft Recognition Journal' and was very interested to see the reference to Avro aircraft in the article 'Airbridge to Berlin'. I feel certain, however, that in some way or other, the figures for the various payloads must have got mixed up. The Avro Tudor 1's operated by B.S.A.A. are quite definitely averaging loads of 26,000 lbs., not 5½ tons as indicated on page 65. All the Avro Tudor 2's and Tudor 5's are now fitted with tanks for diesel oil or petrol and as the capacity is 2,500 gallons, this averages out at a weight of 20,000 lbs., i.e., practically 9 tons.

"I thought you would like to have this information so that a check can be made against official statistics."

We have to plead guilty, and confess that the information about the Bristol Freighter is a confusing mix-up, for which we are truly sorry and not a little ashamed. As regards the payload of the Avro Tudor I, we accepted the published figures in good faith but we are glad to be able to give the correct ones.

We suppose we could call this a case of learning something the short-way—painful but swift—because with no effort at all the above mentioned facts are as clear as daylight to us now and are likely to remain so. It's a sad fact that some lessons have to be painful. **There were even more swift and, unfortunately, much more painful lessons during World War II through wrong recognition of aeroplanes.**

TRICKY TRIO—VII



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