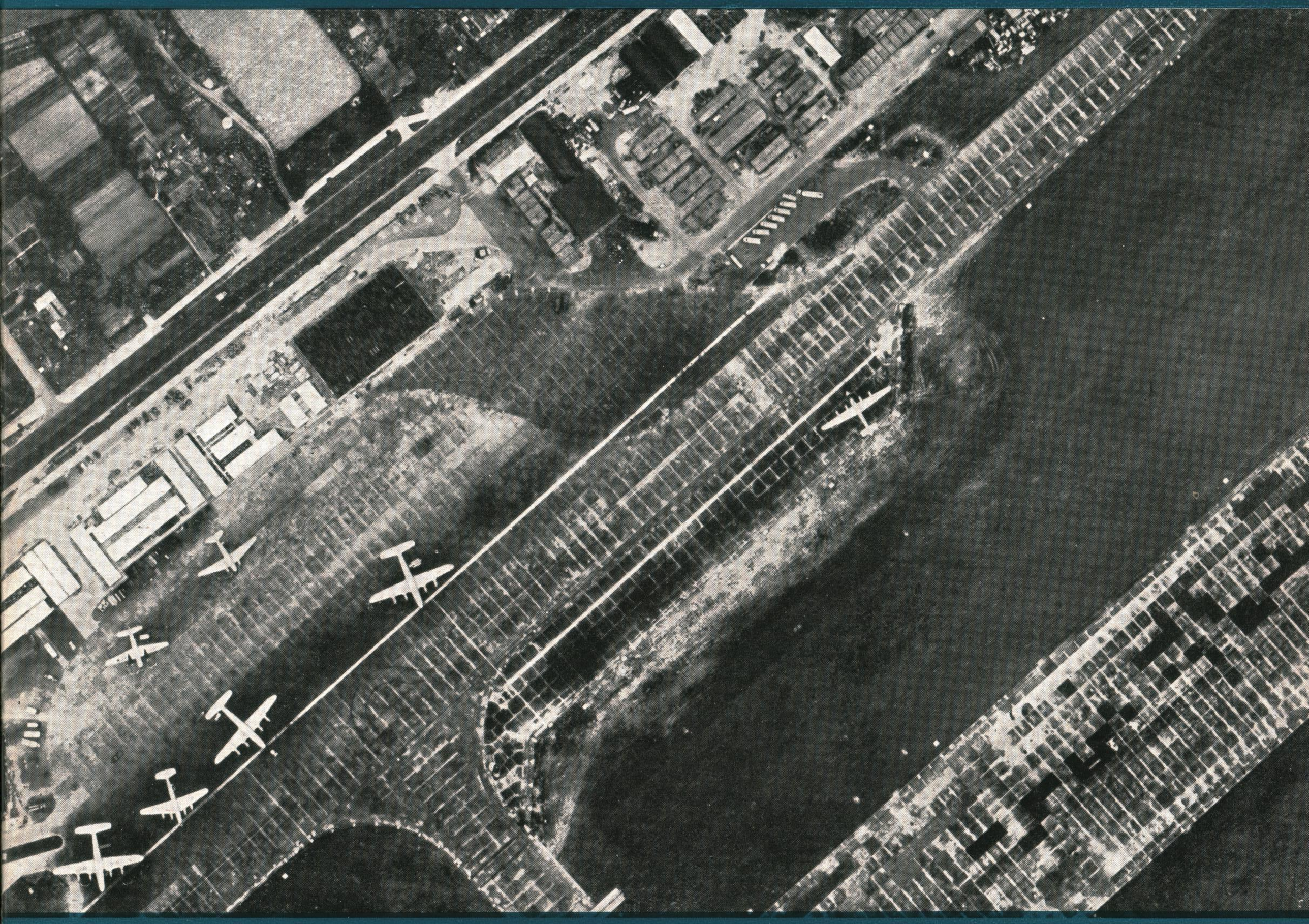
THE INTER SERVICES

# AIRCRAFT RECOGNITION

## *Journal*

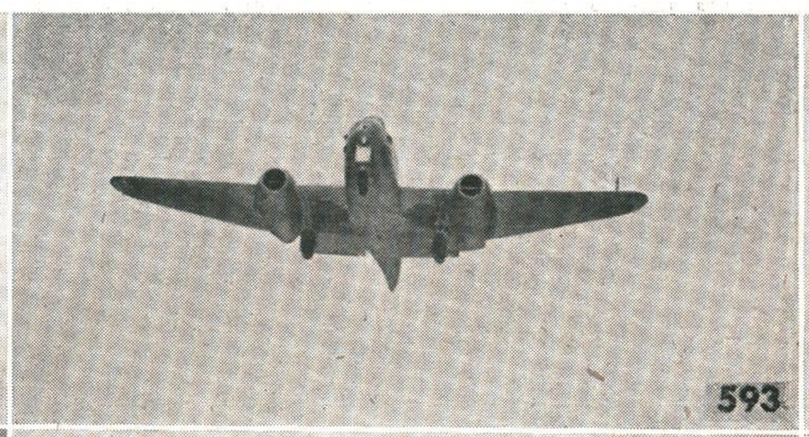


Vol. 3 APRIL-MAY 1949 No. 9

# ELEMENTARY SPOTTING

Recognition Test No. 91

592

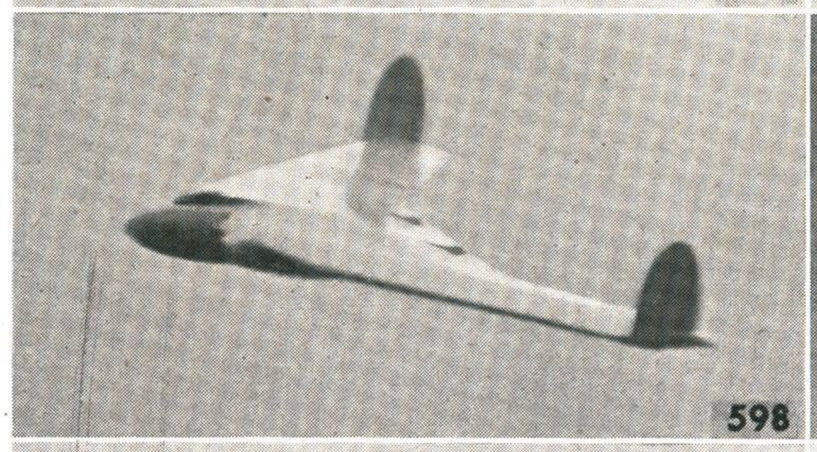

593

594

595

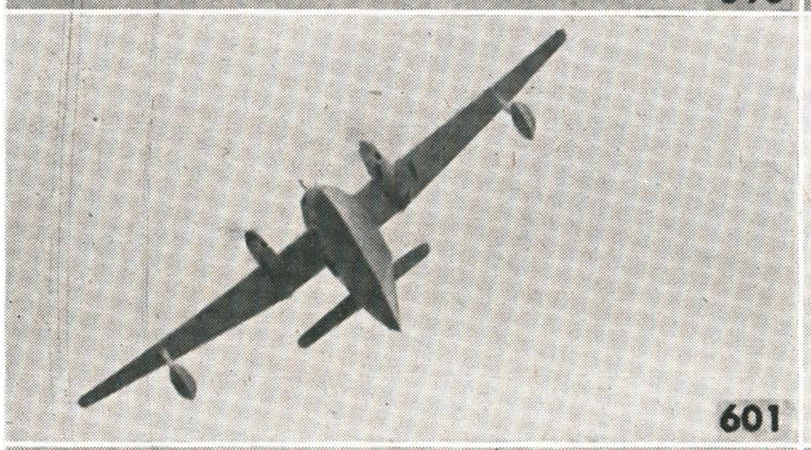
596

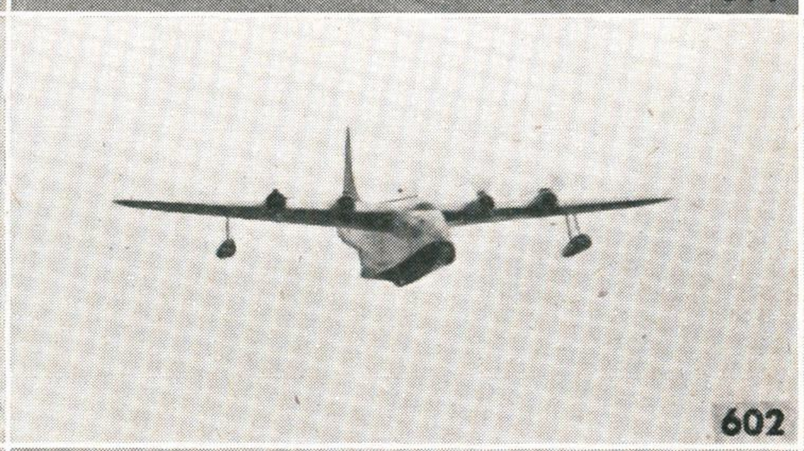
597


598

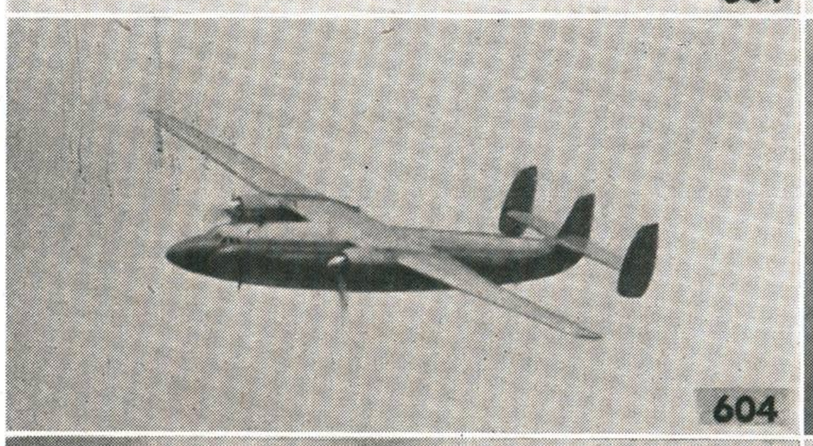
599

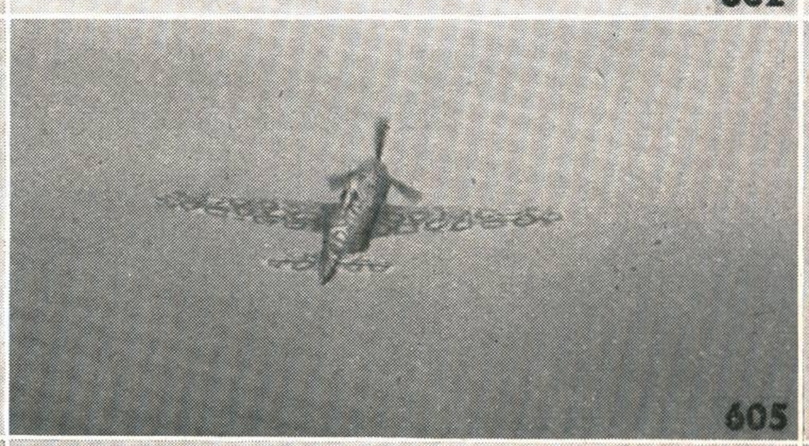
600


601


602

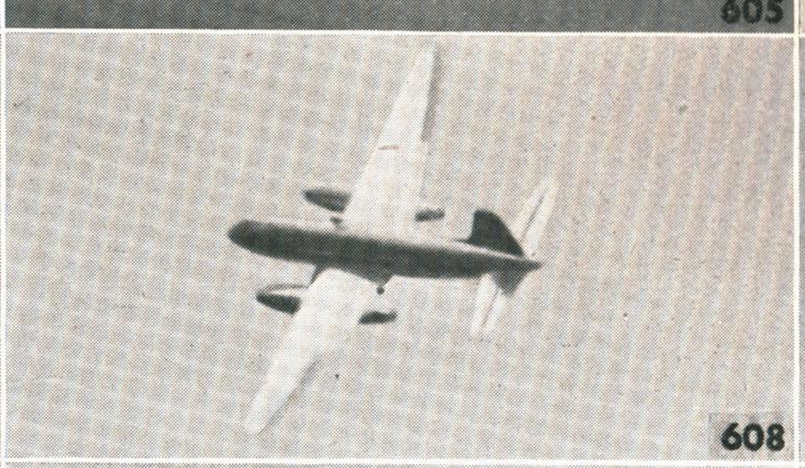
603


604

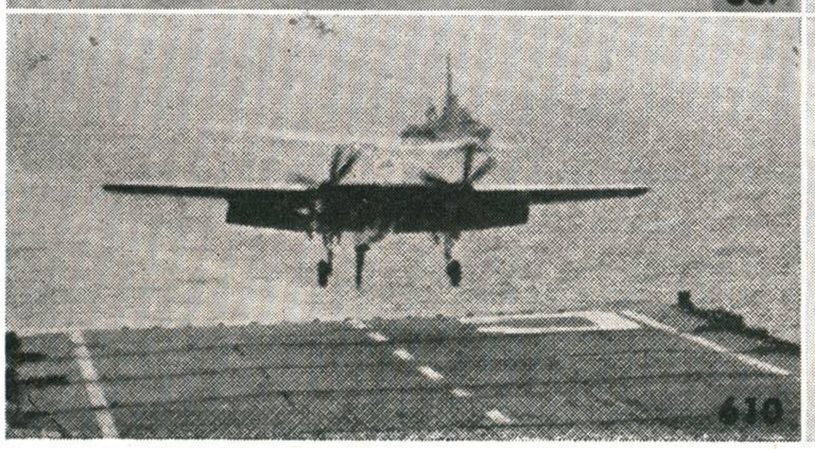

605

606

607


608

609


610

611

612

APRIL/MAY 1949 Vol. 3 No. 9

*Lockheed F-80 Shooting Stars*

# A NOTE FOR INSTRUCTORS

ARE we in danger of becoming academic and impractical in recognition instruction ? Perhaps, perhaps not ; but in these days, when the utmost use must be made of every instructional hour, and where the field of study can be so wide, it is as well to guard against talking instead of doing—in other words to keep an eye on the ball.

● The work of a recognition instructor has two distinct parts —familiarization and speeding up. Speeding up the act of recognizing is just as important as teaching familiarity with shapes but is often overlooked. It is one thing to be familiar with a number of aeroplanes but another to be able to recognize them instantly : familiarity, in other words, is not enough. War-time observers on Beachy Head saved hundreds of lives in local towns by split-second recognition of the " tip-and-run " Fw 190s—they saw and recognized at the same time, not only because they trained themselves to be familiar with a shape, but because they trained themselves at speedy recognition too. So, instructors must ensure that speeding-up keeps pace with shape-familiarization.

● Part of the familiarization process calls for interest matter (glamour). Aircraft recognition pupils would die of boredom if the subject were shorn of its interest matter and made simply a matter of learning so many shapes. On the other hand, they would never reach practical recognition if training became a matter of detail and data. The danger appears to lie with the type of instructor who is an enthusiast about aeroplanes first and a recognition instructor second. Such " gen-men," loaded with facts about every aeroplane which flies, have a habit of plugging awkward gaps in instruction with it—they blind their pupils with "science" and so discourage them. Some instructors insist upon accuracy over facts and figures which from the point of view of recognition don't matter ; thus they produce an impression that aircraft recognition is a bind. Taught in that way, it certainly is. Not that we have anything against " gen-men " or enthusiastic recognition instructors generally—quite the contrary. In point of fact the whole business of aircraft recognition rests fairly and squarely upon the shoulders of the enthusiastic instructor—but it is the " gen-men " who can turn vast knowledge to practical account who are valuable.

● Talking of being practical : all pupils like a definite out-of-class task to do ; left on their own in so large a field they can easily wander from the point. Familiarization activity with the creative idea behind it is especially useful. Pupils could, for example, be set to answer questions requiring some research amongst the *shapes* of the aeroplanes they are studying ; or to do some simple outline sketches of them. They could prepare material for a 10-minute talk on the differences between two confusible types of aeroplane, or list all aeroplanes observed between classes—noting features of those not identified for later discussion. Many similar activities will suggest themselves.

● ALL recognition instruction must therefore be a proper balance of book-work, practice, and speeding up. But there are no rules, and it is up to each individual instructor to decide for himself whether he is really teaching aircraft recognition and not just loading his pupils with useless data—whether he is really *doing* and not just talking—whether he is, in fact, keeping an eye on the ball.

# WATERBORNE AIRCRAFT

**by JOHN A. SIZER**

**This article has been written specially to follow "First Steps in Aircraft Recognition" published in the February and March editions of the *Journal*. Most of the technical terms used to discuss landplanes can be applied to the flying-boat, seaplane and amphibian class. Any other technicalities applied specially to waterborne aircraft will be found herein, as well as details of some of the structural differences between land and waterborne types as they affect aircraft recognition.**

THE flying-boat and seaplane demand features in their layout to suit the conditions under which they operate. That these features in general detract from their aerodynamic performance when the type is put beside a comparable landplane is accepted as part of the price paid by the designer to achieve his ends.

Flying-boats have, like landplanes, almost stabilized into a common layout. Whereas the landplane now has, almost without exception, a low-wing monoplane design and a retractable undercarriage, the flying-boat has a high wing and retractable wing-tip floats. At long last it seems that the flying-boat is slowly approaching the stage where it should have been years ago ; that is to say, its peculiar advantages when built to an optimum size are being recognized, chiefly by airline operators.

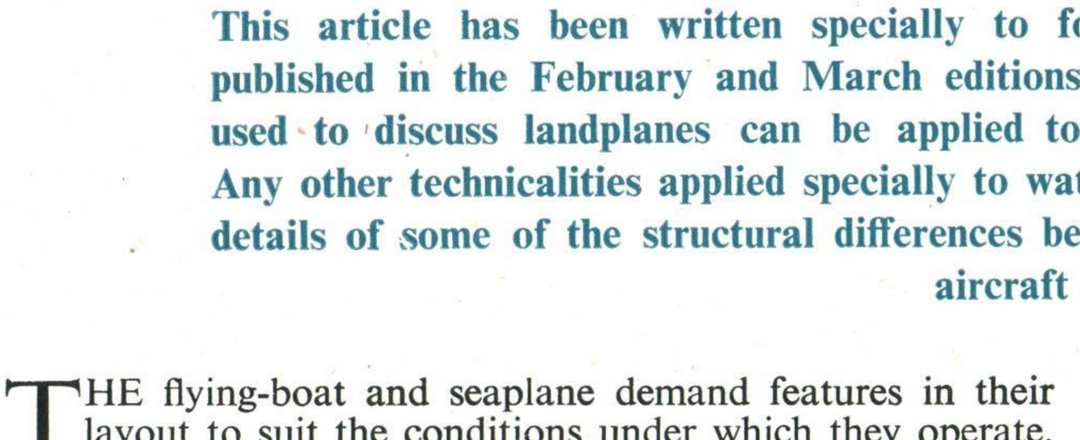



**Fig. 1. Shows how the " vee "-bottom throws the water aside If the chine were rounded (which really means doing away with it altogether) the flying-boat would have decided submarine tendencies. No chine—no planing bottom, and the water would not be thrown aside.**

## Flying-boats

The features of the flying-boat which single it out from other types from the recognition point of view are well-known. They comprise the high wing, the deep hull and the wing-tip floats or sponsons. Also the tail-unit is always high up in the air. The reasons for the high wing are the need to keep the tips of the propellers well above the waves and the need to keep wing-flaps clear of the water. The lines of the hull—its sharp chine and vee-bottom—are necessary so that when the flying-boat is on the water it may be safe directionally and also have a chance of being taken-off the water with a minimum of power.

The vee-bottom, apart from greatly assisting the aircraft in maintaining a straight course in the water, is shaped as it is so that alighting shocks will not be too high, and so that the hull does not bounce on contact with the surface of the water. A further point clearly seen is that the bottom of the hull has " steps " or line-breaks in the planing bottom. These are among the most important features of hull design.

The tail-unit has to be kept as high up as possible because on take-off the water forces, on the forward part of the planing

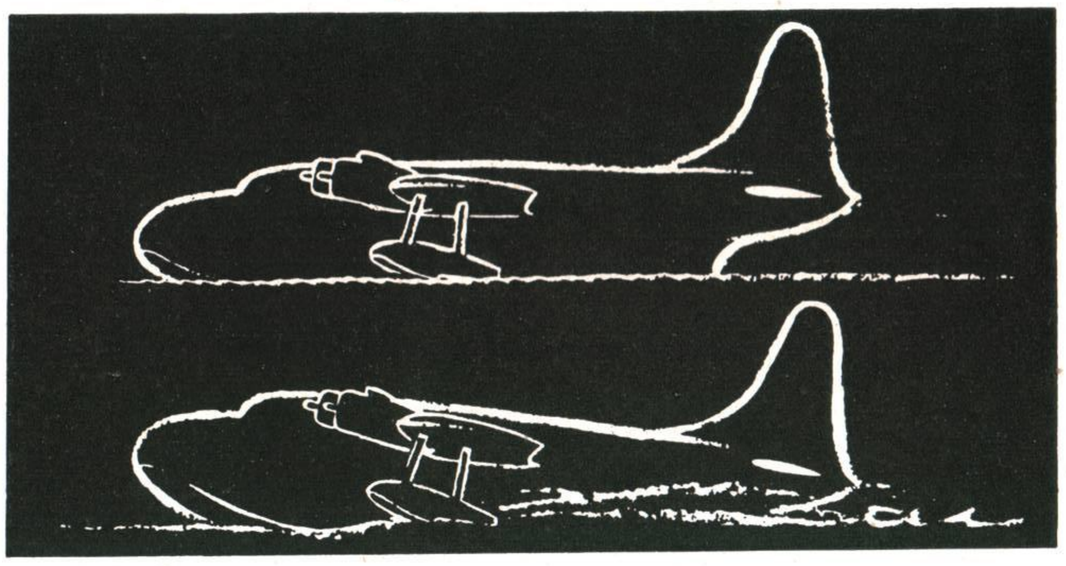


**Fig. 2. (Top) A flying-boat at rest on the water, and (below) taking off " trimmed by the stern ", showing why the tailplane must be set high up.**

bottom, tend to rotate the hull so that it runs in a slightly tail-down position. The spray from the hull running through the water would cause severe damage to the tail unit if the hull were not swept upward, as it is on most flying boats.

At rest, the flying-boat presents a problem, chiefly because the centre of gravity is much higher than the transverse metacentre. This causes what is called a negative " metacentric height". To put it in plain language, if there was nothing to stop it, the aircraft would roll over sideways. Wing-tip floats are fitted to prevent this. These floats have, in general, no other use whatever.

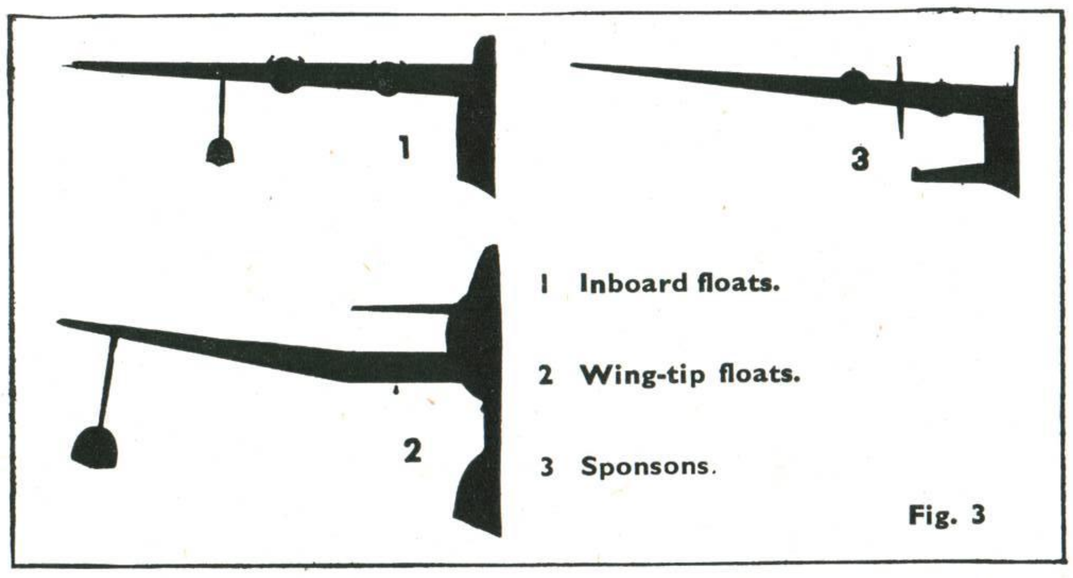



**Fig. 3**

Sometimes the floats are large and mounted close in to the sides of the hull. In other layouts the sponson, secured directly to the side of the hull at the level of the water line, is used. Nowadays, since all wing-floats are of retractable design, the sponson is losing favour, chiefly because it is of little value when the aircraft is flying. And it would be a tough job to make the sponson retractable.

**HULL FORMS : Flying-boat hulls are always designed with "steps" in the planing bottom because this helps the take-off by breaking the suction action of the water. This diagram silhouettes some "step" arrangements (*left to right*) Short Seaford, Vickers Sea Otter, Vickers Seagull, Consolidated PBY-5 Catalina and the Martin PBM-3 Mariner. Note how all tail surfaces are built high up.**

Short Sealand Amphibian

Short Sandringham flying-boat

Auster 6 twin-float seaplane

Vickers Spitfire twin-float seaplane

Curtis SO3C-1 Seagull single-float seaplane

Blackburn B.20 flying-boat with retractable hull

Saunders Roe SR/A1 jet-propeller flying-boat

## Amphibians

If the design of a flying-boat is a tricky compromise to achieve, that of the amphibian is even more so. Here you have people trying to make the best of two conflicting worlds and trying to avoid the pitfalls and difficulties of both. For the amphibian has to be able to do, with reasonable efficiency, the job of being a flying-boat and landplane at the same time. The Short " Sealand " (opposite) is a good example of what can be done by a bold and imaginative design team. In flight, of course, the amphibian flying-boat is easy enough to recognise, the only snag being that it can be confused with the flying-boat. The fact that there are so few of either type about and the fact that amphibians are so much smaller than flying-boats should make the problem a bit easier.

The seaplane, by which term is implied an aircraft which has the ordinary fixed undercarriage replaced by floats, is quite the Cinderella of Aviation. It is a difficult thing all round, as a seaplane is seldom designed as such from scratch. What usually happens is that a successful landplane becomes so successful that it has to widen its use. Hence the fin and rudder are enlarged and the " boots " are put on.

## Seaplanes

What goes for the flying-boat goes for the seaplane so far as design points are concerned. The floats themselves are like baby flying-boats, their length and beam (width) being quite important. They must be long enough to stop the tail getting wet when the aircraft, during take-off, " trims by the stern " ; and they must be far enough apart (track) to stop the waves from one float interfering to any marked extent with the wave pattern of the other float. Sometimes the floats are used as fuel or oil tanks. Seaplanes are quite easy to recognise especially since there are so few of such types. When it is necessary to make a seaplane amphibious, the usual practice is to put a wheel in a box cut into the keelson of each float. A lot of thought was poured into the design of this business, especially so that the wheels should be retractable when the machine was being used on the water. But people don't seem so fussy nowadays, chiefly because more powerful engines have been developed, making it easier to get the aircraft off. Not so long ago, the presence of an amphibious wheel " dragging " in the water meant all the difference between getting airborne and not doing so.

There are severe limits to the size of seaplanes and one of the largest of recent times was the three-engined Short " Valetta " (1930s). A war-time twin-float seaplane of some interest was the Dakota variant, while the Swordfish and Spitfire designs, to mention but a few, are other examples of the type.

## Single Float Seaplanes

The central-float seaplane seems to have a following in the U.S. Navy, although its uses on other than carrier work are severely limited. The central float does the job (nearly) of the two floats fitted in the orthodox seaplane. Wing-tip floats of any size are fitted to do the same job as those on the flying-boat and for the same reasons. The advantages of the central float for Navy work are mainly that the pilot's downward view is unrestricted : this is not so where twin floats are fitted. Examples of the single-float type are the Curtiss Seagull and Seamew. The only British designs I ever saw were the Fairey F.9/30 and the Hawker " Osprey " (which was specially fitted in this manner), and the Short " Mussel," central-float seaplanes are babies in a way. They have to be lowered into and lifted out of the water, mainly because the placing of the nose portion of the float below and ahead of the propeller renders mooring and slipping of moorings to be so difficult as to be nearly impossible, at least in safety.

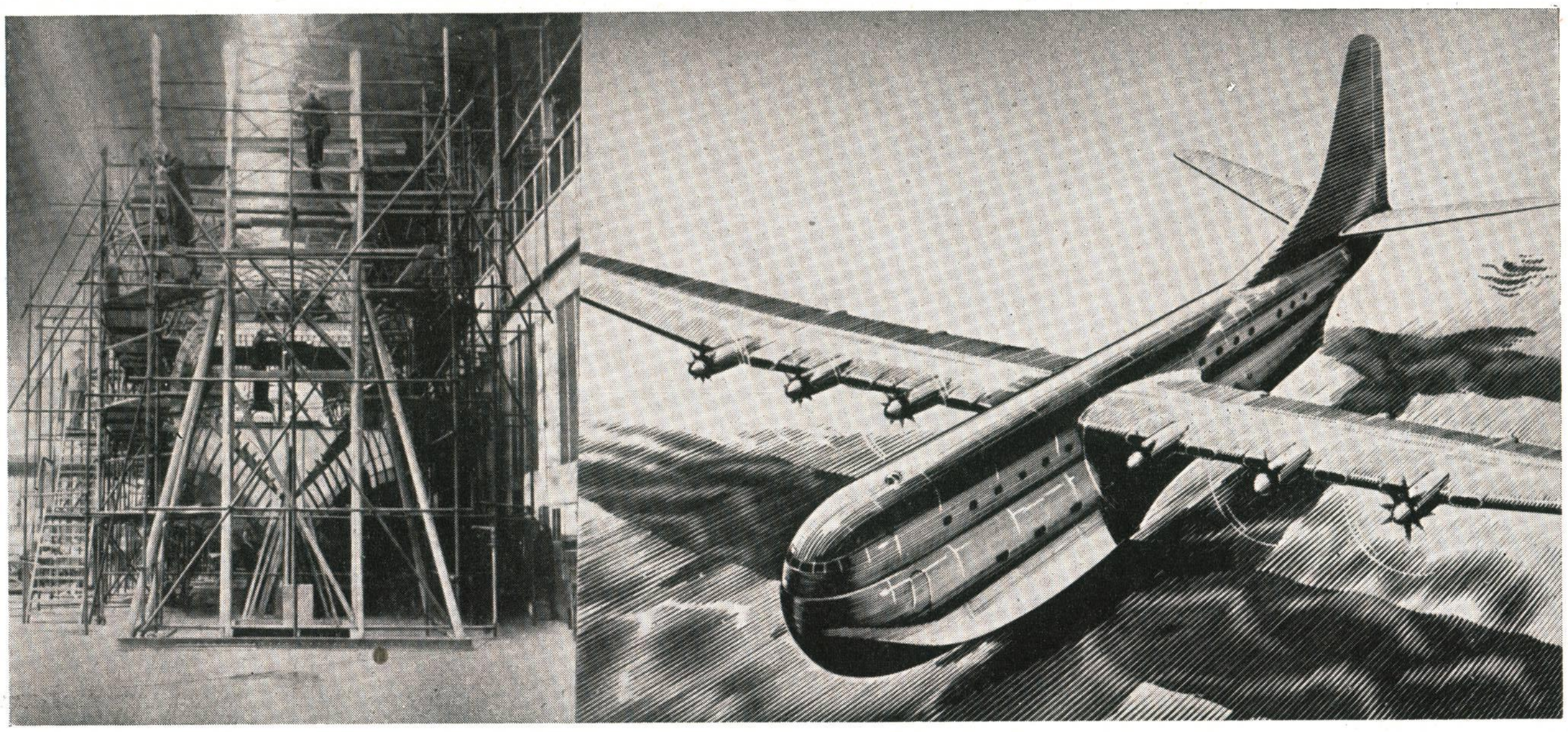
As in music and the other arts, there are variations on the theme. The Blackburn retractable hull design was a case in point. On the water it was a central float seaplane. In the air it was a flying-boat, or rather, it looked like one.

**Flying-boats of the Future**

That all the advantages of the turbojet as applied to aircraft are not lost when embodied in the layout of a flying-boat is clear from a study of the Saro A1 and the Saro S.R.45. The former design illustrates the point that there is much to be gained from the elimination of the airscrews on a flying-boat. To achieve the sparkling performance of the A1 with piston-engines and propellers would have been a formidable if not impossible task. The A1 may be the forerunner of a " new-look " among flying-boats.

The S.R.45 when completed will almost certainly be a serious challenge to anything of equal size and power in the landplane class, and if performance predictions, and forecasts of operating costs are yardsticks it may well be proved, once and for all, that the big flying-ship is a better thing all round for trans-ocean flying than the big landplane.

**The Saunders Roe SR/45 transocean flying-ship under construction (left), and an artist's impression of the completed " vessel ". The prototype is scheduled to make its first flight late in 1950 or early in 1951.**



# *Cautionary Notes on Glamour*

by C. H. GIBBS-SMITH

I AM TOLD that some energetic people, having read my recent article on Glamour in teaching aircraft recognition, have now elevated Glamour to University status, giving degrees and diplomas in Glamour and founding whole institutions to study this absorbing subject. " Can we ever have too much of a good thing ? " asks Cervantes in *Don Quixote*. " No," said Oscar Wilde, " Moderation is a fatal thing. Nothing succeeds like excess." But the advocators of moderation must have their say, too, and I would beseech the maniacs to take bromide and search their souls.

The whole point about Glamour as a teaching device is its aid to *learning and remembering aircraft shapes*. Just that. However absorbing the history of aviation is, and I am a great devotee myself, it has no place in recognition teaching outside strict aids to learning. So let us classify Glamour a little.

The most useful Glamour is that which helps to focus attention on the aircraft. If it is possible to link up such Glamour with the actual shape of the machine, so much the better. If, for example, it were known that Stalin used only one type of aircraft or that his name was indelibly linked with one type, it would be wise to get some adept at caricature to find a way of incorporating the face or figure of the gentleman in question with the aircraft. Each student could even find his own way of linking the man with the aeroplane. With Lana Turner, if she were known to own a particular bomber, it would indeed be easier and we could imitate the American instructors in the recent war by draping attractive degrees of nudity over the poor wretched aeroplane, or parts of it.

I should say the next best way would be to find some outstanding incident or job connected with the aeroplane in question and concentrate on linking story with shape in any of a dozen ways. Superforts could, for example, be linked with atom-bombs, and so on.

Next I should put the history of the aeroplane itself. But this has its pitfalls. Too much interest in the actual history and development of an aircraft might lead to confusing its anatomy with that of its ancestors and the last state of the observer would be worse than the first.

The enthusiastic learning of what particular gadgets the aeroplane has is also a rather perilous line, because many others have similar gadgets and you are left with remembering which particular selection of the gadgets your aeroplane has. By all means climb all over the blessed thing if you have the chance. That is excellent because your eye is there, on the spot, roving all over the shapes and bits and pieces. But just learning about its equipment and habits might be dangerous.

The learning of the bare minimum of actual facts about an aeroplane's equipment and functions and performance is, of course, mandatory, as the Americans say. But not too far, pray.

And so, gentlemen, I suggest that the best brake on Glamourisation is to keep strictly to what helps you to learn SHAPE. Anything else may give rise to indigestion and to vexation of spirit, apart from boring a large number of un-historically minded pilots, gunners and observers.

# SILLOGRAPHS

Recognition Test No. 92

Vickers Viking 1A

Vickers Viking 1B

# VIKINGS and VALETTAS

## by "Confucius"

THE HISTORY of this island home of ours was vitally changed a thousand years ago because there were Vikings in the world. To say that the same is true today would, perhaps, be an overstatement ; but Vikings are today thoroughly interwoven with the every-day life of this land as of several others, and while history may not be altered by the Twentieth Century Vikings, it is certainly being made by them.

We speak, of course, not of blond-haired, blue-eyed giants invading our shores from distant lands, with strange devices on their ships and strange oaths on their lips ; we speak of an aeroplane bearing the same proud name which, day after day, come wind, come rain, brings to Britain from lands no longer distant, modern "invaders" about their lawful business—or maybe pleasure. We speak, to whit, of the Vickers Viking two-motor medium-range airliner.

### A Sitter for Spotters

The Vikings (Tenth Century edition) were, we are told distinctive in appearance. And the same is no less true of the Vikings we have with us today, though in a different sense. Portly fuselage, sharply-tapered low-mid wing, stubby engine nacelles, nicely proportioned fin and rudder. Deep step-down for the cockpit and an elegantly pointed nose ; a straight-forward tailplane (which isn't really quite so straightforward as it looks—but more of that later) ; and a dorsal fin, which, while being fashionable, is quite one of the most petite and charming of dorsal fins we have seen for a long time. There is no mistaking a Viking—and not one of its least useful recognition attributes is its distinctive sit in the air : a combination of the stout fuselage—whichever way you look at it—and the "cocked-up-tail" flying attitude (which is not the same as a nose-down flying attitude) makes the Viking a sitter for any spotter within range.

Furthermore, there is no excuse for failing to recognize a Viking on the grounds that it is a rare bird. As you may have heard, British European Airways Corporation use the Viking in considerable numbers. Go down to Northolt for an hour or two any fine day—or foul, if you feel so inclined—and you will find plenty of opportunity for studying the Viking. Northolt today in fact, without its Vikings, would be desolate indeed.

All that is not to say, however, that B.E.A.C. is the only airline using the Viking ; no other company has so many, it is true, but airlines in many parts of the World use this medium-range airliner.

### Vitals of the Viking

Since every spotter in the country should get a daily dose of at least one Viking, it might be a good idea to have a look at the type in a little more detail.

Vickers' design team at Weybridge, led by G. Edwards as Chief Designer and B.N. ("Geodetics") Wallis as Chief of Aeronautical Research and Development, got down to the design of a civil development of the Wellington before the war ended. Intended as a medium-range passenger transport, this was to use Wellington wings, tail and undercarriage, but to have a new fuselage. As plans for the VC-1 (Vickers Commercial, first post-war design) developed, however, this utilization of Wellington parts was found to be largely impracticable, and when the prototype Viking appeared, rather less of the Wellington was visible in it, save perhaps, in the outline of the wing-shape. The prototype Viking had fabric covered wings and tailplane of geodetic construction like the Wellington; later models have a completely new wing from the structural point of view, with metal covering.

### First flight

Captain J. ("Mutt") Summers lifted the prototype "off the deck" at Weybridge for the first time on June 22, 1945. Following extensive flight trials and the introduction of structural changes in the wing and fuselage—the latter was lengthened by 28 ins. to allow for three more seats—the Viking went into production for civil operators, with B.E.A.C. requirements receiving priority. Large-scale production of the type ended during 1948, although all the jigs are still in existence for special and repeat orders to be fulfilled.

In 1946, the R.A.F. began to view the Viking as being likely to meet the military requirements laid down in Specification C.9/46, so Vickers prepared a military general purpose transport version named the Valetta. Compared with the Viking, the Valetta has a number of modifications. To suit it for glider-towing, it has a hook in the end of the fuselage, which ends in a blunt fairing in place of the finely pointed Viking tail-end—this, incidentally, is the most useful spotting clue for distinguishing the two types. The fuselage floor of the Valetta has been strengthened considerably to permit the carriage of military loads, and large double freight-

Vickers V.V.I.P. Viking

Vickers Nene-Viking

loading doors are in the rear fuselage port side. Detail differences include the fittings of bulged see-back panels on the cockpit side windows, mainly for the pilot's use when paratroops are being dropped.

A production contract for the Valetta was placed by the R.A.F., and at the time of writing the last few aircraft of the original contract are being delivered.

### Variants Unlimited

A word is necessary here about the various versions of the Viking which have appeared. Having emphasized how simple recognition of the Viking should be, we hate having to tell you that a large number of different versions exist. While the most important thing is to recognize the aeroplane as a Viking, the more fastidious spotter will want to know just what sort of Viking it is, and detail spotting of this kind adds a lot of fun and interest to the game.

From the variant point of view, the basic type is best split up into three broad groups ; these are (1) civil Vikings, (2) R.A.F. Vikings, and (3) Valettas. In the first group exist three variants, which, in order of their appearance, are :—

**Viking 1A.** Two Hercules 630 or 631 engines. The original version with short fuselage, geodetic wing and tailplane structure and fabric covering. First deliveries to B.E.A.C. were of this mark. Seven windows down each side of fuselage.

**Viking 1.** Two Hercules 634 or 635. As Viking 1A with revised wing and tailplane structure, metal covered. Very few built, mostly exported.

**Viking 1B.** Two Hercules 634 or 635. Retains the Mk. 1 structural changes, plus a 28-inch extension in the fuselage forward of the wing leading edge. This is the standard production model for home and overseas use. Eight windows down each side.

Before the Valetta became available, a number of Vikings were obtained by the R.A.F. for various purposes. These are as follow :—

**Viking C. Mk. 1A.** As civil Mk. 1A being the early B.E.A.C. aircraft taken over when the Corporation re-equipped with the Mk. 1B. Used for various transport and research duties.

**Viking C. Mk. 2.** Two Hercules 134. A transport version of the Viking 1A; seven windows down each side ; few only used.

**Viking C. Mk. 2 (V.I.P.).** As the designation suggests, a more luxurious version of the C. Mk. 2 for V.I.P. transport duties. Seven windows down each side.

**Viking C. Mk. 2 (V.V.I.P.).** Three aircraft of special standard used by the King's flight, being the King's aircraft, the Queen's aircraft and the attendants' aircraft, numbered VL245, 246 and 247. Externally similar to the C. Mk. 2, but with exclusive internal fittings. Five windows down each side.

**Viking C. Mk. 2 (Freight).** Two Hercules 634. One aircraft of the King's flight used as a flying workshop. Seven windows down each side.

The versions of the military Valetta which have so far appeared are the :—

**Valetta C. Mk. 1.** Two Hercules 230. Long fuselage. Standard airborne forces version with provision for paratroop seats in fuselage. Glider-towing gear provided. Six windows in port side, ten down starboard side.

**Valetta T. Mk. 1.** A much-revised version of the Valetta now under development with a retractable tricycle undercarriage and a bomb bay as an extension under the fuselage.

**Valetta C. Mk. 2.** Externally similar to the C. Mk. 1, but fitted internally as a V.I.P. transport. Replaces the Viking C. Mk. 2.

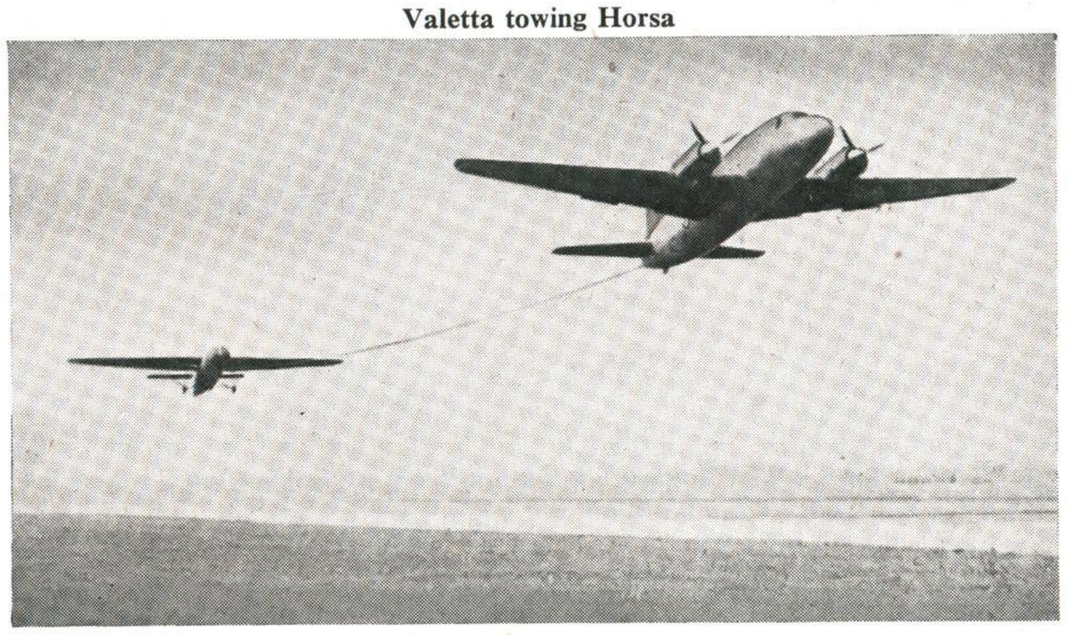
### Assymetry

The next time somebody starts talking about assymetrical aircraft, ask them if they know of a British assymetrical aeroplane flying today. The answer is the Viking—although the assymetry is not very noticeable. The Viking didn't start off that way, either, but during the winter of 1946, some trouble was experienced with de-icing ; ice built up on the tailplane and made the aircraft longitudinally unstable. Resulting modifications to the elevators introduced the assymetry, so that all Vikings and some Valettas now have a rounded tip to the starboard tailplane and blunt tip to the port, in addition to the elevator shape being different. On the latest Valettas, however (see centre-spread) the elevator shape has again been changed producing *symmetrical* tail plane tips.

### One Other

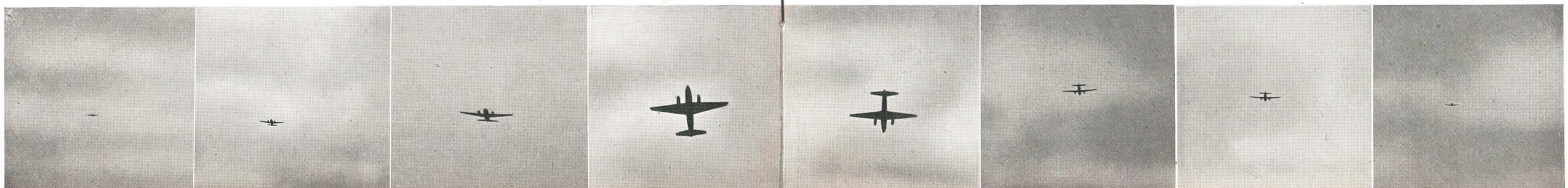
Having dealt at some length with the various models of the Viking liable to be seen over this country, we must refer in closing to one other version of the Viking now flying. This is the Nene-Viking, developed for research flying. A standard Mk. 1B airframe, it has two Rolls-Royce Nene turbojet engines in long underslung wing nacelles, and moves much faster than any other Viking. under the persuasion of the great thrust of the Nenes, Only one of these aircraft has been produced.

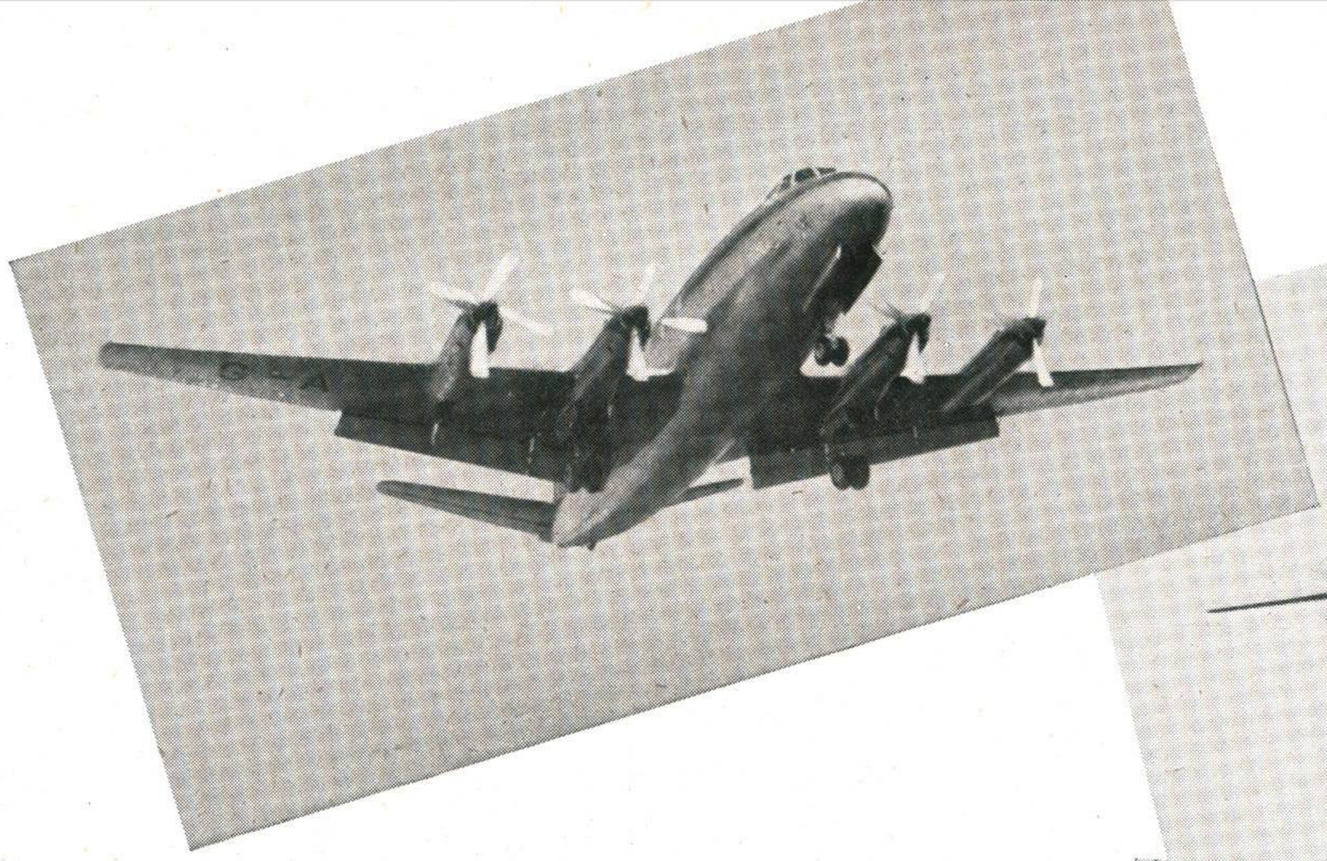
**Valetta towing Horsa**

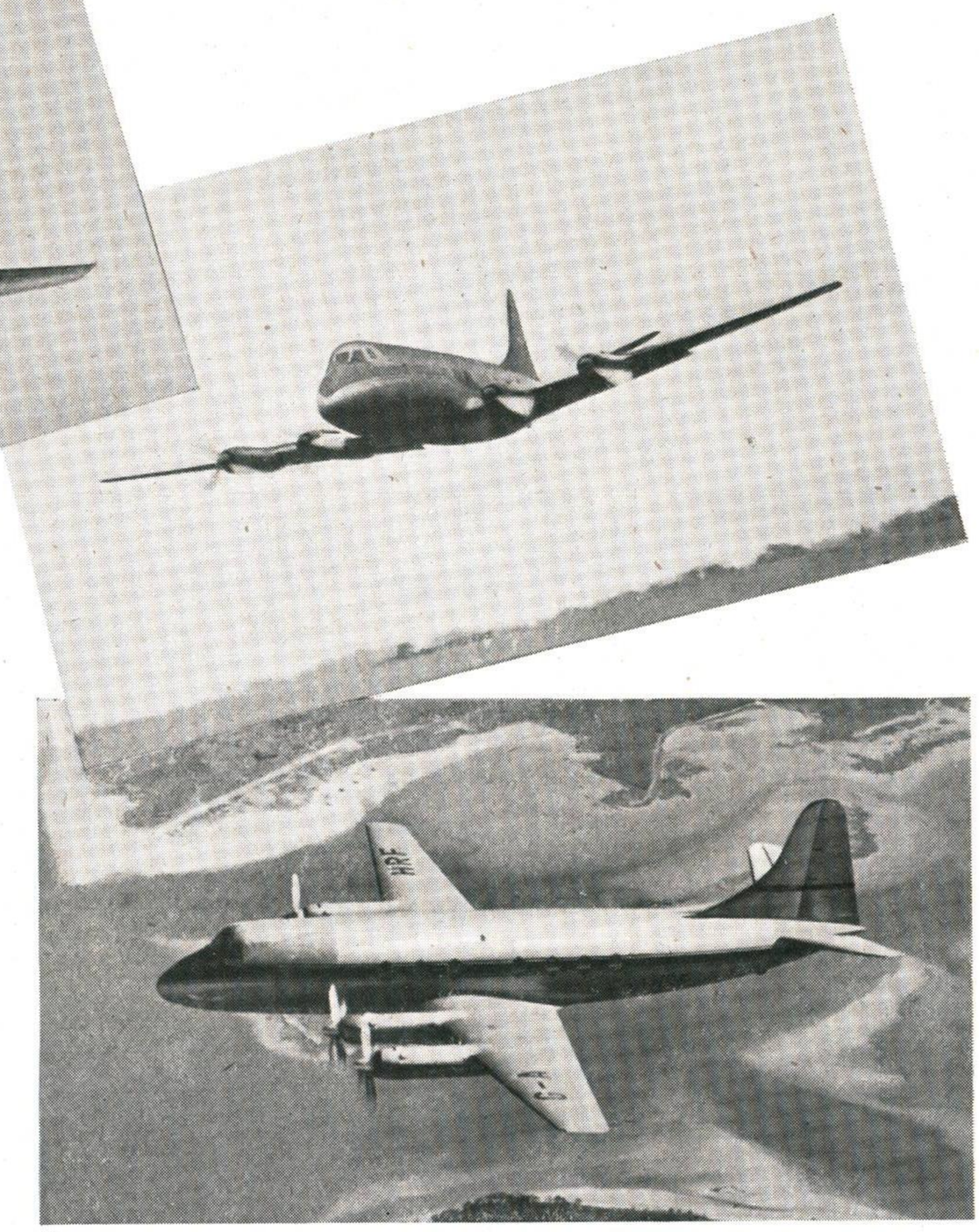


**Silhouette side-view line-up (left to right) :—Wellington, Viking, Valetta and Viscount.**

# VICKERS VALETTA







# The VICKERS VISCOUNT

## The World's First Propeller-Turbine Air-liner

THOUGH one can often catch a glimpse of the Wellington ancestry in the Viking or Valetta, it is difficult to glimpse the Viking, or any other Vickers type, in the Viscount. Yet it can be said that the Wellington, the Viking and Valetta, and the Viscount, are all linked together in the same designing mind—that of Mr. G. Edwards—and as a consequence, the Viscount must carry some influence of ancestry in its make-up. Looking at it very carefully one could perhaps see something of the Viking's lines in the fuselage (or is it imagination?) ; and in the shape of the fin and rudder, the tall characteristic pyramid shape can be seen behind the fin-fairing (or is that imagination too ?). Be that as it may, if there *is* a likeness it is more than a coincidence.

The Vickers Viscount (Vickers V.C.2) was designed and built as a replacement for the Viking on medium-range air-routes. The demand was for a 30 to 40-seater air-liner powered by turboprops to start service by 1951-2. Vickers aimed to produce a high speed airliner with a very high standard of passenger comfort, and, by using turboprops (fuelled by kerosene), crash-proof tanks, a rugged airframe (though appearances belie this—it has too much grace), twin-wheeled tricycle undercarriages, a comprehensive de-icing system, and double-slotted flaps for landing at small airfields, to exceed the most stringent safety requirements of I.C.A.O. (International Civil Aviation Organisation). This has been achieved.

### Construction

The Viscount is a low-wing four-engine monoplane with a single fin and rudder and a tricycle undercarriage. All-metal stressed skin construction is used throughout.

The wing, though not resembling that of the Wellington or the Viking was, nevertheless, based upon design data acquired for the Wellington's wing. In shape (plan) it is equi-tapered with blunt wing-tips. In proportion to the rest of the aeroplane it is on the small side (this remark applies purely from the recognition aspect).

The turboprops, in long cylindrical cowlings, are one of its most helpful recognition features—standing out like four fat fingers. The nacelles are slung under the wings, and the jet-pipes from the turbines emerge at the rear of the outer nacelles, and on the sides of the inner ones, just in advance of the compartment housing the undercarriage.

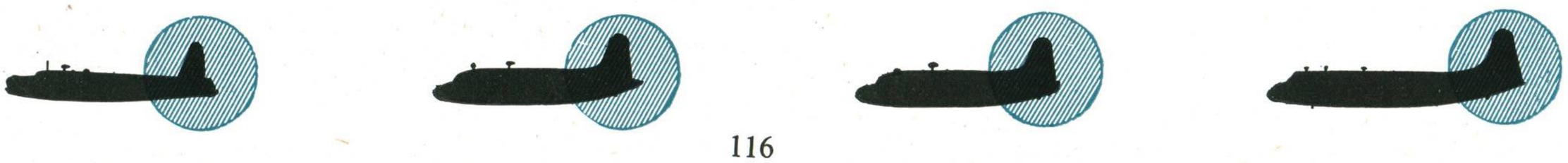
Pressurization decided the shape of the cross-section of the fuselage, which is circular. The " well-fed " fuselage form is tapered-up to a sharp point at the rear and down to a more rounded nose. The unusual (pressurized) cockpit canopy produces a characteristic " head " to the aeroplane. Down each side of the Viscount's fuselage are seven large oval windows. The wing is fitted about half-way along the fuselage and has a small root fillet.

The most unusual feature of the tail-unit is the sharp angle of dihedral in the tailplane. The tailplane is diamond shaped and it has blunt tips. We have already mentioned the basic shape of the fin and rudder as being characteristic of other Vickers types, though its fin fairing is rather large.

Summing up its chief recognition characteristics the Vickers Viscount has abnormally long engines on a clipped diamond-shape wing, and a distinctive tail unit. The characteristic " head " already mentioned reminds us of a sparrow's head (see lowest picture at heading for best impression).

### Data

DUTY : Civil Transport.
MOTORS : 4 Rolls-Royce Dart Propeller-Turbines of 1,400 h.p. each.
PERFORMANCE : MAX. SPEED 327 m.p.h. (288 knots). RANGE : 1,730 miles (1,500 n.m.).
CREW : Three. PASSENGERS : 32 or 43 according to customer's requirements.
SPAN : 88 ft. 11 ins. LENGTH : 74 ft. 6 ins.



# IRON-CURTAIN AIRCRAFT IN THE NEWS

**LA-7** **THE CULT** of the "two-seat single-seater" is practised behind the Iron Curtain. The Lavochkin LA-7 two seat trainer is probably a converted LA-5 fighter. The only apparent difference between the two, other than the second cockpit, is in the position of the small intake under the radial engine of the two-seater. In the single-seater it is under the fuselage. The "plate" behind the spinner (lower picture) is a shutter for cooling control. (Three-view silhouette of LA-7 single-seat fighter appears in May, 1948 *Journal*).

**IL-4** **TORPEDO-BOMBER** " running-up ". Engines inside neat cowlings are M-98 radials of 1,100 h.p. Aspect of " head " formed by nose and cockpit canopy reminds us of a startled starling. Details of torpedo and ancillary gear (*see* "Iron-Curtain Aircraft " in *Journal* for March, 1949) are clearly seen in this photo. Many IL-4s are still in service in S.A.F. (*see* May, 1948 *Journal* for other view and data).

**YAK-18** **TWO-SEAT TRAINER** by Yakovlev carries his trade-mark fin. The engine beneath the characteristicly Russian " jelly-mould " cowlings is a five-cylinder M.11 radial. Other noteworthy features are : exceptionally long cockpit canopy, and a large wing (span 37 ft. 0 ins.) which has a fairly sharp dihedral angle in the outer sections (*see* December, 1948 *Journal* for three-view silhouette).

**IL-2** **STORMOVIK** two-seater ground attack aircraft, forerunner of the IL-10, displays characteristics and "sit" aiding recognition of its more modern counterpart. Chief family features showing in this view are the large triangular fin with the sharp slope on the leading edge, and large fairings beneath each wing, at ends of centre-section, and proportions of cockpit canopy.

**YAK-16** **THOUGH SUPERFICIALLY DAK-LIKE** it is leaner and smaller. In detail it is quite different and the wing has higher aspect ratio (span 56 ft. 0 ins.). Note neat cylindrical engine nacelles and large spinners ; also blunt-topped equi-tapered fin. Yak-16 seats ten passengers (see February, 1949 *Journal* for three-view silhouette).

LA-7


LA-7

IL-2

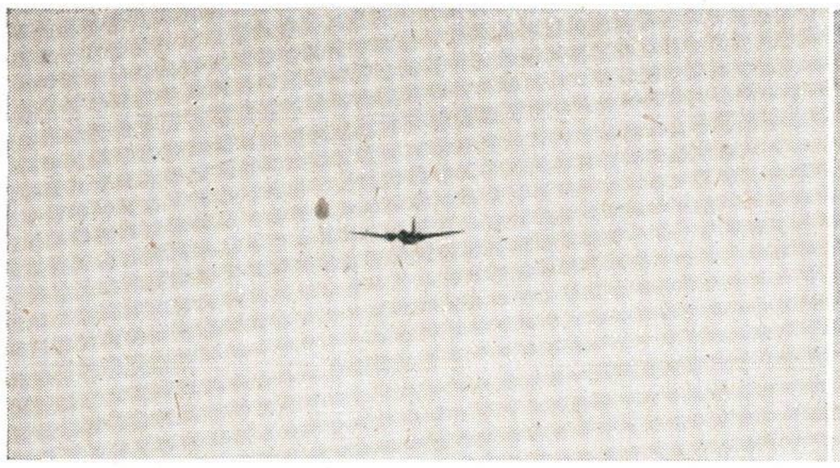

IL-4


YAK-16


YAK-18

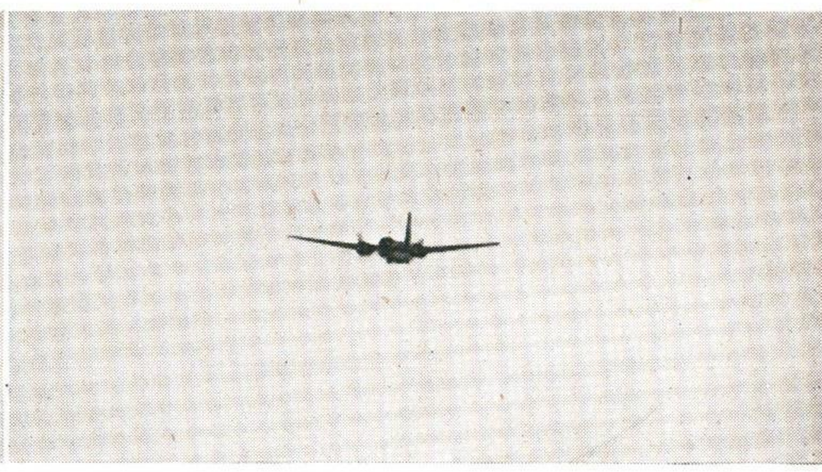
# What's the Score?

No. 3



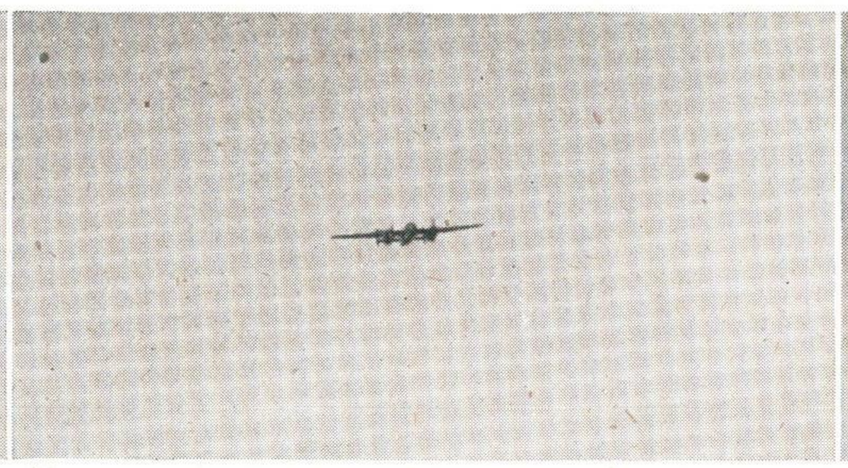
Twin-engines, ?centrally mounted, very close-set—deep rounded fuselage belly—single fin and rudder—" Wellington " aspect——

mid or shoulder-wing—engines underslung?—moderate dihedral——

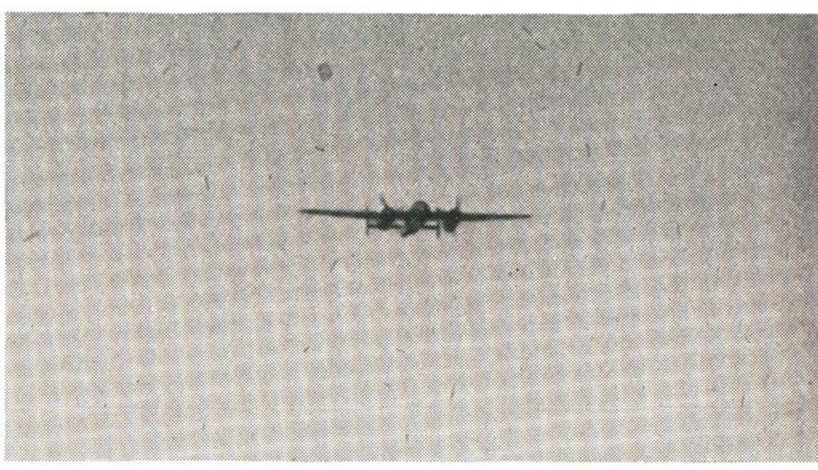


slab-sided fuselage—very tall single fin and rudder——

Twin underslung engines—?twin fins and rudders——

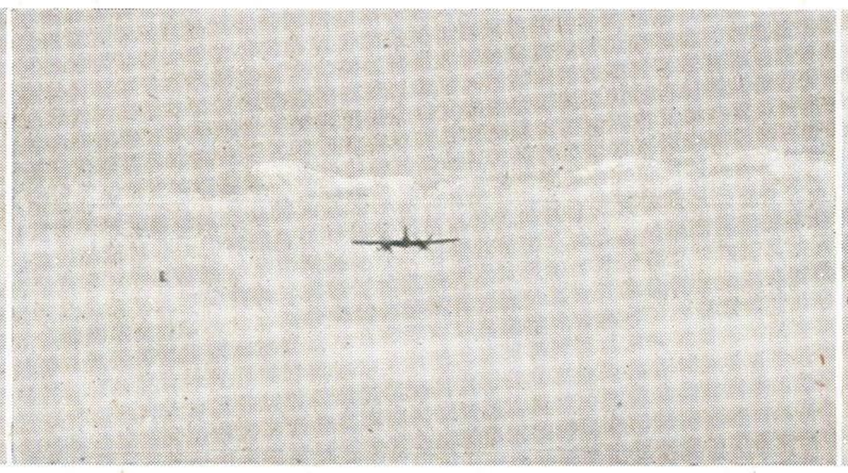


shoulder or high-wing—twin fins (end-plate type) on wide span tailplane——

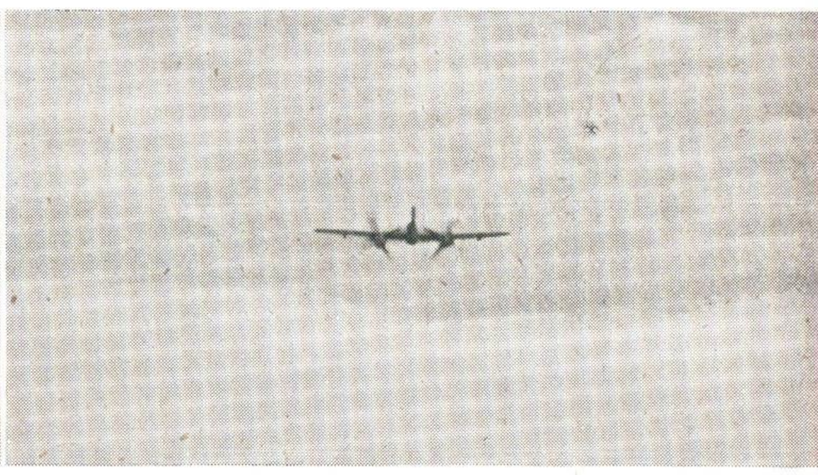


radial engines—high-set tailplane—no dihedral angle——

Twin-engines, widely spaced—thick centre-section——

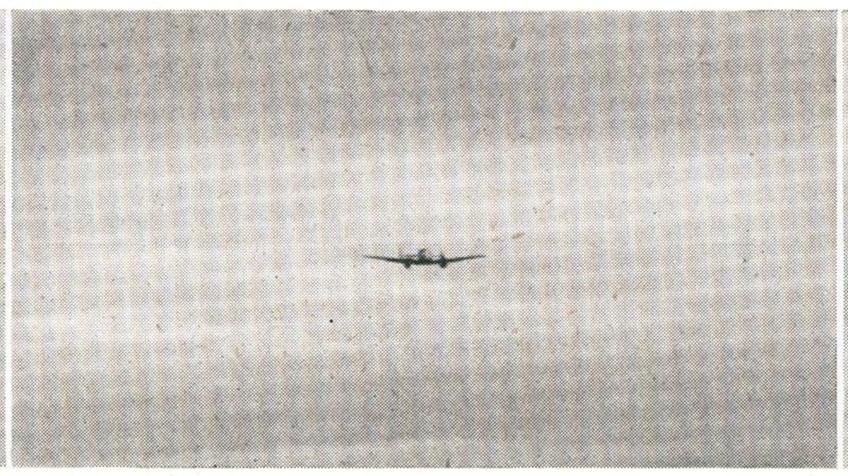


small fuselage cross-section—single fin—? underslung engines——

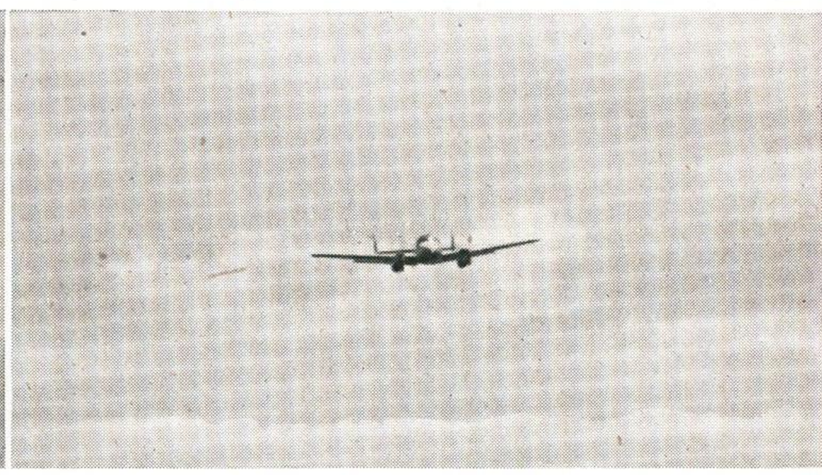


very little dihedral angle—underslung engines confirmed——

Low-wing—twin engines—high tailplane——

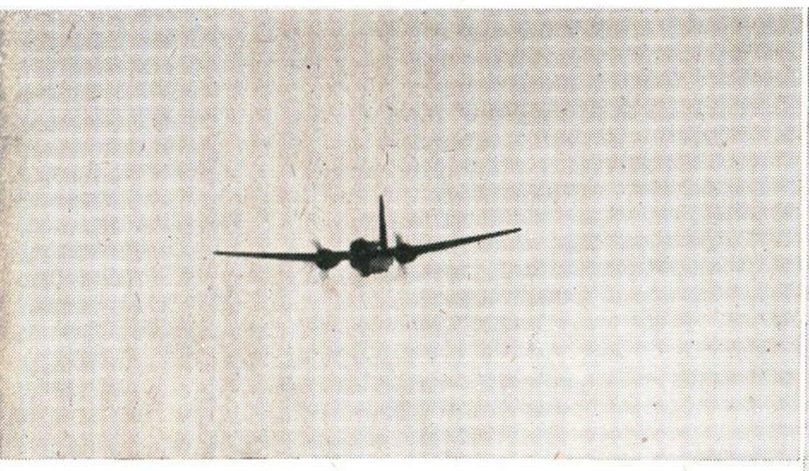


small engines underslung—? dihedral in outer panels only—twin fins (endplate type)——



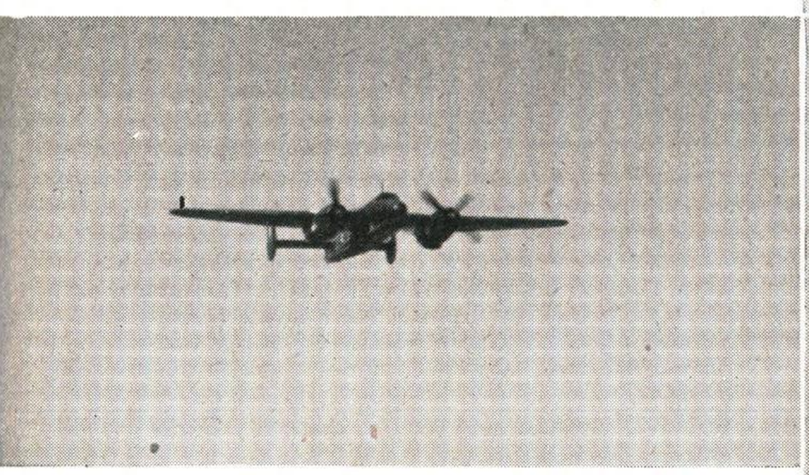
large cockpit—wide span tail—gipsy-type engines— ?" stepped " flaps on wing——

***A quartet of twins which, on the whole, show remarkably different characteristics even in the distant views. Reading from top to bottom they are:— (1) The Lockheed P2V-2 Neptune (Two Wright Cyclone radial engines) Patrol bomber. Note fairings breaking top and bottom fuselage lines. (2) The Bristol Buckmaster (Two Bristol Centaurus radial engines). (3) De Havilland Sea Hornet N. F. Mk. 21 (Two Rolls-Royce Merlin in-line engines). (4) The Miles Gemini (Two Blackburn Cirrus Minor in-line-air-cooled engines). If you can sit down, contemplate each view in sequence and, adding point to point, get the right answer that's good: But it's much better if you can recognise the aeroplane the instant your eye alights on the speck in the sky — in fact it's vital.***



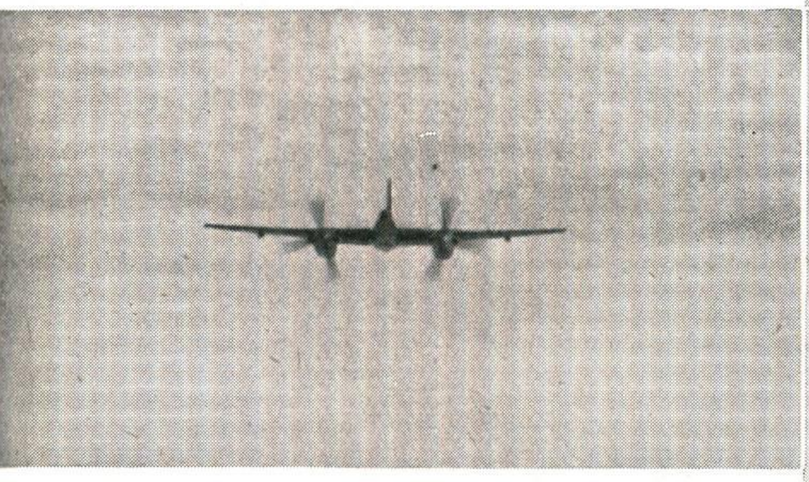
**sharp dihedral angle in wings—radial engines slightly under-slung :——**

?



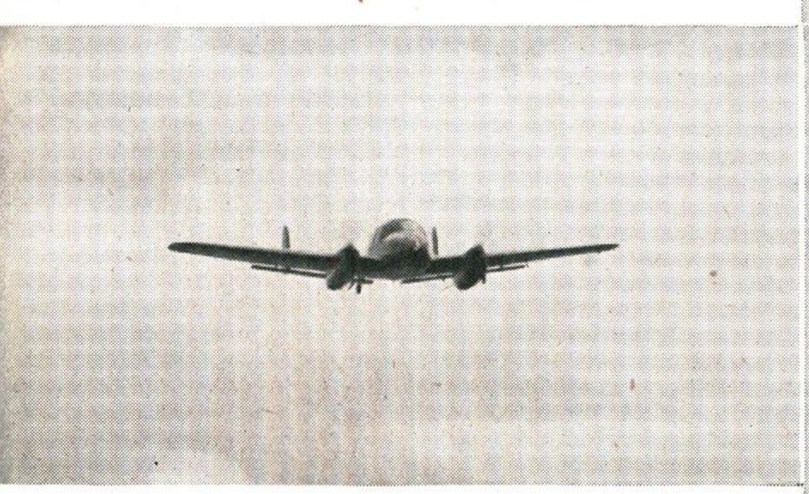
**large rounded fins and rudders—small faired in cockpit :——**

?



**centre section radiators—low-wing—merlin-type engines—" lean and clean " aspect :—**

?



**" stepped " flaps confirmed—sharp wing dihedral from roots—round or blunt wing-tips—very large glazed cockpit on squat fuselage :—**

?

"London" from the Air. (*Photo: Air Survey Company.*)

# LONDON LOG

## By G. D. H. LINTON

(*Press Officer, Ministry of Civil Aviation, London Airport*)

MOST of the thousands of men and women who people the steadily-growing London Airport (still known to the diehard few as Heathrow) have little cause to consider the proportions and shapes of the airliners which, like mechanised moths round an outsize candle, gather from all corners of the world. It is only the air traffic control officer, and to a lesser extent the apron marshal (positioning expert with bats or illuminated wands) who must of necessity cultivate his aircraft recognition. In the summer months, when the spectators' enclosure is open to the outside enthusiast (277,156 visitors during 1948!), there is also a "non-operational" personality who needs a sharp spotting eye—the commentator for the public address system. He is already a very busy man indeed.

Although London Airport does not cope with seaplanes—everything else seems to be allowed for in the final plan—and does not normally cater for the "non-scheduled" operator or private owner, it is surprising what a variety of aircraft call in at our largest civil air base. The tally for 1948 is 58 types, a few of them military: yet fully 75 per cent of all aircraft movements were by the chosen few in main-line service—America's Douglas DC range, and Constellations, and Britain's Tudor 4s, and the evergreen Yorks and Lancastrians.

An introduction early in 1948 was Air France's four-engined Languedoc 161, a distinctive aeroplane that even now, with a large fleet in daily operation, seems to cause some puzzlement to observers on the route to Le Bourget. Later came the first real post-war air transport, the twin-engined Convair-Liner, firstly on delivery to Trans-Australia Airlines and later as replacement for the Dakota, offering almost double the capacity and 50 per cent greater speed, on the high-frequency services of K.L.M. and SABENA.

The airport staff see most of these aircraft unflatteringly close to the ground, when, with wheels lowered and flaps extended, they hardly show the beauty of line often apparent in full flight.

The complete list of London Airport's regular operating companies, with the aircraft types at present in service, reads as follows (*note:* Dakota is here used for all variations of the DC-3 or C-47, and Skymaster for the radial-powered DC-4 or C-54):—

**British Overseas Airways Corporation (B.O.A.C.)**
CONSTELLATION—to New York, Montreal and Sydney
YORK and LANCASTRIAN
LIBERATOR—freighter to Montreal

**British South American Airways (B.S.A.A.)**
TUDOR 1 and 5, YORK, LANCASTER (freighter)

**Qantas Empire Airways (Q.E.A., Australia)**
CONSTELLATION

**South African Airways (S.A.A.)**
SKYMASTER

**Trans-Canada Air Lines (T.C.A.)**
CANADAIR FOUR (North Star), the DC-4M2 model

**Air-India International**
CONSTELLATION

**Air Ceylon (with Australian National Airways)**
SKYMASTER

**Pan American World Airways (P.A.A., U.S.A.)**
CONSTELLATION, SKYMASTER, DAKOTA

**American Overseas Airlines (A.O.A., U.S.A.)**
CONSTELLATION, SKYMASTER, occasional DAKOTA

**K.L.M. (Netherlands)**
CONVAIR-LINER, DAKOTA, occasional DC-6

**Air France**
LANGUEDOC

**SABENA (Belgium)**
SKYMASTER, CONVAIR-LINER, occasional DC-6

**F.A.M.A. (Argentina)**
YORK

**Panair do Brasil (P.A.B.)**
CONSTELLATION

**Iberia (Spain)**
SKYMASTER

**Iraqi Airways**
VIKING

**Philippine Air Lines**
DC-6

**Alitalia**
SM-95

The largest British charter company, Skyways, uses London Airport for their Skymasters (some are on loan to B.O.A.C.), Yorks, Lancastrians, etc.; the M.C.A. Fleet of Doves, Avro 19s and Consuls, based at Gatwick, often visit the airport on communication duty, radio check, and so on; while Central African Airways, Hong Kong Airways, and several home charter companies are occasional users.

In this connection, the appearance during the past year of the well-tried Bell 47 and Westland-Sikorsky S.51 helicopters was significant. The "long-term" planners of the airport undoubtedly have the role of the helicopter as a local taxi into London well in mind.

To those unversed in civil air traffic control lore, it may be of interest at this point to outline the present system as it affects the London area. The Metropolitan Control Zone, with its centre at Uxbridge, co-ordinates all traffic flying to and from London Airport, Northolt, Croydon, Bovingdon, and other airports around the city. In Visual Flight Rule (V.F.R.) conditions, aircraft can approach their destination by any route they choose, but as a matter of routine the operating companies usually insist on their liners following the same track as under Instrument Flight Rules (I.F.R.).

In the latter case, aircraft enter or leave the Metropolitan Zone at certain fixed points, or "gates", flying at pre-arranged altitudes (the lowest height for incoming aircraft is 3,500 feet, and for departures 1,500 feet). These gates are at Luton (Beds), Woodley (Reading), Dunsfold (Surrey), Tonbridge, and Gravesend (spotters and observers living near these places ought to be very experienced—Ed.); at all of these, except Tonbridge, there are radio beacons radiating a certain distinctive signal. Here, or just before, each incoming plane is handed over by Area Control at Uxbridge to Approach Control at the airport of destination, and lastly to Aerodrome Control (or G.C.A. radar) for the final circuits and landing. Approach Control allots heights for "stacking", if there is a queue, and priorities for landing. The reverse procedure, of course, obtains with departures, which are again normally routed over the beacons.

London Airport sometimes takes diversions from Northolt in bad weather conditions, and even in normal fine weather Northolt-based Vikings and such European "invaders" as S.A.S. Skymasters pass close by. When, in turn, flying conditions at London Airport itself are considered too poor by the operators, diversion to the "alternate" airports

at Bovingdon (near St. Albans) or Hurn (near Bournemouth) may be arranged.

The passenger traffic handled at London Airport—the highest reached to date in one month was over 42,000—should be studied in conjunction with the steadily soaring figures for mail and freight and the vast route mileage of such airlines as B.O.A.C., B.S.A.A., Q.E.A., A.O.A. and Pan American in order to gauge progress. The Olympic Games

(Top to bottom) : A B.O.A.C. Lockheed Constellation tucking up its undercarriage as it leaves the runway ; a K.L.M. Douglas DC-6 en route from Amsterdam ; a K.L.M. Convair-Liner (London's latest new type) on the apron ; and, Air France's Languedoc 161 just getting airborne (background : a Constellation and a Douglas Skymaster).

last July brought to the Airport a great influx of trade—and colourful trade, at that—with the " regulars " supplemented by " specials " under the unfamiliar flags of Aerovias Guest (Mexico), Aero O/Y (Finland), L.O.T. (Poland), Loftleidir (Iceland), T.A.P. (Portugal), Philippine Air Lines . . . The last-named afterwards started regular services to and from Manila, thus becoming London Airport's sixteenth operator; there are now 18, of 16 nations (see list opposite). Scheduled movements alone have increased in three years to some 150 a day, while construction of the permanent airport has continued steadily alongside the amassing of invaluable practical experience of large-scale commercial traffic. When three simultaneous movements (on separate runways) become accepted routine, and the centrally sited control is perfected, 4,000 landings and take-offs in the 24 hours should be possible.

The next generation of transport aircraft—with gas turbines providing the necessary urge—has already been heralded by the Vickers-Armstrongs Nene-Viking and the same manufacturer's propjet Viscount. The Viking flew to Paris and back in little over the half-hour each way ; the Viscount came in on a development flight and picked up passengers (also for Paris) with the most impressive ease and lack of fuss. Everyone knows the present economic drawbacks of the turbojet for civil aviation, and is prepared for the practical difficulties of controlling, marshalling and loading jet airliners, yet the visit of these pioneer British designs was a tonic for the patriot and an obvious pointer for the London spotter of the near future.

Before the jets take their place on the air routes, our No. 1 airport is due to harbour two piston-engined craft destined, if all goes well, to make aviation history—the gigantic Bristol Brabazon, shortly to begin flying trials from Filton, and the Boeing Stratocruiser, also far larger than any aircraft at present using London Airport. The " Strat ", bearing many of the distinctive family traits of the military Superfortress, is being introduced on the trans-Atlantic routes of the great U.S. carriers (P.A.A. and A.O.A.) in 1949, and B.O.A.C. also have a fleet of these whale-like monsters on the stocks. Mention of B.O.A.C. reminds one, also, that the Handley Page Hermes 4 and the Canadair Four (similar to T.C.A.'s successful equipment) are both due shortly on the London-based trunk Commonwealth routes. A far cry indeed from the Airco D.H.4 which began British commercial services in 1919 : the place—the London Airport, Hounslow Heath, a mile or two from the London Airport, 1949 . . .

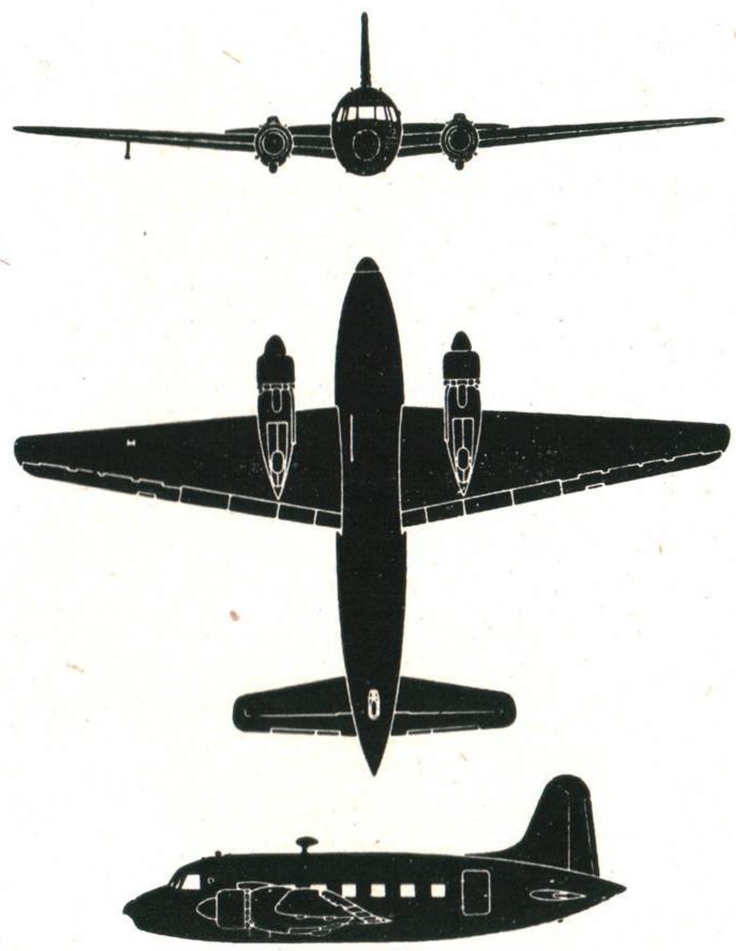
(Top to bottom): The Handley Page Hermes 4, the Boeing Stratocruiser and the Bristol Brabazon, which are destined to use London Airport under B.O.A.C's flag.

# *Made in Britain*

Sixty-seven varieties of the products of Britain's Aircraft Industry can be discerned through the gaps in the clouds covering this airfield. Can you name them? We admit that one or two are hard to distinguish, let alone to recognize; but if we tell you that the airfield is Farnborough . . . enough said. Some of the aircraft will no doubt be recognizable by deduction rather than configuration, but for all that, it is a good test, and an impressive show of products of one of Britain's most valuable assets, her aircraft industry. *(Original photo by courtesy of Air Survey Company).* *Spotting Test No. 93*

# SILHOUETTES — VICKERS FAMILY

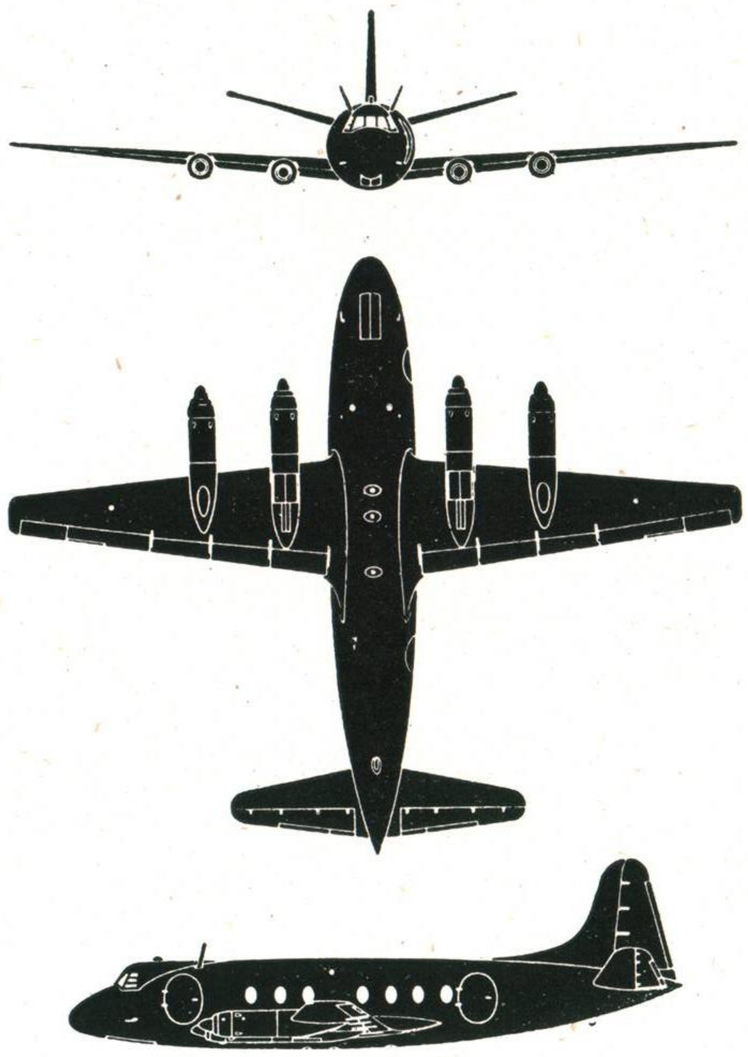
## VICKERS VIKING 1B



British Transport
Engines : 2 Bristol Hercules Radials
Span : 89 ft. 5 ins. Length : 65 ft. 5 ins.

In regular service in British and Foreign air lines.

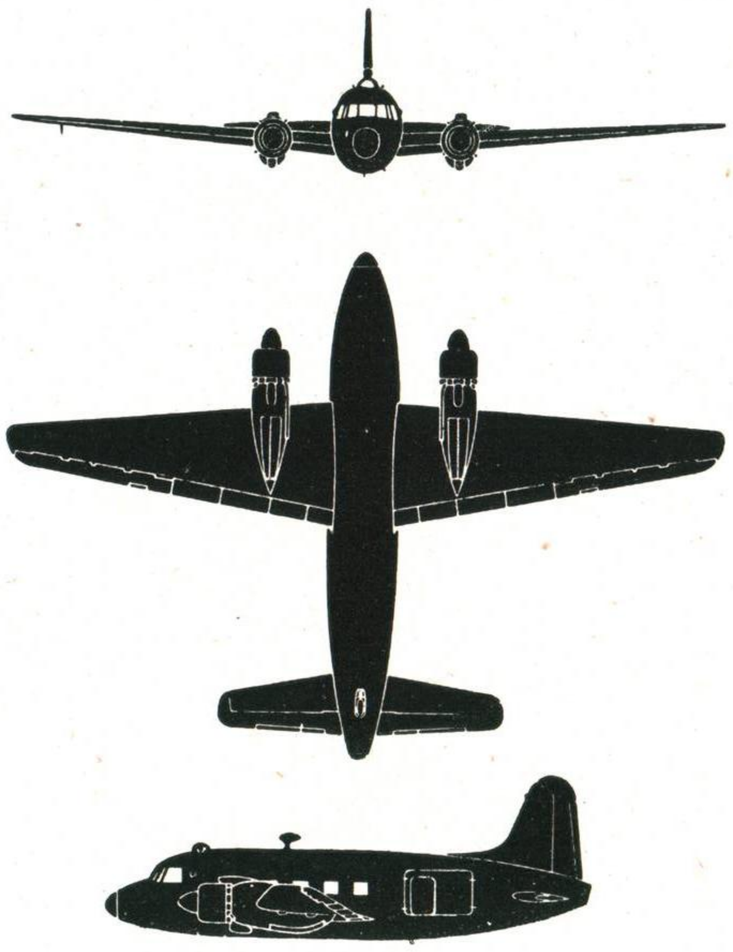
## VICKERS VISCOUNT



British Transport
Engines : 4 Rolls-Royce Dart Turboprops
Span : 88 ft. 11 ins. Length : 62 ft. 11 ins.

One prototype flying : second under construction.

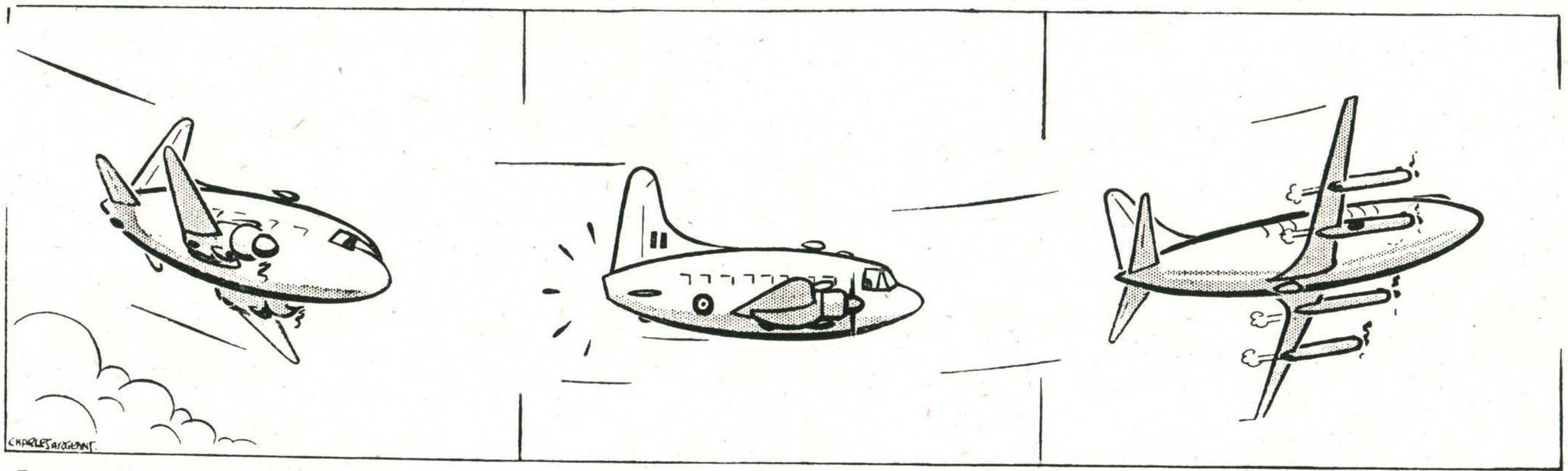
## VICKERS VALETTA



British Transport
Engines : 2 Bristol Hercules Radials
Span : 89 ft. 5 ins. Length : 62 ft. 11 ins.

In service as a troop transport, para-trooper, glider-tug, freighter, ambulance and supply-dropper. Still in production.

# FLIGHTS OF FANCY



Fatness of fuselage form is a fairly obfious feature of Fickers Fikings, Falettas and Fiscounts (Sorry ! but we had to do something to keep the alliteration going) and to familiarize you with that point and also with other family features (and differences) of these aeroplanes, we arranged this flypast.

## SOLUTIONS TO RECOGNITION TESTS IN THIS EDITION :

**FRONT COVER.** *Vertical view of London Airport. Reading from left to right, aircraft shown are:— Against buildings—Viking and Dakota : touching white line— Constellation, Languedoc and two more Constellations : on its own—Liberator Transport. (Photo by courtesy of the Air Survey Company.)*

### No. 91 (ELEMENTARY)

592. B-29 Superfortress
593. Meteor 4
594. Martin 202
595. Tudor 4
596. F-80 Shooting Star
597. Shetland 2
598. A.W. 52
599. Spitfire 9
600. Pioneer
601. Sealand
602. Solent
603. Tudor 8
604. Ambassador
605. Macchi 205
606. Valetta
607. Viscount
608. Viking (Nene)
609. TU-2
610. Sturgeon 1
611. Balliol 2
612. Dove

### No. 92 (SILLOGRAPHS)

516. Shetland 2
517. B-29 Superfortress
518. Firefly 4
519. Lancastrian
520. Auster 6
521. Halifax C.8
522. Dove
523. Martin P4M-1 Mercator
524. Sea Hornet Mk. 22
525. Anson 19
526. Balliol 2
527. Ambassador
528. Bristol 171
529. LA-9
530. Brigand B.1
531. Sea Otter
532. Seafire 47
533. Navion
534. Barracuda 5
535. Viking 2
536. Sea Fury 10
537. Hellcat
538. Freighter 11
539. F-84 Thunderjet
540. Chipmunk

### No. 93 ("Made in Britain")

1. Athena 1
2. Balliol 1
3. Sturgeon T.T.2
4. Brigand B.1
5. Blackburn S.28/43
6. Firefly T.1
7. Seafire F.47
8. Seafury F.B.11
9. Sea Hornet F.R.20
10. Freighter 21E
11. Dove 2
12. Marathon 1
13. Valetta C.1
14. Lincoln (Theseus)
15. Lincoln B.2
16. Gyrodyne
17. Hastings C.1
18. Auster T.7
19. Autocrat
20. Pioneer
21. Balliol T.2
22. Prince 1
23. Ambassador 1
24. Sealand 1
25. Lancastrian (Avons)
26. Lincoln (Naiad)
27. Chipmunk
28. Prentice T.2
29. Auster A2/45
30. Avis
31. Primer
32. Aerocar
33. Athena 2
34. Viscount
35. Viking (Nene)
36. Hawker P.1040
37. Vampire FB.5
38. Meteor 4 (Beryls)
39. Meteor 4
40. Meteor T.7
41. Tudor 8
42. A.W.52 (Nenes)
43. Hermes 4
44. Baby Eon
45. Olympia Eon
46. Newbury Eon
47. Vampire (Ghost)
48. Vampire F.B.5
49. Cierva Skeeter
50. Bristol 171
51. Gyrodyne
52. Satellite
53. Super Ace
54. Hawker P.1040 (N.7/46)
55. Air Horse
56. A.W. 52 (Derwents)
57. G.A.L. 61
58. Proctor 5
59. Primary Eon
60. Proctor 4
61. Prentice T.1
62. Firebrand T.F.5
63. Firefly FB.5
64. Seagull
65. Consul
66. Mosquito TT.39
67. Viking C.2

**BACK COPIES OF THE INTER-SERVICES AIRCRAFT RECOGNITION JOURNAL**

A limited number of back copies of the Journal (New Series) are available. Applications must be made, through the usual channels, to Air Publications and Forms Stores, Air Ministry, Kidbrooke, S.E.3, before the end of August, 1949.

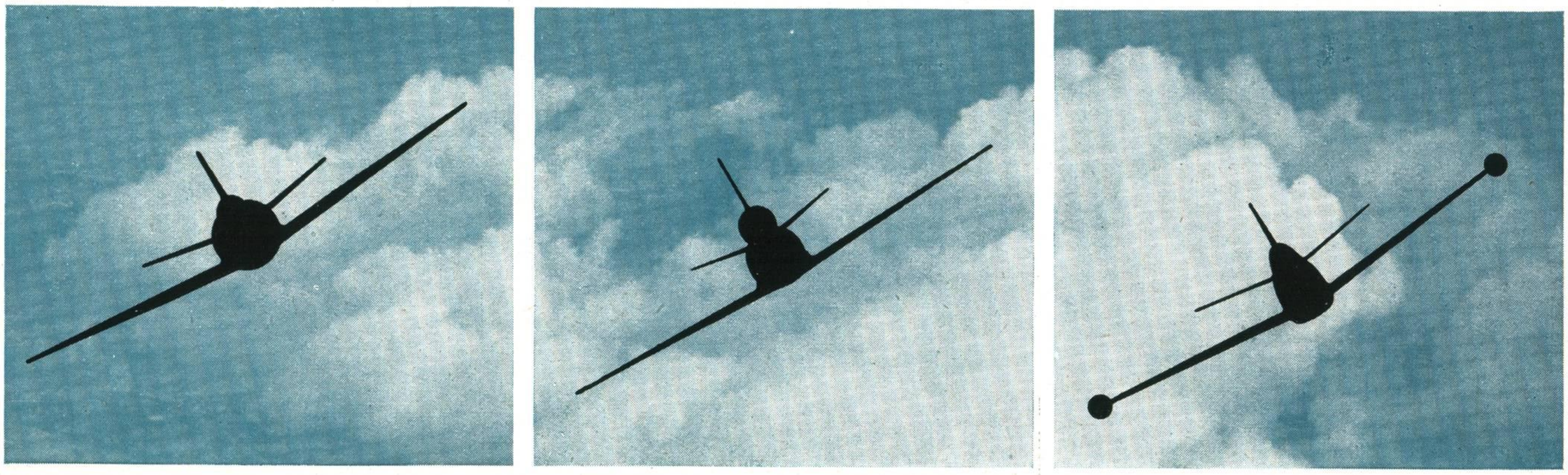
**TRICKY TRIO VIII**

(Left to right) : Vickers Attacker or Sea Attacker ; North American F-86A and North American Fj-1 Fury.

**CROSS-PURPOSES**

As almost every R.O.C. member has observed we unfortunately crossed over the captions of the Balliol photographs on page 53 of No. 9 (February) R.O.C. special pictorial Gazette. The turboprop version is the Mk. 1, which fact we shall never forget.

## TRICKY TRIO—VIII



The Inter-Services Aircraft Recognition Journal is a monthly publication, prepared and produced by Air Ministry, *S.T.*1 (*e*), in collaboration with the Ministry of Supply, *A.T.P.*6. The subject matter is decided by an Editorial Committee consisting of the following members—AIR MINISTRY : *S.T.*1 (*e*) Wing Commander R. B. Ward (Chairman), Mr. C. E. Sargeant (Secretary and Editor) : *T.O.*2(a) Squadron Leader A. J. C. Eagles ; *A.D.I.(Tech.)* Flight Lieutenant J. F. Hall : *Central School of Aircraft Recognition*, Flight Lieutenant D. A. V. Nicolson, D.F.M. ;
ROYAL NAVY : Lt. Cdr. J. G. Hopkins, R.N. ; ARMY : Capt. C. T. Smith, R.A. : MINISTRY OF SUPPLY : *A.T.P.*6, Mr. A. E. Dollery ;
ROYAL OBSERVER CORPS : Observer Commander R. R. Poole ; AIR TRAINING CORPS : Flight Lieutenant E. E. Ashton.

52M 5 49 38-241-0

*Printed under the Authority of H.M. Stationery Office by Fosh & Cross Ltd., London*