JOINT SERVICES

RECOGNITION *Journal*



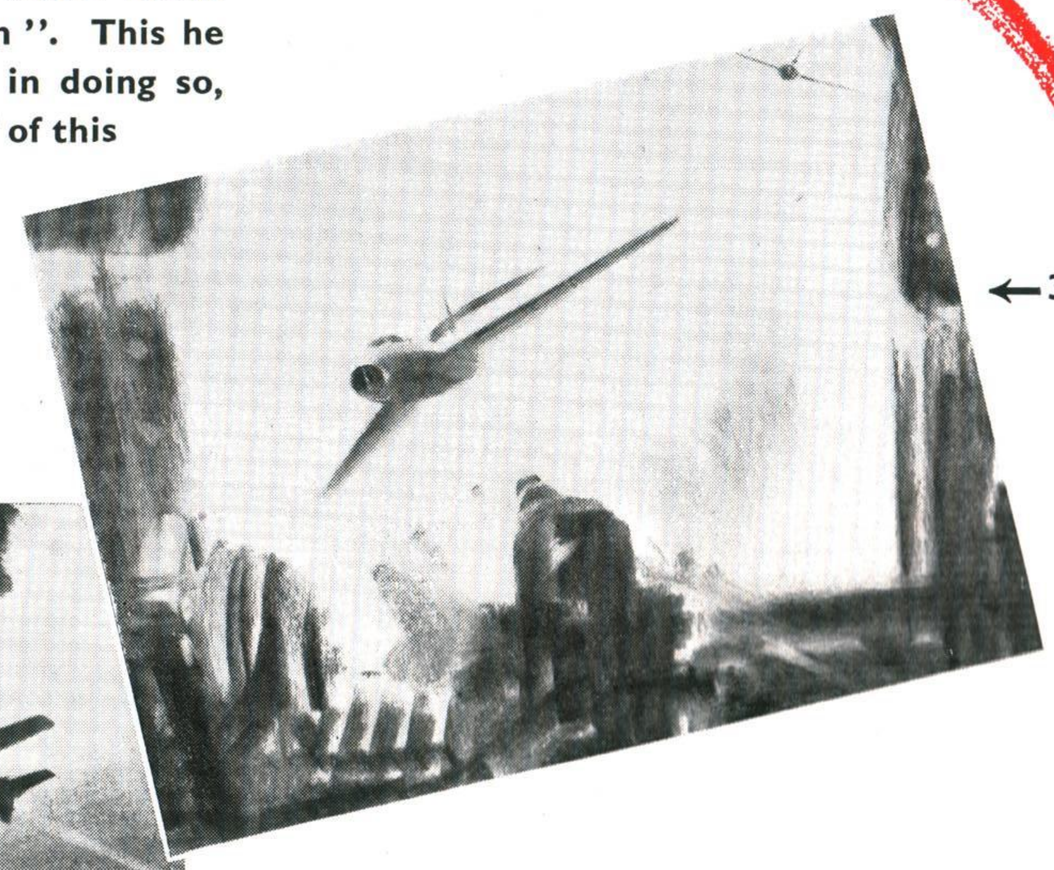
Vol. 6 JANUARY 1951 No. 1

For official use only

Action Here!

by FRANK WOOTTON

The MIG-15 has been in action in Korea. We asked Frank Wootton to "capture" one for us in "action". This he has achieved in his usual brilliant style, and, in doing so, portrays the characteristic "tail consciousness" of this new Soviet Air Force jet-fighter. Pictures 1 to 3 might be typical views from a bomber as the MIG-15 snooped around. Nos. 4 to 6 might well be typical views from an escort fighter seeing it off.



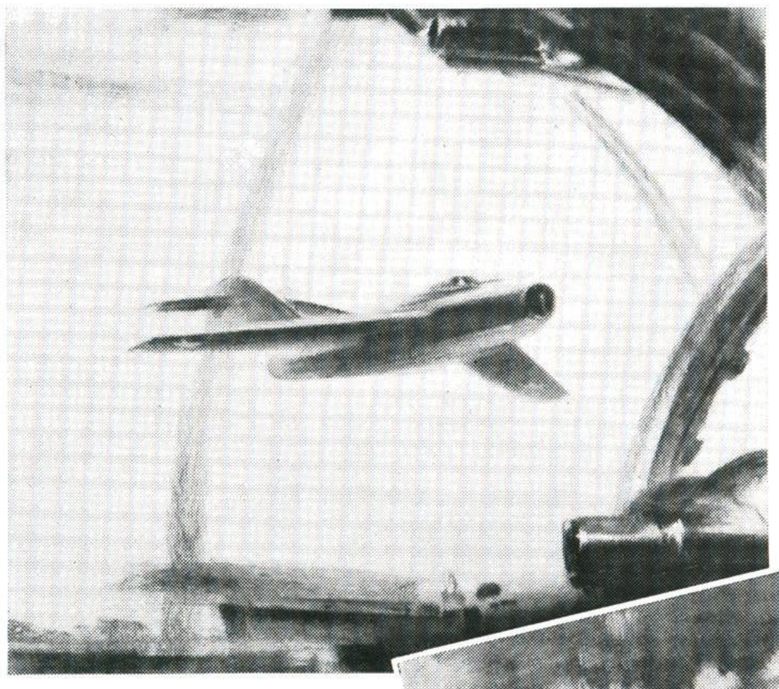
←3. Under-Attack !

1. Searching ↓





← 4. High quarter attack!
(from fighter)



↑ 2. Checking-up



6. Beaten off ! →



5. In the sights ! →



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RECOGNITION JOURNAL

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FOREWORD

BY

Air Vice-Marshal T. N. McEvoy,

C.B., C.B.E.

Assistant Chief of Air Staff (Training)

BUT for a short break after the second World War, the *Inter-Services Aircraft Recognition Journal* has served its single purpose for more than eight years. With this edition it changes its title, widens its scope for the future, and includes information on the visual recognition of ships and armoured fighting vehicles as well as aircraft.

There ought to be no misunderstanding anywhere about the value of visual recognition. It is vital. Although scientific developments continue to change the conduct of war, recognition of the enemy still depends mainly upon the eyes, and ears, of sailors, soldiers, airmen and observers.

The object of the new *Joint Services Recognition Journal* is to aid all concerned in this process of familiarizing themselves with the appearance of ships, tanks and aircraft likely to be seen in war.



WARSHIP RECOGNITION

by Lieutenant Commander J. G. HOPKINS, R.N.

THE inclusion of warships and armoured fighting vehicles (AFVs) in the *Recognition Journal* is a logical step in establishing the permanent place which visual recognition should take in the training of sailors, soldiers and airmen. Although warship recognition is mainly the concern of the Navy and R.A.F., and AFVs of the Army and R.A.F., the inclusion of these two items will be of general interest to others and will provide a common ground for promulgation of information not necessarily accessible in other official form.

Hitherto there has been a general belief that Recognition refers to aircraft only and it is well to dispel this idea and to encourage interest in the weapons of the other services as well as of other countries. Many cases of faulty recognition where loss of life and material were involved are ready to hand and there are too many people in the services too happy to quote such examples, and, unhappily, too lazy or bored to learn from them. In the stress of prolonged operations mistakes are possible and will continue to be made. Sound training based on the fundamentals will assist the fighting man to distinguish friend from foe and, incidentally, will provide an efficient stand-by in the absence of scientific devices or their failing.

What then are the fundamentals of warship recognition and how are they best presented ?

Type

Warships are designed and built to perform specific tasks and all those having a common task can be grouped together into " types ". Briefly these are :—

BATTLESHIP
BATTLECRUISER
AIRCRAFT CARRIER
CRUISER
DESTROYER
ESCORT
SUBMARINE

There are other types of smaller vessels with which it is not proposed to deal at this stage.

Now each type has certain characteristics which form the basic parts of their construction which are termed *hallmarks*. These hallmarks give an instant clue to recognition of type. The battleship, for instance, has a massive, pyramidal superstructure amidships and its hull shape has great beam in relation to length. The reason for such hallmarks is the immense and complicated installation which is necessary for controlling the armament and the necessity to accommodate and protect the propulsion machinery

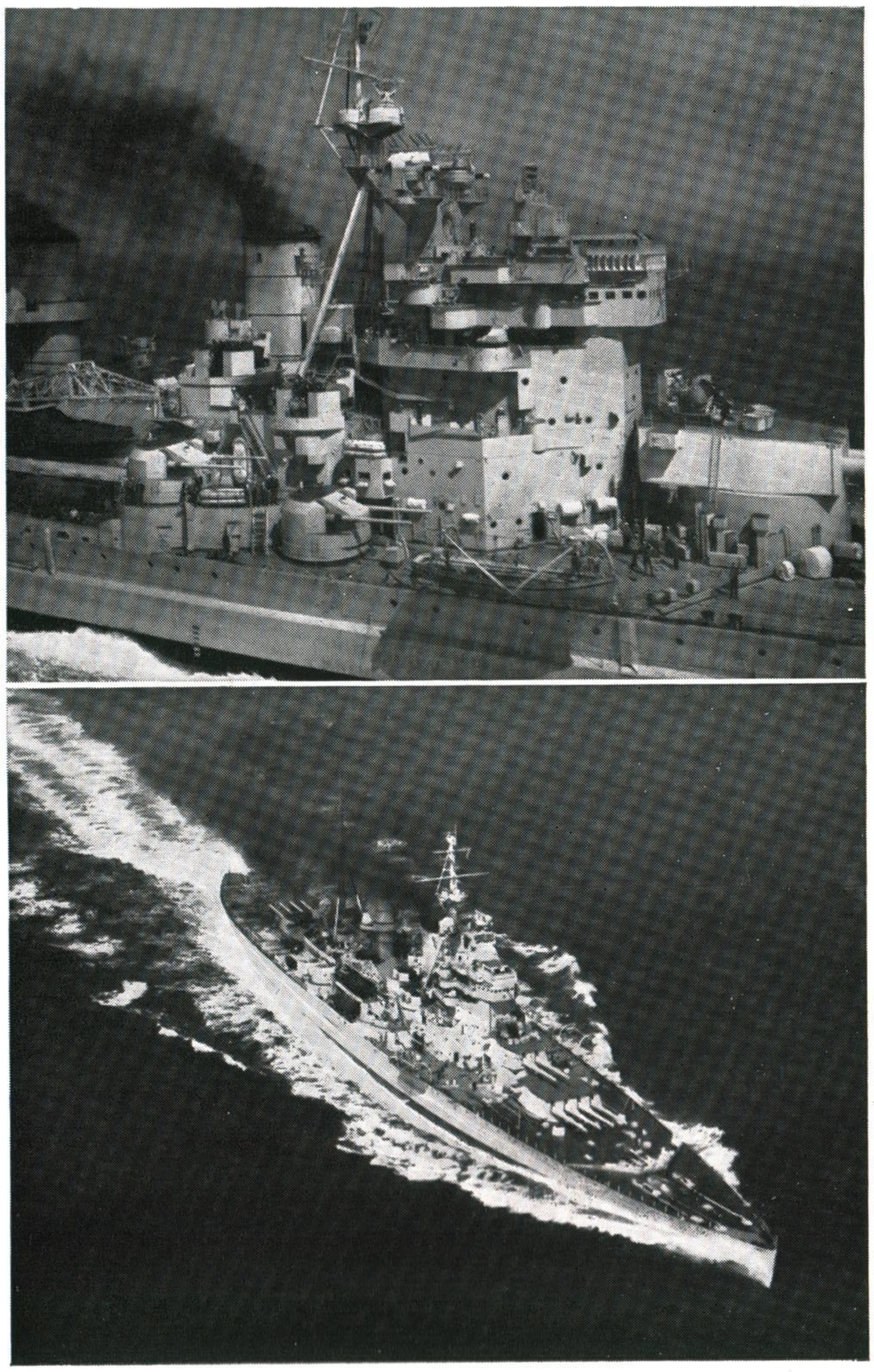
In addition each type has *general features* and a working knowledge of these is essential for positive identification. A case in point is that no existing battleship has more than two funnels, and the main armament forward of the bridge is usually superimposed on structures known as barbettes.

Having identified the unknown vessel by type the next stage is to establish her nationality.

Nationality

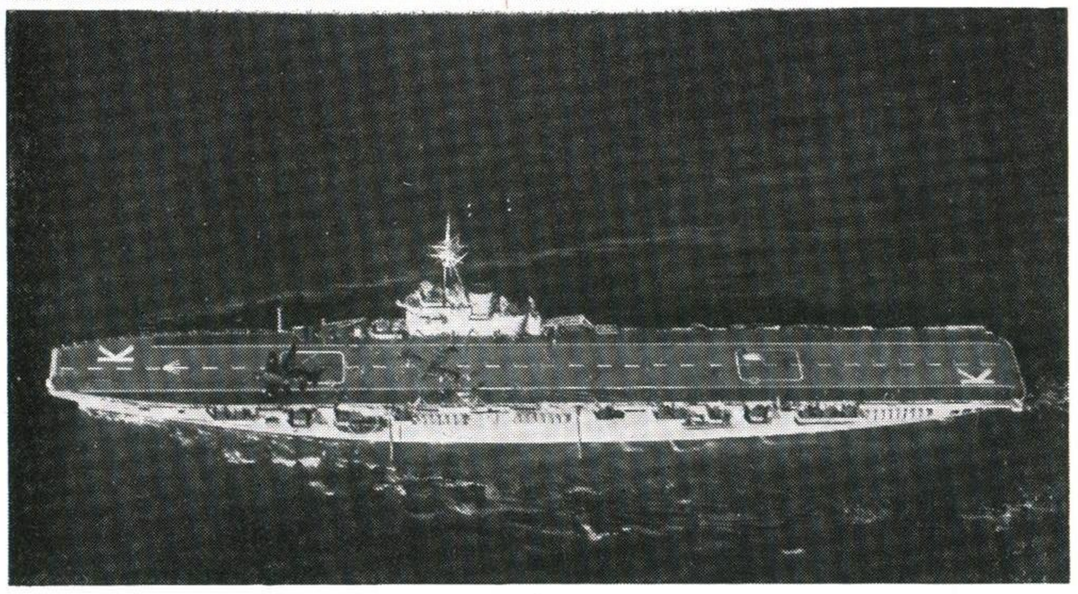
The warships of the larger powers have peculiarities in their outward appearance which enables the trained observer to distinguish one nation's ships from another's. National characteristics are most generally marked by certain peculiarities in the shape of salient features and by a most distinctive arrangement of one or more features. One feature alone, however, should never be used for final recognition—some confirmation should be sought. For instance most British battleships and cruisers have square box-like bridges and upright, uncapped funnels, whereas U.S. ships have pyramidal bridges and capped funnels.

Briefly, then, we have shown that the two essentials in warship recognition are to establish, firstly, *type* and then *nationality*. For all general purposes these two facts will prove sufficient especially when any sighting is backed with " briefing " intelligence and knowledge of the movements of friendly warships. To enable observers to establish type and nationality it is essential that some form of planned instruction be given, backed,



The hallmarks of a Battleship are the massive pyramidal superstructure amidships (shown in detail in the uppermost view) and hull proportions of great beam in relation to length. A typical beam/length ratio for a battleship is six to one. These photographs are of H.M.S. *King George V.*





The characteristics of the Aircraft Carrier are a long, flat, roughly rectangular flight deck, a high freeboard and a very compact superstructure (if any) which is invariably placed on the starboard side. These views are of H.M.S. *Victorious* (above) and H.M.A.S. *Sidney* (below).

where possible, with practical experience with actual ships and/or models. Unless observers have learned the fundamental facts they are liable to make mistakes particularly with battleships and large cruisers ; armament lay-out in these ships can be confusing—especially in the case of American cruisers ; the guiding factor in this case being the relative proportions of length and beam. Viewed from sea-level the chances of confusion are enormously reduced but, to the airman, such views are rare and he must, therefore, rely on sound training.

How then, should basic instruction be framed so that the trained observer will be able, instinctively, to recognize major warships? The method recommended is as follows :—

Terminology. Standardization of terms is a most desirable object and pupils should be taught these terms. The fact that many are common to the Navy and RAF simplifies the job so far as the airman is concerned.

Type. Characteristics of the main types should be taught and demonstrated. Their hallmarks vary slightly with nationality but are always present and easily recognizable provided pupils have been properly trained. Having outlined the type hallmarks instruction should then be given on the characteristic general features of each type to enable pupils to build a complete picture ; it is worthy of note that good training enables an observer to spot type hallmarks and other general features at a glance (weather conditions, etc., being favourable) in the same manner as with an aircraft.

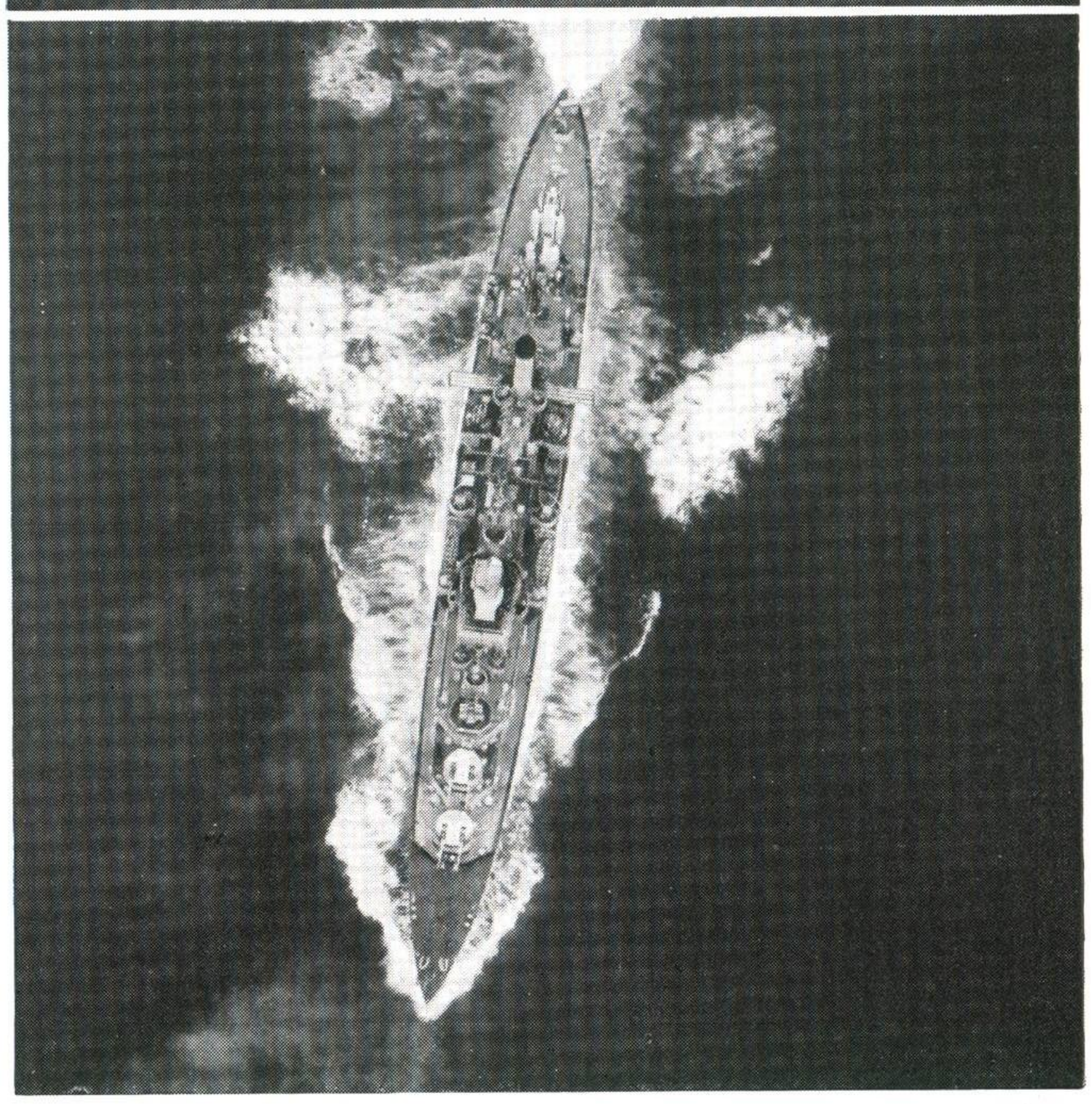
Nationality. Certain national characteristics are sufficiently marked to give ease of identification but a great deal more effort is required in this part of warship recognition and there is much that must be memorised. Practical experience with actual ships is an invaluable aid but good results can be achieved with the use of models. Photographs, too, provide unlimited scope in presenting different perspectives, but care should be taken to use them in addition to, rather than instead of, models or live targets.

Class and Name. To date no mention has been made of the two final steps in warship recognition. Class and Name are pure refinements and may never be necessary in operations ; class, however, can be of very great importance in the later stages of instruction. The potentialities of different classes in the same types may vary considerably and the tactical importance of being able to distinguish one from another is great. For instance American aircraft carriers can be divided into four main classes, namely :

CVB—*Midway* which carries approximately 105 planes.
CV —*Essex* ,, ,, ,, 90 ,,
CVL—*Independence* ,, ,, 48 ,,
CVE—*Commencement Bay* ,, 30 ,,

(*Continued on page 11*).





Main characteristics of cruisers are : large box-like bridge structures; a more even " spread " of superstructure along the length of the ship with two shallow " humps " of structure (as opposed to the " pyramid " of the battleship) and a narrow beam/length ratio of from nine to one to as much as eleven to one. These views are of a British (improved) Dido class cruiser.

MORE NON-IDENTICAL TWINS

by CONFUCIUS

MOST readers of this *Journal* will have heard of "specifications", to which most military aircraft are designed. Specifications are drawn up by a technical body at the Air Ministry or the Admiralty in the light of existing or anticipated requirements for particular types of aircraft. Depending on the type of aircraft the specification is more or less stringent, but in most cases it will lay down the type of engine to be used ; the number of seats ; the type of construction required ; the maximum loaded weight ; the performance ; the armament and equipment, and any other particular requirements.

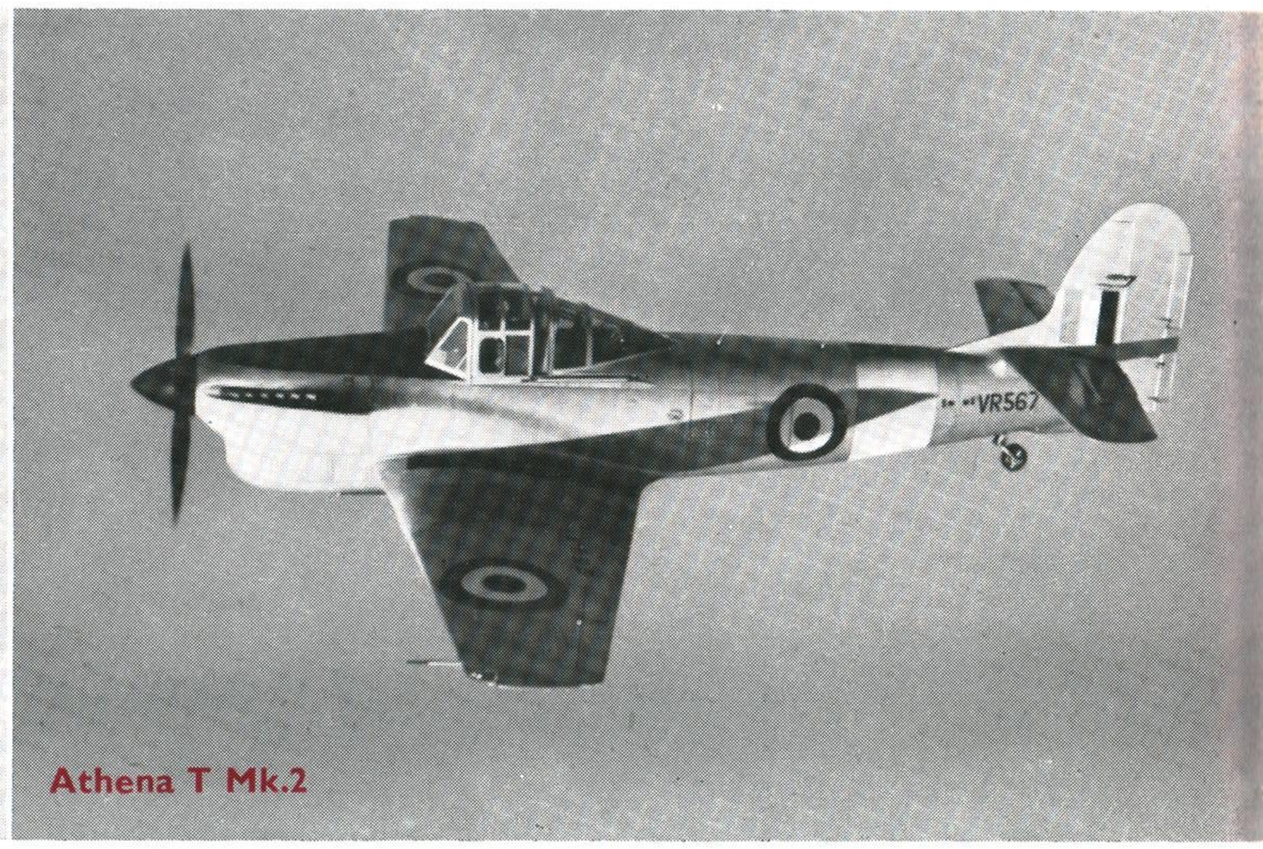
In the case of Admiralty specifications, much more stringent requirements are usual—for instance, the aircraft must not exceed a certain height, the span must be reduced sufficiently to permit accommodation in the lifts on aircraft carriers, and much special equipment must be carried.

When the specification has been drawn up, certain aircraft companies are selected as being most likely to be able to meet the specification, and are invited to submit designs.

Preliminary designs are studied by the appropriate committee, and, under current practice, the two most promising are selected and prototypes ordered. Evaluating trials with these prototypes will follow with a view to one being selected for production. Many variations from this system do occur of course, and in particular, where a specification is drawn up to cover a modified version of an existing type, obviously no competition is held.



Balliol T Mk.2



Athena T Mk.2

Each specification is given a number when drawn up, indicating the type of aircraft and the year of issue of the specification. Thus, for example, T.7/45 calls for a trainer (T) and is the seventh specification issued in 1945. As the publication of specification numbers for new aircraft gives an important clue to their chronology and the trend of planning they are now published only in relation to older aircraft.

Since the end of the war many aircraft have appeared as a result of specifications, but, in particular, there have been three excellent examples of the current policy of ordering two types to one specification for evaluation. A study of these three pairs of non-identical twins throws some interesting light on the way in which different designers achieve the same end as laid down for them before they start.

TRAINING TWINS

Our first twins are the Avro Athena and the Boulton Paul Balliol, which both originally saw the light of day as a result of the T.7/45 specification. This was a revolutionary specification for a trainer as it called for the use of an airscrew-turbine for power (the Mamba or Dart), and was to seat an instructor and two pupils. Naturally a certain performance, and in particular, certain flying characteristics were required of the type, and both the Avro and the Boulton Paul design teams arrived at similar solutions to the problem of meeting these requirements.

When the Air Staff realized that the anticipated rate of progress on airscrew-turbines was not being achieved, a new specification was drawn up—T.14/47, which in effect called for the modification of the Athena and Balliol to have the Merlin 35 for power and only two seats, side-by-side. Prototypes of the earlier type were already under construction, and there have in fact been three Balliols with Mambas, one Mamba-Athena and one Dart-Athena flown.

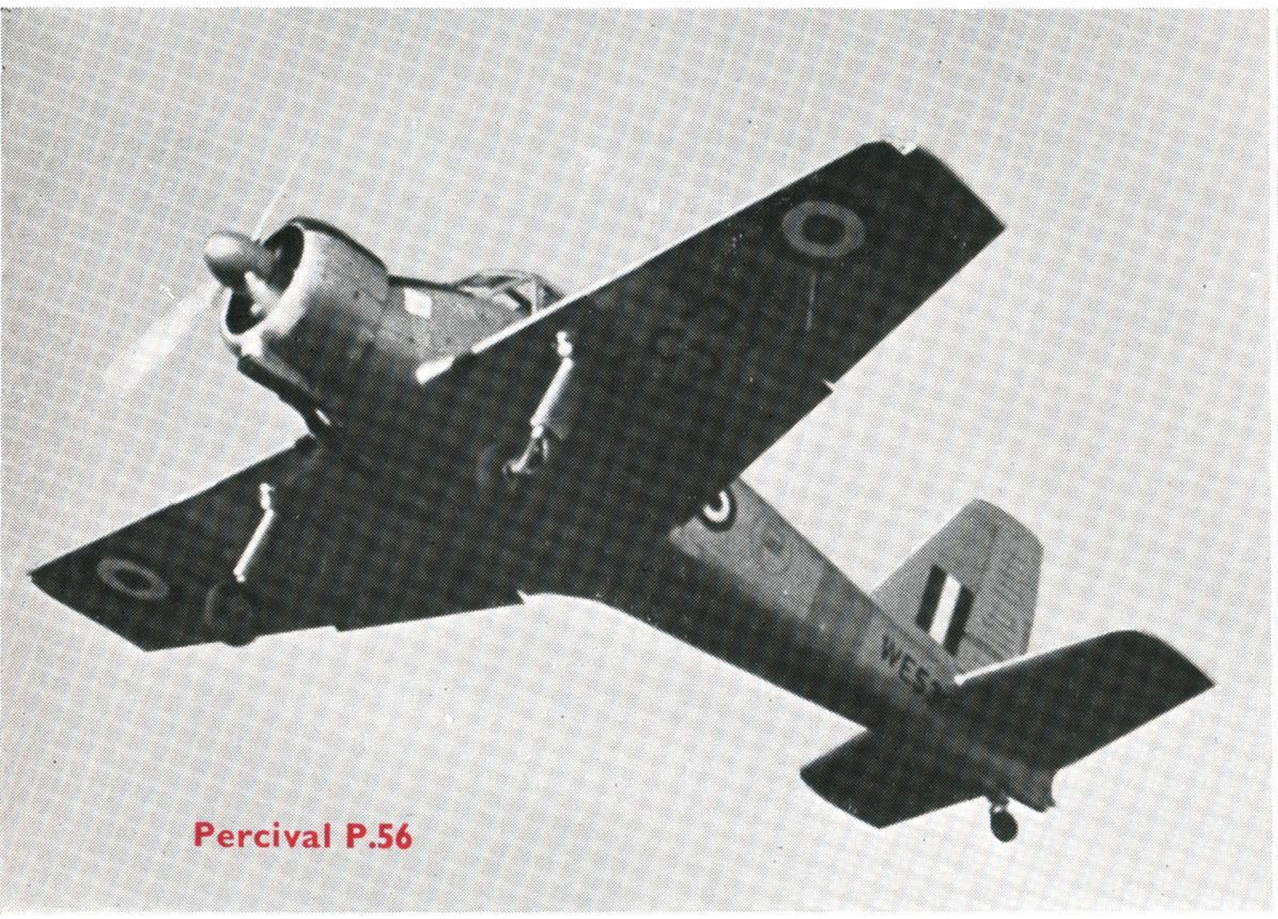
Further prototypes of each type were ordered with the Merlin engine, and then a pre-production batch of each (about 17 aircraft) for the full-scale evaluation. The testing has been extensive and has resulted in the production order going to the Balliol T Mk.2, as the new applied-flying trainer for the R.A.F. The pre-production Athena T Mk.2s are to see service at the R.A.F. College of Flying however, and are therefore still important.

Recognitionally, the Athena and Balliol have a number of common features, as is to be expected. Both are distinguished by the prominent snout of the Merlin with its deep square radiator ; the wing is well forward, with most taper on the trailing edge, and the cockpit in both cases is an all-transparent enclosure raised above the fuselage top-line. Important clues to the identity of the Balliol are the set-forward fin and rudder ; considerable outer wing dihedral ; and narrow chord wing. The tall Athena fin and rudder is likewise a distinctive feature.

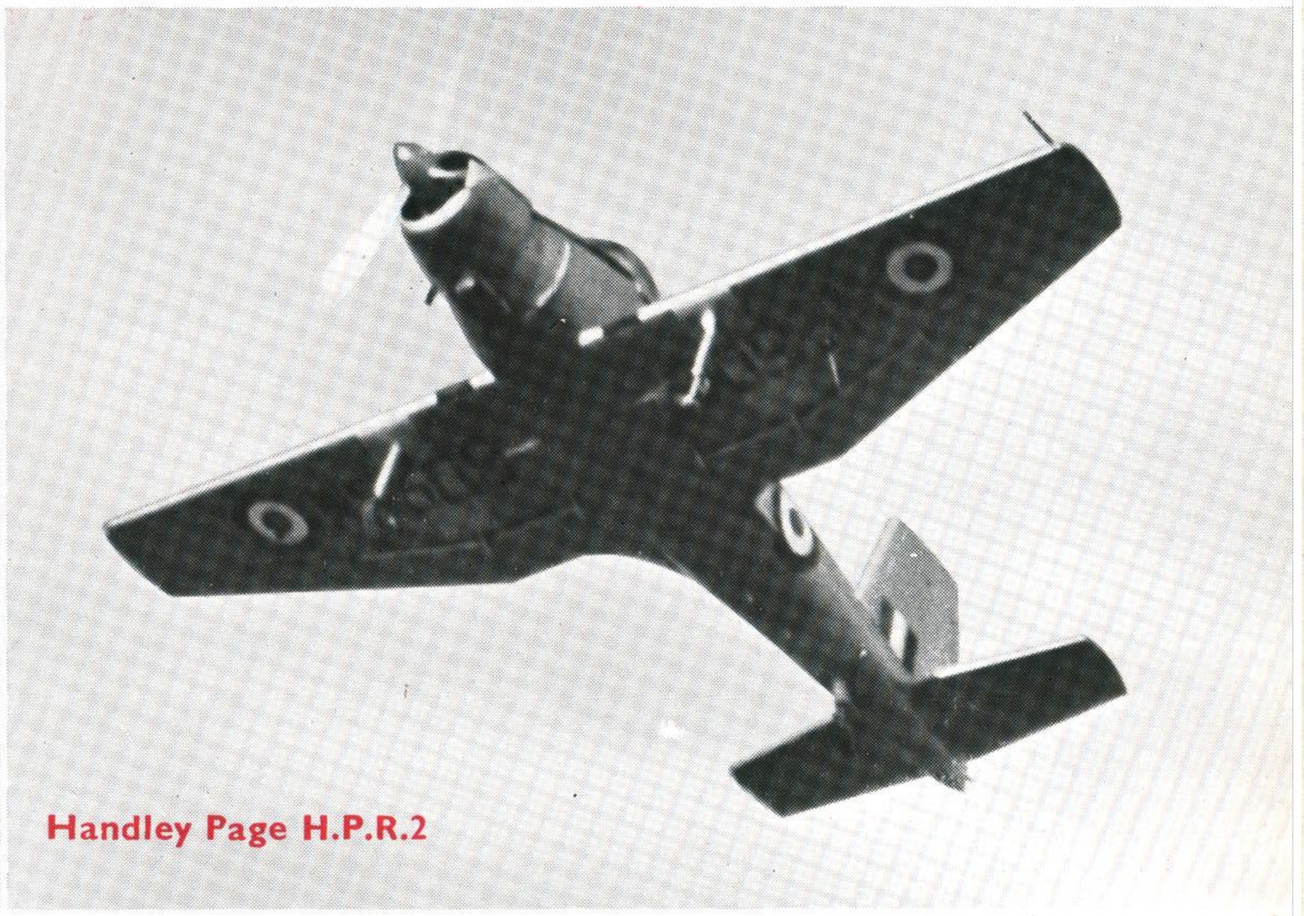
MORE TRAINERS

The next pair of twins are also trainers. They conform to a more up-to-date specification for a primary trainer for the R.A.F., to replace the Prentice. The specification again required certain flying characteristics and performance, and also demanded special facilities for easy ground maintenance. Originally, a Leonides engine was specified, but that has been changed to a Cheetah as large stocks of spares for the latter are held by the R.A.F.

As a trainer is simple—at least comparatively—to design, and there is the prospect of substantial orders for whichever type is ordered, competition is usually keen. This case was no exception, and more than a dozen companies submitted designs. Those by Percival and Handley Page (Reading)



Percival P.56



Handley Page H.P.R.2

were selected. Prototypes of both these designs are now flying—the P.56 and H.P.R.2—and in the latter case a Leonides-powered prototype has also been produced on the company's own initiative.

Here again we find the designers arriving at similar conclusions in meeting the requirements. The two types are most alike in appearance, and careful attention to detail will have to be paid in distinguishing between these two, until such time as one is selected for service. Both feature a large number of removable panels to make possible the servicing of the engine control runs, etc., from the outside of the aircraft.

HOSTILE TO SUBMARINES

The third pair under consideration arose from a specification for a carrier-borne anti-submarine aeroplane, with all that that entailed! Fairey and Blackburn, whose designs were selected for construction, both have a long association with the Navy, and were therefore able to bring a wealth of experience to bear.

The specification called for the use of a coupled airscrew-turbine engine (giving the advantage of cruising at half-power on one engine); the carriage of a war-load internally; retractable anti-submarine radar in the fuselage; provision of deck-arrester gear, etc.; take-off performance suitable for carriers; the usual dimensional restrictions for carrier aircraft, etc.

Designing this aeroplane obviously was a much tougher nut to crack than in the case of the trainers. The Blackburn YA 5 design started out with a coupled Naiad for power, but when this engine failed to materialize, the Double Mamba was substituted, bringing it into line with the Fairey 17. (To get the basic design flying as soon as possible, two prototypes of the YA 5 have actually been produced with the Griffon engine; these have now been joined by a Double Mamba prototype known as the YB 1).

Although all details of performance of these two types are restricted, we can see something of the compromises reached by the designers which are sufficiently different to make recognition comparatively simple. Both, of course, comply with the specification as far as equipment, load, etc., are concerned.

The performance requirement, however, was not so easy. Blackburn, by giving their aircraft a fairly high wing loading, have achieved excellent manœuvrability and a good turn of speed at the expense of take-off performance. A lower wing loading enables the Fairey 17 to take-off in a phenomenally short space, but penalises manœuvrability and speed. Excellent pilot-view is also provided in the Fairey 17.

Different ways of getting the aircraft into the required space for hangar stowage were also used. The Fairey 17 has a double fold in each wing, outer parts folding down as the inner panels fold up. The YB 1 wings had a simple upwards fold originally, but the need to increase the wing area has now led to an increase in span, which has in turn necessitated a double wing fold, with the tips turning down as on a Seafire.

Thus it will be seen that while specifications frequently result in two (or more) similar aircraft being produced, different conceptions of the same requirement can produce divergent types. In the past, some more obvious examples of this have occurred than the three pairs dealt with here; the future will no doubt see more non-identical twins produced to the same specification, sometimes generally similar, sometimes having little in common.

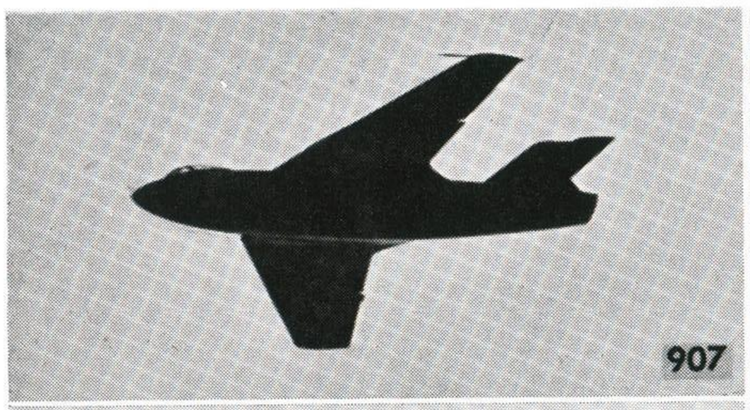


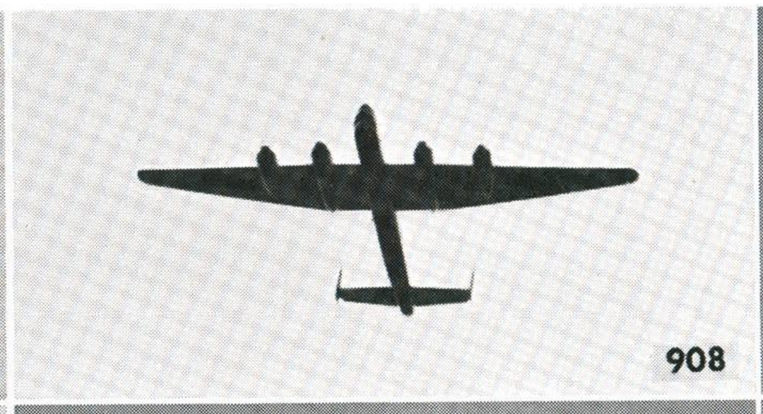
Fairey GR.17

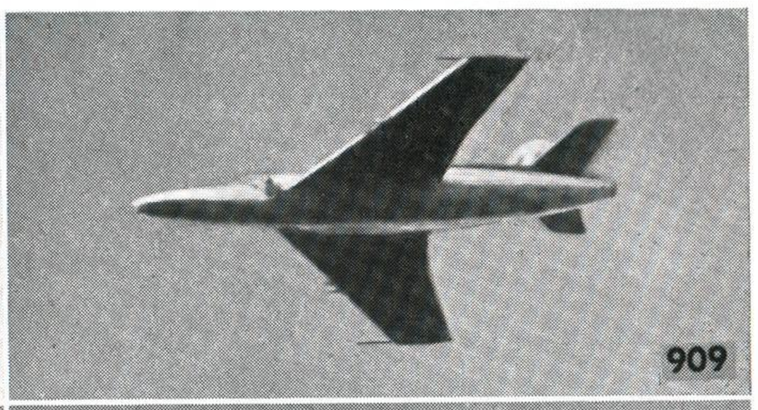


Blackburn YB1

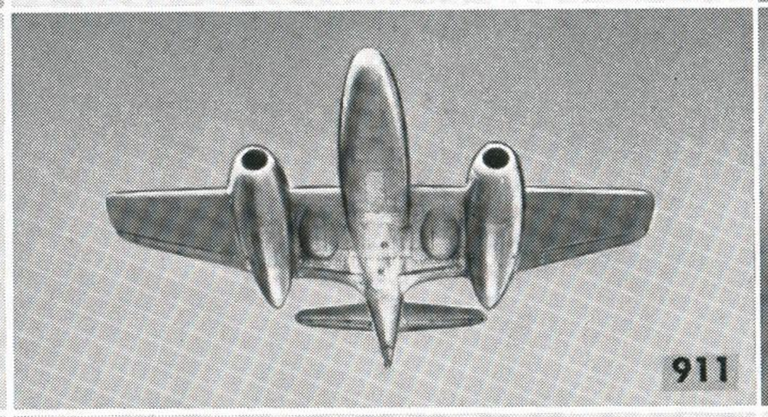
ELEMENTARY SPOTTING

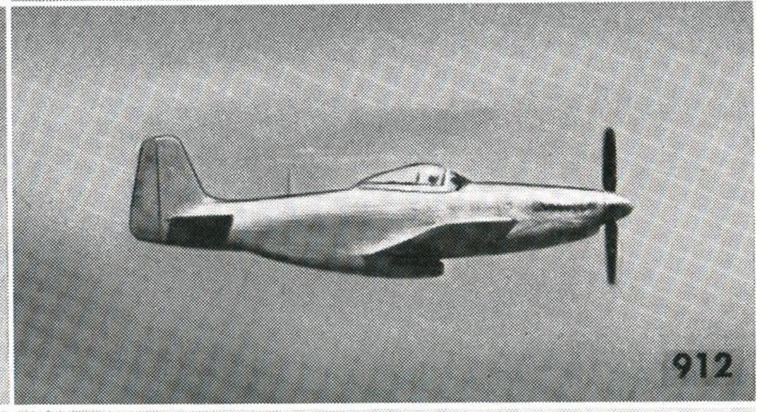

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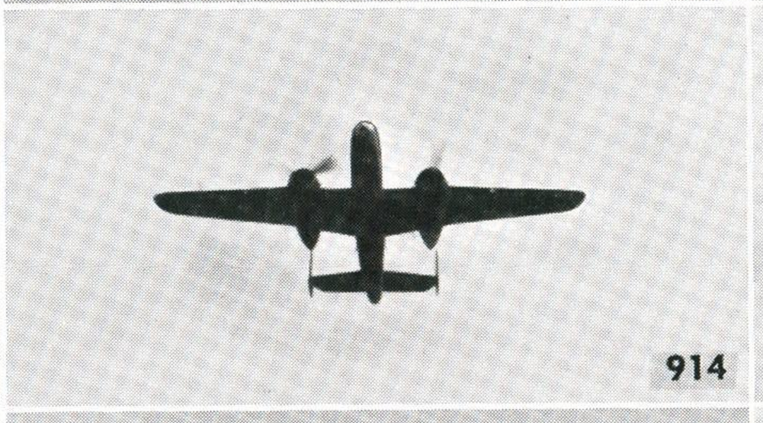

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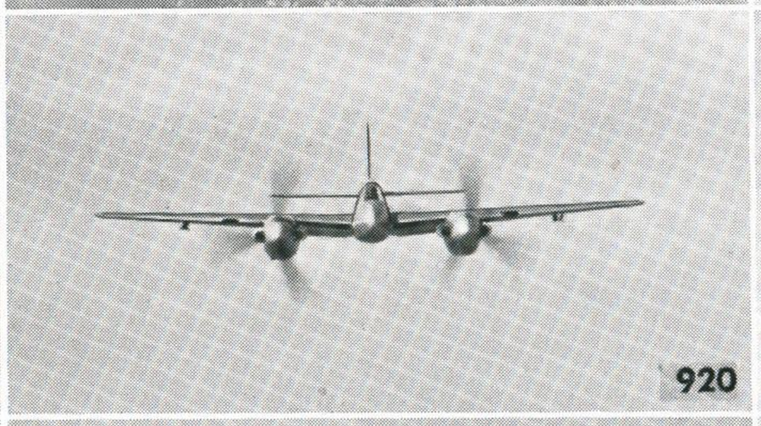

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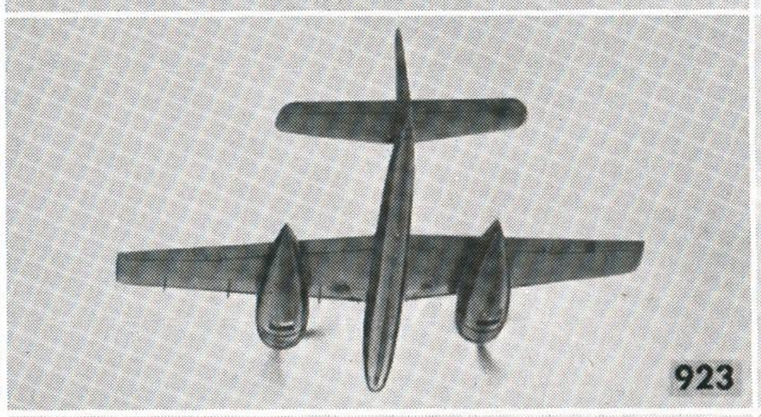

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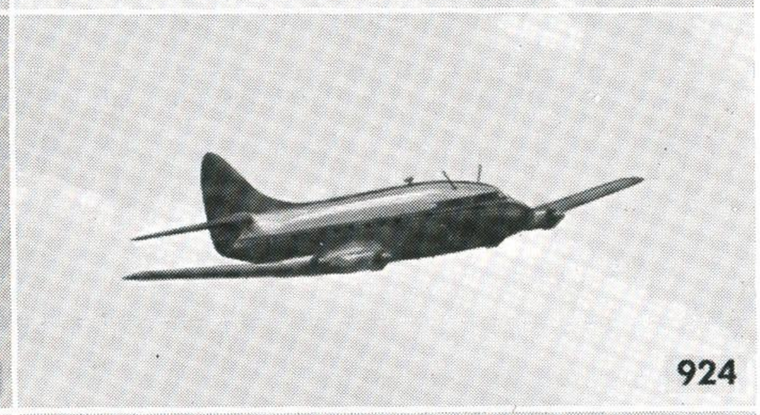

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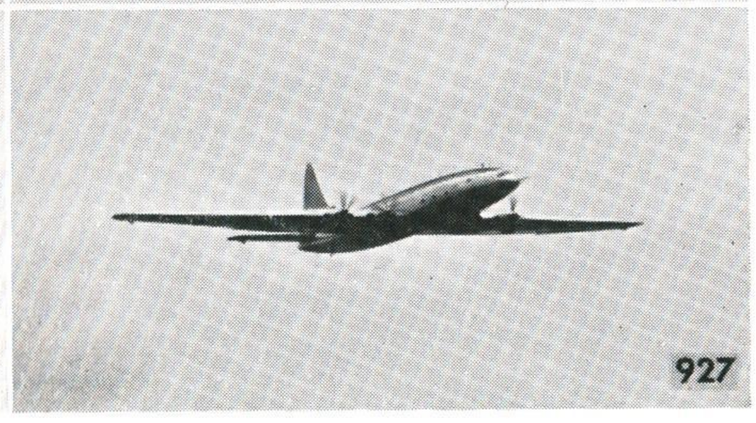

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CHARACTER STUDY

No. 11—The Seahawk

THE Hawker Seahawk moves through the air with the rigid but elegant pose of the exhibition diver : Head up, legs close together in one combined limb, and outstretched arms slightly raised from the shoulders.

This aircraft has one of the finest and smoothest figures in the air today, with her bold round bosom and streamlined torso. The character is indelibly imposed by the sharply broadening centre section of the wings and the graceful curves of the fuselage fore and aft. The tapered wings, with shallow rounded tips, grow bulky at the roots from every angle, caused not only by the plan-wise breadth but by the close-set air intakes in front and the jet pipes at the rear. This front and rear swelling tends to shorten the span optically as the dihedral is of course only apparent in the outer wing sections.

The engine is so effectively sunk within the aircraft that only from rear views are we reminded of it by the twin nozzles. The Seahawk often looks like a violently activated glider.

The fuselage is fat, round, and tapered with the well-proportioned cockpit-bubble well forward to give a visual balance to the tail. The side view has what one might call an equal fore and aft taper, and the plan shows a blunt pointed nose, swelling centre and torpedo taper aft to meet the tailplane. From front and back the fuselage is nearly circular.

The tail unit is one of those combinations of shapes that *grow out of* the fuselage, rather than ride on it. The tailplane, only slightly tapered, sprouts flatly out and above the top line of the fuselage, but has not that propped-up look that some jet aircraft tails have.

Altogether the Seahawk is as fine a looking aircraft as you can wish for, with clean lines, distinctive character and overall grace. She first flew in 1947 and is to go into Service with the Royal Navy. Essential data are as follows :—

Span : 39 ft. Length : 39 ft. 8 ins.

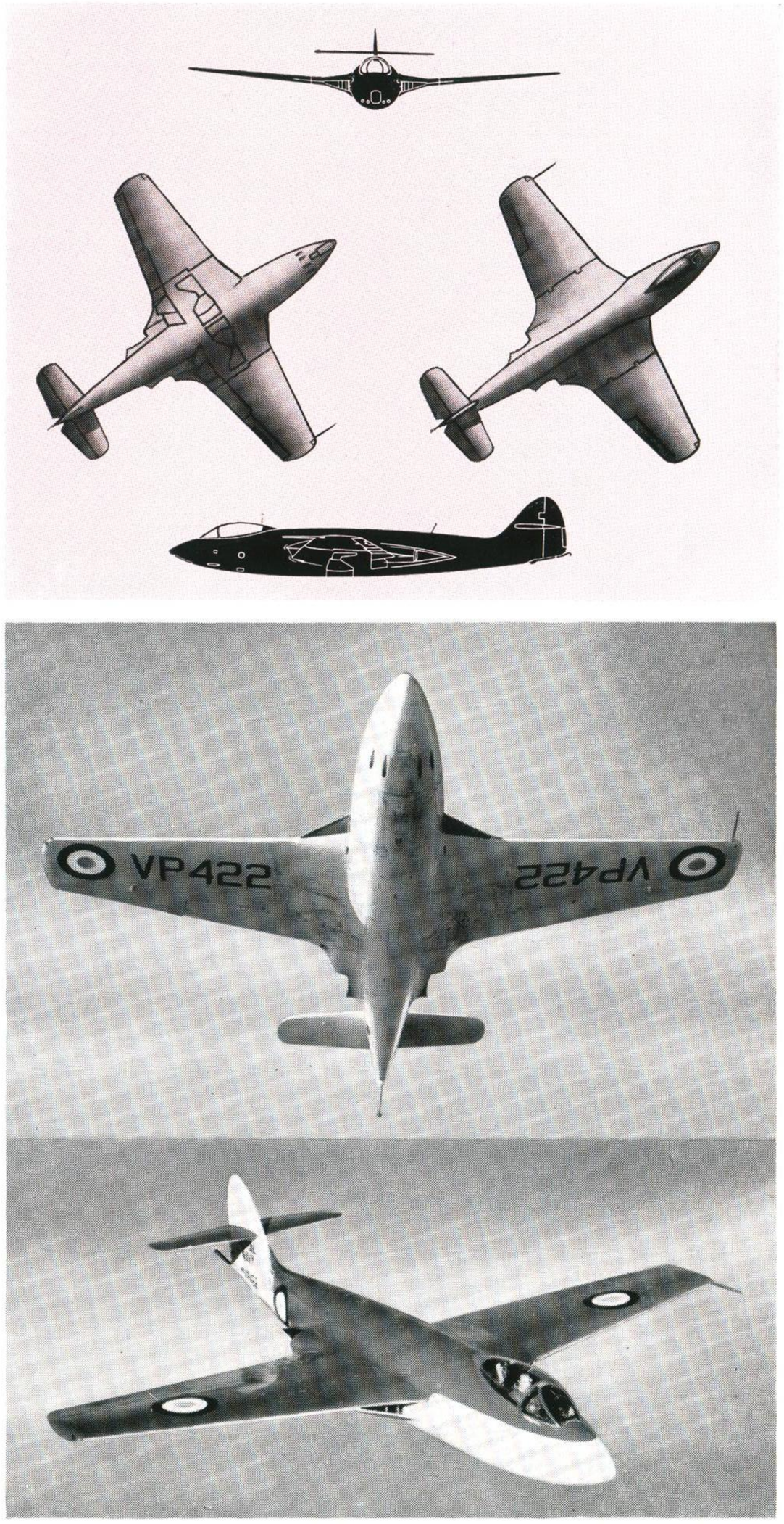
Maker : Hawker.

Engine : 1 R.R. Nene 4 turbojet.

Armament : 4 20 mm. cannon in nose.

Function : Naval fighter.

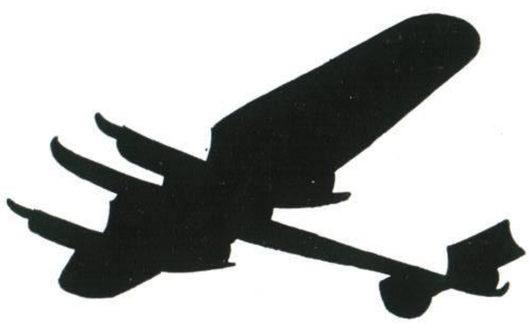
C. H. GIBBS-SMITH



. . . bold round bosom and streamlined torso.



SEMI-SILLOGRAPHS


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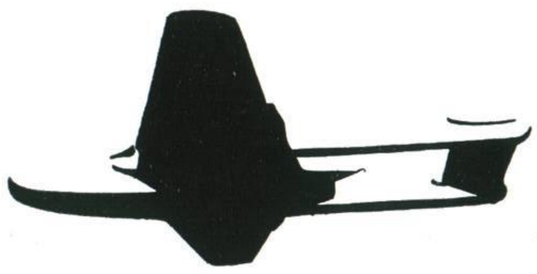

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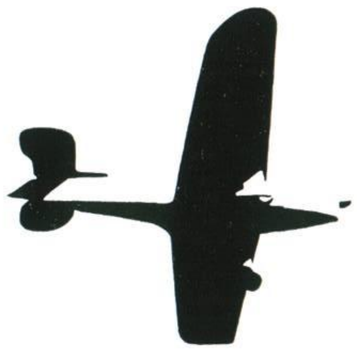

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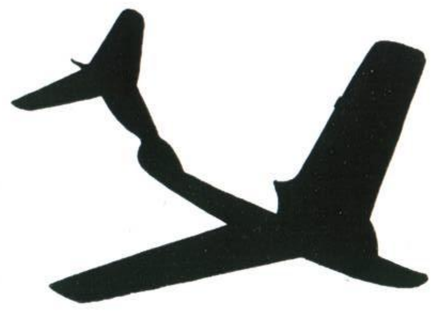

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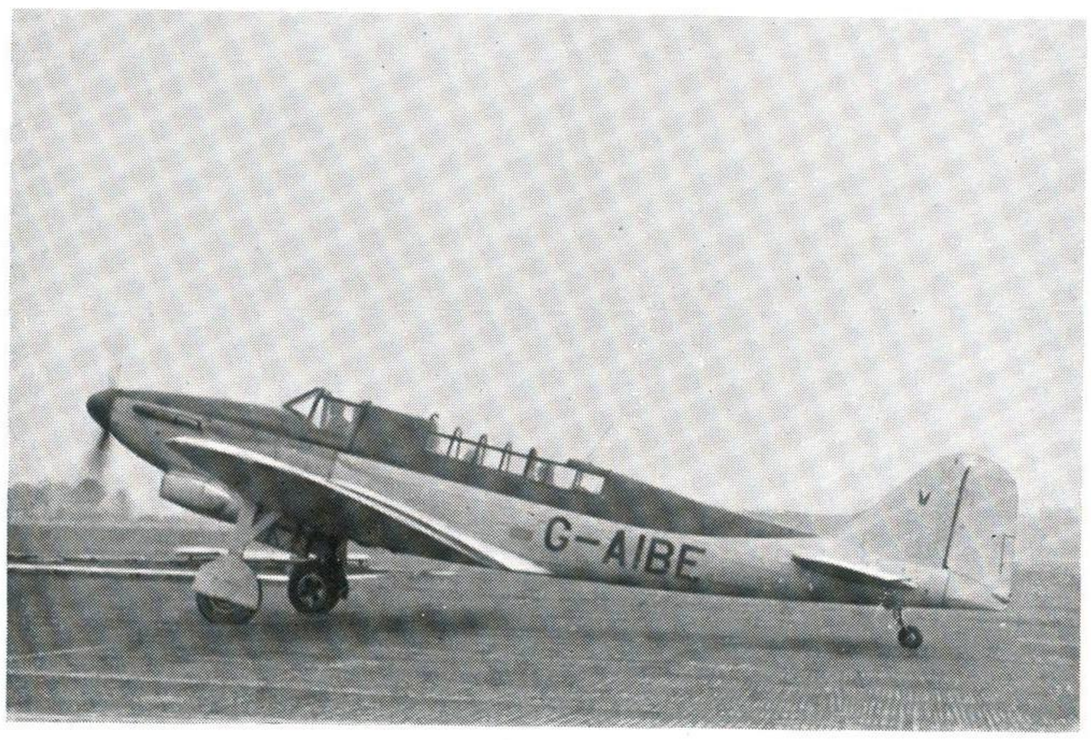

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First and Last

Many readers who have contributed reports for " Spotting Possibles " of the Fairey Fulmar will be interested to see this picture of the " first off " and strangely enough the last existing model of the Fulmar which is now used for photographic purposes.



Semi-Sillographs

Suggestion from Observer P. G. Cooksley of No. 19 Group R.O.C. provides a novel method for illustrating the shape and form of an aircraft under intense top-lighting conditions. Observer Cooksley points out that in such circumstances the recognition features of the uppers surfaces tend to be lost, and the remaining shadows are the only accurate features left to work on. Readers will find it simple and instructive to try this for themselves by tracing-off the outline of a suitable aircraft from the JOURNAL and blacking-in the shadow areas only. A full page of Semi-Sillographs appears on the page opposite.

Semi-conscious

We recently received a report from an Observer who had seen a Tipsy Bellboy!

Wreck-cognition



(Answer on rear cover).

Quote

" Recognition of friendly and enemy ships and armoured vehicles from the air is just as important as the recognition of aircraft from the ground ".

Inter-Services Aircraft Recognition Journal, July, 1943.

Misquote

The Miles Gumini . . . obviously for pilots with " treacle-feet ".

Aerogram



Lift the deck chair Pa'! (Answer on rear cover.)

WARSHIP RECOGNITION—

Continued from page 5

The implications of reporting a CVB for a CVL need no emphasis. Similarly the three main maritime powers have a minimum of four different classes of cruisers and as many as ten, in the case of the U.S. Navy. It needs little imagination to realize that the employment of such a variety of warships may have very real effect on tactical issues, and reconnaissance reports should therefore carry a degree of reliability.

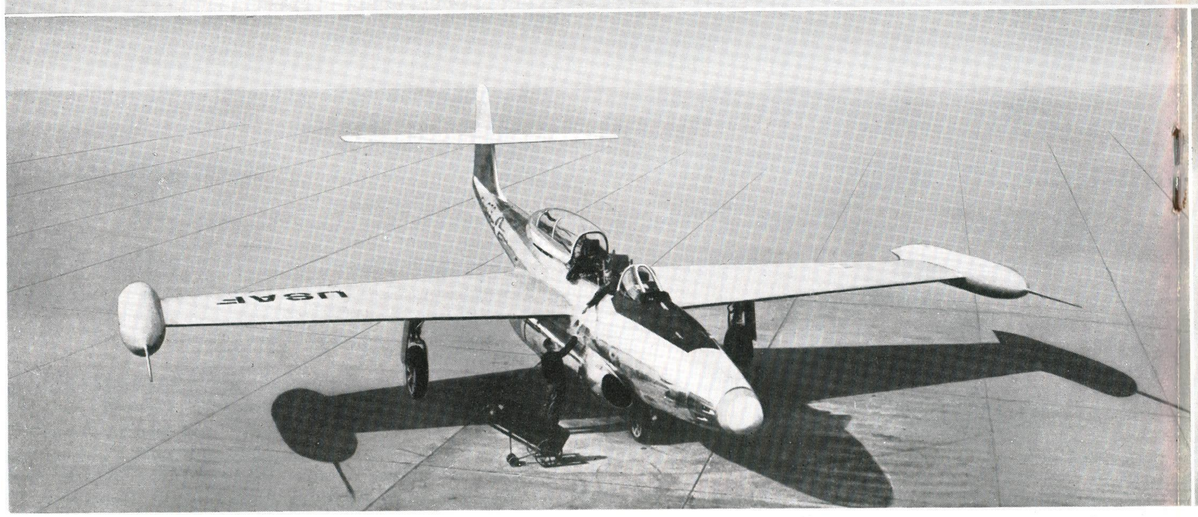
To sum up—the essence of good warship recognition can be written in four words, thus :—

TYPE—NATIONALITY—CLASS—NAME

If the instructor and pupil keep these four words constantly in mind then the course of instruction will proceed along methodical and proper lines. The self-evident importance of knowing first things first provides a perfect guide, and, with scaled drawings of elevation and plan views, models, photographs and live targets it is possible to make the subject interesting and reasonably easy to absorb.

Finally, the value of knowing how another service lives and works and a knowledge of how their ships, aircraft or tanks are handled and fought is of inestimable value. Even greater value can be obtained from knowing the sailors, soldiers or airmen who man them if only because it will inevitably make the subject more interesting.





NORTHROP F-89 SCORPION

Swept-up tail of this all-weather jet fighter gives it a striking resemblance to an enormous scorpion. The F-89 is equipped with radar for seeking out other aircraft and/or ground installations by night or day, and in bad weather.

Other details are :—

Span : 55 ft. Length : 52 ft.

Engines : 2 Allison turbojets mounted externally in nacelles on lower fuselage sides.

Armament : six 20 m.m. cannon.

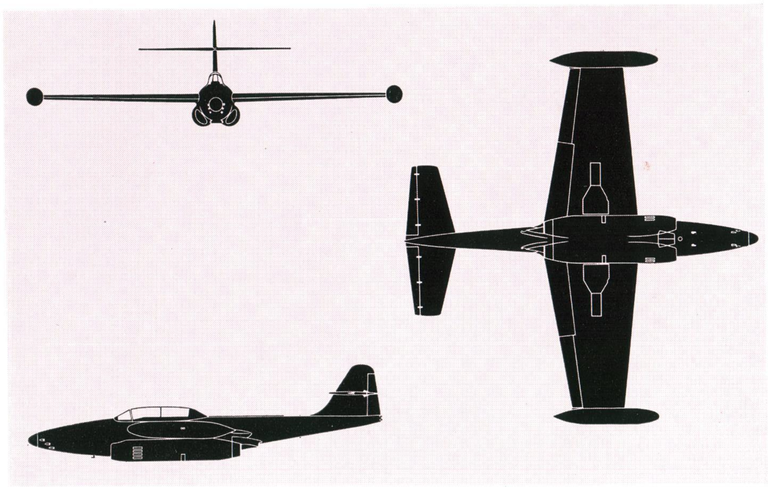
Crew : pilot and radar operator (in tandem).

Max. Speed : 600 m.p.h. approx.

Undercarriage : tricycle.

Function : all-weather fighter.

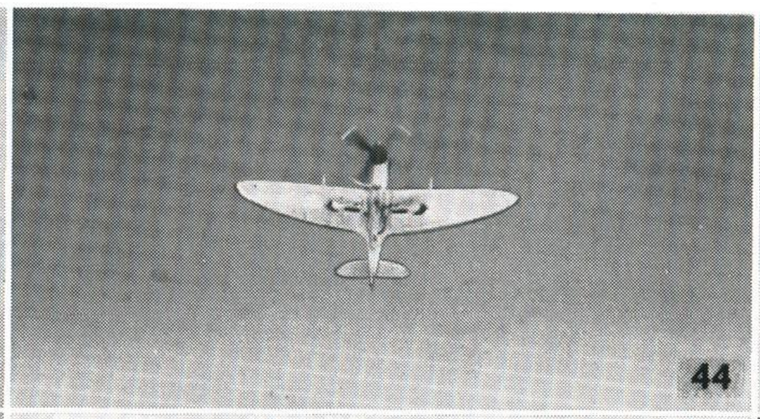


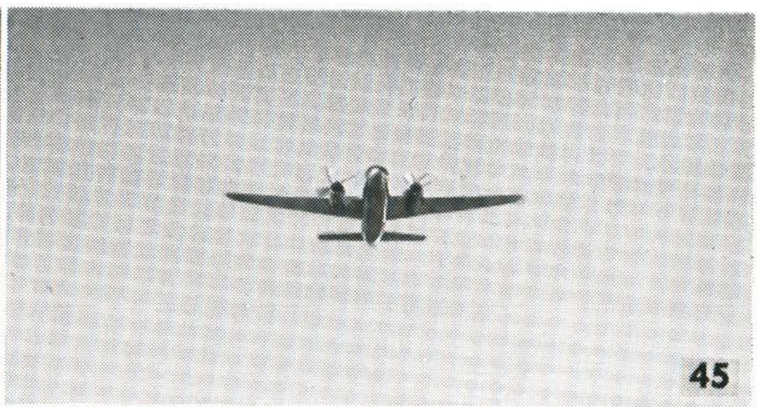




ADVANCED SPOTTING

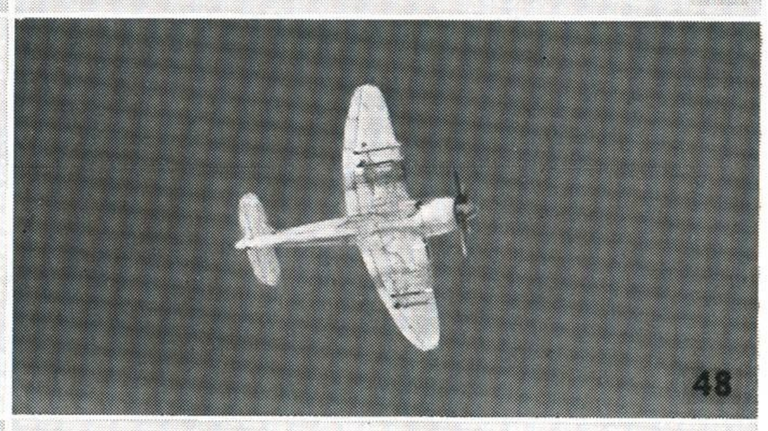

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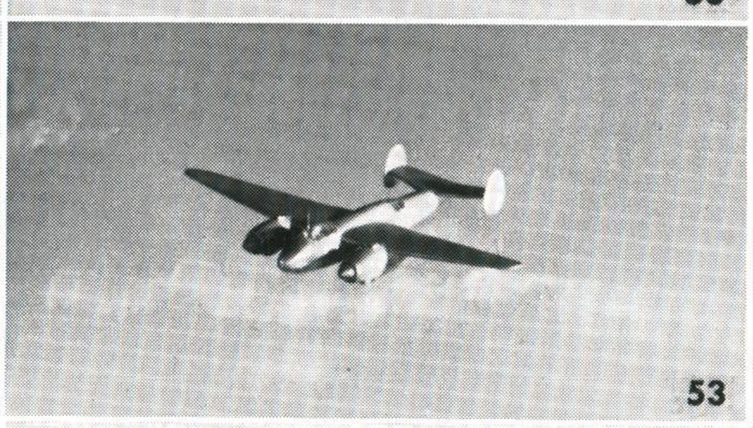

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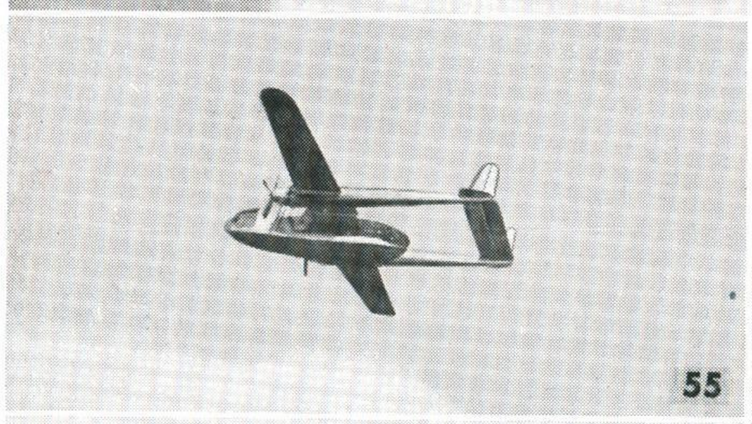

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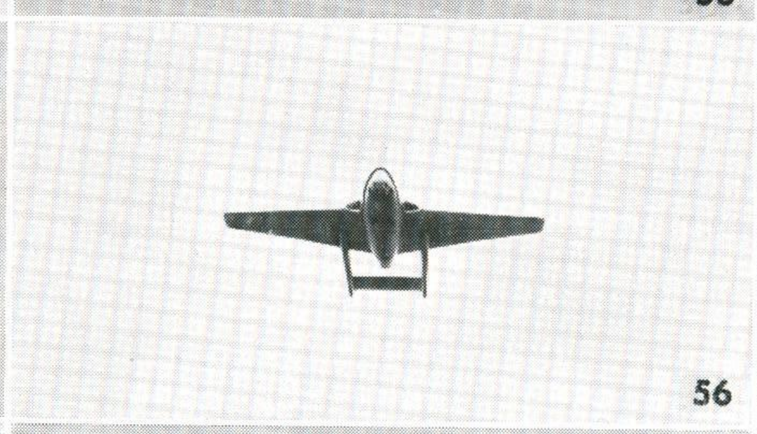

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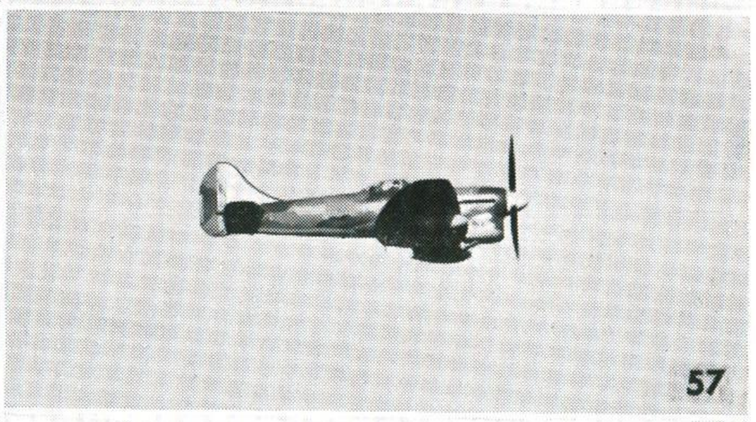

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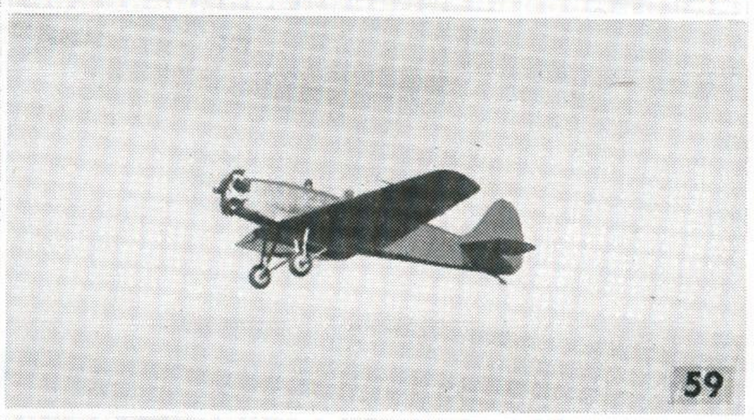

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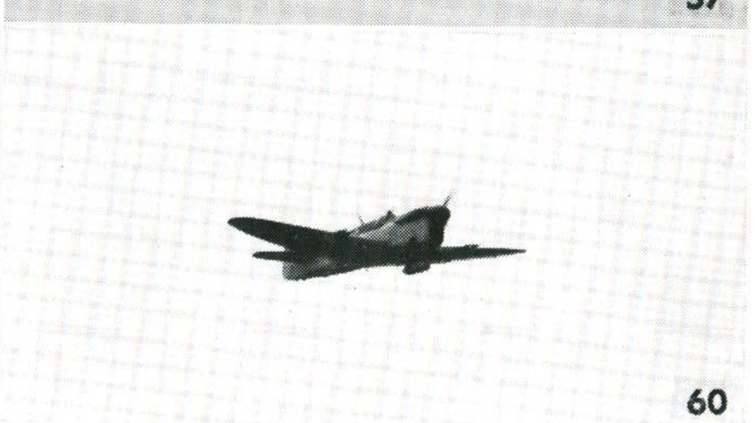

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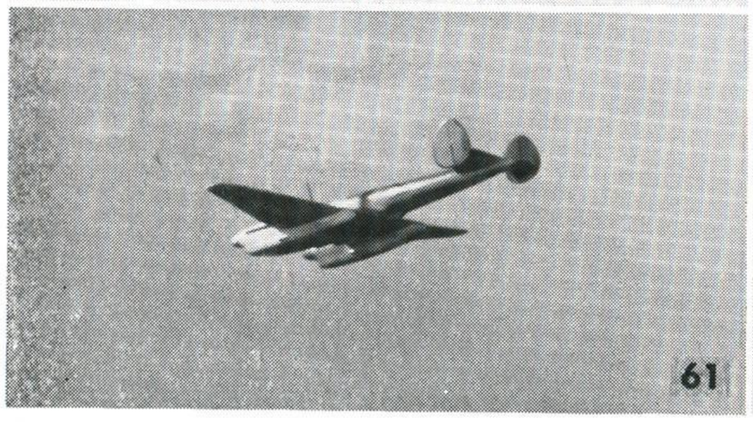

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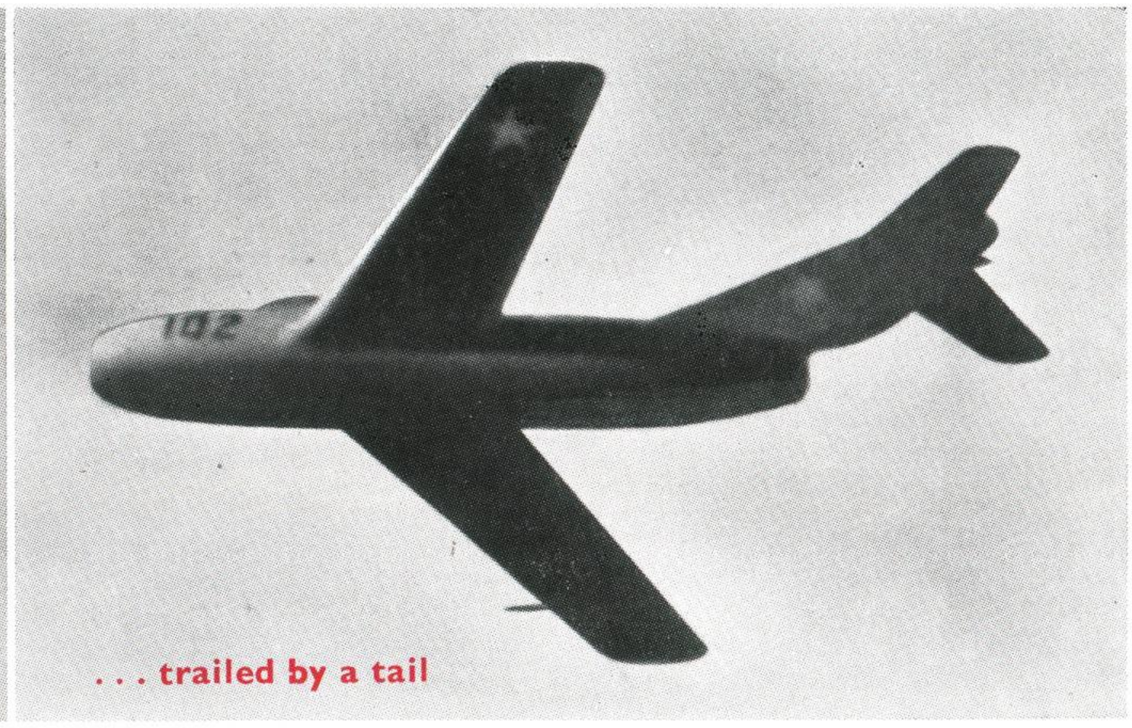

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What's the Difference?

Hawker P.1081 and MIG-15 compared

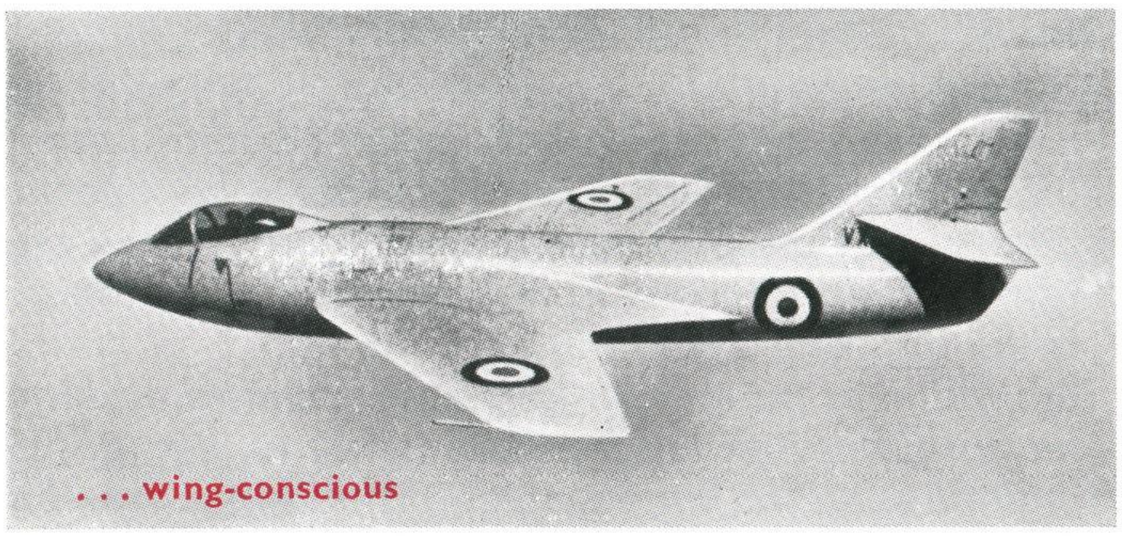


. . . lead by a nose

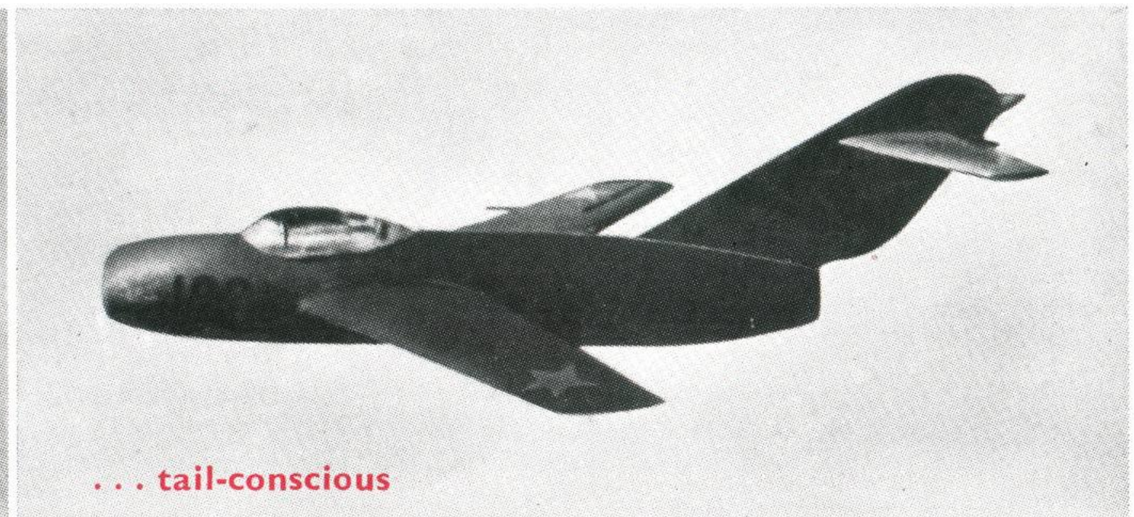


. . . trailed by a tail

Wings, tails and noses distinguish these two turbojet fighter types. Mr. Camm's filly leads by a nose—a sharp one, and generous wing-root fillets contrast sharply with the stark, lean, utility-cut of the wings of Mr. Mikoyan's sawn-off flying

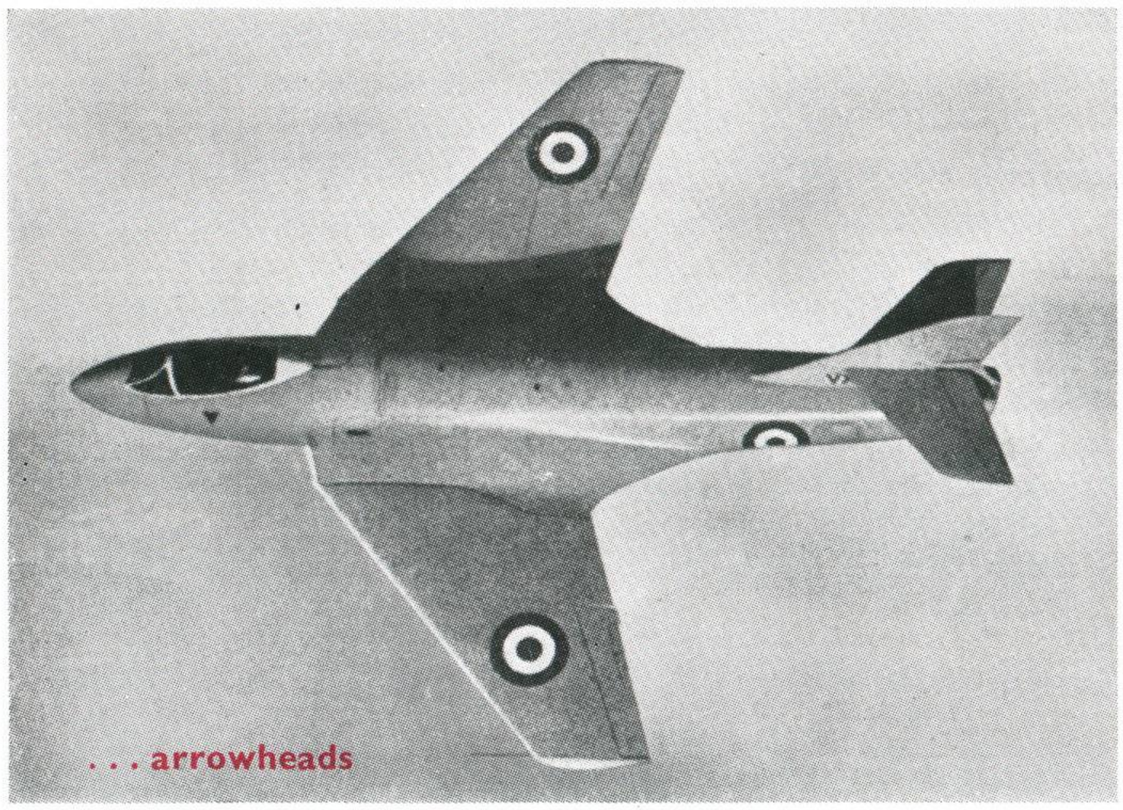


. . . wing-conscious

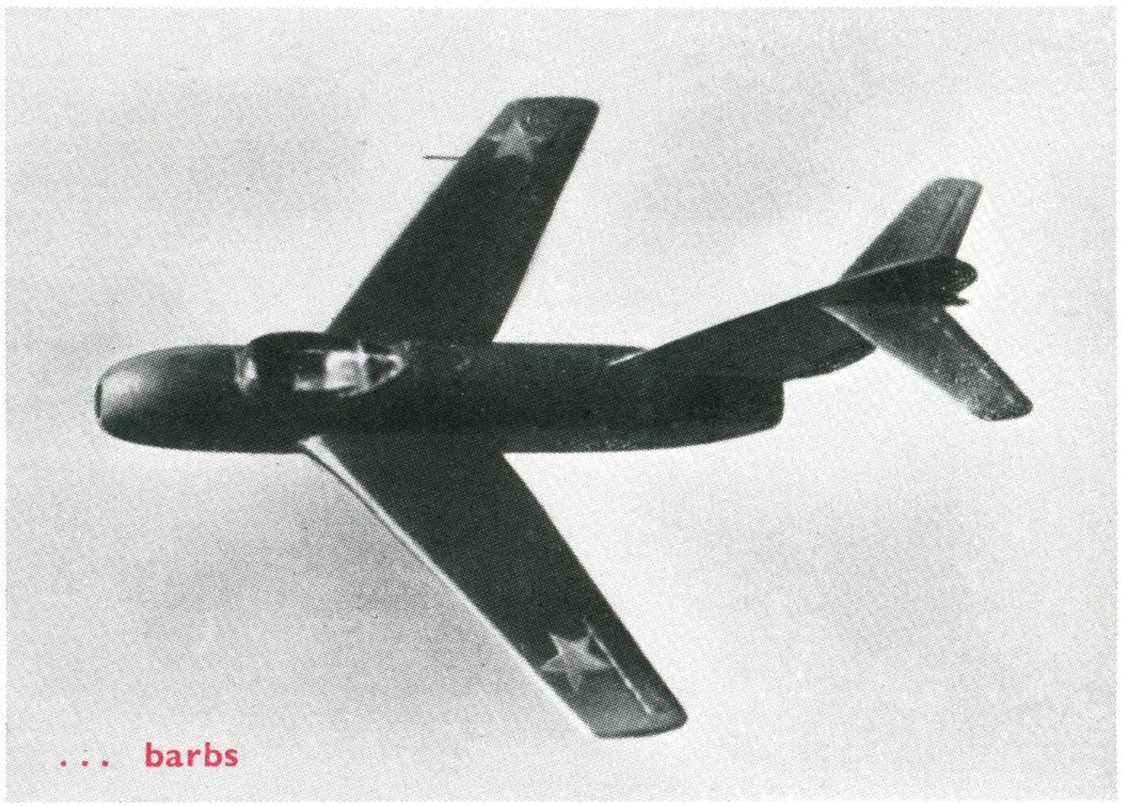


. . . tail-conscious

stove-pipe. In distant impressions the differences in plan between these two are the differences between arrow heads, thus ◀ and barbs, thus << . In views showing the tail the MIG-15 reaches a new "high" for tailforms.

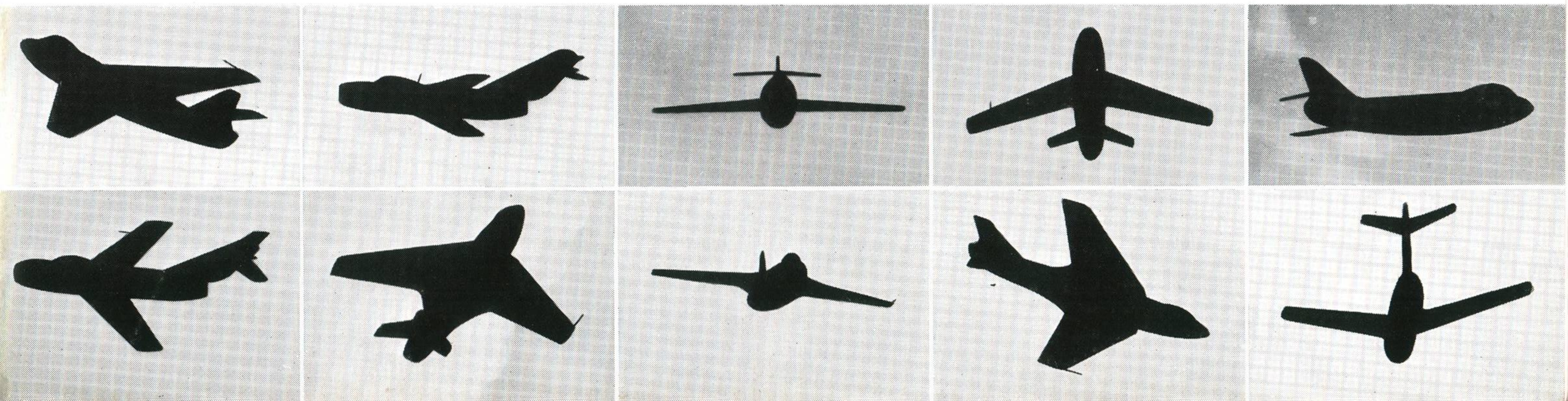


. . . arrowheads



. . . barbs

Now recognize these sillographs. *(Answers on rear cover)*





A tank can change its appearance from minute to minute . . .



. . . the turret moves in relation to the hull ; its gun and its shadows move.



. then there are the shadows cast by the tank itself, on itself and on its surroundings.

The Recognition of

ARMOURED FIGHTING VEHICLES

by C. H. GIBBS-SMITH

THE recognition of an Armoured Fighting Vehicle presents the same problem as we have in identifying a maiden aunt of Edwardian vintage. Both can be identified only if you are thoroughly acquainted with their features and characters, as both tend to masquerade under a burden of stowage bins, reticules, equipment, accessories, foliage and outrageous hats.

An aircraft operates in a rigid form, unhampered by any outside influence except the lights and shadows cast on its own structure. A tank, however, even without the confusing paraphernalia it usually sports, can change its appearance from minute to minute. First of all there is the form-destroying feature of the turret. It moves in relation to the hull ; its gun moves ; and its shadows move. Then there are the shadows cast by parts of the tank on itself and by the tank on its surroundings—on the ground (with its own strange shapes), on buildings, or on surrounding vegetation. A strong sun can make a monstrous jumble of shapes.

Next come the shadows that can be cast *on* the tank *by* its surroundings. This is just as fruitful a source of confusion, which can be further combined and confused with the vehicle's own cast shadows.

Finally the simplest confusion of all : the actual hiding of parts of a tank by its surroundings, near or distant.

***Bottom left*: . . . a monstrous jumble of shapes . . . caused by the addition of a few branches.**

***Bottom right*: . . . the actual hiding of the tank by its surroundings.**





Add to these considerations the impedimenta we noted at first, and the conclusion is forced upon us that A.F.V. recognition is chiefly a problem of identification by individual features—in direct contrast to recognizing aircraft by their overall shape and character. This is not to say that a tank cannot be " grasped " at one bat of the eye by a man who is intimately aware of its overall character. This is of course possible, even under severe conditions of lighting and paraphernalia. The air-to-ground observer must particularly attempt this accomplishment.

But, by and large, the secret of tank recognition lies in the instant and accurate diagnosis of features ; features occasionally on their own but more often in the combination of two or more of them. And these features will generally be found on the front half of a tank, which must always be less obscured by appendages than the rear. A highly trained and sensitive eye, even observing at great distances through binoculars, will quickly register such details as a double-baffle muzzle-brake or the rear turret machine-gun mounting ; the peculiar form of a suspension ; the sit and shape of turret and hull ; of turret in its relation to the hull ; and so on.

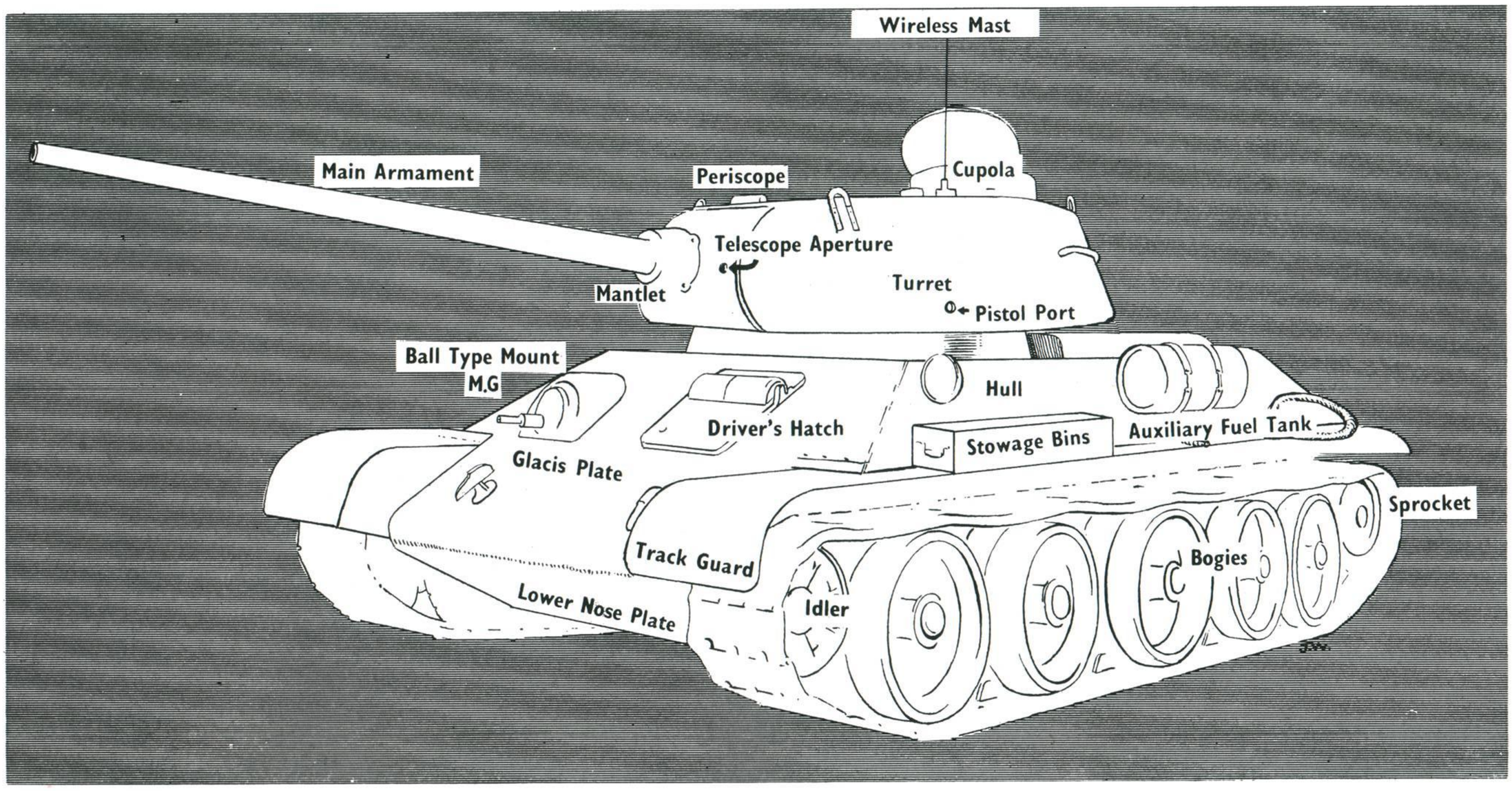
To the " feel " of a tank's character, to the intimate knowledge of its armoured anatomy, the experienced observer will gradually acquire the added artistry of appreciating light—light at all times of the day and night ; strong light, dim light, diffused light, sunlight and moonlight, searchlight and starlight. (He may also tackle the sounds of his vehicles, but pitfalls are to be found all along this way.) Then he should be a master of his craft, a skilled co-ordinator of knowledge and sensibility, as quick to spot a tank in a winter overcoat, as a detective can pierce the cleverest disguise of a crook.

In closing, a word must be said about recognizing A.F.V.s *in absentia*, by their spoors. Most vehicles leave as distinctive spoor marks as are imprinted by car tyres, and the man who is a good tank detective will inevitably become involved in diagnosing what has passed over the ground he treads.

The illustrations on the page opposite are of the Russian Joseph Stalin 2 heavy tank.

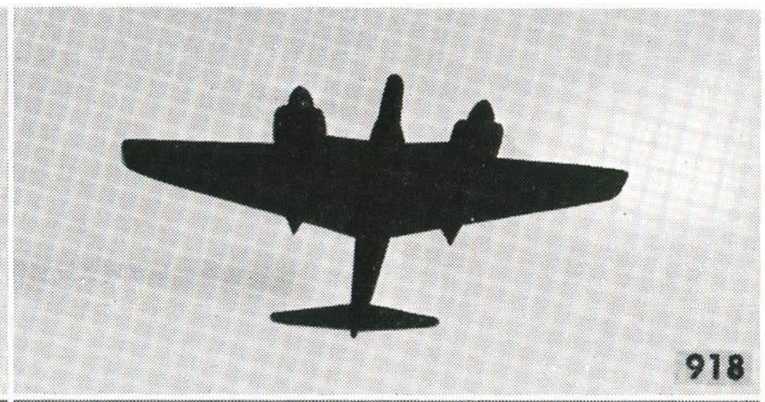
TANK TECHNICALITIES

This drawing, which is of a Russian T-34/85, labels the main external recognition features of a tank's anatomy. Though it by no means exhausts the vocabulary of terms or parts, it is sufficient for a start. One or two technicalities are further explained, for example ; the cupola, a shallow-domed assembly on top of the turret, is normally for observing, but it is also equipped with a hatch. We show it open. The track assembly on this tank has no top rollers to carry the track from the sprocket (which drives) to the idler wheel ; the track is carried on the tops of the road wheels or bogies. The sprocket incidentally, in this vehicle, has no teeth, but a system of rollers within the sprocket which engage horns built into the track. The " nose " of the T-34 tank is formed by the glacis plate and the lower nose plate. Some tanks have a separate nose plate joining these two. More auxiliary fuel tanks may be carried than are shown here.

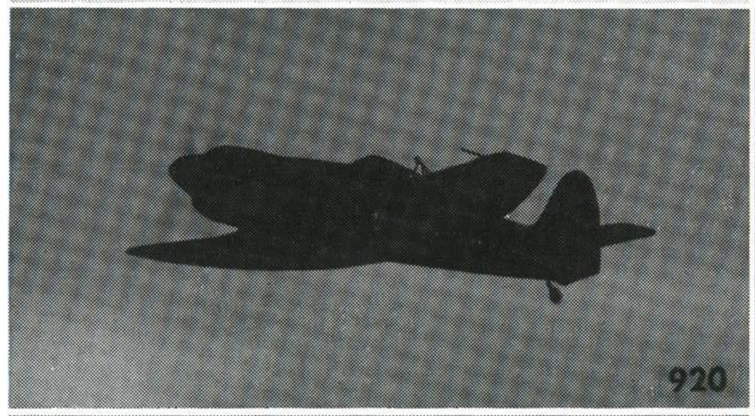


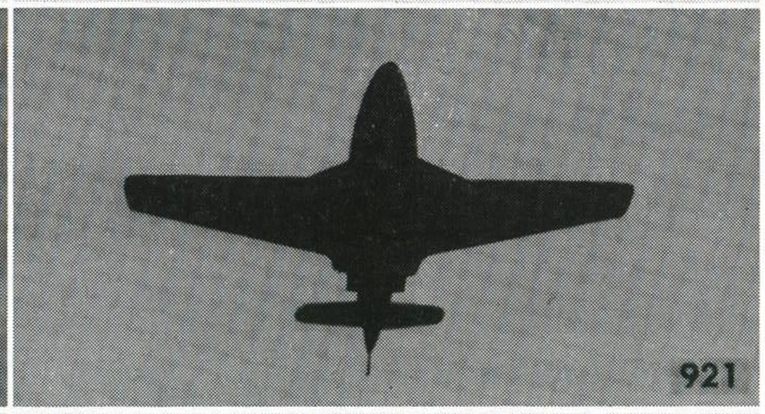
SILLOGRAPHS

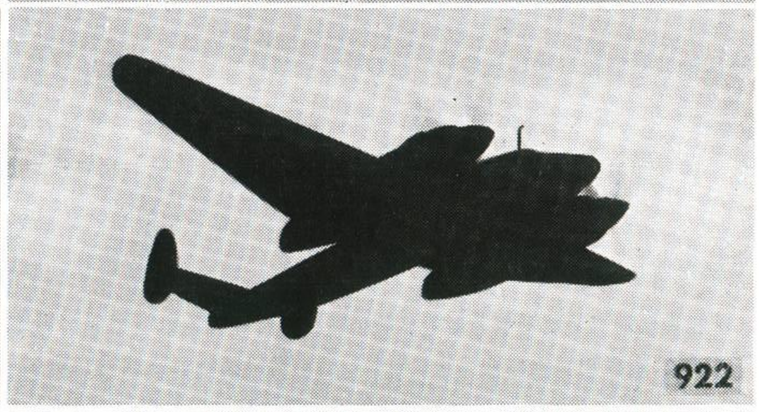

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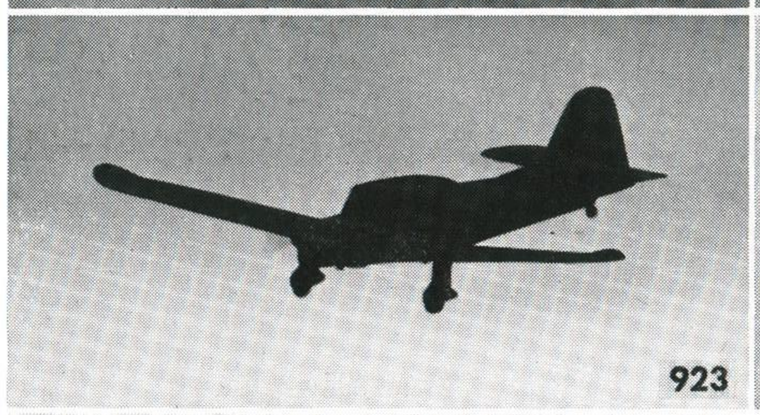

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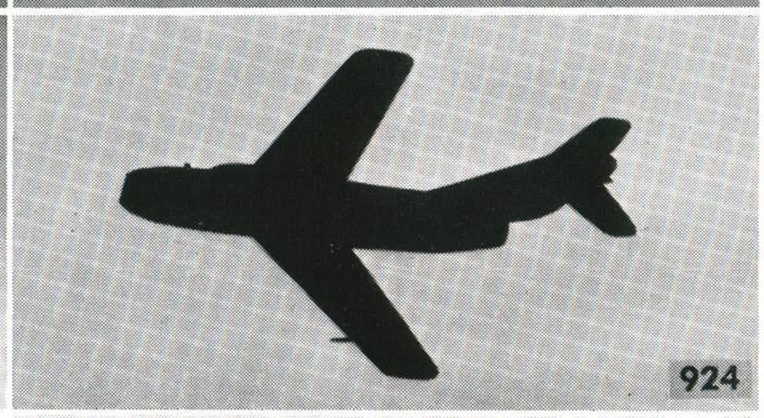

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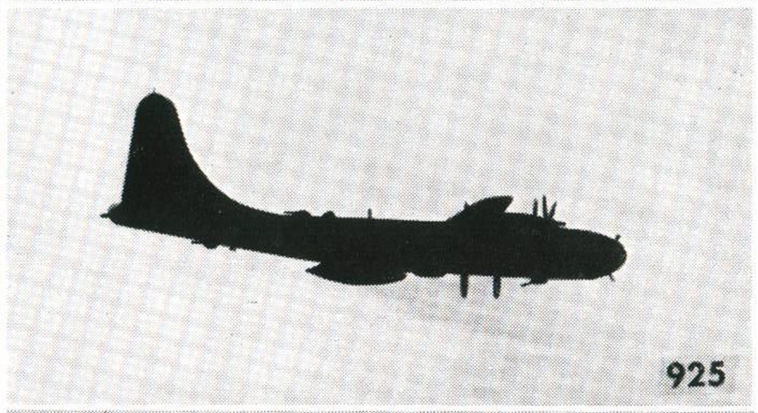

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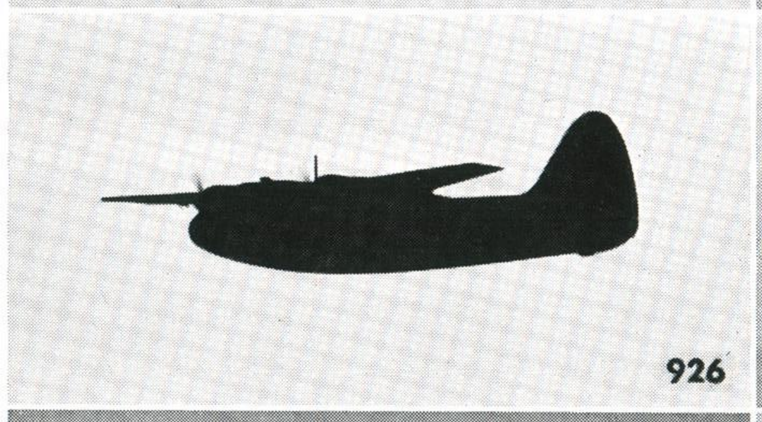

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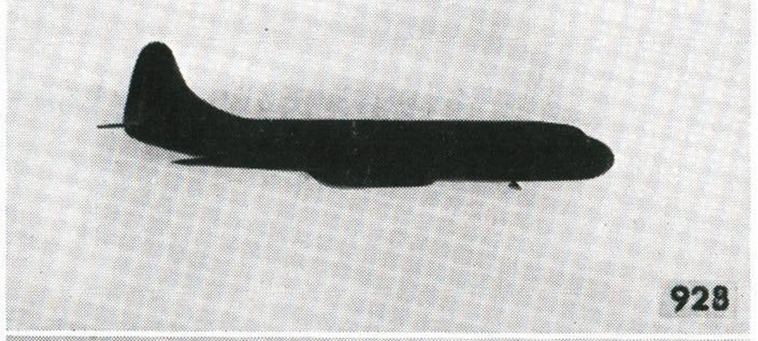

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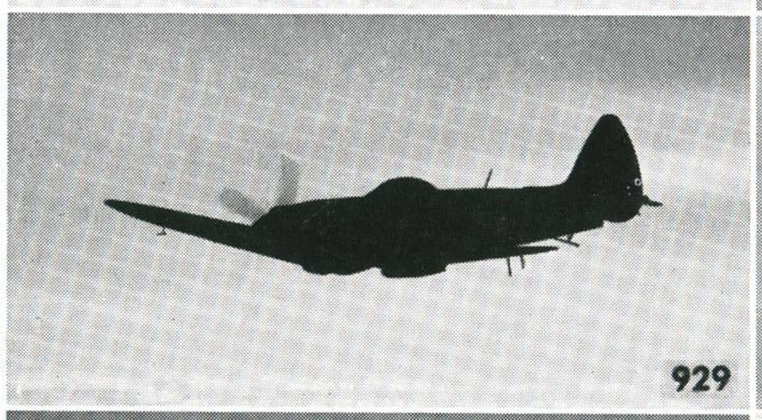

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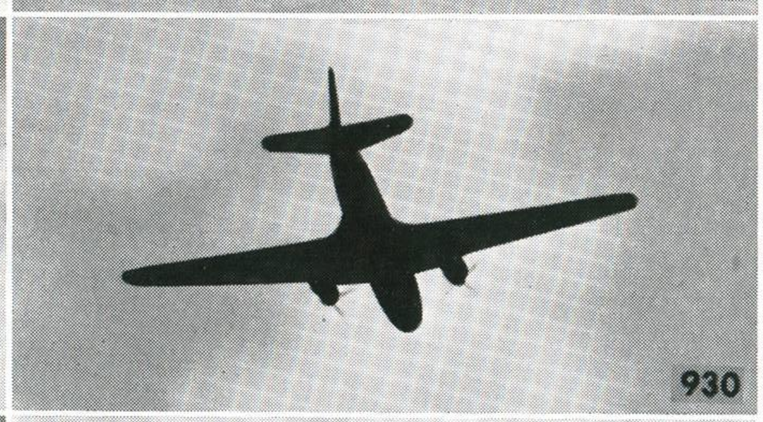

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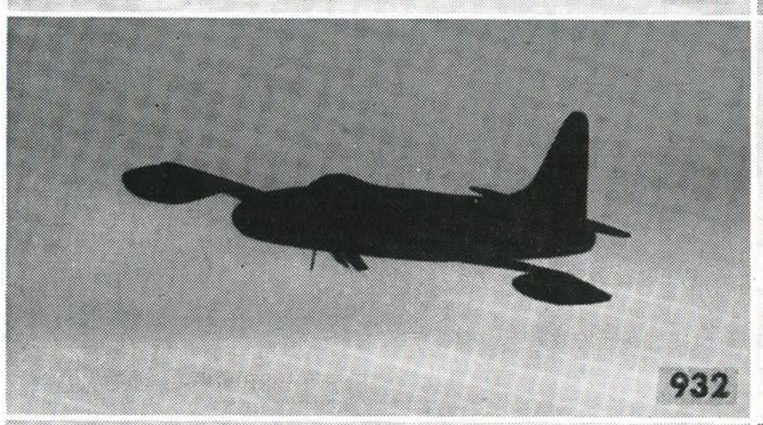

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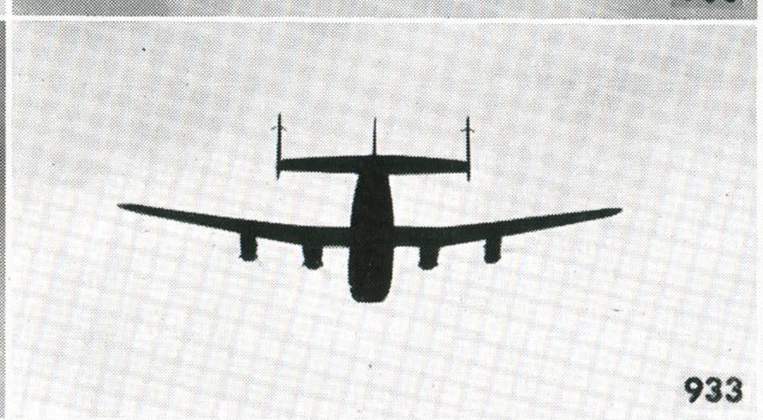

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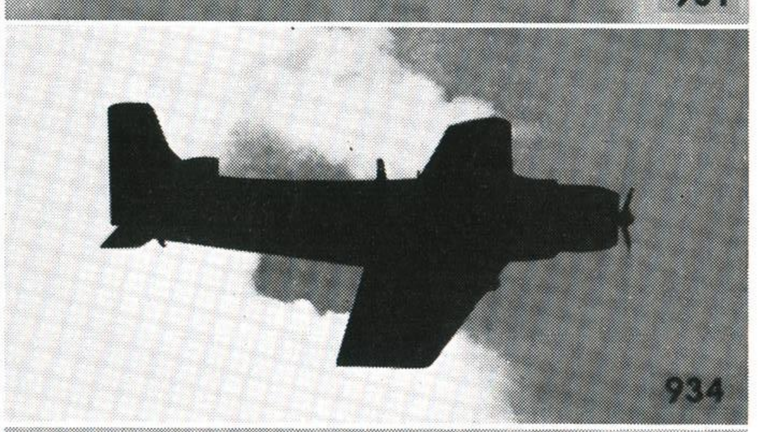

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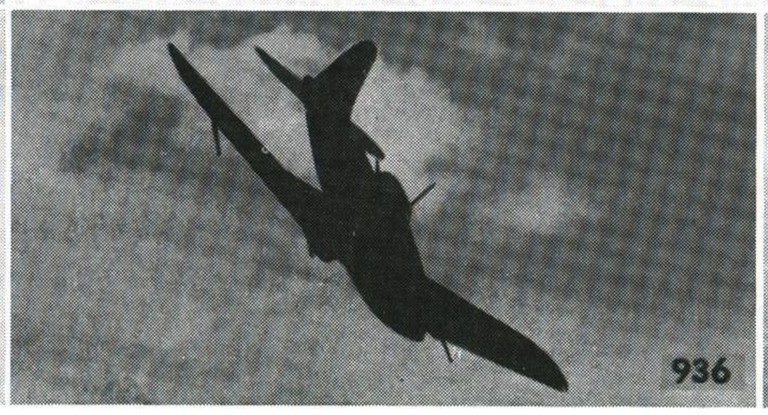

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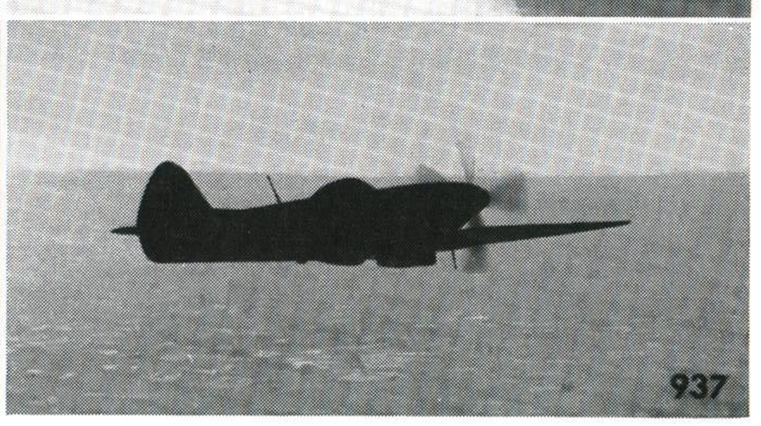

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SKYKNIGHT

by Obs. R. A. McLEAVY, R.O.C.

BROADLY SPEAKING, the numerous problems presented in the construction of almost any type of carrier-borne aircraft are about the worst a designer can expect to encounter. As the demands of modern warfare become more involved, the designs increase in complexity. So it is hardly surprising to learn that the Douglas design team, headed by E. H. Heinemann, had quite a shock when beset with the specification for the F3D Skyknight.

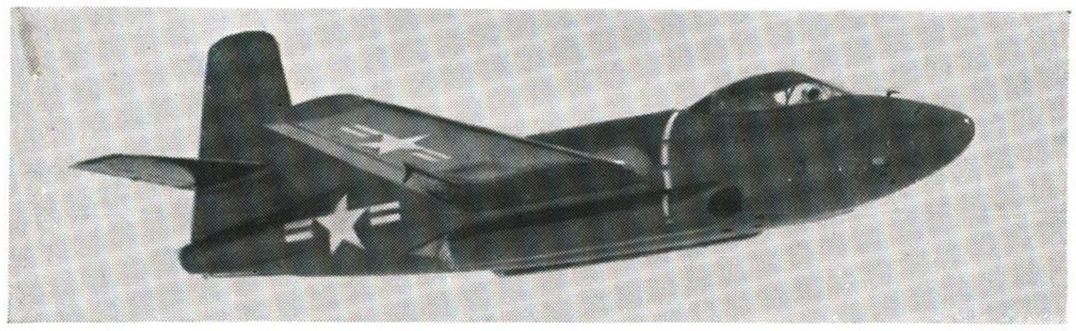
The tale began nearly six years ago. At the beginning of 1945, long-term planners of the U.S. Navy's Bureau of Aeronautics wanted a two-seat, twenty-four hour all-weather fighter to defend Carrier Task Forces. It had to be capable of intercepting the type of high-altitude, high-performance bomber expected to be in evidence in the early 1950s.

Their requirements, though straightforward enough, were exceptionally difficult to meet. Numerous experiments had to be made with the positions for the crew, radar, jets and fuel before a satisfactory layout was finally decided. Fortunately, jet engines are fairly adaptable pieces of mechanism. The two 3600 s.t. Westinghouse J-34's on the Skyknight had to be attached to the fuselage, below the wing roots, on internal mountings. Although the tail-pipes have a skewed axis, the arrangement has worked very efficiently, and the proximity of the jets to the ground greatly assists maintenance. Either of the units can be detached, lowered by a standard bomb hoist, and replaced within an hour.

Due to the mass of equipment tucked away within the fuselage, the Skyknight looks distinctly " over-fed ". Radar is mounted in the extreme nose, and later versions may have a second set in the tail. To prevent loss of performance through drag, radio and radar aerials had to be mounted internally—leading to the development of a non-metallic material for the parts housing them. Eventually it was decided to construct the areas involved —the nose, tail, dorsal fin and the tip of the vertical tail —in laminated glass cloth.

Behind the radar, beneath a large, fixed canopy, the pilot and radio/radar operator sit side-by-side in a pressurized cabin with the main fuel tanks immediately aft. Instead of using an ejector seat in an emergency, the crew fold their seats to the side and drop through an escape hatch in the bottom of the fuselage.

As the Skyknight has a fairly exclusive profile—rather like that of a heavy-weight beetle—it is unlikely



to cause anyone a spotting "headache". Attached to its buxom fuselage are mid-set, square-cut wings and a tall " Douglas " fin and rudder with a dorsal fin. The tail-plane is set relatively high. From most angles the unusual turbo jet cowlings will assist in establishing its identity.

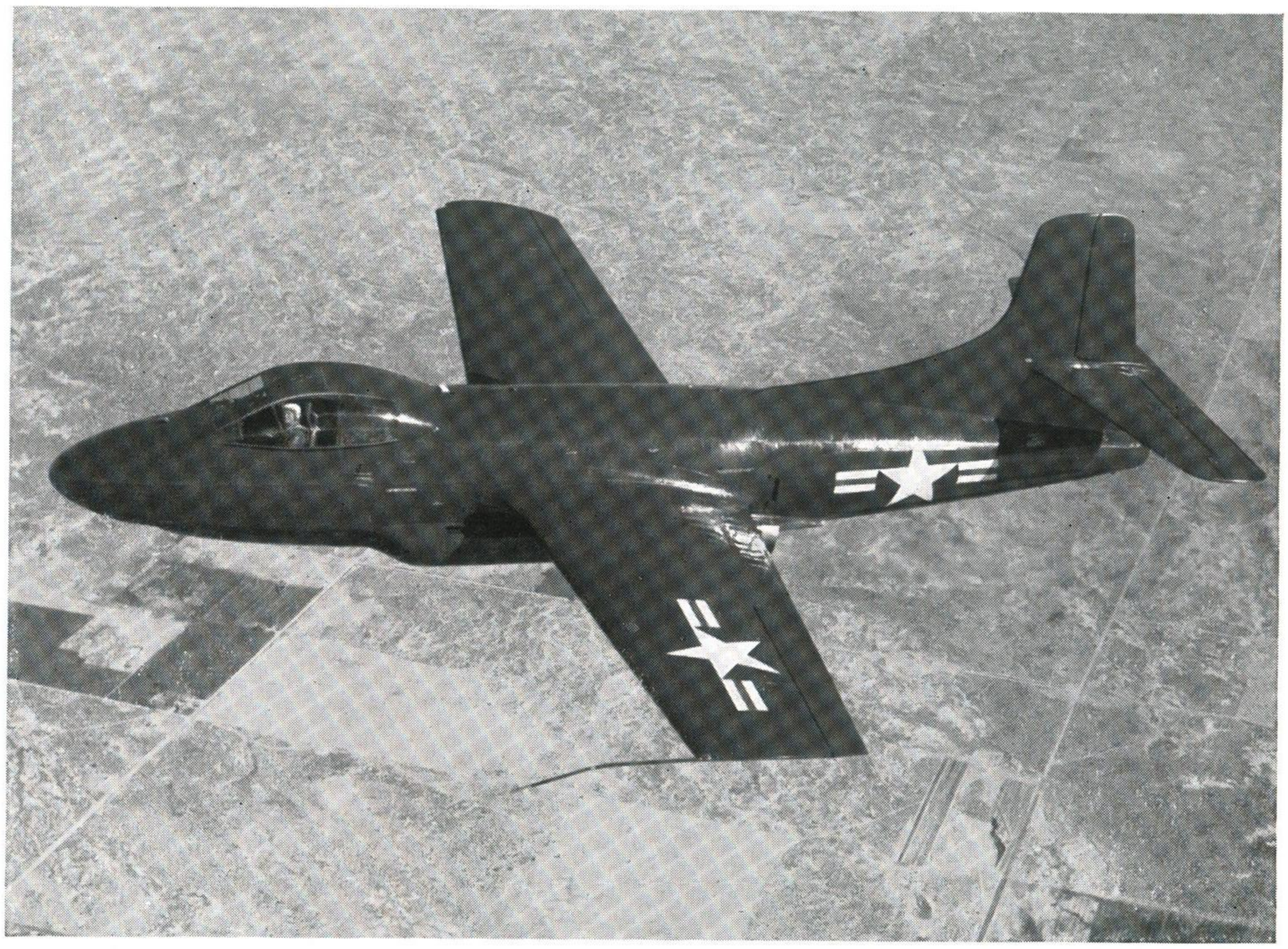
Drop tanks, when in use, are fitted below each wing near the folding joint. For several reasons tip-tanks were not adopted. There was, for example, the problem of obtaining the necessary lateral control with one tank empty, and it would have been difficult to fill the tanks when the wings were folded.

Ninety-eight Skyknights have been ordered. In September, 1948, a month after the prototype made its first flight, the Bureau of Aeronautics ordered twenty-eight F3D-1s for delivery by September, 1950. Almost a year later a further contract was given for seventy F3D-2s. Operational life of the design is expected to be about five years.

Skyknights will be available for the following alternative rôles : attack-fighter, patrol or reconnaissance aircraft, and long-range escort. Four 20 mm. cannon are mounted in the nose and the usual provisions are made for the external carriage of bombs and rocket-projectiles.

A nose-wheel type undercarriage is fitted and to prevent possible damage to the rear fuselage during landings, an auxiliary tail wheel has been added.

The Skyknight is still " classified " and no details of its performance have yet been released. Unofficial reports indicate that it can operate successfully at heights up to about 48,000 feet.



THE HAWKER P.1081

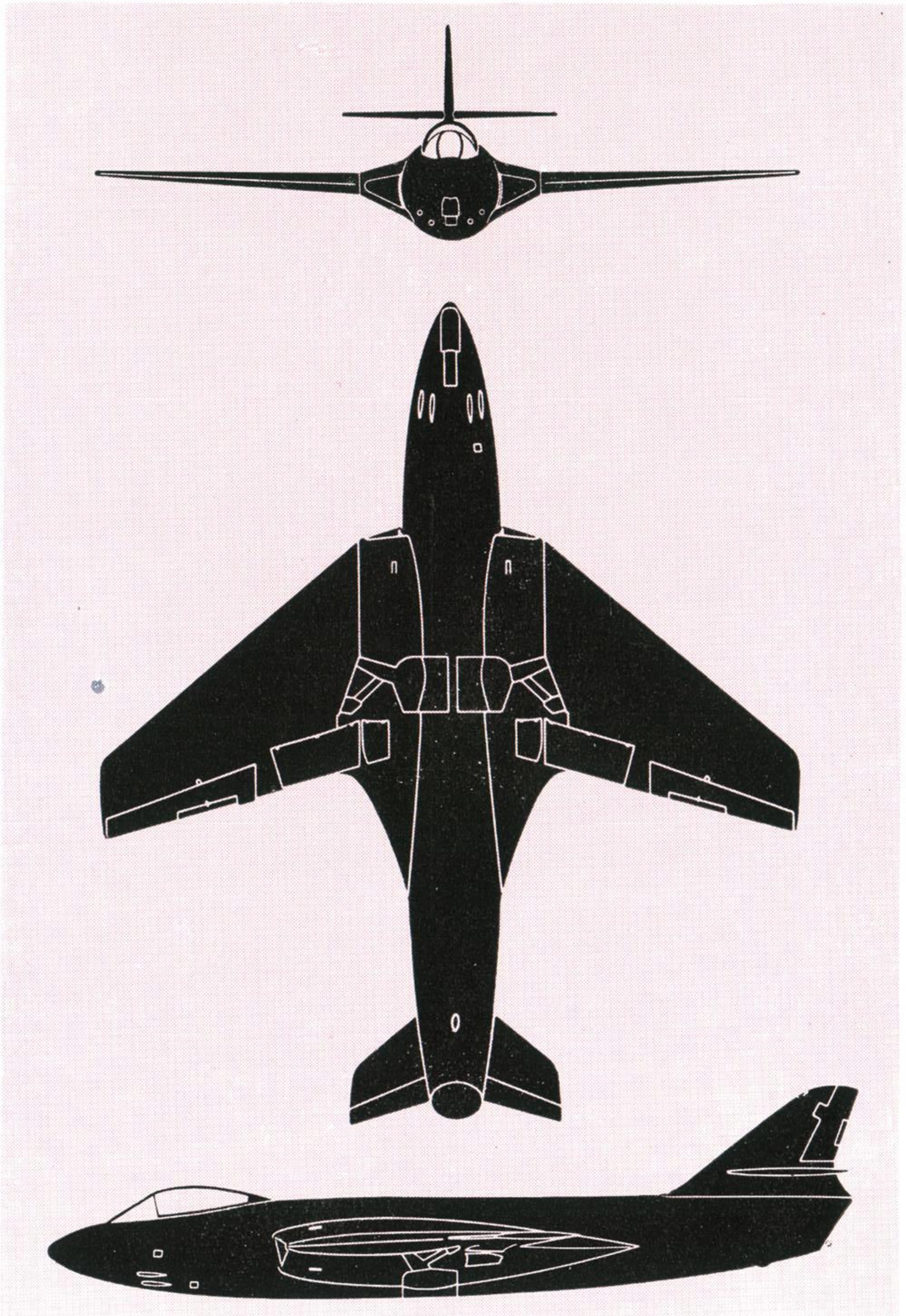
by R. W. Thomas, B.Sc.

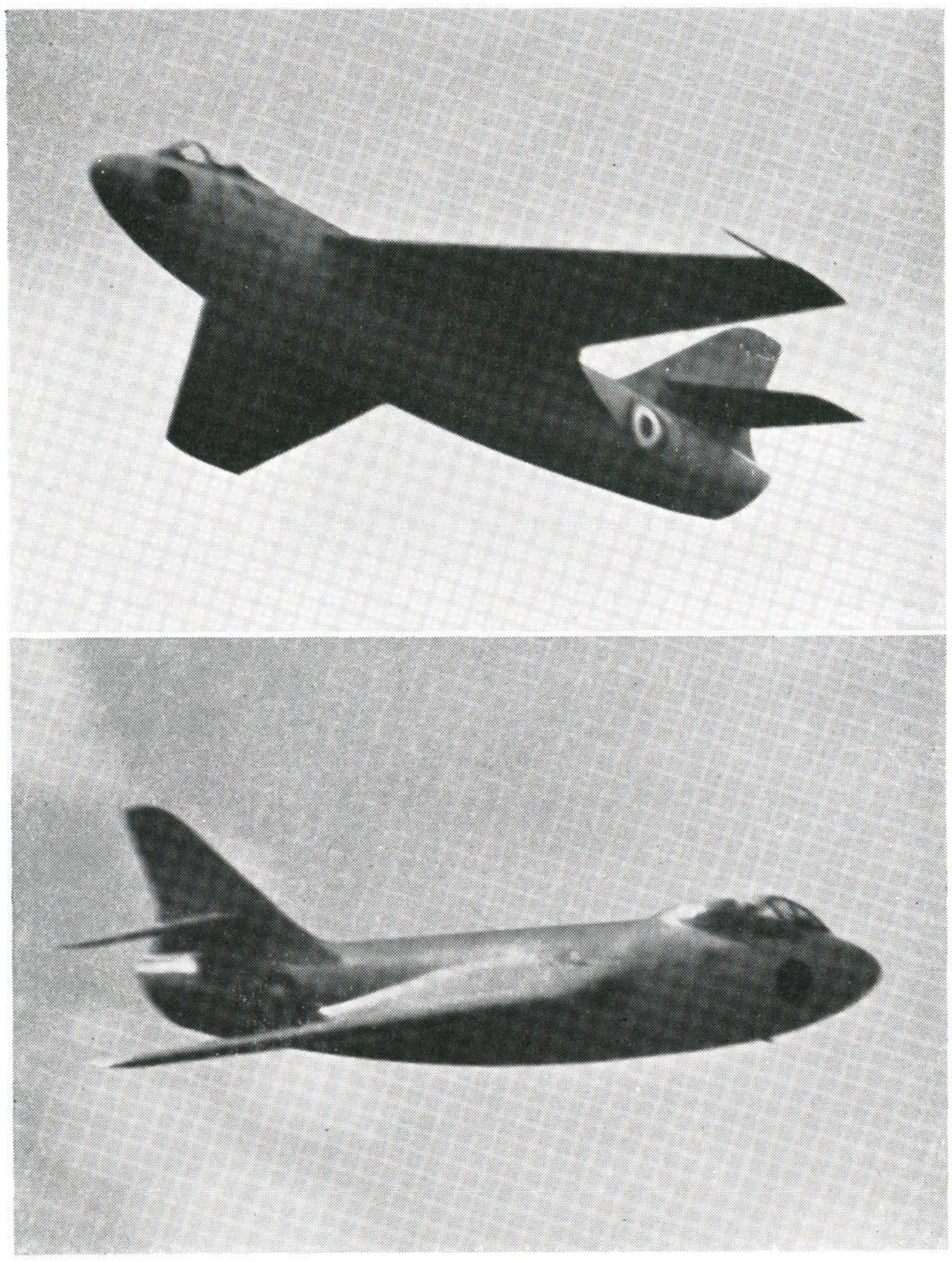
IN OUR JULY 1950 EDITION, we traced the development of Hawker single-seat jet aircraft from the original P.1040 to the production Seahawk naval fighter and the P.1052 research aircraft. It is now possible to describe in outline the latest machine of the series, the Hawker P.1081 fighter. This aircraft, which is a logical development of the P.1052, is to go into production in Australia for the R.A.A.F., and, although it seems unlikely that many will be seen over here, British spotters should know it thoroughly to prevent confusion with other "swept-back" aircraft as this layout is becoming increasingly common.

The prototype, VX279, first flew in June of this year, and, within a week, had taken part in the flying display held in connection with the Brussels Air Show. It made its public début in this country at the R.A.F. Display in July.

The wings are similar to those fitted to the P.1052, and have a 35° sweepback. This does not impair the low-speed handling qualities of the aircraft and it greatly improves performance at high mach numbers. Provision is made for carrying drop tanks under the wings.

A major innovation, but by no means an unexpected one is the replacement of the original bifurcated jet-pipe by a long single pipe passing through the fuselage. The reason for this change is to permit the installation of





after-burning or re-heat so that performance, particularly rate of climb, may be boosted for short periods. From the spotters' point of view this modification has fattened the rear fuselage, and the removal of the two jet exhausts has made it possible for the trailing edge wing roots to be faired off more smoothly. The engine remains a Rolls-Royce Nene 4 in the prototype.

Another major modification is the sweeping back of the tail surfaces, and the increasing of the fin area. This gives better control at high mach numbers. An adjustable tailplane is fitted for control in the trans-sonic region and is also used for trimming throughout the speed-range.

From most other points of view the P.1081 remains similar to the Seahawk. The former is however intended as a land-based fighter and consequently is not fitted with folding wings or arrester gear. The pilot's cockpit, which gives a remarkably fine view over the nose, is the same, and the armament remains at four 20 mm. cannon. A nose-wheel undercarriage is fitted.

No more may be said about the P.1081 at the present time but, although performance figures are not available, from its demonstration at the S.B.A.C. Show it is obviously one of the fastest aircraft in the country.

Dimensions :

SPAN : 31 feet 6 inches. LENGTH : 37 feet 3½ inches.
WING AREA : 258 sq. ft.

INTELLIGENCE

Comet

Plans for a new long distance version of the Comet are announced. In the new version, the Ghost centrifugal type engines will be replaced by axial flow types to give greater range and speed. Such engines already being built in Britain are the " Sapphire " and the " Avon ", although it is not yet known what type of engines will be used in the long range Comet.

MIG-15

It is reported from Korea that encounters have been made between MIG-15's and Lockheed F-80 Shooting Stars. Also in use in Korea are B-26 Invader, F-82 Twin Mustang, F-51 Mustang, C-54 Skymaster, B-29 Superfortress, F4U-4 Corsair, Sunderland, Seafire, YAK-9, Sea Fury, Fireflies 1 and 4, YAK-3, F9F Panther.

Globemaster 2

The Douglas C-124 Globemaster 2 has made a successful take-off at a gross weight of 194,500 pounds. This is well in excess of the design loading. Globemaster 2's are being produced for the U.S.A.F.

Westland Sikorsky S.55

Westland Aircraft Ltd., who have been manufacturing the Sikorsky S.51 helicopter are now to produce the larger S.55 for military, naval and civil requirements.

Lockheed F-94C

A new two-seat all-weather fighter version of the F-94 designated the F-94C is now reported to be in production The F-94C differs mainly from the F-94 in that it has a swept-back tailplane. The nose has also been redesigned, and "finned" tip tanks are carried. Picture on front cover.

Supermarine 510

All-swept experimental fighter, the Supermarine 510 has made successful deck landings on an aircraft carrier.

SR/A1

New tests are being made with the Saunders Roe SR/A1 jet-fighter flying boat. The SR/A1 was the first jet flying boat in the world to fly, and is a single seater armed with four 20 m.m. cannon. Structural features include a high-set stubby wing situated well back on the fuselage, a fat two-step hull and a cross-tree tail unit. Semi-retractable floats are placed mid-way between hull and wing-tips. Span is 46 ft. It has been suggested that such an aircraft would have been most useful in Korea.

Convair R3Y-1

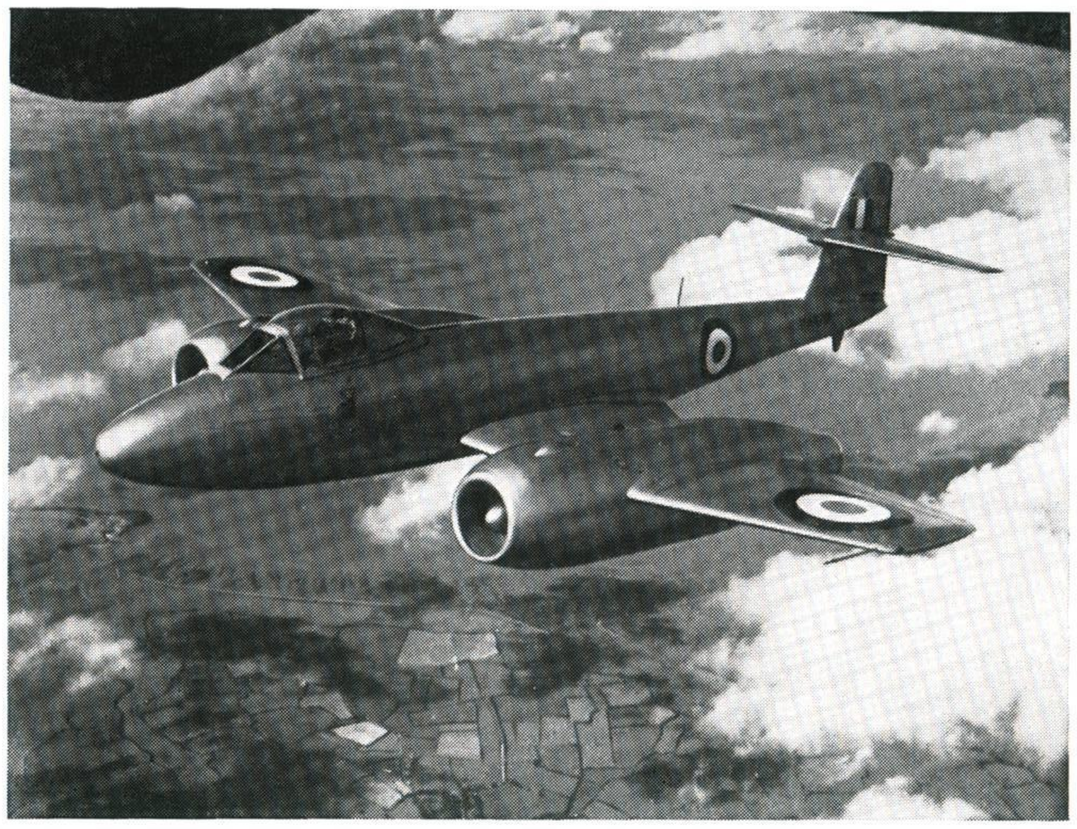
Reports indicate that the order for Convair XP5Y-1 turbo-prop flying boats for the U.S. Navy (see Intelligence, November, 1950 *Journal*) has been cancelled in favour of the R3Y-1, a transport version of the same aircraft.

Venom NF Mk. 2

Two-seat all-weather night fighter selected to replace the Sea Hornet in the Navy, is the D.H. Venom NF Mk. 2. The NF Mk. 2 has been developed from the FB Mk. 1 single-seat day fighter which featured a swept-back wing-leading-edge. Also equipped with two seats, but for a different purpose is the D.H. 115 Vampire Trainer, developed from, and similar in outline to, the D.H. 113 Night Fighter.

Sapphire Meteor

Shown below experimentally installed in a Meteor 8 are two Armstrong Siddeley Sapphire jets. Readers can draw their own conclusions from the estimation that one Sapphire has the same power as four of the larger type piston engines.



BOOK REVIEW

by JOHN W. R. TAYLOR

The latest Volume of **The Army Air Forces in World War II,** although numbered fourth in a projected series of seven, is actually the third to appear. It describes the USAAF's part in the struggle against Japan during the two critical years from August 1942 to July 1944, and is thus roughly contemporary with Volume Two (**Europe : Torch to Pointblank**), which we reviewed in the November 1949 *Journal.*

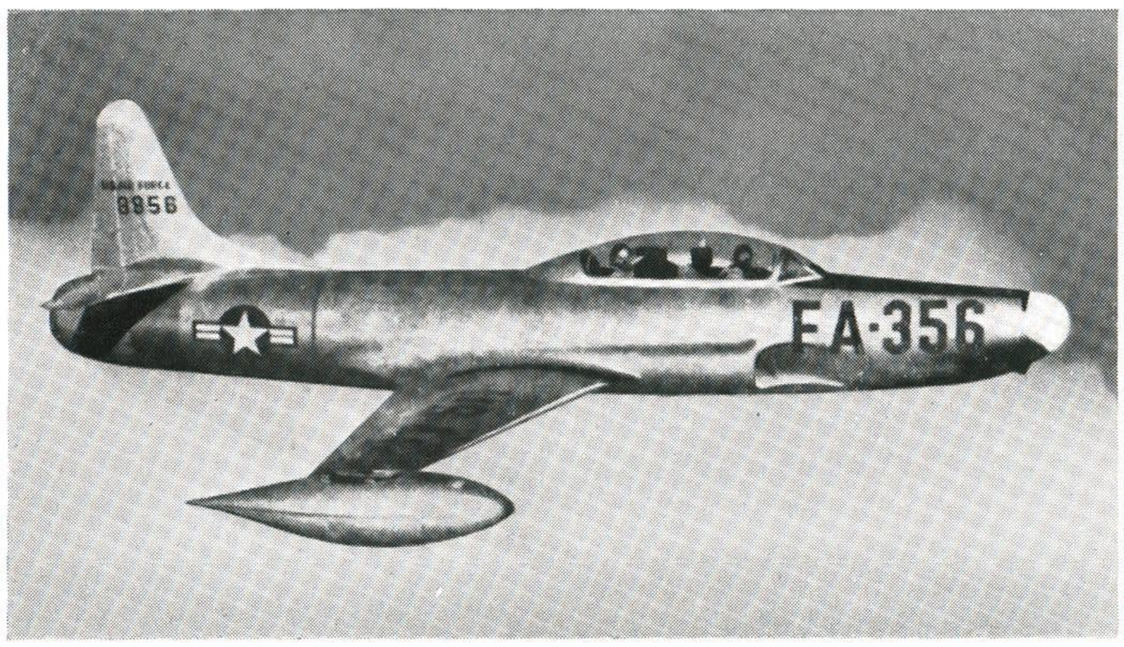
In it one can study the whole turn of events in the Pacific, as America recovered from the shock of Pearl Harbour and slowly geared her overwhelming resources for the grim, island-hopping campaign that led to Tokyo. The narrative begins with the enemy's outward sweep at full flood, and closes at the time when MacArthur's forces were being readied for a return to the Philippines, and when U.S. engineers, still under sniper fire, were preparing the giant air bases in the Marianas from which the B-29s began their death-blows against the heart of the Japanese Empire.

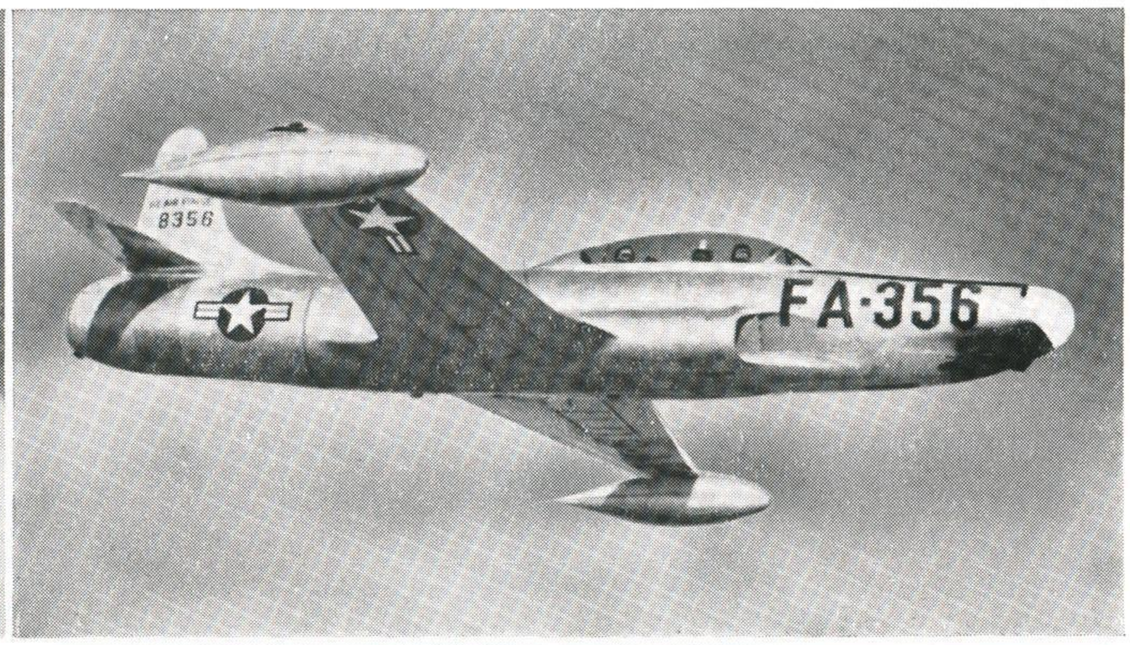
References to the work of Australian " Coast Watchers " will be of particular interest to readers of this Journal, for they were surely among the bravest aircraft " spotters " of all time. Equipped with binoculars and portable radios, they set themselves up in hiding near the enemy's shore bases and airfields in the South Pacific, and reported every movement of his ships and aircraft. Although referred to as " the poor man's radar," they supplied information that radar could never provide, and did so under the very noses of the enemy. Concentrations of Japanese ships were carefully noted, land targets identified for U.S. fighter-bombers, and enemy bomber formations reported the moment they left their home airfields. This latter resulted in some spectacular victories by intercepting American fighter groups.

There is plenty more good stuff in this Volume, which achieves the same extremely high standards of accuracy and authorship as its two predecessors.

" THE ARMY AIR FORCES IN WORLD WAR II", Volume Four : The Pacific—Guadalcanal to Saipan. 825 pp. Published by the University of Chicago Press and in the U.K. by the Cambridge University Press. $6.00 net. (48s.).

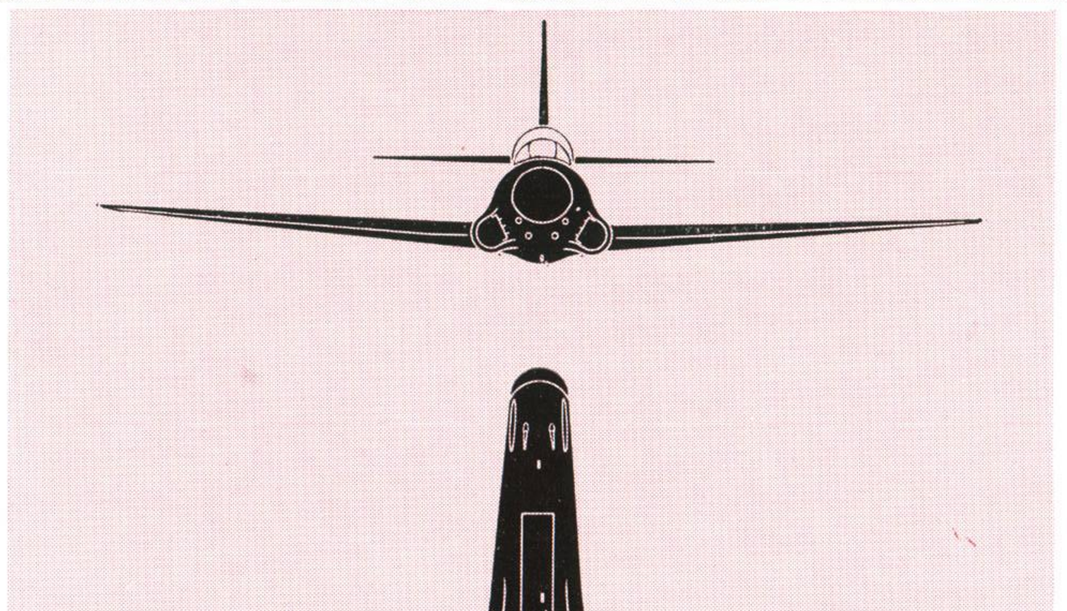
LOCKHEED F-94A



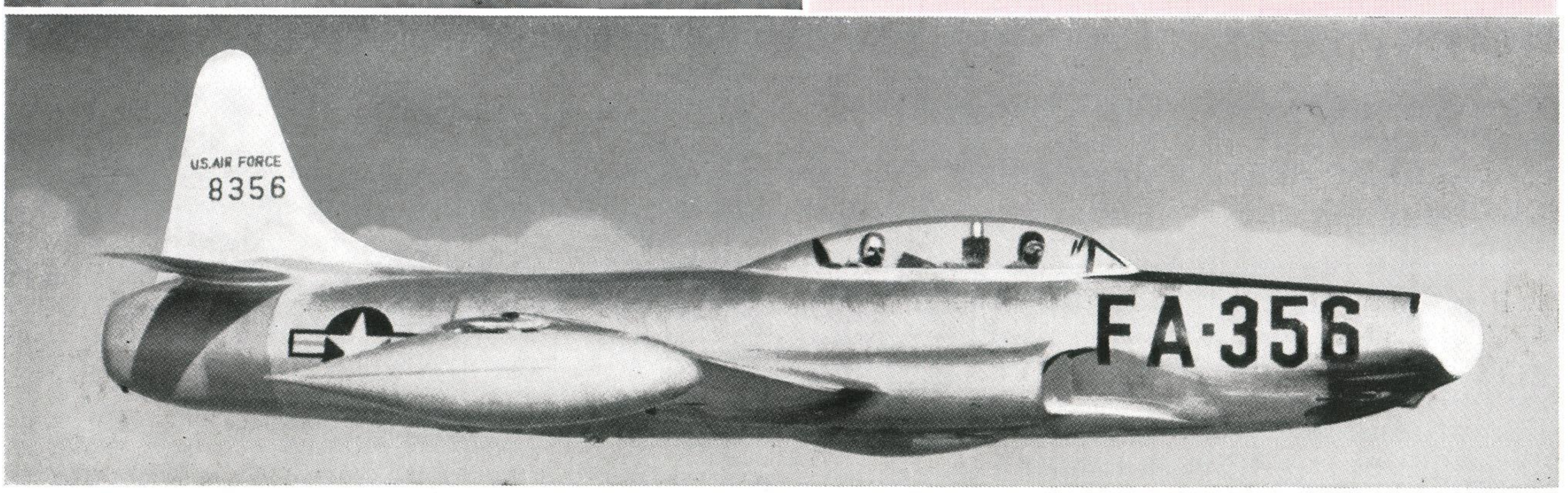


If the F-80—the Ninety-Four's progenitor—is visually a "Nosey-Poke" its offspring is a nosier one, and moreover is proud of it.

What could be more apt an occupation for an aeroplane led by such a nodosity and having such an air of sniffy arrogance and high-flown dignity than that of "all-weather sniffer-outer" of enemy bombers at high-altitude. For this heavily-armed fighter, fitted with a powerful after-burner, bids fair to become one of the world's most formidable interceptors. It carries 3,000 lb. of radar in its monstrous nose, and 4 20 mm. cannon. Other details are : Engine : one Allison turbojet. Span is 38 ft. 10 ins., and length 40 ft. 1 ins.

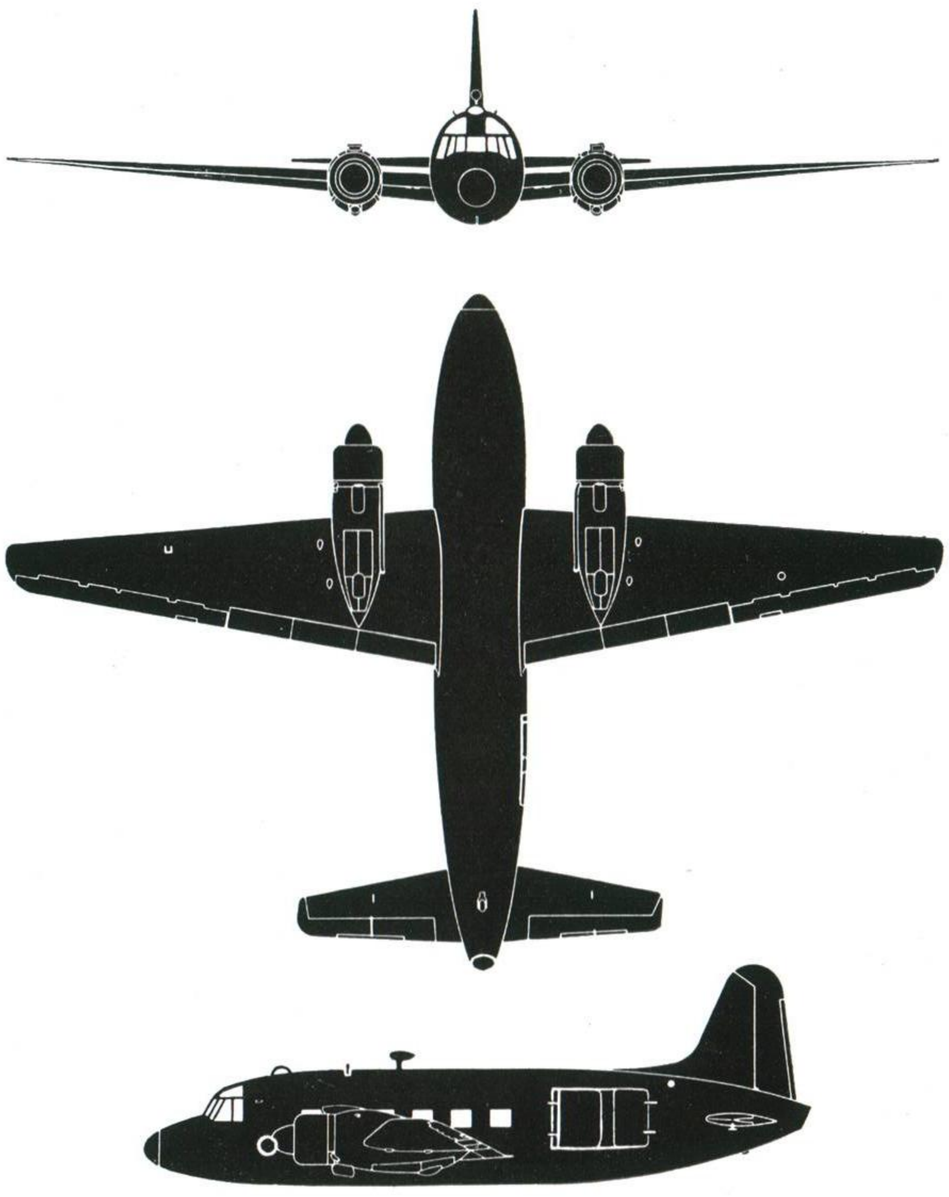






SILHOUETTES — TWIN-TYPE TRANSPORTS

VICKERS VALETTA



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

Recognition Points :

Wings : low-mid set, moderate dihedral, straight taper more marked on trailing edge, pointed duo-curve tips.

Engines : centrally mounted radials with large spinners.

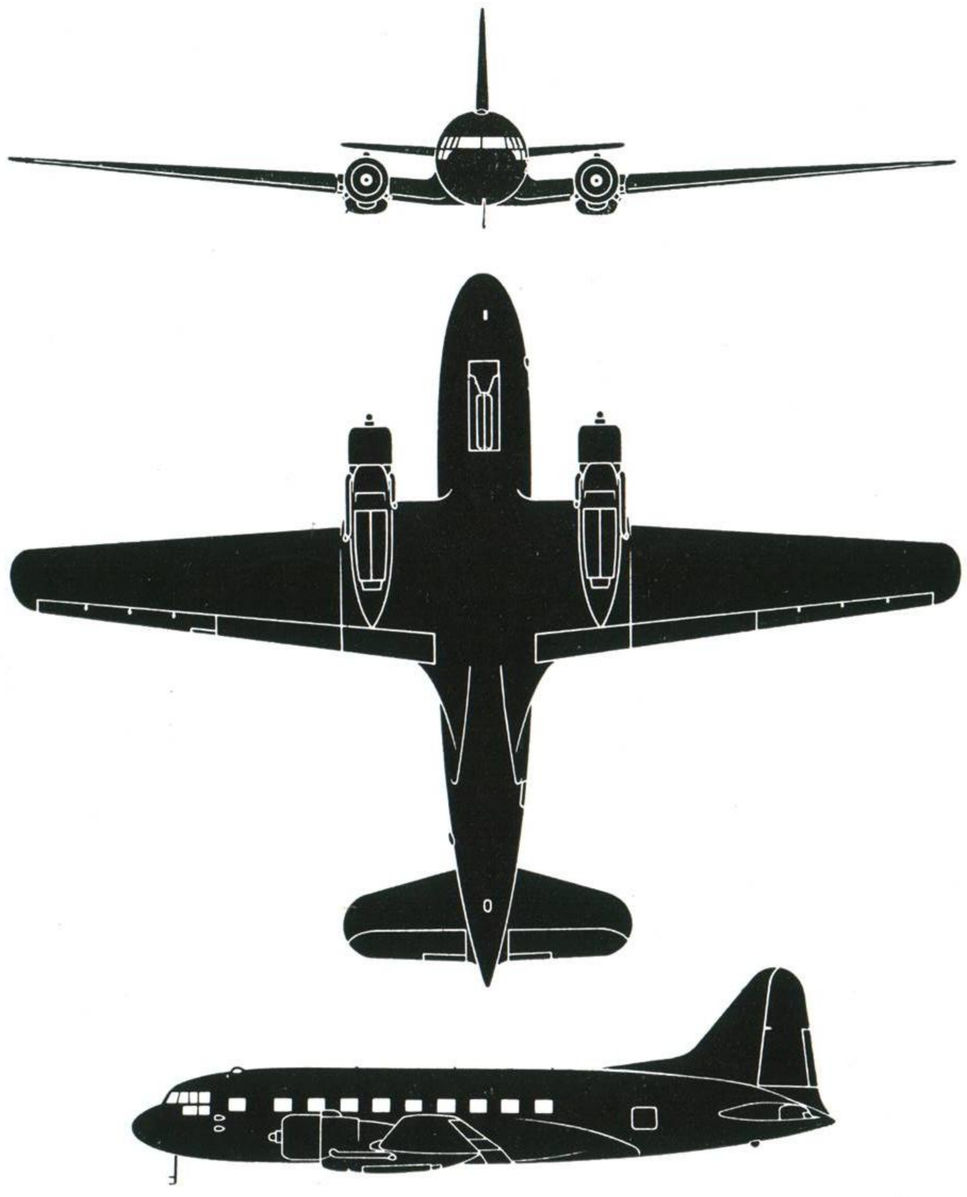
Fuselage : oval in section, fat, cigar-shaped with pointed " snub " nose and prominent step formed by cockpit, sawn-off tail-cone projecting aft of fin and rudder.

Tailplane : mid-set on rear fuselage, wide span, straight taper, blunt starboard tip, square port tip.

Fin and Rudder : tall, straight taper, rounded tip, small dorsal fairing.

Detail : tail wheel undercarriage.

ILYUSHIN IL-12



Russian Transport
Engines : 2 ASH-82FN radials
Span : 100 ft. Length : 74 ft. 3 ins.

Recognition Details :

Wings : low-set, moderate dihedral, short span, narrow, straight taper, forward built sentre-section, large root fillets, rounded tips.

Engines : centrally mounted, long radial nacelles with swollen fairing to house undercarriage, no spinner cones.

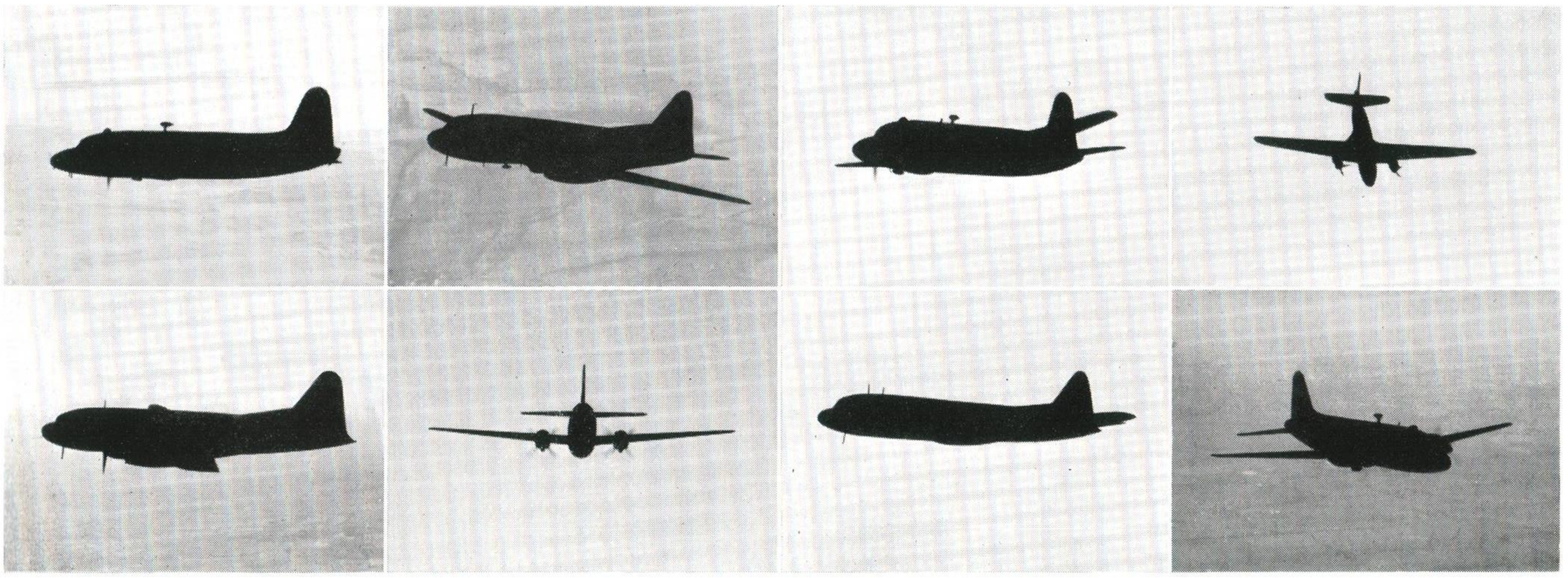
Fuselage : circular in section, cigar shaped, long nose with " snub " tip and step formed by cockpit, pointed tail cone.

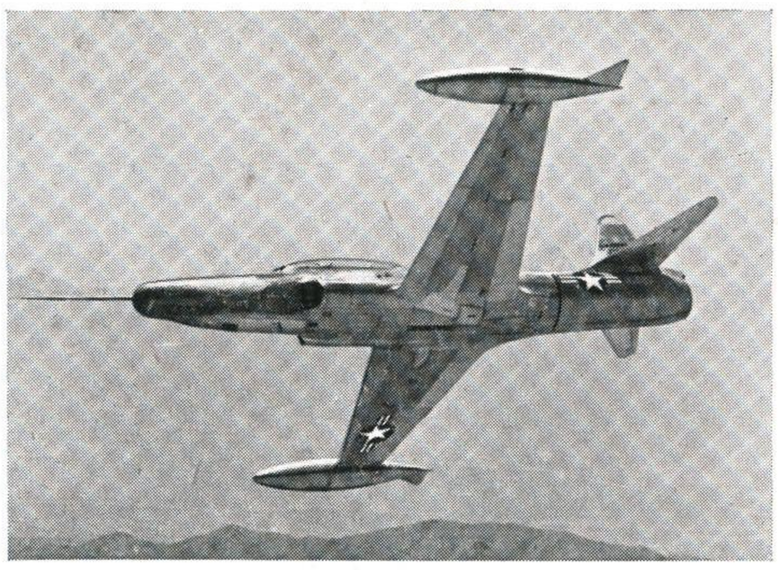
Tailplane : mid-set on rear fuselage, slight dihedral, taper on leading edge, straight trailing edge, rounded tips.

Fin and Rudder : broad, triangular, dorsal fin.

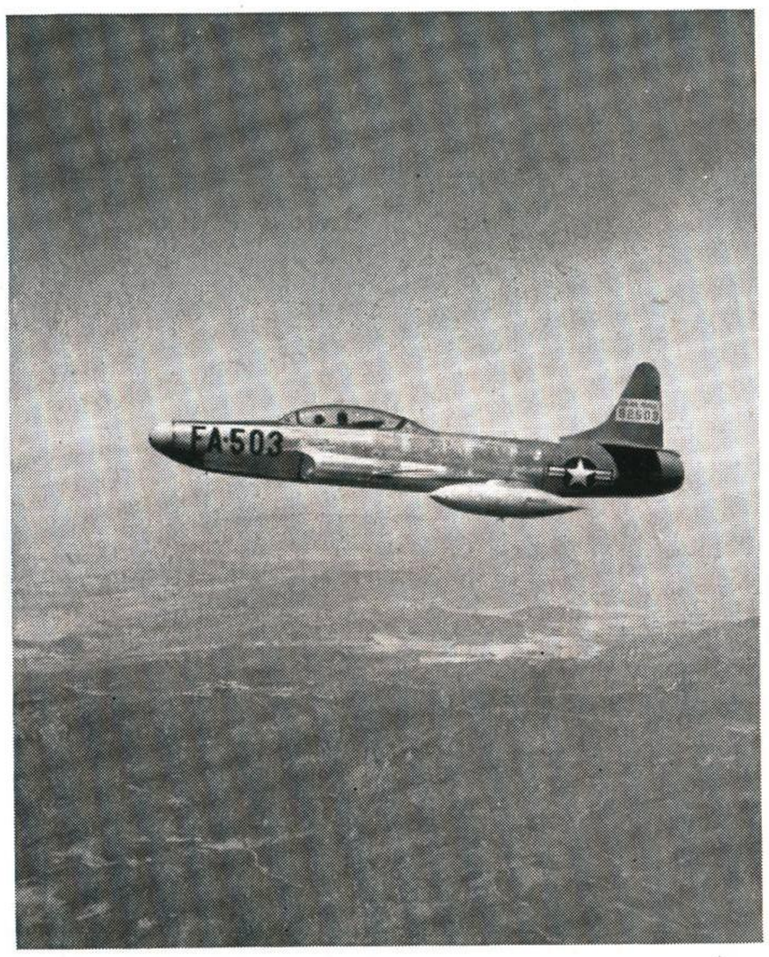
Detail : tricycle undercarriage.

Now solve these SILLOGRAPHS (Answers on rear cover)





COVER : Lockheed F-94C all-weather jet-fighter (see Intelligence page 21). Below : Lockheed F-94A (other pictures on page 22).



AEROGRAM

Lift the deck chair Pa! = The Fairchild Packet

TRICKY TRIO

Left to right : RF-61 Reporter, F-82F Twin Mustang (Radar Nacelle), C-119 Packet.

VALETTA and IL-12 SILLOGRAPHS (Page 23)

Top, left to right : Valetta, IL-12, Valetta, IL-12
Bottom, left to right : IL-12, Valetta, IL-12, Valetta.

SOLUTIONS TO RECOGNITION TESTS IN THIS EDITION:

ELEMENTARY

907. Hawker P. 1081
908. Lincoln B Mk. 2
909. Supermarine 535
910. F3D-1 Skyknight
911. Meteor T Mk.7
912. F-51H Mustang
913. Survey Prince
914. B-25 Mitchell
915. PO-2
916. Sikorsky S-51
917. HRP-1 Rescuer
918. Bristol 171
919. Sealand I
920. Sea Hornet PR Mk.22
921. Universal Freighter
922. Sapphire-Meteor
923. F7F Tigercat
924. Apollo I
925. Heron I
926. Sea Prince C Mk.I
927. Brabazon I

SEMI-SILLOGRAPHS

938. Brigand B Mk.I
939. MIG-9
940. TU-2
941. C-82 Packet
942. YAK-9
943. B-36
944. F9F Panther
945. Canberra B Mk.2
946. Hornet F Mk.3
947. Sea Vampire F Mk. 20
948. Prentice T Mk.I
949 IL-10
950. PE-2
951. B-47 Stratojet
952. Constellation
953. IL-12
954. Seahawk F Mk.I
955. P2V-2 Neptune
956. Meteor F Mk. 4
957. Seagull ASR Mk.I
958. MIG-15

ADVANCED

43. Convair XP5Y-1
44. Seafire F Mk.17
45. Viking 1B
46. Seafire FR Mk.47
47. Seagull ASR Mk.I
48. Seafury FB Mk.11
49. Ashton I
50. Sturgeon TT Mk.2
51. Fairey GR.17
52. F9F-5 Panther
53. TU-2
54. Northrop Pioneer
55. C-119 Packet
56. Vampire FB Mk.5
57. Tempest F Mk.6
58. Hastings C Mk.I
59. UT-2
60. Firefly FR Mk.I
61. PE-2
62. Short SB.3
63. Canberra B Mk.I

SILLOGRAPHS

917. PE-8
918. Sea Hornet NF Mk.21
919. B-29 Superfortress
920. Seafury T. Mk.20
921. Seahawk F Mk.I
922. TU-2
923. Prentice T Mk.I
924. MIG-15
925. B-50D Superfortress
926. Sea Prince C Mk.I
927. Wellington T Mk.10
928. TU-70
929. Seafire F Mk.17
930. IL-12
931. F-84 Thunderjet
932. F-80 Shooting Star
933. York C Mk.I
934. AD-2 Skyraider
935. Viking 1B
936. IL-10
937. Spitfire F Mk.22

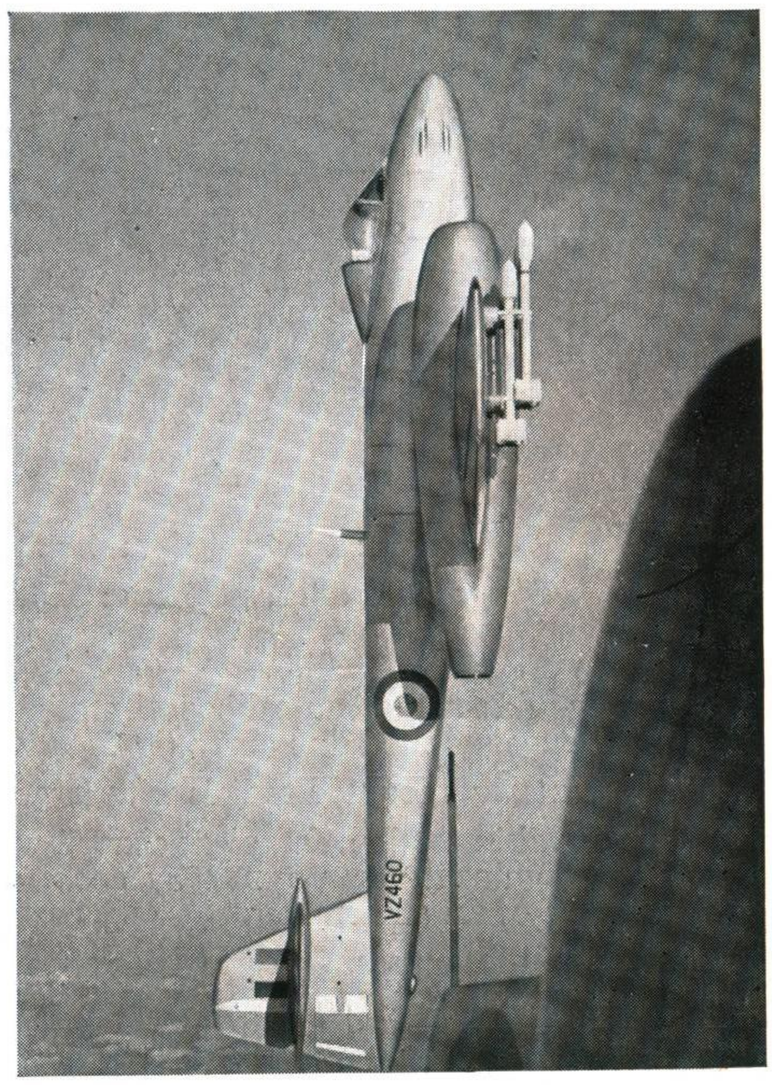
WRECK-COGNITION

PE-2

P.1081 and MIG-15 SILLOGRAPHS (Page 15)

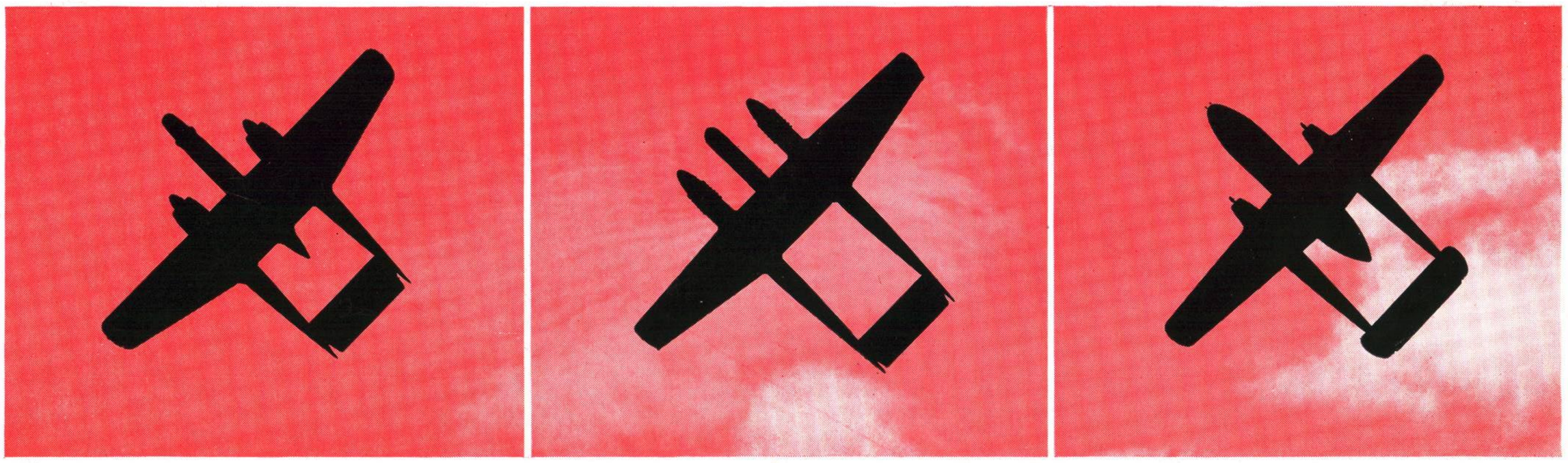
Top, left to right : P.1081, MIG-15, MIG-15, MIG-15, P.1081

Bottom, left to right : MIG-15, P.1081, P.1081, P.1081, MIG-15



GOING UP — This picture of a Meteor 8 "going up" with eight 95 lb. rocket projectiles illustrates its rocket-like climb. Part of the Meteor 7 trainer from which the photograph was taken can also be seen.

TRICKY TRIO



45,645 1/51 38-241-0

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