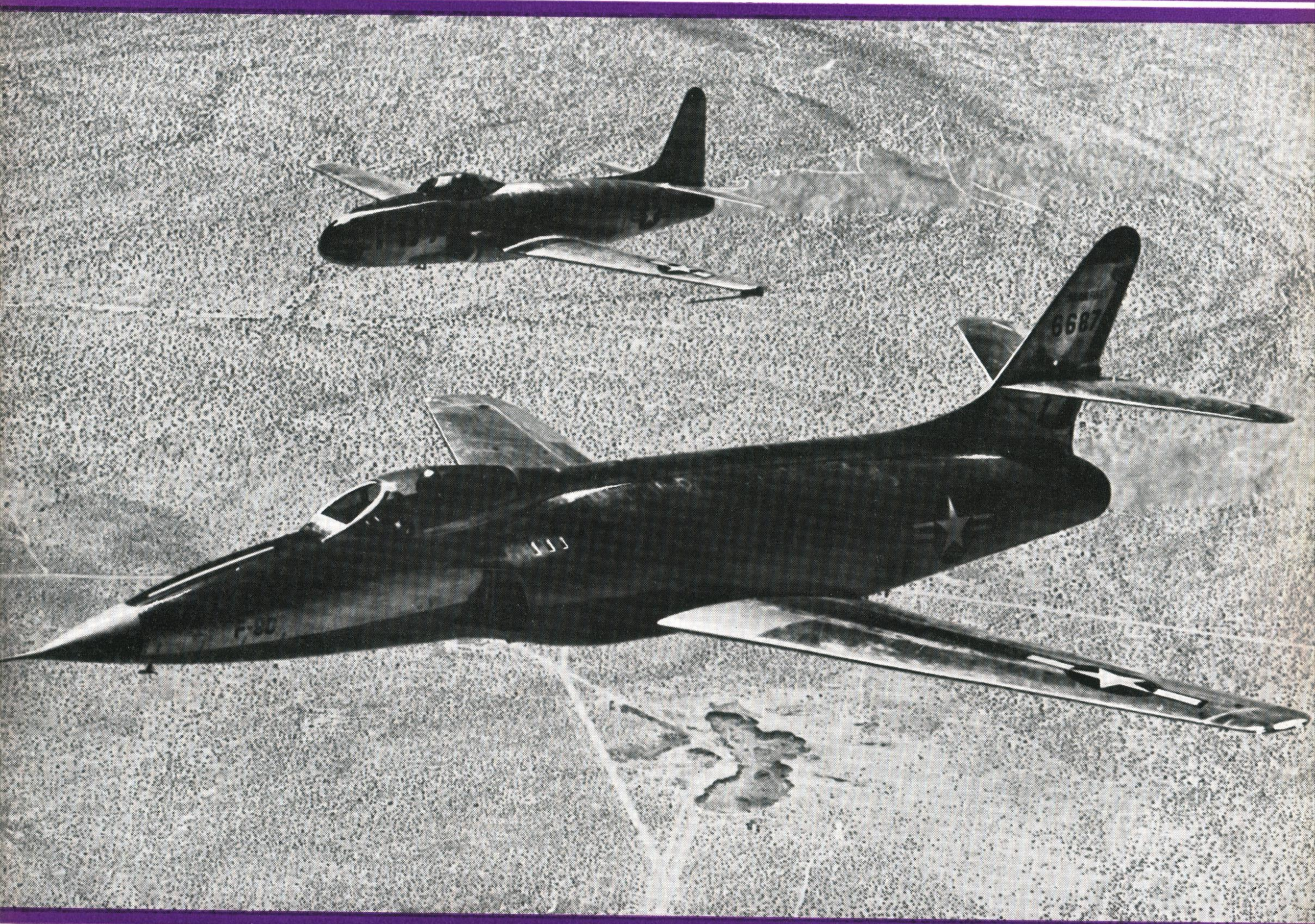
THE INTER SERVICES

AIRCRAFT RECOGNITION

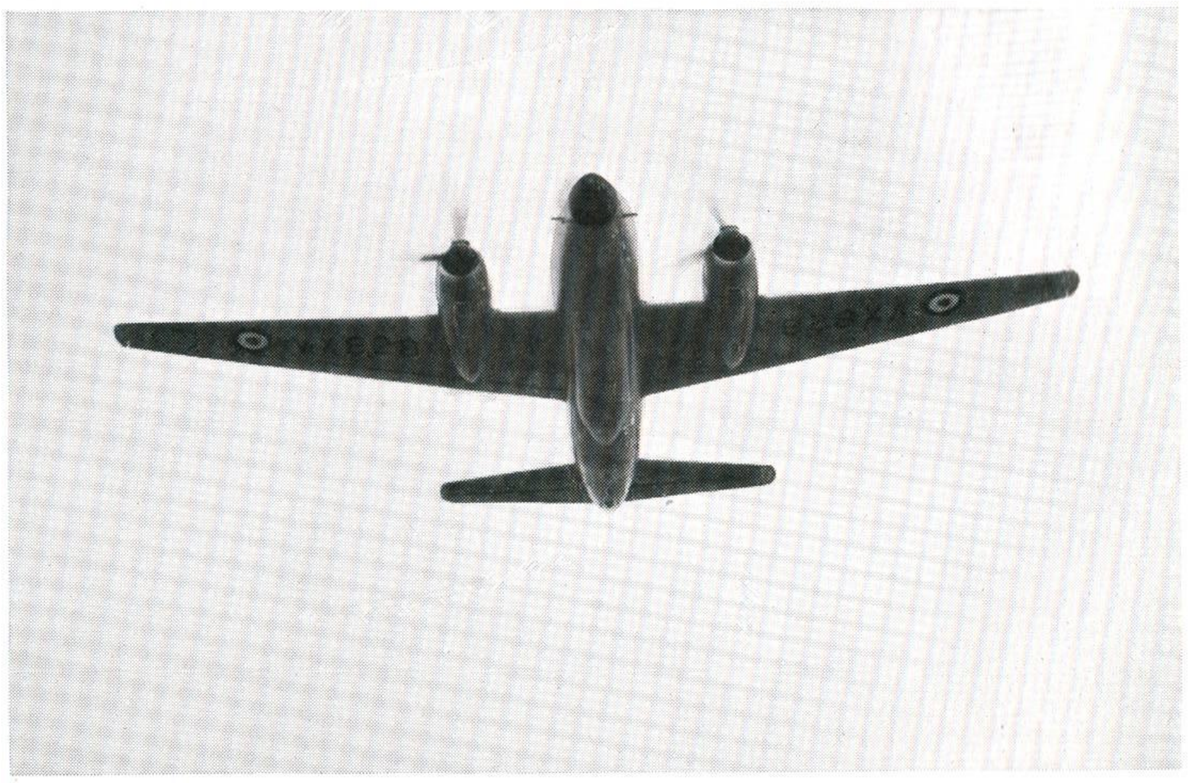
Journal



Vol. 4 JANUARY 1950 No. 5

Vickers Armstrongs Varsity













(2 Bristol Hercules radial engines)

APART from the " pannier " (or " under-nacelle ") on its belly, the structural differences between the Varsity (featured above) and its elder brothers Viking and Valetta are small, though they are numerous. They lie in wing and tailplane tip shape ; in engine and nacelle shapes, and their projecting scoops ; and in lengthened fuselage nose. The Varsity, though it has a tricycle undercarriage (with twin-wheeled main oleos and a steerable nose-wheel) also has a fixed faired tail-wheel (bumper). The Varsity provides, in one aeroplane, facilities for training in air-navigation/bomb-aiming, piloting and radio/radar signals (hence the lengthened nose). The flight deck accommodates pilot, navigator and radio-operator. The under-nacelle accommodates a bomb-aimer and pupil.

Data :—Span 95 ft. 6 ins., Length 67 ft. 6 ins., Height 23 ft. 11 ins.



JANUARY 1950 Vol. 4 No. 5

THE INTER SERVICES

AIRCRAFT RECOGNITION JOURNAL

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A Good Year!

YOU MAY HAVE BEMOANED the size of your apples, or your raspberries; or simply toiled in sweating silence in the dusty soil in your garden beneath the fierce "Indian Summer" skies of 1949. Or you may have sat back in the shade and simply worried about the high rate of taxation, or the price of cigarettes, or the petrol ration, or some such thing. But for all that, 1949 will probably long be recognized as a Good Year, particularly in the Air; and its enduring summer sun played no small part in making it so.

Lighting is perhaps, the most important part of a stage setting. For a setting as spectacular as that of Farnborough in 1949, sunshine, blue skies and cumulus clouds (however uncomfortable for the actors) were the ideal. This was Dame Fortune's contribution to what will probably come to be known as the "Show of Shows." It was against this natural back-drop that Great Britain was able to display to the World the products of her Aviation Industry with such terrific and inspiring effect; the full, and, we hope, rich harvest from which will be reaped for many years to come.

Against similar burnished backgrounds other inspiring effects were frequently to be seen during 1949. We speak of the interlacing contrails of aeroplanes in mock battle. British, United States, French, Belgian and Dutch fighters and bombers, to the thunderous music of their motors, wove patterns symbolic of the fabric of Western Defence across England's summer skies. The many air exercises held during 1949 tried all the Defence Services, including the Royal Observer Corps. This magnificent, voluntary organization gained valuable experiences from the exercises, and it is good to know that its very active and interesting part in the defence system was shared by a very satisfactory number of new recruits.

Fine weather spells more flying hours and thus more recognition hours; for every aeroplane flying is a potential recognition target. The weather men say that 1949 was a record year for sunshine: to judge by the violence of the reaction to our passing reference in the July *Journal* to Spotting Logs, it was also a record year for active aircraft recognition.

A different, though equally warming sort of sun shone upon the *Journal* during 1949. For, in support of all the Defence Services, it grew to twenty pages; the extra space enabling us greatly to improve the presentation of our subject. That this has been well worth while can best be judged by the increasing flow of correspondence from all quarters. A great influx of ideas, suggestions, criticisms and wants; and a widening circle of experienced contributors to assist in putting things over, have undoubtedly paid handsome recognition dividends. In short, it has seemed that a better understanding of the problems, and of the true value of aircraft recognition, is at last abroad—in both senses of the word if the volume of letters from overseas is any measure. We send thanks to all who have supported us with their advice and contributions during 1949.

We make no apology for reiterating here that aircraft recognition is not a simple subject to undertake; it means more than the memorizing of a number of shapes; it means a special study of its own: it is a branch of aeronautics not lightly to be accepted or rejected at whim or wish, for it saves lives in War. In Peace it must be practised to ensure proficiency if War should come—it is, in fact, a defence factor helping to insure against War. It also provides a good background for all who would identify themselves with a Nation of Air-Farers—for such is Our's, if we read the messages of 1949 correctly.

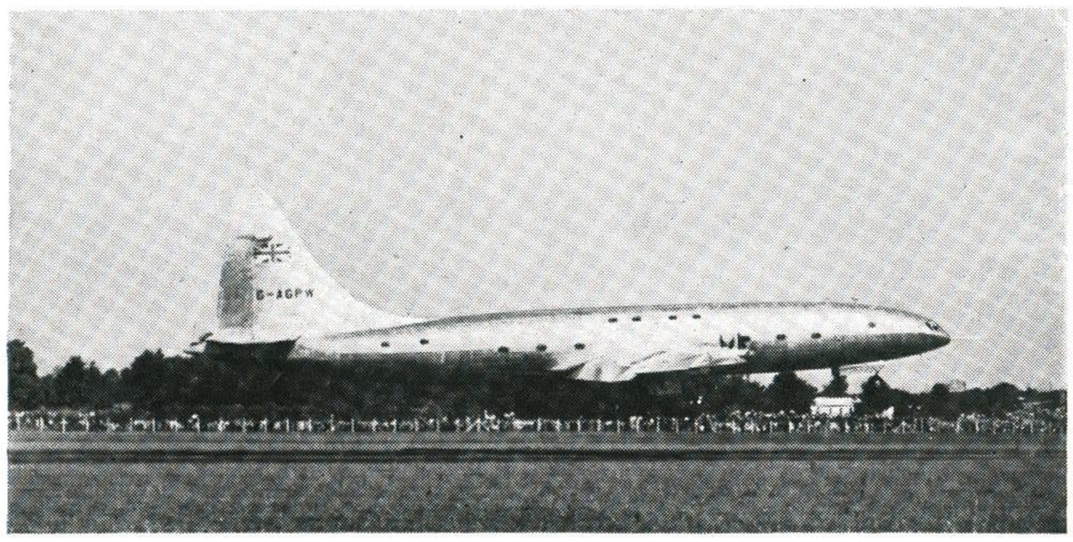
We must recognize 1949 as a Good Year. We shall hope that, for all our readers, 1950 will be at least as bright.

"This may be a take-off, Chaps!"

FIRST FLIGHT OF G-AGPW

by JOHN A. SIZER
A.R.Ae.S., A.I.N.A., A.I.Ae.S.

WITH these words from A. J. Pegg, " Garth " Gibb let go the parking brake and the largest civil aircraft in the world rolled forward to take its place in Aviation History. The crew had assembled much earlier and had been in the aircraft for an hour or so doing the umpteen checks needed in so large a piece of intricate machinery. Having had a good engine run we stood down for half an hour or so drinking ice-cold orange juice in the shade of the hangar outbuildings. It was a glorious Sunday morning and already the airfield was fringed to a good depth with people in all the bright gaiety of a seaside-cum-race-meeting atmosphere. For we'd done a good job the day before in getting all the taxying over and done with. And the news had spread that to-day, if the " Brab " *could* fly it would.



First Take-off

After we'd finished our checks, put 'chutes and all our gear aboard, a brief crew meeting was held on a patch of grass near the refuelling point. Pegg said, " I may have a crack at getting it off. We're not going to mess about charging up and down the runway. Now, is there any one of you not feeling quite up to it, if we do get off ? " There was no dissension. " Right, " said Pegg, " Be ready in half an hour."

After our orange-juice, feeling very conspicuous in our white overalls (new for the occasion) we went over to the aircraft which had by now been towed over the railway lines and was standing on a strip of runway which cuts across the main strip. The sun beat down and we knew it was going to be a warmish do. Quite methodically and without any fuss we were inside the aircraft all set at our places. Gibb made secure all the doors and then went back to the side observation blisters. From this point you can see the rudder, elevator, and one set of flaps and the aileron, on one side. There is a similar blister on the other side of the aircraft. The pilot cannot see the wing except at its extremities, and checking of control sense and operation is a three-man job—pilot and two observers.

Johnny Hayman was talking to his outside stooge who tells him all he needs to know about what's happening outside. The rest of us were clicking away at our special jobs. Soon all the inter-com stations used had reported to each other. The engines were run-up. The brakes came off and we moved off smoothly turning left down to the west end of the runway. On the run down brakes were tried, and we rolled on in an atmosphere of calm intention. At the end of the runway we followed the white track-line specially laid on for this very occasion and turned through 180° to face the other direction.

After a moment or two for final crew checks Pegg called for take-off revs. and boost, and the aircraft was held on the parking brake while these came up. The call from Pegg to Gibb for the latter to release the parking brake. Moving forward now. Accelerating nicely. Everything smooth. Hearing the speed build-up, read out in Gibb's loud clear voice, " 65, 70, 75," and so on, until the jubilant "Airborne ! "

Well, we've done it now. We're in the air and having appreciated that dreadful yet thrilling truth all that remains to be done is to set about our tasks of recording as much data as we can. The cameras are going according to plan so we can leave them to themselves while we peer and pry and sniff in every corner of this mammoth aircraft. We are a bundle of senses, and each sense is responsive to vibrations, noises that shouldn't be, and smells of fuel oil and other fumes. But how well she rides ! Smooth, purposeful, elegant. The fin and rudder and tailplane and elevator look carved of gold. Rock steady and impressive. Out of the observation hatches the immense wings stretch, it seems, to infinity and the mighty rush of air leaves them undisturbed by any shuddering or shaking. The undercarriage and flaps come up with that sure precision they'd shown in ground tests. The flaps, too, behave beautifully. A trial manning of emergency stations—into the wing you go and—strange—it's not so bad as you thought it would be. In fact it's remarkably quiet and not at all draughty.

Some slight gentle turns. Wonder where we are? Round now. Letting down. As the flaps come down (in pairs) more power is needed to maintain height and speed. We must be pretty close to the runway. Yes, this is it. The first landing. And Pegg paints it on so daintily that no-one felt the main wheels arrive. She bumped forward a bit to put the nose-wheel on, but it was one of the loveliest of landings. Everybody relaxes. We've done the first job and now it's congratulations all round—over the inter-com the tension has gone out of our words and we're plain humans again who have been doing a job. Looking out of the window near my station I can see a great ocean of faces as we charge down the runway spilling off the speed of our arrival. We stop near the railway crossing. When the engines' noise dies their roar is replaced by a mightier but less familiar sound. As Pegg opens the door to lead us out we are deluged by the great applause—and quite astonished ! There is a moving joy all round and no-one could have been more surprised than the crew at the terrific reception they gave us as we came down the quite ridiculous ladder to terra firma.

After that it was every man for himself. I was out of my gear and rushing madly to my local to have one before closing time. Arrived there sinking the best-tasting pint of my life, someone was saying " The Brab flew to-day. Looked lovely she did." Well, that was that. They say it was a good show.

First Landing



CHARACTER STUDY

by

C. H. GIBBS-SMITH

No. 1—The Boeing Stratocruiser

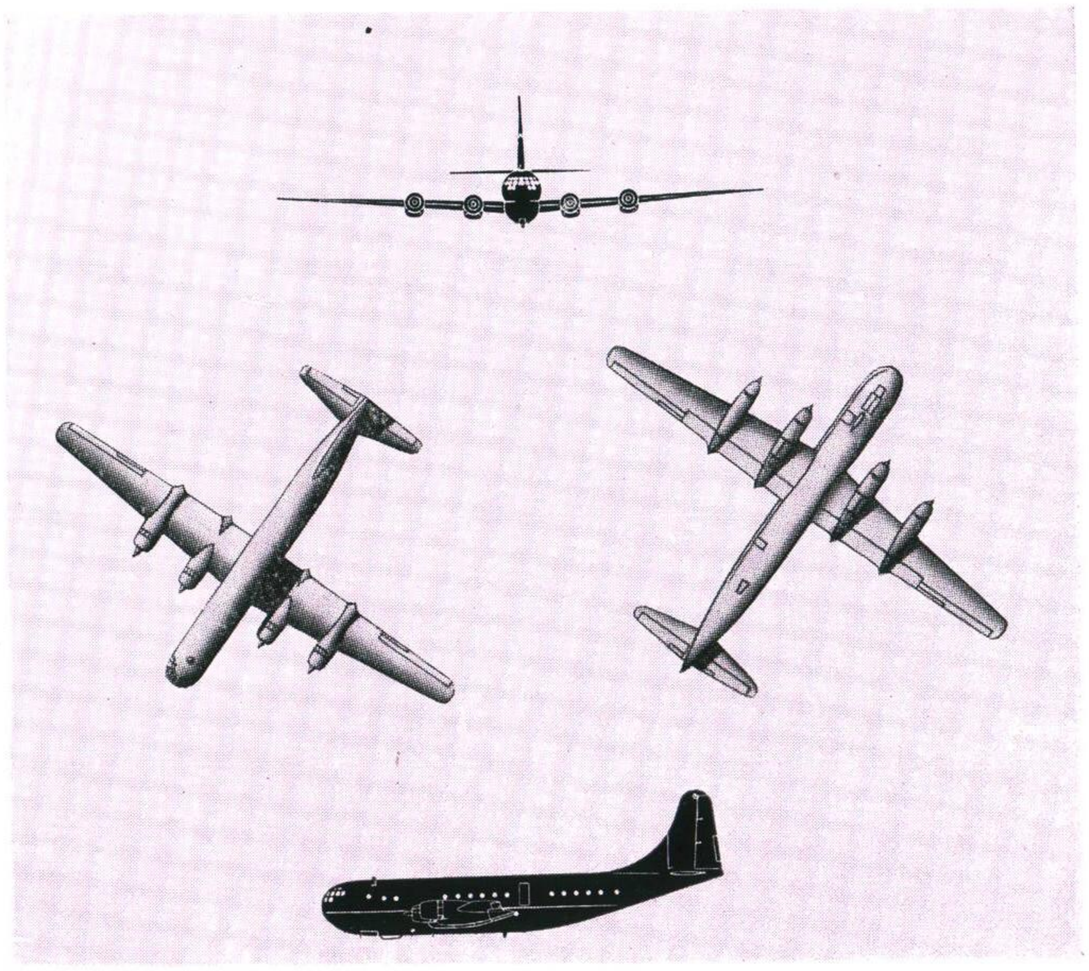
THIS bulky progeny of a line of Fortresses reminds one of a rare tropical fish which has just sprouted wings. The Stratocruiser, an excellent and easily remembered name, is a four-engined low-wing monoplane with a single fin and rudder. It is an aircraft with a number of interesting recognition features some of which you cannot recognize with any ease at all. So, to deal with the latter first, we should discount the pinched-in fuselage only really noticeable from dead ahead or astern, and the protruding nacelles. They cannot be seen at any height to speak of.

The main thing to concentrate on is the preponderating effect of the great fuselage. It is so deep, bulky and smooth that it dwarfs the wings and motors ; and owing somewhat to the smooth, smug, nose has a marine monster look from most viewpoints. But it is also the drastically swept-up look of the whole aircraft in its hindquarters, ending in a fin and rudder jutting up into the sky like a lighthouse, that completes the main character-impression of the Stratocruiser. An interesting feature of the fuselage character, which ties up with straight high aspect ratio wings, is the effect of long straight lines : the straight top of the fuselage, its straight underside, the straight sweep up beneath the tail. In fact the only aggressively noticeable curves in the aircraft are the fin and rudder and the nose. From any view but directly beneath or above, it is this fuselage-look that predominates.

In the plan views there is still a distinct fat-fuselage look, which dwarfs wings and tail-plane, but these views lack any really distinctive character. There is, however, a good recognition point in the underside plan-view—the four engine nacelles which may break up the wing surface into deep shadowed forms. This also goes, in lesser degree, for the top plan view.

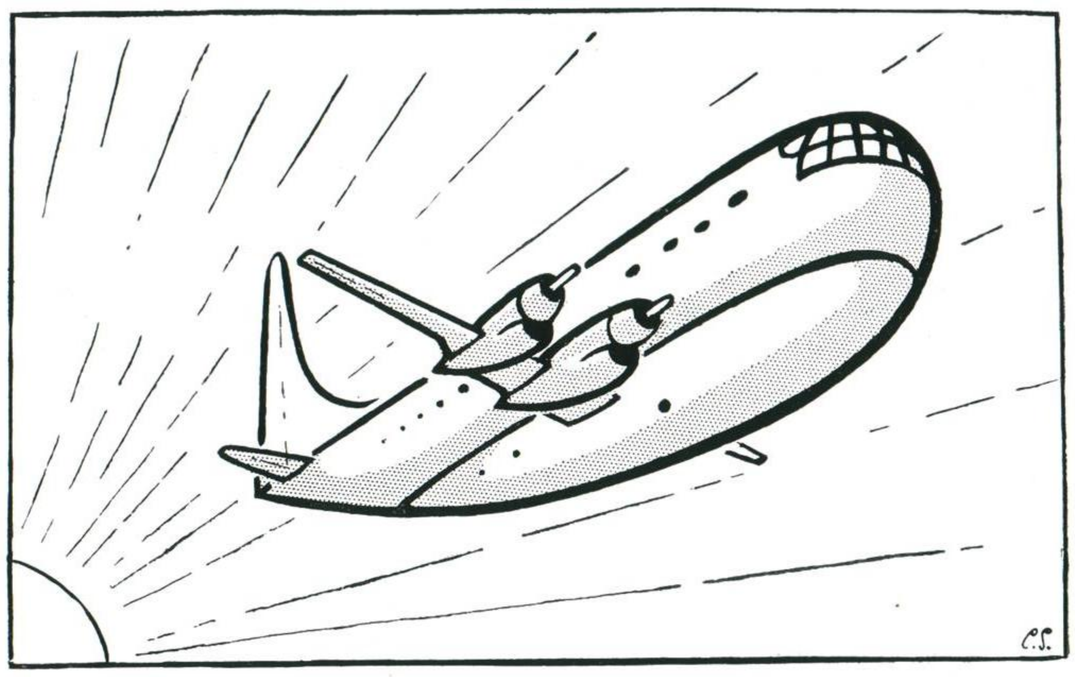
The ancestry of the Stratocruiser which first flew in July, 1947 is that of the Fortress series. The B-29 is its parent, the famous Flying Fortress (B-17) its grandparent and the B-50 might be described as its brother. From warlike antecedents, the purely transport Stratocruiser has appeared on the world's skyways.

Basic facts about the Stratocruiser are : *Origin* : U.S.A. *Length* : 110 ft. 4 ins. *Span* : 141 ft. 3 ins. *Cruising speed* : 301 m.p.h. *Maker* : Boeing. *Engines* : 4 Pratt and Whitney radial R.4360. *Function* : transport. Used by the U.S. and Britain and will be in use soon with other nations.







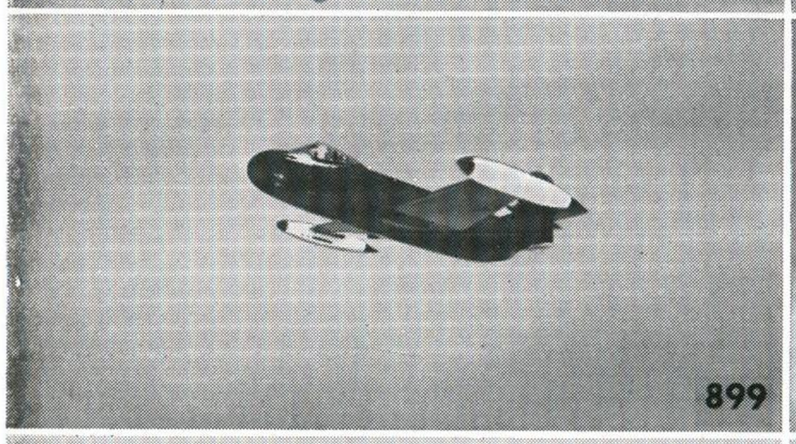


ADVANCED SPOTTING


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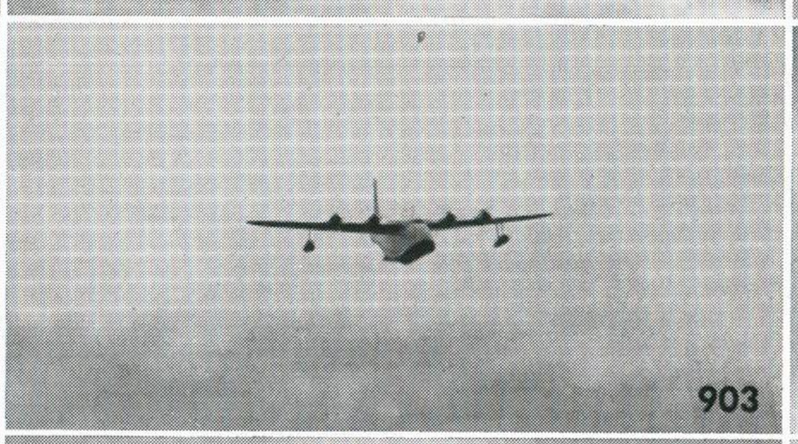

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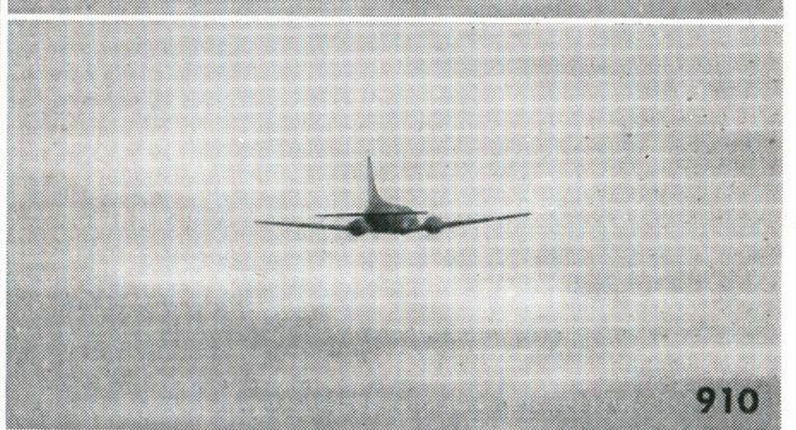

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INTELLIGENCE

Russian Visitor

First Russian-designed aeroplane to alight in Britain since the TB-7 came in 1941, was the Ilyushin IL-12, which touched down at Northolt on 12th September on a special visit in connection with the Prague Fair. Two of these aeroplanes are at present operated by Ceskoslavenské Aerolinie (C.S.A.) on regular continental routes from Prague to Paris and Prague to Sofia. When a further delivery of IL-12s has been made to C.S.A., it is possible that they will be seen regularly in this country. Worthy of comparison, recognitionally, although a slightly larger aeroplane, is the Convair-Liner. Equi-taper on wing and tail surfaces, rounded tips, and triangular fin and rudder are some of the features clearly labelling the IL-12 (silhouette—page 180, October *Journal*) ; an interesting modification noticeable in the version which visited Northolt was the addition of a fin fairing.

Turbo-Triad

Power for the Martin XB-51 high-speed ground-support bomber is provided by three turbojets, one in the rear fuselage and two mounted on pylons on the lower sides of the fuselage below the leading edge of the wing. As well as a 35° sweep-back on all flying surfaces this latest Martin design also displays a " T " type tail unit—the cross piece of the " T " being on top of the fin and rudder. The XB-51 has a six-wheel undercarriage (two separate pairs in tandem under the fuselage with two baby balance wheels at the wing tips). All wheels are retractable. (Photos later.)

Sub-Seekers

A few details have recently been released about the Navy's fleet of anti-submarine aircraft ; they are the Blackburn Y.A.5 and Fairey 17. From first appearance they are not dissimilar, both revealing inverted gull wings, blunt wing and tail tips, six bladed contra-rotating propellers and rather pot-bellied bodies supported by tricycle undercarriages. We are glad to note, however, a helpful signpost to identity in the tailplane of the Y.A.5 which has marked dihedral. The Fairey 17 is fitted with a Double Mamba paired airscrew turbine, and the Y.A.5 with a Rolls-Royce Griffon piston engine although it is possible that later versions of the Y.A.5 will also be equipped with airscrew-turbine power units.

Willing Horse

Experimental mating of original American airframe of the DC-3 with two Armstrong Siddeley Mamba II turboprops (to replace the present Twin Wasp radials) may offer a new lease of life to a famous aeroplane. The 3,000 odd piston engined DC-3s still in service are rapidly proving uneconomical against modern operational requirements, and it is hoped that, for operators faced with this problem, the Mamba-Dak will open up new possibilities. In identifying the Mamba-Dak it will be as well to remember that the two turboprops (which are housed in rather "bomb" shaped nacelles) will make for less noise and higher speeds.

Jet Liner

A. V. Roe of Canada's new C-102 jetliner 40-60 seater passenger transport is news from Ontario, Canada. The jetliner is powered by four Rolls-Royce Derwent 5 turboprops concealed in two completely underslung "double-cigar" nacelles. Interesting recognition feature is the "cross-tree " type tail structure.

Transport Titans

Paragon of four-engined weight lifters, the first model of the Douglas C-124 Globemaster 2 was recently rolled out of its hangar on to the pre-flight line. It has been evolved from the C-74 Globemaster one of which recently performed a record flight across the Atlantic carrying 103 men. The new C-124 is designed to transport troops, tanks, bulldozers and loaded trucks, and will move 50,000 lbs. of payload 850 miles, unload, and return to base without refuelling. Up to 200 troops plus their field equipment can be carried in one sitting, and huge clamshell doors at the nose will enable wheeled vehicles to be driven through an opening of over 11 ft. by 11 ft. into the Globemaster's cavernous interior. Compared with the C-74 the C-124 has a much bulkier fuselage although it utilises the same wings, empennage and power plants as the C-74. (Photos later.)

BOOK REVIEWS

by JOHN W. R. TAYLOR

Regular readers of this Journal will need no reminder that one of the best ways to learn the recognition features of any aeroplane is to sit down and draw it, even if the finished masterpiece looks like a parsnip with warts.

For those who wish to take their drawing a little more seriously, and particularly for recognition instructors lucky enough to possess a blackboard, we can thoroughly recommend a little book entitled **How to Draw 'Planes,** by Frank Wootton. It goes into the subject rather more deeply than can be done in the *Journal*, and is fully illustrated with reproductions of his rough sketches and finished drawings. In fact, even if you never aspire to drawing anything but your wages, it is well worth spending three shillings of them on **How to draw 'Planes,** just for the pictures.

Another very reasonably priced book that has come our way is **Modern British Aeroplanes** by Charles Gardner, the B.B.C's Air Correspondent. Despite its title, it deals with such topics as "Why an Aeroplane Flies," how piston and jet-engines work, and navigation, as well as with descriptions of representative aircraft in each category from primary trainers to big bombers and helicopters. Designed for boys of 9 to 90, " the young reader is here presented (when his father has finished with it) with a volume which will teach him a lot by painless methods."

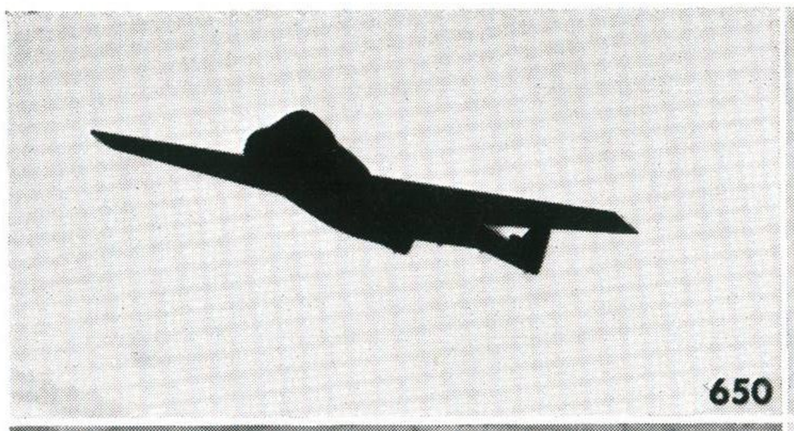
Finally, something much more serious—**Destiny Can Wait,** the history of the Polish Air Force in World War Two. It is an inspiring, beautifully-presented story of 17,000 men in R.A.F. blue, who fought with superb heroism and skill to free their beloved homeland, only to find that victory brought no freedom to Poland. There are hundreds of stories of gallantry in action, thrilling " spy " episodes such as the story of how the Polish underground acquired a complete V.2 rocket and radioed its secrets to London before the enemy fired the first across the Channel, plenty of facts, figures and excellent photographs, and drawings by the great Polish artist, Feliks Topolski. It is a story worthy of an honoured place in any library and, as profits go to the Polish Air Force Association, it can also be our way of saying " Thank you " to the dependants and colleagues of 2,000 Polish airmen who died for us as well as Poland.

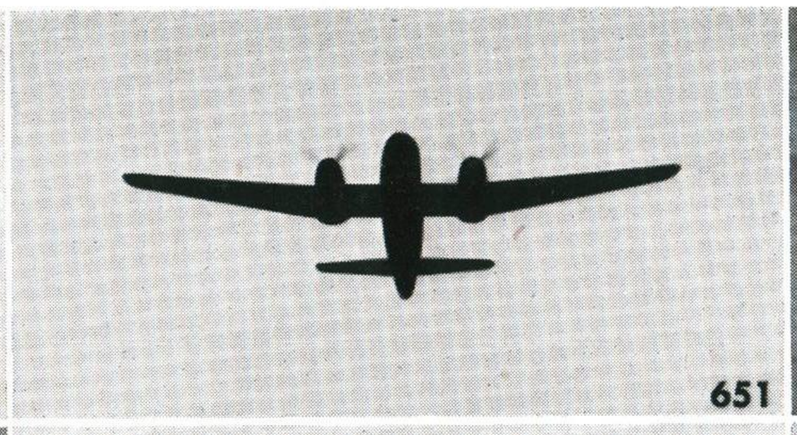
" How to Draw 'Planes ", by Frank A. A. Wootton. Published by The Studio. 64 pp. 3s. net.

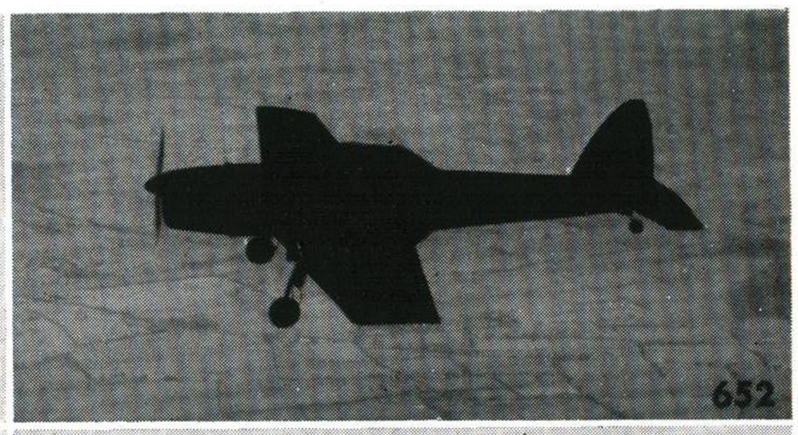
" Modern British Aeroplanes " by Charles Gardner. Temple Press Ltd. 112 pp. 8s. 6d. net.

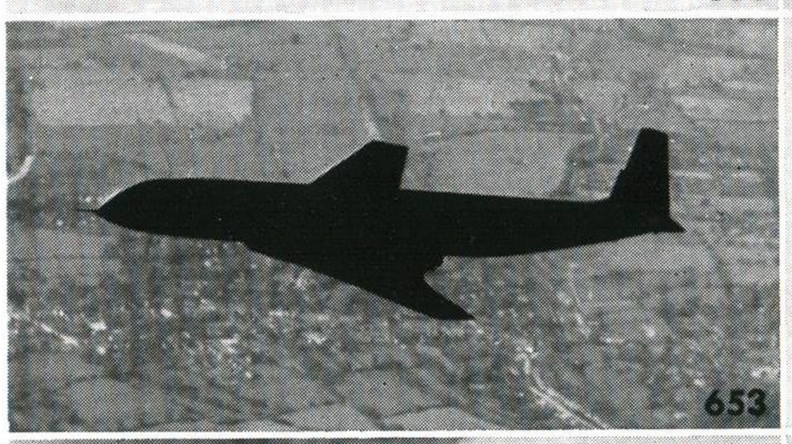
" Destiny Can Wait ", William Heinemann Ltd. 402 pp. Obtainable from P.A.F. Assoc., 14 Collingham Gardens, S.W.5. 25s. net.

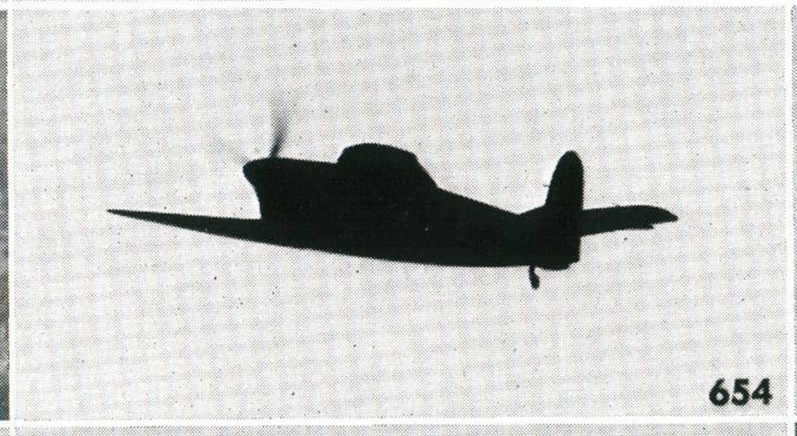
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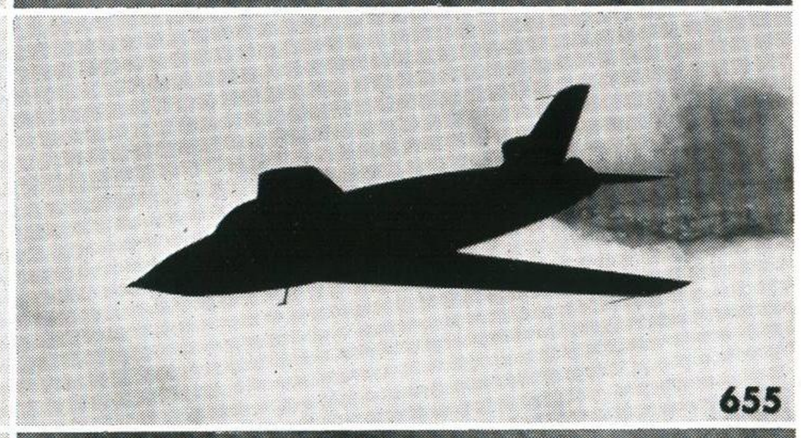

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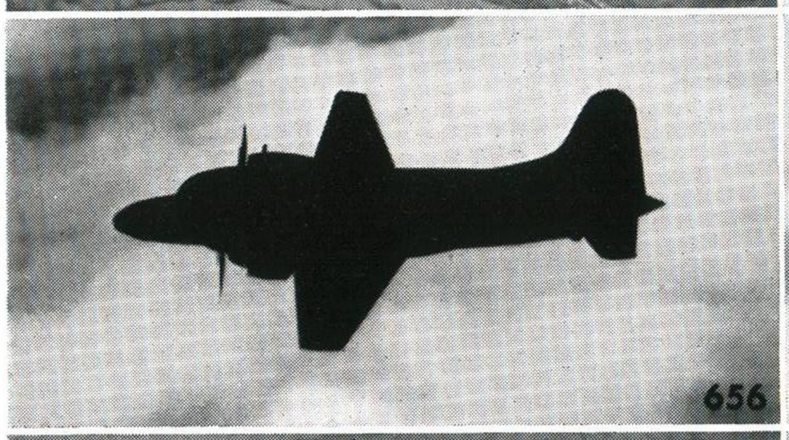

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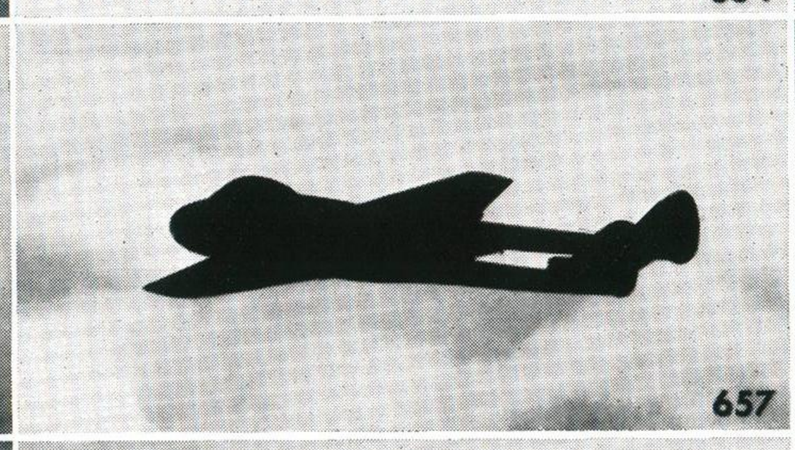

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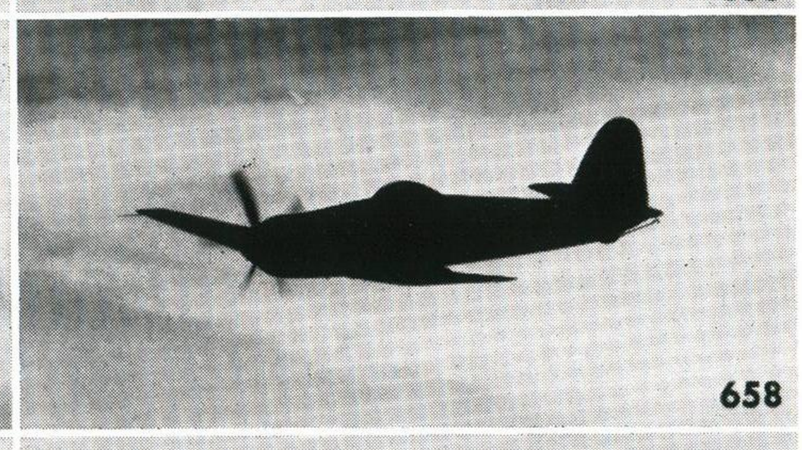

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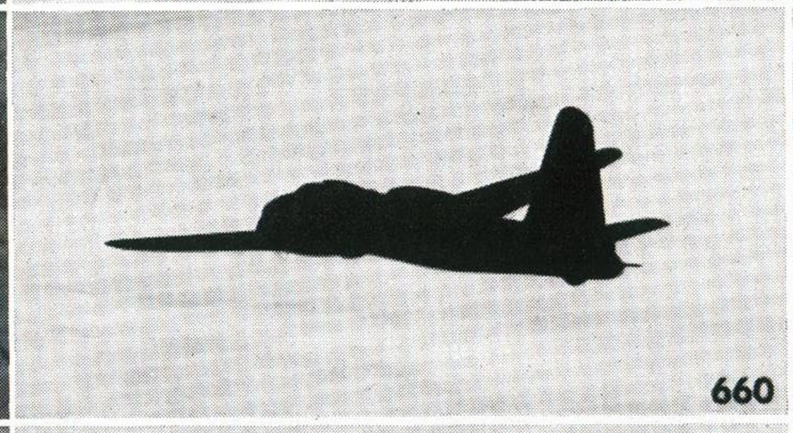

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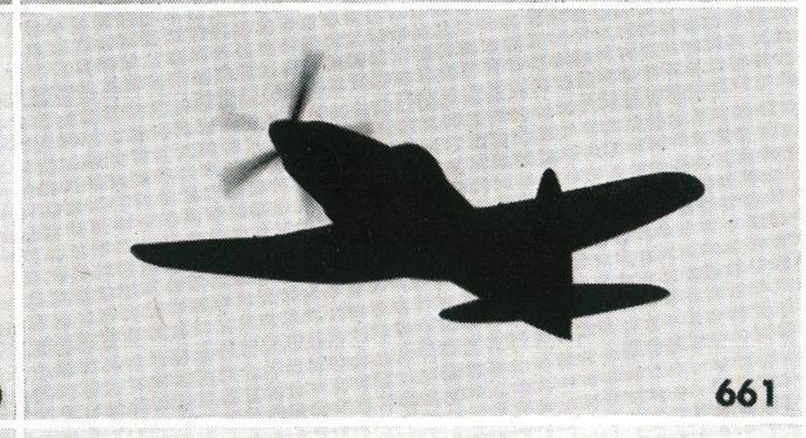

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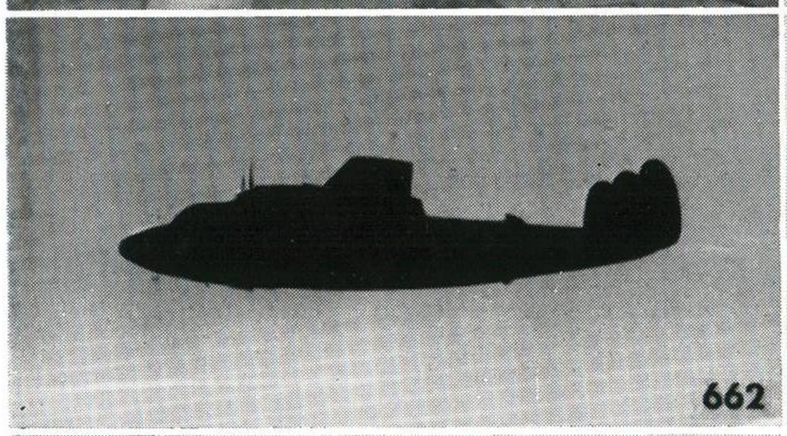

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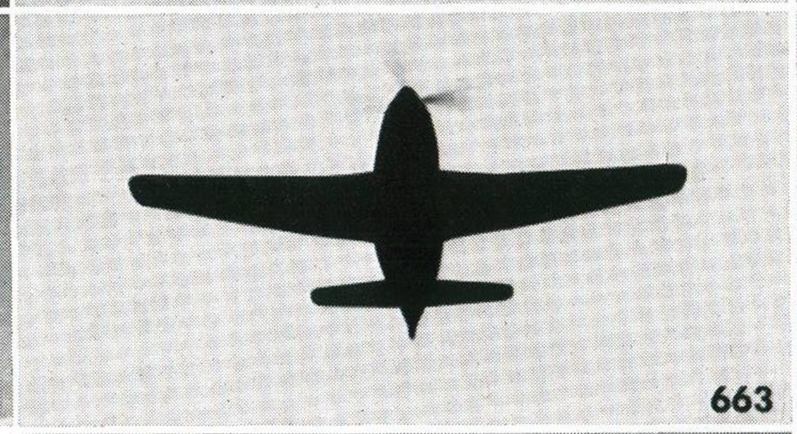

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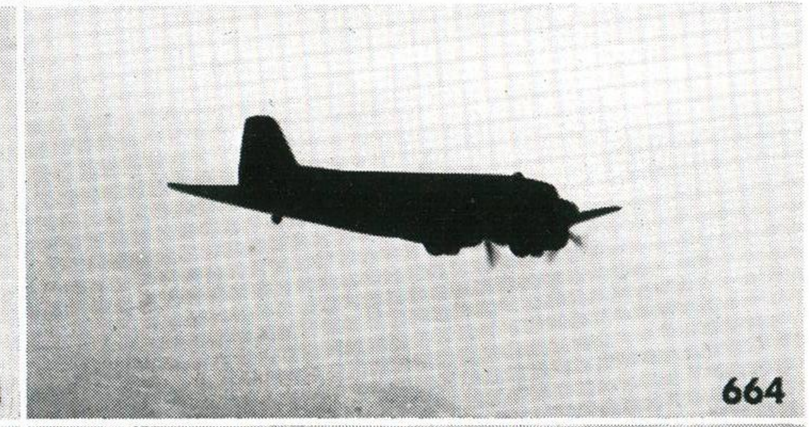

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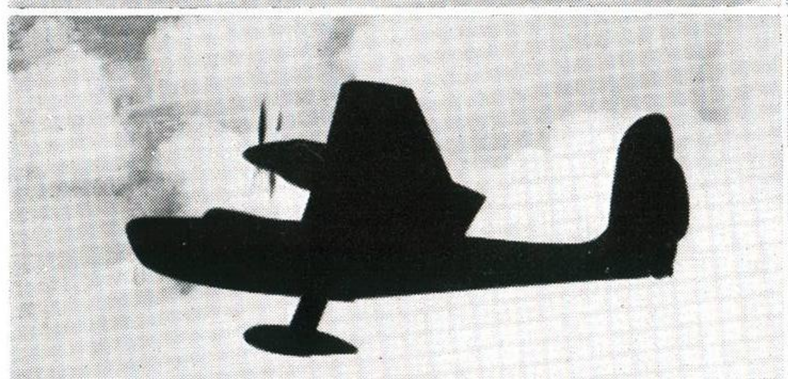

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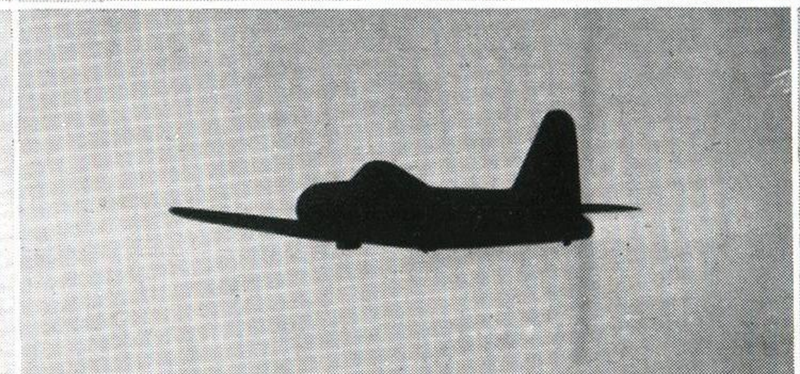

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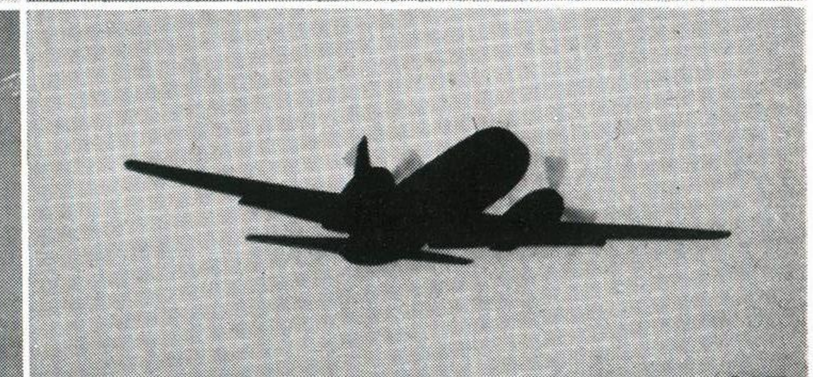

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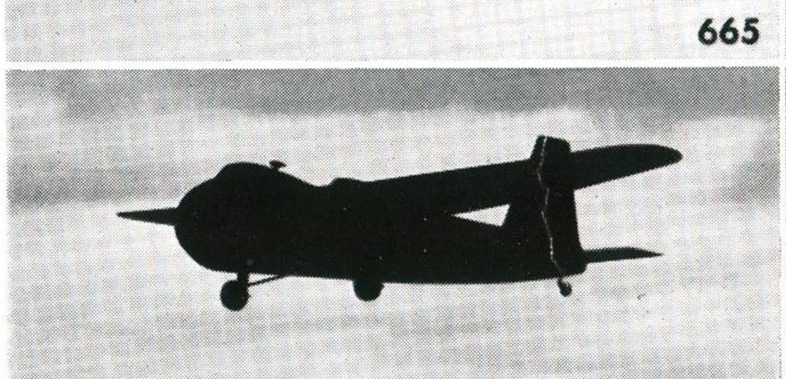

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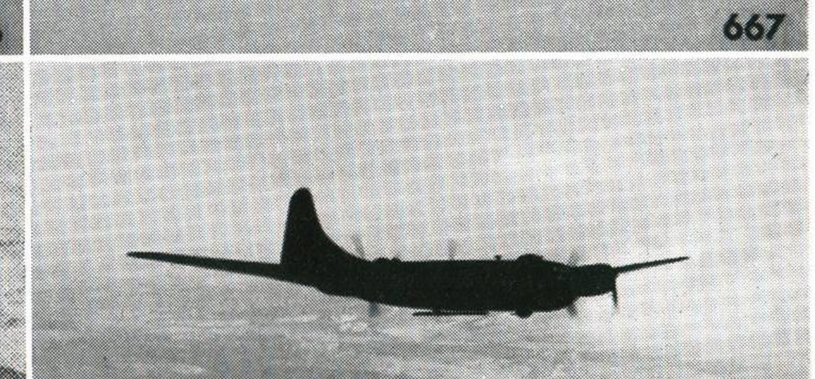

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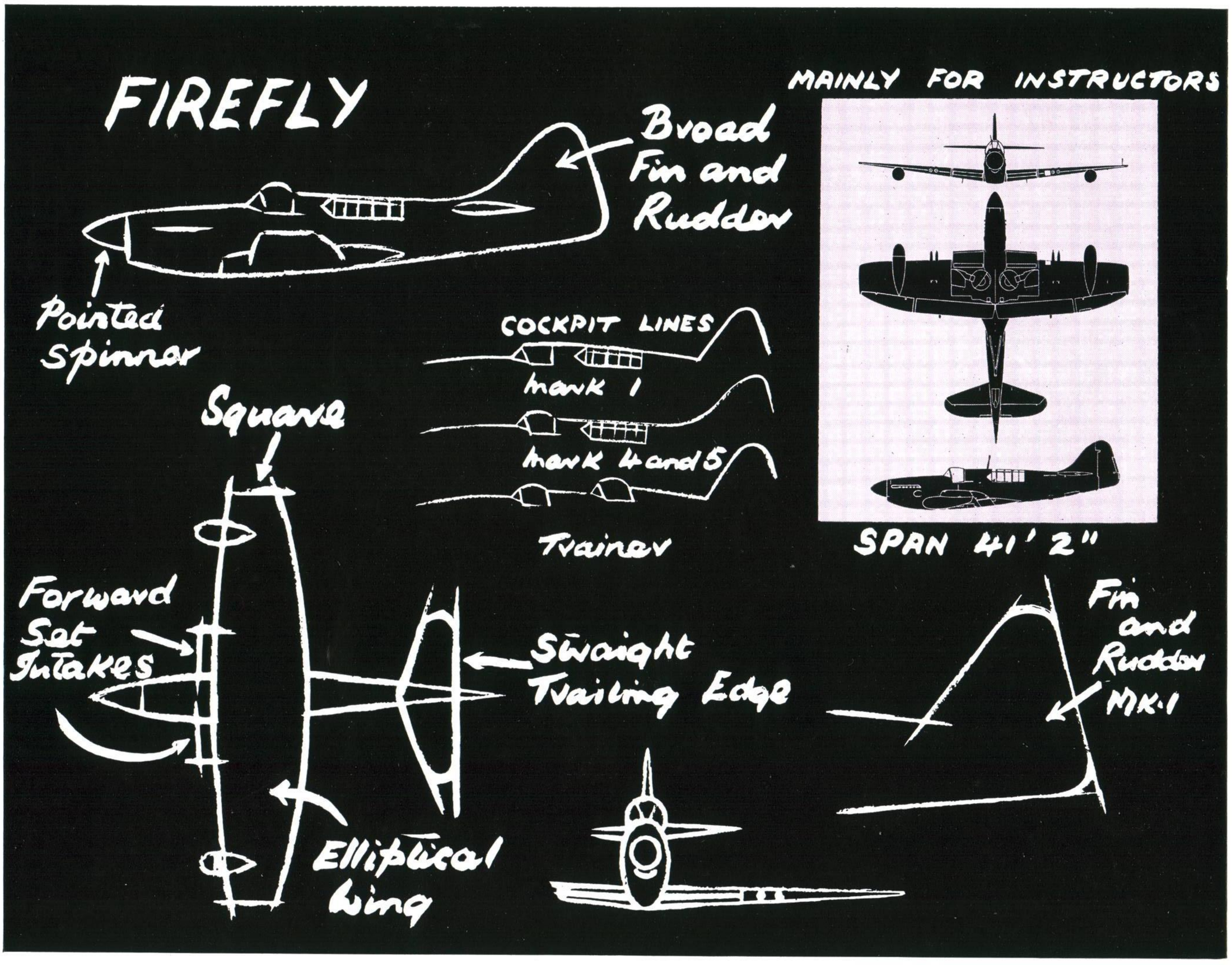

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It is difficult to decide whether the Fairey Firefly has had more changes of form than of function. Since it first flew, eight years ago, it has fulfilled no less than five separate functions and continues to do so. They are : reconnaissance (FR Mk. 1, FR Mk. 4. FR Mk. 5) night-fighting (NF Mk. 5) anti-submarine (AS Mk. 5) operational training, and target towing. In achieving this adaptability the Firefly's profile has undergone a number of changes, and of its main structures (wings, engine, fuselage, tail unit) none has escaped re-shaping at one time or another. All marks however retain the basic elliptical wing set well back on the fuselage, and a " fan-tail " tailplane which is set full forward of the rudder eaving a good deal of nose and rudder sticking out fore and aft respectively. In between will be found a variety of fuselage outlines which our drawings illustrate. The original fin and rudder shape has been altered only by a sort of switch back, or " S " bend, in the leading edge. The article by John Taylor on page 92, aptly entitled " The Versatile Firefly," tells the whole story of the Firefly and its re-shaping.

Entomologists will tell you that the Firefly survives only in the warmer regions of the earth's surface. Its Fairey-built namesake however, flourishes regardless of climate or temperature, and is to be found in numbers in Great Britain, Canada, Australia, the Netherlands and Sweden. Doubtless it will also be seen in other far corners of the earth in His Majesty's Aircraft Carriers.

TECHNICAL DATA :

Type : **Low wing, single-engine monoplane with single fin and rudder.**
Duties : **Naval Fighter-Bomber.**
Builders : **Fairey Aviation Co., Ltd.**
Engine : **One Rolls-Royce Griffon in-line engine of 2,245 h.p.**
Performance : **Max. speed : 386 m.p.h. at 14,000 ft.**
Max. range : 1,300 sea miles.
Armament : **4 20 mm. Hispano cannon in wings. Various combinations of bombs and rockets.**

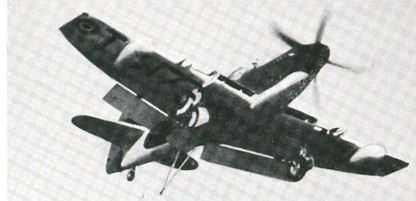
RECOGNITION DETAILS :

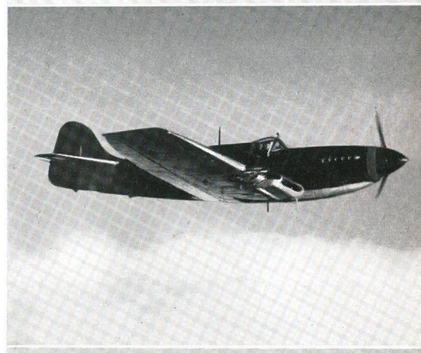
Wings : **Low-set, elliptical, protruding radiators at leading edge roots, clipped tips, moderate dihedral from roots, provision for drop tanks inset from wing-tips.**
Engine : **Pointed, small lip intake duct beneath.**
Fuselage : **Deep curved base line forming angle with fin and rudder, straight top aft of stepped up cockpit.**
Tailplane : **Set well forward on fuselage through fin base, near triangular with marked taper on leading edge and pointed tips.**
Fin and Rudder : **Triangular with " hump-curve " leading edge.**
Main Features : **Elliptical clipped wing, triangular tail surfaces, or " fan-tail " tailplane ; nose-up flying attitude.**

The FIREFLY 4 & 5



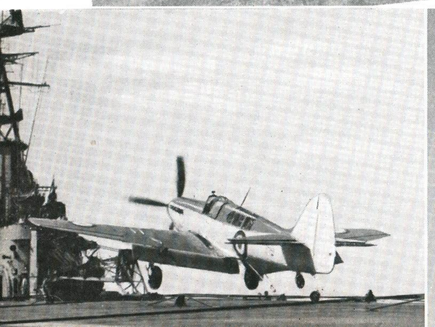
FAIREY









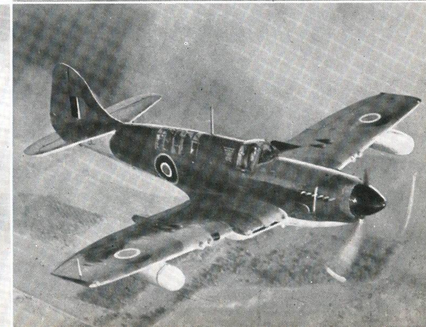












The VERSATILE FIREFLY



THE FAIREY FIREFLY is in a class by itself. Even if it were not the only two-seat, single-engined naval reconnaissance-fighter in the world, its unrivalled versatility would certainly justify that claim.

Clue to its versatility is that second cockpit behind the pilot, for it is becoming increasingly apparent that, except during short-range daylight interceptor missions, a present-day Service pilot has quite enough to do in flying his aircraft and firing its guns, without having also to keep an eye on all the complex radio and radar devices which help to tell him where he is and where his target should be. It is to the credit of the Royal Navy that it realised the value of a second crew-member in its long-range reconnaissance-fighters long before the Firefly was conceived.

BY

JOHN W. R. TAYLOR

Because its designers have been able to combine a two-seat layout with good performance and a rugged airframe, the Firefly is in service to-day for duties ranging from fighter-reconnaissance and anti-submarine patrol to operational training and target-towing, by day or night, in all climates, from land and sea bases.

Designed to a strict Naval specification, based on two earlier Fairey project tenders, the prototype Firefly flew on 22nd December, 1941, less than 18 months after the Admiralty had approved the mock-up and given the Company the go-ahead for production. It was an orthodox low-wing monoplane, but from the recognition point of view its semi-elliptical wings, nose radiator duct and large Fairey-Youngman wing flaps made it a " cinch "—a feature happily shared by certain other Fairey types.

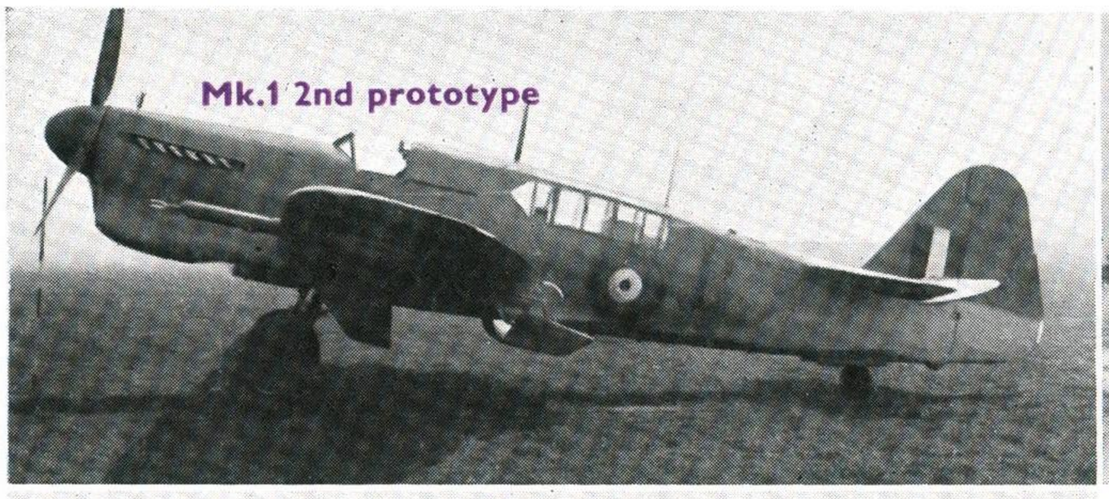
The prototype was followed within a few months by a number of pre-production Mk. I's, which were taken over by the Navy for Service testing. Experience with these aircraft led to a few minor modifications, including a taller windscreen and bubble hood on the pilot's cockpit to improve forward view, and a reduction in size of the rudder mass-balance. Later, fairings were added over the protruding muzzles of the aircraft's four 20 mm. Hispano cannon.

The first genuine production batches of Firefly I's were supplied in secret to H.M. Aircraft Carriers in July, 1943, and made their début soon afterwards in Norwegian waters. Later they achieved an outstanding success thousands of miles from Norway, with a shattering rocket attack on Jap-held oil refineries at Palembang, Sumatra, from which the Eastern enemy drew 75 per cent of his aviation fuel. A single squadron devastated this vital plant, which the Americans had graded as a target of maximum importance and difficulty. (One pilot remarked afterwards that the Fireflies had certainly put the " bang " in Palembang). It was, however, merely the start of a fine record of achievement in actions which ranged from the Arctic to the Tropics and ended only when Fireflies became the first British aircraft to fly over Tokio in World War Two.

Simultaneously with the Firefly I's, Fairey's built 37 Firefly N.F. Mk. II's designed specifically for night interception. They were basically similar to the Mk. I's but had twin radomes fitted in the leading edges of their wing centre-section, and a longer fuselage. The latter proved necessary when numerous weighty radar sets were installed in the rear fuselage, so upsetting the aircraft's C.G. that the engine had to be moved forward 18 in. to compensate for the added weight aft. The space thus provided between the cockpit and engine was filled with further radar equipment.

After a time, improved, more compact radar equipment became available, which could be carried in a bomb-shaped container slung beneath the centre-section of the Firefly I. As the standard FR Mk. I could thus be adapted to fight by night as well as day, whenever required and without structural modification, production of the Mk. II was brought to an end.

As a point of interest, a Firefly I was sent to the U.S. Navy experimental base at Patuxent, Washington, for demonstration and " evaluation " flight tests, during which it was flown for 80 hours in 10 weeks, mostly at night. It proved very popular there, especially after a series of mock combat interception trials in competition with a Hellcat, in which it gained the honours on every occasion.

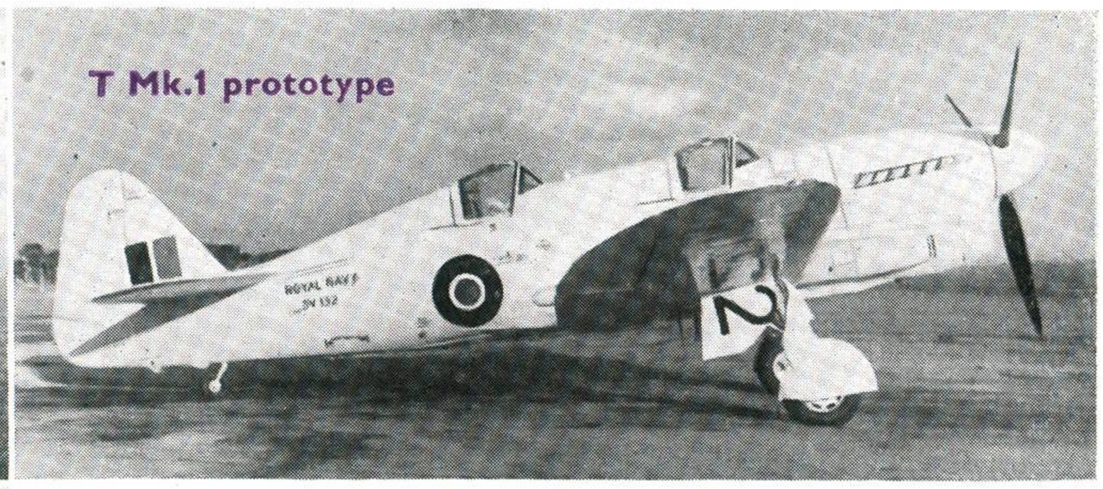

Mk.1 2nd prototype


Mk.2 prototype

All these early Mk. I and Mk. II aircraft were powered by 1,730 h.p. Rolls-Royce Griffon IIb power plants, which had been specially developed for naval use to give maximum output at sea level, while maintaining adequate power up to operational heights. After a time, the slightly more powerful Griffon XII appeared, and this engine was fitted to all Mk. I's subsequent to the 470th machine, without external modification.

When the first two-stage Griffon 74's were produced some time later, one was installed in the Firefly III prototype. which had an orthodox underslung nose radiator like the Mk. I, in a bulbous, crescent-shaped duct. It was decided, however, that to make the best possible use of the greatly increased power of the new engine (2,245 h.p.), a major re-design of the forward end of the airframe would be necessary. So the radiators were moved to the wing leading edge and the engine cowling revised to make it as clean and close-fitting as possible. This resulted in the well-known Firefly 4, which superseded the Mark I in production for the Royal Navy and Royal Netherlands Navy. The first production Mk. 4 flew on 25th May, 1945.

From the spotter's point of view, it is just as distinctive as the Mk. I. The prototype had Mk. I wings and tail unit, but for production 20 in. were cut off the end of each wing, the tips being left square, and the leading edge of the fin was extended forward in a convex curve. These features combine with the leading-edge radiators and the Fairey-Youngman flaps to give the Firefly 4 a low confusibility factor, except possibly in head-on view. Even then, the fact that all aircraft normally carry a radome under their starboard wing tip and a fuel tank under the port tip is a great help. At times they also carry an assortment of rockets, drop tanks and bombs,


T Mk.1 prototype

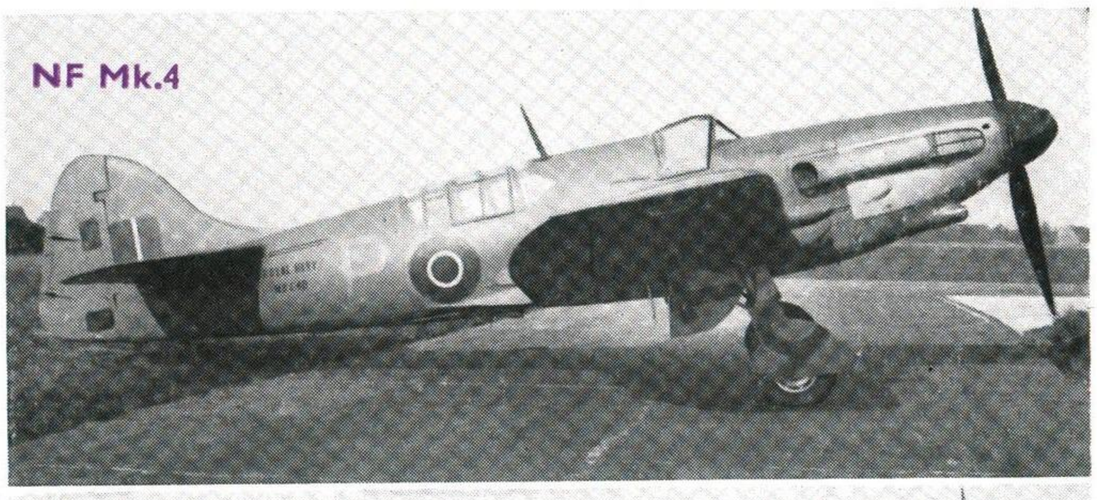
which are not so helpful to spotters but make the Fireflies extremely formidable fighting machines.

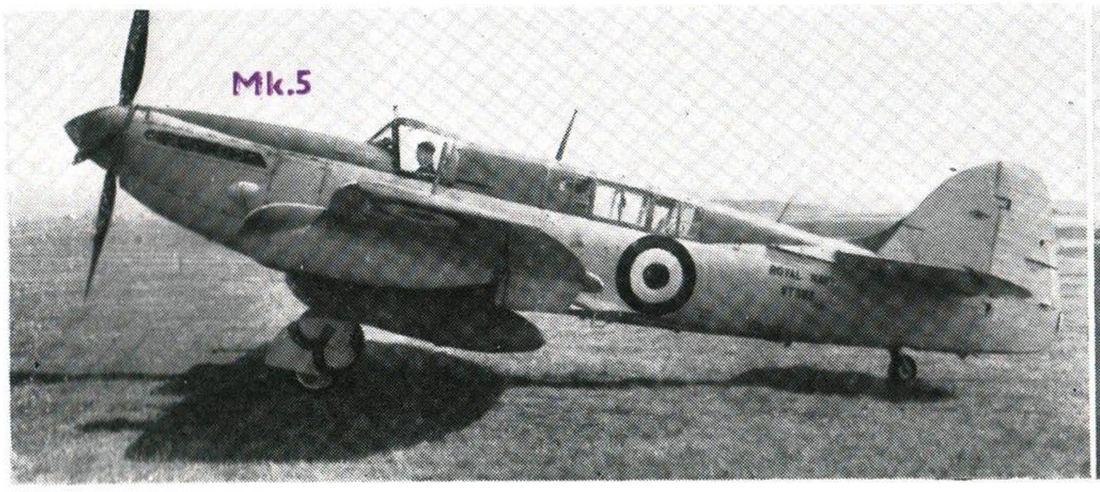
Early production Mk. 4's had a small scoop air intake under the engine, but this gave way later to a cleaner " mouth " intake directly behind the spinner of the 4-blade Rotol propeller. Incidentally, one aircraft was fitted experimentally with a contra-prop., but as this gave no marked improvement in performance or to the already good handling characteristics, it was not adopted for production.

In 1948 the Firefly design was carried a stage further when the Mark 5 superseded the Mk. 4 on the assembly lines at Fairey's factory at Hayes. Externally there is little difference between the two. Internally, radio and " electrickery " mods enable the Mk. 5 to be used at will for day fighter-reconnaissance (FR Mk. 5), night fighting (NF Mk. 5) or anti-submarine patrol (AS Mk. 5), with specialised equipment and armament to suit each rôle. As the Firefly has also been cleared for operation in all climates it is probably, from the operational commander's viewpoint, the aircraft with the widest flexibility of employment in the world.

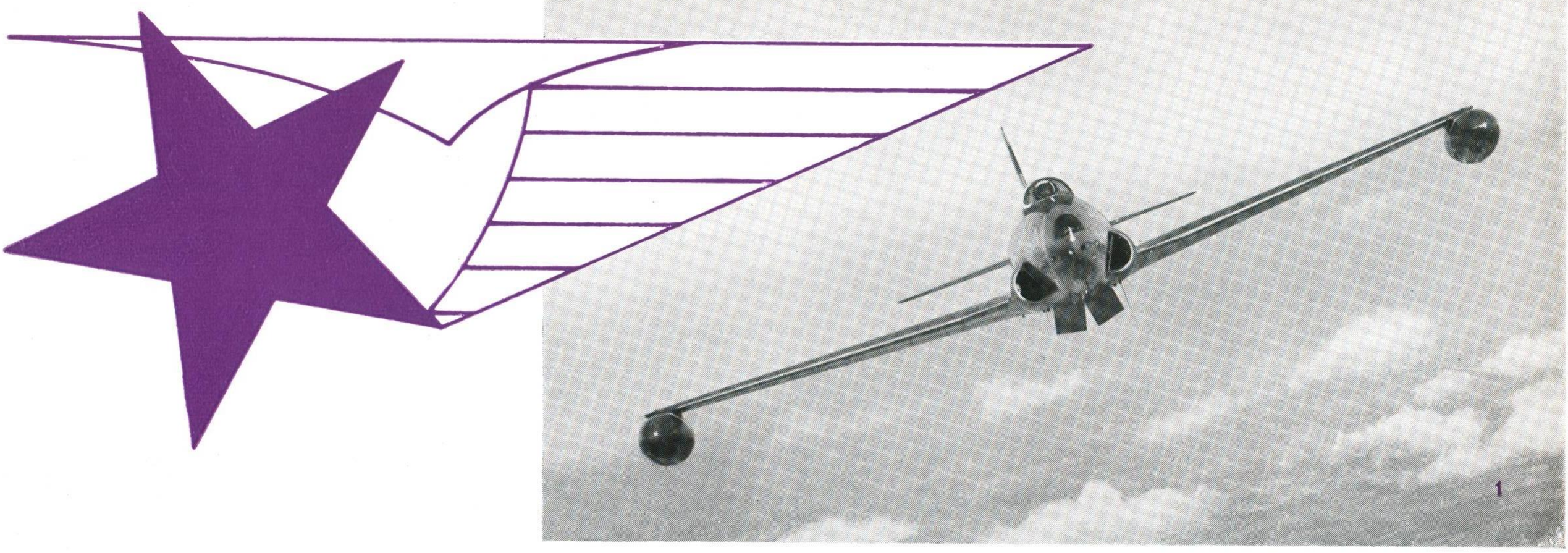
Meanwhile, many Mk. I's are still giving good service as reconnaissance-fighters and, in slightly modified form, as tactical flying and weapon trainers (Mks. T.1 and T.2 respectively) and, in Sweden, as high-speed target tugs.

To date, well over 1,300 Fireflies have been delivered to the Navies of Great Britain, Australia, Canada and the Netherlands, including 132 Mk. I's built by General Aircraft, and the type is still in full series production. Indeed, the design is so versatile that the Firefly's greatest rôle may be yet to come.


NF Mk.4


Mk.5


FR Mk.4



ASTRONOMIC FIGHTERS

by "CONFUCIUS"

WHEN, on January 9th, 1944, a new star was seen for the first time over the West Coast of the U.S.A., no astronomer, hopefully searching the corners of outer space, was thrilled by its discovery. In fact, we doubt if any astronomer witnessed that first appearance. The newcomer's arrival was of much more importance to spotters than to any erudite sky-watcher with his telescope and spectrascope, his maps and his charts, for the star, of course, was the prototype XP-80 Shooting Star ; first entry into the jet propulsion field by Lockheed. So was added on that day in 1944 just one more shape to be learnt by you and I, just one more type to go down in the " basic " list, just one more designation to be remembered.

The history of the war-time development in Britain and Germany of the jet engine is well-known, and need not be re-told here. As this article professes to deal with the Shooting Star, however, we will explain briefly how that aeroplane is related to the overall jet development. When Lockheed's were approached by the U.S.A.A.F. (as it then was) with a request that the company should design a single-jet single-seat fighter, American jet engines were in an early stage of development. It was, therefore, decided that a de Havilland H-1 (forerunner of the famous Goblin) should be used, and an engine of this type duly arrived in the U.S.A. in July, 1943. Lockheeds, with Clarence L. Johnson as chief designer, lost no time. Just 143 days after the first request was made, the prototype had been designed, built and flown.

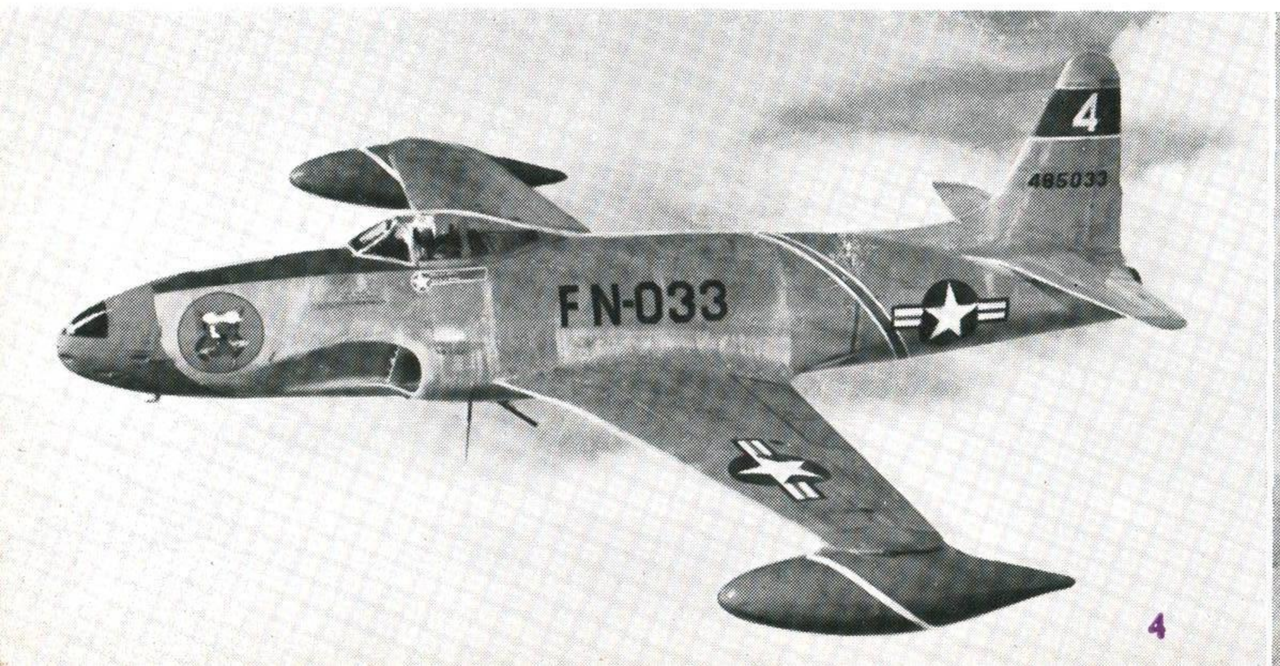
The aeroplane which resulted, designated the XP-80, had a strange appearance to eyes accustomed to piston-engined fighters. Sitting close to the ground on its tricycle undercarriage, it had a long nose, delicately rounded in side elevation but distinctly pointed in plan view. Extending forward from the wing roots were two bulging air intakes which gave the type an ugly facial expression when viewed from head-on. The wings, almost half way back along the fuselage, featured an almost straight trailing edge and considerable sweep-back on the leading edge, with blunt tips. Circular in cross-section, the fuselage, of greater girth than was usual in a fighter, ended abruptly in a circular jet outlet, surmounted by the tall, angular fin and rudder and diamond-shaped tailplane.

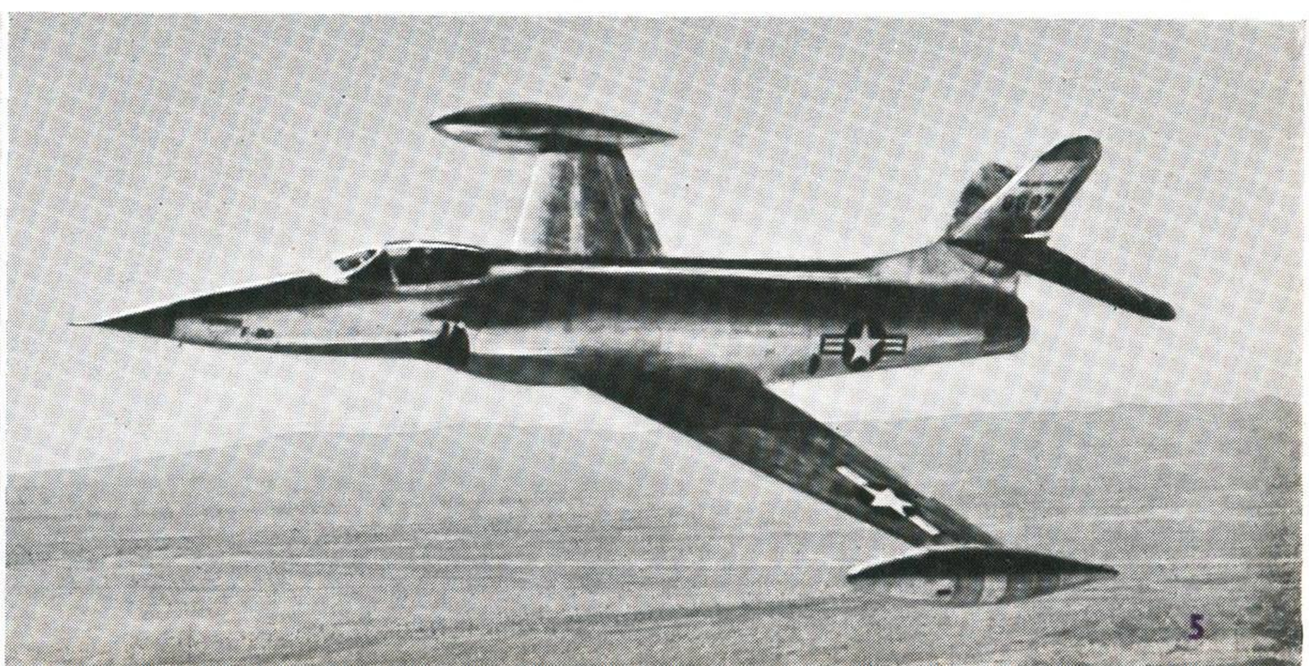
Here then, was our new shape. Its performance, by all standards, was revolutionary, and the U.S.A.A.F. did not hesitate to order a small batch for service testing. An aeroplane going into production in the U.S.A. obviously could not rely for power upon an engine produced in England, with the war-swept Atlantic in between. Therefore, plans were laid for the production of the Goblin in the U.S.A. The American designed General Electric I-40 gas turbines was by this time reaching a satisfactory stage for service, however, and all Shooting Stars since the first prototype have in fact used the latter engine, now known as the Allison J-33.

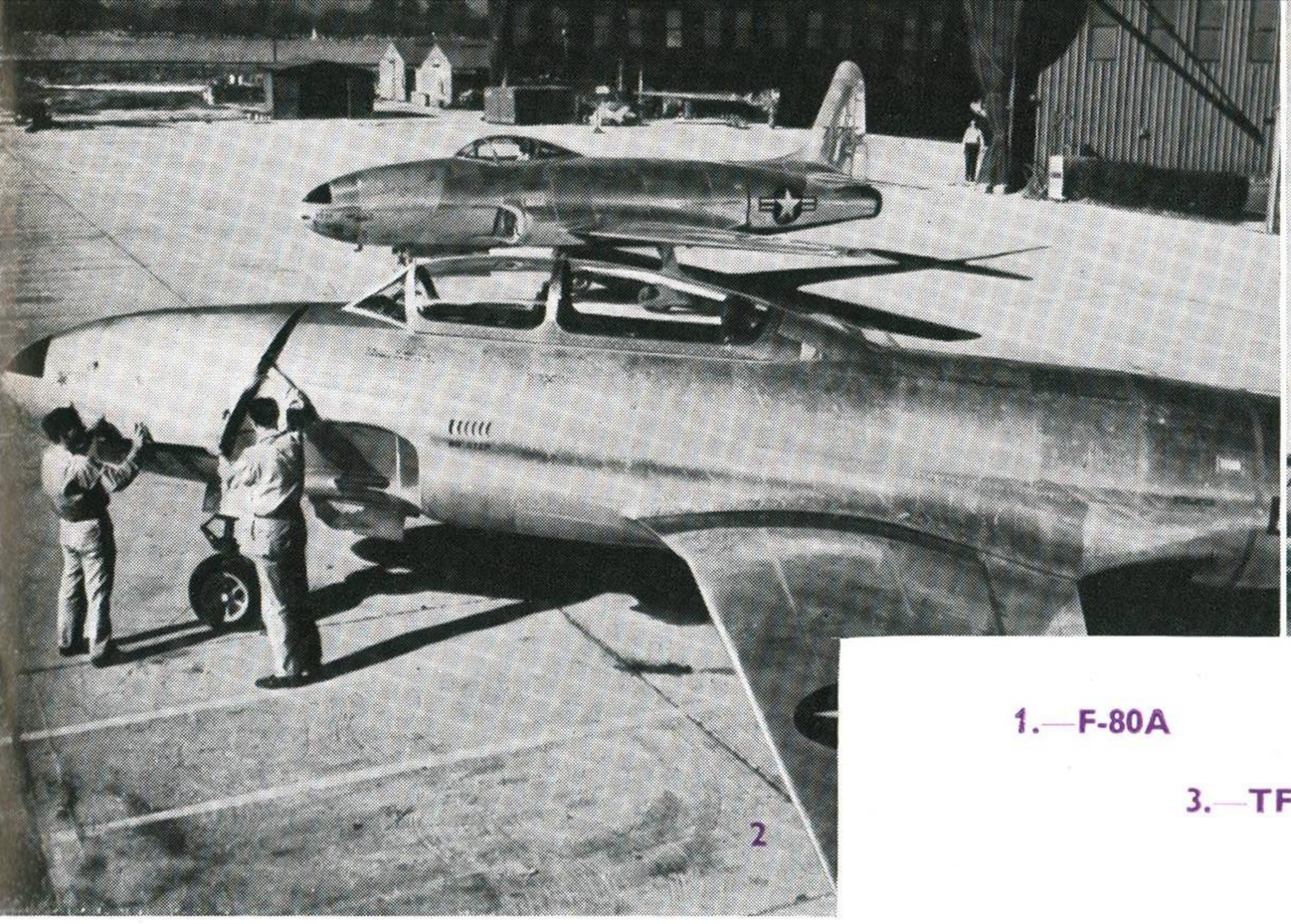
As a result of the new engine being fitted, and using data accumulated with the first prototype, certain modifications were introduced on the service test batch of YP-80A aircraft. Most important of these modifications, from the spotter's viewpoint, was the use of rounded wing-tips, tailplane tips and fin and rudder top. The forward fuselage was also re-designed. As the F-80A and now officially named the Shooting Star, the type went into large-scale production, and before the War ended American-based squadrons were being re-equipped. No true operational experience was gained with the type, but two of the early models were flown in Italy during 1944, chiefly to obtain data on operations in the Mediterranean climate.

The first opportunity given to British spotters of seeing the Shooting Star in the air came in 1946, when one example was brought to England. It went to Rolls-Royce's establishment at Hucknall, where a Nene gas turbine was fitted, and was frequently seen in the air in that district.

To increase the range—ever a pressing problem with jet fighters—long-range tanks were introduced, in a novel position. Tanks of 150-gallon, and later 300-gallon capacity, were fitted to the wing-tips, snuggling against the under side and projecting outwards beyond the true span. These tanks,









1.—F-80A 2.—TF-80C

3.—TF-80C

almost always fitted, are a characteristic feature of the Shooting Star's general appearance in the air, although, of course, it is never safe to base recognition solely on a feature of this kind.

Variety Unlimited

All good aeroplanes, it seems, quickly succumb to the urge of the specialist to " modificate ". The P-80 proved no exception. In the first place, it has been the subject, as a single-seat fighter, of the usual kind of development aimed at increasing production. This has led to the following versions (all current fighters are, of course, now designated " F " and not " P ") :

F-80A. Original production version with the Allison J-33-21 engine (General Electric design). Most were later modified to F-80B.

F-80B. Engine as for F-80A, but service improvements, including provision for water/alcohol injection to boost engine power, rocket launchers under wings, and a strengthened nose section to permit greater fire power. A new thin wing is used for high speed, though the plan shape remains unchanged. Used by U.S. Navy for training as the TO-1.

F-80C. Current production model, similar to F-80B but with improved Allison J-33-23 enigne.

To suit the Shooting Star for use as a photographic reconnaissance aeroplane, early in its career a new nose was developed, in which cameras were carried in place of guns. Apart from having the camera window, this nose is distinguishable by being longer and blunter than the fighter nose. The first two such aircraft were designated XF-14 and XF-14A (when "F" was used for photographic aircraft, not fighters), but the version is now known as the RF-80A, B, or C as the case may be.

The use of jet fighters has brought about associated problems in the technique of pilot training and conversion. To cater for the new requirements, Lockheeds set to work on a new version, which appeared in 1948. This is the TF-80C, being basically an F-80C with a re-designed cockpit and forward fuselage. Two occupants are seated beneath a long " glasshouse," and have full dual control. This cockpit canopy, combined with the usual lines of the Shooting Star, is an immediate clue to the TF-80C, which is used by the U.S. Navy as the TO-2.

Development of the two-seat F-80 opened up the way for a later version, which made its appearance earlier last year. This is by way of being a stop-gap for use as an all-weather and night fighter, a major requirement of the U.S.A.F. at the present time. Using the lengthened fuselage and two-seat cockpit of the TF-80C, this new version, designated the F-94, has a bulbous nose carrying radar scanner equipment in addition to four 0.5 machine guns. "Afterburning" or jet-pipe reheating (remember the Vampire and Meteor at Farnborough in September ?) is used, giving the rear fuselage an increased diameter.

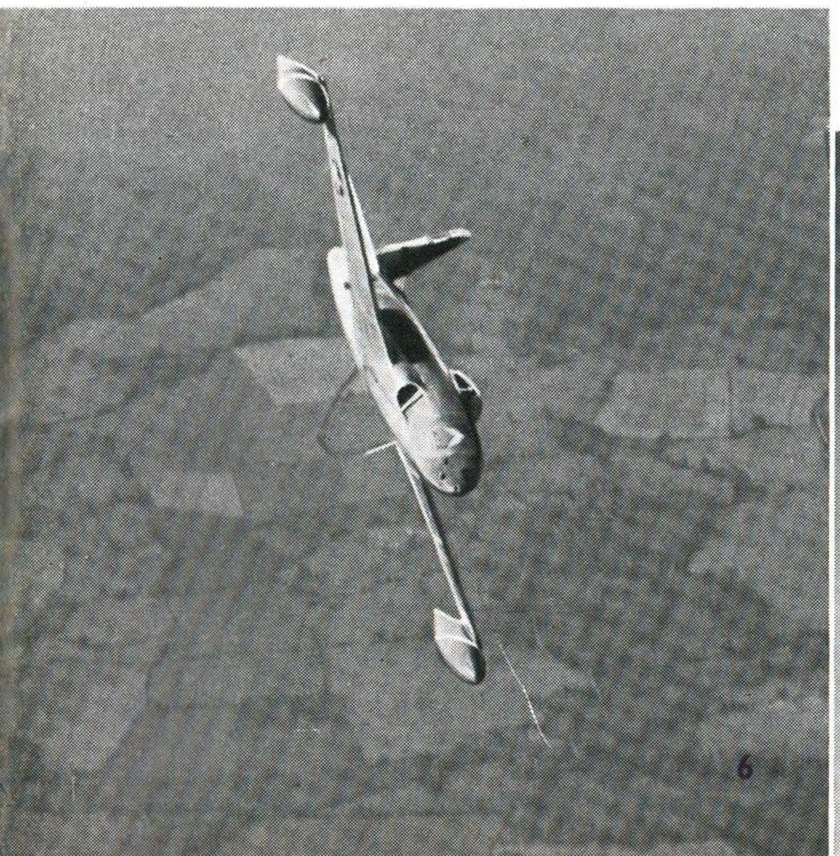
Briefly re-capping, then, we can use this as a working guide :—single cockpit and " elegant " nose mean a plain F-80 ; single-cockpit and bulbous nose, the RF-80 P.R. job, lengthened fuselage and cockpit, with " elegant " nose. TF-80C, and lengthened fuselage and cockpit, bull " snout " and fat rear fuselage, F-94.

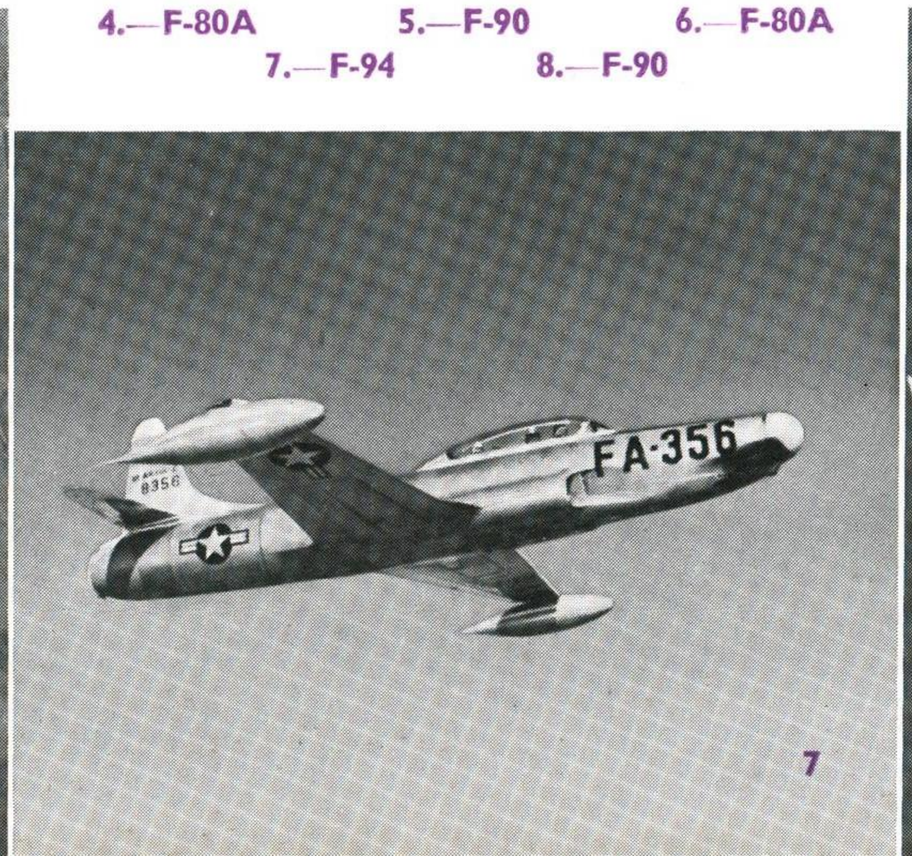
Continuation

Earlier last year, Lockheed announced the first flight of a new jet fighter, the first produced by the Company since the Shooting Star itself and a possible replacement for it. This is the XF-90, an advanced looking " penetration " fighter, though recognisably Lockheed. Arrangement of the air intakes on the XF-90 is similar to that of the Shooting Star, but the nose is finely pointed, and sweepback is used on all surfaces.

4.—F-80A 5.—F-90 6.—F-80A

7.—F-94 8.—F-90

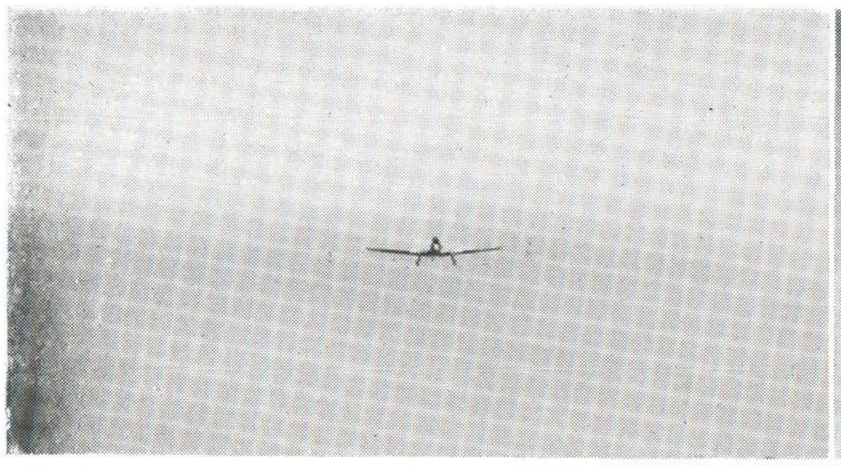




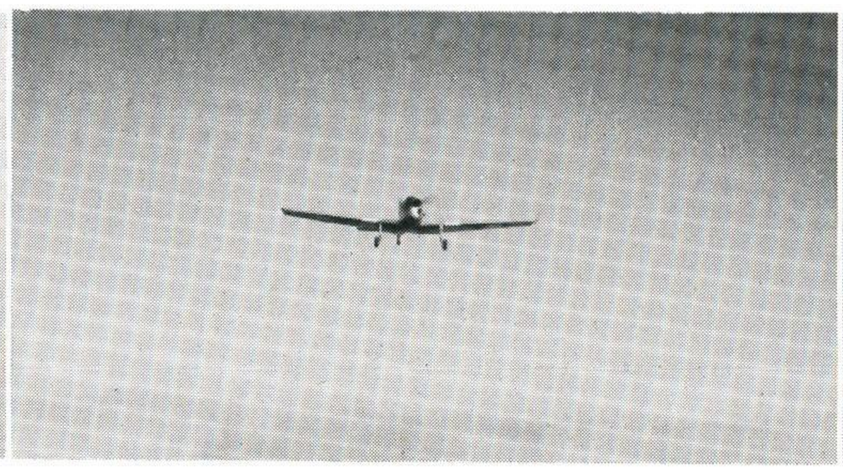


What's the Score?

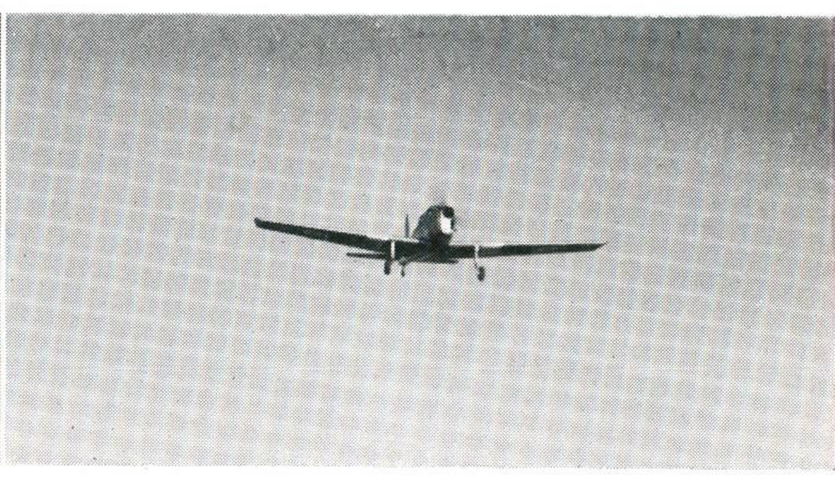
No. 6



1 Single-engine type — low-wing — moderate dihedral——



fixed undercarriage—in-line engine——



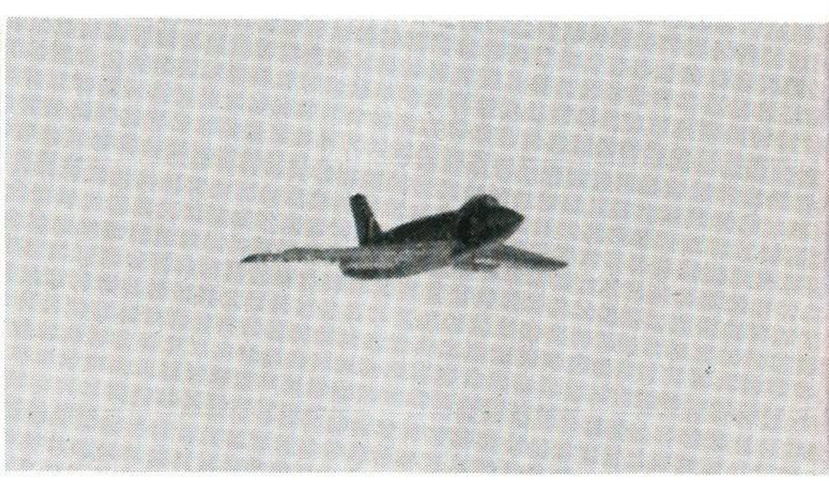
single fin and rudder—square-cut wing-tips——



2 Single-engine type—drooping wing?——



single fin and rudder—cockpit on nose——



swept flying surfaces—cheek intakes—bullet body-form——



3 Twin-engine type—single fin and rudder low-set tailplane——



mid-wing—slight dihedral——



radial engines, high-mounted——



4 High-wing—triple fins and rudders——



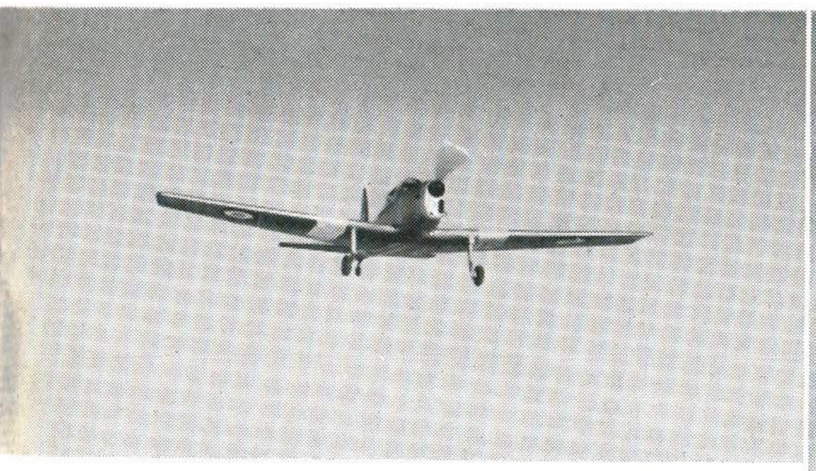
Four engines—slight dihedral——



fat, flat-bottomed fuselage—wide-span tailplane——

Research, Training and Transport

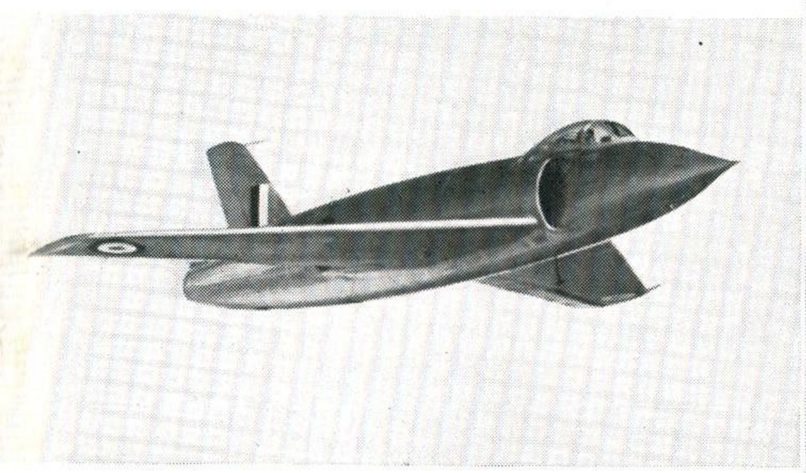
are the functions of the four aeroplanes specially posed for progressive examination here. No. 1 is the ***de Havilland Chipmunk (one Gipsy Major 10 in-line).*** *It is to replace the Tiger Moth, and will be the standard aircraft for training pilots in the R.A.F.V.R. No. 2 is the* ***Vickers Supermarine 510 (one Rolls-Royce Nene turbojet)*** *swept-wing, research development of the Attacker, and forms, with its "drooping wing" aspect an interesting recognition comparison with the Hawker P.1052 (see September Journal page 14). No. 3, the* ***Vickers Varsity (two Bristol Hercules radials)*** *is, as its name suggests, a crew-trainer (further data later). No. 4 is the* ***Handley Page Marathon (four Gipsy Queen 71 in-line)*** *medium range passenger transport/freighter.*



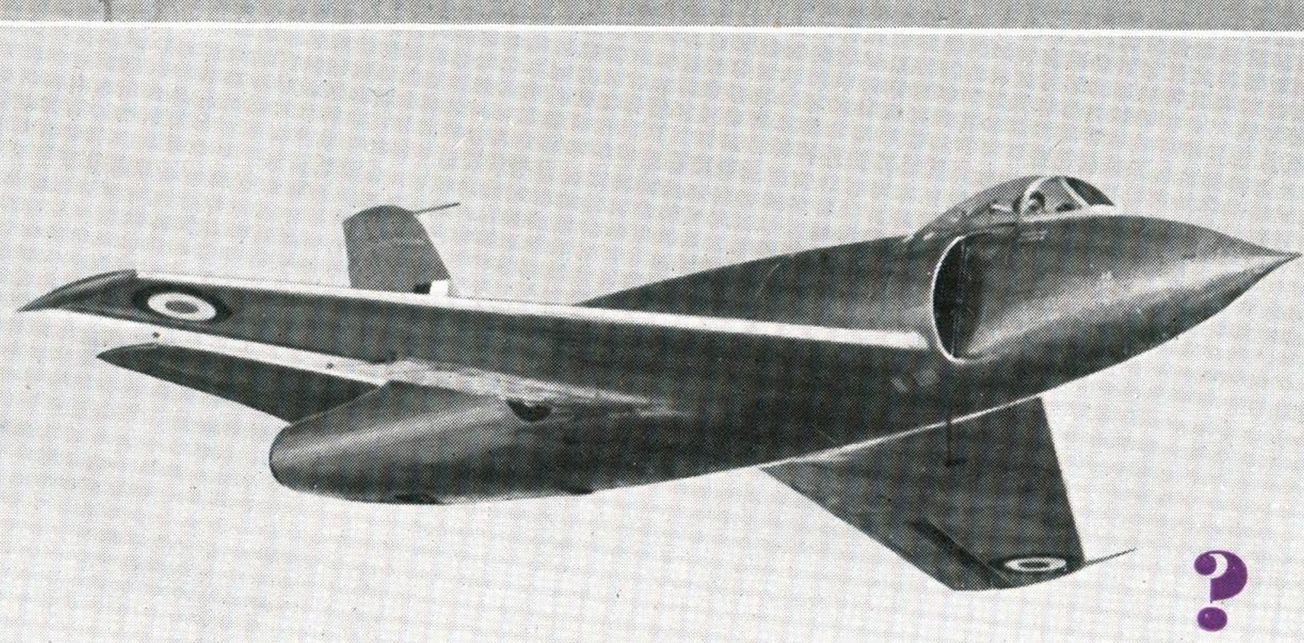
long " glasshouse " over cockpit— pointed fin (spearlike)——



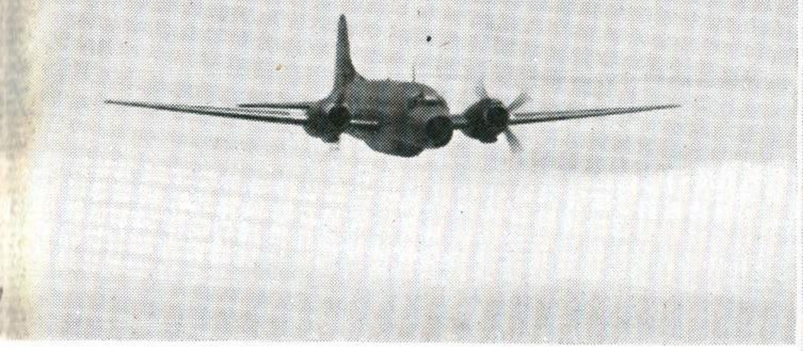
?



squared-off flying surfaces — " needle-point " nose — jet-pipe behind tail——



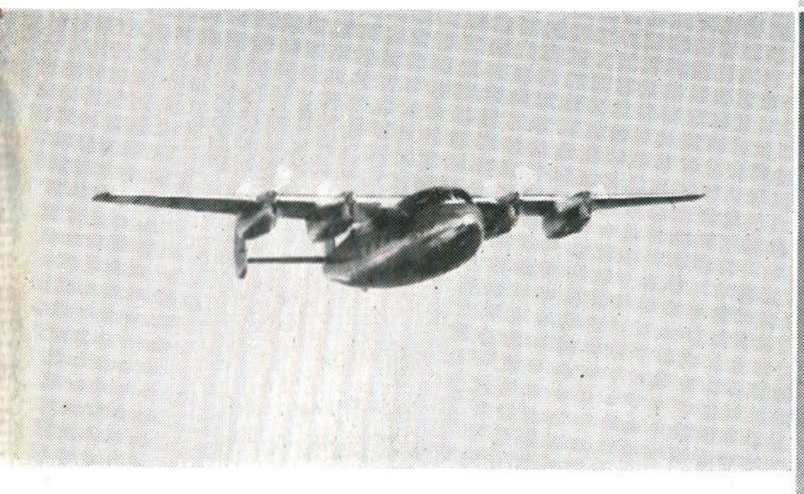
?



large container under fuselage— large fin fairing——



?



streamline fuselage — egg-shaped fins and rudders——



?



R.A.F. Model Aircraft Association Formed

An R.A.F. Model Aircraft Association, to which station model aircraft clubs and individual serving personnel may affiliate, has been formed. There are known to be approximately 2,000 model aircraft enthusiasts in the R.A.F., and it is believed that a far greater number exist, and may come forward now that model aircraft activities in the Service are to be put on an organized basis. There are some 150 model aircraft clubs throughout the R.A.F.

Details as to affiliation fees, competitions to be organized, and other aspects of the association will be made known shortly, after a meeting between officers of the association and members of the Society of Model Aeronautical Engineers.

One of the association's first plans is to hold, this year, a model aircraft competition, embracing all Commands, to be followed by an open R.A.F. Model Aircraft Competition involving all types of models.

Group Captain C. G. Pearce, of R.A.F. Station, Debden, Essex, Technical Training Command's representative for model aircraft clubs, has been elected chairman of the association, with Squadron Leader R. B. Lord, R.A.F. Station, Wittering, Northants, and Flight Lieutenant C. S. Cooke, D.F.C., A.F.C., D.F.M., of Headquarters, R.A.F. Transport Command, as honorary secretary and treasurer, respectively. Representatives of all commands, and of No. 90 Group, have been appointed.

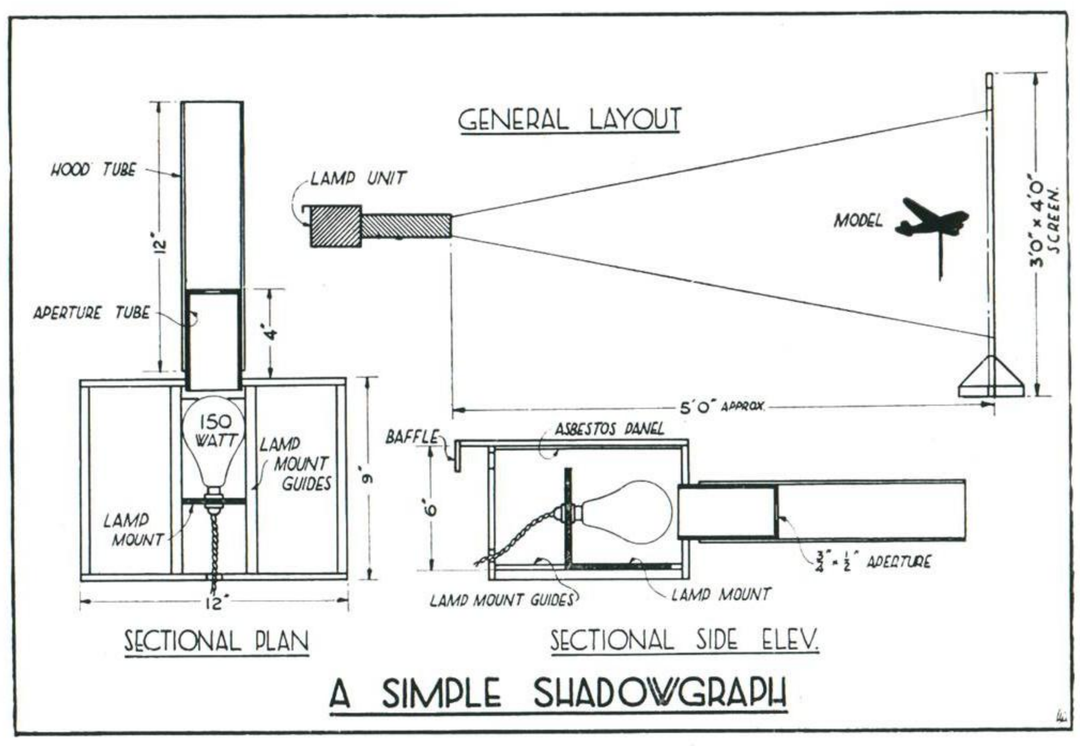
Speaking of the importance of organizing model aircraft activities within the R.A.F. Group Captain Pearce said that if the new association was to prove really helpful to model aircraft clubs and individual enthusiasts it would need the whole-hearted support, financially and otherwise, of all interested persons. Only through such support would the association be able to increase, as it hoped to do, the model aircraft facilities now available on R.A.F. stations.

" The average airman does not get airborne very often," said Group Captain Pearce, " but interest in model aircraft is a very important thing, and can teach members of the R.A.F. a great deal about real aircraft. Through working models, the airman can learn about such invaluable principles applicable to real aircraft, as trim, centre of gravity, weight-to-power ratio, and methods of construction."

(As Group Captain Pearce did not specially mention the great value of making scale-model aircraft as an aid to aircraft recognition training, we asked him if he included the encouragement of scale-modelling in the activities of the clubs. He said it certainly did, and, to use his own words " I am flat-out for scale-modelling of aircraft ; it is an excellent aid to recognition training." We hope everyone learning aircraft recognition will take a keen interest in the station model aircraft club—Ed.)

❖ ❖ ❖

Gadget Corner



If you need a shadowgraph, here are simple plans for making one. They can be enlarged to actual size by epidiascope and traced off.

Any Ideas ?

The following useful hint for adding interest to aircraft recognition talks has been received from Observer D. E. Charles of Group 5/H1 Post, Royal Observer Corps.

Briefly it is this : Between training meetings, the instructor cuts from his daily paper all details of aircraft in the news, particularly the headlines. He then selects two or three with the best news value and finds a good photograph of each aircraft mentioned. The picture is shown on the epidiascope and at the same time the instructor delivers a summary of the news item, following it up with a chat about its recognition details and any other available material data.

Editorial Comment : This idea might also be used to fill up odd spaces on notice boards.

Aerogram



Have no Rata (Answer on back page)

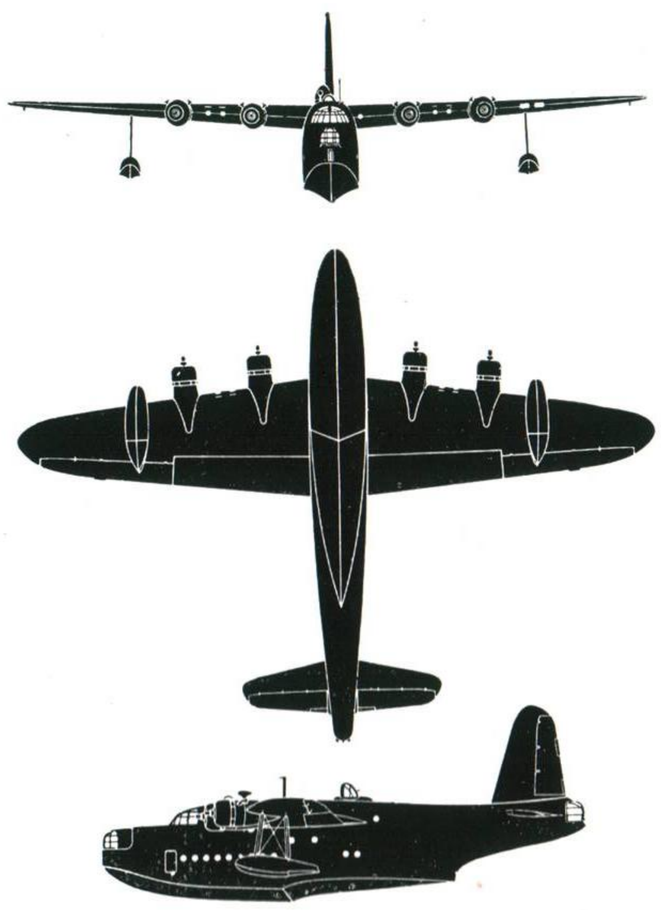
Solid Fact

An Army officer took his troop to an airfield for the purpose of encouraging their enthusiasm in Aircraft Recognition. As they gathered round the door of an Oxford to look at its interior he was slightly staggered to hear one of his men remark " Blimey ! it's 'oller ! "

(This is rather sowing the wind, from which we expect to reap a whirlwind of stories, from all Services, of the " seamy side " of recognition training—Ed.)

SILHOUETTES—SHORT FLYING BOATS

SUNDERLAND GR Mk. 5



British General Reconnaissance

Engines : Four Pratt and Whitney Twin Wasp radials

Span: 112 ft. 9 ins. Length: 85 ft. 4 ins.

Recognition Points

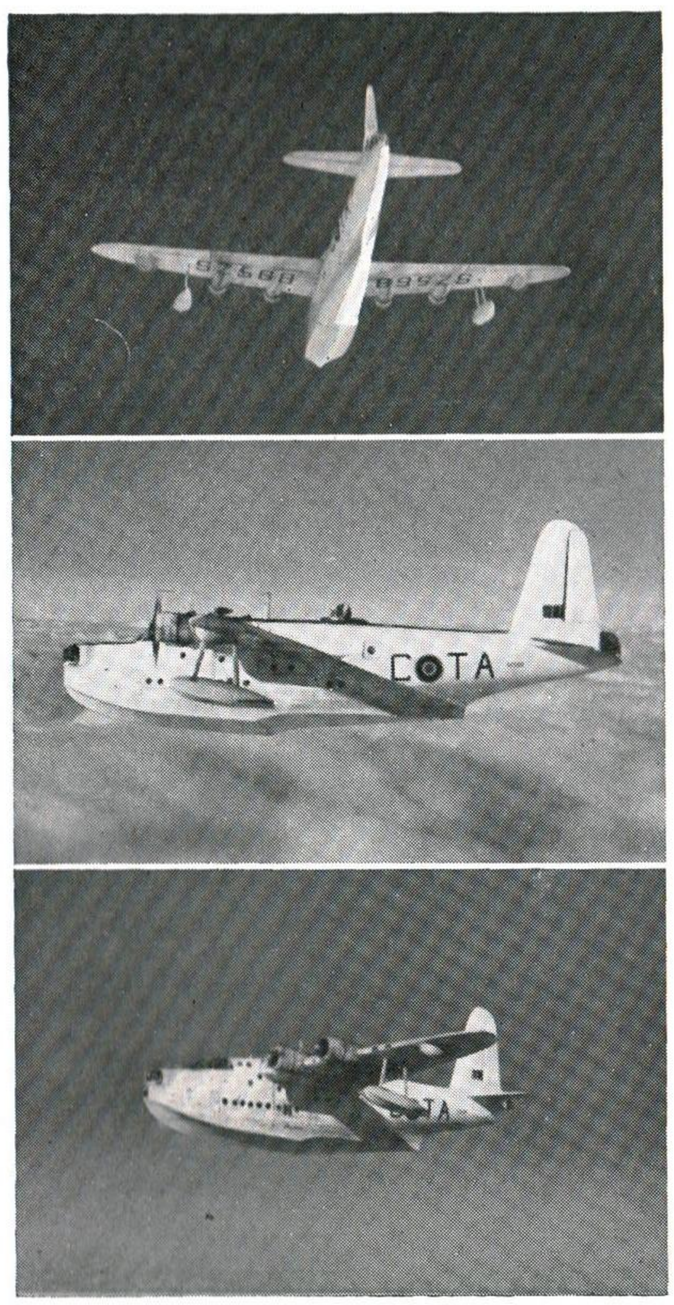
Wings : High, thick, equi-taper, pointed tips.

Engines : Mid-set, slightly offset outwards to line of flight.

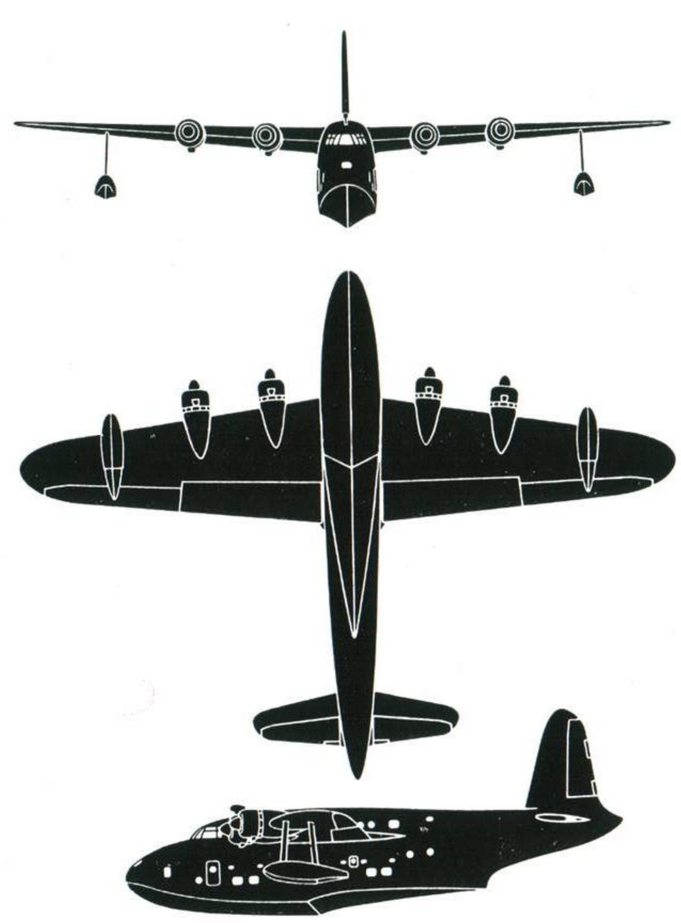
Hull : Deep " stirrup " section with two-step planing bottom ; "dog-nosed" bows.

Tail Unit : Tailplane ; tapered, duo-curve tips, broad tapered fin and rudder with duo-curve tip, tending to lean back.

Detail : Balance floats outboard of engines, nose turret, stepped-up cockpit, mid-upper turret, rear turret at base of rudder forming blunt end-piece.



SANDRINGHAM 1



British Transport

Engines : Four Pegasus 38 radials

Span: 112 ft. 9 ins. Length : 86 ft. 3 ins.

Recognition Points

Wings : High wing, thick, equi-taper, pointed tips.

Engines : Mid-set, slightly offset from line of flight.

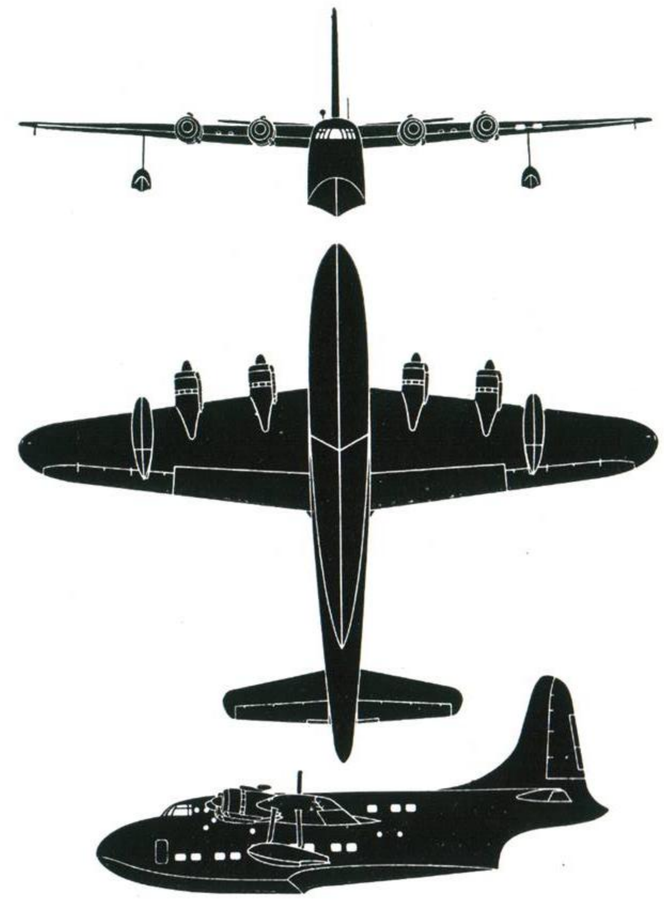
Hull : Deep " stirrup " section with two-step planing bottom, pointed " fish face " bows, pointed tail cone faired to rudder base.

Tail Unit : Tailplane ; tapered, duo-curve tips, broad-tapered fin and rudder with duo-curve tip, tending to lean back.

Detail : Balance floats outboard of engines, stepped-up cockpit, tail cone extends aft of rudder.



SOLENT 2



British Transport

Engines : Four Hercules 637 radials

Span: 112 ft. 9 ins. Length 89 ft. 7 ins.

Recognition Points

Wings : High, thick, equi-taper, pointed tips.

Engines : Mid-set, slightly offset from line of flight, high angle of incidence.

Hull : Deep " stirrup " section with longer two-step planing bottom deeper " S " bend in stern ; pointed " fish face " nose, pointed tail cone faired to rudder base.

Tail Unit : Tailplane ; wider span, equi-taper, duo-curve tips, slight dihedral, prominent fairing on tail fin and rudder, duo-curve tip, tending to lean back.

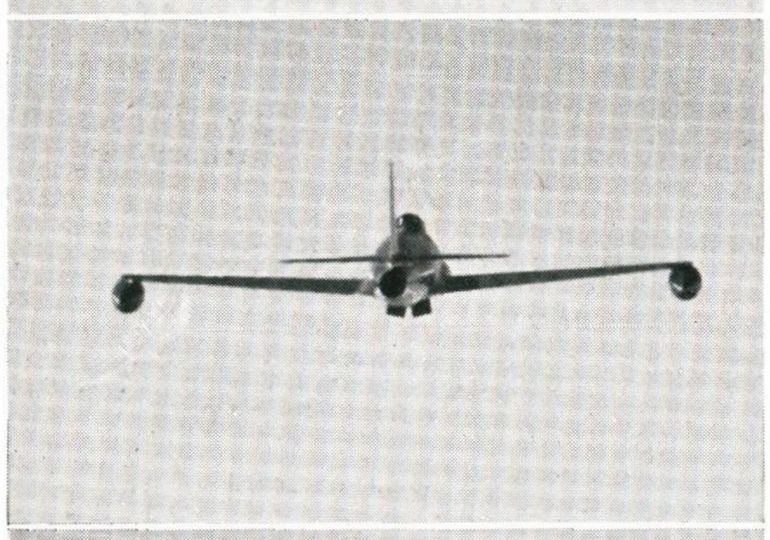
Detail : Balance floats outboard of engines. stepped-up cockpit.





COVER PHOTO : The Lockheed F-90, future fighter for the U.S.A.F., is paced by a Lockheed F-80. It is not difficult to see a family resemblance in the shape of the fin and rudder, even though that of the F-90 is sharply swept back. Below, are further views of the F-80.







SOLUTIONS TO RECOGNITION TESTS IN THIS EDITION :

ADVANCED

896. F9F Panther
897. Wyvern TF Mk. 2
898. Constellation
899. F6U-1 Pirate
900. Shackleton GR Mk. 1
901. Stratocruiser
902. Venom FB Mk. 1
903. Solent
904. Canberra B Mk. 1
905. Hermes 5
906. Bristol 170
907. Canadair DC-4M
908. Firefly FR Mk. 5
909. Sea Fury T Mk. 20
910. Convair-Liner
911. Meteor F Mk. 4
912. Comet
913. Sealand
914. Canadair DC-4M
915. D.H. 113
916. B-36A

(P)—Prototype

SILLOGRAPHS

650. Venom FB Mk. 1
651. P2V-2 Neptune
652. Chipmunk T Mk. 10
653. Comet (P)
654. Athena T Mk. 2
655. Vickers Supermarine 510 (P)
656. Varsity T Mk. 1
657. Sea Vampire FB Mk. 20
658. Sea Fury FB Mk. 11
659. Viking 1A
660. P2V-2 Neptune
661. Wyvern TF Mk. 2
662. Marathon 1
663. Athena T Mk. 2
664. C-47 Skytrain
665. Seagull ASR Mk. 1 (P)
666. FR-1 Fireball
667. Convair-Liner
668. Freighter 21
669. F6F Hellcat
670. B-29 Superfortress

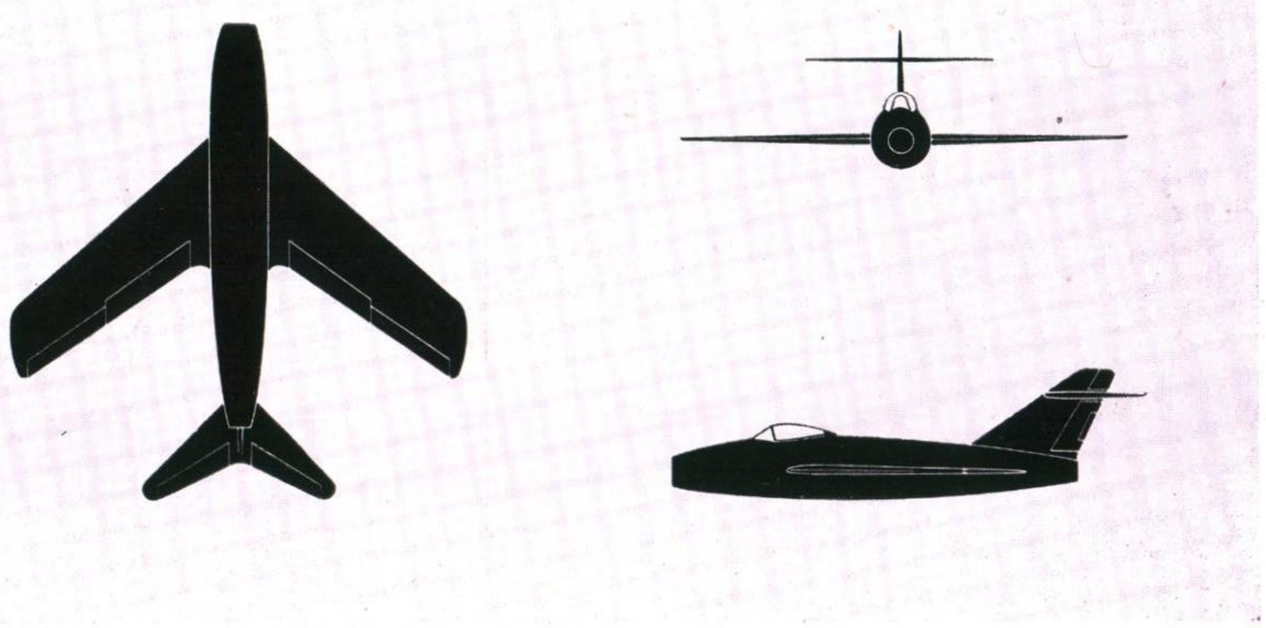
TRICKY TRIO

Left to right: Avro Lincoln B Mk. 2 ; Avro Shackleton GR Mk.1 ; Handley Page Halifax A Mk. 9.

AEROGRAM

HAVE NO RATA=AVRO ATHENA

Nameless Fighter of the Soviet Air Force. A provisional silhouette of a new swept-wing Russian fighter which was seen in some numbers at Moscow's Air Display in 1949.



TRICKY TRIO



The Inter-Services Aircraft Recognition Journal is a monthly publication prepared and produced by the Assistant Chief of Air Staff (Training), Air Ministry, in collaboration with the Ministry of Supply—Controller of Supplies (Air)—Air Technical Publications. Contributions and correspondence should be addressed to the Editor, Inter-Services Aircraft Recognition Journal, Air Ministry, Room 405, Richmond Terrace, Whitehall, London, S.W.1.

52M. 1/50 38-241-0 *Printed under the Authority of H.M. Stationery Office by Fosh & Cross Ltd., London*