JOINT SERVICES

RECOGNITION

Journal

Vol. 6 FEBRUARY 1951 No. 2

For official use only

PACKET

Transport by Fairchild

FEBRUARY 1951 Vol. 6. No. 2

JOINT SERVICES

RECOGNITION JOURNAL

The *Joint Services 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, *Joint Services Recognition Journal*, Air Ministry, Room 405, Richmond Terrace, Whitehall, London, S.W.1.

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FRESH FIELDS

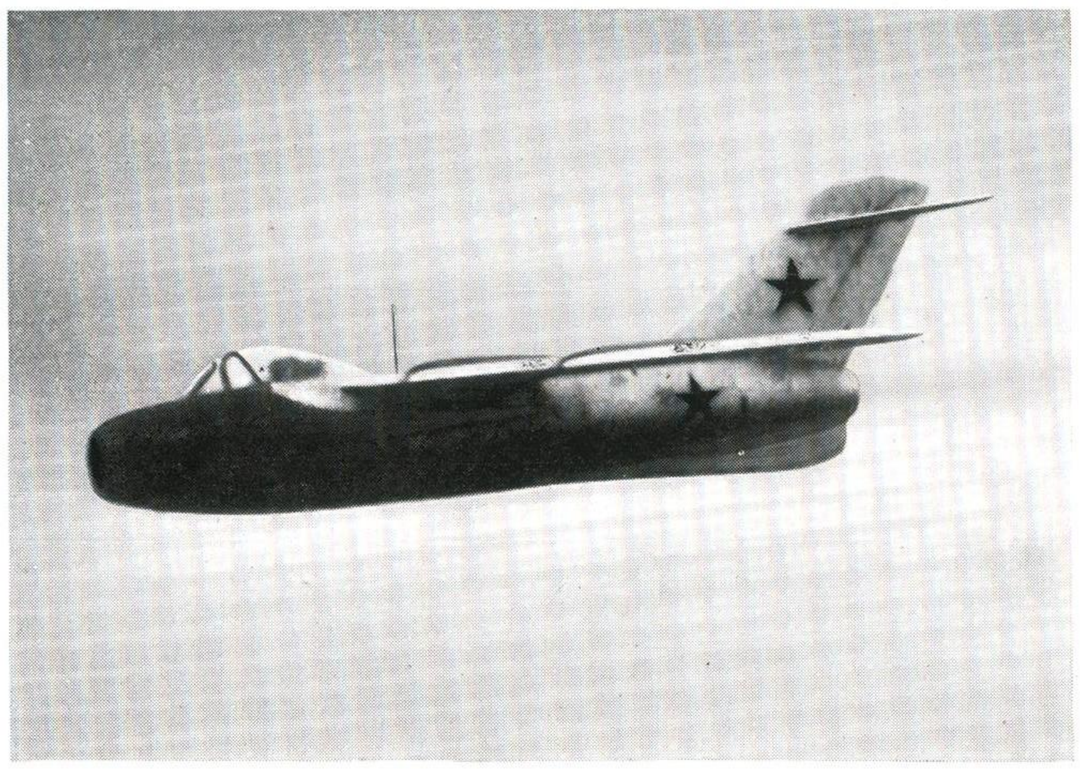
LAST MONTH we introduced into the *Journal* two new objects in the field of visual recognition training: ships and armoured fighting vehicles. This month we include a glossary of some of the technical terms used in warship recognition training—mainly for beginners, and, in respect of armoured fighting vehicles, a recognition test for the already-experienced tank-spotter.

We should, perhaps, make it clear that it is not our intention to progress with ship and tank recognition as one would with classes of beginners. Apart from editorial and production difficulties of such a scheme, there are many readers already in possession of varying degrees of experience in one or other of these fields. We shall, rather, try to cater for everyone in turn and to kill three or four birds with one stone by devising presentations with the widest possible appeal.

Though the principles and techniques of learning to recognize anything are always the same (constant, conscious or unconscious viewing of the object) the operational recognition of ships and tanks from surface level often demands accurate knowledge of detail. The sailor, for example, may require to recognize a ship in certain circumstances by what he can see of her superstructure—when, for example, she is seen hull down. The airman will seldom, if ever, need to do this : he is usually required to take in a ship—indeed a whole fleet of ships—at little more than a glance. Similarly the artilleryman, or the tank commander, may be required to identify an enemy tank by the ill-concealed corner of its turret, or by so small a feature as the form of its glacis plate. The pilot on reconnaissance could hardly expect to recognize by such detail, and would generally be able to identify a tank only when he can see the whole object—or most of it.

It is our intention to cover all these points of view—and any others which develop—in as interesting and efficient a manner as possible. We shall receive great help from readers concerned with ship or A.F.V. recognition if they treat us to the same vigorous and constructive comment which has been a feature—indeed, which was the breath of life of the late lamented *Inter-Services Aircraft Recognition Journal.*

LAVOCHKIN'S LATEST



News is now releasable about the new Soviet swept-wing fighter designed by Lavochkin. In general it is similar to the MIG-15 and a contemporary type of approximately the same performance, but is slightly larger. It has a shoulder-high wing—which is probably very thin as the undercarriage goes into the fuselage; two well-spaced chord-wise boundary layer fences on each wing and a long shallow ventral fin at the rear of the fuselage. Further photographs and data will appear in our next edition.

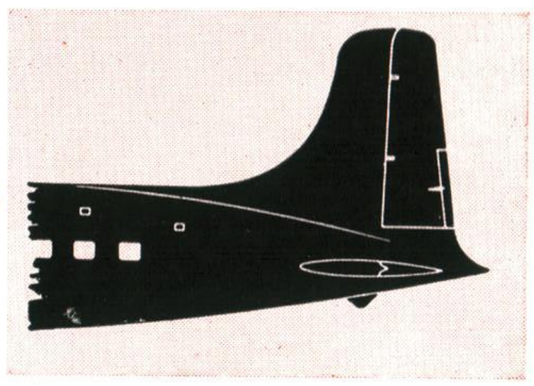
This is an experimental article designed to show instructors the possibilities of using word pictures to concentrate attention on varieties of shape.

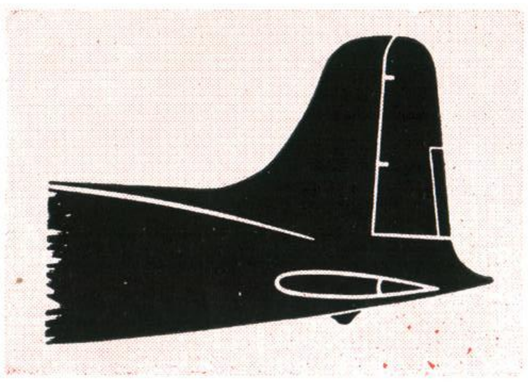
SHAPES AND WORDS

by C. H. GIBBS-SMITH

Sometimes a dull article is written upon an important subject. This is one of those articles, and the subject is shape—shape in the abstract, but using fins and rudders as examples. It is particularly important to say that these notes are not intended to encourage recognition by individual features—the tails are used here solely to emphasise differences of shape and to suggest similar descriptions and analyses when studying any shapes anywhere. For convenience the word "tail" is here used to mean the fin and rudder as well as the fuselage end as corporate shapes.

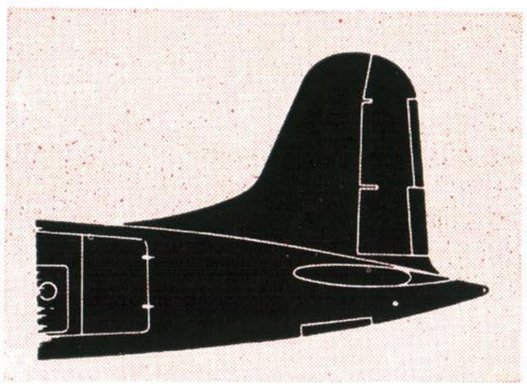
No. 1 is shown to exemplify the curious fact that if there is one unusual element in a shape it lends character to the whole and one tends to pay attention only to that part. Here it is the flattish top to the tail. Leading and trailing-edge slopes seem ordinary and un-noteworthy in comparison.

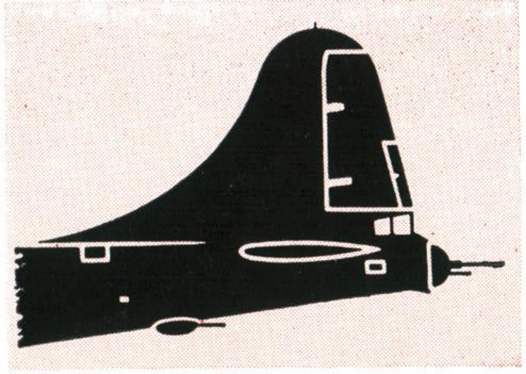




Now look at **No. 2.** It is still a blunt-topped tail, but with a difference. The top angles have been softened and there is a new shape as a result of the leading edge curving over more fully and slowly than the trailing edge corner. It is this difference which causes a slight optical "pause" when looking at it.

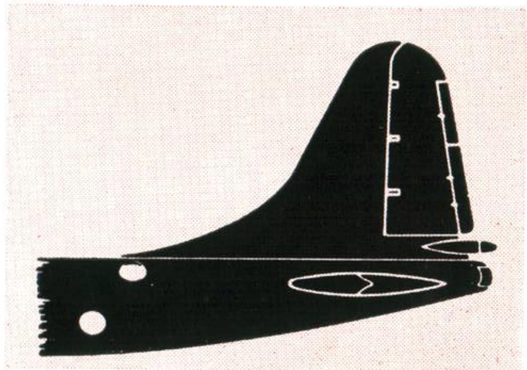
In **No. 3,** with its bold, broad shape, it is the sharp angle made between the leading edge and the dorsal fin that immediately claims attention. The top curve is also interesting. It bends slowly down aft, as a whole, and adds to the somewhat "sliding off" look of the whole tail. The long thin fuselage cone sticking out behind, and the sharp angle made by the trailing edge meeting it, makes the eye flit to the other (not so sharp) angle made with the dorsal fin the other side. The low sweeping curve on the under side of the fuselage is also a factor in the "sliding off" look.

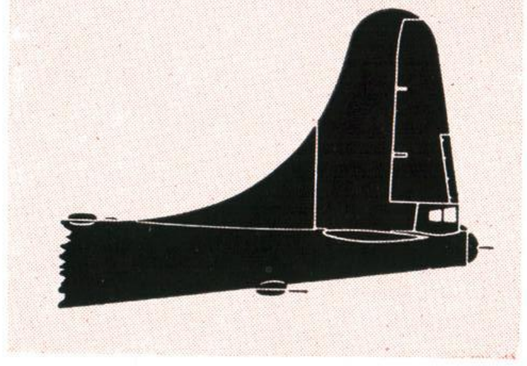




No. 4 has a completely different kind of character, in that the tail completely dominates the fuselage, growing out of it like some monstrous leaf. The slow forward curve down of the fin accents the feeling of growth still more, and the fine uncomplicated top of the tail turns and dives steeply down to the blunt gun cone. The straight underside of the fuselage gives greater effect to the tail curves.

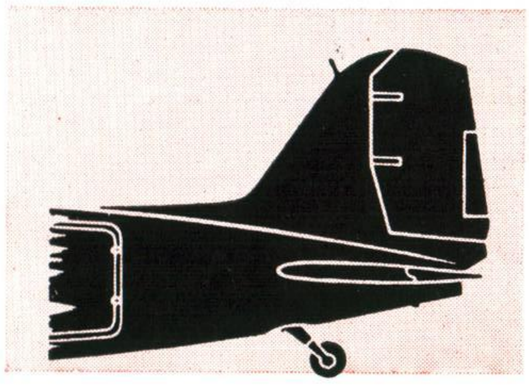
No. 5 is also a dominating tail but without the sense of "growing out" seen in No. 4. This is primarily caused by the peculiar break in the leading edge curve, almost a kink, which makes the eye falter and destroys the feeling of harmony and growth. The top curve is one of those which drop moie to the rear than to the front, the leading edge curve at the top being sharper by a fraction.



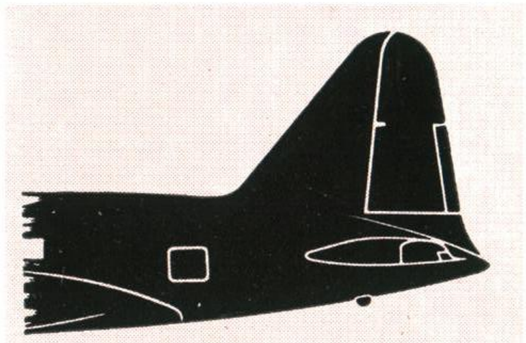


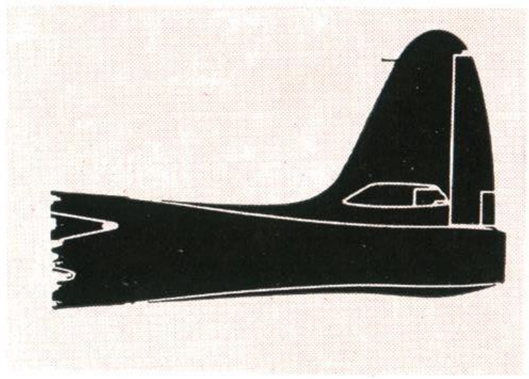
In **No. 6** the whole tail has lost all sense of proportion in relation to the thin slightly tapering fuselage and rears itself up into a not very graceful thimble top. The whole affair is so tall that it optically nearly topples—like the crest of a wave. It is saved only by the great sweeping curve made down and into the fuselage.

Of completely different character is the familiar outline of **No. 7,** a tail so well known that one seldom pauses to analyse what is really a very interesting shape. It is a mixed angle-curve shape with two optical pivots—the angle made between the leading edge and low dorsal fin, and the angle between the top curve and the trailing edge. Once free of the fin, the leading edge climbs straight to the top, curves over and breaks sharply into the straight drop of the trailing edge. The latter falls steeply and breaks into the insignificant jumble of angles at the bottom.



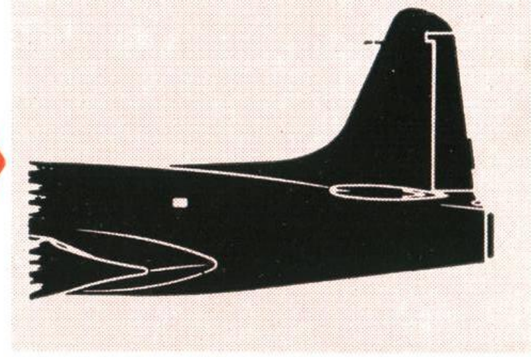
No. 8 is a much simpler shape and rather unusual. The overall feeling is one of a bold, broad mountain curved down rearwards a little at the top. It is a simple straight-sided affair with a hump at the top and a snub little curve out at the bottom of the trailing edge where it meets the fuselage cone. The thickness of the rear fuselage also adds to the general feeling of depth and breadth of the tail shape.

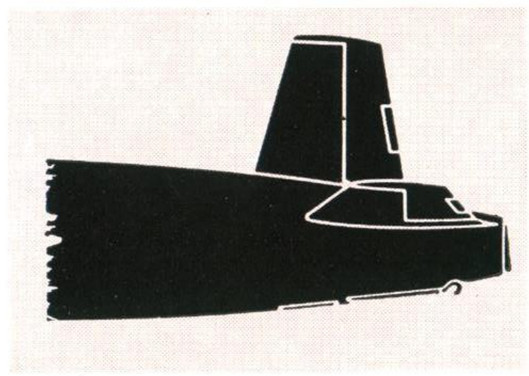




No. 9 is yet another distinct type. Its character is stamped on it by two peculiar curves—the pointed curve at the top and the slight but significant swelling beneath the fuselage end, which provides what is almost a shallow echo of the curves above. The whole tail swells out from a waist in the rear fuselage and the sharp springing up of the leading edge and steep waterfall of the trailing edge (right down to the shorn off fuselage shape made by the jet) makes a memorable tail. Note also the difference between leading and trailing edges. The former is straight on its mid section ; the latter bows slightly outwards.

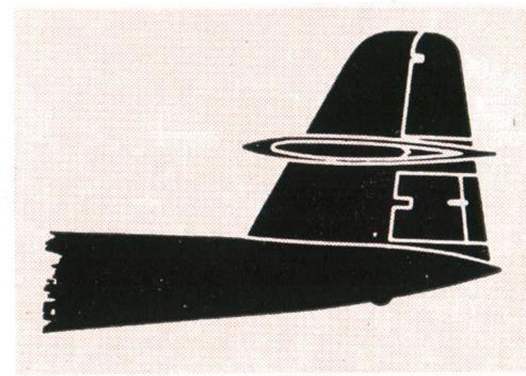
No. 10 belongs to the same form family, being tall and narrow with the shorn off jet pipe to make the trailing edge hard and precipitate. The leading edge, however, has a slow curve up from the dorsal fin and then soars to a very unusual jutting corner. This in turn gives way to a slow downward curve and after turning the corner falls almost vertically downwards.

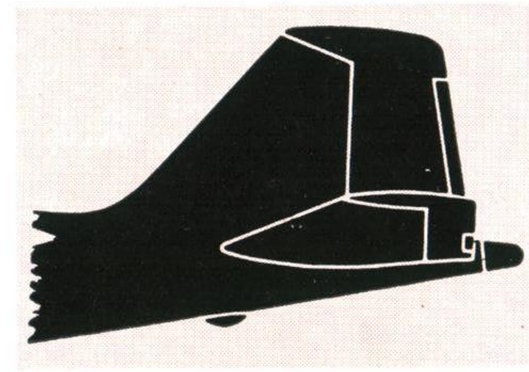




No. 11 is again of a different family. It is one of those tails that seem to be riding on the fuselage as opposed to "growing out" of it. This is a supremely severe affair of lines and angles. The great deep fuselage, ending in the blunt jet-pipe, seems too big and important to be much troubled by its small tail. The latter sits well forward, sprouting up in a sharp angular line to meet a broad and almost flat top, and then goes sharply down the other side.

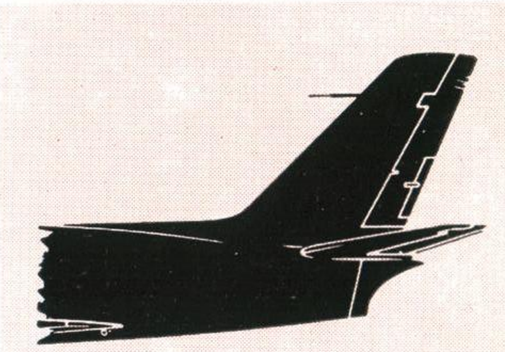
No. 12 is another of the "riding" tails, but it has taken a firm hold on the slender fuselage end and dominates it ruthlessly. The added shape of the tailplane, borne half-way up, gives it added visual weight and importance. The shape itself is a bold, steep mountain, rising steeply in the front and dropping even more steeply at the rear, with a flat blunt-edged plateau on top. It is one of the boldest tails aflight and it looks over-broad because of the comparatively insignificant fuselage.

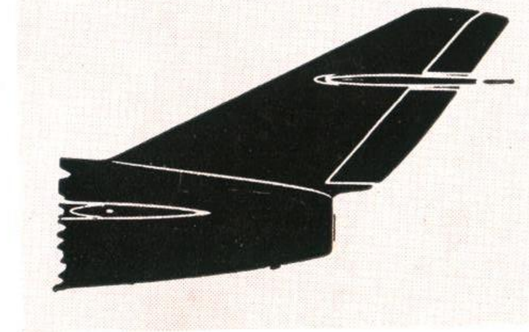




No. 13 is a freak. It is the broadest tail in existence in relation to its height, and sprouts aggressively out of the fuselage. The little fuselage cone adds a certain impertinence to the overall shape. The leading edge slopes obliquely back and up to the broad flat plateau and dives down aft in a steep straight line. This great combination of straight lines and the bold broad surface is even more accentuated by the steep rising line of the underside of the fuselage. Altogether a unique tail in the sky.

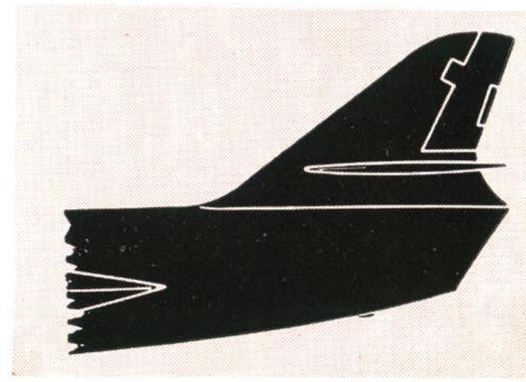
No. 14 is also a unique shape, made so by the overall lean-back and the almost flat level top. This tail is a shark's fin, and from a narrow dorsal fin the leading edge climbs up to a plateau from which the trailing edge falls down and forward at a slightly less acute angle than the leading edge. The deep fuselage with its peculiar scooped out end for the jet pipe, somewhat spoils the aggressive feeling of the tail, which remains raked and fast-feeling, but yet not completely dominating the scene.





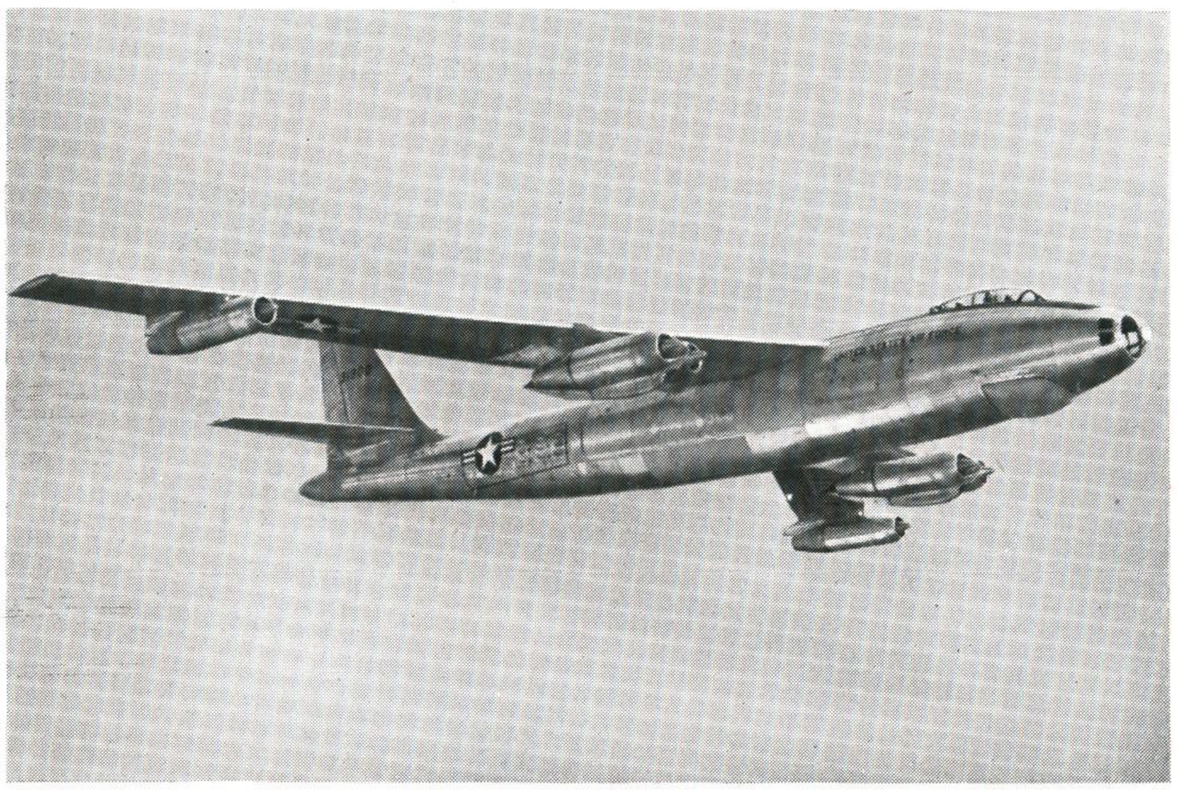
No. 15 takes the raking style still further, almost as far as it can go. This tail looks as if it is travelling at the speed of sound all on its own. The long straight leading edge rushes upwards and backwards at a sharp angle, to meet a very slightly curved plateau ; and then down and forwards again. At the base of the trailing edge it overhangs the jet nozzle. This tail completely dominates the end of the fuselage, and the high set tailplane gives it a look of being airborne on its own account.

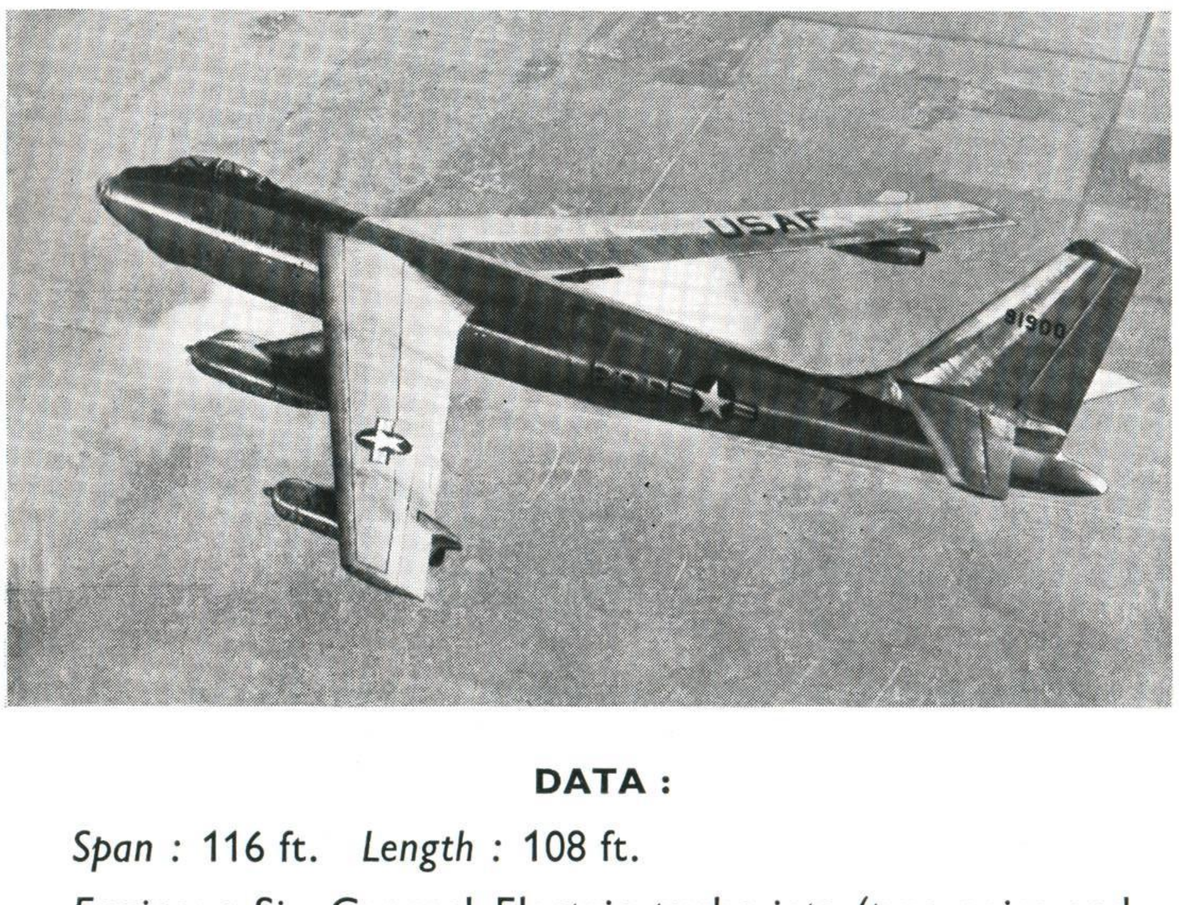
The final tail, **No. 16,** is one of the oddest of shapes. Sitting on the top of a great deep fuselage, with its sloping jet nozzle, the leading edge shoots raking back in a mildly convex curve and turns gently over the top to meet a sharp edge. Then down and forwards for a length, until the trailing edge changes direction and curves outwards to meet the end of the fuselage. The tailplane, set just below the rudder, gives this strange combination of shapes a particular interest and closes this excursion into some of the complex forms of the aeroplane tail.

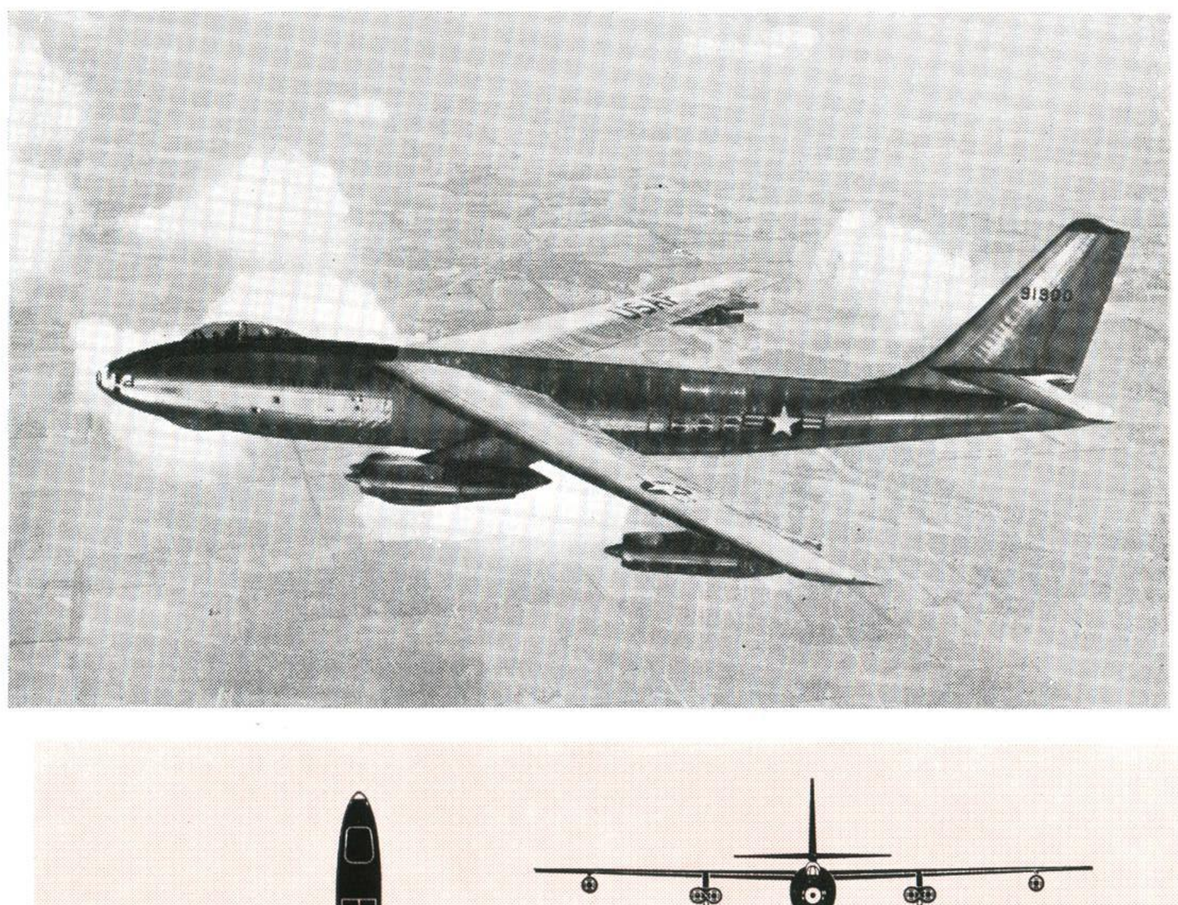


The key to the identities of these tails is given on the rear cover.

BOEING B-47A STRATOJET







DATA :

Span : 116 ft. *Length :* 108 ft.

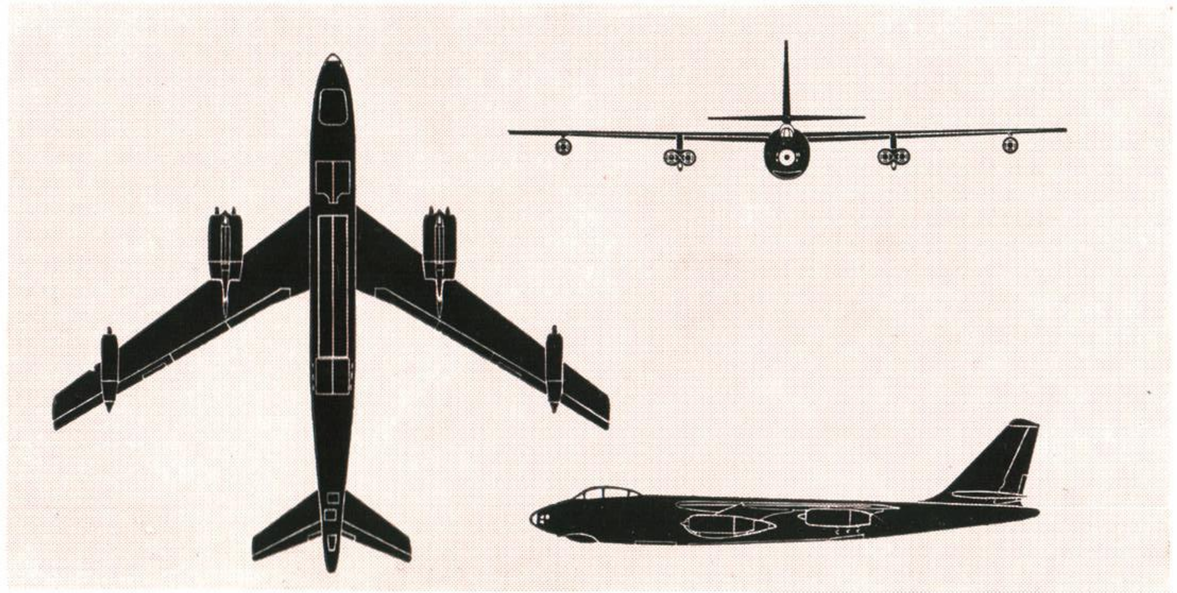
Engines : Six General Electric turbo-jets (two pairs and two singles) suspended in pods below wings plus 18 J.A.T.O. rockets in sides of fuselage.

Armament : 20,000 lbs. of bombs (internal). Remote-controlled tail armament.

Top speed : over 600 m.p.h.

Function : medium jet-bomber.

Crew : three.



CHARACTER STUDY No. 12

The Vickers Attacker

THE VICKERS ATTACKER is a swelled aggressive blow torch, with a pinched-in nose and a fat blunt nozzle at the rear. Withal it is a handsome creature, with its smooth skin and slippery stream-line.

The Attacker is a low-wing monoplane and the wings sprout stiffly with moderate dihedral from the rounded belly. With almost equi-taper, they are brought to blunt endings—they are in fact rather board-like and impersonal—but a subtle character is given to the overall wing-shape by the slight angles made when the leading and trailing edges leave the centre-section and bound the outer-wing panels.

The engine character of the Attacker is confined to the twin intakes forward, which give rise to the nose pinch-in to keep them freely open to the air-stream in front.

The fuselage is the most outstanding feature of the aircraft. Its pointed nose, with its bullet plan, growing into the great puffed-out form which continues (although with a gentle taper) to the stern. The maximum swell is aft of the wings, giving the whole machine a certain questing look. At the end the jet nozzle cuts down in a sharp deep shape. The swelling is equally apparent from every viewpoint. Only the nose section changes character as the aircraft rolls, the smooth transition of the side view giving way to the broken, pinched-in, bullet-shape which is complete in the plan view.

The tail of the Attacker is a very characteristic group of shapes. The tail-plane is deep of chord and out of scale (visually) with the mainplanes. Dihedral is pronounced and taper is equal to broad, blunt tips. But it is the fin and rudder unit that is most remarkable. It rides small and rigidly angled on the great fuselage barrel, well forward, and sticking up like an insignificant chimney in a lonely sky line. As the machine rolls, the fin and rudder seems to rock helplessly from side to side, unnoticed, ineffectual and pathetic.

The Attacker first flew in 1946 and is now in service with the Royal Navy. It is, of course, the proud successor to the Spitfire, and one of the youngest descendants of the Schneider seaplane which won the trophy for England and established the Spitfire stable. Following are the chief figures for the Attacker :—

Span : 36 ft. 11 ins.

Length : 37 ft. 6 ins.

Engine : One R.-R. Nene turbojet.

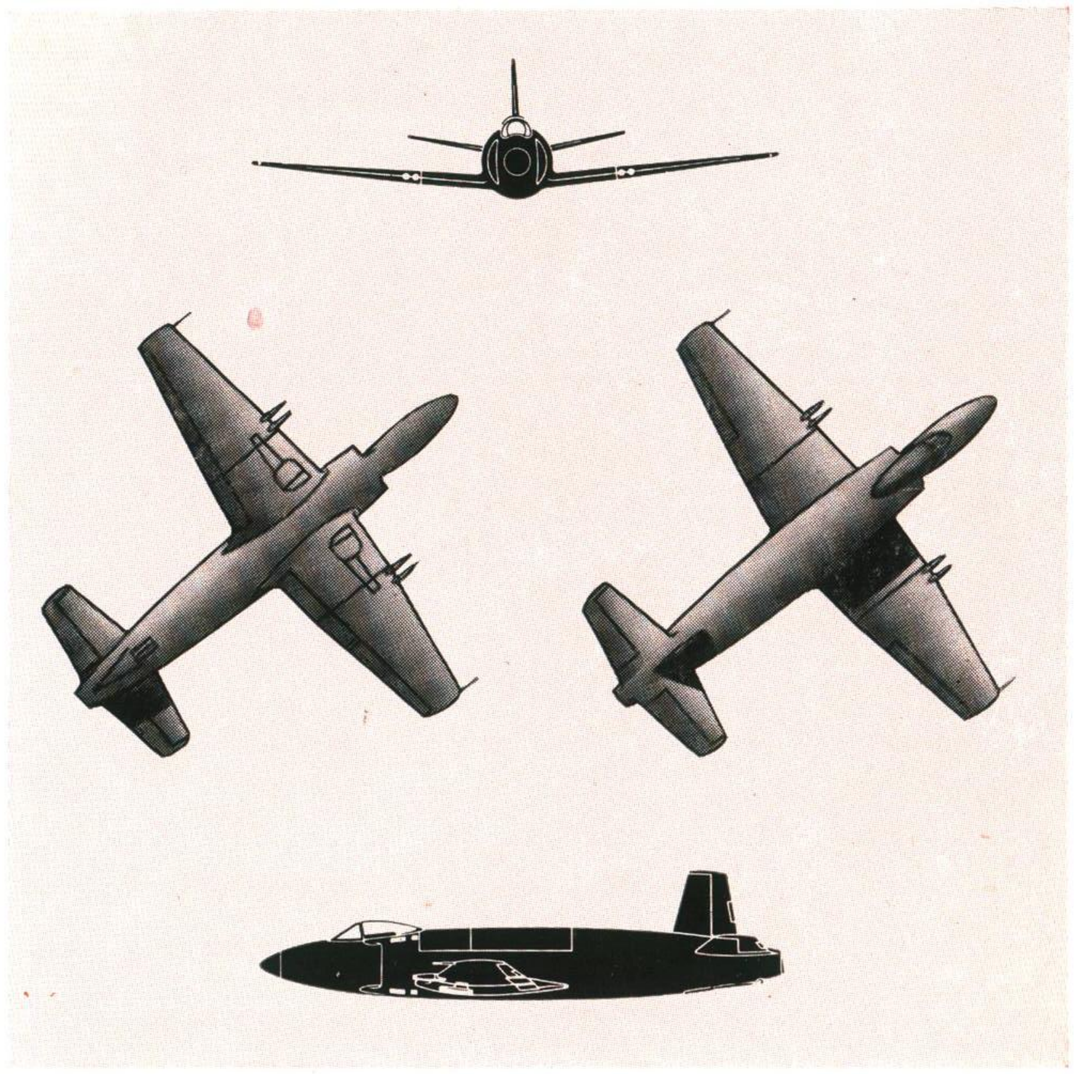
Maker : Vickers.

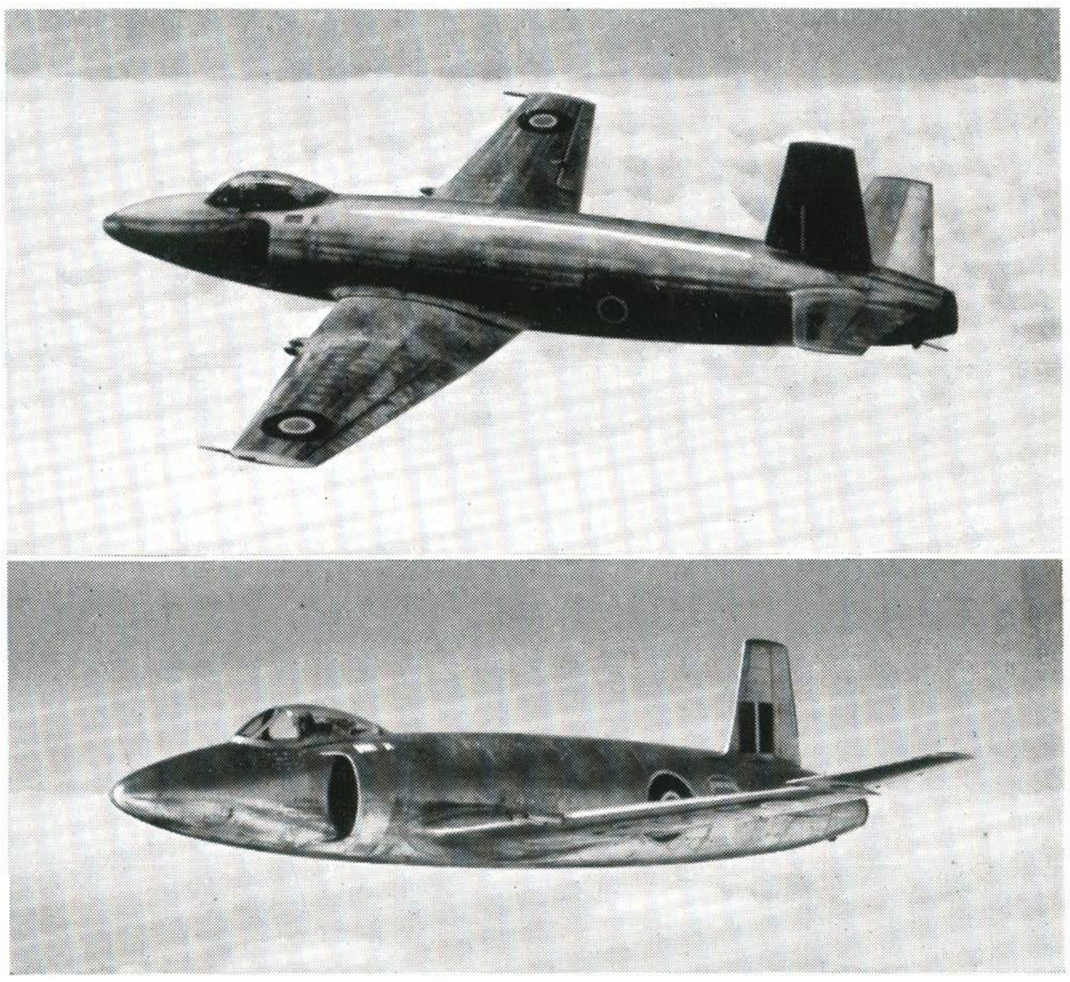
Function : Fighter.

Armament : Four 20 mm. cannon in wings, bombs or rockets may be carried under wings.

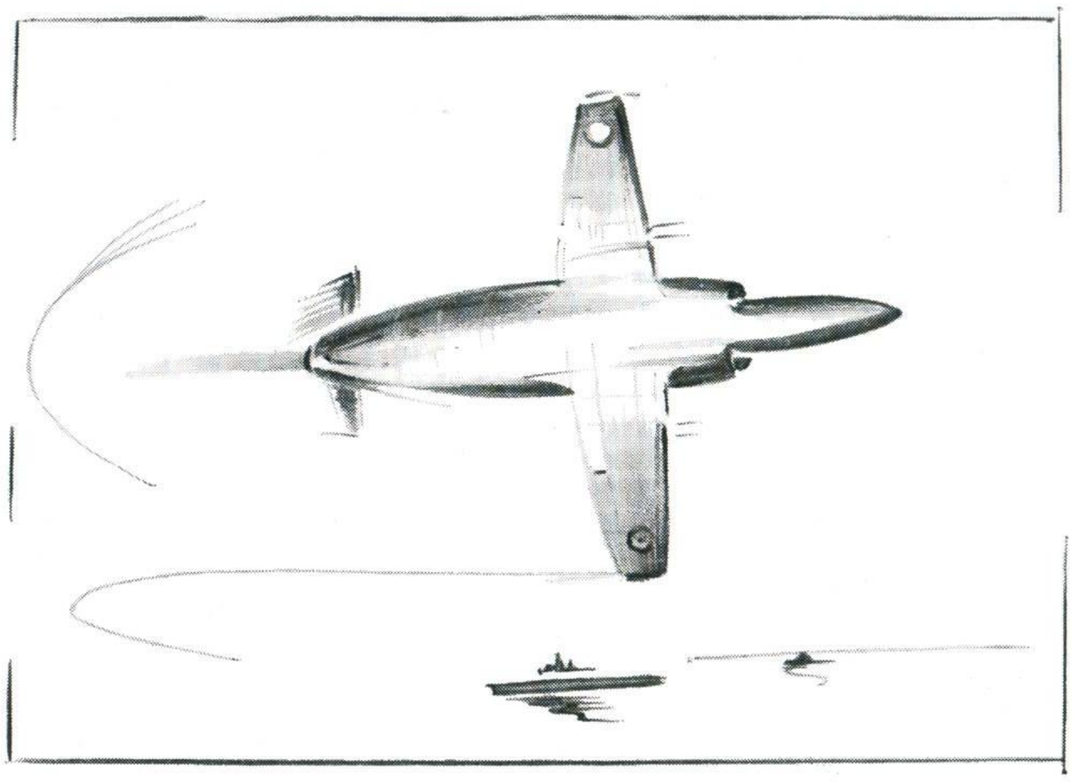
Max. Speed : 590 m.p.h.

C. H. GIBBS-SMITH





. . the great puffed-out form . . .



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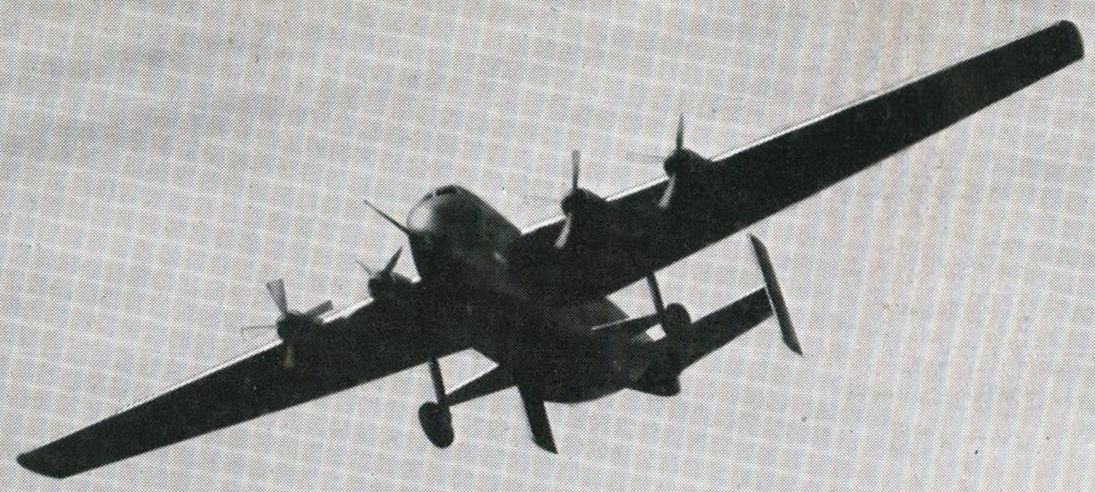
VICKERS 510



Some

BLACKBURN UNIVERSAL

R.O.C. MASTE

D.H. HERON

BLACKBURN YB 1

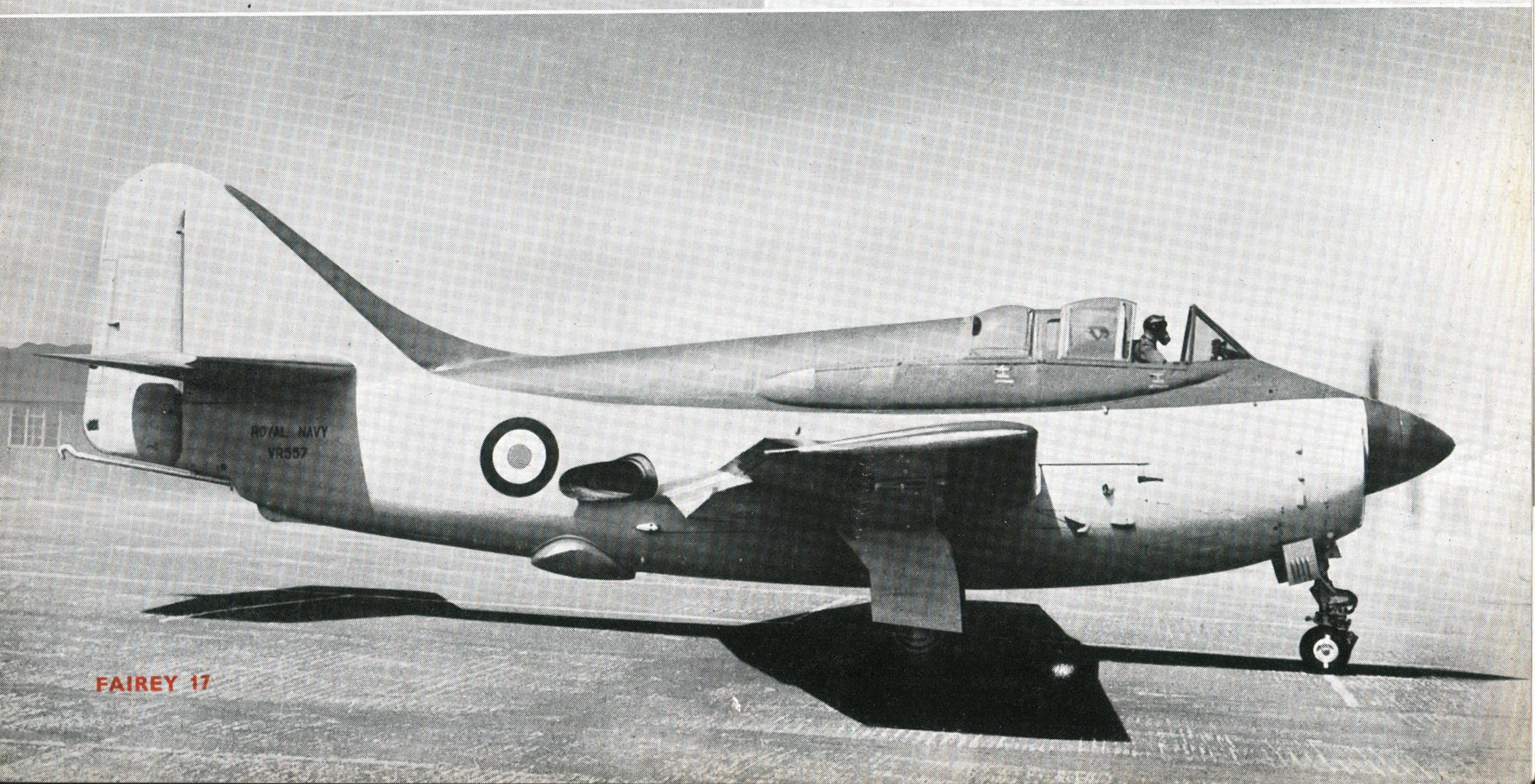
STURGEON TT MK.2

R TEST TYPES

BLACKBURN YB 1

BLACKBURN UNIVERSAL

HAWKER P.1081



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ELEMENTARY SPOTTING

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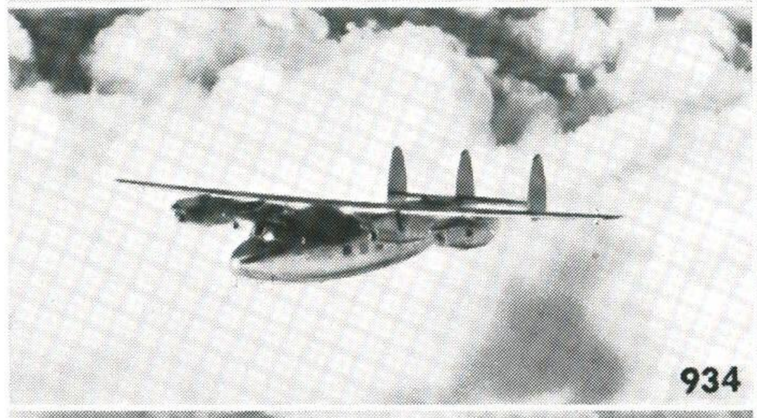
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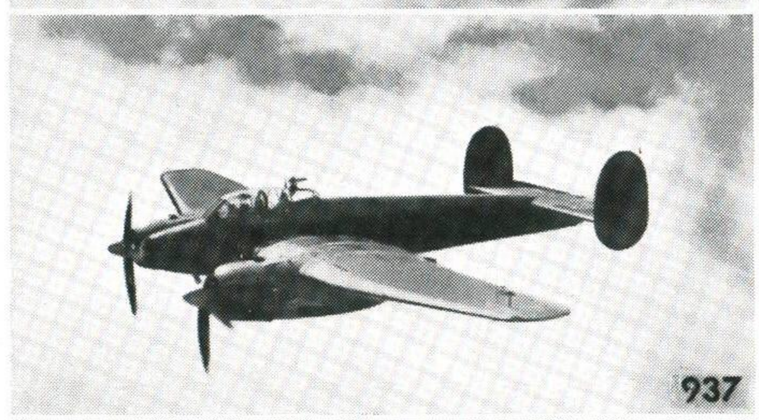
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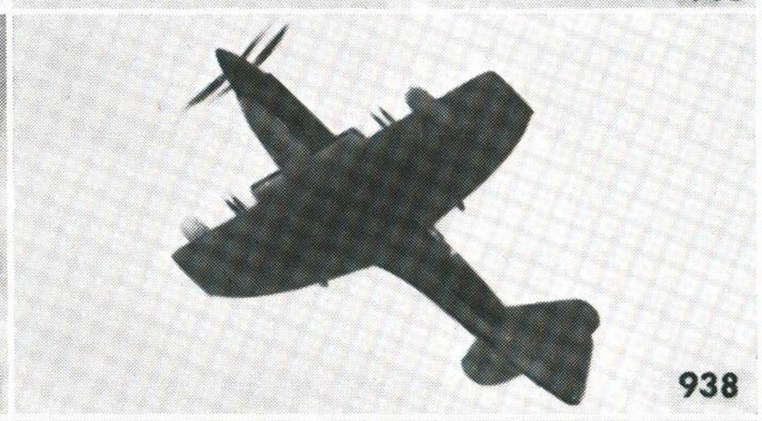
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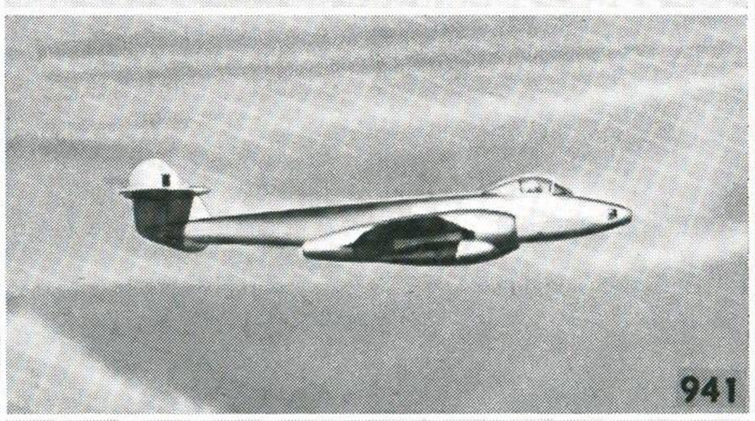
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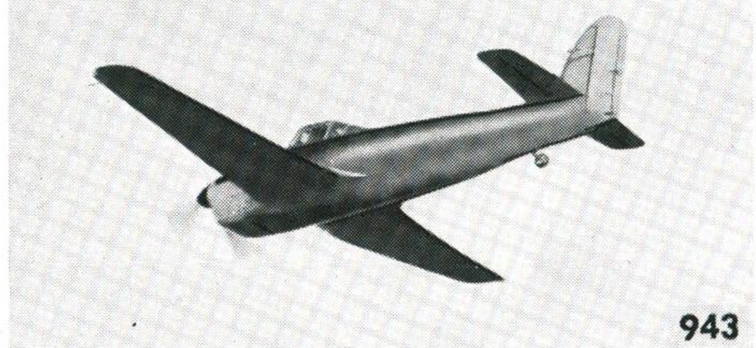
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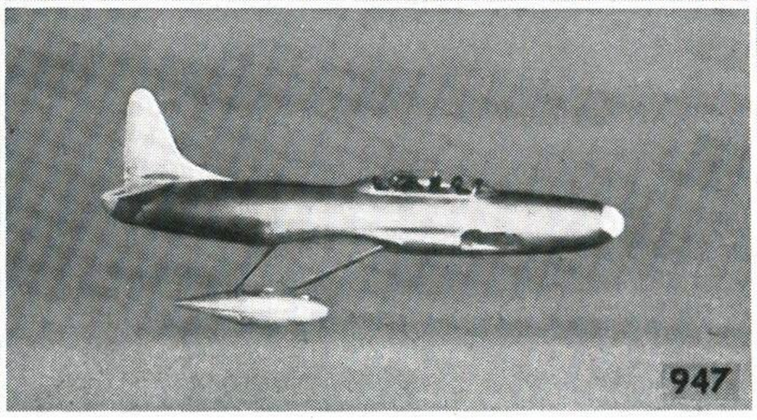
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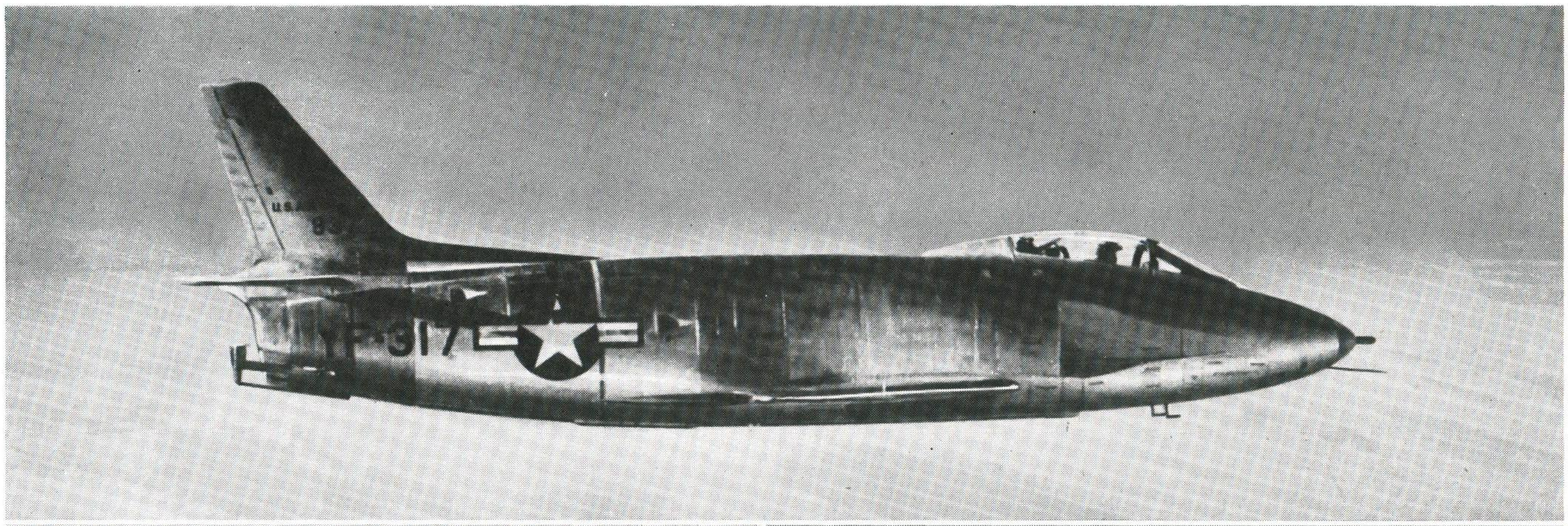
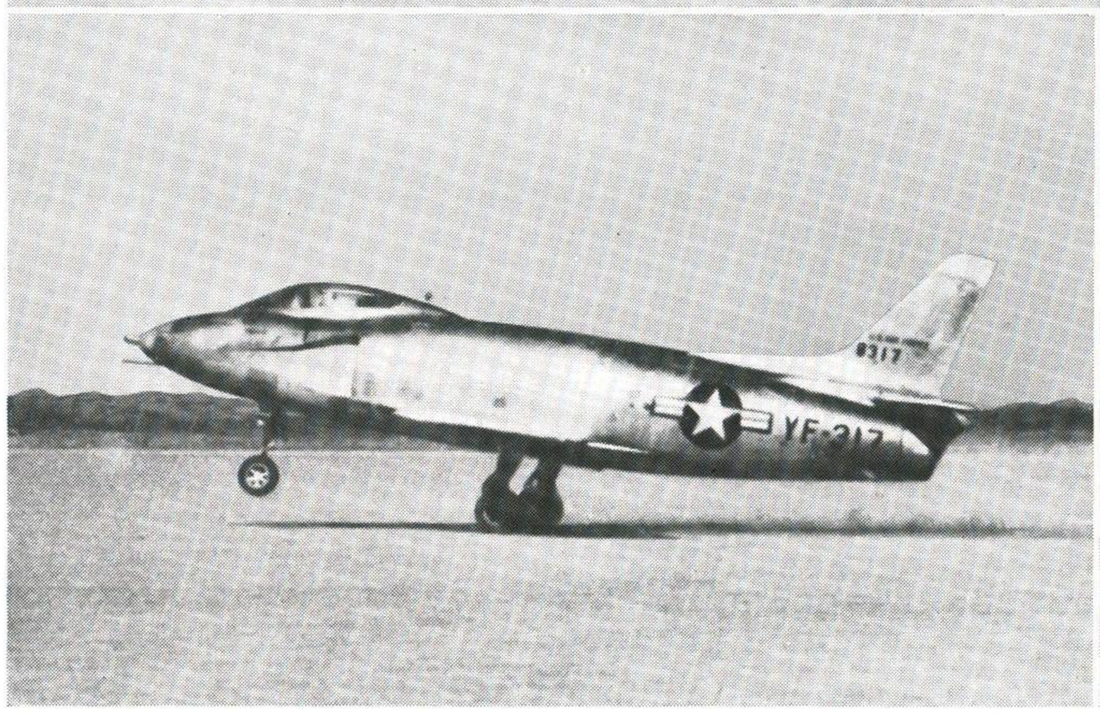
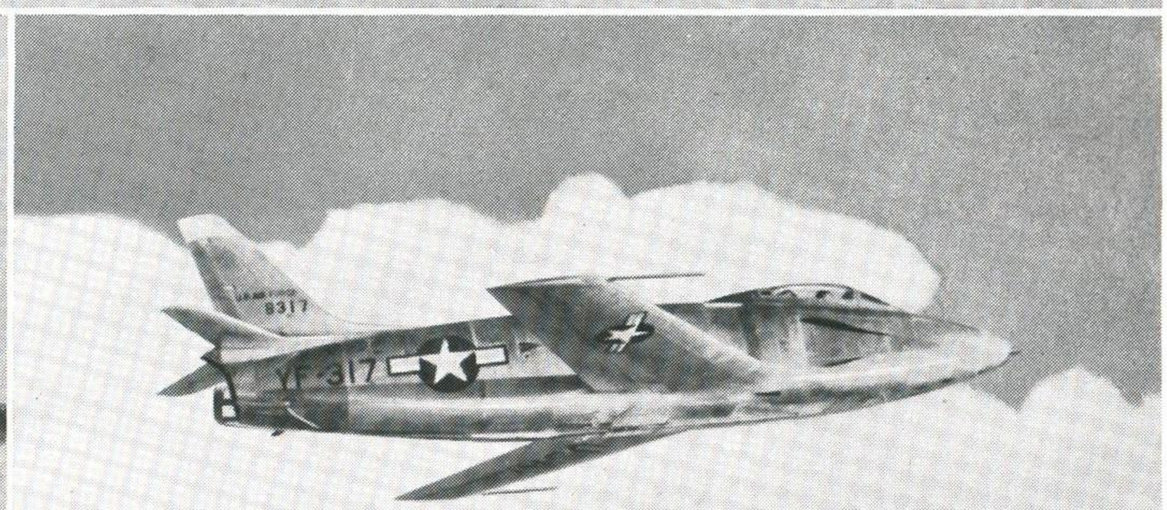
NORTH AMERICAN YF-93A







One Pratt & Whitney turbojet,
with after-burner.

Span : 39 ft. *Length :* 44 ft.

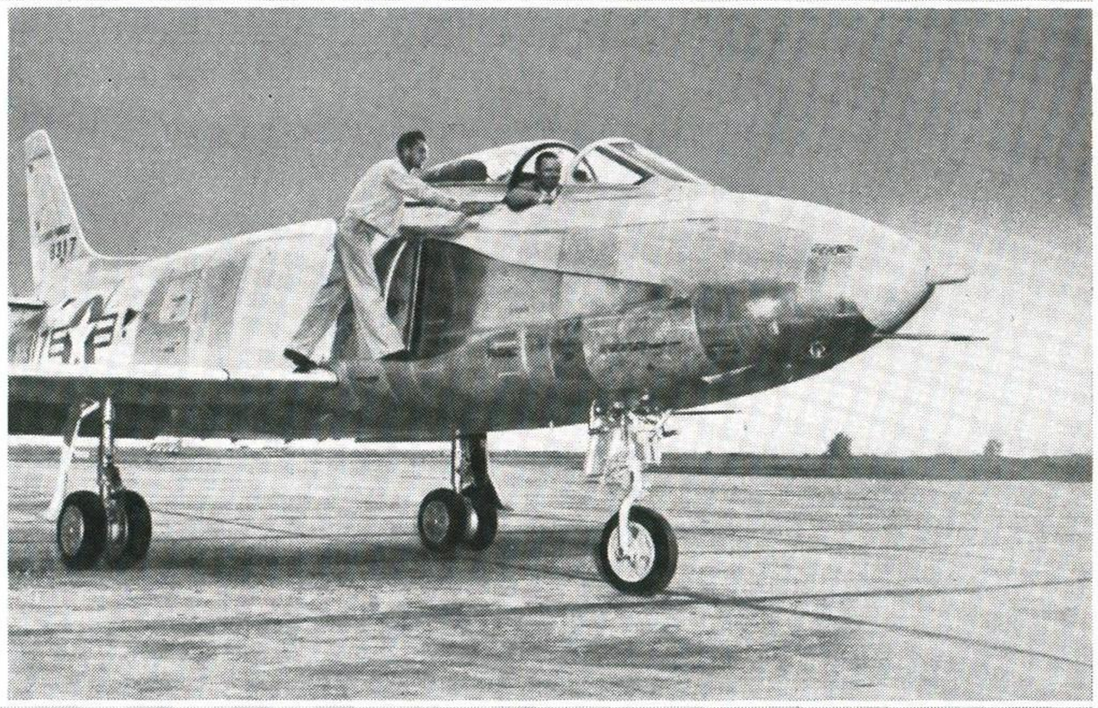
Armament : not disclosed.

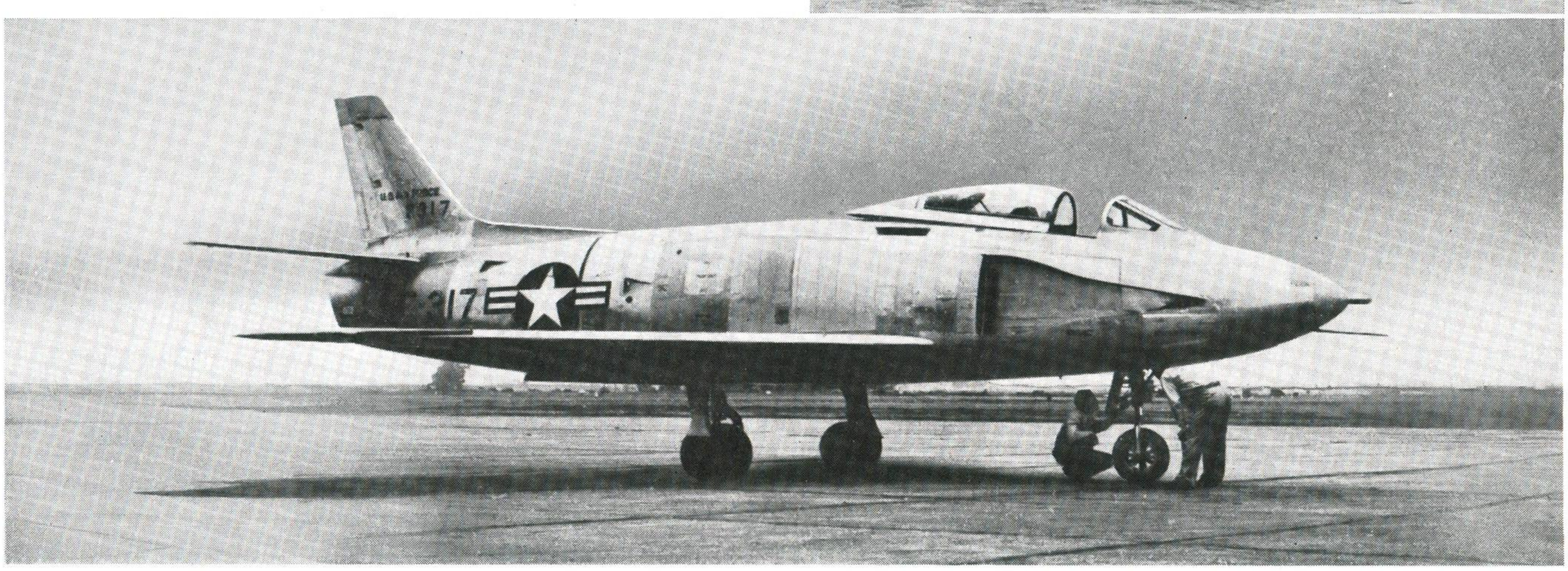
Speed : not disclosed.

Function : single-seat fighter.

Development of Sabre with re-designed fuselage and flush side air-intakes.

Re-designed tricycle undercarriage with double main wheels. No tail dihedral.

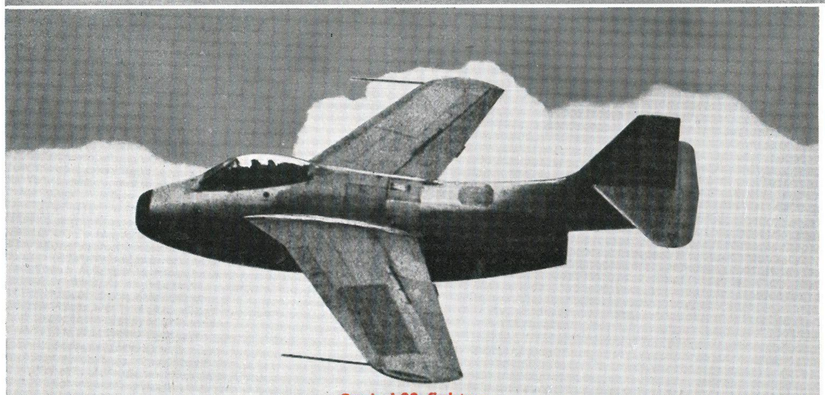




Convair B-36D bomber.

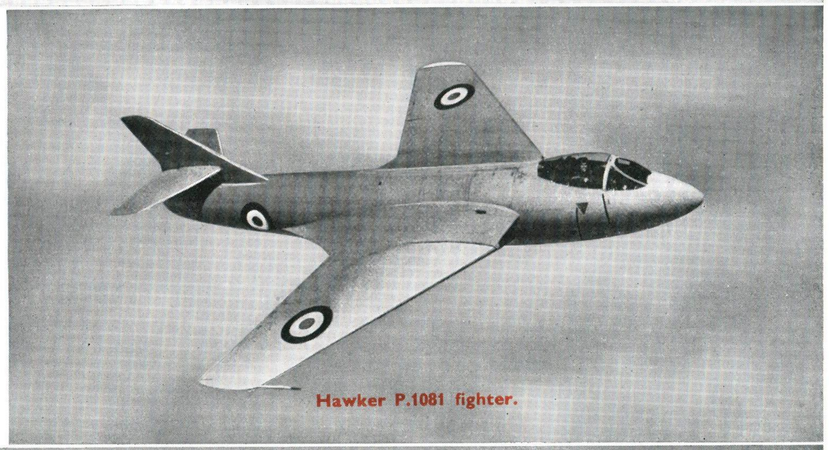
MIG-15 fighter.

Boeing B-47A bomber.

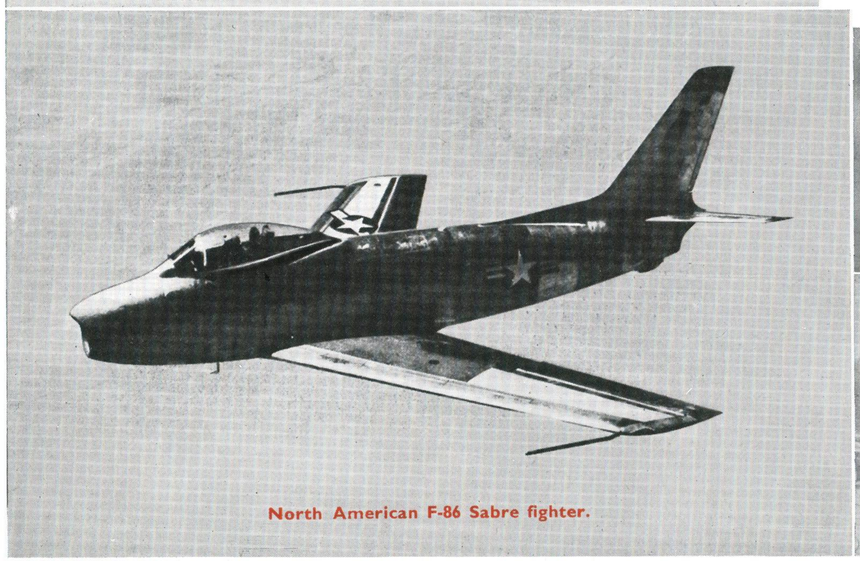


Saab J.29 fighter.

SWEPT WINGS IN THE NEWS



Hawker P.1081 fighter.



North American F-86 Sabre fighter.

Dassault MD-450 Ouragan fighter.

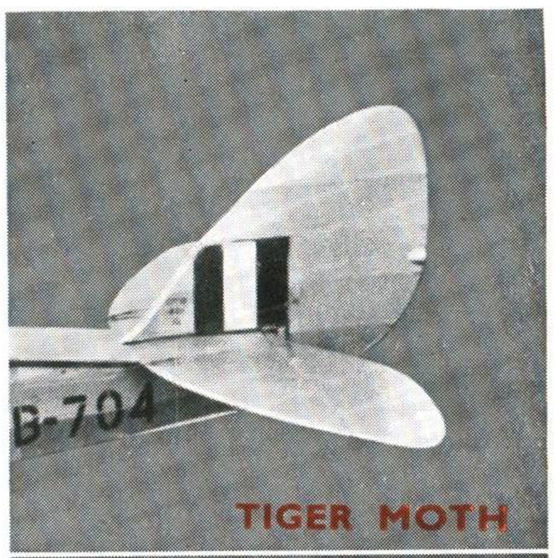
Convair B-36A bomber.

"Beauty is altogether in the eye of the beholder," it is said. So are some family likenesses in aeroplanes. But there is no doubt that designers of aeroplanes have strong tendencies to perpetuate shapes and other characteristics even in their swept-wing designs. The author mentions some of those he sees.

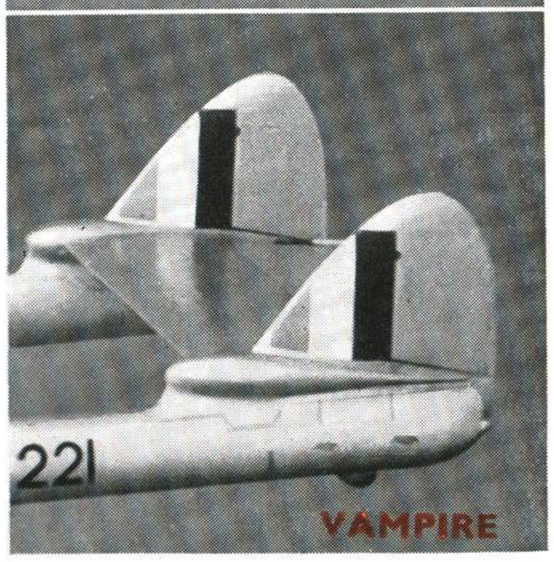
From Generation to Generation . . .

by Lieutenant G. D. H. LINTON
Intelligence Corps (T.A.)

FAMILY CHARACTERISTICS in aircraft design have a habit of persisting down the years, particularly in the shape of the tail unit and (to a lesser extent) the wing plan. Sometimes a designer regards such shapes as the rightful trademark of his handiwork ; elsewhere, he believes that he found long ago a correct aerodynamic pattern and sees no reason to discard it. In either case, a " family feature " of this kind is a great help to the spotter and the hard-pressed recognition instructor, searching always for an interesting background to his training.



TIGER MOTH



VAMPIRE

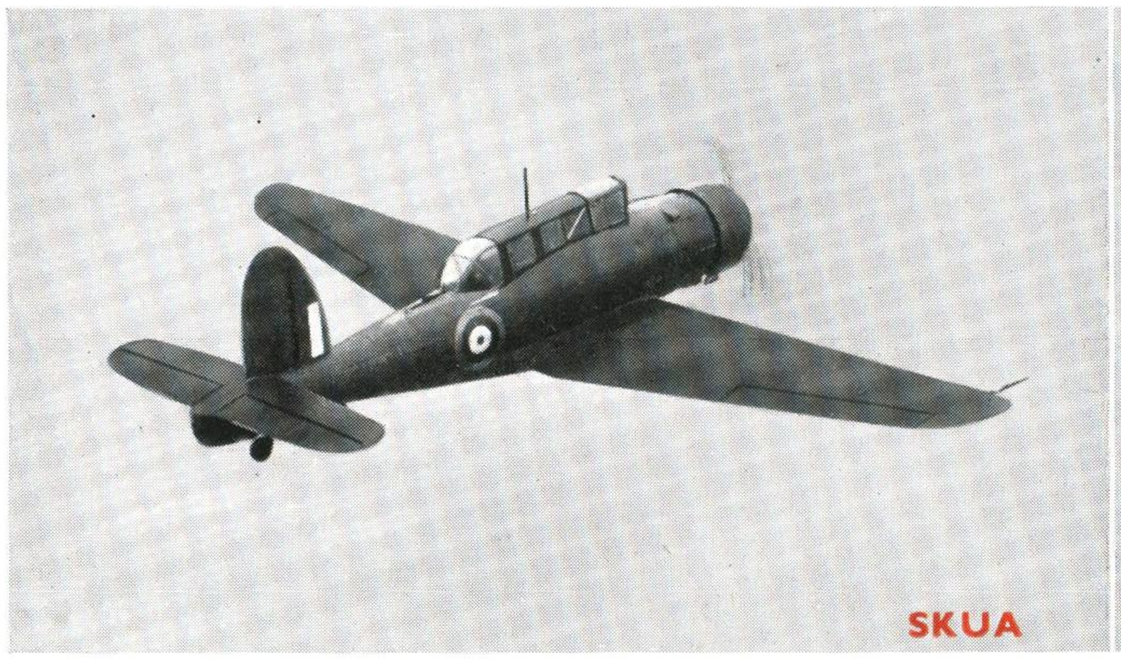
The outstanding example of this perpetuation of design in the British aircraft industry is, perhaps, de Havilland. This famous enterprise is, of course, notable for its steady yet spectacular growth under the original small band of pioneers since the first World War. The first designs by Captain Geoffrey de Havilland during that war came to fruition long before the founding of the de Havilland Aircraft Co. (in 1920), but although no one is likely to accuse the de Havilland design team of lack or original thought, there is a definite family resemblance — particularly in the tail design—handed down from D.H.1 through Moth, Rapide and the rest to D.H. 100, the standard Vampire of today. Even the Comet, or D.H.106, despite its straight-edged wing and tail, harks back to the beautiful de Havilland 91 Albatross of immediate pre-war days. Although the turbo-jet gives the airframe planner more scope for radical redesign, as yet, orthodox shapes are in general being built around the essential engineering basis : de Havilland of Canada's Chipmunk is an obvious blood-relation of the Mosquito and Hornet, and the Beaver of the pre-war Hawk Moth (likewise a " bush job "), while the Australian Drover, despite its utility conception, bears many traces of that home thoroughbred, the Dove.

In the fighter field, the Supermarine Spitfire and its sisters are often correctly described as direct descendants of R. J. Mitchell's record breaking S.6 racing seaplane of 1931—in fact we can look further back to the S.5 and even to the S.4. Slim lines, curved wing and small curved fin and rudder are the " signposts " here.

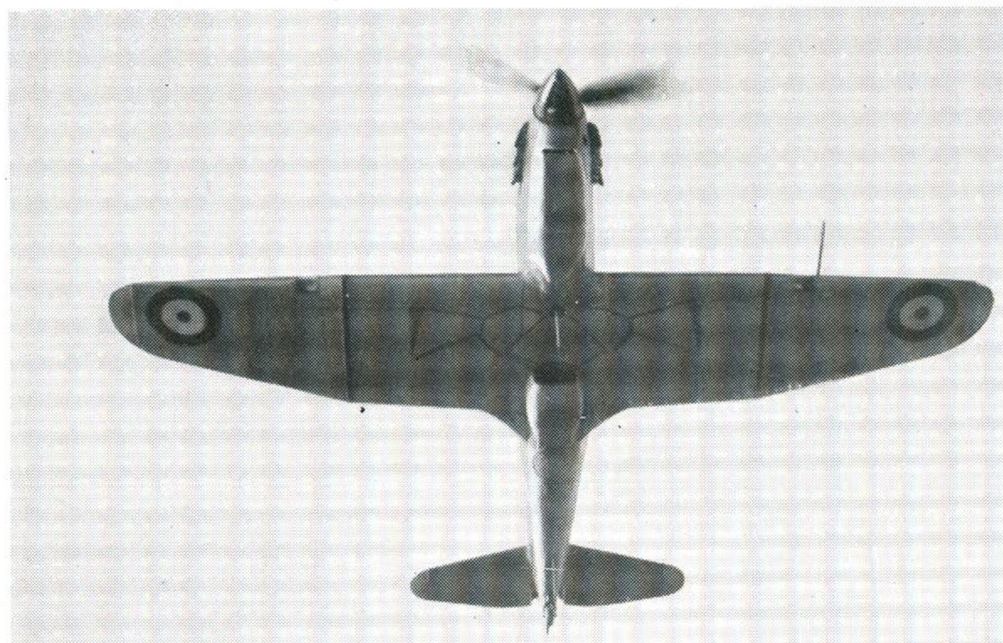
Sidney Camm's Hawker fighters are another famous breed which has been steadily improved, but not " out of recognition "—witness the Fury biplane of 1930. Then glance at the historic Hurricane : with the bigger Merlin in the nose, and, of course, a monoplane—but she has the same purposeful look and the same round tail ; and thirdly at today's Sea Fury, perhaps the Royal Navy's last " piston " fighter to see action. A different nose now, to house a radial engine—higher power and finer lines, hence much higher performance—but no mistaking the family. Some may come further up-to-date and include the Seahawk (or its experimental developments, P. 1052 and P.1081) ; thus we enter the jet era with intakes and orifices, and shorter undercarriages—but the current wing plan (even its span of 40 ft.) is a constant reminder of the Hurricane designed

MOSQUITO

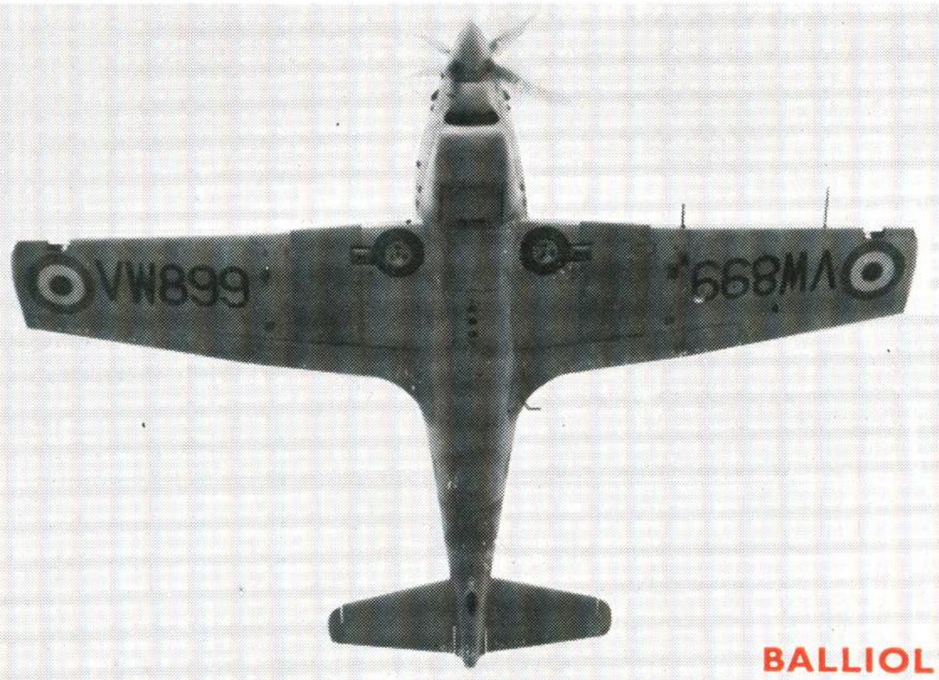
CHIPMUNK


SKUA

FIREBRAND



DEFIANT



BALLIOL

15 years and more ago. Since Mr. T. O. M. Sopwith has always been a leading light of Hawker Aircraft, we may perhaps look back legitimately to the Pup, the Camel and the other famous Sopwith "scouts" of the first war.

A. V. Roe—here is a firm which began even earlier in the history of flying, and whose 504 biplane was in R.N., R.F.C. or R.A.F. service from 1914 to the '30s, finishing its days as one of the world's most famous training and joyriding aeroplanes. There have been a host of Avro types, many of them with a secure niche in the memory, and even if we restrict our attention to trainers, the Tutor, Cadet and the present-day Athena are obviously close relations. And we cannot omit the Anson, still very actively in use, with the same low triangular tail and cabin shape as the Athena. This reminds one of the latter's contemporary, the Boulton Paul Balliol. Have you ever compared the Balliol with the Defiant fighter of 1938 ?

The strain of Handley Page "heavies" began with the O/100, O/400 and V/1500 in the First World War, and continued thereafter with the commercial W.8, W.9 and W.10 series of air liners and, on the military side, with the Hyderabad and Hinaidi bombers. This straightforward development process covered over nearly 20 years, and even when the monoplane came into the picture, who could doubt that the Hampden, the massive Harrow and the war-winning Halifax came from the H.P. stable ? The modern Hastings and Hermes are very different in design conception, but have the same air of strength.

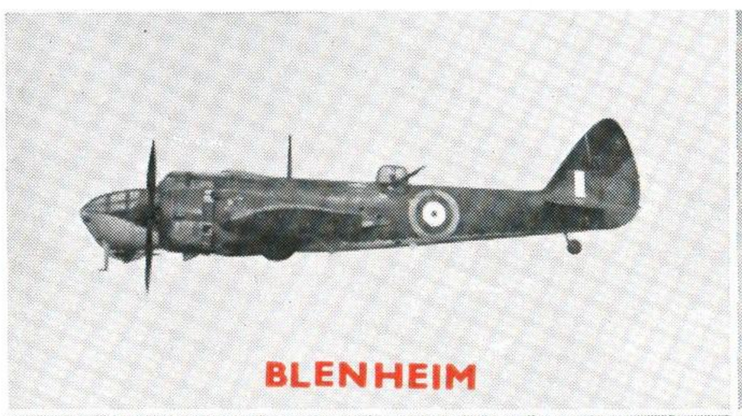
Bristol, Blackburn and Fairey have rung changes more variously than most of the other big companies, but the design teams have undergone several major changes, and naval requirements (as met by the latter two concerns) are being constantly modified. But the line from Blenheim to Brigand was clear and unbroken, and one seems to remember that the Blackburn Skua and the Blackburn Firebrand both had rudder in advance of elevator . . .

Vickers have also struck out in a variety of different designs, but the Viscount turbo-prop airliner—future pride of B.E.A.—is, despite its ultra-modern conception, surely the descandant of the Wellington. The "Wimpey" had the same long, narrow wings, the same marked dihedral and that notable tall single fin. The first big Vickers design by Rex Pierson (now succeeded by George Edwards) was the Vimy bomber of 1919—historic not only for its own exploits but also for setting the fashion handed down in the Virginia, Victoria and other outstanding biplanes.

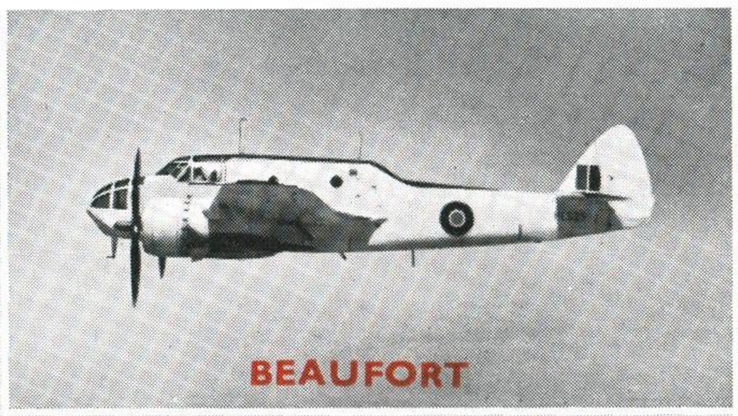
Specialists in marine aircraft—a field in which British designers have long excelled—include Short Brothers & Harland and Saunders-Roe. Sir Arthur Gouge, formerly Shorts' chief designer, is now a "Saro" designer, and it will be interesting to see how many "Empire Boat—Sunderland" shapes re-appear in the huge Princess flying ship. There are many notable British products that have not been mentioned, but few do not betray this sensible genealogical development and "built-in" pride in their forebears.

From the U.S.A., we will take but one group—the products of North American Aviation. From the single-engined F-51 Mustang to the twin-engined B-25 Mitchell to the four-engined B-45 Tornado jet bomber, the story is the same : in a phrase, square-cut efficiency—and the F-86 Sabre, world's speed record holder, presents her similar profile as proudly as any Rolls-Royce or other famous car *marque* perpetuates a radiator design year by year.

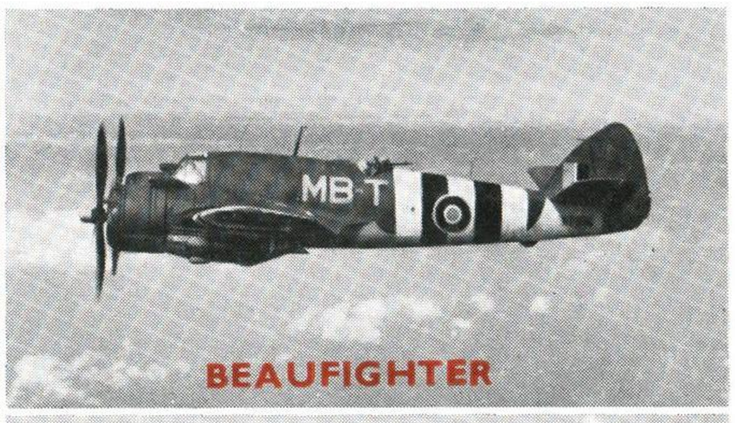
To conclude mention should be made of two important "tail trademarks" which live behind the "Iron Curtain". They are to be found in the fighters of Lavochkin and Yakovlev.



BLENHEIM



BEAUFORT



BEAUFIGHTER

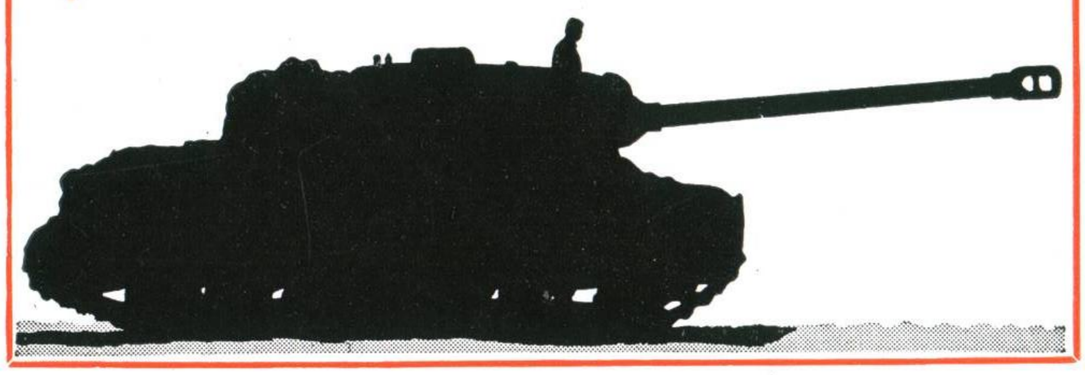
BUCKINGHAM

BUCKMASTER

BRIGAND

TANK TEST

1



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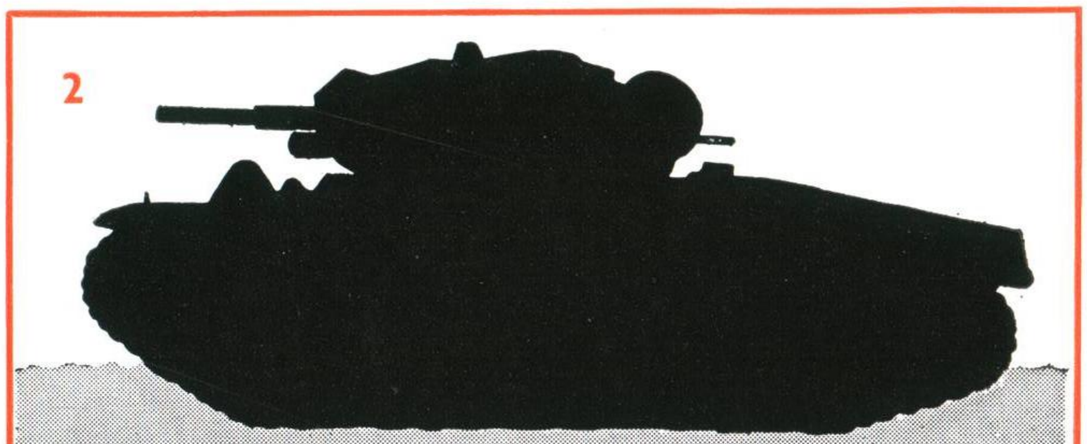

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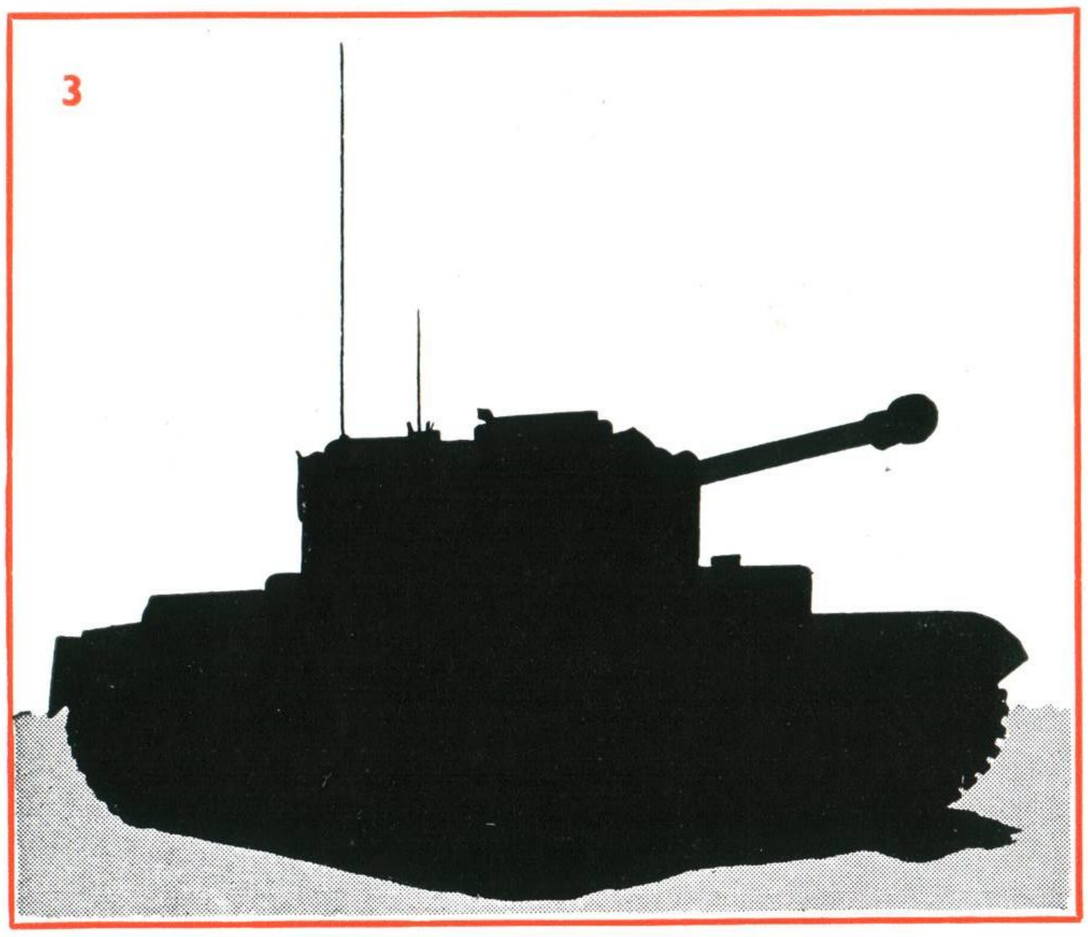

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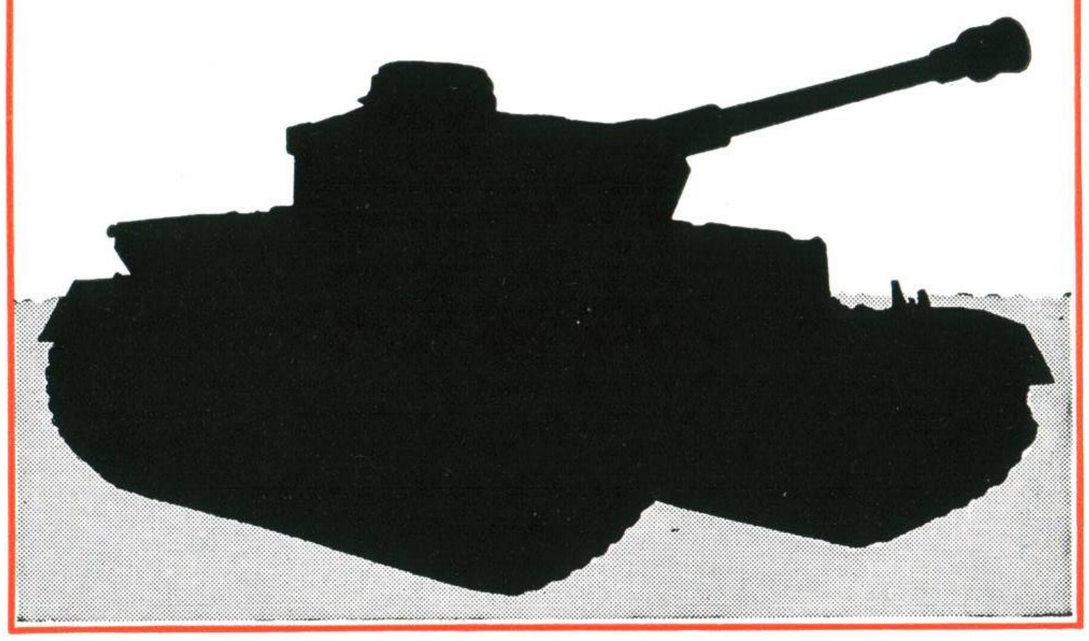

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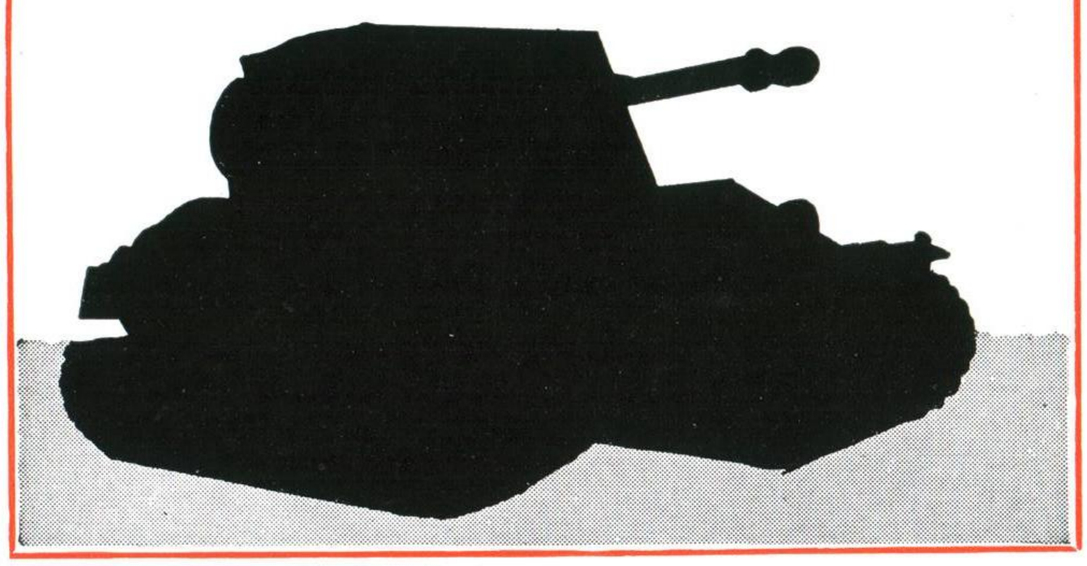

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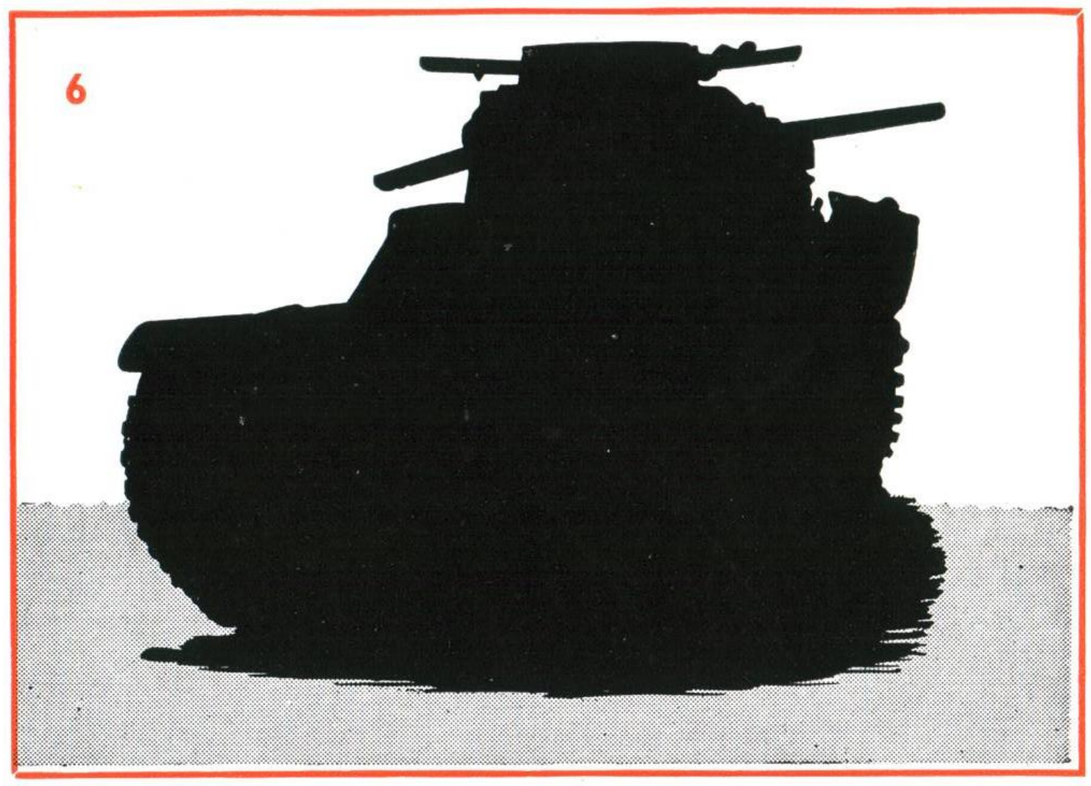

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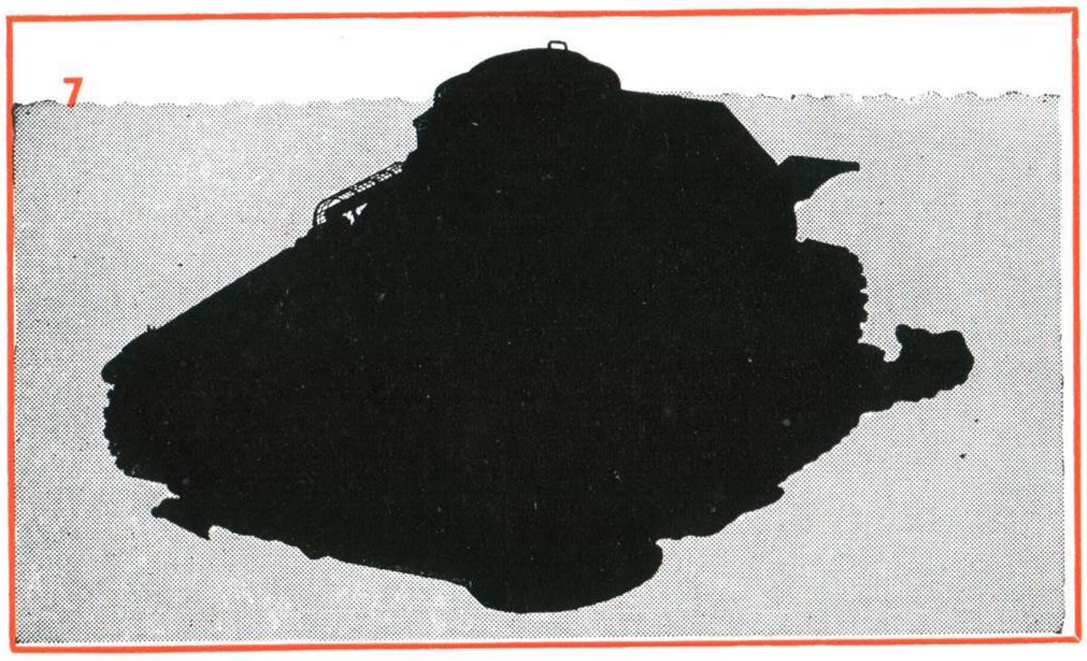

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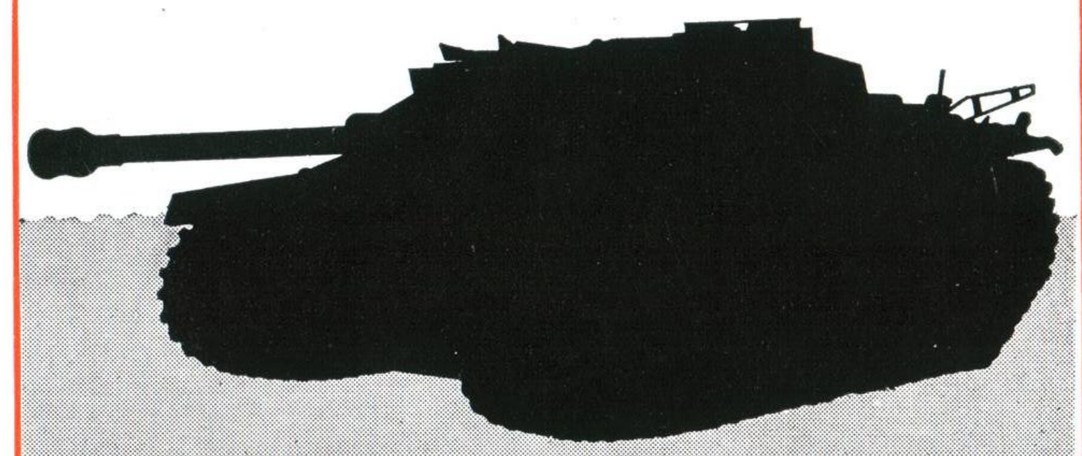
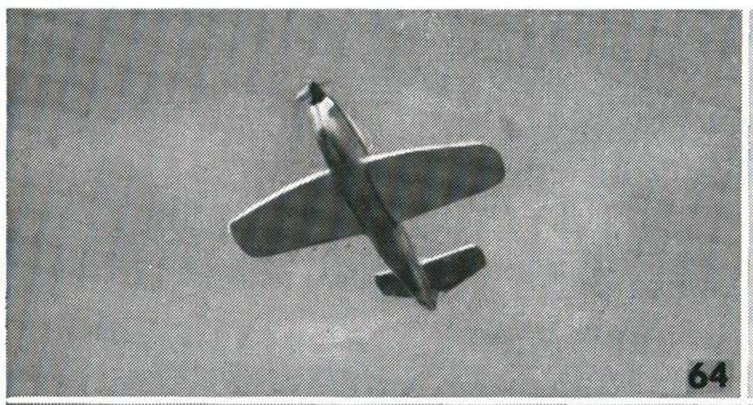


ADVANCED SPOTTING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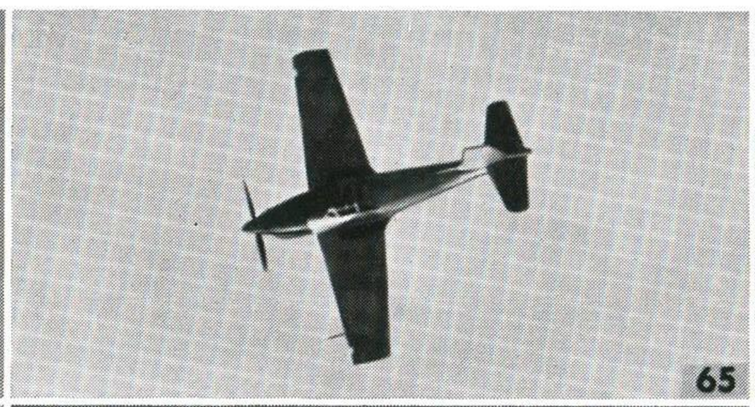
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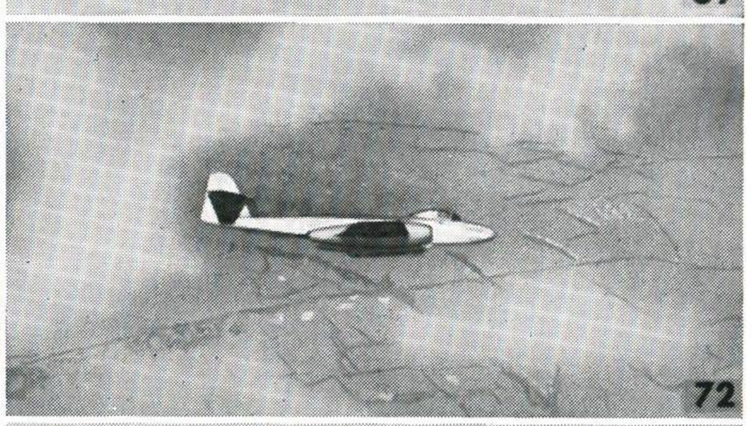
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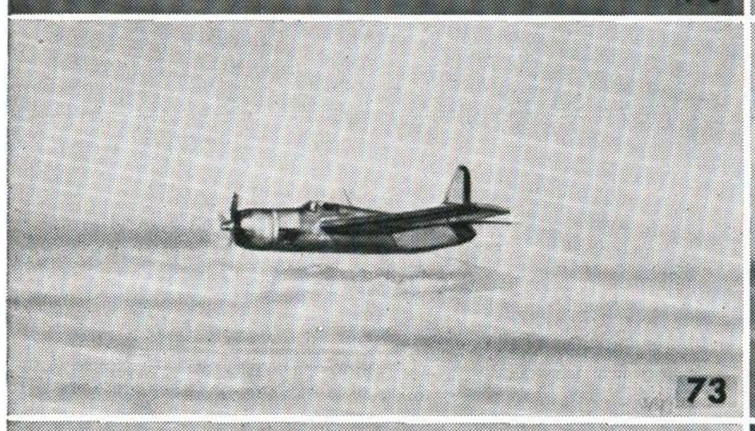
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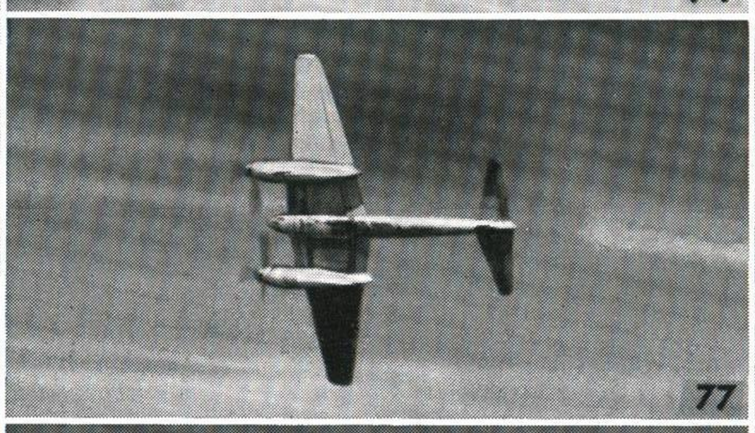
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WARSHIP RECOGNITION — TERMINOLOGY

ABAFT
Towards the stern from any part of a ship.

AFT
Near or towards the stern.

AHEAD
Directly in advance of the ship.

AIRCRAFT LIFT
(CARRIERS ONLY)

Power-operated platform for carrying aircraft up and down between the flight deck and the hangars below.

AMIDSHIPS
Portion of the ship midway between bow and stern.

ARMAMENT
Guns, torpedoes, aircraft, etc., carried by a warship. The main armament usually refers to the largest calibre guns, and the secondary armament to the next largest guns.

ARMOUR
Hardened-steel plating, provided to withstand enemy shells, torpedoes, mines or bombs. It is fitted to the sides, decks, turrets, bridge, and other vital parts.

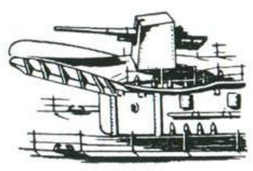
ASTERN
Directly behind the ship.

ATHWARTSHIPS
Across the ship (*i.e.* at right angles to the fore and aft line).

BARBETTE
Armoured ring on deck surrounding gun machinery and surmounted by a gun house or turret.

BATTERY
Any particular group of guns.

BEAM
Greatest width of a ship's hull. " On the beam " or " abeam " means in a direction at right angles to the fore and aft line of the ship.

BLAST OR FLASH SCREEN


Lip-shaped projection on superstructure carrying turrets, designed to give protection from the blast of the guns.

BOW
Part of the hull adjacent to the stem.

BOW WAVE
Wave formed under the bows as a ship moves forward.

BREAKWATER
Low barrier on the forecastle which prevents water sweeping aft along the deck in rough weather.

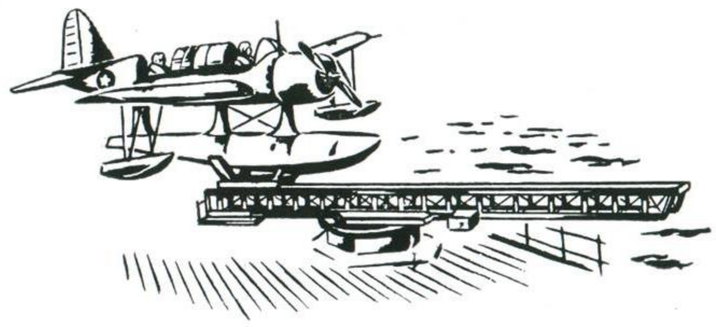
BRIDGE
A raised platform from which the ship is navigated.

BRIDGE STRUCTURE
A superstructure containing the bridge

BROADSIDE VIEW
View of a ship gained when a distant observer faces the ship's side squarely.

CAPITAL SHIP
Term denoting a battleship or battle-cruiser.

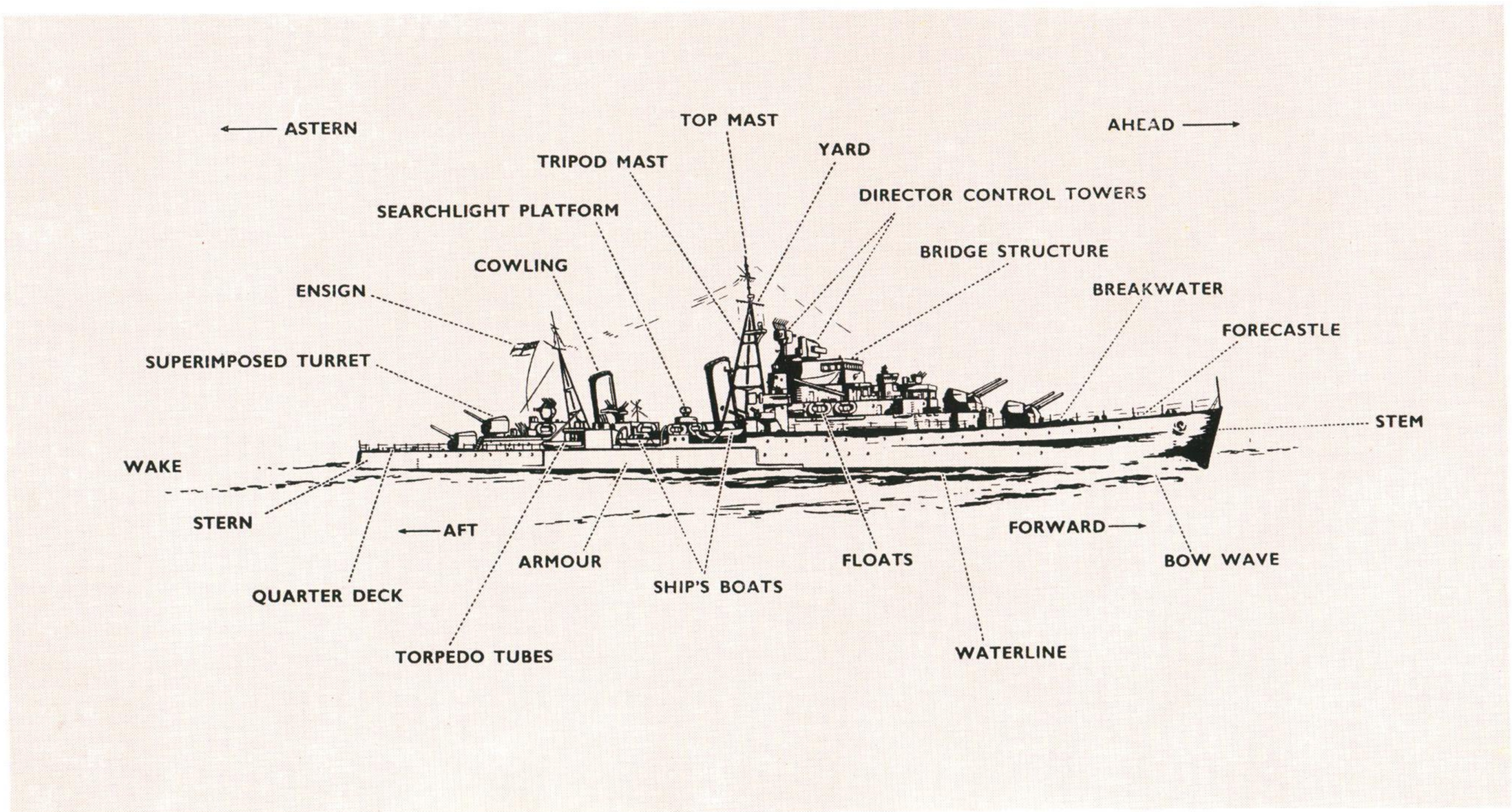
CATAPULT
Mechanical device for launching aircraft from ships. It can be fixed athwartships or made to revolve.



CENTRE LINE
The fore and aft line passing from stem to stern.

CONNING TOWER
Armoured compartment from which the ship is navigated when in action.

CONNING TOWER
A superstructure projecting above the hull of a submarine.



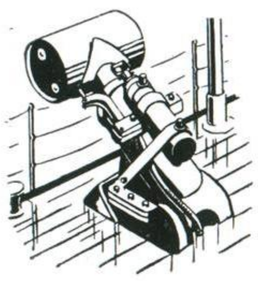
COWLING
Fitting on top of funnel to deflect smoke and fumes away from the bridge.

DAVITS
Curved steel fittings, used in pairs, to support and lower boats into the water.

DECKS
Horizontal platforms dividing the hull at various levels.

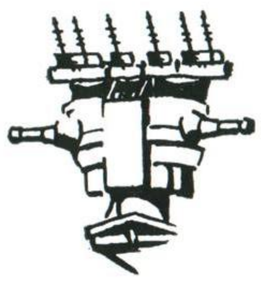
DEPTH CHARGE RACKS
Racks near stern to carry depth charges.

DEPTH CHARGE THROWER



Apparatus which hurls depth charges clear of the ship. Other forms of release gear are chutes and rails.

DIRECTOR CONTROL TOWER
Protected revolving tower in which gunnery control instruments are situated.



DISPLACEMENT
Weight of the volume of water displaced by a ship, expressed in tons. This is the standard method of indicating the tonnage of warships and is international.

DRAUGHT
Vertical depth of water between the waterline and the keel or propellers.

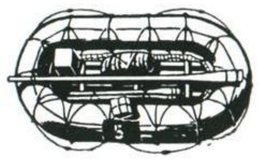
ENSIGN
National flag displayed by warships.

ENSIGN STAFF
Light pole on which the Ensign is hoisted.

FLAG SHIP
Ship of a fleet which wears the Admiral's flag.

FLASH SCREEN
See " Blast Screen."

FLOATS AND RAFTS
Lifesaving equipment carried in conspicuous and readily-accessible positions.



FLIGHT DECK
Long flush upper deck used by aircraft for taking-off and landing.

FLOTILLA
A number of destroyers (or smaller ships) grouped into a unit under one command.

FLOTILLA LEADER
A destroyer equipped to carry the Flotilla Commander.

FLUSH DECK
Continuous deck from bow to stern, unbroken by any raised or sunken portion.

FORE AND AFT
Lengthwise of a ship.

FORECASTLE
Forward part of the upper deck. A raised forecastle is raised above the level of the upper decks.

FORWARD
Near or towards the bow.

FREEBOARD
Distance between waterline and a ship's upper deck.

FUNNEL
Tubular structure which carries smoke or engine exhaust clear of the ship. It may be raked or vertical, and of round, oval or pear-shaped cross-section. A combined funnel merges two or more funnels into one structure.

GUN HOUSE
Steel house enclosing the mounting and breech mechanism of a gun, large enough to accommodate the gun's crew.

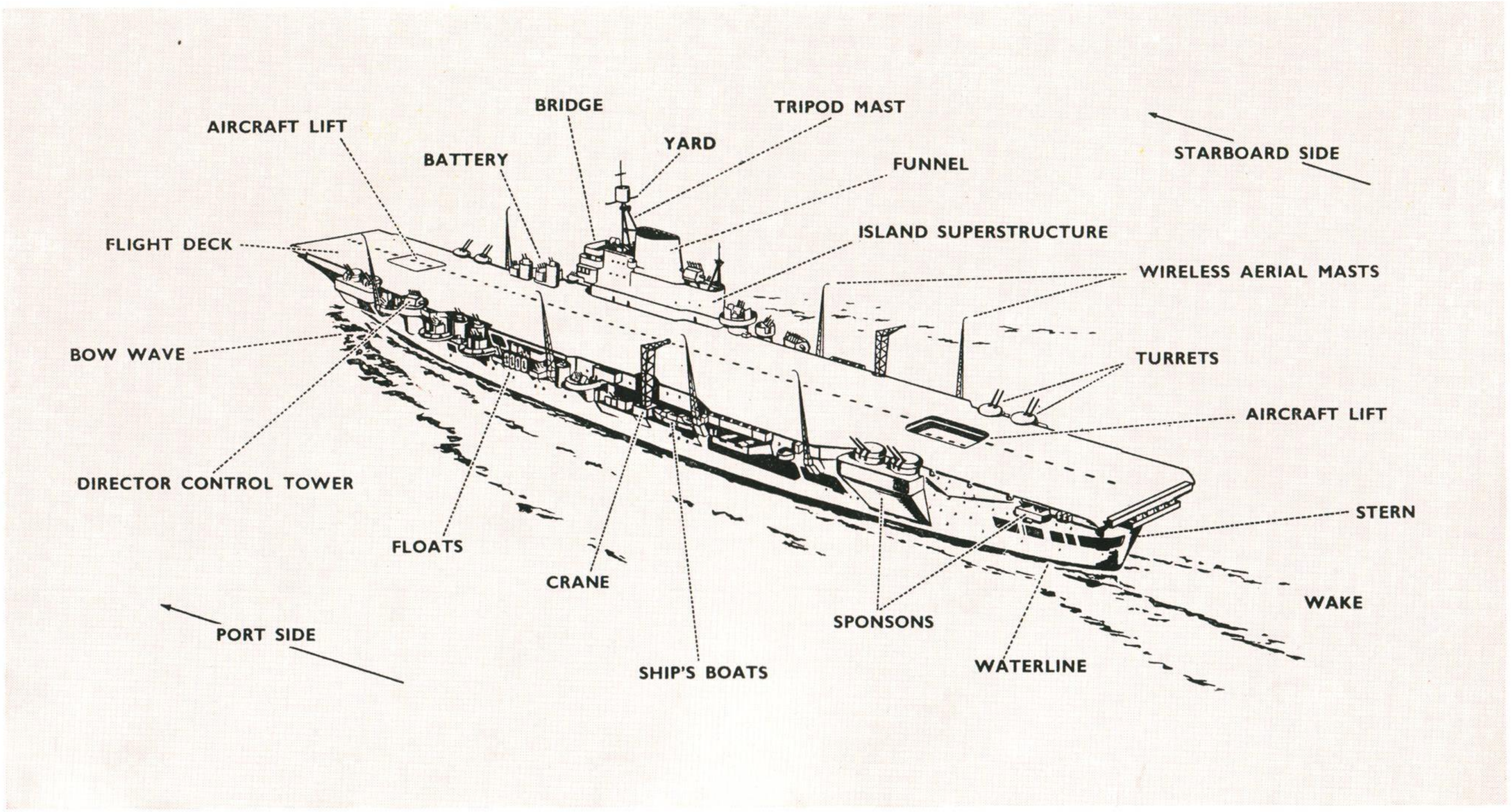
GUN SHIELD
Steel plate fixed to the front of a gun as protection from splinters and the weather.

HALYARDS
Light lines used to hoist signal flags to the yard.

HOIST
Any group of signal flags or pendants which are " hoisted " to the yard at one time.

HULL
The main body of a ship.

HYDROPLANES
The horizontal vanes or planes at bow and stern of a submarine which assist it to dive, surface, or trim.



ISLAND SUPERSTRUCTURE
Compact mass of superstructure (bridge, funnel, etc.) on the flight deck, standing on the starboard side.

JUMPING WIRES
(OF SUBMARINES)
Cables running from conning tower to bow and stern ; designed to ward off nets, hawsers, mine cables, etc.

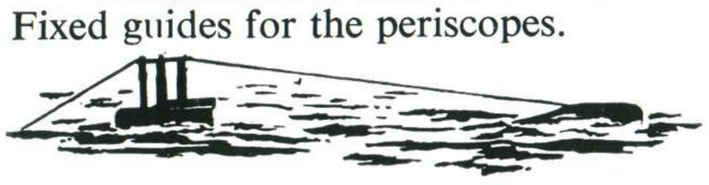
KEEL
The lowest longitudinal portion of the hull.

KNOT
Measure of speed, expressed in nautical miles (6,080 ft.) per hour ; 1.15 statute miles per hour.

NET CUTTER
Hard-steel saw-edged fitting on bow, and sometimes stern, to enable a submarine to cut through defence nets, etc.

PERISCOPE
Long vertical tube enclosing an optical system which gives a surface view to an observer in a submerged submarine. It can be raised or lowered at will. Frequently two periscopes are fitted, both projecting from the conning tower structure.

PERISCOPE STANDARDS
Fixed guides for the periscopes.



POLE MAST
Vertical or raked cylindrical mast, usually in a single piece.

PRESSURE HULL
The main hull of a submarine which can withstand the pressure of water at the greatest designed depth.

QUARTER
The sector between abeam and astern.

QUARTER DECK
That part of the upper deck, abaft the mainmast.

RAKED
Inclined from the vertical. A mast, funnel, bow or stern can be raked.

SADDLE TANKS
(OF SUBMARINES)
Large storage tanks built along the pressure hull of many submarines.

SEARCHLIGHT PLATFORM
Platform fitted around a funnel in some large ships ; or upon a separate steel lattice tower.

SHIP'S BOATS
Small boats power-driven or equipped with oars and sails, usually suspended from davits.

SILHOUETTE
Broadside outline of a ship. A " low silhouette " means a ship has a squat structure.

SNORT
A device allowing submarines to take in air whilst submerged. When in use it breaks the surface of the water ; when not in use it lies along the submarine's casing.

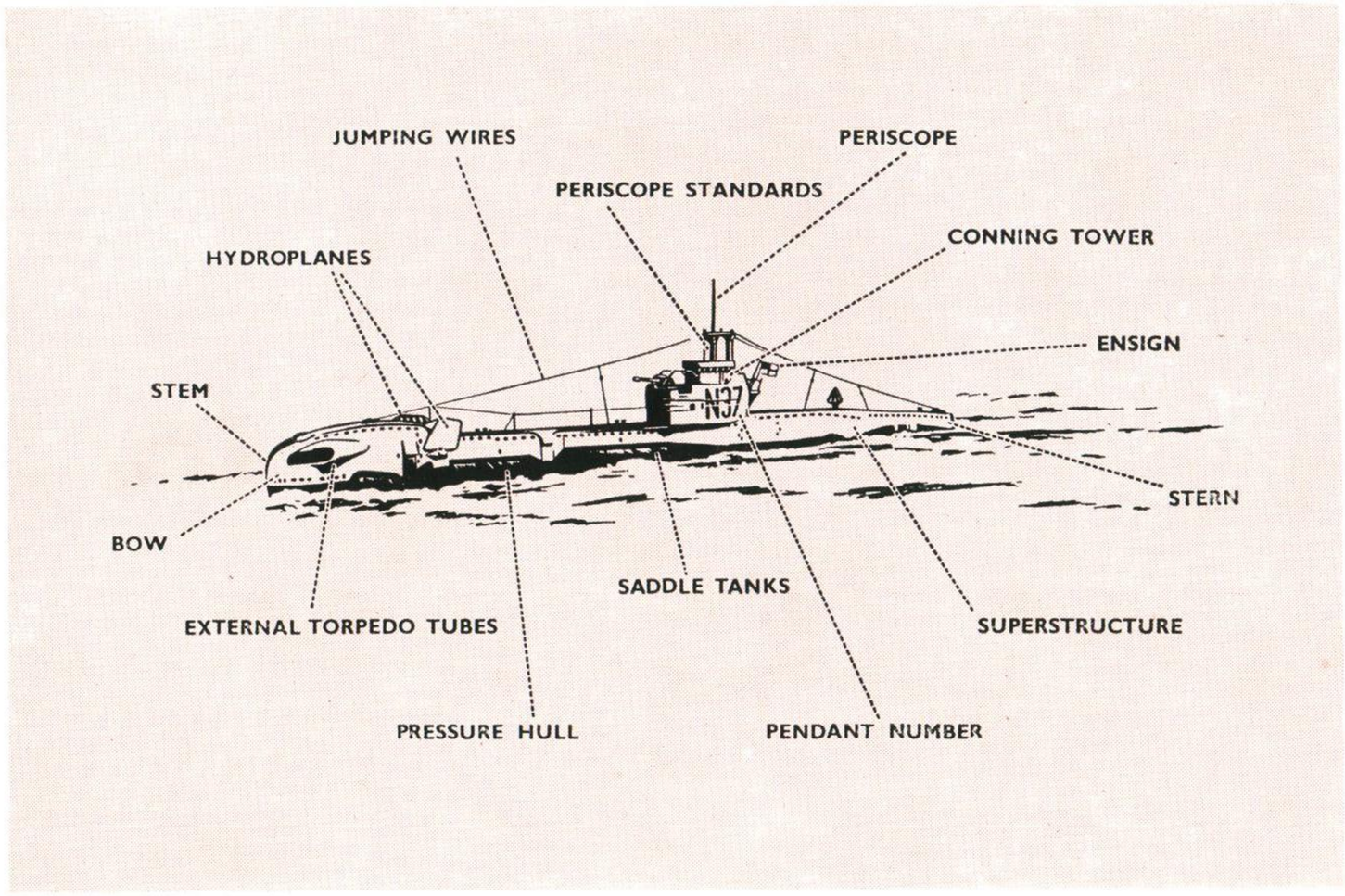
SPONSON
Projection from the ship's side, usually to support guns.

SQUADRON
A number of warships (cruisers or larger) grouped into a unit under one command.

STEM
The foremost part of the ship's hull.

STERN
Extreme aftermost part of the hull.

SUPERIMPOSED TURRET
Turret placed at a higher level than a neighbouring turret, so that the guns of both can fire simultaneously in the same direction.

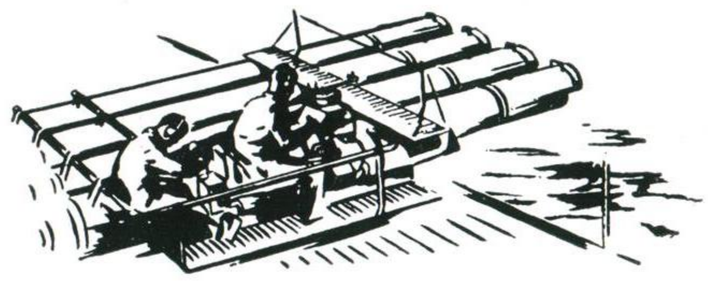


SUPERSTRUCTURE
Structures or houses built upon the upper deck.

SWEEP
A towing device for cutting mine cables.

TOP MAST
Lightly constructed upper mast.

TORPEDO TUBES
Tubes for discharging torpedoes. They



are fixed or rotating, and are mounted singly or in sets up to five. Normally they are positioned on the centre line of the ship.

TRIPOD MAST
A mast which is supported by two steel struts in place of rigging. This mast may carry control platforms, signal gear, etc. The lower mast is frequently merged into the bridge structure.

TURRET
Revolving, box-like structure housing one, two, three or four guns. A " twin " turret has two guns, a " triple " turret three guns, and a " quad " turret (uncommon) four.

UPPER DECK
The topmost deck.

VENTILATOR
Funnel-like fitting projecting from the deck or from superstructure.

VISUAL CALL SIGN
(OR PENDANT NUMBER)
Two or more numbered pendants or numeral flags, sometimes preceded by an alphabetical or special flag, allocated to a warship by means of which she may be signalled visually.

WAKE
Track of disturbed water a ship leaves astern.

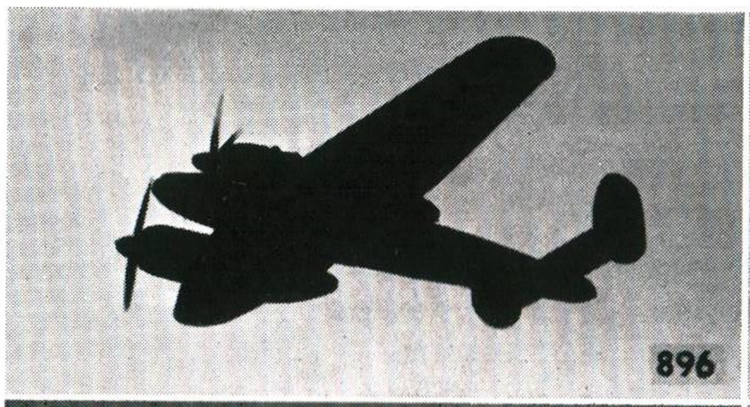
WATERLINE
Line along the hull at the surface of the water.

WINDSCREENS
Collapsible screens to shield aircraft from weather.

WIRELESS AERIAL MASTS
(CARRIERS ONLY)
Light masts provided solely to support wireless aerials. Positioned at the sides, they are swung out-board when flying is in progress.

YARD
Spar rigged athwart a mast, nowadays used solely for signalling.

SILLOGRAPHS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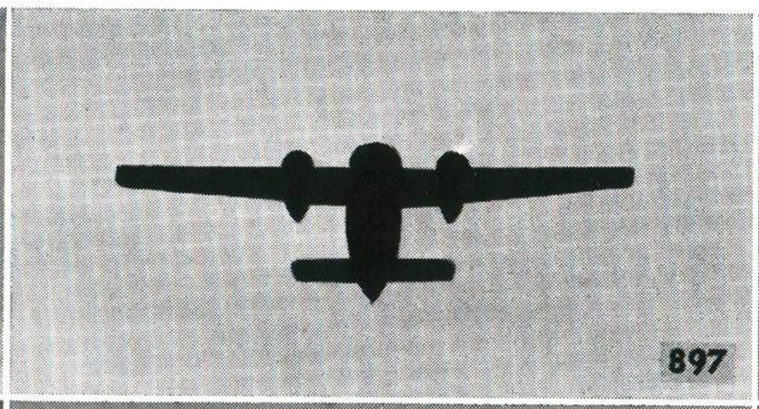
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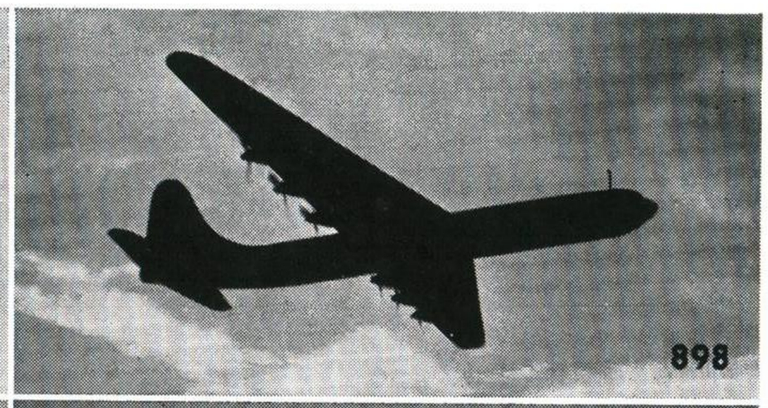
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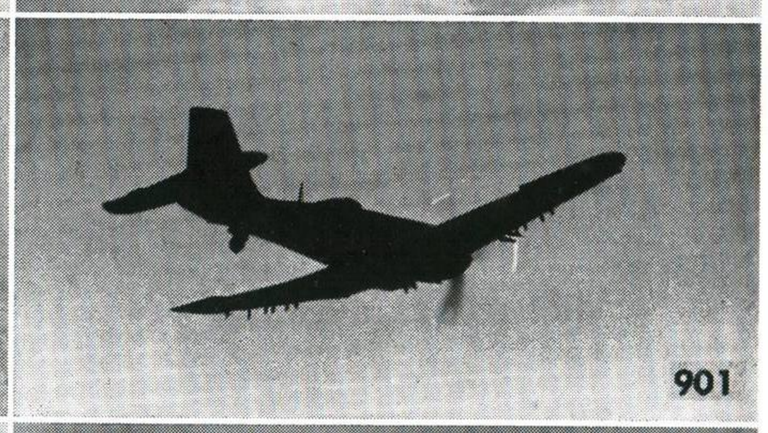
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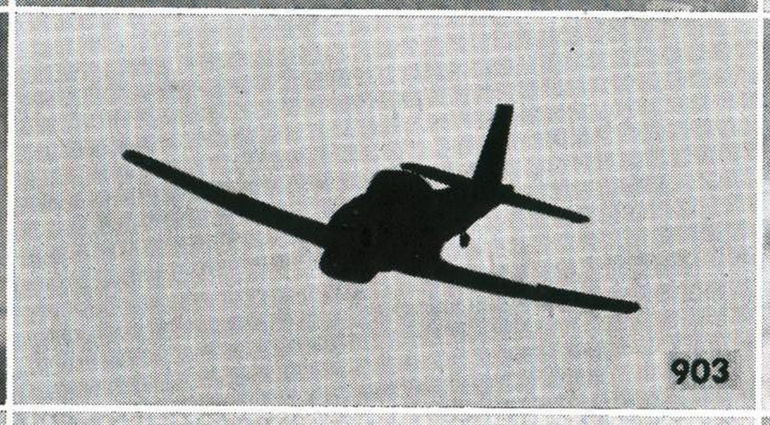
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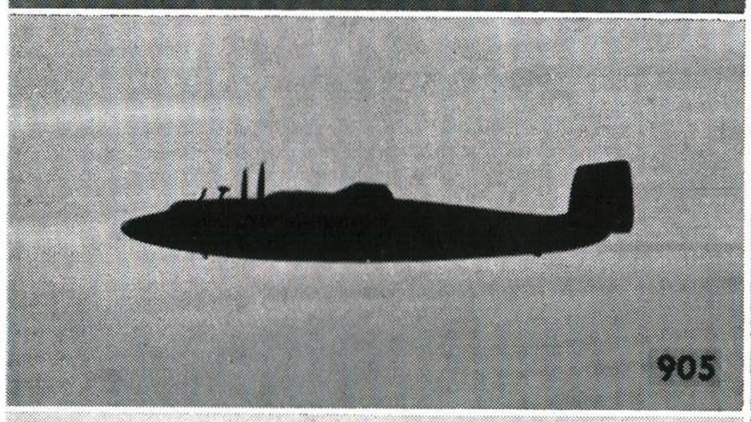
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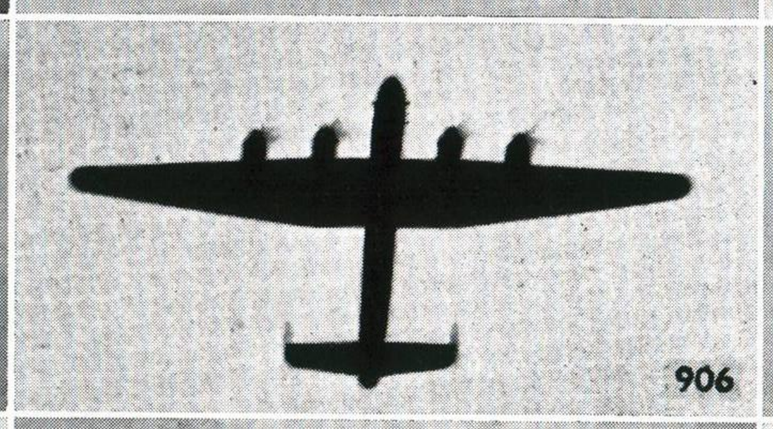
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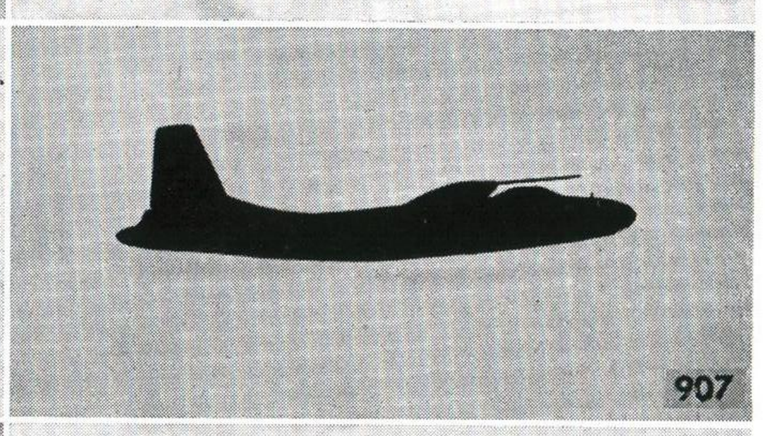
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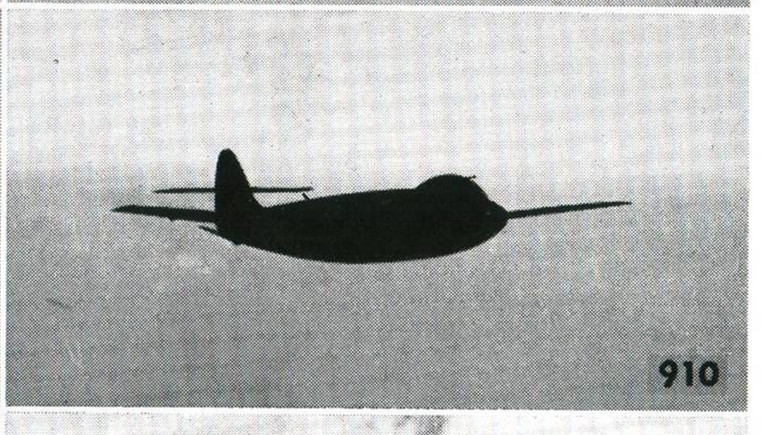
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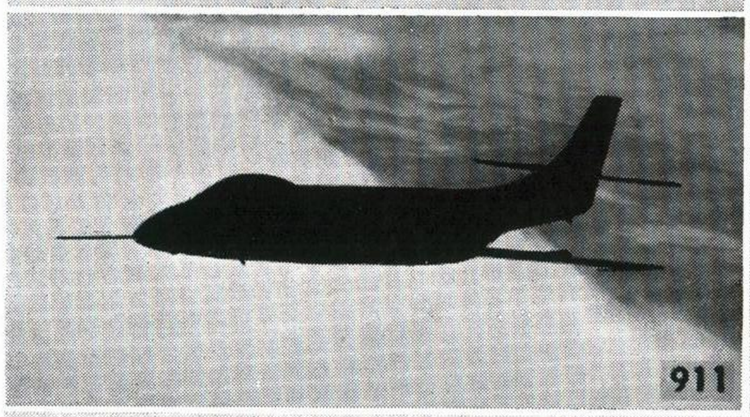
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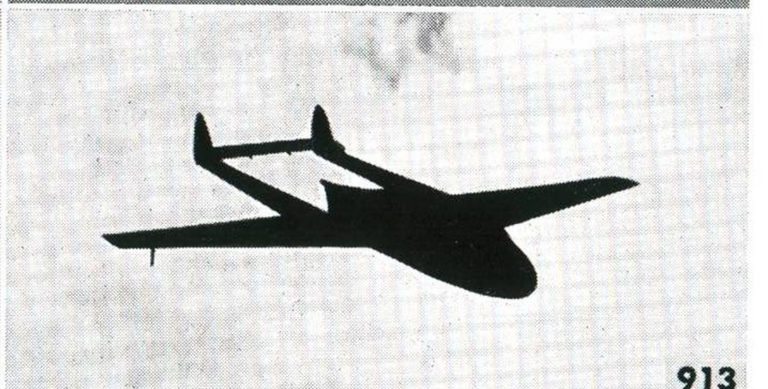
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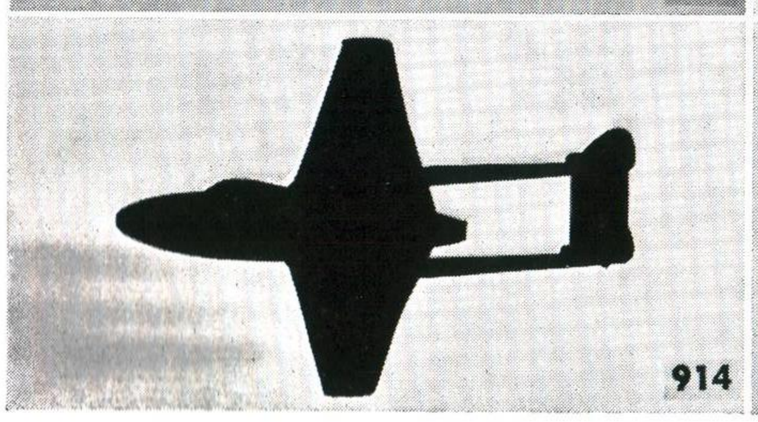
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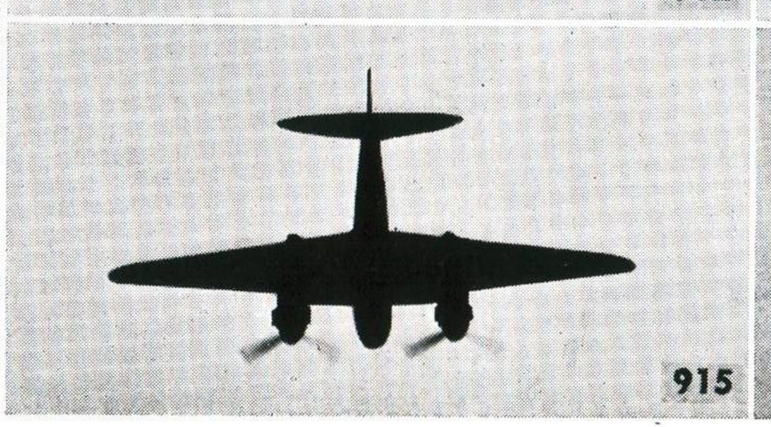
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BOOK REVIEWS

by JOHN W. R. TAYLOR

Even if you agree with the late Henry Ford that " History is bunk," it should not prevent your enjoying the fourth and last volume of Capt. Norman Macmillan's history of **The Royal Air Force in the World War.** As a story book of enterprise, achievement and gallantry it ranks high. As a reference book it is invaluable, for here are " now it can be told " details of a thousand and one actions that paved the way for final victory in the West and the Pacific, together with statistical tables of operational sorties, bomb tonnages and aircraft losses of every R.A.F. Command.

No branch of the Service has been overlooked in the narrative and there are many references to the fine work of the Royal Observer Corps, especially during the V.1 attack on London. Successes and setbacks alike are recorded and analysed in detail, with no attempt to disguise mistakes and wrong decisions. This is important, for the surest fact that emerges from the study of any history is that it has a habit of repeating itself. For that reason, it is a sobering thought that at one stage of the war R.A.F. machines had to lower their wheels every time they crossed our coastline below a certain height, as a recognition aid to trigger-happy gunners. The problem of plotting low-flying raiders is still with us, and we must ensure that a poor standard of recognition does not again penalise our own defence fighters.

Now, a quick transition from the past to the future. In the August 1950 *Journal* we reviewed a little book entitled **Interplanetary Flight,** which described how we might one day fly to the moon and planets. Two young Americans—Chesley Bonestell and Willy Ley—have now given us, in **Conquest of Space,** a vivid and magnificent preview of what we shall see when we get there. The design and construction of a space-ship, and of satellite vehicles from which a Super R.O.C. might one day be able to keep an eye on the whole world, are described in simple terms ; but it is for Chesley Bonestell's paintings that this book has become a best-seller. Based on the latest scientific research, they show what the earth would look like from a space rocket, and what we believe to be typical landscapes on the moon and planets of our solar system. If you enjoyed the film *Destination Moon*, this book should be irresistible.

Finally, a first-class adventure story which proves that fact can be far more exciting than fiction—**Wingless Victory,** an account of Sir Basil Embry's escape from Occupied France in the summer of 1940. It begins when Sir Basil, then a Wing Commander, was shot down whilst leading his squadron into action against advancing German *panzer* troops, and ends when he was back again with his comrades nine weeks and five days later. Between times he had enough adventures to last any ordinary man a lifetime, mostly grim ones as he bluffed his way to freedom and fought his own private war against the enemy. But if you can read without a hearty chuckle or two the account of how he fooled a German Intelligence Officer by acting as a penniless, very Irish refugee, you must be very hard-boiled.

Wingless Victory should be read by every member of Fighter Command and the Royal Observer Corps, for Air Marshal Sir Basil Embry is now their C.-in-C. and it proves that they could have no finer leader.

" THE ROYAL AIR FORCE IN THE WORLD WAR "—Vol. IV, 1940-45 (II), by Captain Norman Macmillan, M.C., A.F.C. George G. Harrap. 360 pp. Illustrated. 15s. net.

" THE CONQUEST OF SPACE "—Paintings by Chesley Bonestell ; Text by Willy Ley. Sidgwick and Jackson. 160 pp. 18s. net.

" WINGLESS VICTORY "—By Anthony Richardson. Odhams Press Ltd. 256 pp. Illustrated. 9s. 6d. net.

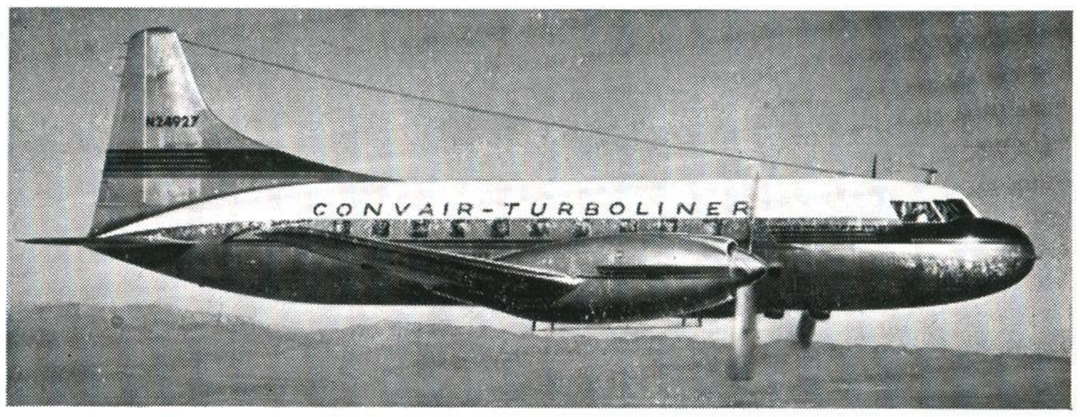
INTELLIGENCE

H.M.S. *Theseus*

Fairey Fireflies and Hawker Sea Furies from the Glory Class light fleet carrier H.M.S. *Theseus* are reported to have been in almost continuous operation against advancing Communist forces in Korea.

Convair-Turboliner

America's first turboprop transport the Convair-Turboliner has made its first flight. The Turboliner is a research transport ordered from Consolidated Vultee Aircraft Corporation by the Allison Division of General Motors



Corporation to test turboprop engines in a modern commercial-type aircraft. The airframe is basically a Convair-Liner which has been modified to use two 2,750 h.p. Allison 501 turboprop engines in place of the 2,400 h.p. piston engines installed in Convair-Liners. Visible modifications to the Convair-Liner airframe are in the engine-nacelle area.

Marauder

Subject of readers' letters to the Editor has been the re-appearance in spotting tests of the B-26 Marauder. Reason is that this aircraft is being supplied to the French Air Force. Although it is not now in service with U.S.A.F. and its old designation B-26 is not strictly applicable, it is still to be known as the Marauder in the F.A.F. It is understood that the French will use Marauders in Indo-China.

Apollo

It is reported that the Armstrong Whitworth Apollo gas-turbine powered airliner is to make proving flights to Europe this year. The Apollo was the first turboprop airliner to be fitted with axial-flow type engines. These differ from the centrifugal type in the method of feeding air into the combustion chambers. The small diameter of the axial flow type is well illustrated by the slim nacelles of the Apollo's four Mamba engines.

Fairey 17

At the time of going to press, the evaluation trials of the Fairey 17 and the Blackburn YB 1 are drawing to a close, and an announcement is expected in favour of a production order for the Fairey 17.

Thunderjet Development

It is reported that trials are to take place with a "Sapphire" version of the Republic F-84F all-swept development of the Thunderjet. It is hoped to feature the F-84F in the next edition of the Journal.

Car Ferry

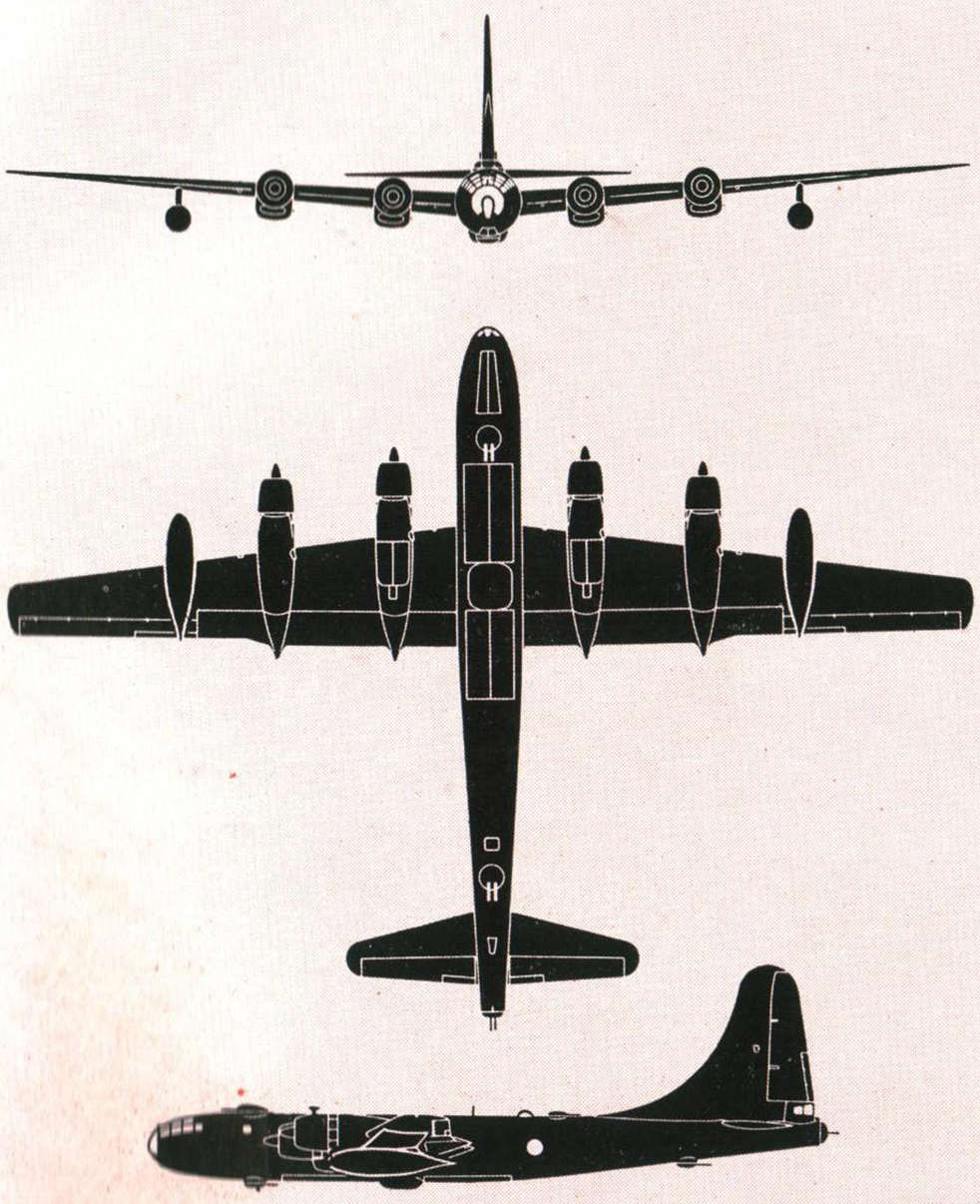
A Bristol Freighter car-ferry service has now opened between Malta and North Africa, in addition to the one already in operation across the English Channel. No one should have difficulty in spotting the Freighter with its enormous "bull"-nose and angular fin and rudder.

Netherlands Aircraft

Two squadrons comprising Sea Furies and Fireflies from the Dutch aircraft carrier *Karel Doorman* are arriving in this country for training. It is intended that these aircraft shall operate from a British aircraft carrier during the summer cruise of the Home Fleet.

SILHOUETTES — A PAIR TO COMPARE

BOEING B-50D



American Medium Bomber

Engines : 4 Pratt & Whitney piston engines

Span : 141 ft. 6 ins. Length : 99 ft.

Recognition Features:

Wings : mid-set, marked dihedral, straight taper on leading edge, near straight trailing edge with " kink " at outer engines, blunt tips.

Engines : four mid-set radials with intake scoop below, protrude well forward of wing and just break line of trailing edge.

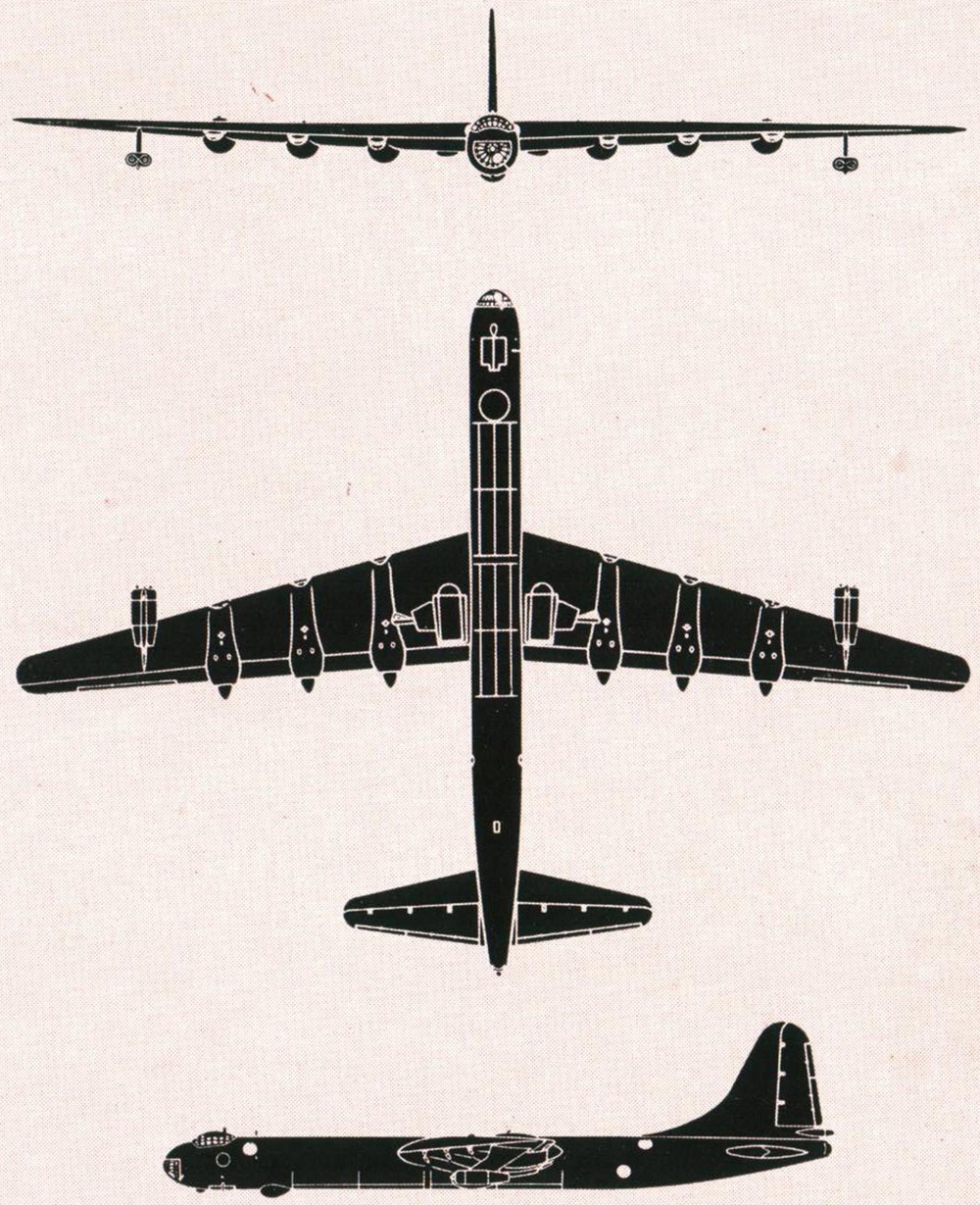
Fuselage : circular section, tapering at rear.

Tailplane : straight taper, rounded tips.

Fin and Rudder : tall, large dorsal fairing.

Detail : fuel tanks suspended from wings outboard of outer engines, cockpit streamlined into nose, various turrets upper, lower and rear.

CONVAIR B-36D



American Heavy Bomber

Engines : 6 Pratt & Whitney piston engines plus 4 General Electric turbojets

Span : 230 ft. Length : 162 ft.

Recognition Features:

Wings : high-set, nearly half way along fuselage, thick, with practically no dihedral, marked taper on leading edge, slight back-taper on trailing edge, pointed tips.

Engines : six built-in and slightly underslung " pushers."

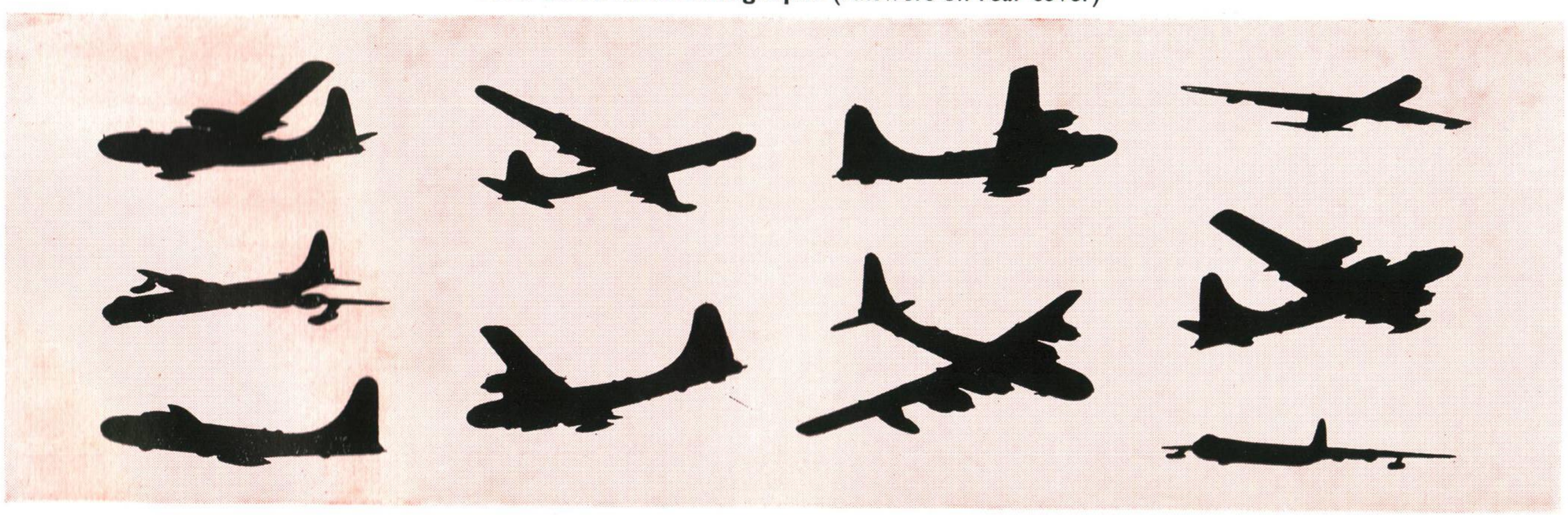
Fuselage : long and tubular with upswept underside towards tail.

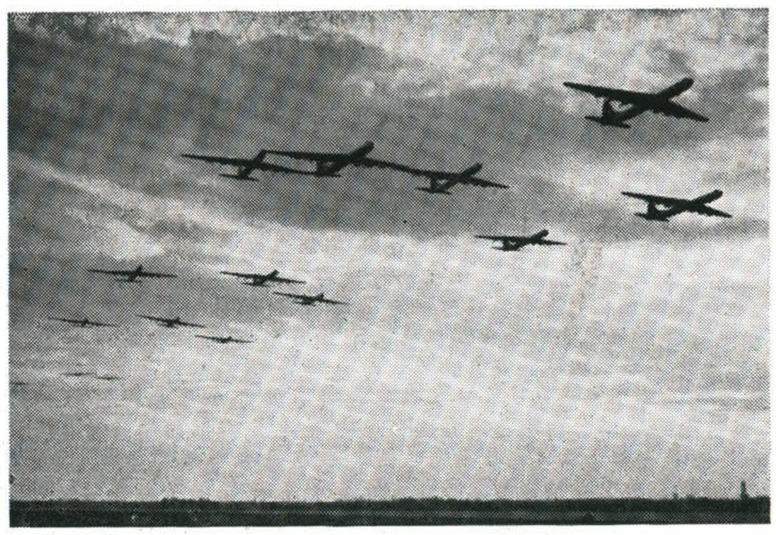
Tailplane : diamond shaped.

Fin and Rudder : triangular, rounded tip, dorsal fairing.

Detail : cockpit forward on nose, four turbojets suspended in pairs from wings outboard of outer piston engines, turret under forward fuselage, fairing for radar equipment at base of rudder.

Now solve these Sillographs (Answers on rear cover)





COVER : Convair B-36B formation. Other views below

SOLUTIONS TO RECOGNITION TESTS IN THIS EDITION :

ELEMENTARY

928. F9F Panther
929. Auster 6
930. Convair B-36
931. F8F Bearcat
932. Canberra B Mk.1
933. F4U Corsair
934. Marathon 1
935. Convair L-13
936. Comet
937. Brigand B Mk.1
938. Firefly FR Mk.4
939. Constellation
940. L-17 Navion
941 Meteor PR Mk.10
942. North American AJ-1
943. Athena T Mk.2
944. Meteor NF Mk.11
945. B-45 Tornado
946. Gemini 1A
947. North American F-94A
948. F-89 Scorpion

ADVANCED

64. Blackburn YB-1
65. Balliol T Mk.2
66. Mosquito NF Mk.36
67. Fairey 17
68. Attacker F Mk.1
69. B-47A Stratojet
70. Ambassador
71. Chipmunk T Mk.10
72. Meteor FR Mk.9
73. AF-1 Guardian
74. P2V-2 Neptune
75. F2H Banshee
76. AM-1 Mauler
77. Hornet F Mk.3
78. Meteor F Mk.8
79. Canberra B Mk.2
80. Hastings C Mk.1
81. FJ-1 Fury
82. Lockheed XF-90
83. Bristol 170
84. Athena T Mk.2

SILLOGRAPHS

896. Brigand B Mk.1
897. Sea Prince
898. Convair B-36
899. Marathon 1
900. Canberra B Mk. 1
901. Firebrand TFB Mk. 5
902. Anson 19
903. Balliol T Mk. 2
904. Hastings C Mk. 1
905. Ambassador
906. Lincoln B Mk. 2
907. B-45 Tornado
908. Bristol 170
909. F-86 Sabre
910. Seahawk F Mk. 1
911. XF-88 Voodoo
912. Harvard 2
913. Sea Vampire FB Mk. 20
914. D.H. 113
915. Mosquito T Mk. 3
916. Firefly FR Mk. 5

TRICKY TRIO

Left to right : Bristol 170, SHCHE-2, C-125 Raider.

B-50D and B-36D SILLOGRAPHS

Top line : B-50D, B-36D, B-50D, B-36D.
Middle : B-36D, B-50D.
Bottom line : B-50D, B-50D, B-50D, B-36D.

TANK TEST SOLUTIONS

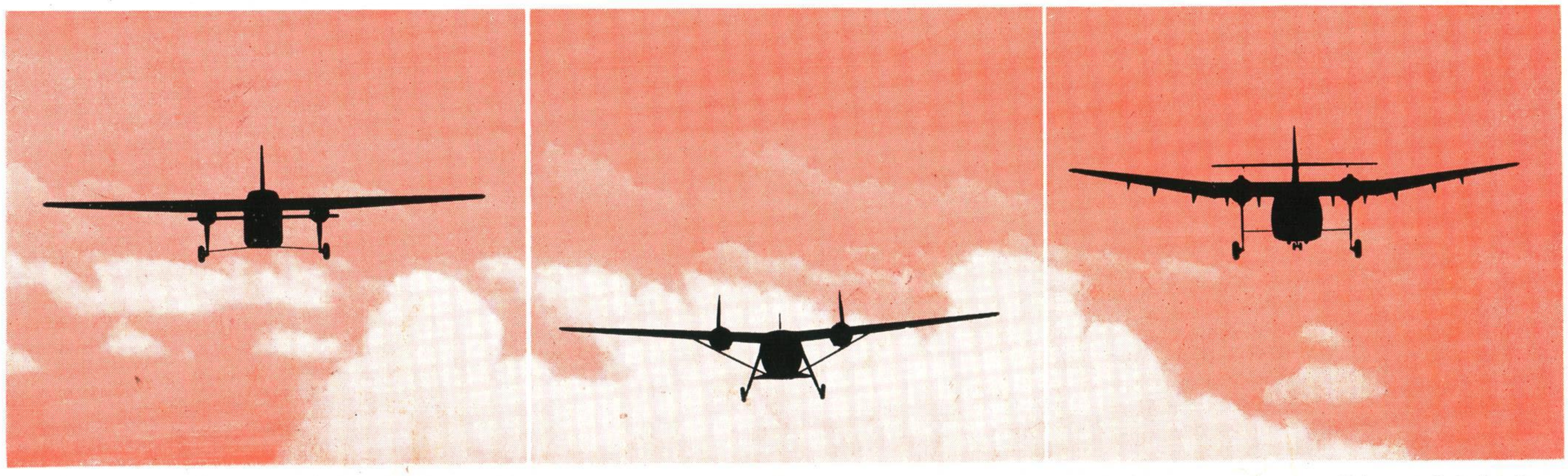
1. Russian Joseph Stalin 2
2. Swedish M.42 medium tank
3. British Comet cruiser tank
4. German Mk. 4 Model F2and G
5. Swedish M.43 self-propelled gun
6. Japanese Type 95 light tank
7. Japanese Type 97 tankette
8. German 7.5 assault gun 40

Note : All these A.F.V.s are in service, though not necessarily in the armed forces of their countries of origin. Many German and Japanese tanks for example are used by their former enemies.

TAIL KEY

1. DC-6
2. DC-4
3. Hastings
4. B-29 Superfortress
5. Convair B-36
6. B-50 Superfortress
7. Dakota
8. IL-12
9. F-84 Thunderjet
10. F-80 Shooting Star
11. Attacker
12. Meteor 8
13. Canberra
14. F-86 Sabre
15. MIG-15
16. P.1081

TRICKY TRIO



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