

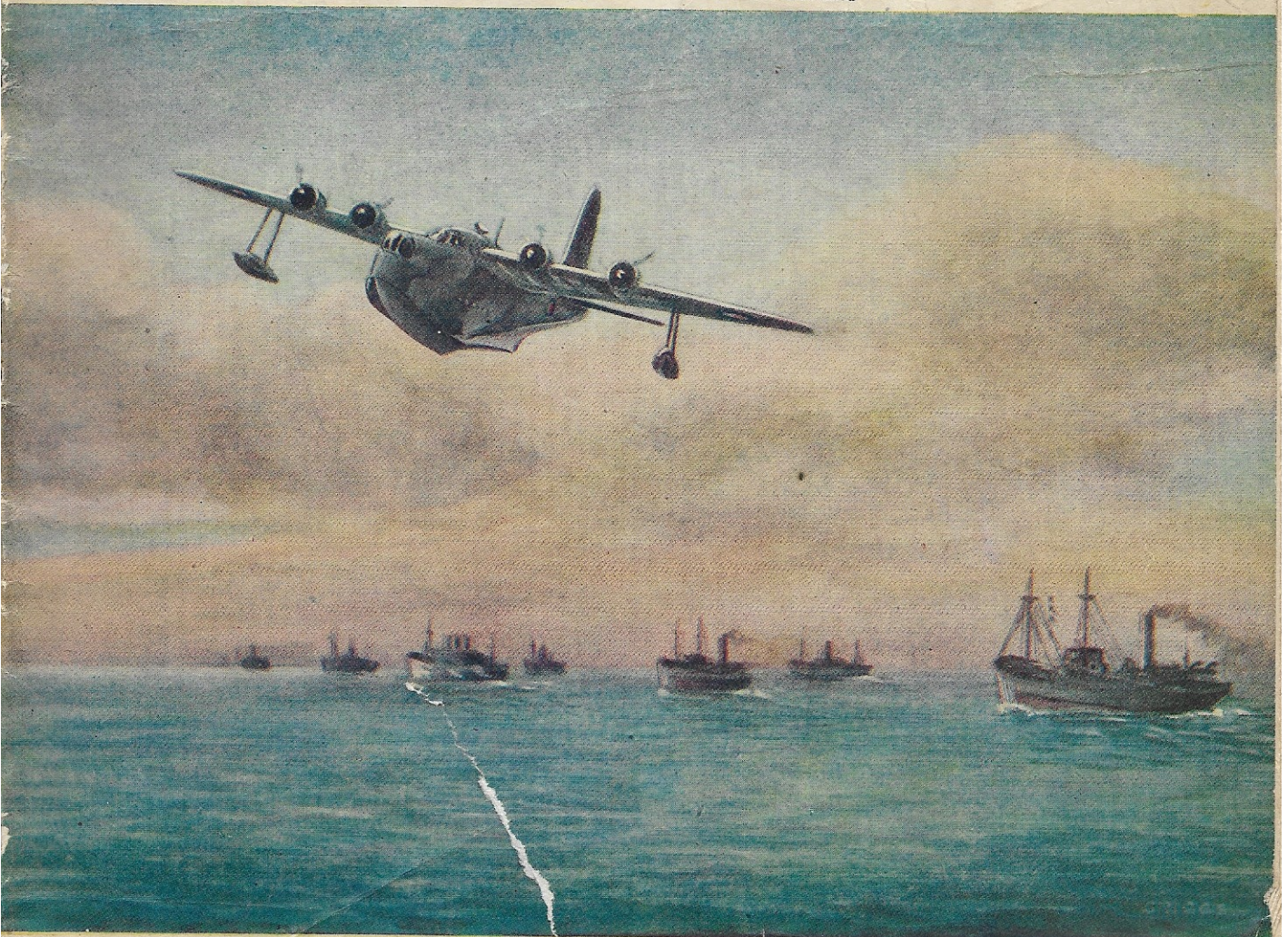
**AIR** TRAINING CORPS  
**GAZETTE**

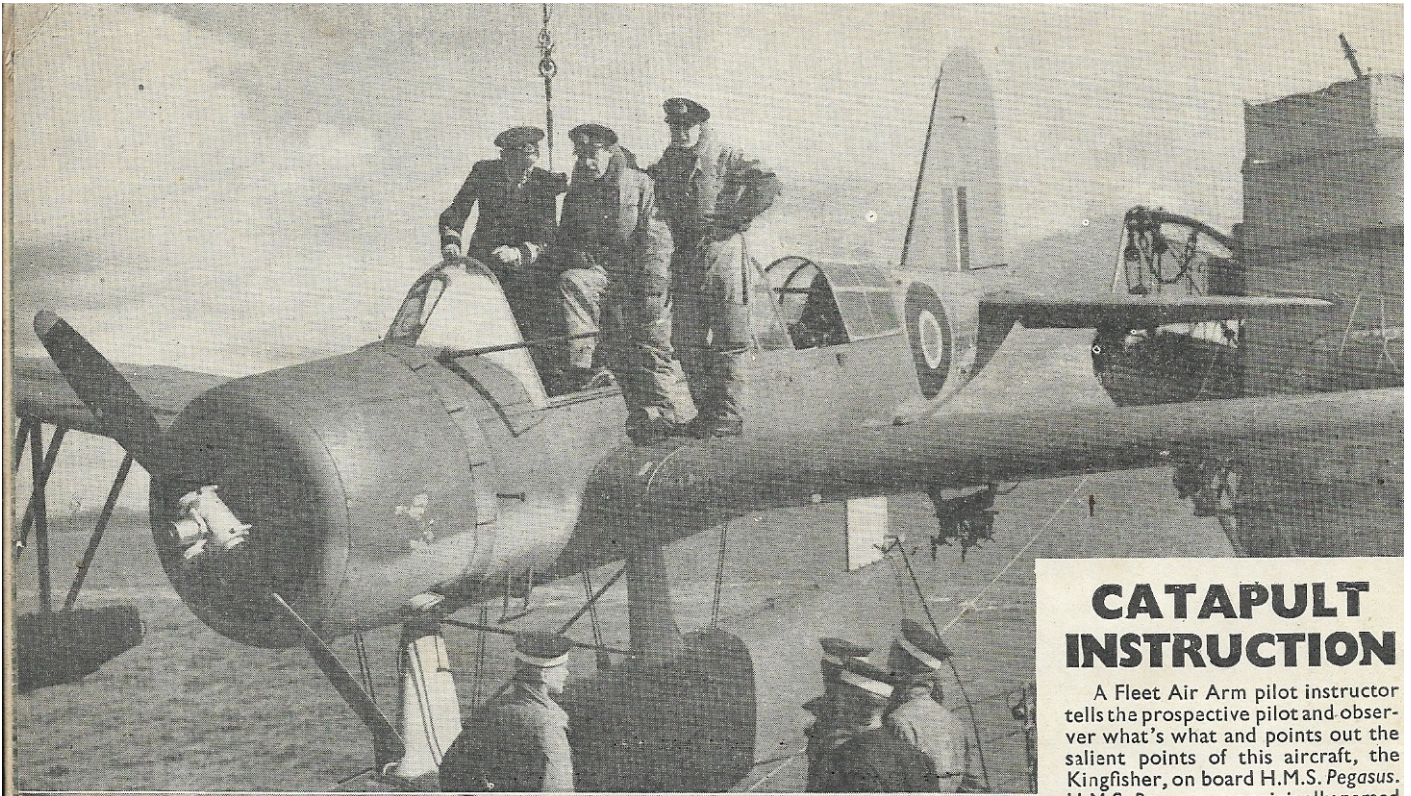
VOL. II - No. 12 DECEMBER, 1942

Price 6d.



Over Land and Sea  
The Short Stirling and the Short Sunderland



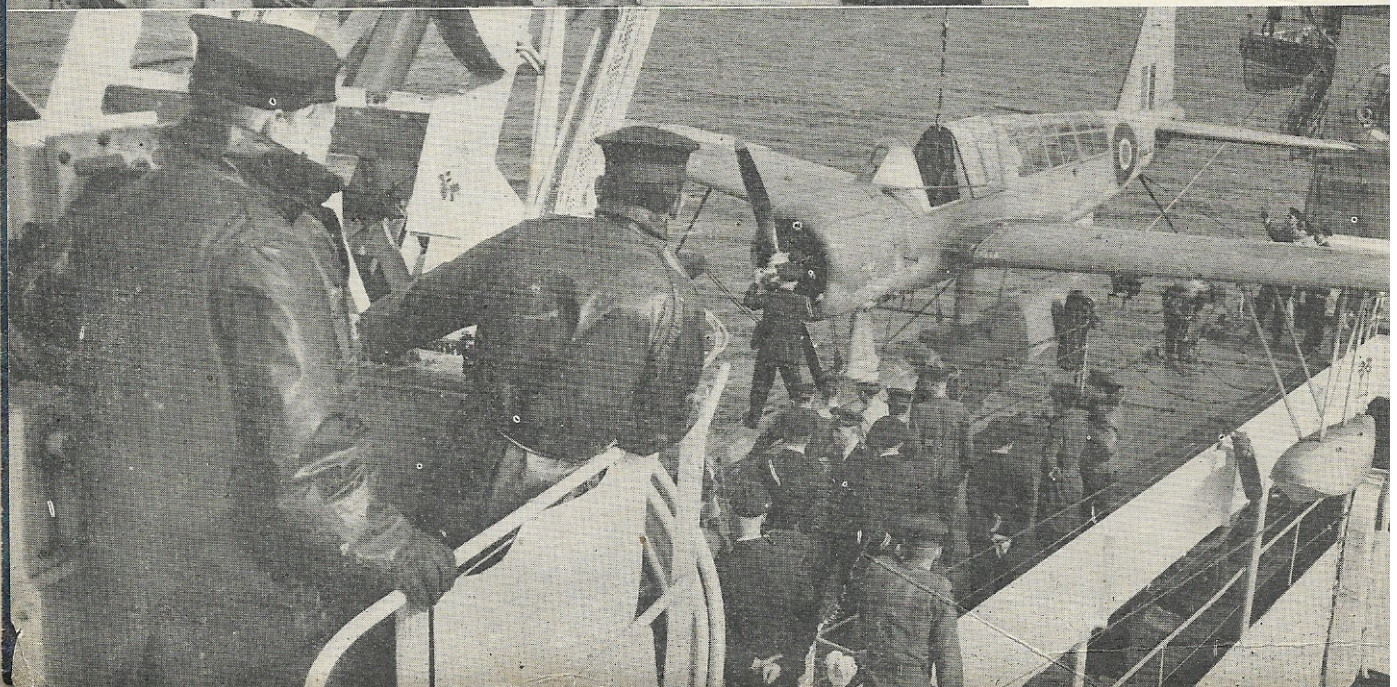


## CATAPULT INSTRUCTION

A Fleet Air Arm pilot instructor tells the prospective pilot and observer what's what and points out the salient points of this aircraft, the Kingfisher, on board H.M.S. Pegasus. H.M.S. Pegasus was originally named Ark Royal and was employed as a seaplane carrier during the 1914-18 war. It is now used as a catapult training ship.

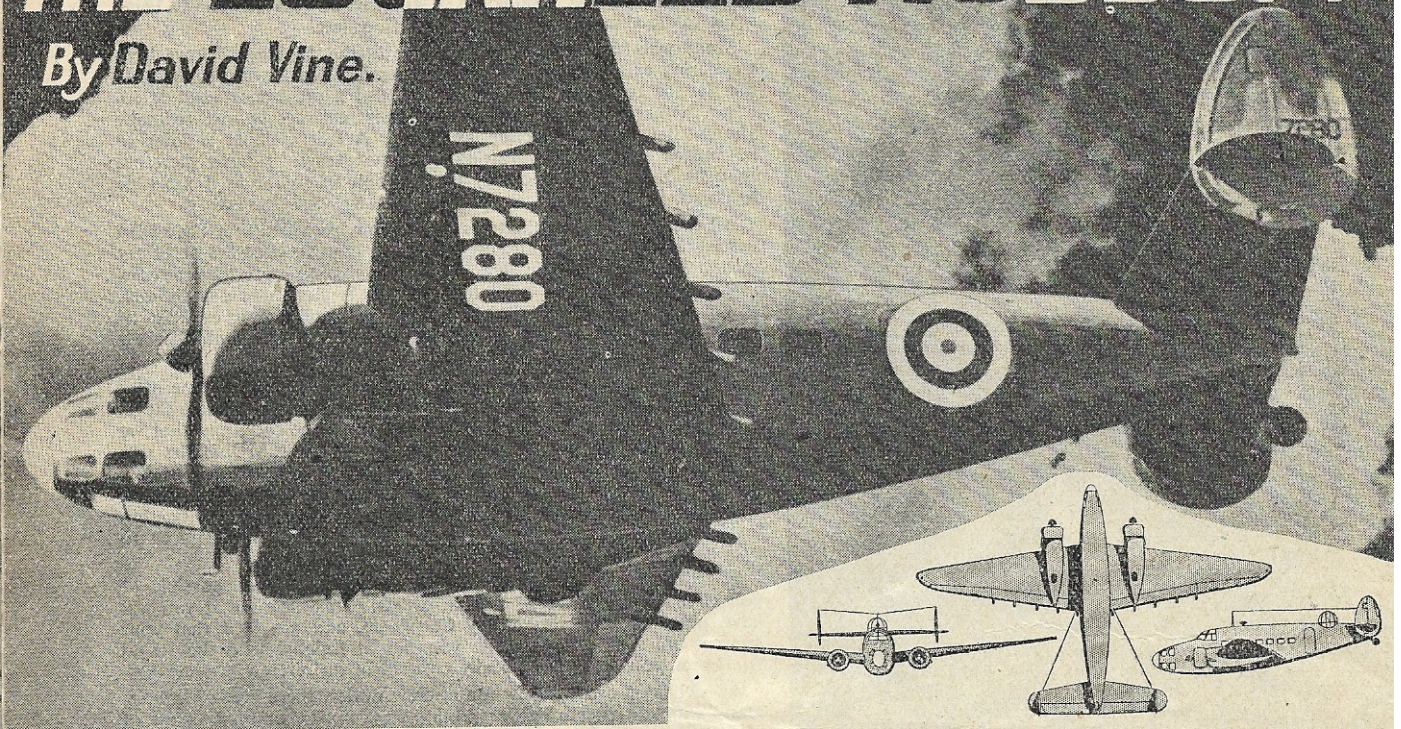
The aircraft is lowered for instructional purposes—instructional for both aircraft and catapult crews. Note the bomb-racks, V.P. aircrew and Royal Navy painted aft of the roundel.

"She's off." The real thing this time. Here are the catapult operators at the controlling levers. Few people can really imagine what a  
*(continued on page 3 of cover)*



# THE LOCKHEED HUDSON

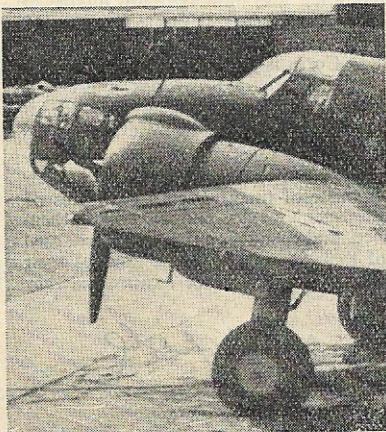
By David Vine.



WITH three years of constant war service with the R.A.F. Coastal Command, the Lockheed Hudson reconnaissance bomber has built for itself an enviable record of outstanding service and merit, and is still doing so.

Developed from the well-known Lockheed "14" airliner, which it closely resembles externally, the Hudson has many internal differences and is really quite another aeroplane from its famous forebear. The outboard egg-shaped rudders are the same, and the bulbous fuse-

The Hudson's wing-tip slots.



lage can now house as good a load of bombs as the "14" had passenger load.

The wing span of the Hudson is 65 ft. 6 in., and an aspect ratio of 7.79 gives it excellent lifting and flying qualities. The elevators are interesting, because they not only have a greater travel upwards, but also a greater area. This is made possible by a small flap (normally resting on top of the fuselage) which is raised by the upgoing elevators, and so forming one continuous control surface in the "up" position. This assists take-off considerably. The upward travel of the elevators is 14 inches and only six inches down. Surprisingly for a modern twin-rudder aircraft, both rudders have equal travel in either direction, namely, 30 degrees, so no differential rudder mechanism is fitted, as on most modern twin rudders.

#### Cable Control

The Hudson is interesting from its wide use of cable control, at a time when cable operation seems to be falling into neglect. The whole of the engine controls and the flying controls are cable-operated. The bomb doors are cable-operated from a single hydraulic jack, while the Fowler flaps are also cable-operated by one hydraulic jack.

The Hudson has a single cranked control column, but provision is made for another should it be necessary. An automatic pilot is a standard fitment. De-icing

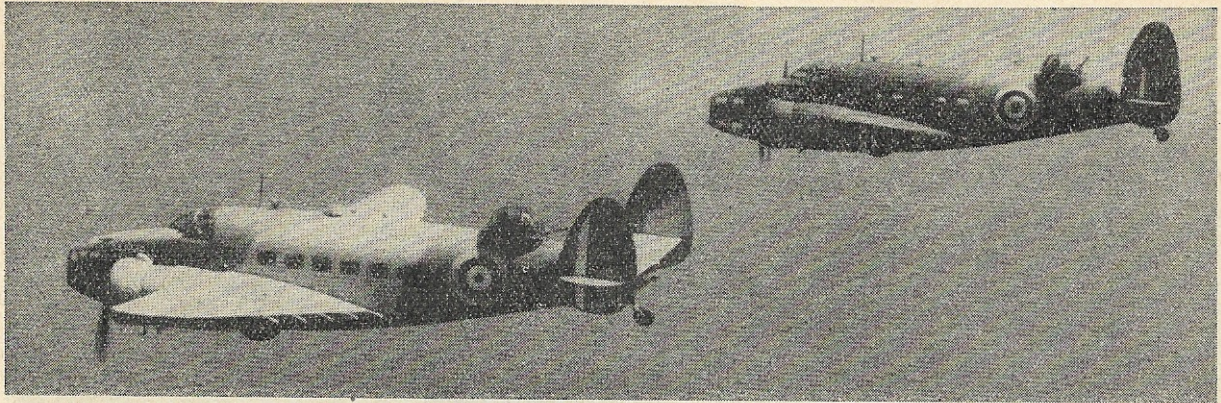
is done by pulsating rubber boots along the leading edges, a method not favoured now, though it seems effective enough on the Hudson. The hydraulic system is big, and operates bomb doors, brakes, flaps and undercarriage.

In an emergency the cabin door, which contains the rubber dinghy, can be jettisoned. The rear gunner escapes through the door aperture; the pilot, navigator and radio operator through the detachable cockpit roof. There is also an extra escape through an emergency exit in the side of the fuselage opposite the cabin door.

#### Slots and Flaps

At the tips of the wings are fixed slots designed to prevent wing-tip stall, which might occur on a finely tapered wing. The slots are cut into the wing itself, and come into operation at a fixed angle of attack.

By far the most interesting part of the Lockheed Hudson, and retained on the Vega Ventura, is the Fowler flap. This is operated by a single hydraulic jack and a complicated series of pulleys and cables passing inside the bulbs seen at the trailing edges of both the Ventura and the Hudson. These flaps are of the split type, and with an area of 107½ square feet take up nearly twenty per cent of the total wing area, a useful additional lifting surface for loaded take-offs. So the



**Hudsons of Coastal Command on patrol.** Since the war began these aircraft have flown millions of miles to protect shipping.

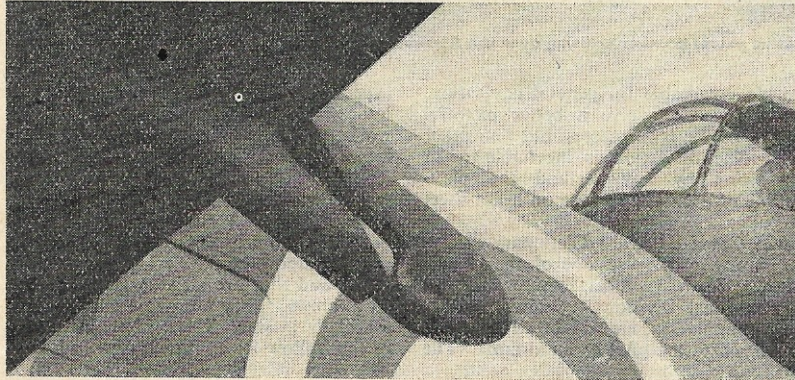
Fowler flap is not merely an air brake for steepening the gliding angle, but also an auxiliary wing which increases the normal wing area for take-off with big loads. This means that the flap has to be moved well back behind the trailing edge,

creasing wing area, the second where the flap provides an air brake at about 80 degrees, and the third where the whole flap area extends behind the trailing edge at about 60 degrees. When the pilot wishes to lower the flaps, he sets the con-

There are ten tracks in all, five to each flap, port and starboard.

#### Armament

The Hudson is fitted with an electrically operated Boulton and Paul gun turret with a wide arc of fire between the two rudders. There are two Browning .303 machine-guns firing forward, and two aft from the retractable "scoop." Two Wright Cyclone engines give a total of over 2,000 h.p. The construction, though exceptionally sturdy, is the conventional stressed skin, flush riveted to formers and stringers. The wings have a front and rear spar and stamped-out ribs. The bomb compartment is spacious, as the deep fuselage indicates. The bomb doors are opened and shut by a double-acting hydraulic jack and a series of cables. In fact, the Hudson can be called a cable-operated aeroplane.



**Close-up of one of the bulbs of the Fowler flaps.**

a mechanical problem of extreme difficulty cleverly solved by the use of rollers running inside metal tracks and pulled by cables.

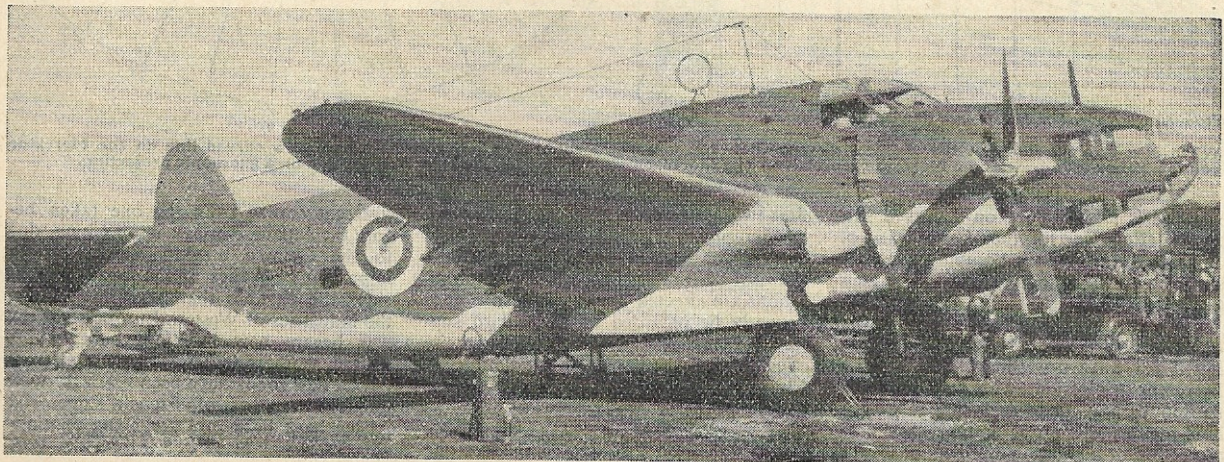
The Fowler flap has three positions. The first position is at 30 degrees for in-

creasing wing area, the second where the flap provides an air brake at about 80 degrees, and the third where the whole flap area extends behind the trailing edge at about 60 degrees. When the pilot wishes to lower the flaps, he sets the con-

#### Young Brother Coming On

Soon we shall be hearing more about the Lockheed Vega Ventura, a development of the Hudson and powered with two 2,000-h.p. Pratt & Whitney Double Wasp engines. The Ventura incorporates many of the features that have made the Lockheed Hudson one of the most outstanding American aeroplanes of this war.

**The Vega Ventura, successor to the Hudson.**



# Geography Matters

Geography is one of the bases of air strategy and essential to the pilot's work.

by **Captain Norman Macmillan,**  
M.C., A.F.C.



A U.S. Navy Catalina patrol bomber cruising over the Alaskan Peninsula.

**N**O one can understand the conduct of the war without a considerable knowledge of geography. It is basic to all strategic thought. Many modern weapons and all vehicles of communication are designed to overcome geographical handicaps; in this respect the aeroplane has a unique significance. In airmanship specialised geographical knowledge is essential.

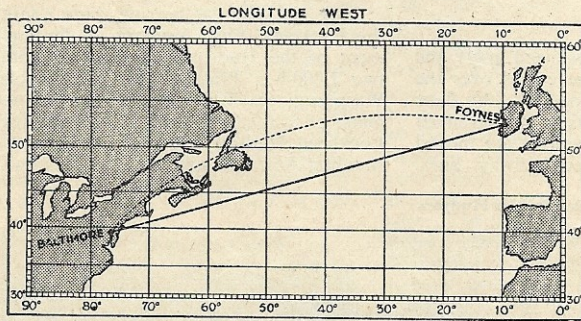
## Global War

President Roosevelt has called this a "global war." The term indicates that the

world; unsuitable for general navigation, these projections give a better pictorial outline of the land masses, but remember that some distortion is inevitable when portraying by any method the plan-outline of a curved surface on a flat sheet of paper.

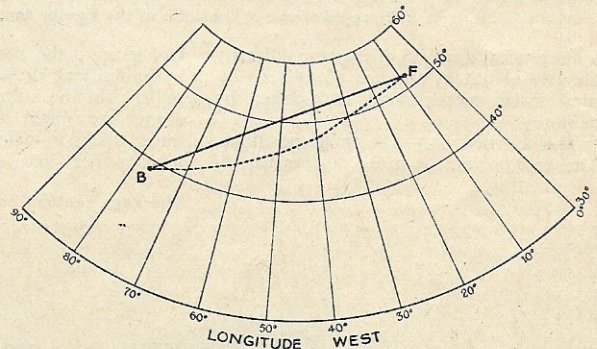
The Concise Oxford Dictionary defines geography as the "science of the earth's surface, form, physical features, natural and political divisions, climate, productions, population, etc." Not all these are important to the pilot of an aircraft. The

aspect of geography which is of great importance in airmanship. I refer to the works of man—cities, industrial areas, factories, docks, railways, roads, canals, navigable rivers (as distinct from non-navigable streams), bridges, irrigation works. These are things which man has produced, improved, diverted or superimposed upon the physical features of the earth, and they are striking landmarks to all aircrews. They are subject to change, especially in war. Think of the diversion of the Yellow River, which now follows a



From *Air Navigation Simply Explained* (Pitman).

When is a straight line not the shortest distance between two points? When it is drawn on a Mercator projection. The shortest



route is a great circle shown as a curved line on the Mercator projection, but as a straight line on a gnomonic projection.

struggle is taking place on a curved surface. (Relative to the Lancasters of Britain, the Fortresses bombing Japanese shipping off the Solomon Islands and New Guinea fly inverted.)

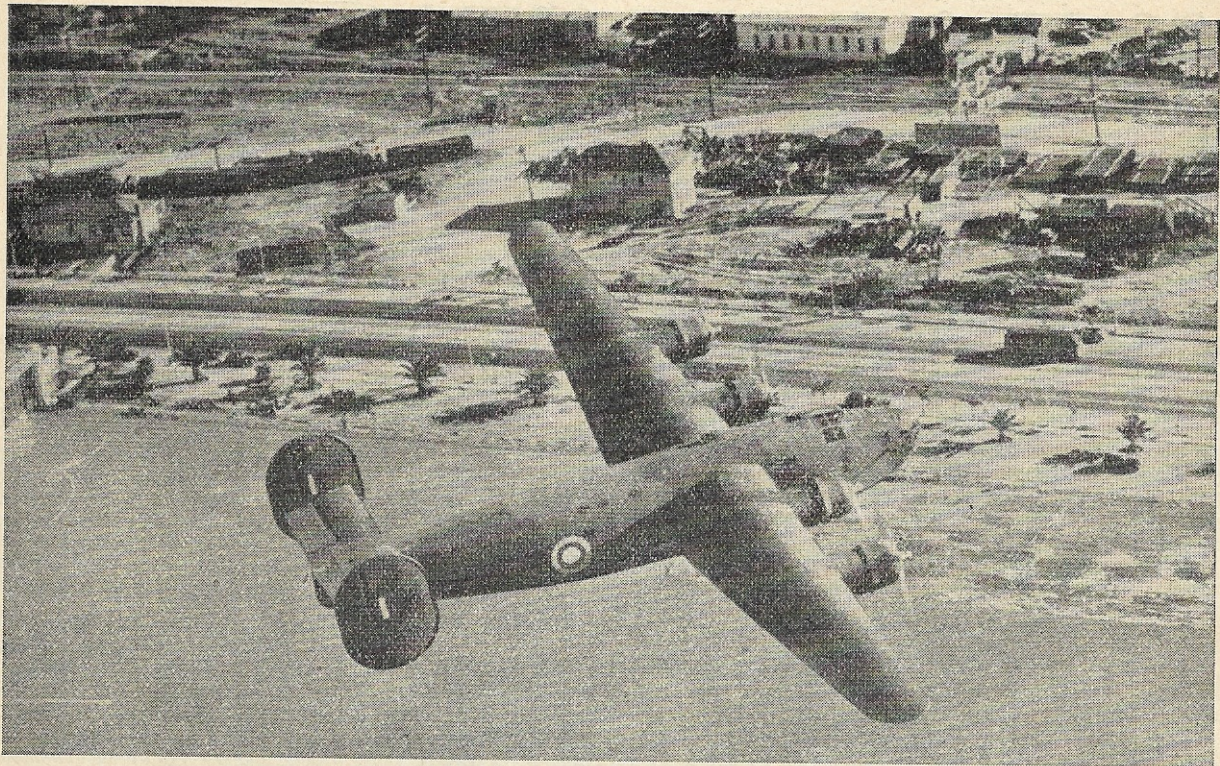
To study the geographical complexity of this war a globe is better than a map; but if you must use a map, do not use a Mercator projection, with its great distortion of the areas and shapes of the land masses—get an azimuthal equal-area projection or a gnomonic projection of the

first two he resolves into navigation and cartography. Physical features, climate and natural divisions require special study. Political divisions, productions and populations are affected by war, and so cannot properly be regarded as a standard subject. (What, for example, is the precise effect of the war upon the populations of China and the Ukraine?)

## The Works of Man

The definition just quoted ignores one

different course from the one taken before the Japanese attack upon China, due to the Chinese breaking the dykes to impede the advance of the invader. Consider the changes that have come upon the industries of Western Europe since the war began—new buildings built, plants shifted, workers transmigrated. In Central Africa new roads have been hewn through jungle, the ports of French Equatorial Africa have been and are being continually improved at Duala, Libreville, Port



A Consolidated Liberator over San Diego.

Gentil and Point-Noire. The coastline of West Central Africa, from Bathurst to Point-Noire, has become a zone for air traffic whose present volume would have been considered fantastic before the war, for that coastline is a landfall for United Nations' aircraft flying from America to China and all the lands between, save those in enemy occupation. Brazzaville, former capital of the French Congo, is now the capital of all French Central African territory, newly called Fighting French Africa.

#### Know Your Landing-Ground

You who may be going to be a member of an aircrew ought to know as much as possible about the world over which you will fly and upon which you must land, because such knowledge will help you to be more efficient when you begin operational flying. But your immediate concern should be to study basic geography, which is not subject to the fluctuating influences of war; upon this should be superimposed a survey of current geography (to bring your knowledge up to date) when you are just about to graduate.

#### What Every Pilot Should Know

If I were asked to define the essential elements of basic geography for those who fly, I would suggest the following: (1) The areas of the land masses of the world; (2) their situation relative to one another and the distances between them; (3) their permanent physical features; (4) their contour, that is, the heights of each land mass above sea-level; (5) their situation relative to the Equator; (6) their

climate and vegetation; (7) their hours of daylight and darkness throughout the year; (8) special cases where exceptional conditions are found; (9) the four great oceans—Pacific, Atlantic, Indian and Arctic; (10) coastlines; (11) hinterlands; (12) the great inland seas; (13) natural subdivisions of the land masses; (14) types of people, their language, general character, population density; (15) cities, railways, roads, canals, irrigation works, docks, telephone and radio facilities, currency; (16) minimum range and height of flight required for safe travel over and within each zone.

If pilot and navigator know, in addition, with sufficient exactitude, which areas are in occupation by the enemy, they can reach a quick geographical solution of any flying problem.

Note that basic geography would ignore classification by the artificial boundaries of ephemeral states and nationalities. Current information would have to be superimposed upon the basic knowledge, just as a key grid is overlaid upon a map. This is the only way to indicate that the world belongs to man as a whole; sectional holdings are mutable from year to year; to airmanship these changes are artificial and should be so regarded geographically.

It is useless to teach students that Tokio is the capital of Japan or Delhi the capital of India unless they have a clear idea where the two countries lie, the distance between them, the gradual transformation of the types of men found in the intervening territory, from one race to another, one language to another, by processes of

climatic and tribal selectivity, until two entirely different peoples are found.

#### Precision

Yet it does not help United Nations aircrews to know the difference between a French West African and a French Equatorial African, unless thereby they get sufficient warning to take off before being arrested by Vichy partisans if by mistake they landed in the wrong place. It is too much to expect aircrews who to-day fly thousands of miles in the course of a few days to know at a glance the appearance of every kind of man or to begin to try to understand the hundreds of languages and dialects in the world. What is more important is the nature and climate of the terrain, its hours of daylight at different seasons and its situation relative to other lands. It is essential for aircrews to know precisely where they are before they land. Pinpoint precision is the thing that matters. Then, with a true knowledge of geography, they will know beforehand what it will be like after they land.

Aircrew geographic needs are different from those of groundsmen. To-day no one can afford time to acquire redundant knowledge. The geographic studies of future air pilots, navigators, observers, bombardiers, wireless operators and flight engineers should therefore first be directed to the acquisition of a sound basic knowledge if their operational efficiency is later to become of the highest order, for the present artificial divisions of the world may alter radically before they even graduate.

# SO IT CAN BE DONE!

IN 1924 (or thereabouts) I took a minor part in a curious and somewhat unpleasant episode. At the time I was a station adjutant. An officer reported for duty. I asked for his log book. He said he had lost it—a strange remark for a flying officer to make, because if there is one thing he takes care not to lose it is his log book. However, I asked for his training card. He had no training card. In short, this officer had no documentary evidence whatever to show that he was entitled to wear the wings that he sported on the breast of his tunic. I reported this unusual state of affairs to the C.O., who instructed me to obtain from the officer concerned particulars as to where and when he had done his flying.

## He Just Flew

In due course I was handed one of the most incredible documents it has ever been my lot to read. I own frankly that I put the writer down in my mind as a



Teaching themselves to fly in aircraft with wings so clipped that they could not get off the ground.

liar—as Mr. Churchill would say—of the first order. For this, briefly, is the story he told. He asserted that in 1919, while on the ground staff at Cranwell, he had occasion to make an urgent visit to Hendon. So, observing a Sopwith Snipe preening itself on the aerodrome, he, without ever before sitting in a cockpit, got into the aircraft and flew it to Hendon. Then he flew back.

Now this, to my mind, made him a double-dyed liar, for I was not prepared to believe that anyone could just step into what was then considered a high-performance aircraft, and fly it for more than 30 seconds without colliding with something with considerable violence. Remember, I was a pilot, and I had flown Snipes.

This officer went on to say that after this initial flight he made it a habit to fly an aircraft whenever he found one available, and so, in due course, he taught himself to fly. In these circumstances he felt justified in putting up his wings.

Now, it is one thing to think a fellow a liar, but quite another matter to call him one to his face. I did go as far as to tell this chap that I found his story rather hard to believe. I can't tell you what the C.O. said, because every alternate word of his considered opinion was unprintable. The C.O. was a war pilot of note, and, I am glad to say, he is still

by **W. E. Johns**

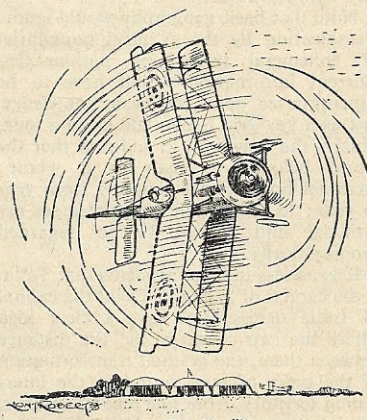
with us. I spoke to several old pilots in the mess, and their opinions differed only from his in the choice of their adjectives. It was a difficult position, and I retired to think the matter over.

## Penguin Progression

I knew, of course, that the earliest pilots had taught themselves to fly, for the simple reason there were no instructors. I had also watched French embryo pilots teaching themselves to fly in aircraft with wings so clipped that they could not get off the ground. Having made themselves proficient with these penguins, they passed on to a type that had a normal ceiling of about ten feet. And so they went on, by degrees, to orthodox aeroplanes. But none of these training types was to be compared with a Snipe, which had the inherent vice of all

machines fitted with a powerful rotary engine—excessive torque. I won't say that the Snipe was as tricky as the old Camel, because, for one thing, it had dihedral on both upper and lower planes, which the Camel had not. But that any man could step into a Service type like the Snipe, and fly it, I was not prepared to believe. Nor did I think it likely that any man who had never been in the air could find his way from Cranwell to Hendon

"Excessive Torque."



and back. In this line of thought I was not alone, for the view was shared by every pilot on the station.

The upshot of it all was this budding Icarus narrowly escaped a court-martial. He was sent to an F.T.S. for training. Subsequently he appeared with wings that had been acquired in the manner approved by the Air Council, but even then he would often boast that he had taught himself to fly.

I should say that I have heard of other cases of alleged self-training, but this was the only one that came to my personal notice. For years I have been satisfied in my mind that no man without air experience could take a modern aeroplane off the ground and put it down again without bending something. Apparently I have been wrong. If the newspapers are to be believed, it has just been done. For three half-crown wagers, one Peter Lancaster, aged sixteen, stepped into a Tiger Moth, the property of the R.A.F., took it up to 2,000 feet, stayed there for 25 minutes, and then returned it intact to *terra firma*. It takes a bit of believing, but there it is.

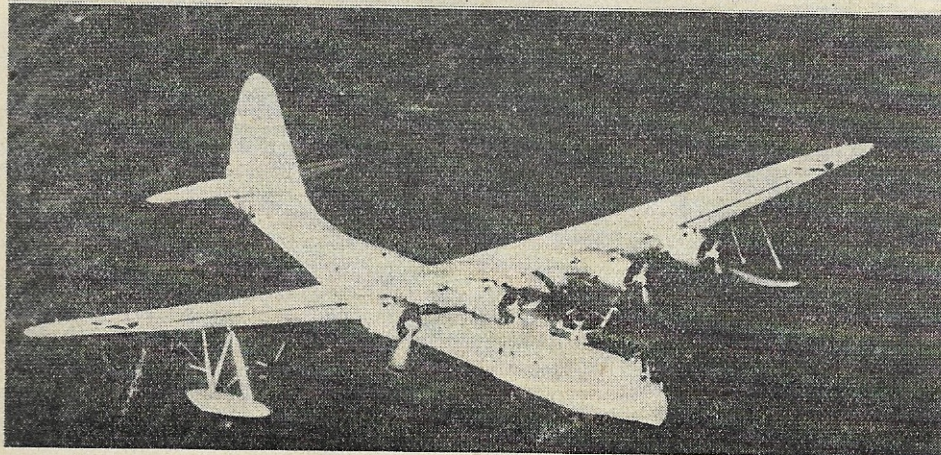
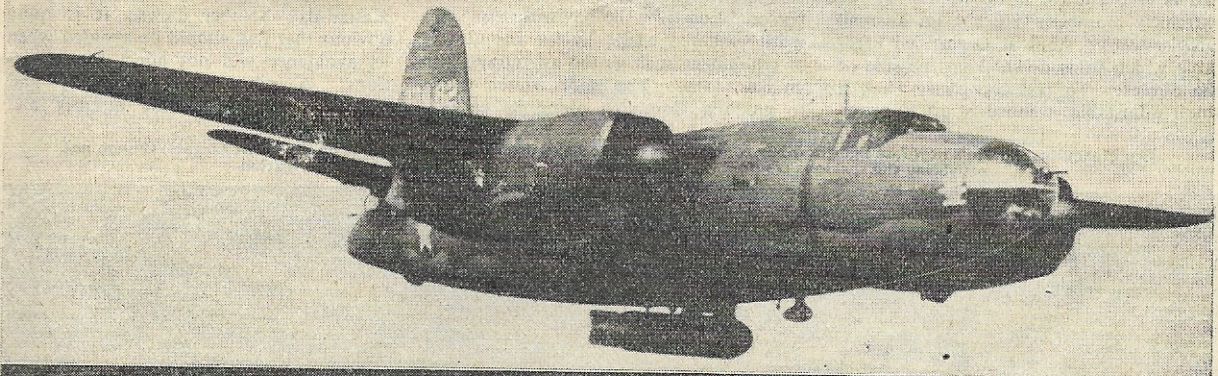
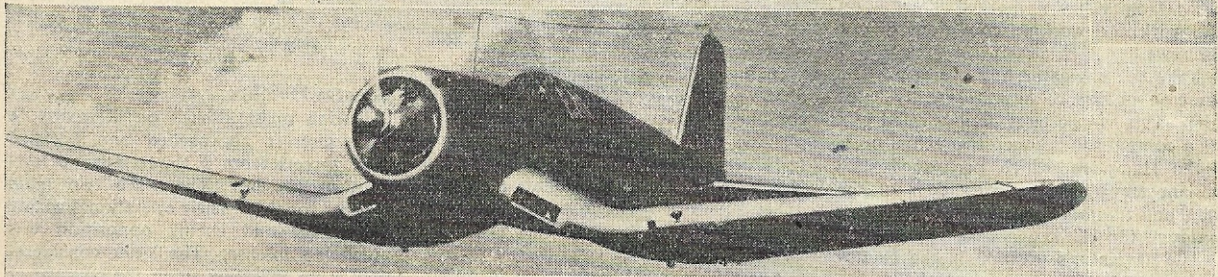
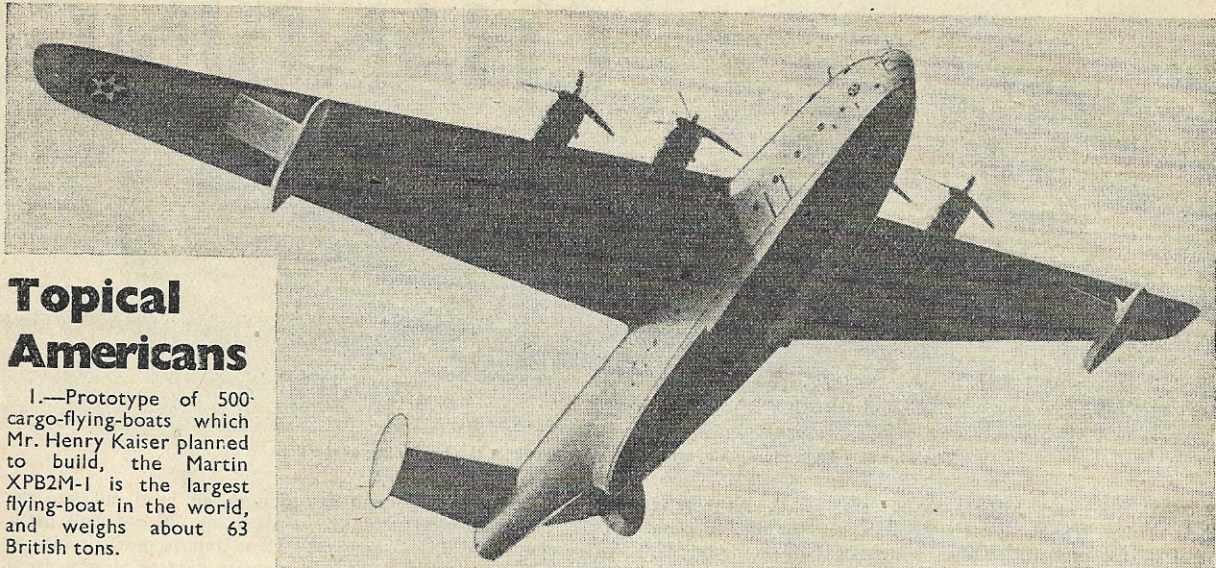
## Homework

Later, after he had paid for this most joyous joyride, Peter is alleged to have stated that he had read many books on flying, and made models with success. As I read that a frightful picture sprang into my mind's eye. It was a picture of what the sky—and the earth—would look like if every youth who had read books on flying, and made models with success, decided that he could, in fact, fly the full-sized article. There are quite enough things dropping out of the heavens without making matters worse.

Let us be fair. Peter's show was, from one angle, a good one. But any intelligent person must take a poor view of it. After all, he wasn't just risking his own neck. He might have killed a lot of people. He might have bumped into a hangar and written off a whole squadron of machines. Regarded from that aspect, the show was definitely not so good. I deplore that it was so slightly condemned, because it might create the impression that flying is 'easy'—that every cadet could fly, without training, if he had the necessary nerve. Well, you may be able to fly, but it is much better to have someone with you, who knows he *can* fly, when you decide to find out.

## Topical Americans

1.—Prototype of 500-cargo-flying-boats which Mr. Henry Kaiser planned to build, the Martin XPB2M-1 is the largest flying-boat in the world, and weighs about 63 British tons.



2.—Large numbers of Vought-Sikorsky F4U-1 Corsair shipboard fighters are now serving in the U.S. Navy. Top speed quoted as 366 m.p.h. at 16,500 feet.

3.—The Martin B-26B or Marauder fast medium bomber.

4.—Vought - Sikorsky XPBS-1, experimental flying-boat powered with four 1,050-h.p. Pratt & Whitney Twin Wasp engines. There are bow, midship and stern gun turrets.