

JUNE, 1944

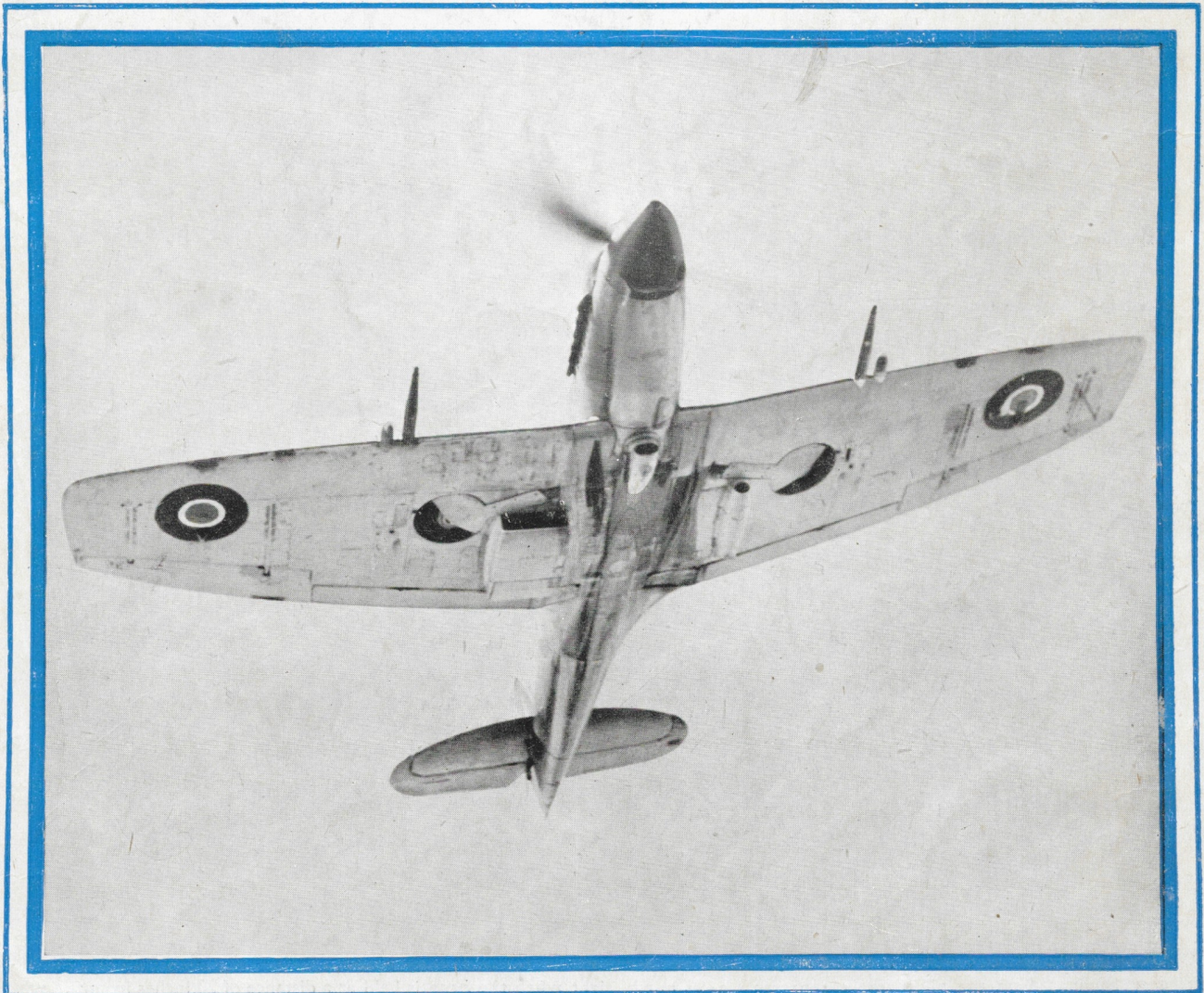
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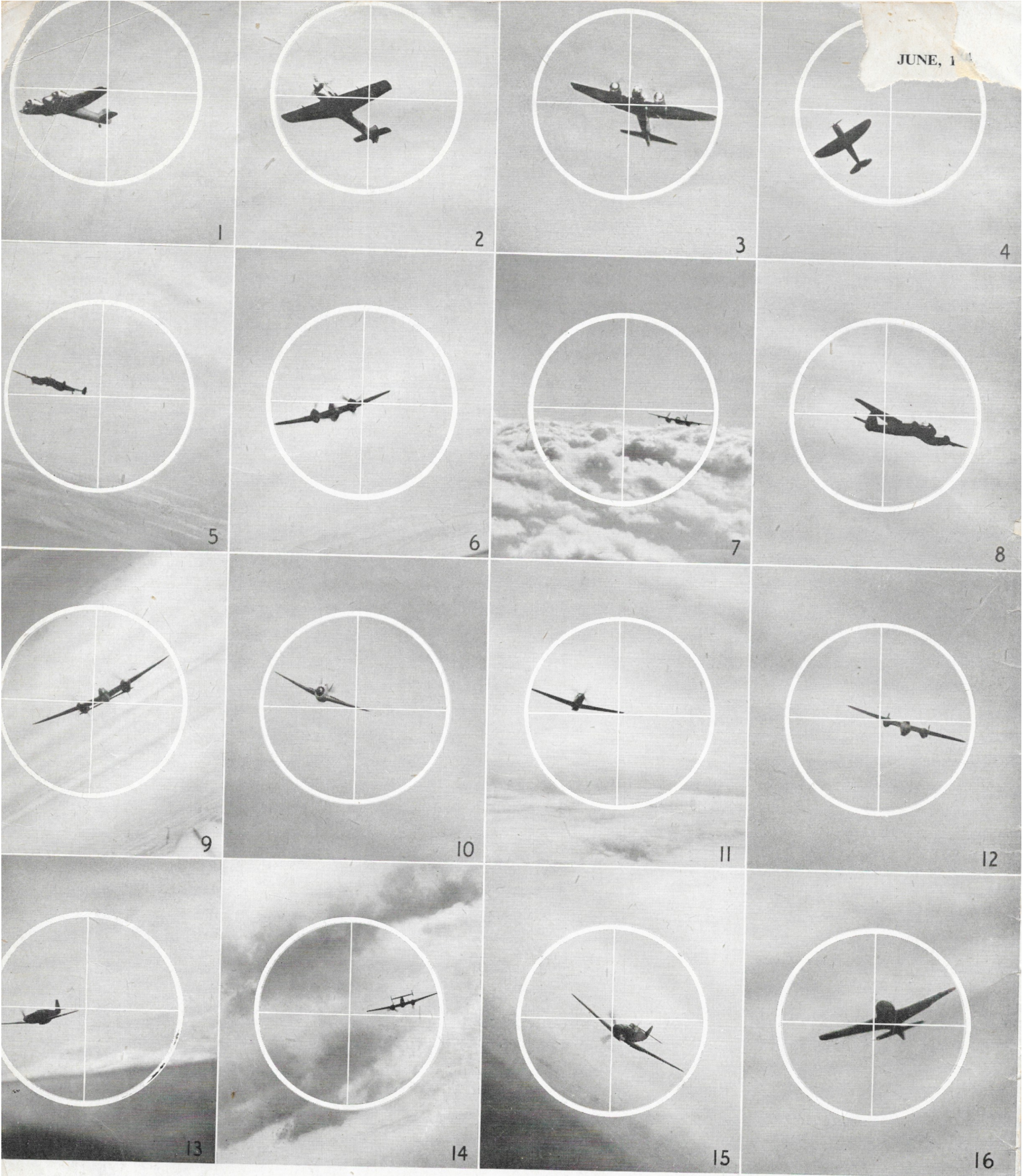
AIRCRAFT RECOGNITION

THE INTER-SERVICES JOURNAL



JUNE 1944

JUNE, 1



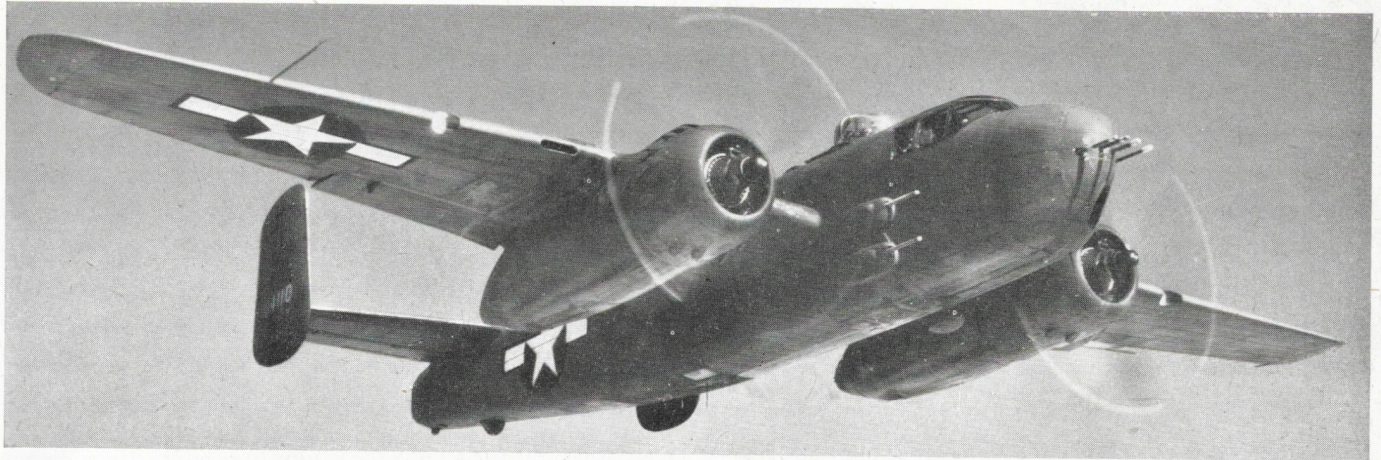
THROUGH THE GUN SIGHT

The ring superimposed on the photographs represents a 50 m.p.h. sight when the page is held at a distance of 20 inches from the eye, but no attempt has been made to illustrate the correct aiming allowance. When you have recognised the aeroplanes assess the approximate range of the enemy types.

Recognition Test No. 82

AIRCRAFT RECOGNITION

THE INTER-SERVICES JOURNAL



THE BABY FORTRESS—The latest attack version of the North American Mitchell, the B-25H, which has 15 guns, including the 75 mm. cannon, and a bomb load of up to 4,000 lb.

THE ROYAL OBSERVER CORPS has widened its bounds. It is now at sea. Not in the sense of being confused in its recognition but—literally. Members of the R.O.C., temporarily attached to ships of the Royal Navy and of the Mercantile Marine, are exercising their skill both defensively, in protecting the ships and the friendly aircraft which may fly within range, and also offensively in spotting any enemy aeroplane which may sneak under Allied air cover.

Such an innovation is a tribute to the training of the Corps. As in the defensive days of 1940 so now in the offensive of 1944, the R.O.C. may be proud of its rôle in the forefront of the battle.

Its services are needed. Recently there have been tragic instances of mistaken identity. Naval fighters shot down a Douglas C-54 Skymaster flying near a convoy off the British coast. In the Pacific an unfortunate engagement between United States light surface craft and United States aircraft resulted in the loss of two ships and two aircraft. In the Mediterranean many Douglas C-47 Skytrain (Dakota) transports were shot down by Army gunners in two disastrous encounters—caused by an error in orders and by mistaken identity.

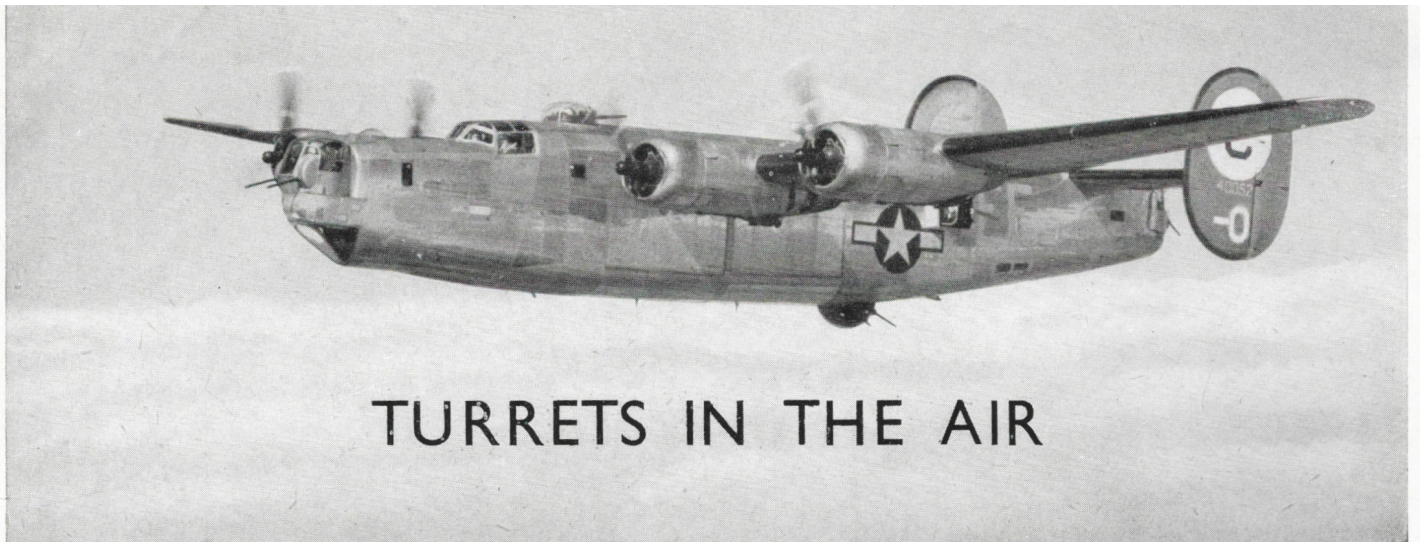
The Dakota is not classed among the primary list of aircraft for recognition instruction in the R.A.F. In view of its widespread use—many more than 5,000 have been built—this seems to be wrong. The pointed wing-tips of the Dakota have, before now, been mistaken for those of the Junkers Ju 188. The Dakota must be known.

Recognition of the specialised ability of the Royal Observer Corps as an asset to ships at sea in intensive operations, opens up new possibilities and reveals fresh needs brought about by air warfare. Aircraft recognition is now a skilled and specialist subject. It cannot be learned in a few weeks' course. Nor can proficiency be attained except by practice in the field founded upon accurate, well ordered and up-to-date knowledge.

In the future a separate Aircraft Recognition Corps may well be needed, supplying its trained and practised members to all services. Good eyesight, quick and alert minds, swift reactions, accurate memories and an intense interest in aeroplanes are the qualifying needs. The Royal Observer Corps at sea may be the start of a new era in practical aircraft recognition—saving Allied lives and giving no enemy a second chance.

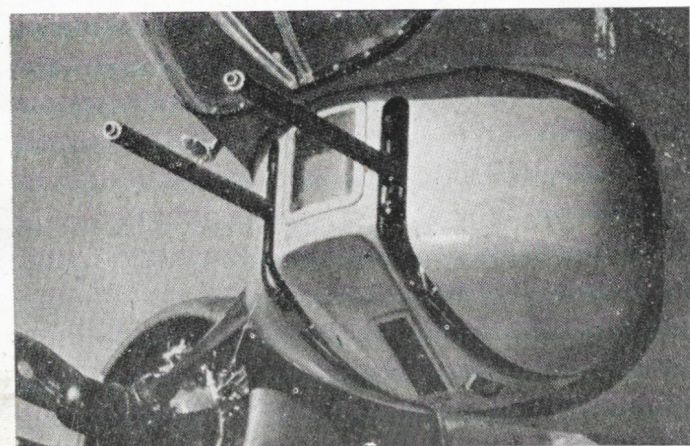
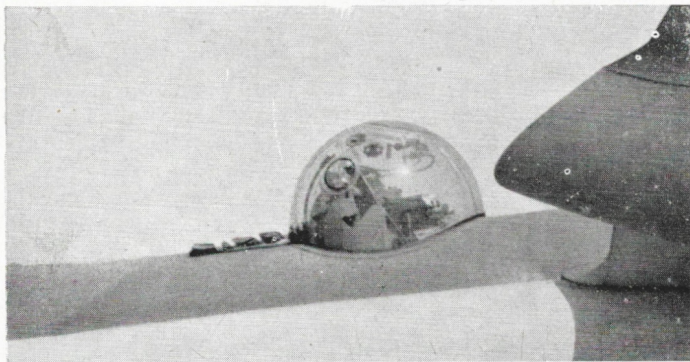
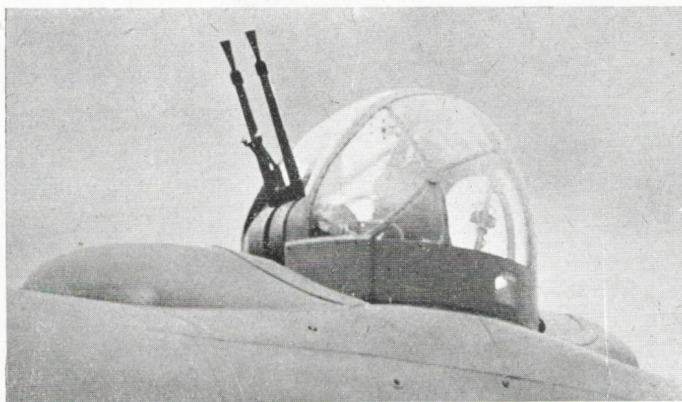


DEFENSIVE SPEED—A de Havilland Mosquito bomber. Mosquitos are now carrying a 4,000 lb. bomb to targets in Germany and the occupied countries.



TURRETS IN THE AIR

CAP-A-PIE—Most be-turreted of all bombers in service to-day, the Consolidated B-24J can carry up to 14 half-inch machine-guns. The four turrets are in the nose and tail, on top and underneath, with additional waist, tunnel and roof positions. In this photograph a B-24J is seen flying over England shining in its latest uncamouflaged silver finish.



POWER-OPERATED multi-gun turrets are a prominent feature of most Allied but few enemy heavy and medium bombers. They have done much to make possible the survival of daylight formations of bombers in combat with single-seat fighters, at speeds at which the old form of hand-operated guns would have been almost useless.

Although the power-operated gun turret has advanced far since the War began it is still in its early stages of development. More and bigger guns are likely to be fitted in the future and already the remotely-controlled turret has begun to make its appearance—in the Messerschmitt Me 410, for instance, and on the "chin" of the Boeing B-17G.

There are two basic types of turret, the hydraulically operated and the electrically operated. A third type with both electric and hydraulic operation—one for the elevation the other for traversing—is also in service. Each type has its own particular advantages for different purposes.

All these gun turrets spring from the British Boulton Paul electro-hydraulic and Frazer-Nash (Parnall) hydraulic gun turrets. The first Boulton Paul turret was flown in the nose of the Overstrand biplane day-bomber in 1934. It was pneumatically operated. The first Frazer-Nash turret was flown in the rear cockpit of a Hawker Demon two-seat fighter in 1936. Eventually, Boulton Paul turrets went into service in Lockheed Hudsons and Frazer-Nash turrets in Armstrong Whitworth Whitleys—to be followed by their installation in dozens of more recent types of aeroplane. Bristol, Vickers and Armstrong Whitworth gun turrets were close behind. Of these latter types only the Bristol remains, vastly improved.

When the War began no power-operated gun turrets were in production in the United States or in Germany. British turrets were sent to America for study and before long a range of American-built turrets was installed in American bombers. Whereas the British turrets mounted up to four 0.303 inch machine-guns the Americans were designed from the start to take two 50-calibre machine-guns of greater range and fire-power than the earlier rifle calibre guns.

Six American concerns have designed gun turrets up to the present. They are Sperry, Bendix, Martin, Consolidated,

DOMES OF WAR—Twin-gun turrets illustrating a variety of defensive treatment. At the top is the Frazer-Nash twin 0.303 inch dorsal turret of the Stirling. In the middle is the Martin twin-50 calibre dorsal turret of a Mariner, the most roomy of all turrets. At the bottom is the remotely controlled "chin" turret of a Boeing B-17G which is sighted and fired by the bombardier in the nose.

Emerson and Erco. The Consolidated turret is hydraulic ; all the others are electric. The following table shows the application of the various turrets :—

Aeroplane	Nose or Chin	Mid Upper	"Ball"	Tail
Lancaster	Frazer-Nash	Frazer-Nash	None	Frazer-Nash
Halifax	None	Boulton Paul	None	Boulton Paul
Stirling	Frazer-Nash	Frazer-Nash	None	Frazer-Nash
Fortress	Sperry	Sperry	Sperry	None
Liberator	Emerson	Martin	Sperry	Consolidated
Mitchell	None	Bendix	None	None
Marauder	None	Martin	None	Martin
Havoc	None	Martin	None	None
Sunderland	Frazer-Nash	Frazer-Nash	None	Frazer-Nash
Mariner	Martin	Martin	None	Martin

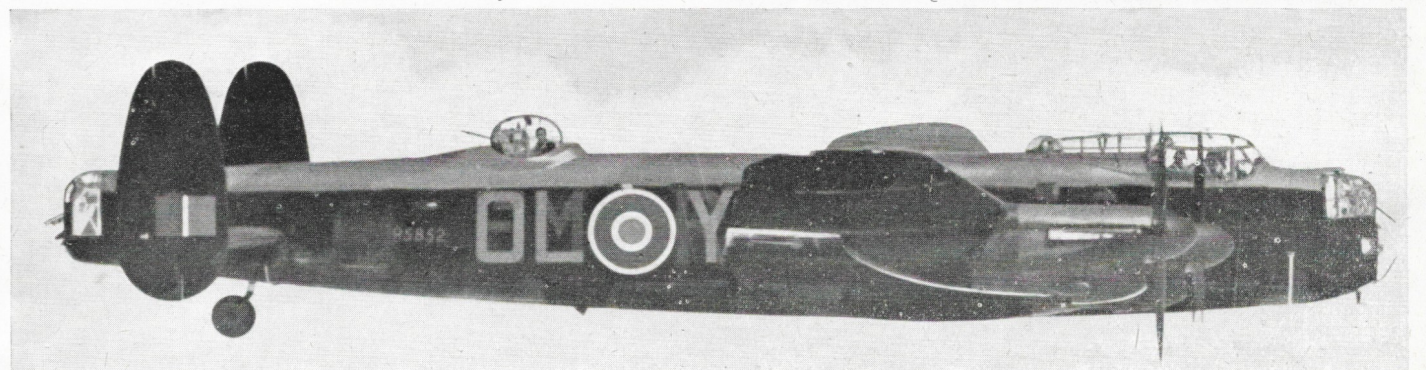
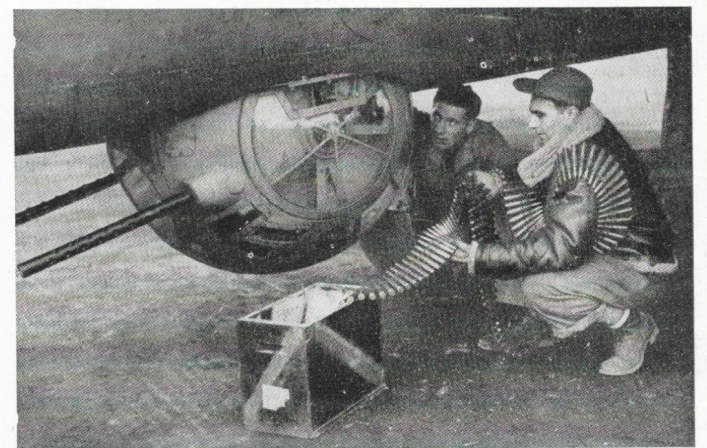
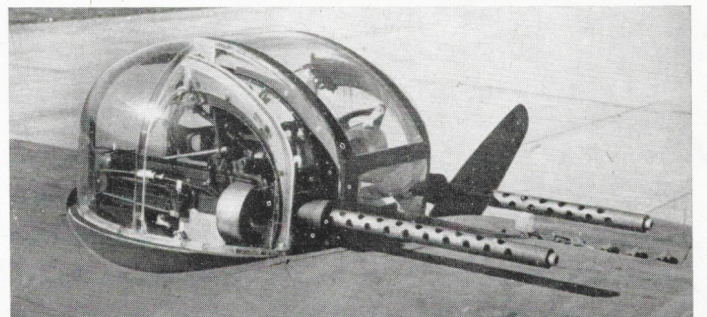
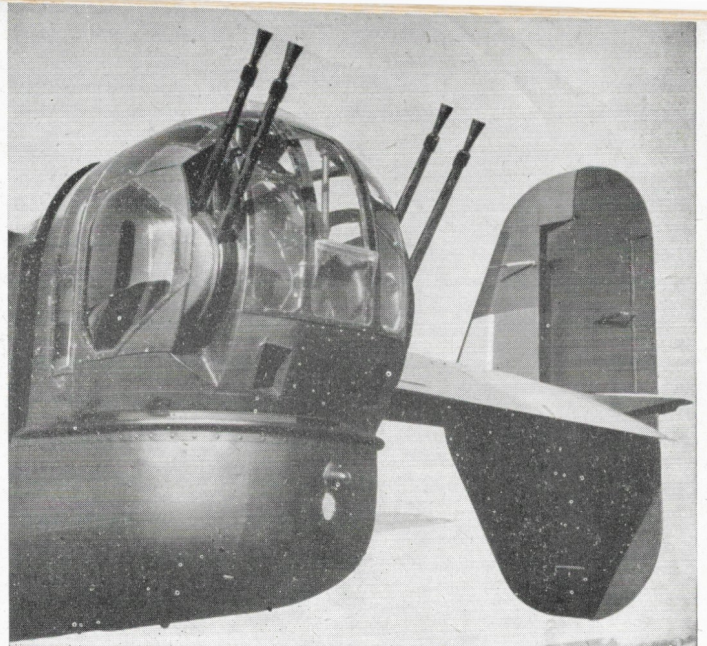
Although these six companies are responsible for the design work other concerns share in production. For instance both Briggs and Emerson build the Sperry "ball" turrets. Some of the Liberators have Consolidated tail turrets set in the nose because of a shortage of the Emerson type.

This table presents the question "When is a turret not a turret?" The answer is "When it is hand operated." For instance, the twin 50-calibre tail guns of the Fortress are on hand-operated mountings ; the guns in the tail of the Marauder were originally hand operated but are now in a Martin twin-"50" turret.

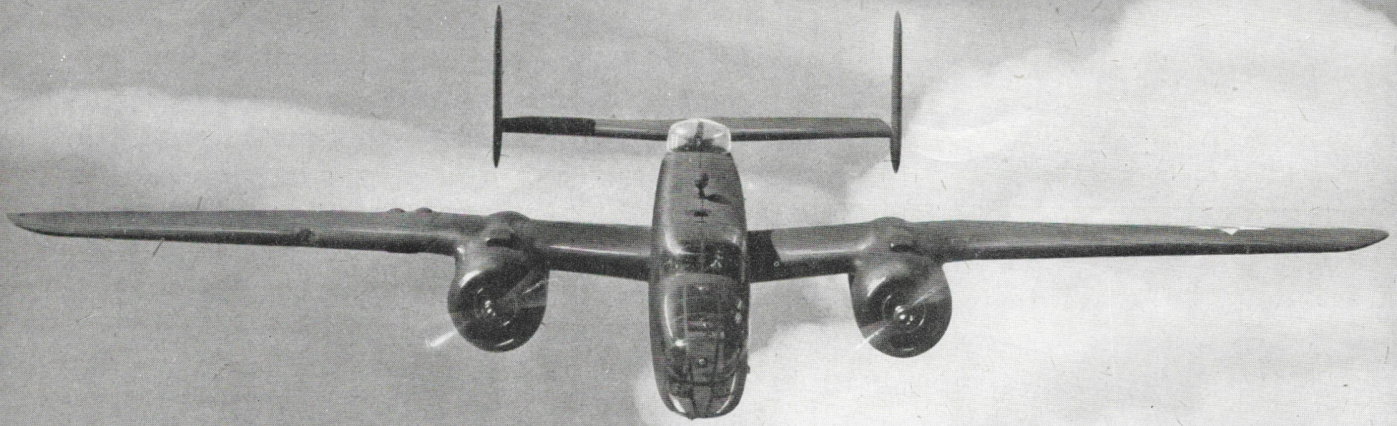
The functions of a turret are threefold. Firstly, the turret must have efficient rotary and elevation mechanism combined with a reflector sight so that the gunner can keep his sights on the target however fast or however slow its relative speed. Secondly, the turret must be large enough to house the gunner comfortably yet small enough and of a form to present the minimum drag. Thirdly, it must be placed to afford a good field of fire. It must not be too heavy but it must be armoured. Finally, the guns must be supplied with an adequate quantity of ammunition. Modern servo-feeds have improved the supply problem enormously.

Most turreted of all aircraft to-day is the Consolidated Liberator with four power-operated turrets—all of different make. The Germans have installed power operated turrets in the He 177, Do 217, Ju 290, Bv 138, Ju 188, Fw 200, the Bv 222 and some elderly Do 18s. Details of Japan's progress are not known although some form of turret appears on several Japanese aeroplanes.

TOPS AND TAILS—*Top*, the four-gun Boulton Paul tail turret of a Handley Page Halifax ; *middle*, the Bendix dorsal turret of a North American B-25H Mitchell ; *bottom*, the Sperry "ball" turret of a Fortress. The two-gun turrets with 50-calibre guns have more than twice the fire-power of the four-gun 0.303 inch turrets.



NIGHT-CRUISER—An Avro Lancaster reveals its three Frazer-Nash turrets. There can be no doubt that the light armament represented by eight rifle-calibre guns of the Lancaster is much less formidable in defence than the greater number of half-inch guns on the American bombers despite the higher rate of fire of the smaller guns.



NORTH AMERICAN MITCHELL

TO NORTH AMERICAN AVIATION, INC., of Inglewood, California, belongs the distinction of having in production at one and the same time in its various plants three outstanding aircraft of widely different functions—the Harvard (AT-6), the Mustang (P-51) and the Mitchell (B-25).

The company was invited by the U.S. Army Air Corps to submit design data on a medium bombardment aeroplane in January, 1939. Prior to this it had devoted all its production facilities to single-engined aircraft, mainly trainers, although it had built two experimental twin-engined prototypes—the NA-21 and the NA-40. The NA-40, which formed the basis of the design submitted to the Air Corps, was a high-wing attack-bomber with tricycle landing-gear, twin-ruddered tail-unit, an armament of seven machine-guns, four in the wings, and a crew of three.

To meet the Air Corps specification for a medium bomber the original NA-40 was almost completely redesigned. A new fuselage to accommodate a crew of five and the specified bomb load, a new tail structure and engine nacelles and a different wing set in the mid position characterised the XB-25, the design of which was approved by the Army on September 10, 1939. Ten days later the company received a contract for the construction of 184.

The accepted design of the B-25, the first of which flew for the first time on August 19, 1940, called for a high-speed mid-wing monoplane fitted with two 1,650 h.p. Wright R-2600 two-row radials and carrying a crew of five, a normal bomb load of 2,400 lb. and an armament of four 0.30 in. machine-guns, one in the nose and three amidships, and one 0.50 in. gun in the extreme tail. The nose gun could be used in any of three ball-and-socket mounts in the transparent panels of the bomb-aimer's enclosure and the midship guns were located one on each side and one on top of the fuselage. The bomb bay was arranged to carry bombs ranging in size from 100 to 2,000 lb. and up to a maximum overload of 3,600 lb.

The first few B-25s built had wings with constant dihedral

from roots to tips but in tests with the XB-25 at Wright Field it was found that directional stability in the bombing run was not all that could be desired. To remedy this the outer wings were re-rigged flat to give the characteristic gull-wing arrangement that has since been such a distinctive feature of the B-25. This change was incorporated in the tenth machine off the production line.

Only two dozen B-25s were built before self-sealing fuel tanks and armour for the pilot were incorporated. This modification, the first of many to come, became the B-25A.

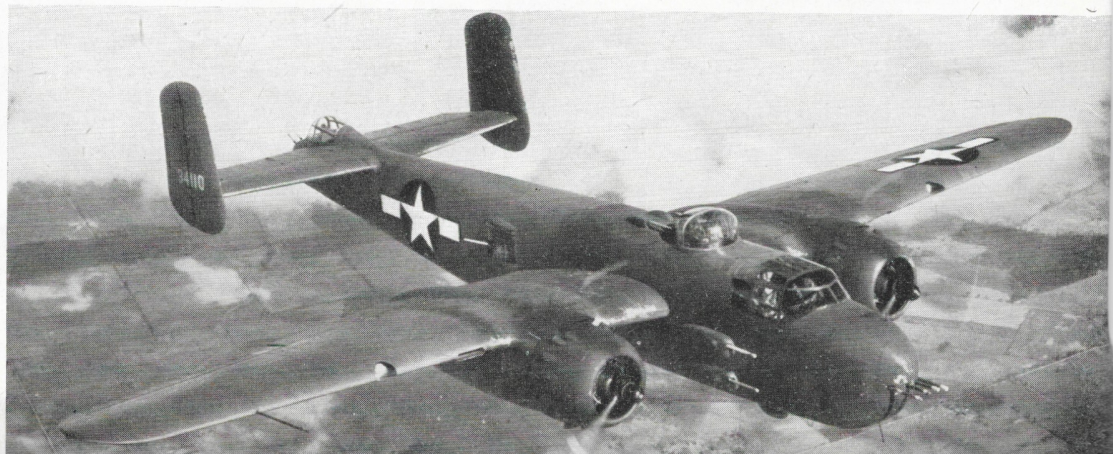
The first formation to receive the B-25 was the 17th Medium Bombardment Group stationed on the Pacific North-West coast and on the entry of America into the War aircraft of this group undertook anti-submarine patrol in northern Pacific waters for two months. The B-25 is claimed to have been the first American twin-engined bomber to sink an enemy submarine.

At about this time the B-25 was given the type name Mitchell in memory of the late Brigadier-General William Mitchell, a prophet of air power who was for many years without honour in the land of his birth. This is the first and only instance in which an American military aeroplane has been named after a member of the U.S. armed forces.

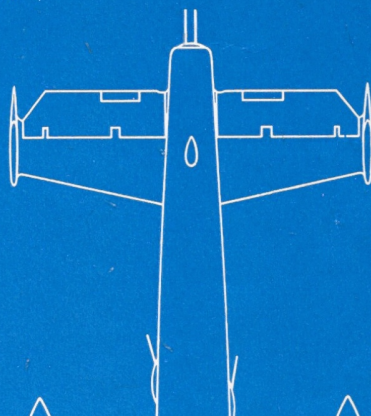
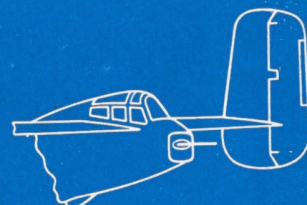
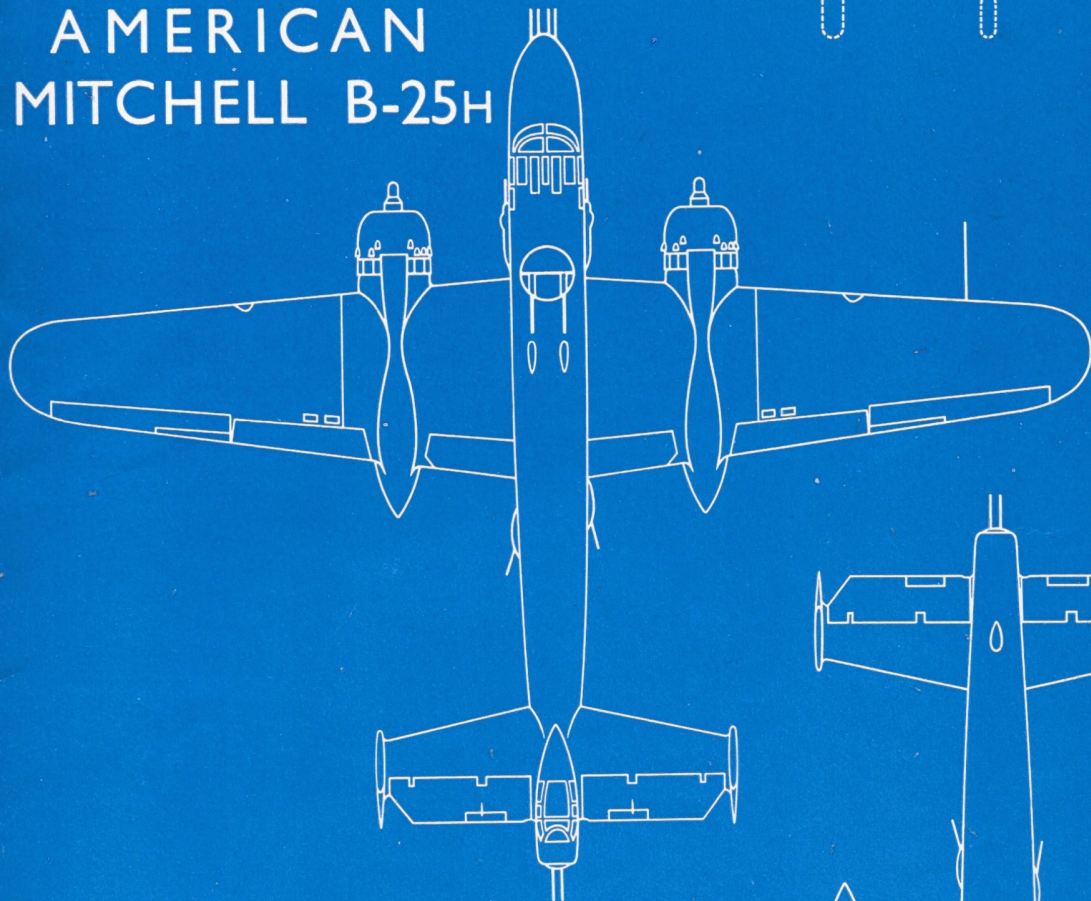
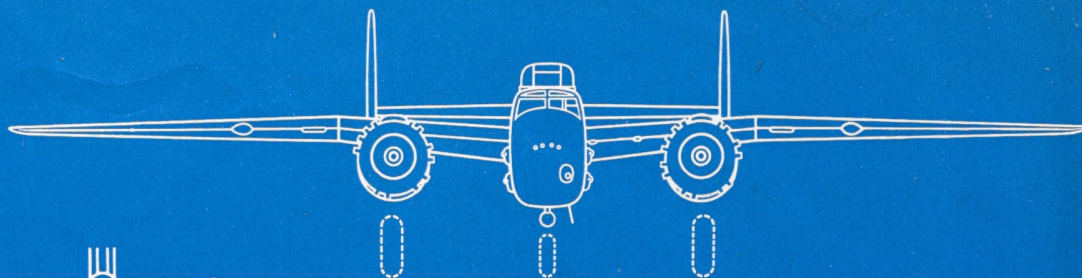
The next version was the B-25B, in which the armament was almost completely revised. The nose gun remained, but in place of the midship and tail guns two Bendix electrically-operated turrets, each with two 0.50 in. machine-guns, were installed above and below the fuselage aft of the wings. The lower retractable turret was remotely controlled. The B-25B was adopted by the R.A.F. as the Mitchell I.

To increase the mobility of the Mitchell, auxiliary fuel tanks were designed to be carried in the bomb-bay, in the bombardier's compartment, beneath the pilot's compartment and in the rear fuselage. With these tanks Mitchells were flown long distances to the fighting fronts. Later, all but the bomb bay tanks were replaced by self-sealing out-board wing tanks and Sperry automatic pilot and automatic

THE LATEST — The latest attack version of the Mitchell, the B-25H which has the 75 mm. cannon and four 0.50 in. guns in the nose. Notice the new position of the dorsal turret (moved forward), the two "package" guns at the side of the nose, the enclosed waist guns and the new tail position which has two 0.50 in. guns. There is also a precision bomber version with a glazed nose.

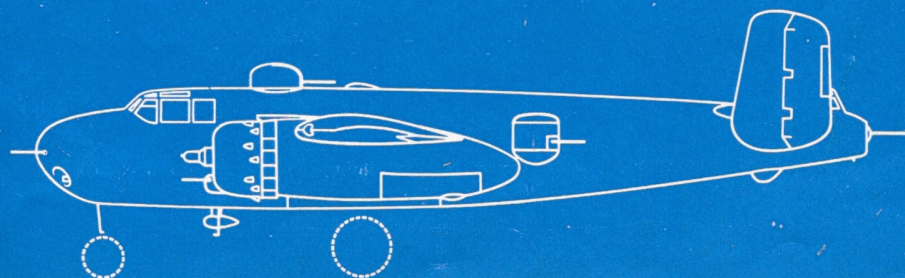
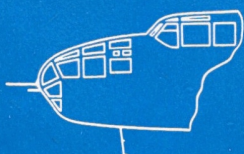
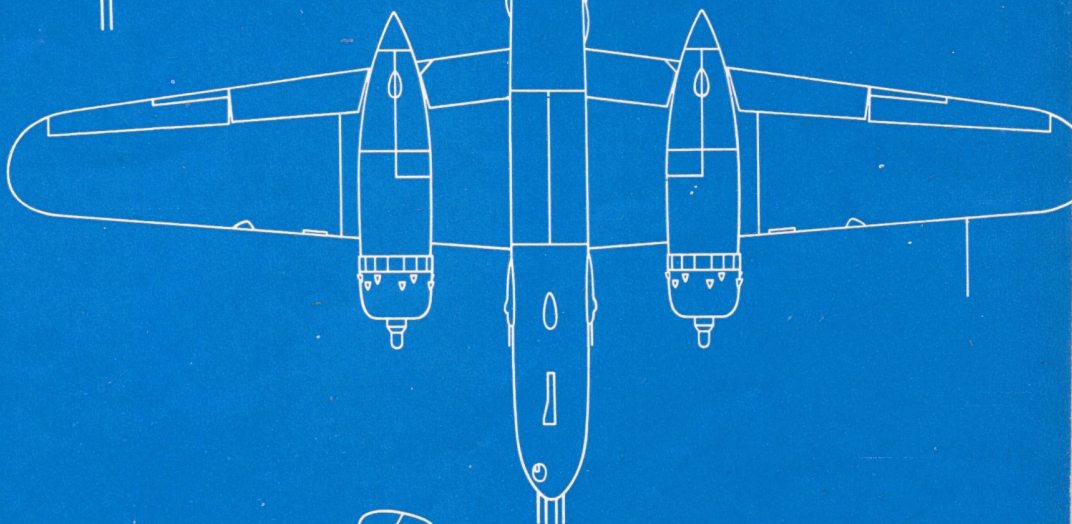


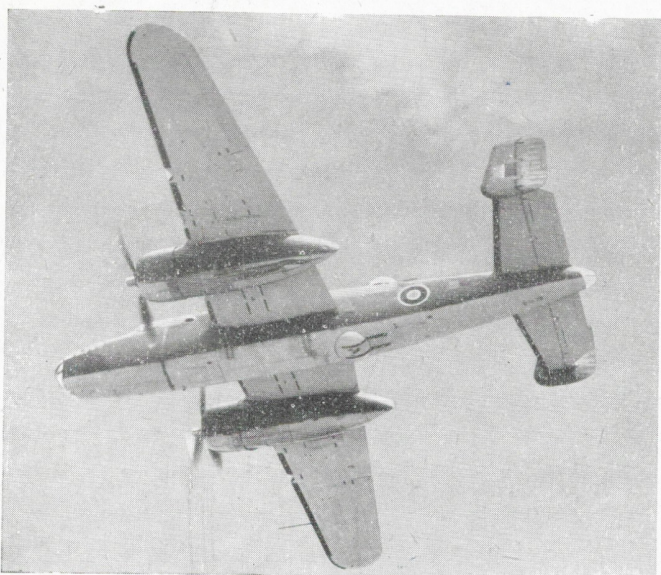
THE NORTH AMERICAN MITCHELL B-25H



Dimensions

Span	...	...	67' 6"
Length	...	...	51' 11"
Height	...	...	15' 9"
Wing Area	...	...	610 sq. ft.





MITCHELL I—The first R.A.F. version of the B-25, which is also shown in the heading on the previous page. Its U.S. number is the B-25B.

flight control equipment were installed to permit crossings of the oceans by island-to-island hops. The Sperry-equipped Mitchells were designated the B-25C and B-25D. In the R.A.F. they are known as the "Mitchell II" and in the U.S. Navy as the PBJ-1.

Mitchells were responsible for two outstanding raids in 1942. In the first, ten Mitchells, with three Boeing Fortresses, flew from Australia to secret bases in the Philippines from which they made, on April 13 and 14, bombing expeditions against Japanese bases and shipping at Manila, Cebu, Davao and Batangas. They then returned to Australia carrying a number of passengers evacuated from Bataan and Corregidor. On April 18 sixteen Mitchells, led by Brig.-Gen. J. H. Doolittle, took off from the aircraft-carrier *Hornet* 800 miles from the Japanese mainland and bombed Tokyo. The entire personnel which took part in the Tokyo raid were volunteers from the 17th Medium Bombardment Group.

The widespread use of the Mitchell in U.S. theatres of war as far apart as Alaska and Australia, China and North Africa, called for the incorporation of special equipment such as electrical heating for guns and crew, carburetter de-icers and windshield de-frosters for cold weather operation; windshield wipers for tropical rains and sand filters and excluders for desert flying, etc. Some Mitchells were fitted with special torpedo gear and releases in the bomb bay for operation against Japanese shipping in the South-West Pacific. The American short 22.4 inch torpedo was used.

The next, and most novel, version of the Mitchell was the B-25G which was the first operational aeroplane to be fitted with a 75 mm. M-4 cannon. This gun, which is 9 ft. 6 in. long and weighs 8 cwt., is mounted in a cradle on the port side of the fuselage and extends aft under the pilot's seat where a damping mechanism takes care of the 21-inch recoil. A shorter, "solid" and heavier-armoured nose also accommodates two 0.50 in. machine-guns which are used as sighters and to spray flak-gunners while the cannon is being aimed. All the forward-firing guns are operated by the pilot. The cannon is loaded by hand by the navigator from a magazine above the breech. Each shell, which is 23 inches long, weighs 15 lb.

The B-25G, which carries a crew of four, retains its former bomb capacity and rear armament and aft of the pilot's compartment resembles the B-25C. In the absence of the nose bombardier the machine loses its effectiveness as a precision bomber, but it can still be used for skip or dive bombing or torpedo dropping under the control of the pilot.

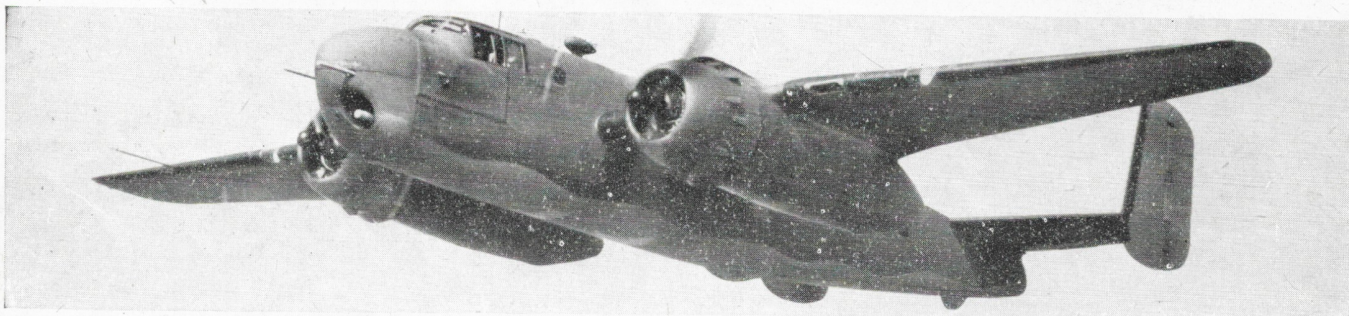
The next development was the B-25H. This model retains the 75 mm. cannon but has a greatly enhanced machine-gun armament. In the nose there are four 0.50 in. guns; on each side of the fuselage forward of the wings are two further fixed 0.50 in. guns; the upper two-gun turret is moved forward to the roof of the navigator's compartment; and on each side of the fuselage midway between the wings and tail there is a new type single-gun waist turret. Finally, there is a two-gun position in the extreme tail.

In the precision bomber version of the B-25H the nose armament is replaced by a glazed nose with bomb-aimer's position and an armament of one fixed and one flexible 0.50 in. guns. Aft of the nose the armament remains as for the B-25H.

The pilot is still responsible for firing all forward guns and dropping bombs but owing to the increase in rear armament the crew has been increased to five. The B-25H is fitted with two Wright R-2600 engines of a later mark with 1,700 h.p. available for take-off.

The cannon-armed B-25 first went into action in the South-West Pacific in September, 1943, and was later used in the Mediterranean in support of the operations on the west coast of Italy. Against shipping the 75 mm. weapon has a devastating effect.

As with all other thoroughbred aircraft, the Mitchell has lent itself to a wide diversity of duties and has seen service in almost every Allied theatre of war. Apart from its use by the American forces, the Mitchell has been supplied in quantity to the Royal Air Force, the Royal Netherlands Army and Naval Air Services both in Europe and Australia, the Red Air Force and the Chinese Air Force.



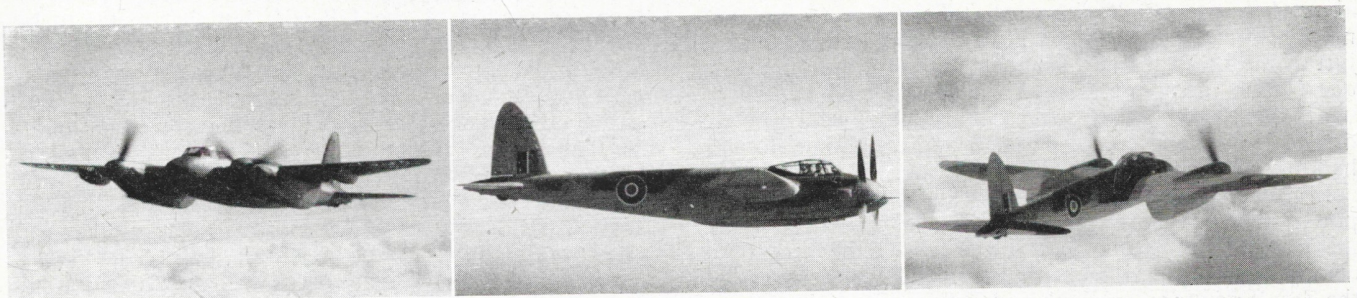
ATTACK MODEL—The B-25G, the first Mitchell to have the 75 mm. cannon. An improved cannon, lighter and with a new mechanism which reduces the recoil, is now installed.

PHOTOGRAPHIC ANGLES



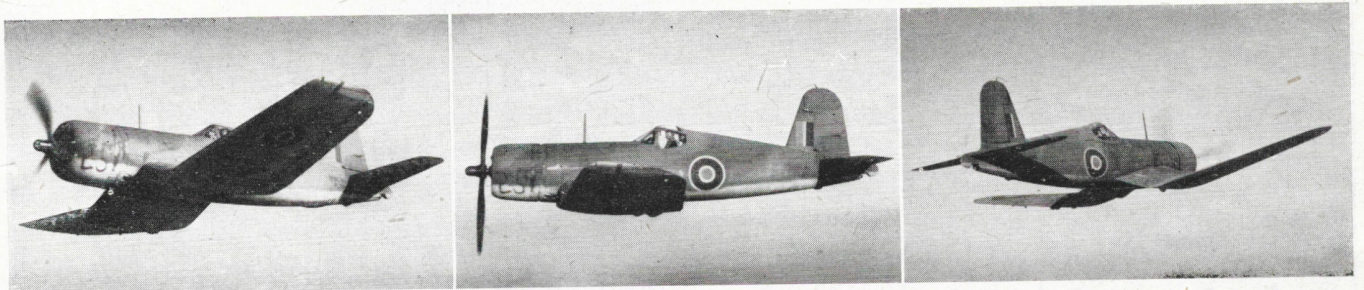
FAIREY BARRACUDA

After months of secrecy the Barracuda made its debut in a cloud of glory at the beginning of April by a successful attack on the Tirpitz. The Barracuda, the first British addition to the Royal Navy for some time, is the successor of the Swordfish and is designed for level and dive bombing as well as for torpedo carrying—hence the Christmas-tree effect. It carries a crew of three. It is an easy aeroplane to recognise because of its high wing, the braced tailplane set unusually high (somewhat reminiscent of the Whirlwind,) and the large “Youngman” flaps-cum-dive-brakes on the trailing-edge of the wing. It has a Rolls-Royce Merlin 32 engine. Span 49 ft. 2 in., length 40 ft. 6 in.



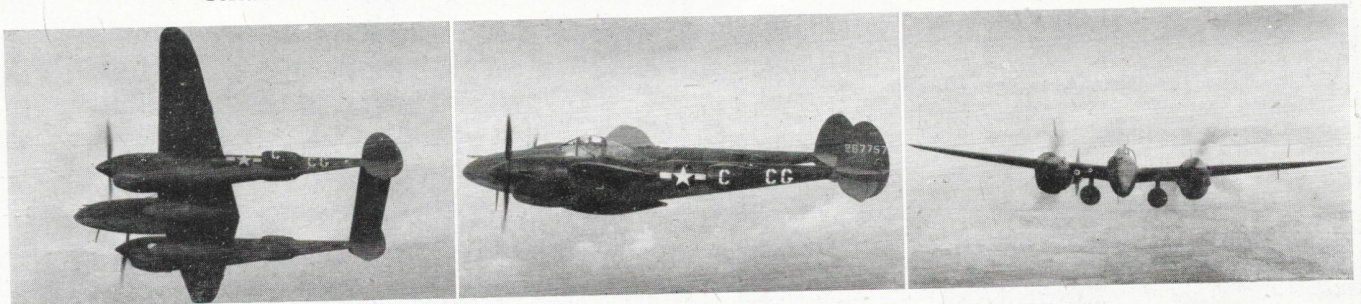
DE HAVILLAND MOSQUITO FIGHTER-BOMBER

Most versatile of all Allied types, the Mosquito is constantly adding to its duties or to its theatre of operations with the Royal Air Force. The fighter-bomber version operating in the European theatre carries long-range tanks under the wings. Alternatively, a 500 lb. bomb may be carried under each wing in addition to a 1,000 lb. bomb load inside the fuselage and full fighter armament of four 20 mm. cannon and four 0.303 inch machine guns. Span 54 ft. 2 in., length 41 ft. 2 in.



CHANCE-VOUGHT F4U-2 CORSAIR II

Two versions of the Corsair single-seat fighter are now in service with the Royal Navy. The Corsair II differs from the Mark I by having a bulging cockpit-cover and blunter wing tips, giving almost a clipped-wing appearance. Corsairs operating from aircraft carriers were among the fighters which escorted the Barracudas in the attack against the German battleship Tirpitz. This was one of the first occasions on which Corsairs had been mentioned in action with the Fleet Air Arm. Span 40 ft. 6 in., length 33 ft. 4 in.



LOCKHEED P-38 LIGHTNING

Latest version of the Lightning is the P-38j which has new 1,350 h.p. Allison engines with an inter-cooler system requiring deeper intakes below the engines. For long-range escort duties with the U.S.A.A.F. over Germany the Lightnings are now carrying extra tanks slung underneath the wings. As a fighter-bomber two 1,000 lb. bombs may be carried. Lightnings are now usually seen without camouflage but with the tops of the engine nacelles and the nose painted black to prevent glare dazzling the pilot. Span 52 ft. 0 in., length 37 ft. 10 in.

JAPAN THE COPYIST

AT THE TIME of Pearl Harbour and at the beginning of the War with Japan there was a tendency among the Allies to treat Japanese aircraft as a rather serious kind of joke. In many Western minds, the Japanese could not build really sound aircraft—their designs were inferior copies of obsolete British and American types with perhaps a few more up-to-date German and Italian designs built under licence and when they did try to design for themselves they were able to produce only fantastic contraptions that were useless as fighting machines.

A glance at the A.P.1480F in 1941 would certainly have justified anyone in thinking that a war with Japan would be a walkover so far as the air was concerned. But Japan, while planning for years this fatal trial of strength with the great Western Powers, had managed to maintain complete secrecy about her aircraft development. This arm of her war machine was to be the spearhead of her drive southward just as the Luftwaffe had been in the van of the Nazi conquest of so many countries in Europe. Those aircraft of which details had been allowed to "leak out" were obsolete or obsolescent and completely new and up-to-date designs had taken their place.

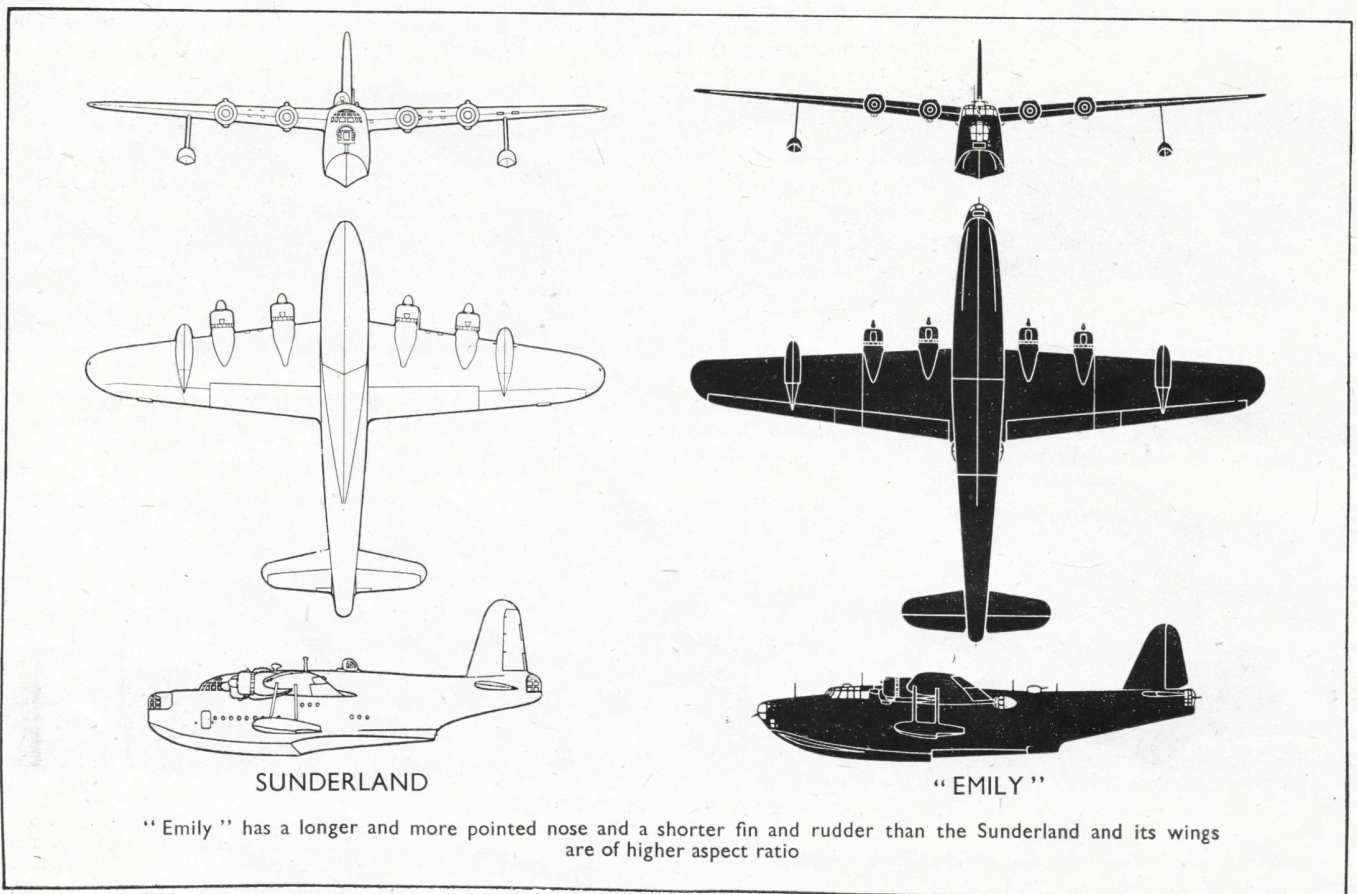
In the early days of 1942 it was realised that Japanese air power was something very real which an all-out effort on the part of the U.S.A. and Britain would be needed to combat. The astonishment that followed the discovery of the Zero's power to outclimb and outmanoeuvre the Ameri-

can fighters opposed to it swung the pendulum of opinion far in the other direction and people began to overestimate the qualities of Japanese aircraft.

After more than two years of fighting in the Far East things have fallen into their right perspective. To-day we know much more of Japanese designs, can assess them soberly and find them neither very good nor very bad but just a little inferior all through to the equivalent types in service with the Allied Air Forces.

There has been no confirmation of any German or Italian types being used operationally and early reports of Me 109s and Fw 190s were probably caused by misidentification of "Tony" and "Hamp." "Tony" and "Judy"—a two-seat deck-landing reconnaissance bomber which has recently been reported in operational service—are powered by a Japanese version of the DB 601, but that seems to be about the limit of help from the other end of the Axis.

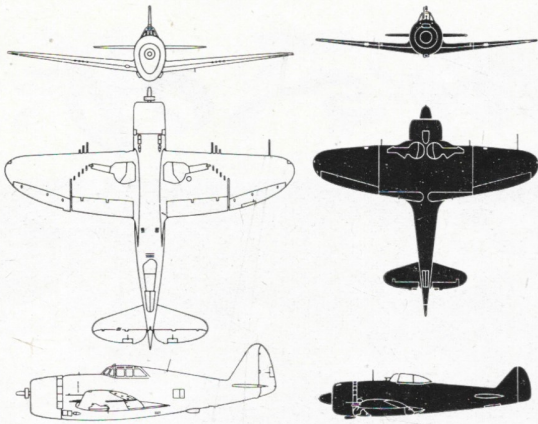
Most of the current types are, without question, original designs and there is nothing fantastic or "oriental" about them: good designs so far as they go, and some, naturally, better than others. But most of these designs are inspired by Western counterparts; "Tony" looks like a cross between a Hurricane and an He 113; "Lily" can look uncomfortably like a Baltimore; "Oscar" has been mistaken for the Mohawk, which has seen much service in East Asia; "Tojo," the new Army fighter, has "Seversky" written all over it as surely as had the Reggiane 2000 before it; and



THE DARK INVADERS—

THUNDERBOLT

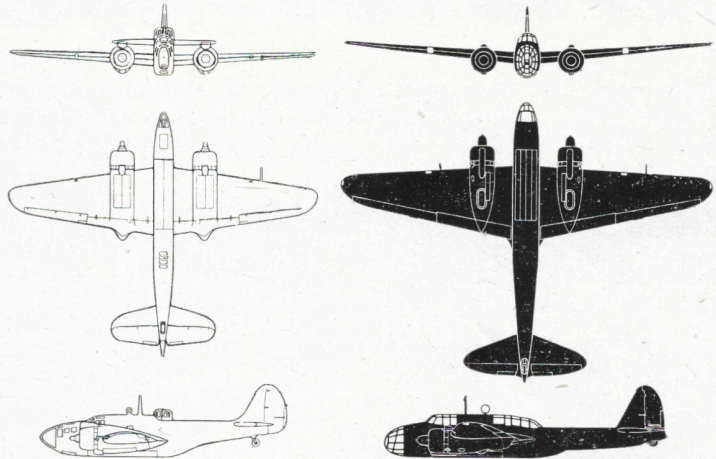
"TOJO"



The Thunderbolt has a mid-wing, "Tojo" a low wing. "Tojo's" wing span is much shorter and the wing tips less pointed than the Thunderbolt's. "Tojo's" tail projects far beyond the tailplane.

BALTIMORE

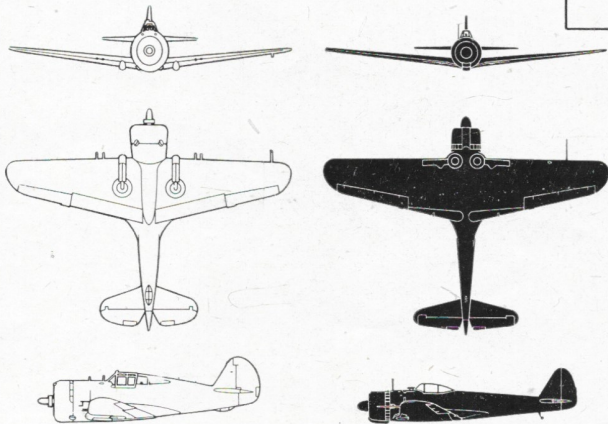
"LILY"



The Baltimore's engines are centrally mounted and break the trailing-edge of the wing, "Lily's" engines are underslung. "Lily's" wings have greater dihedral, its fuselage is longer and has a pointed end. "Lily's" fin has a noticeably straight leading-edge.

MOHAWK

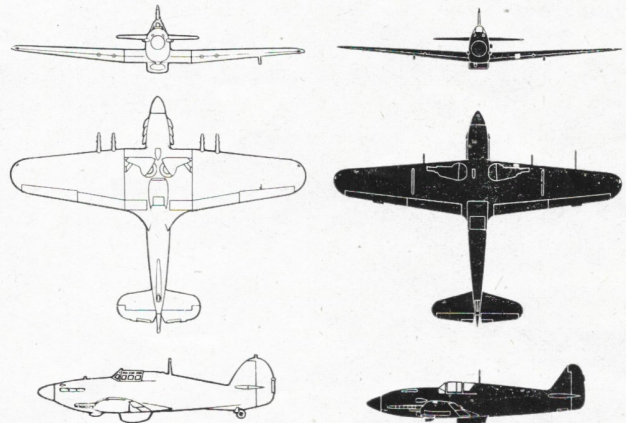
"OSCAR"



The Mohawk is short and fat. "Oscar" is long and slender. Notice the great difference in the relation of engine size to wing span.

HURRICANE

"TONY"



The Hurricane has many curves; "Tony" is more angular. "Tony's" wing has more dihedral and higher aspect ratio. "Tony's" tailplane is much wider than the Hurricane's.

POINTS OF DIFFERENCE

"Emily" is near enough to a Sunderland to make one remember that Sunderlands are now in service with the Royal Australian Air Force.

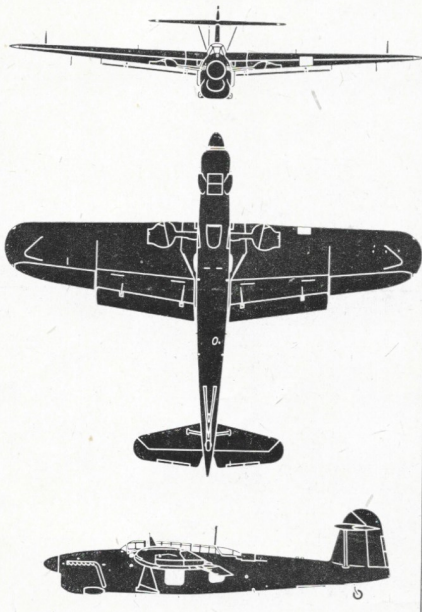
All this is disconcerting from a recognition point of view. But far from discouraging anyone from trying to learn the Japs it should prove an added incentive to know them thoroughly and in full detail. To learn where these similar types differ, attention must be paid to details so

here is a case where the two aircraft should be placed side by side—the known (we hope) American and British types—and the perhaps less known Japanese.

Photographs of Japanese aircraft are still not numerous but in any picture you may see in this Journal or elsewhere notice just those points of difference from the equivalent Allied types that you have learned by comparing the silhouettes. You will find it profitable.

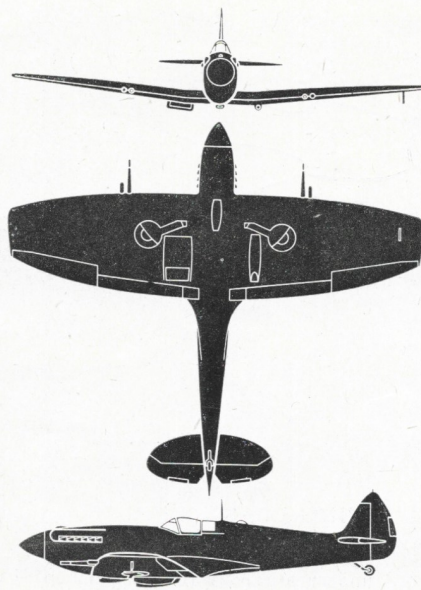
NEW AND REVISED SILHOUETTES

FAIREY BARRACUDA
(Rolls-Royce Merlin)



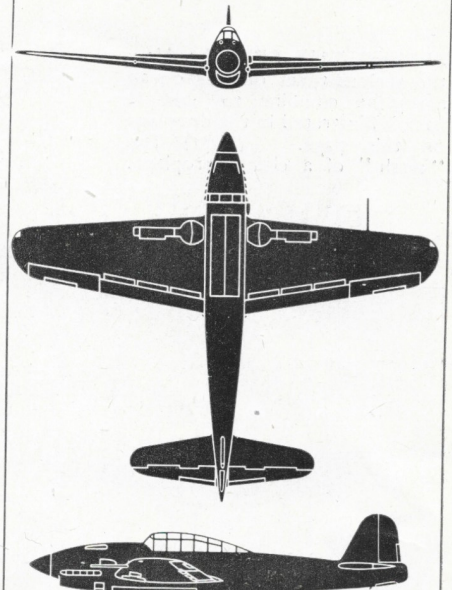
British Torpedo Bomber
Span 49 ft. 2 in. Length 40 ft. 7 in.

SUPERMARINE SPITFIRE XII
(Rolls-Royce Griffon)



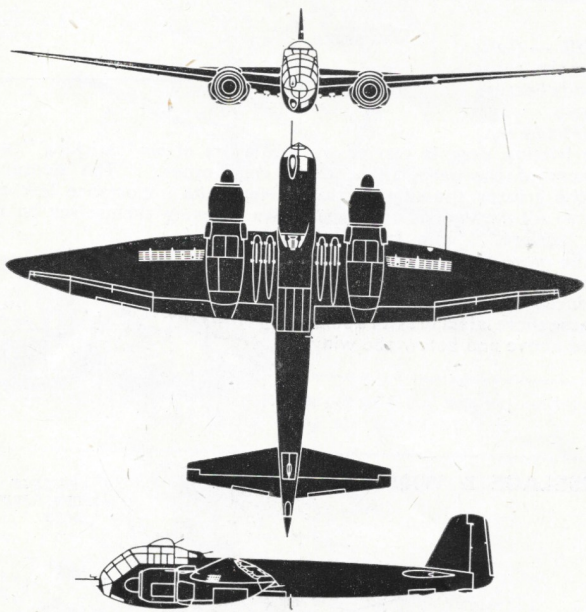
British Fighter
Span 32 ft. 2 in. Length 30 ft. 9 in.

"JUDY" NAVY 2 (AICHI)
(Aichi Atsuta 21)



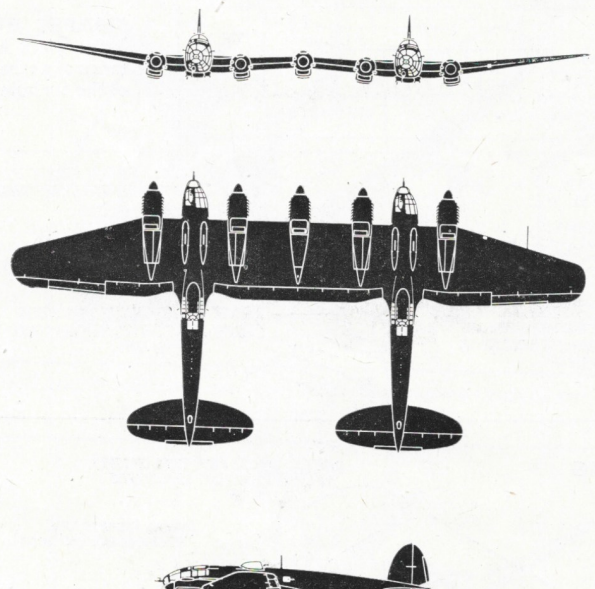
Japanese Reconnaissance Bomber
Span 37 ft. 9 in. Length 33 ft. 6 in.
(Provisional Silhouette)

JUNKERS Ju 188E
(two BMW 801)



German Bomber
Span 72 ft. 6 in. Length 50 ft. 0 in.

HEINKEL He 111z
(five Jumo 211)



German Glider Tug
Span 115 ft. 0 in. Length 53 ft. 7 in.
(Provisional Silhouette)

In the above drawings the Ju 188 and the He 111z have been corrected in the light of fresh information, the alterations being mainly to the nose of the Ju 188 and the dihedral of the wings of the He 111z. The middle engine of the He 111z is a Jumo, not a BMW 801. (The black line at the bottom of each panel shows the comparative span of the Spitfire IX)