BOMBER PLANES

that made history

by

DAVID C. COOKE

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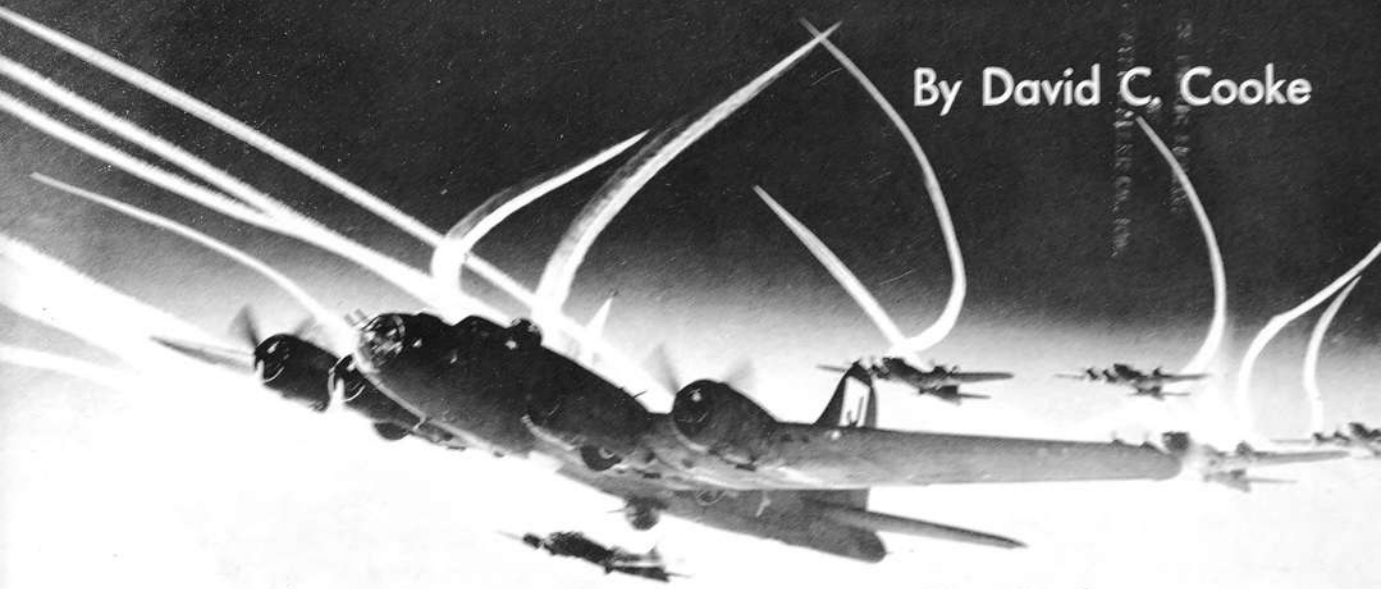

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FOREWORD

The first recorded use of the airplane as a bomb carrier in actual military operations was during the Italo-Turkish War of 1912. According to a historian of the time, "Lieutenant Gavotti of the Italian Aeronautical Service, flying at an altitude of 700 feet, threw from his machine upon an Arab camp a bomb made of picrate of potash . . . and saw a cloud of smoke and Arabs flying in all directions."

Bombardment aviation has made tremendous strides since those early days. Now, instead of carrying small bombs hardly larger than hand grenades, modern bombers can be armed with nuclear weapons capable of demolishing entire cities. Instead of struggling along at less than 100 m.p.h., modern bombers can fly faster than the speed of sound. Instead of approaching their target at an altitude of a few hundred feet, modern bombers can fly higher than 50,000 feet.

Bombers are designed to destroy, but this is not a book about destruction. It is a book about development. It traces the history of the bomber from the Rumpler Taube, Sopwith Tabloid, Albatros B-2, Caudron, Salmson, Handley-Page, Gotha, and De Havilland DH-4 of World War I through the Flying Fortress, Liberator, and Lancaster of World War II to the Peacemaker, Stratojet, Stratofortress, and Hustler of today. It is the story of progress from the rickety airplanes of 1914 to the winged marvels of the Jet and Rocket Age.

All of the most famous bombers are described and pictured on the following pages in the approximate order of their development. I have also tried to give the true story of each airplane presented.

It would have been impossible to collect photographs of some of the airplanes illustrated without the assistance of a number of people. I would like to extend my thanks to Majors James Sunderman and Kenton McFarland of the U. S. Air Force; Lieutenant Commander Herbert Gimpel of the U. S. Navy Bureau of Aeronautics; A. J. Charge of the Imperial War Museum, London; Philip Hopkins of the Smithsonian Institution; and Elizabeth Brown of the Institute of Aeronautical Sciences. Special thanks are also due to Peter M. Bowers, Martin Caidin, Ken Powers, and the representatives of the aircraft companies who cooperated so wholeheartedly.

—DAVID C. COOKE

To the Men and Officers of the 444th
Bomber Group, Eighth Air Force, USAAF.

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RUMPLER TAUBE

Germany

Although a number of "bomb-throwing" experiments had been conducted with airplanes before 1914, there were no actual bombers when World War I started. Airplanes were little more than eyes for the infantry and artillery, spotting targets, mapping enemy defenses, and seeking out troop concentrations. But within two weeks after the declaration of war, Lieutenant Hermann Dressler of the Imperial German Flying Corps shocked the world.

Without benefit of official orders, Dressler took off in his Rumpler Taube (Dove) on August 13, 1914, and dropped four 4-pound bombs on the outskirts of Paris. The bombs exploded harmlessly, but they caused great concern among the French and British.

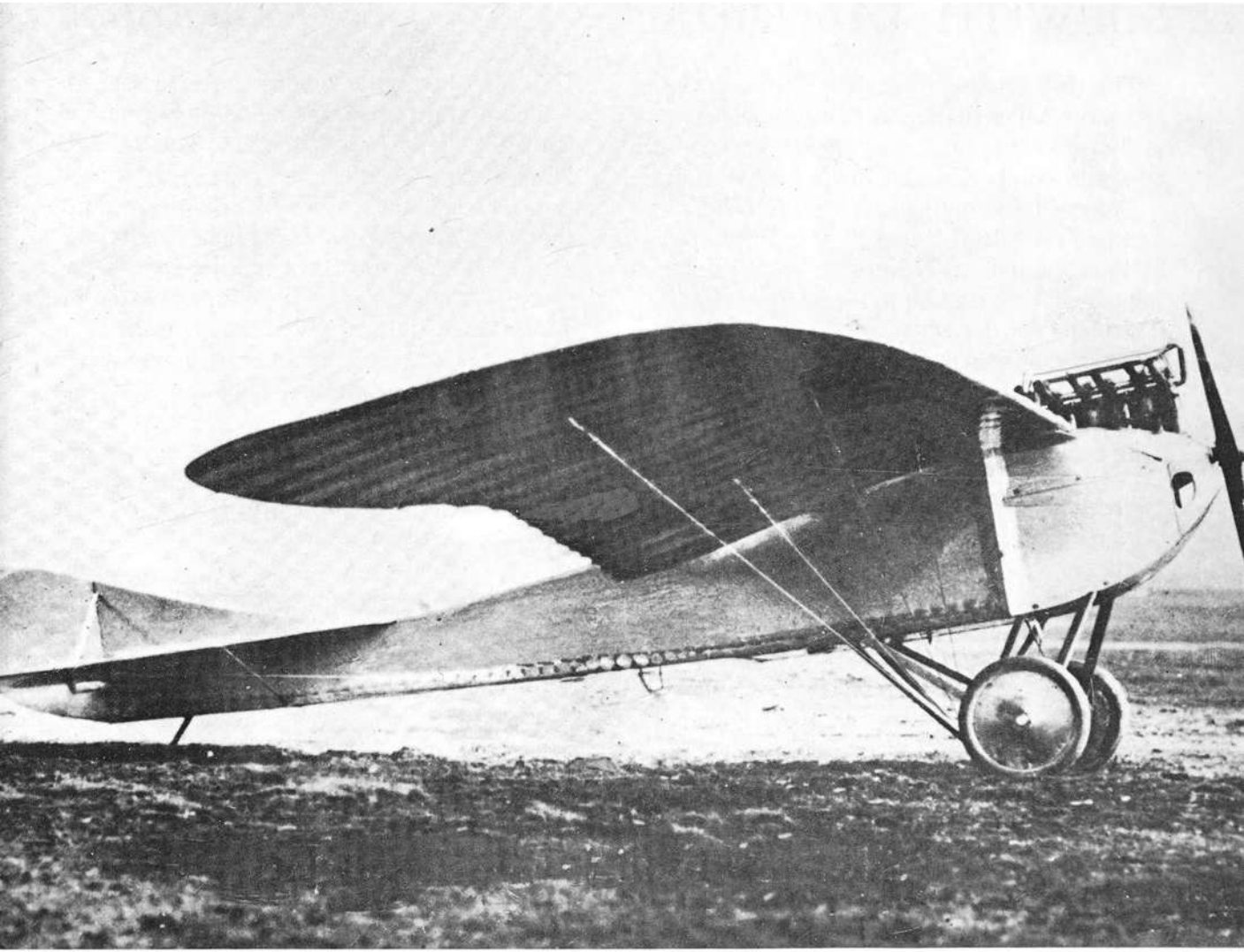
The Germans did not immediately return to Paris, but the seeds of bombardment aviation had been planted. Lieutenant Dressler in his Taube had proved that bombers could fly over armies of thousands of soldiers without danger and carry the war to enemy home areas. Orders went out to aircraft companies to design larger machines to carry heavier, more destructive bombs.

But while the Germans started aerial bombing in World War I, the Taube was not of German design. The plane had been designed in 1911 by an Austrian named Josef Etrich, who patterned his wings after those of the dove, warping the tips for stability. Etrich sold his design to the German government, and the Rumpler company was given an initial order for twenty of the machines. Rumpler built the plane following Etrich's basic design but later substituted hinged ailerons for the awkward wing warping.

In addition to bombing, the Taube was also used in some of the first aerial combats, with the observer firing a pistol or rifle at the enemy. Captain Fritz von Falkenhayn, son of the German field marshal, was killed in one of the earliest of these combats, shot through the heart by the observer in a French Farman Shorthorn.

Other data: Wing span, 46 feet; length, 27 feet 3 inches; engine, 100 h.p. liquid-cooled Argus or Mercedes; loaded weight, 1,763 pounds; maximum speed, 75 m.p.h.; service ceiling, about 11,000 feet; armament, pistols and rifles plus light bombs.

The slow, ungainly Rumpler Taube dropped the first bombs in World War I. (Imperial War Museum)



SOPWITH TABLOID

Great Britian

The tiny single-seat British Sopwith Tabloid was smaller than most fighter planes used in World War I, yet it was the first successful strategic bomber in the history of warfare.

Designed and built in secrecy, the Tabloid had its first official Royal Flying Corps trials at Farnborough on November 29, 1913, during which it created something of a sensation. The plane was demonstrated to the public the following month, flying around a closed racing course in competition with monoplanes. The Tabloid proved its superiority by running away with all of the speed and performance events. The man who piloted the Tabloid that day was Harry G. Hawker, who was to become one of the most famous long-distance flyers in the history of British aviation.

When the R.F.C. and Royal Navy Air Service went to France in 1914, several Tabloids were among their assorted equipment. At first these unarmed aircraft were used solely for observation and artillery spotting, but then the British Admiralty realized that something had to be done to try to stop the German Zeppelin attacks against London and other cities. A plan was proposed to bomb the Zeppelin sheds at Cologne and Düsseldorf.

The first attempt was made on September 22, 1914, with four Tabloids. The mission failed because of poor weather in the target area. Then, on October 6, Squadron Commander Spenser Grey and Flight Lieutenant R. L. G. Marix took off from the British airfield at Dunkirk for the second attempt. Marix dropped a 20-pound bomb on the Düsseldorf shed, which burst into flames when the huge hydrogen-filled Zeppelin Z-IX exploded.

This was the first truly successful bombing raid of World War I. However, it had a near-tragic ending for Lieutenant Marix. His Tabloid developed engine trouble on the return flight, crash-landing twenty miles from Antwerp, Holland. Marix was uninjured and completed his trip to Dunkirk on a borrowed bicycle!

Other data: Wing span, 25 feet 6 inches; length, 20 feet; engine, 80 h.p. air-cooled rotary Gnome; loaded weight, 1,060 pounds; maximum speed, 92 m.p.h.; service ceiling, 13,000 feet; armament, pistols and rifles plus light bombs.

A Sopwith Tabloid made the world's first strategic bombing attack. (Imperial War Museum)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MAURICE FARMAN SHORTHORN *France*

Perhaps the most amazing feature of the World War I Maurice Farman Shorthorn, by modern standards, is that it flew at all. There was a saying in the British Royal Flying Corps, which purchased 1,084 of the machines from the French for bombing and pilot training, that students who learned to fly the Shorthorn could fly anything with wings, with or without engine.

The Shorthorn was one of the true pioneers of bombardment aviation, and one of its most famous pilots was the Frenchman Captain Happe. Known as the "Pirate of the Skies," Happe had a long black beard which waved in the slipstream as his personal insignia. He won fame as the first successful bombing specialist of the war. Loaded with bombs, his Shorthorn had a ceiling of only 3,000 feet and no maneuverability whatever; but enemy opposition was so weak early in the war that Happe went out three times daily and always returned.

Another Shorthorn pilot who flew his way to fame was Lieutenant de Dreuille. The first night-bombing pilot of the war, he developed his specialty late in 1914. By January, 1915, de Dreuille's name was almost constantly in the dispatches for daring raids on German supply centers behind the fighting lines. He was limited in the development of his specialty by the fact that the only bombs available weighed but a few pounds.

A Farman Shorthorn also won the dubious distinction of being the first French airplane shot down by the Germans during the war. While on an observation mission late in August, 1914, Captain Sailler and Lieutenant Le Galle were fired upon and driven down by an Aviatik two-seater.

The Shorthorn was the first airplane in British service to be armed with a machine gun. The first R.F.C. squadron of Shorthorns arrived in France in September, 1914. The extra weight of the gun so reduced the plane's performance that the pilots were rarely able to engage the enemy!

Other data (Model S-11): Wing span, 53 feet; length, 30 feet 8 inches; engine, 70 h.p. liquid-cooled Renault; loaded weight, 2,046 pounds; maximum speed, 66 m.p.h.; service ceiling, no accurate record; armament, pistols and rifles plus light bombs.

The Farman Shorthorn was one of the pioneers of bombardment aviation. (Imperial War Museum)

VOISON PUSHER

France

World War I was only two months old when the French *Armée de l'Air* gained its first recorded aerial victory. On October 5, 1914, Sergeant Frantz in a Voison Pusher, accompanied by Adjutant Quenault as gunner, encountered a two-seat German Aviatik over the battle lines and shot it down with rifle fire.

In those early days of warfare the opposing powers looked upon airplanes as merely eyes of the army and artillery, without designating them for special tasks. The British used their air service for little more than observation. The Germans were developing a bombing squadron at Ostend, with long-range plans of attacking England, but over the lines in France they adopted tactics similar to the British. Both sides carried out bombing, artillery spotting, and other aviation duties with whatever planes were in flying condition.

Then, in March, 1915, the French Air Force divided its airplanes into four separate categories, and the Voison was designated as a bomber.

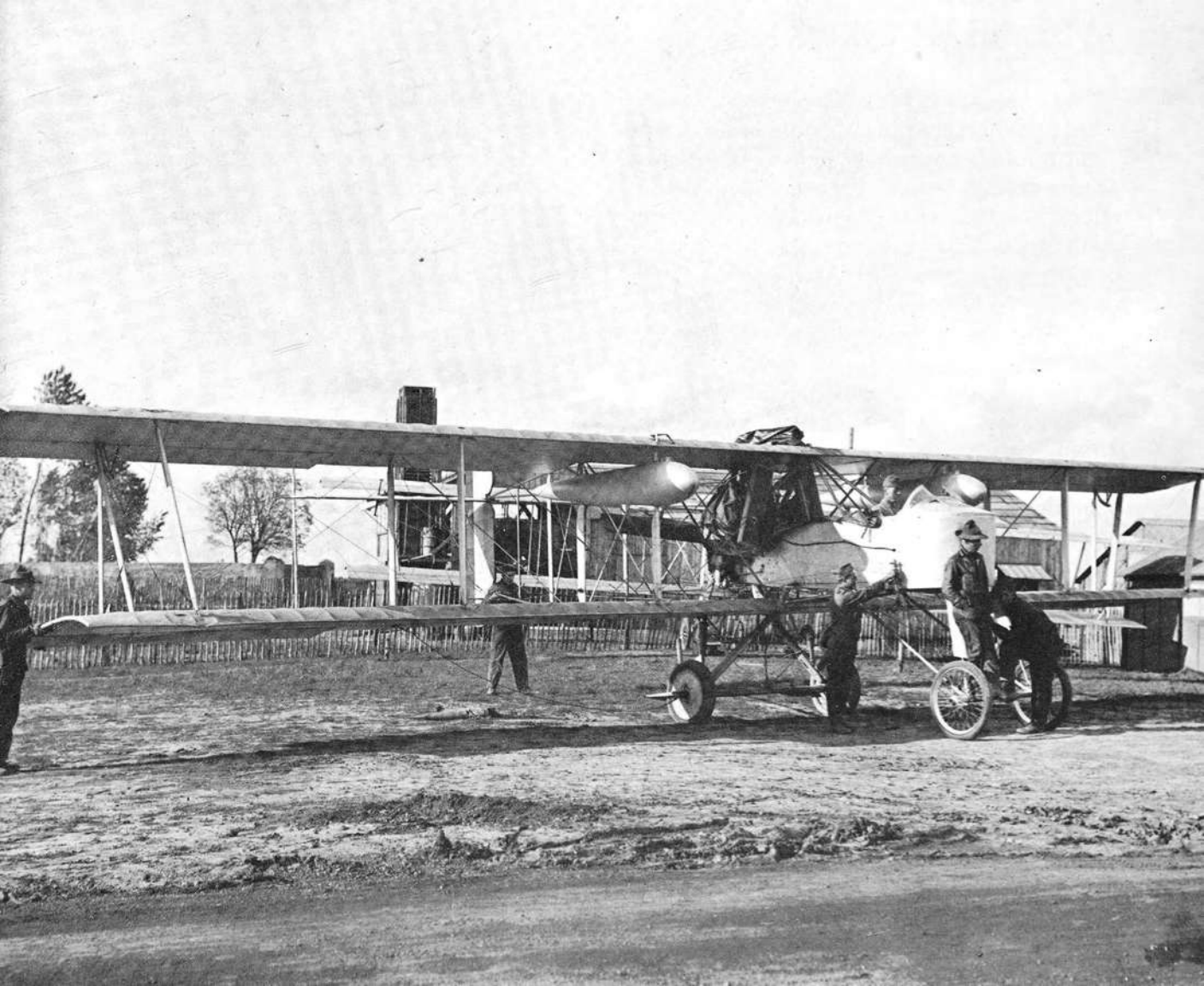
Captain de Gays was placed in command of the first bombardment group, which was composed of three flights of six Voisons each. Unescorted and with little fear of enemy interference from the air, the Voisons shuttled back and forth over the lines with their small loads of bombs. Most of these raids were against enemy observation balloons or troops, for the full potentials of bombardment aviation had not yet been visualized.

The Voison was used on daylight raids throughout 1915 and in the first few months of 1916. But then enemy fighters suddenly became so much of a problem and losses were so high that it was decided to use the machine strictly for night bombing.

A Voison squadron commanded by Captain Laurens dropped a record number of bombs in June, 1917. On two consecutive nights the machines dropped a total weight of 21,750 pounds; in April, 1916, the same squadron had required fifty raids to drop 25,500 pounds of bombs.

Other data: Wing span, 48 feet 5 inches; length, 31 feet 3 inches; engine, 140 h.p. air-cooled rotary Salmson; loaded weight, 2,959 pounds; maximum speed, 62 m.p.h.; service ceiling, 10,000 feet; armament, one .30-caliber machine gun and about 250 pounds of bombs.

Ten Voison pushers were purchased by the U. S. Air Service as trainers. (National Archives)



ALBATROS

Germany

By September, 1914, the Germans realized that aerial bombardment could become a potent military advantage, and they organized a squadron at Ostend, France, called the Carrier Pigeons. With that squadron rode a Prussian dream. Their ground forces were advancing steadily, and when the troops reached Calais, the Carrier Pigeons were to follow. From that point they could take off and bomb England.

The best and most experienced pilots from every squadron of the German Air Force were transferred to Ostend, where they were quartered in railroad sleeper cars to increase their mobility. But the dream of bombing England did not come about as soon as expected, since the German troops were unable to take Calais and the Albatros B-2's with which the squadron was equipped did not have sufficient range to cross the North Sea to London with a full load of bombs.

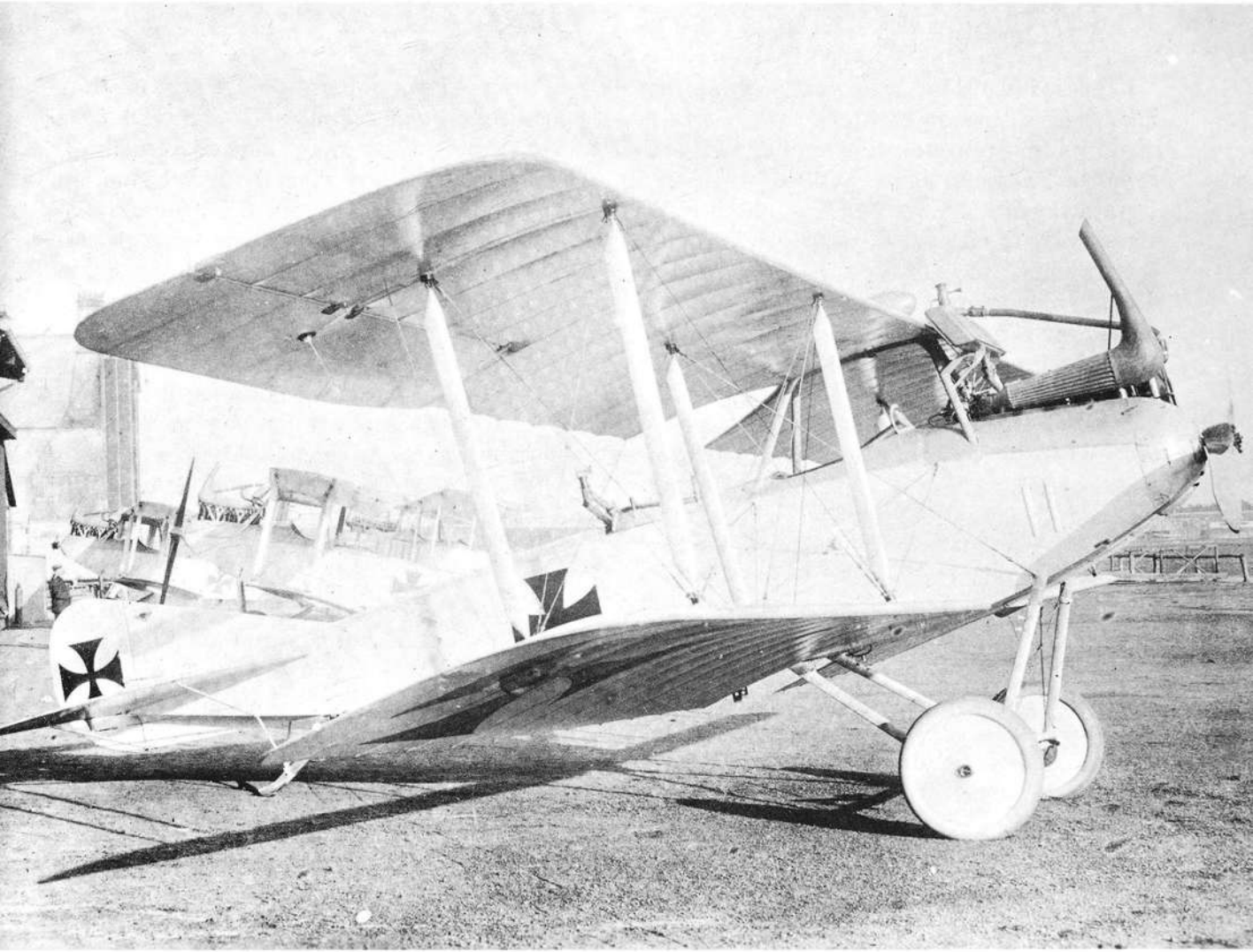
Finally, tired of inaction, the Carrier Pigeons took off on the night of January 28, 1915, on their first mission—a raid against Dunkirk, the most important ammunition dump and supply base of the British army in France. This was a world's first—the first true bombing squadron on its very first mission. It was also the first time that an attacking force had flown in formation.

After this mission, which caused a number of fires in Dunkirk, the Carrier Pigeons added airdromes to their list of targets. This was the first tactical bombing in warfare.

The Albatros B-2 was designed by Ernst Heinkel, who was also destined to design the first jet plane in the world—the He. 178, which was first flown on August 27, 1939. Later versions of the Albatros saw service through to the end of the war. Major Raoul Lufbery, America's third-ranking ace with seventeen victories, was shot down by an Albatros C-3 on May 19, 1918. The plane was also flown by a number of Germans who later became famous aces.

Other data (Model C-3): Wing span, 38 feet 6 inches; length, 27 feet 6 inches; engine, 160 h.p. liquid-cooled Mercedes; loaded weight, 3,044 pounds; maximum speed, 87 m.p.h.; service ceiling, 12,000 feet; armament, two 7.9-mm. machine guns and about 250 pounds of bombs.

The Albatros C-3 made history flying with the Ostend Carrier Pigeons. (Smithsonian Institution)



ROYAL AIRCRAFT FACTORY F.E. 2 *Great Britain*

Designed in 1915 as a two-seat fighter, the F.E. 2 (F.E. meant Fighter Experimental) made its first appearance over the Western Front in France in January, 1916.

An awkward, clumsy machine, the F.E. 2, along with the De Havilland DH-2 single-seater, helped to overcome the Fokker Eindecker (monoplane) scourge. However, when the German front-line fighter squadrons received their new Albatros D-1's in September, 1916, the days of the F.E. 2 as a fighter were numbered. During that first month of operations with the D-1, the Germans shot down an even one hundred Allied machines—many of them F.E. 2's. Baron Manfred von Richthofen scored his first confirmed victory on September 17 against an F.E. 2B; the ace destroyed thirteen other F.E. 2's before his career was ended on April 21, 1918.

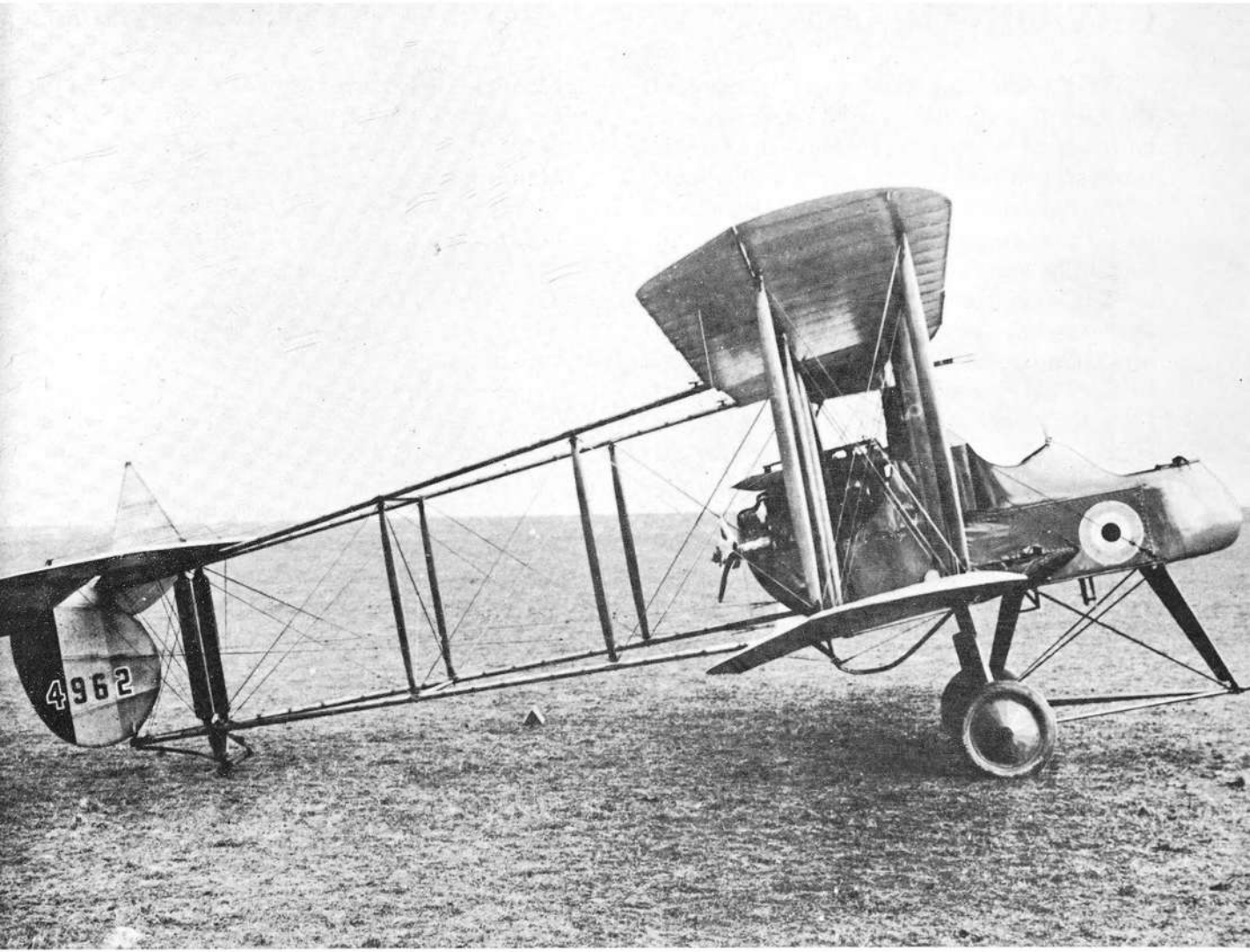
But while the "Fee" was soon outclassed as a fighter, it became famous as a night bomber, and was used in this capacity to the end of the war. During March, 1917, the F.E.'s of Number 101 Squadron attacked eight German airdromes, five railway stations, and eight villages where troops were billeted.

Despite its poor performance (the machine required fifteen minutes to climb to 6,500 feet), the F.E. 2 was a difficult airplane to attack, particularly when flying in formation. The gunner, who sat in the front cockpit, had two Lewis machine guns: one firing forward and to the sides, and the other firing to the rear. To operate the rear gun, it was necessary for the gunner to stand up with his feet and ankles just inside the nacelle coaming—wearing neither a safety belt nor a parachute!

The Royal Aircraft Factory and various sub-contractors produced 1,364 F.E. 2B's and 248 F.E. 2D's, which were similar in layout but with 250 h.p. Rolls-Royce engines. Almost 400 "Fees" were used for training purposes, 213 remained in England on Home Defense to fight the Zeppelins and Gothas, and the remainder were sent to France.

Other data (F.E. 2B): Wing span, 47 feet 10 inches; length, 32 feet 3 inches; engine, 160 h.p. liquid-cooled Beardmore; loaded weight, 3,469 pounds; maximum speed, 81 m.p.h.; service ceiling, 16,500 feet; armament, up to four .30-caliber machine guns and 192 pounds of bombs.

F.E. 2B's were outclassed as fighters but became successful night bombers. (Imperial War Museum)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CAUDRON G-4

France

The French Caudron G-4 day bomber was the last of the outrigger-tail type airplanes built during World War I. It was also the first successful twin-engined bomber in the world.

The machine was designed and built in the latter months of 1915 and sent to front-line squadrons early in January, 1916. On January 23 a squadron of G-4's dropped 130 bombs on the railroad station and army barracks at Metz. On the return trip they were attacked by ten Fokker Eindecker and Aviatik scouts. Despite the fact that the German planes were armed with propeller-synchronized machine guns, only one of the Caudrons was shot down.

It is amazing that the lumbering, poorly armed Caudron managed to survive its first few months of combat. However, this ancient 1915 design, which was outmoded even before it went into combat, survived not only for a few months but through to the end of the war. Even more amazing is the fact that one Caudron pilot, Sublieutenant Delorme, managed to shoot down five enemy planes and became listed on the roster of aces.

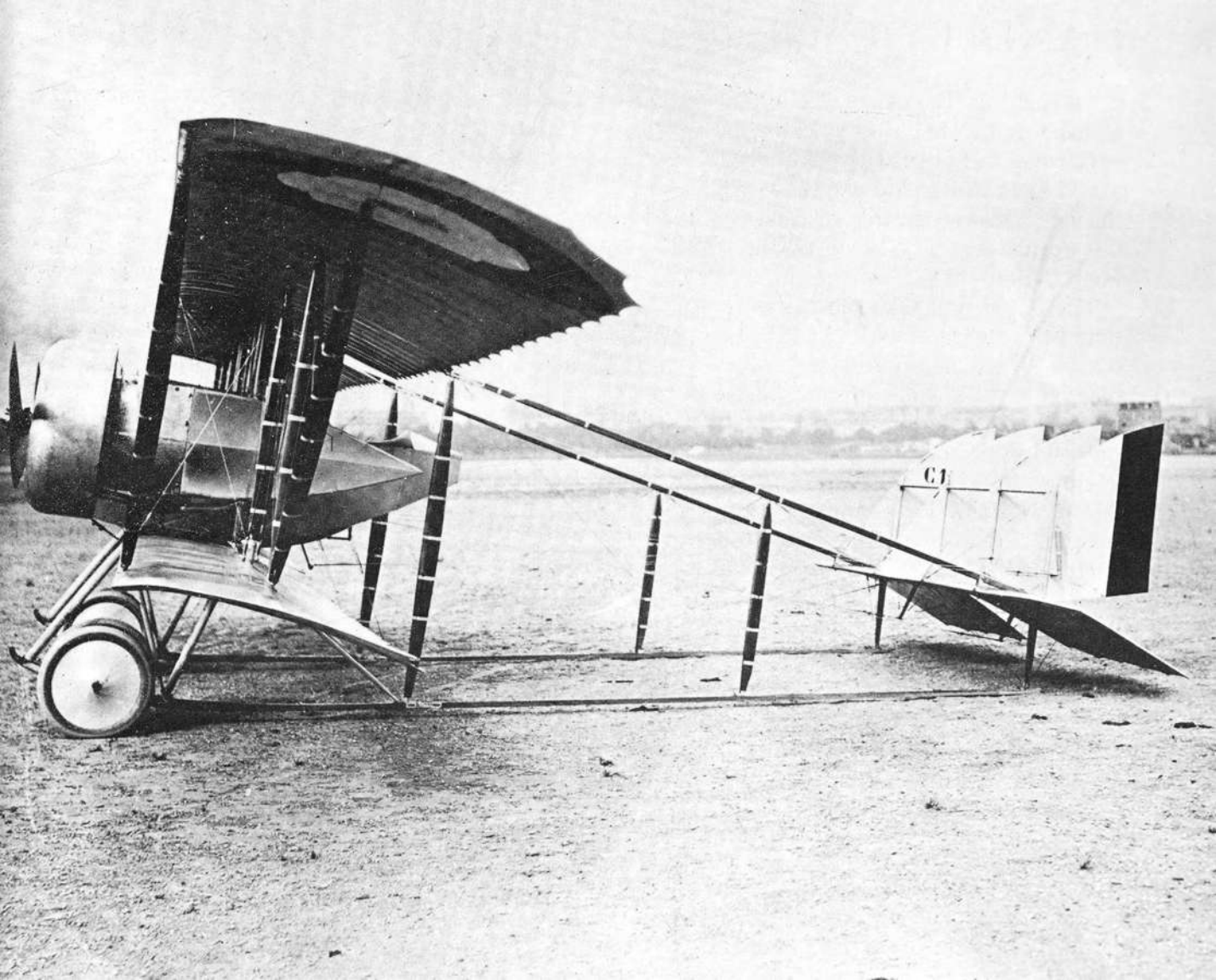
In 1917, when the Germans won control of the air, the French became so hard-pressed for combat planes that they sent the G-4 down to strafe enemy trenches. On one occasion eight of the slow bombers descended to an altitude of less than 300 feet and raked infantry positions for an hour and a half.

The one fact which saved the Caudron from early extinction was that during bombing raids enemy fighters first engaged the escorting single-seaters. By the time the dogfights were finished, the Germans had often burned up so much of their scant fuel supplies that they were forced to turn back to their bases.

Late in 1916 the G-4 was reclassified as a night bomber, serving in this capacity to June of the following year, when it was handed over to training squadrons. The U. S. Army Air Service also purchased ten of the machines for training purposes.

Other data: Wing span, 56 feet 5 inches; length, 23 feet 6 inches; engines, two 80 h.p. air-cooled rotary Le Rhones; loaded weight, 2,970 pounds; maximum speed, 82 m.p.h.; service ceiling, 14,000 feet; armament, one .30-caliber machine gun and about 250 pounds of bombs.

One Caudron G-4 pilot shot down five enemy planes and became an ace. (Smithsonian Institution)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HANDLEY-PAGE 0/400

Great Britain

As early as December, 1914, the British realized that if they were to carry the air war to German rear areas with any real effect they would have to develop a special airplane for the job. This recognition of need resulted in the world's first true bomber—the Handley-Page 0/100.

The 0/100 was taken into the air for the first time on December 17, 1915, but it was not at all satisfactory. The test pilot complained that the ship had a violent tail flutter, it was logy on the controls, and there was too much vibration. He also complained that its engines were not powerful enough.

The Handley-Page company went about making necessary changes, and Rolls-Royce engineers rushed design work on a larger, more powerful engine to drive the machine. These efforts resulted in the 0/400, which was almost identical in size and layout to the 0/100.

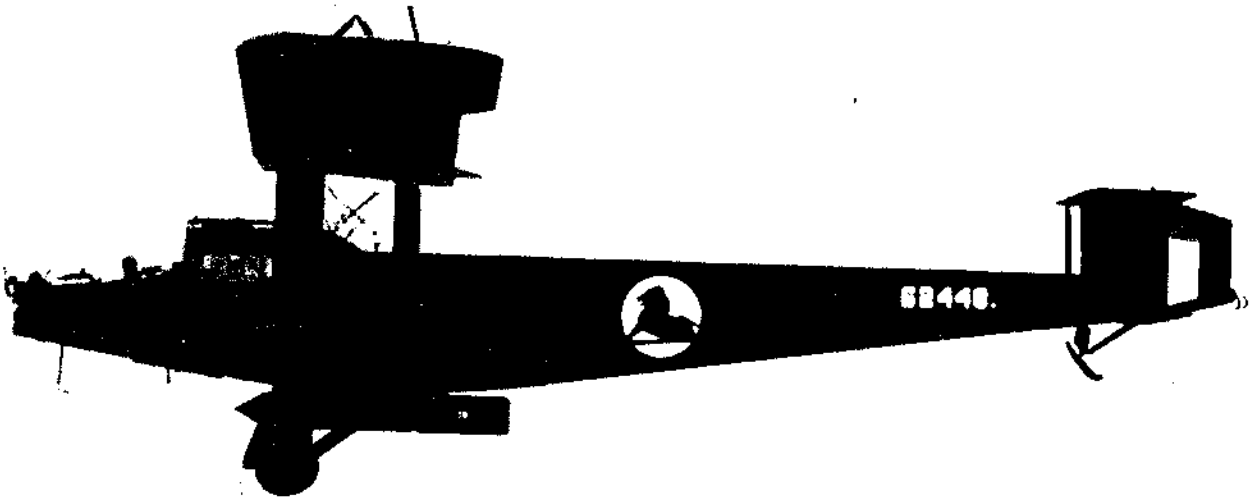
The first production 0/400 took off from the Handley-Page factory on February 2, 1917, for aerial delivery to France. However, the pilot ran into a severe thunderstorm and lost his way. He finally decided to land on a farm and ask directions. Too late, he discovered that the farm was on the German side of the lines—and both he and his machine were captured.

The Handley-Page bomber was not used operationally to any great extent until April, 1917, when the Royal Navy Air Service squadron at Dunkirk, France, started flying antisubmarine patrols with the machine over the North Sea. Then, in retaliation for German raids against London, the bomber was sent against Gotha bases. Eight tons of bombs on the St. Denis Westrem airdrome in four days forced the Germans to evacuate the field.

The four-seat 0/400 was so successful that the British decided to build an even larger bomber, the V/1500, for strikes against Berlin. However, only three of these had been built by the time of the Armistice.

Other data: Wing span, 100 feet; length, 62 feet 10 inches; engines, two 360 h.p. liquid-cooled Rolls-Royce Eagle VIII's; loaded weight, 14,022 pounds; maximum speed, 98 m.p.h.; service ceiling, 10,000 feet; armament, five .30-caliber machine guns and 1,792 pounds of bombs.

The Handley-Page 0/400 was the world's first true heavy bomber. (U. S. Air Force)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GOTHA

Germany

When it became obvious to the Germans during World War I that they would not be able to attack England successfully with small aircraft, they decided to build large, long-range bombers especially for the job. One of these was the dreaded Gotha.

The first Gotha was delivered from the Gothaer Waggonfabrik plant in the fall of 1916. After tests, the German Air Ministry was so impressed that it ordered thirty of the machines to be delivered by February 1, 1917. However, a number of production difficulties were encountered.

Finally, in the middle of May, twenty-one Gothas droned across the North Sea at an altitude of 18,000 feet. They had planned to bomb London, but heavy clouds forced them to seek other targets. They unloaded their bombs on Shorncliffe and Folkestone, killing ninety-five people and injuring 195.

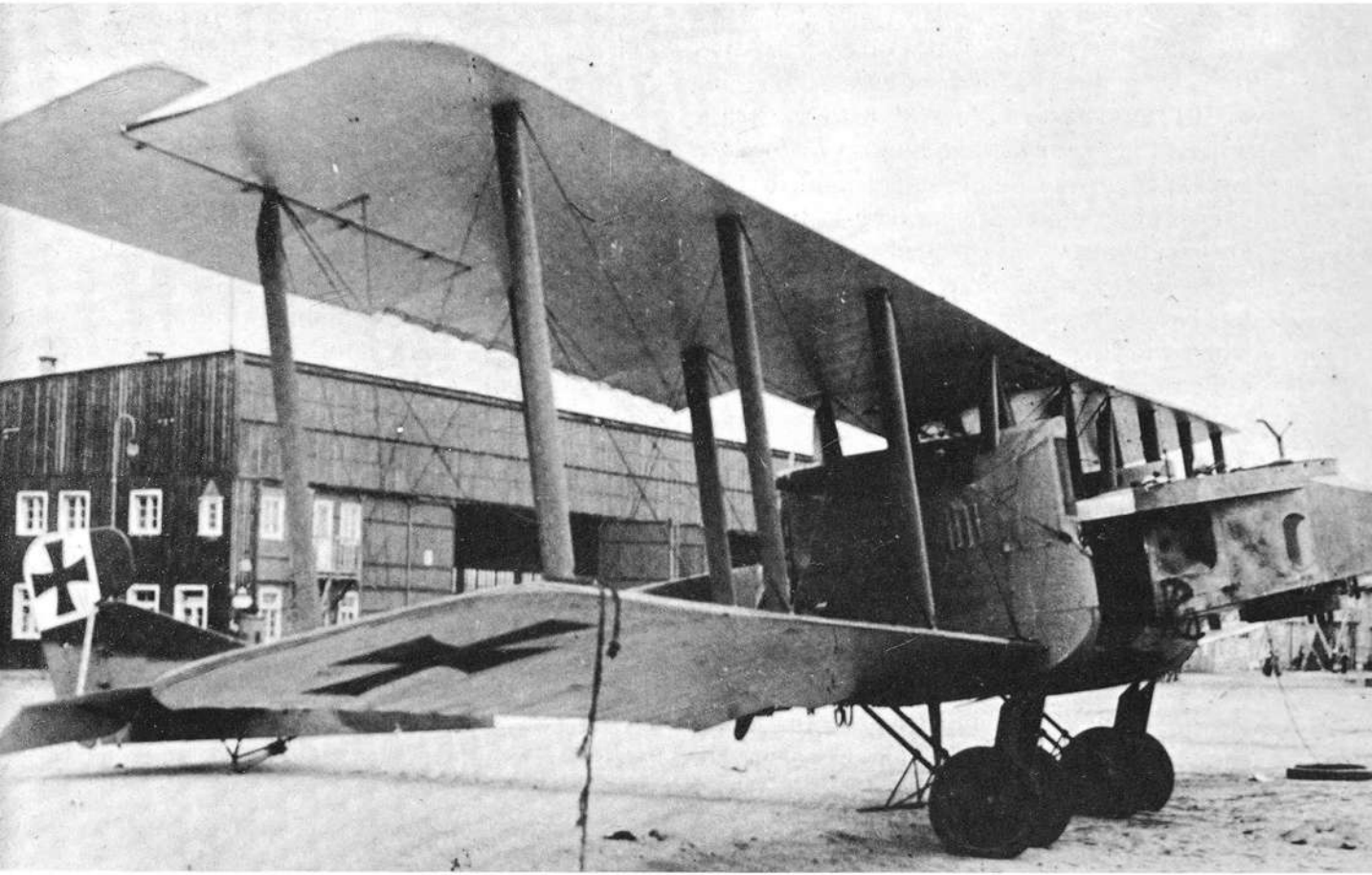
The Gothas returned to England, twenty-two strong, on June 5, and again they were unable to get through to London. But eight days later the weather was perfect, and fourteen of the bombers hit London, killing 162 people and injuring 432. Ninety-two defensive fighters went up to intercept the raiders, but not one German plane was shot down.

After several more daylight attacks, the Gothas started to come by night. In all, from May, 1917, to August, 1918, thirty-three raids were flown against London and other English cities, killing 837 people and injuring 1,991 and causing millions of dollars' worth of damage. But even more important to the Germans, these raids tied up 1,690 British airplanes for defensive purposes—planes which otherwise could have been sent to the fighting fronts in France.

The Gotha was smaller than the Handley-Page 0/400, which was similar in general layout. However, the Gotha was much more successful than its British counterpart, proving for the first time the terrible destruction which could be wrought by bombing.

Other data (Model G-5): Wing span, 77 feet 8 inches; length, 40 feet 9 inches; engines, two 260 h.p. liquid-cooled Mercedes; loaded weight, 8,763 pounds; maximum speed, 87 m.p.h.; service ceiling, 21,000 feet; armament, three 7.9-mm. machine guns and 1,000 pounds of bombs.

Germany's Gotha was the most successful heavy bomber of World War I. (U. S. Air Force)



DE HAVILLAND DH-4

Great Britain

The British two-seat De Havilland DH-4 was the finest day bomber used by any country during World War I. Between the spring of 1917 and the summer of 1918 the plane proved its worth by standing up to the best fighter opposition the Germans had to offer.

Fast and rugged DH-4's ventured over the lines on hundreds of missions without fighter protection. But no protection was necessary, for between March, 1917, and July, 1918, when the Fokker D-7 reached the front in large numbers, the DH-4 was not only faster than enemy single-seaters but also had a higher ceiling.

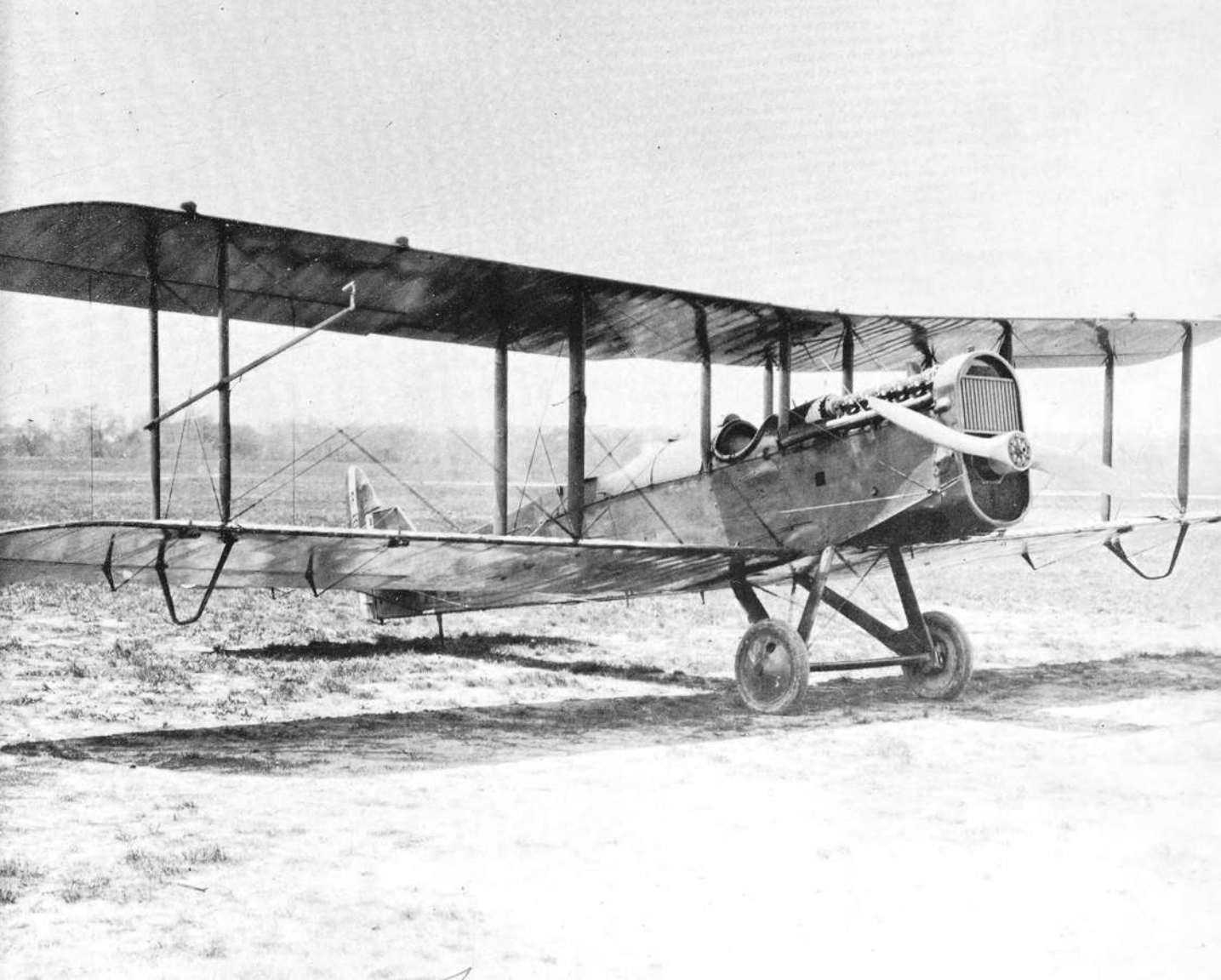
When the United States entered the war in April, 1917, rights were obtained to manufacture the DH-4. Schedules called for building thousands of the planes, but the plan was such a failure that in April, 1918, only fifteen DH-4's were rolled from the factories. One of these reached France and was flown across the lines on May 17, but three more months elapsed before a complete squadron of American-built DH-4's with Liberty engines was able to go against the enemy.

The DH-4 had once been the greatest of all day bombing planes, but in American service it soon became known as the "Flaming Coffin" because of the ease with which it caught fire in combat. Of the 1,213 American-built DH-4's to reach France and England before the Armistice, only 543 saw action.

Despite this history, the DH-4 continued to perform valuable work. On August 12, 1918, for example, a flight of twelve DH-4's returning from a bombing raid was attacked by forty German fighters from the old Richthofen Circus. The Americans came through without loss and managed to send seven enemy planes crashing in defeat. It is also a matter of record that of the four Congressional Medals of Honor awarded to American airmen during World War I, two of these were won by Lieutenants Erwin Bleckley and Harold Goettler in a DH-4.

Other data: Wing span, 42 feet 6 inches; length, 29 feet 8 inches; engine, 375 h.p. liquid-cooled Rolls-Royce Eagle; loaded weight, 3,472 pounds; maximum speed, 137 m.p.h.; service ceiling, 23,000 feet; armament, two or three .30-caliber machine guns and 545 pounds of bombs.

Two American DH-4 flyers were awarded the Congressional Medal of Honor. (U. S. Air Force)



BREGUET 14

France

Square, squat, and ugly, the French Breguet 14 was used as a day and night bomber, artillery spotter, and two-seat fighter from the latter part of 1917 through to the end of World War I. The French navy also added twin floats to the plane and used it for observation and bombing.

Though not an attractive machine, the Breguet 14 was well advanced for its time. Where most other planes used in World War I were of wooden construction, the Breguet was built almost entirely of aluminum, with fabric covering. This sturdy construction made the plane somewhat slower than the British De Havilland DH-4, which was built about the same time. However, the Breguet remained in active service longer than most war planes of the 1914-1918 period, with several French squadrons still equipped with the ship as late as 1930.

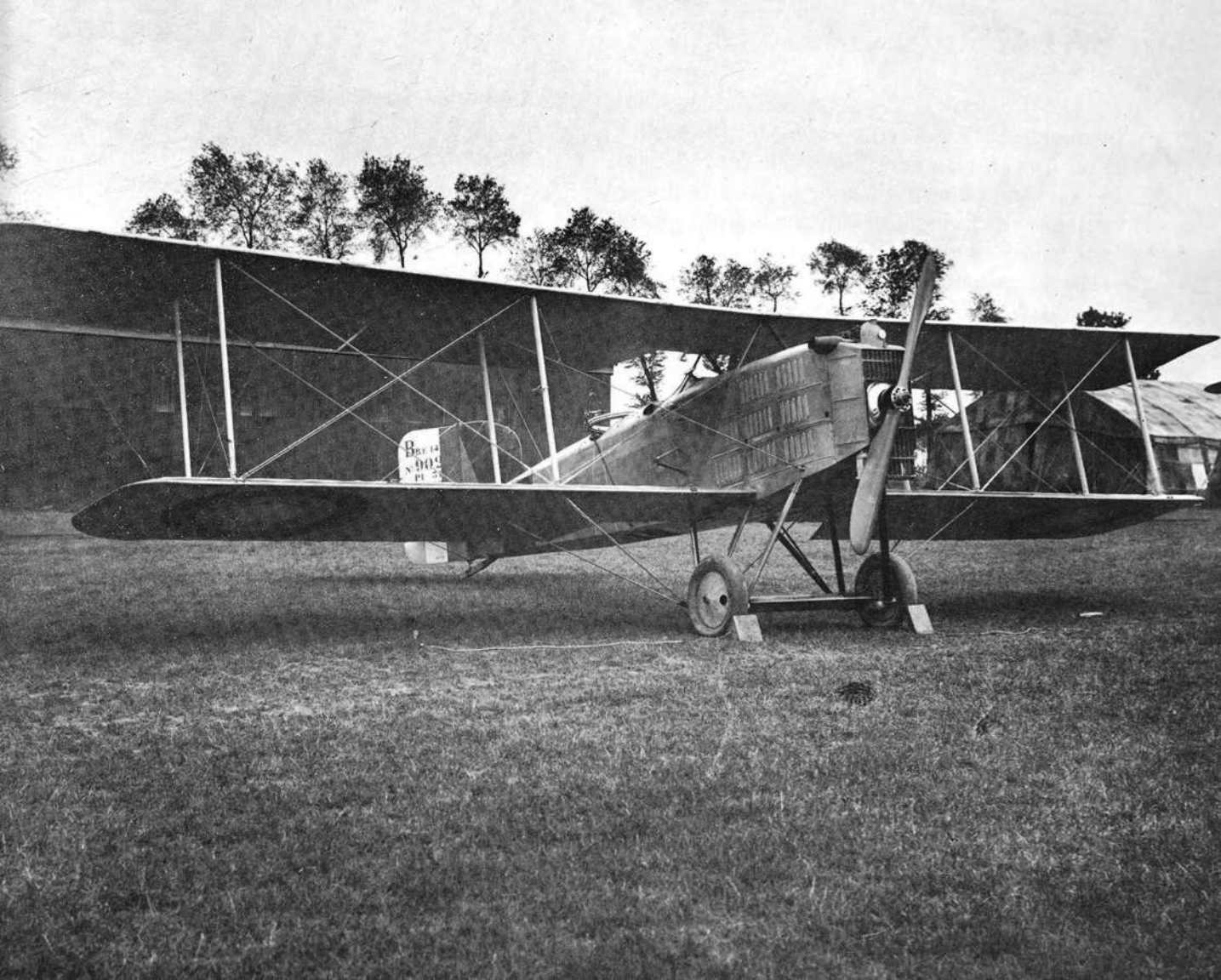
The U. S. Army Air Service bought 266 Breguet 14's from the French to equip fifteen front-line squadrons and one training squadron. The first American day-bombardment squadron to go into action was the 96th, which was completely equipped with Breguets. The group's first mission was flown on June 12, 1918, against the railroad yards at Dommary-Baroncourt.

Despite American dislike for the Breguet, French bomber pilots were very satisfied with the machine. It was a tremendous advance over the Voison and Caudron and had enough range to carry the war deep behind the German lines. During the May 14, 1918, raid against Bois de Champion, direct hits on the enemy munitions dump caused such an explosion that Dutch scientific instruments recorded it as a local earthquake.

The Germans considered the Breguets such a threat that orders were issued to concentrate all fighter strength against them. As a result of this order, one French squadron lost forty-five planes and 116 airmen in a period of only a few weeks.

Other data: Wing span, 37 feet 3 inches; length, 29 feet 7 inches; engine, 300 h.p. liquid-cooled Renault 12F; loaded weight, 3,380 pounds; maximum speed, 115 m.p.h.; service ceiling, 20,000 feet; armament, two or three .30-caliber machine guns and 660 pounds of bombs.

The Breguet 14 was well advanced for its time, had aluminum framework. (National Archives)



SALMSON SAL-2 A.2

France

The French Salmson SAL-2 A.2 was designed in 1917 as a replacement for the earlier Caudron and Breguet. But while the Salmson was a good plane and slightly faster than the Breguet, its flying and fighting qualities were not nearly as good. Despite this, the machine was a favorite among American pilots in World War I and it was ordered by the U. S. Air Service in larger numbers than any other foreign-built plane except the Spad S.13 fighter.

The Salmson first went into action in the spring of 1918. Though designed for observation and day bombing, it was also used for ground strafing, night bombing, and photographic mapping. Twenty-four light fragmentation bombs could be fitted on the lower wings for use against troops.

During the first few months of operation on the Western Front, Salmsons and other Air Service bombers were sent out in small formations on nuisance raids. But Colonel William "Billy" Mitchell was looking for better results, and he came up with a daring plan. He concentrated all of the bombers and fighters under his command, along with a number of French groups, and on September 12, 1918, started sending this fleet of 1,481 planes against the St. Mihiel section of the front. The St. Mihiel bulge had been sticking into the French lines as a constant threat, and Mitchell wanted to smash the Germans back.

Waves of two-seat Salmsons pounded the enemy on the ground, while escorting Spad and Nieuport fighters wrested control of the air from the Fokkers and Albatroses, and the St. Mihiel salient was forced to give ground under the barrage. This was the first time in history that airplanes had been used in mass bombing attacks.

The Germans shot down 773 Allied aircraft during the month of September, 1918—their high point of the entire war—but they lost so many planes themselves that they never again achieved aerial superiority. St. Mihiel was the beginning of the end.

Other data: Wing span, 38 feet 6 inches; length, 27 feet 9 inches; engine, 260 h.p. liquid-cooled Salmson; loaded weight, 2,870 pounds; maximum speed, 116 m.p.h.; service ceiling, 16,600 feet; armament, three .30-caliber machine guns and 500 pounds of bombs.

The Salmson carried up to 500 pounds of bombs on external wing racks. (National Archives)

MARTIN MB-2

United States

Late in 1917 a young aircraft designer named Donald Douglas, who was then employed by the Glenn L. Martin Company in Cleveland, Ohio, designed a fast, twin-engined bomber that looked very good on paper. Glenn Martin was so enthusiatic about the plane that he took the plans to Washington, D.C., and showed them to the Aircraft Production Board. But he was waved away. The United States was building only foreign-type airplanes, and new designs were not wanted.

Then, on January 17, 1918, the officials on the Aircraft Production Board changed their minds. Martin was given a contract to build his Douglas-designed plane.

The MB-2 was too late to see action in World War I. However, when the first model of the ship was tested by the U. S. Army Air Service, it was called "the greatest bombing plane in the world." And while other airplane contracts were being canceled, more than 200 MB-2's were ordered.

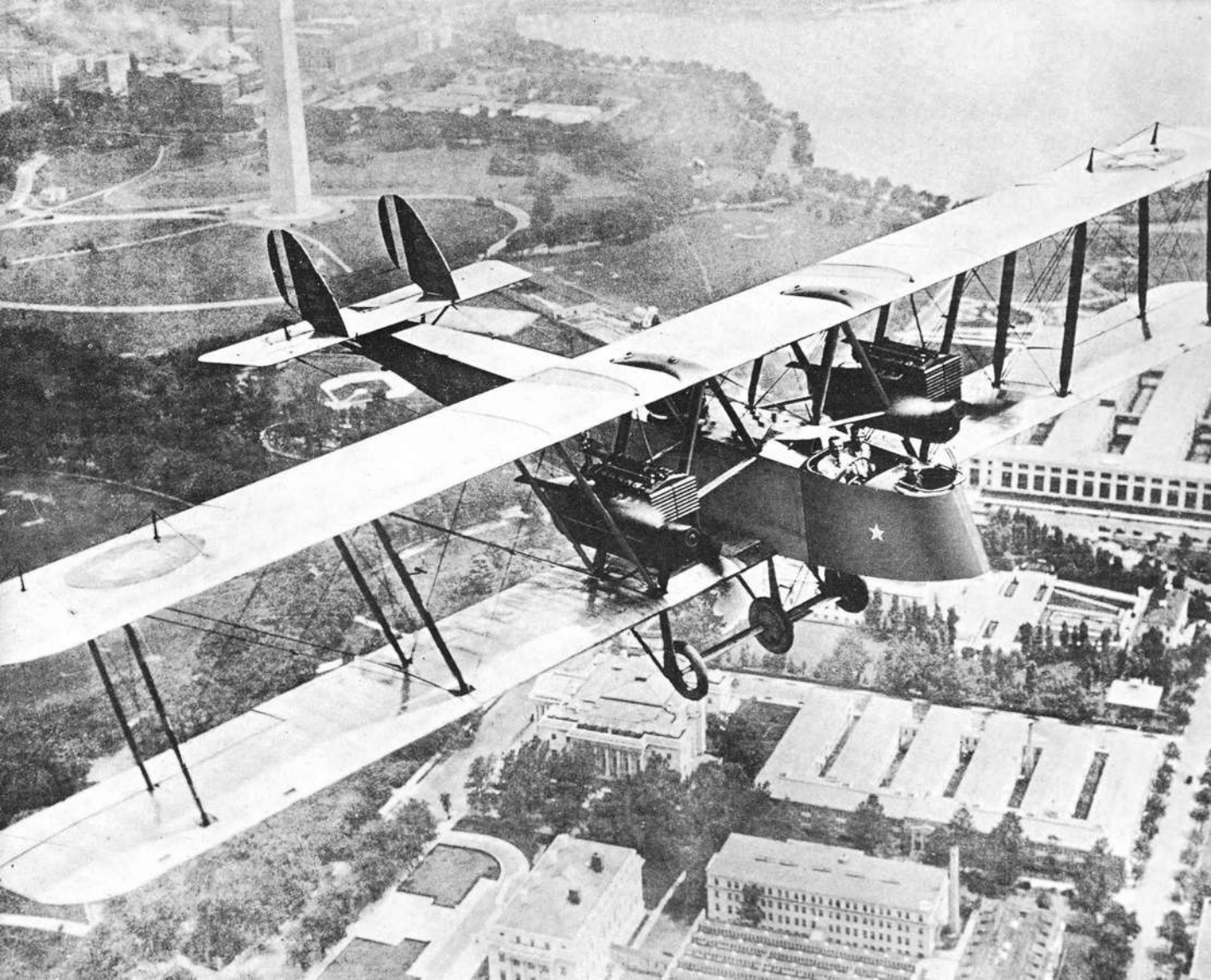
The MB-2's greatest claim to fame came in 1921, when Brigadier General William "Billy" Mitchell was challenged by the U. S. Navy to prove his argument that airplanes could sink battleships. A test was arranged, to be held during June and July, about sixty miles off the coast of Virginia, with former German warships as targets.

Three Navy F-5-L flying boats sank the *U-117* submarine in sixteen minutes, dropping twelve bombs from an altitude of about 1,000 feet. Next, a flight of SE-5A fighters sent the *G-102* destroyer to the bottom. Then, on July 18, three of the four-seat Martin bombers flew out to sea and dropped eleven bombs—and the cruiser *Frankfurt* went down.

The 27,000-ton battleship *Ostfriesland* was the next target. According to the Navy, the ship was unsinkable. But on July 21 seven MB-2's, each carrying a 2,000-pound bomb, sank the dreadnought in twenty-one and a half minutes.

Other data: Wing span, 71 feet 5 inches; length, 46 feet 4 inches; engines, two 400 h.p. liquid-cooled Liberties; loaded weight, 12,075 pounds; maximum speed, 107 m.p.h.; service ceiling, 16,000 feet; armament, four or five .30-caliber machine guns and 2,000 pounds of bombs.

The MB-2 was the first strategic bomber built in the United States. (The Martin Co.)



BOEING B-9 DEATH ANGEL

United States

At the start of the 1930's, the Keystone LB-5A and the Curtiss B-2 Condor were the standard U. S. Army Air Corps bombing planes. They were fabric-covered biplanes, and they were slow—actually little more than World War I concepts with increased horsepower and strength. But the stage was set for the first great revolution in bombardment aircraft.

The Boeing Company was encouraged by the Air Corps to turn its talents to the design and production of a really modern bomber. At that time the company was working on a spectacular new all-metal monoplane, the Monomail, and it was decided to enlarge the plane and add another engine to turn it into a bomber.

The plan was good, but the Boeing engineers did not know where to place the engines for best results. Until this time all large monoplanes had their engines either above or below the wings, but Boeing thought there might be a better arrangement. They turned to the National Advisory Committee for Aeronautics for help, and tests with models proved that the best results would come from mounting the engines out in front of the wings, with the engine cowlings faired back.

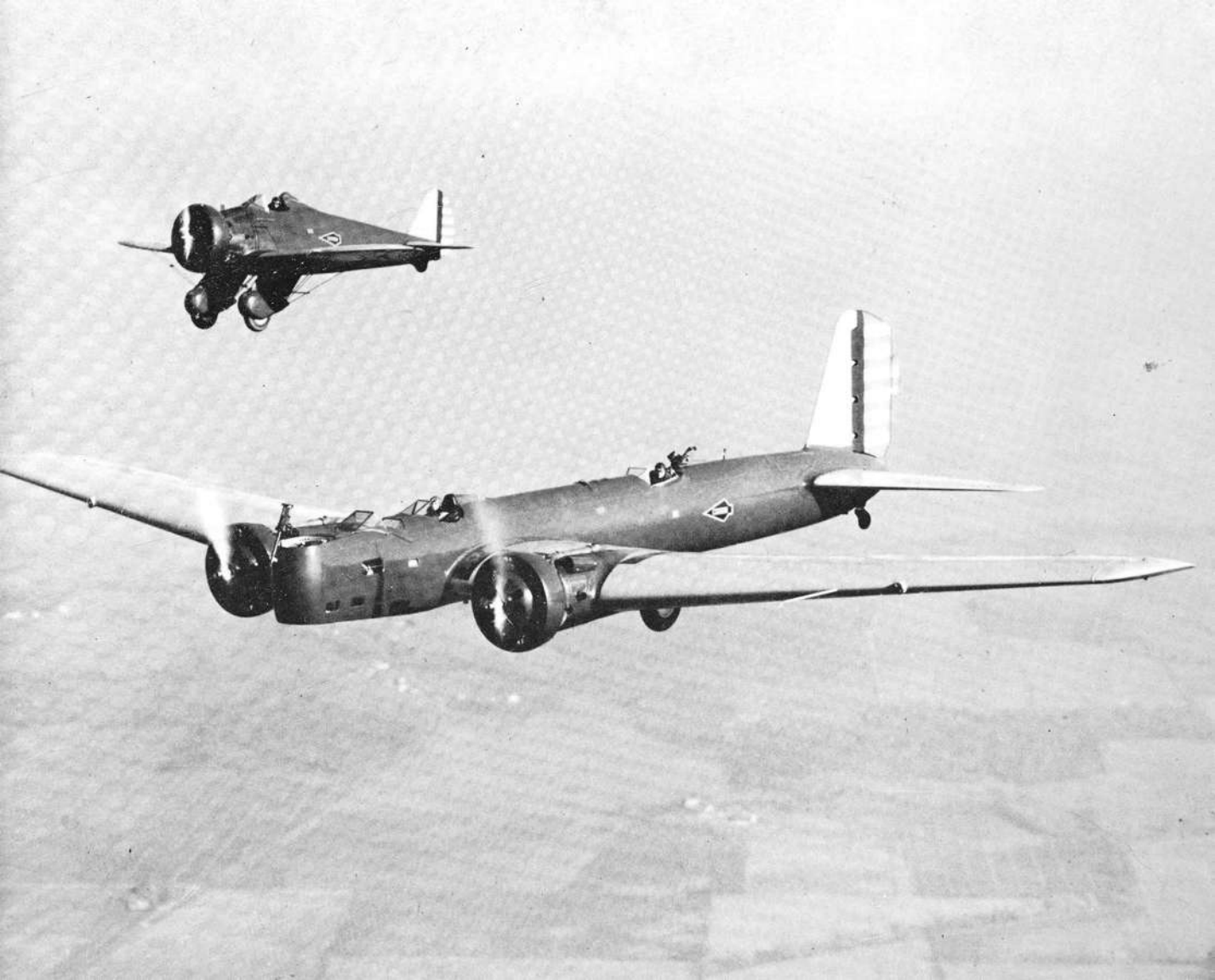
Finally, in the middle of April, 1931, the new airplane was rolled out of the factory. It was different from anything that had ever been built—the world's first truly modern all-metal, low-wing, twin-engined bomber. It was also the first military airplane with a retractable landing gear.

The B-9 was taken up for its first flight on April 29, and it was even faster than the engineers had expected—faster than any other bomber in the world, faster than most operational fighters.

But while the B-9 was a revolution in bombardment design, it was not ordered into large-scale production. A still faster and better bomber had been designed by the Martin Company.

Other data (Y1B-6A): Wing span, 76 feet 9 inches; length, 51 feet 5 inches; engines, two 630 h.p. air-cooled radial Pratt & Whitney Hornets; loaded weight, 13,919 pounds; maximum speed, 186 m.p.h.; service ceiling, 20,150 feet; armament, two .30-caliber machine guns and 2,400 pounds of bombs.

Boeing's B-9 Death Angel was almost as fast as the small P-26A fighter. (U. S. Air Force)



MARTIN B-10 FLYING WHALE *United States*

While Boeing was working on the B-9 Death Angel, the Martin Company was pushing production on its XB-907. But where the earlier MB-2 had been a great advancement over other bombers of its day, the 1932 Flying Whale seemed destined to failure.

After the all-metal, mid-wing bomber was tested by the U. S. Army Air Corps, it was flatly rejected for production. The main reason for this rejection was that the XB-907's landing speed was too hot—93 m.p.h. instead of the 63 m.p.h. demanded by Air Corps specifications.

But the Martin Company refused to accept defeat. It got a sixty-day extension of time from Washington, and in that period the wings were rebuilt and made four feet longer. More powerful engines were also added, the fuselage nose altered to enclose the gunner's cockpit for the first time on any airplane, and the pilot's and copilot's cockpits were covered by a transparent sliding canopy. All this, plus more, in a period of only two months!

When the experimental model was resubmitted to Wright Field for further tests, it rocked the Air Corps back on its heels. They had thought the Boeing B-9 was fast at 186 m.p.h.—but here was a bomber that could roar along at more than 200 m.p.h., which was twice the speed of the standard Keystone and Curtiss bombers.

Martin received an order for thirteen YB-10's. These were followed by the YB-10A, YB-12A, and XB-14 before the order for 103 B-10B's came through.

For developing the B-10, Martin received the Collier Trophy, aviation's highest award, in 1932.

Perhaps the greatest testimony to the B-10 was its action record two full years after the Japanese struck at Pearl Harbor. At this time the plane was obsolete, but twelve of them with Dutch crews sank twenty-six enemy ships, including a battleship, before they were destroyed on the ground by enemy bombing.

Other data (B-10B): Wing span, 70 feet 6 inches; length, 44 feet 9 inches; engines, two 700 h.p. air-cooled radial Wright Cyclones; loaded weight, 14,887 pounds; maximum speed, 215 m.p.h.; service ceiling, 25,000 feet; armament, three .30-caliber machine guns and 2,000 pounds of bombs.

The Martin B-10 was the first bomber to have an enclosed gunner's cockpit. (U. S. Air Force)


200
BIRD-O-PREY XI
200

HEINKEL HE.111

Germany

The Heinkel He.111 was first built in 1935 for Lufthansa, the German airline company, as a ten-seat passenger transport. At the time of its introduction the plane was the fastest commercial transport in the world, with a top speed of 255 m.p.h. Then, when the *Luftwaffe* came out of hiding in 1935, the German Air Ministry decided to produce the He.111 as a bomber.

Many aviation experts have insisted that the He.111 was planned as a bomber in the first place, and that the commercial version was a cover-up for its real purpose. However, Ernst Heinkel, who designed the plane, said in his autobiography published in 1956 that this is not true, that the He.111 was never intended to be anything except a transport.

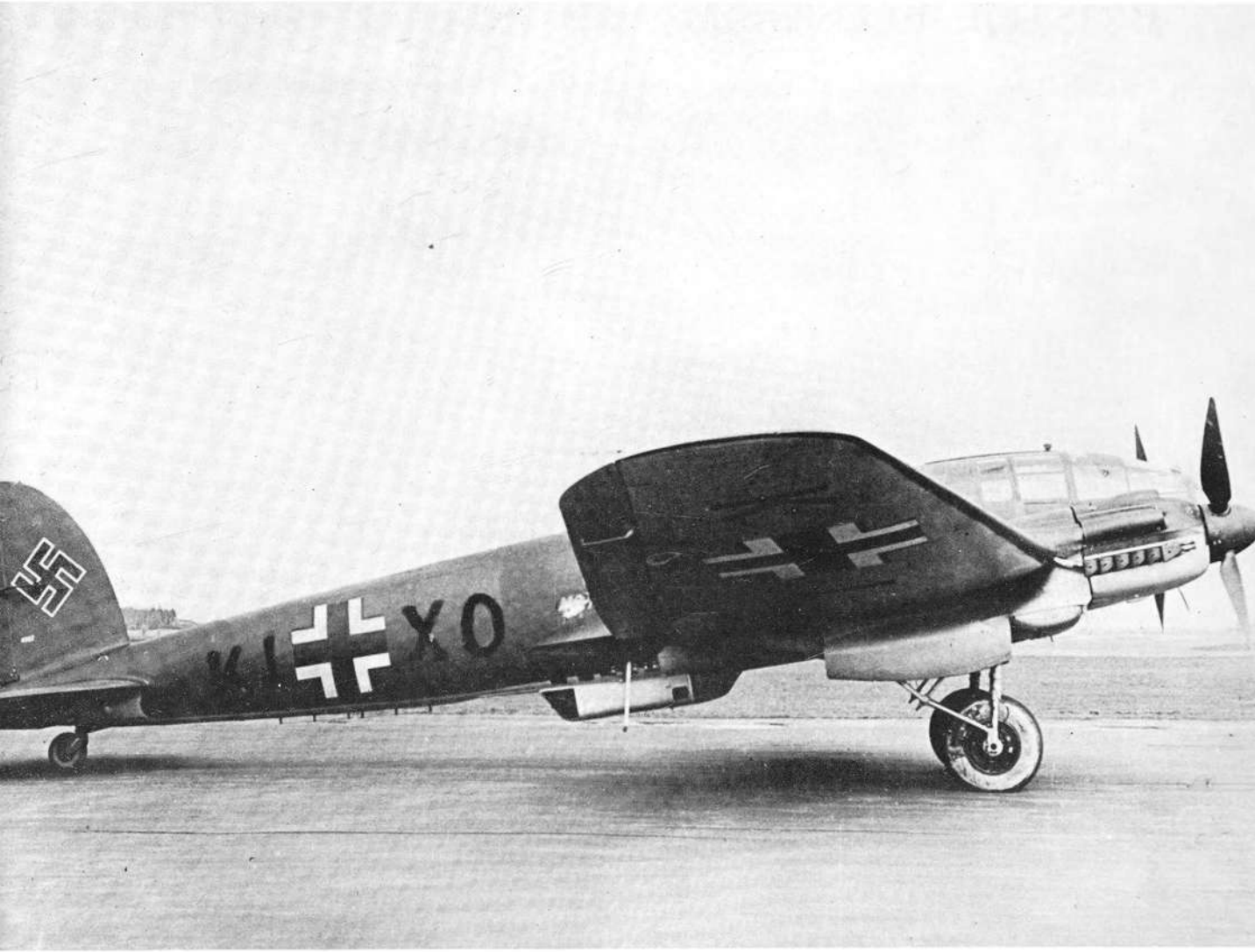
The He.111 saw its first action in the Spanish Civil War in 1936, and it was so fast that enemy fighters could not catch it. The German Air Ministry was so excited about the plane that it was ordered into production to be the *Luftwaffe's* standard high level bomber. About 800 of the machines were built before World War II started in 1939, and production continued through 1944.

The He.111 bore the major burden of the bombing attacks in Poland and France, and with a very low ratio of losses. But its poor defensive armament was no match for the Spitfire and Hurricane during the Battle of Britain, and it was shot down in large numbers. Even though the He.111 was obsolete by 1941, it remained in production because the Germans failed to develop a replacement.

One of the most curious developments of the design was the He.111Z. This was actually two He.111's joined together, with two fuselages and one wing. A fifth engine was added where the two wing panels joined. This version was intended to tow giant gliders for the invasion of England—an invasion which never came off because of the growing aerial strength of the Allies.

Other data (He.111P): Wing span, 73 feet 6 inches; length, 53 feet 7 inches; engines, two 1,750 h.p. liquid-cooled Junkers Jumo 213E's; loaded weight, 35,000 pounds; maximum speed, 300 m.p.h.; service ceiling, 33,000 feet; armament, five 7.9-mm. machine guns, one 20-mm. cannon, and 4,400 pounds of bombs or two 1,764-pound torpedoes.

When the He.111 was first built, it was faster than most single-seaters. (U. S. Air Force)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BRISTOL BLENHEIM

Great Britain

At 11:15 on the morning of Sunday, September 3, 1939, England declared war on Germany. One minute after noon the same day the Royal Air Force Bomber Command flew its first mission of World War II. The mission was to photograph units of the German fleet then steaming out of Wilhelmshaven. The airplane used on the mission was a Bristol Blenheim—the first British military plane to cross the German border on war duty since the end of World War I.

The following day twenty-nine Blenheims and Vickers Wellingtons took off to attack the German battleship *Von Scheer*. The vessel was severely damaged, and two Wellingtons and five Blenheims were shot down.

On the early days of that first month of war the Blenheim was among the first British aircraft to be sent to France. However, the pilots were ordered to restrict bombing attacks to military objectives without injuring civilian population. The British were fearful that massed raids on cities would bring the entire weight of the then mighty *Luftwaffe* swooping down in reprisal.

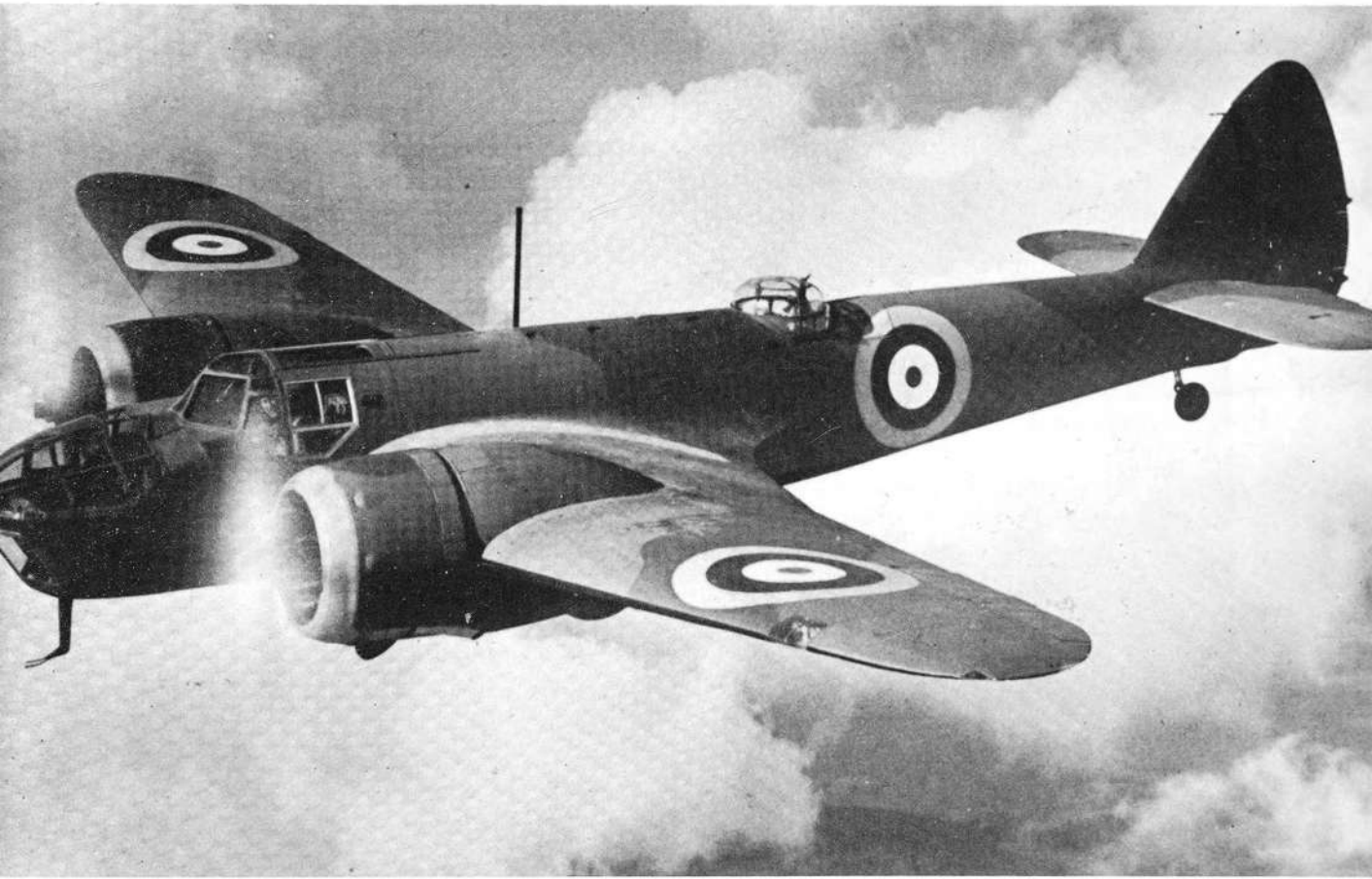
The Blenheim, like the German Heinkel He.111, was not originally developed by the military. The first version of the plane was called "Britain First," Bristol Type 142, and it was built in 1935 to the order of Viscount Rothermere. The project engineer was Captain Frank Barnwell, who also designed the Bristol Fighter of World War I fame.

"Britain First" was the fastest plane of its type in the world, with a top speed of 282 m.p.h. The Air Ministry became interested in the machine as a medium bomber, and the first production Blenheims came from the assembly lines in 1937.

Though the Blenheim was originally built as a bomber, it was also pressed into service as a fighter during the early months of the war. This version had four fixed, forward-firing machine guns under the fuselage in addition to standard turret armament.

Other data (Mark IV): Wing span, 56 feet 4 inches; length, 39 feet 9 inches; engines, two 840 h.p. air-cooled radial Bristol Mercury XV's; loaded weight, 14,400 pounds; maximum speed, 285 m.p.h.; service ceiling, 27,280 feet; armament, four .303-caliber machine guns and 1,500 pounds of bombs.

Bristol Blenheims dropped the first R.A.F. bombs in World War II.



BOEING B-17 FLYING FORTRESS *United States*

In 1934 the Boeing Airplane Company turned its talents to the second revolution in bombardment aircraft, using its own money to design and develop a "battleship of the air." This was the Model 299, which finally became the B-17 Flying Fortress—the world's first all-metal four-engined monoplane bomber.

The first Fortress was completed in July, 1935, and it created an overnight sensation. It flew 2,100 miles nonstop from Seattle, Washington, to Wright Field in Dayton, Ohio, at an average speed of 252 m.p.h.

Although this first XB-17 was later destroyed, when a pilot took off with the controls locked, the Air Corps was so impressed with the bomber that it placed a service order for thirteen.

The first production B-17 was delivered to Langley Field, Virginia, on March 1, 1937, where the Second Bombardment Group had been set up to train pilots and crews for Fortress operation. Only thirteen of these planes had been delivered up to the outbreak of war in Europe in 1939.

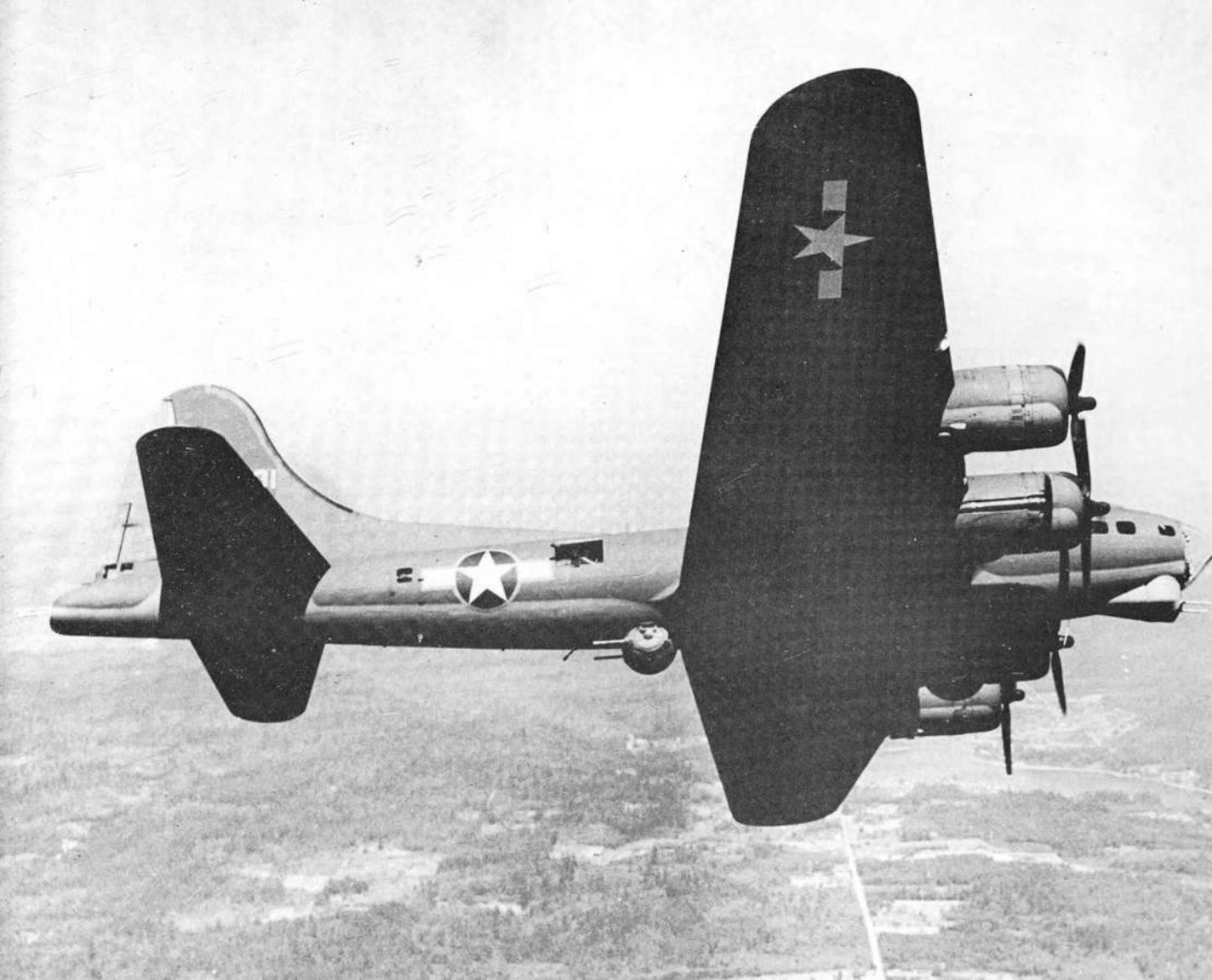
The B-17C, which carried a crew of nine men, was the first of the Fortress series to see war action. A British Royal Air Force squadron used the plane in an attack in March, 1941, against the German battleships *Scharnhorst* and *Gneisenau*, damaging both severely.

The first all-American bombing raid against the Germans took place on August 17, 1942, when twelve B-17's were sent against the railroad yards at Rouen, France. The mission was a complete success. The enemy also lost two fighters destroyed and two probably destroyed, while there was not a single casualty among the Fortress crews. By February, 1944, the U. S. Eighth Air Force had grown so strong it was able to send more than a thousand Fortresses on a single mission.

B-17's were used in every theatre during World War II. In Europe alone, they dropped more than 640,000 tons of bombs.

Other data (B-17G): Wing span, 103 feet 9 inches; length, 74 feet 9 inches; engines, four 1,200 h.p. air-cooled radial Wright Cyclones; loaded weight, 49,000 pounds; maximum speed, 302 m.p.h.; service ceiling, 35,600 feet; armament, eleven .50-caliber machine guns and up to 16,000 pounds of bombs.

Greatest of the Flying Fortresses was the B-17G, which had thirteen guns. (Boeing Airplane Co.)



AICHI 99

On the morning of December 7, 1941, the Japanese struck at Pearl Harbor, Hawaii, to bring the United States into World War II as an active combatant. The attack was planned with stealth and cunning, and the American forces were caught unprepared—naval vessels floating peacefully at anchor, airplanes on the ground, their guns not even armed.

One of the planes that took part in the Pearl Harbor attack was the Type 99 dive-bomber, which had been designed and built by the Aichi Watch and Electric Machine Company.

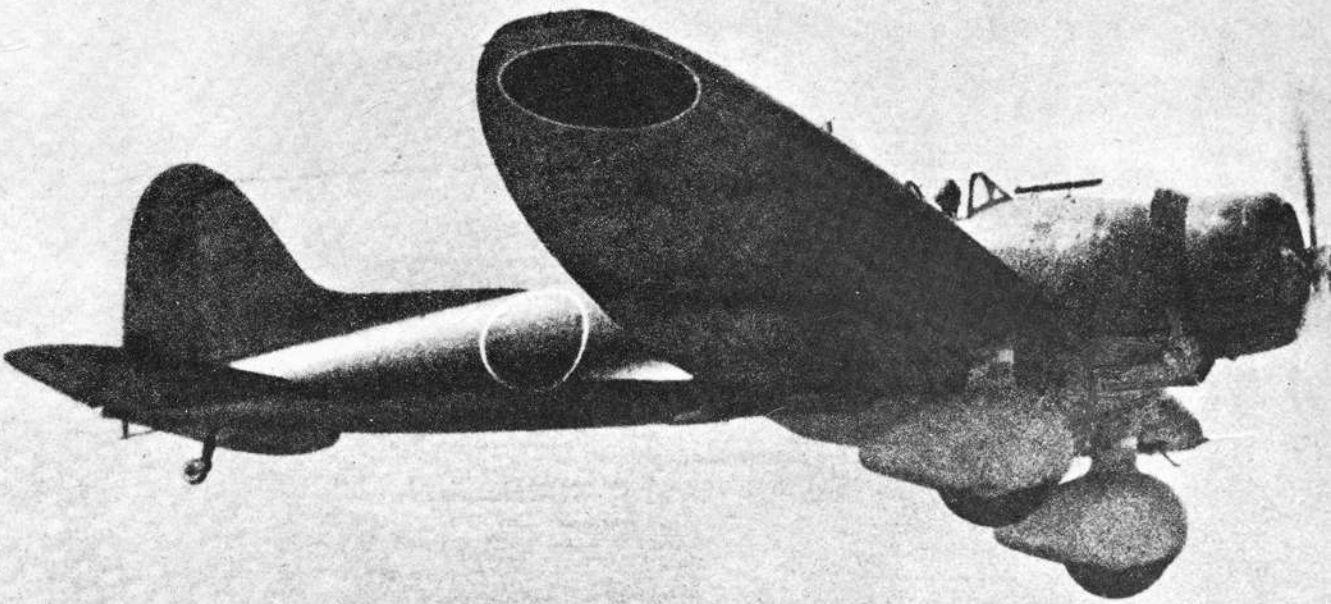
Twenty-four hours after Pearl Harbor, Aichi 99's joined Mitsubishi torpedo-bombers in a strike against the British base at Singapore. Two days later these same aircraft sank the new British battleship *Prince of Wales* and the battle cruiser *Repulse* off Malaya. Aichi dive-bombers also caused considerable damage to the U. S. carrier *Yorktown* on June 5, 1942, during the Battle of Midway; the following day the crippled ship was sent to the bottom by an enemy submarine. Then, on October 26, during the Battle of the Santa Cruz Islands, two Aichis crashed on the deck of the *Hornet*, damaging the carrier so severely that it had to be sunk by other ships in the U. S. task force.

The first low-wing, all-metal airplane built in Japan, the Aichi 99 (nicknamed "Val" by the Allies for identification purposes) was designed in 1936 after studies had been made of the German Heinkel He.66, He.70, and He.74. The experimental model of the ship was flown the following year.

The Aichi scored tremendous military successes, despite the fact that it was poorly armed and did not have self-sealing fuel tanks or armor. In all, some 1,500 of the machines were produced for the Japanese navy. These were finally replaced as first-line by the more modern Aichi D4Y Suisei (Comet).

Other data (Model D3A2): Wing span, 47 feet 7 inches; length, 34 feet 9 inches; engine, 1,030 h.p. air-cooled radial Mitsubishi Kinsei (Golden Star) Model 54; loaded weight, 9,347 pounds; maximum speed, 241 m.p.h.; service ceiling, 27,200 feet; armament, four 7.7-mm. machine guns and 1,050 pounds of bombs.

Aichi 99 dive-bombers spearheaded the Japanese attack against Pearl Harbor. (U. S. Navy)



JUNKERS JU. 87 STUKA

Germany

The German Junkers Ju. 87 Stuka was one of the most potent tactical bombers of all time. It was the scourge of Europe, the weapon that conquered nations. It was the plane that dive-bombed the Polish tanks and air force out of existence in days, the plane that pulverized strong Belgian forts in hours, the plane that ravaged Holland and France in advance of the German panzer divisions. It was also the plane that was shot down in wholesale numbers in the Battle of Britain in 1940, and the plane that helped lose the bombing war for the Germans.

On February 26, 1935, when Adolf Hitler announced that he intended to build a new German air force, he wanted to equip his *Luftwaffe* with as many airplanes as possible in the shortest space of time. Because of this, and because of the months or years which often went into developing multiengined planes, it was decided to concentrate as much as possible on single-engined planes. Two years previously the Swedish factory of the Junkers company had designed and built the K47 two-seat dive-bomber which gave "startling" results. Hitler and Hermann Goering, chief of the *Luftwaffe*, decided to put this type of plane into production.

The Ju. 87 was combat-tested during the Spanish Civil War, where it first appeared at the beginning of 1938. The Germans were so excited about the war record of the plane that production was stepped up. This mistake was to prove costly in the later years of World War II, when Germany did not have a single four-engined strategic bomber worthy of the name.

Contrary to popular belief, the Ju. 87 did not dive at high speeds. With the drag of the external bombs holding it back, the plane achieved a speed of only about 350 m.p.h. at the steepest point of its dive. This slow speed, plus poor defensive armament, made it a suicide plane for its two-man crew during the Battle of Britain.

Other data (Ju. 87D): Wing span, 45 feet 4 inches; length, 36 feet 6 inches; engine, 1,300 h.p. liquid-cooled Junkers Jumo 211J; loaded weight, 14,500 pounds; maximum speed, 255 m.p.h.; service ceiling, 27,900 feet; armament, two 7.9-mm. machine guns, two 20-mm. cannon, and up to 3,960 pounds of bombs.

The feared Junkers Ju. 87 Stuka was a failure in the Battle of Britain. (U. S. Air Force)

LOCKHEED HUDSON

United States

On July 29, 1937, a squat, twin-engined, twin-tailed, low-wing monoplane took off from Burbank, California, for its first flight. This was the Lockheed Model 14 Super Electra, which had been designed as a fourteen-passenger commercial transport. Less than a year later the British Air Ministry ordered 250 of the planes as Royal Air Force bombers. By 1943, when the Model 14 went out of production, almost 3,000 of them had been built, including 300 AT-18's and 1,326 A-28's and A-29's for the U. S. Army Air Force.

Renamed Hudson by the R.A.F., the Lockheed transport-turned-bomber was in such demand when war came in September, 1939, that a decision was made to fly production models right across the Atlantic Ocean—the first landplanes to be delivered from the United States to England by air.

The first American plane to fight in World War II, the Hudson received still another name from its pilots—"Old Boomerang." This nickname was bestowed affectionately because the machine always seemed to come back from missions, though battered by enemy fire. One Hudson managed to land safely after having an engine shot out, its fuselage ripped open, its tail riddled, and both wings peppered with bullets.

Truly, Hudsons did everything. They distinguished themselves as dive-bombers, mast-high sea raiders, skip-bombers, and submarine busters. They worked doggedly during the British retreat at Dunkirk in 1940. They operated on every continent in service with American, British, Canadian, Australian, Dutch, and other Allied forces. Of the 259 German U-boats sent to the bottom by the R.A.F., Hudsons destroyed the bulk.

A Hudson was also the first airplane in history to capture a submarine. This was in 1941, when one of the machines bombed and strafed a U-boat into submission and then circled it until surface craft came along to take the sub and its crew into tow.

Other data: Wing span, 65 feet 6 inches; length, 44 feet 3 inches; engines, two 830 h.p. air-cooled radial Wright Cyclones; loaded weight, 18,500 pounds; maximum speed, 254 m.p.h.; service ceiling, 24,500 feet; armament, seven .303-caliber machine guns and up to 3,300 pounds of bombs.

The Lockheed Hudson was the first American plane to fight in World War II. (U. S. Navy)

JUNKERS JU. 88

Germany

While a number of German airplanes used in World War II were labeled inferior by some experts in England and the United States, the Junkers Ju. 88 was acknowledged as being "ingenious" and "one of the best all-around airplanes in existence."

The first Ju. 88 was rolled from the Junkers factory late in 1937, and in the fall of 1938 Hermann Goering ordered the company "to build me in the shortest possible time a tremendous bomber fleet of 88's." But a number of unexpected problems were encountered, and a year later only sixty-nine of the machines had been built.

One of the first Ju. 88's delivered to the *Luftwaffe* in March, 1939, was flown by Ernst Siebert to an international record by carrying a payload of 4,000 pounds 620 miles at an average speed of 321 m.p.h. On May 30 Siebert flew another Ju. 88 with a similar payload 1,240 miles at 311 m.p.h.

Difficulty in getting the Ju. 88 into production was one of the reasons why the Germans lost the Battle of Britain. The machines started coming from the factory in quantity only after the mass attacks on England had begun in 1940; they were shipped to France by rail and assembled at front-line airfields on the English Channel. Squads of mechanics were drawn from several German airplane companies for this assembly work. The demand for the plane was so great that many aircrews had only a few flights in their Ju. 88's before being pressed into operational duty.

Originally designed for level bombing as well as dive-bombing, the Ju. 88 was also used as an intruder fighter, to strike at British bombers taking off from or landing at their bases at night. This version carried a crew of two or three and was fitted with up to twelve fixed, forward-firing 7.9-mm. machine guns as well as three swivel guns.

Last version of the machine, produced late in the war, was the Ju. 188, which had a top speed of 336 m.p.h.

Other data (Ju. 88K): Wing span, 60 feet 4 inches; length, 47 feet 1 inch; engines, two 1,200 h.p. liquid-cooled Junkers Jumo 211B's; loaded weight, 25,000 pounds; maximum speed, 310 m.p.h.; service ceiling, 29,800 feet; armament, six 7.9-mm. machine guns, one 20-mm. cannon, and 4,400 pounds of bombs.

The U. S. Air Force tested a captured Ju. 88, found it a potent weapon. (U. S. Air Force)

DOUGLAS SBD DAUNTLESS

United States

No airplane in the U. S. Navy during World War II had a finer combat record than the SBD Dauntless. It was the Navy's standard scout-bomber throughout much of the war, and was credited in 1944 with sinking a greater tonnage of enemy warships than all other arms of the service.

The Dauntless won its greatest victories during May and June, 1942, in the Battle of the Coral Sea and the Battle of Midway. Operating with another Douglas airplane, the TBD Devastator, the SBD sank six enemy aircraft carriers, two heavy cruisers, five destroyers, and five troop transports. The Japanese never recovered from these crushing defeats.

The most amazing fact about this record is that the SBD Dauntless was very close to obsolete by U. S. Navy standards when it was dive-bombing Japanese surface vessels and submarines to destruction. The plane was an improved version of the Navy XBT-2 of 1938, which was in turn an improved version of the BT-1 of 1934.

According to official government records, the Dauntless was flown into combat more often than any other carrier-based bomber. In a period of twenty-nine months, SBD's flew 1,189,476 wartime operational hours, which amounted to one-fourth of all flying from aircraft carriers.

The SBD also had the lowest ratio of losses of any Navy plane operating in the South Pacific. In one engagement alone on May 8, 1942, a flight of Dauntlesses shot down eleven Japanese fighters and damaged seven others without loss to themselves. One SBD was also credited with shooting down seven enemy planes in two days.

Finally, in July, 1944, the 5,991st and last SBD rolled off the production line at El Segundo, California. Most of these had been delivered to the Navy for carrier operations, but a number were also in Army Air Force colors under the name A-24 Banshee.

Other data (SBD-6): Wing span, 41 feet 6 inches; length, 32 feet 1 inch; engine, 1,200 h.p. air-cooled radial Wright Cyclone; loaded weight, 9,298 pounds; maximum speed, 254 m.p.h.; service ceiling, 24,900 feet; armament, two .30-caliber and two .50-caliber machine guns and up to 1,600 pounds of bombs.

The SBD Dauntless saw more combat than any other U. S. Navy bomber. (U. S. Navy)


2

HANDLEY-PAGE HALIFAX

Great Britain

The Handley-Page Halifax was one of the Royal Air Force's "big three" heavy bombers during World War II. Originally produced in 1940 to help overcome the obvious weight-carrying shortcomings of the twin-engined Vickers Wellington and Armstrong-Whitworth Whitley, the R.A.F.'s standard heavy bombers at the outbreak of war, the Halifax was still performing important missions when Germany collapsed in 1945.

Halifax production was sorely delayed by German blitz attempts against England during the Battle of Britain in 1940. At that time the crying need was for fighters to stop the onslaught, for unless the *Luftwaffe* could be thrown back, the war would be lost. With typical British determination, however, bomber production was continued, with sure conviction that the R.A.F. would be able to defeat the German attacks and go on the offensives themselves in the future.

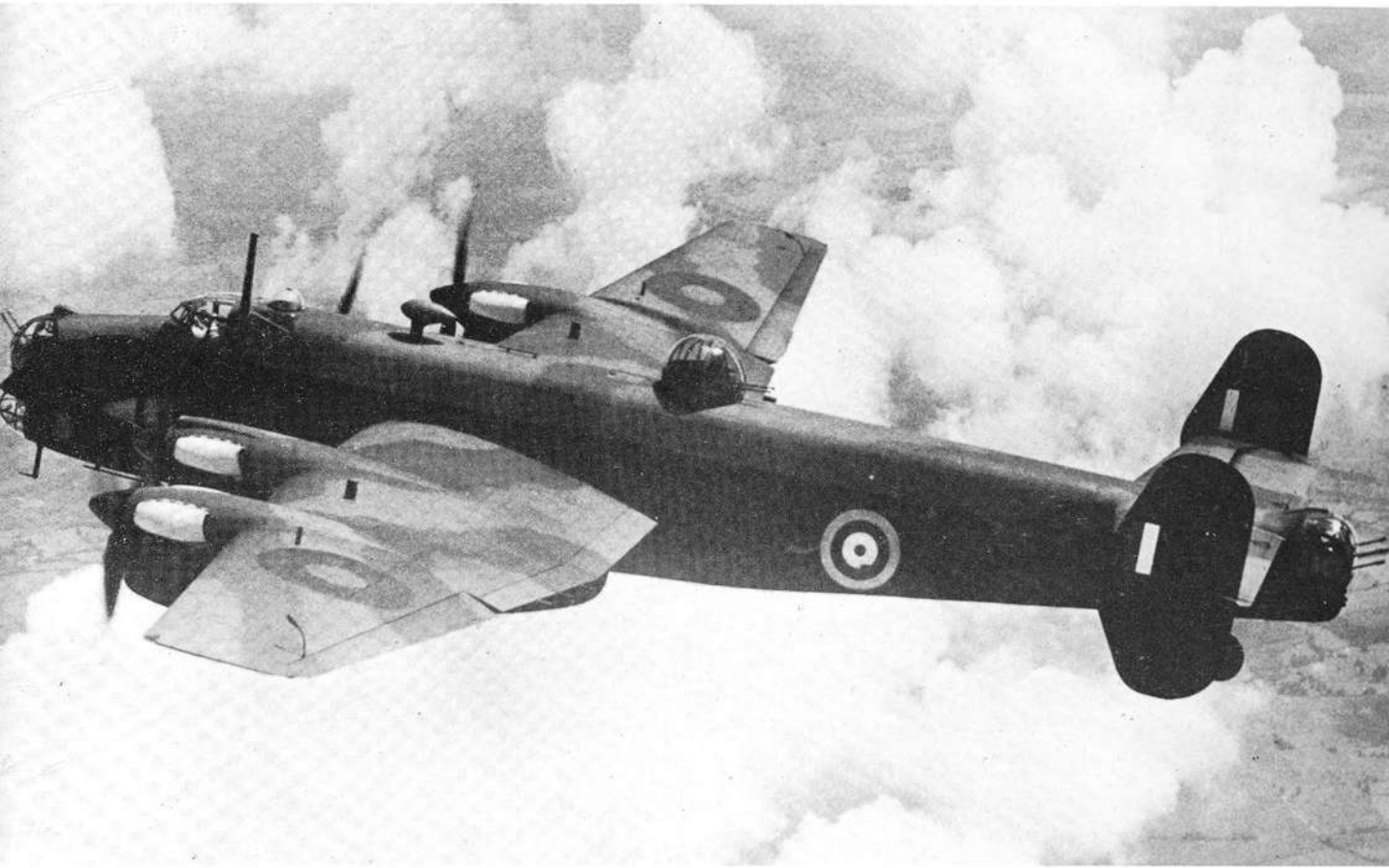
Finally, on March 11, 1941, the Halifax was ready for operations in sufficient numbers to make its weight felt, and attacks were launched against both Le Havre, France, and Kiel, Germany. On longer-range missions, the Halifax blasted a radar-parts plant at Friedrichshaven, across Lake Constance from Switzerland, and even penetrated as far as Milan, Italy, to bomb engine and armament factories.

As early as 1918 the R.A.F. had planned to carry the war deep into Germany with the secret V/1500, which was a larger and improved version of the Handley-Page 0/400 (see page 20). This bombing program was halted by the Armistice of November 11, 1918. However, another Handley-Page design —the Halifax—was destined to give the Germans a sample of the plan which had been saved for them.

The Halifax never received the glamorous publicity given the Avro Lancaster and Short Stirling, but it was one of the best bombers to see service in World War II.

Other data (Mark III): Wing span, 104 feet; length, 71 feet 7 inches; engines, four 1,675 h.p. air-cooled radial Bristol Hercules XVI's; loaded weight, 65,000 pounds; maximum speed, 270 m.p.h.; service ceiling, 21,000 feet; armament, ten .303-caliber machine guns and up to 14,500 pounds of bombs.

The Handley-Page Halifax was one of the best bombers of World War II.



SHORT STIRLING

Great Britain

As early as 1936 the British realized that in the event of war the aircraft they had on hand would not have sufficient bomb-carrying ability to cause lasting damage to enemy targets. With this problem in mind, the Air Ministry issued aircraft specification B.12/36, which called for a four-engined bomber capable of carrying bomb loads of at least 5,000 pounds. The design submitted by Short Brothers won the competition, and in an effort to save money, the company suggested that it first build a half-sized model, as a test bed. This model, which was powered by four 130 h.p. engines, crashed on its first landing.

Short built two experimental full-scale Stirlings. The first of these was taken up for its initial flight during May, 1939, while war clouds hung heavily over Europe. The Air Ministry rushed the test program, and the machine was ordered into production.

By August, 1940—the month the Battle of Britain started—Stirlings were coming into service. They made their first raid on Germany on the night of February 10, 1941. One of the longest missions flown by the plane was against the famed Skoda armament factory located in Pilsen, Czechoslovakia.

When the Stirling first went into service it was the closest thing to a flying battleship that aviation had ever seen. Its bomb bay was more than forty feet long, and it carried more armor plating than any other aircraft in the world. The first Stirlings to go into operation carried a bomb load far greater than that of the early Boeing B-17 Flying Fortress and also had more machine guns with a greater arc of fire, thus giving much better protection.

No time or effort was wasted trying to give the Stirling pleasing lines. It was essentially a weight carrier, rushed into production at a time when England needed aircraft—and especially bombers—of all types. The R.A.F. pilots who flew the ship into action called it the "flying freight car."

Other data (Mark III): Wing span, 99 feet 1 inch; length, 87 feet 3 inches; engines, four 1,650 h.p. air-cooled radial Bristol Hercules VI's; loaded weight, 70,000 pounds; maximum speed, 267 m.p.h.; service ceiling, 18,000 feet; armament, eight .303-caliber machine guns and up to 18,000 pounds of bombs.

R.A.F. pilots called the Short Stirling the "flying freight car."

MITSUBISHI 01

First-line in most respects, the Mitsubishi Type 1 was the most versatile bomber in quantity service with the Japanese during World War II. In addition to level bombing, it was also used for torpedo-bombing, photo reconnaissance, and even night fighting. As a torpedo-bomber, its load of one large or two small torpedoes was carried internally.

Designed in 1938 and first flown in October, 1939, the machine was put into production as the standard Japanese navy medium bomber. Allied airmen who met this Mitsubishi design in combat had the highest respect for its performance and defensive firepower. However, they soon discovered that its self-sealing fuel tanks were not effective, and that the plane caught fire easily.

The Mitsubishi Type 1 saw its first military action in May, 1941, during a raid against Chunking, China. Its first notable mission in World War II was in opposition to a U. S. Navy task force west of the Gilbert Islands on February 1, 1942. The plane was nicknamed "Betty" by the Allies.

The Mitsubishi was designed to operate strictly from land bases. But following the example set by Lieutenant General James Doolittle with his Tokyo raid from the *Hornet*, it was also flown from carriers during the Battle of Midway. The defeat suffered by the Japanese navy during this historic battle was the turning point in the Pacific war.

The machine was also used as a mother ship for the jet- and rocket-propelled Oka (Cherry Blossom) suicide planes, which were dubbed Baka, meaning "Fool," by the Americans. Mitsubishis carried Okas to within a few miles of target, then released the suicide planes to go diving to their doom.

The first model of the plane produced in 1940 was powered by 1,100 h.p. engines and had a top speed of 270 m.p.h. Later versions had more powerful engines and speeds in excess of 300 m.p.h.

Other data (Model G4M2): Wing span, 82 feet 4 inches; length, 65 feet 7 inches; engines, two 1,850 h.p. air-cooled radial Mitsubishi Kasei (Mars) Model 21's; loaded weight, 27,500 pounds; maximum speed, 331 m.p.h.; service ceiling, 30,800 feet; armament, five 7.7-mm. machine guns, two 20-mm. cannon, and up to 4,840 pounds of bombs or torpedoes.

The Mitsubishi G4M2 "Betty" was Japan's most versatile bomber in World War II. (Martin Caidin)

CONSOLIDATED B-24 LIBERATOR *United States*

The Consolidated B-24 Liberator, along with the Boeing B-17 Flying Fortress, was the real work horse of the U. S. Army Air Force during World War II. The B-24 had a greater range than the B-17 and could carry a larger load of bombs, but the B-17 was faster and had a higher ceiling.

Consolidated started research and design work on the B-24 in 1938, and the plans for the machine were finally presented to the Air Materiel Command in March of the following year. A month later—April 29—the Air Corps signed a contract with Consolidated for the experimental model to be completed within nine months. On December 29, three months after war had started in Europe, the XB-24 was flown for the first time.

A number of Liberators were made available to the British in their war against Germany. However, the Royal Air Force found the planes disappointing for daylight operations. But according to General Adolf Galland, chief of German Fighter Aviation, the R.A.F. did not fly their formations tightly enough for the Liberators to protect each other.

The B-24 became the U. S. Army Air Force's long-range bomb-hauler when American squadrons started operations in Europe. Alone and without escort, it flew as far south from England as twenty miles north of the Spanish border, and as far east as prewar Poland. But perhaps of all missions flown by Liberators, the ones which will be remembered longest were those against enemy oil fields.

Taking off from North Africa on August 1, 1943, 177 Liberators skimmed across the Mediterranean and struck against the oil fields at Ploesti, Romania, major supplier of gasoline to Germany.

The Liberator was built in larger numbers than any other American bomber used during World War II. Final production figures came to 19,251.

Other data (B-24J): Wing span, 110 feet; length, 67 feet 3 inches; engines, four 1,200 h.p. air-cooled radial Pratt & Whitney Twin Wasps; loaded weight, 60,000 pounds; maximum speed, 294 m.p.h.; service ceiling, 32,000 feet; armament, ten .50-caliber machine guns and up to 20,000 pounds of bombs.

B-24J Liberators had four power turrets and two hand-held waist guns. (Otto Menge)


.273250

AVRO LANCASTER

Great Britain

There is no question that the Avro Lancaster was England's greatest contribution to bombardment aviation during World War II. This is one of the weapons which pounded German cities and factories by night while American heavies were hitting them by day. Such round-the-clock operations gave the enemy little rest. Lancasters also carried the largest high explosive bombs of the war—the 12,000-pound "Block Buster" and 22,000-pound "Grand Slam."

This outstanding airplane owed its origin to British Air Ministry specification B.13/36 of 1936, which called for a twin-engined medium bomber to be built around the Rolls-Royce Vulture X-type liquid-cooled engine. Avro's reply was the Manchester. The experimental model of the plane was first flown in July, 1939, and about eighteen months later the Manchester began to go into service.

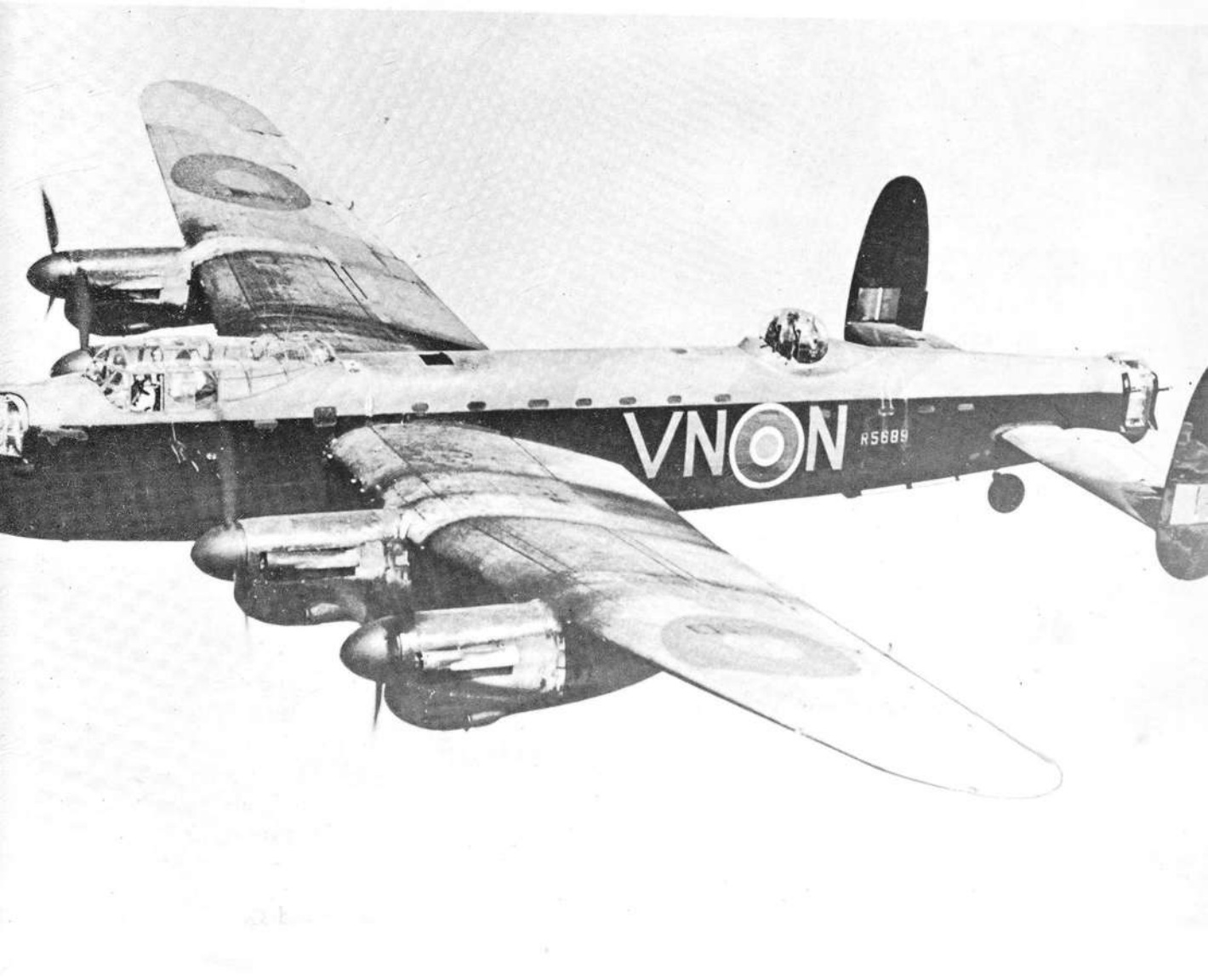
The Vulture engine in the Manchester turned out to be quite a headache for maintenance crews, and the ship was taken out of production. In the meantime, however, Avro had revised the Manchester design to use four Rolls-Royce Merlin engines. These changes were so simple that about 75 per cent of the original Manchester parts and assemblies could be used in building the new plane, which was named the Lancaster.

The Lancaster's performance was little short of amazing for such a heavy machine. It could be looped, and it was used for dive-bombing on more than one occasion. In 1944, when the author was a war correspondent in England, he saw a Lancaster barrel-rolled at an altitude of less than a thousand feet. It is safe to say that no other airplane in the world of comparable size had better flying characteristics than the Lancaster.

The first operational flight of the Lancaster was in March, 1942. It served through to the end of the war and performed more valuable work than any other heavy bomber in the Royal Air Force.

Other data (Lancaster II): Wing span, 102 feet; length, 69 feet 4 inches; engines, four 1,650 h.p. air-cooled radial Bristol Hercules VI's; loaded weight, 68,000 pounds; maximum speed, 275 m.p.h.; service ceiling, 20,000 feet; armament, ten .303-caliber machine guns and up to 22,000 pounds of bombs.

Lancs were the R.A.F.'s champion weight carriers of World War II. (U. S. Air Force)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NORTH AMERICAN B-25 MITCHELL

United States

Lieutenant General James Doolittle's famous raid with sixteen North American B-25's over Tokyo, Japan, on April 18, 1942, gave the world its first combat glimpse of an airplane which was to become one of the most versatile weapons of World War II. The B-25 Mitchell also became the most heavily armed bomber ever to see service and was used for high- and low-level bombing, ground strafing, photo reconnaissance, submarine patrol, and even as a fighter.

During the war Mitchells were flown by the Dutch, English, Chinese, Russians, and Australians as well as the U. S. Army, Navy, and Marine Corps. A total of 9,816 B-25's were produced at the California and Kansas plants of North American Aviation.

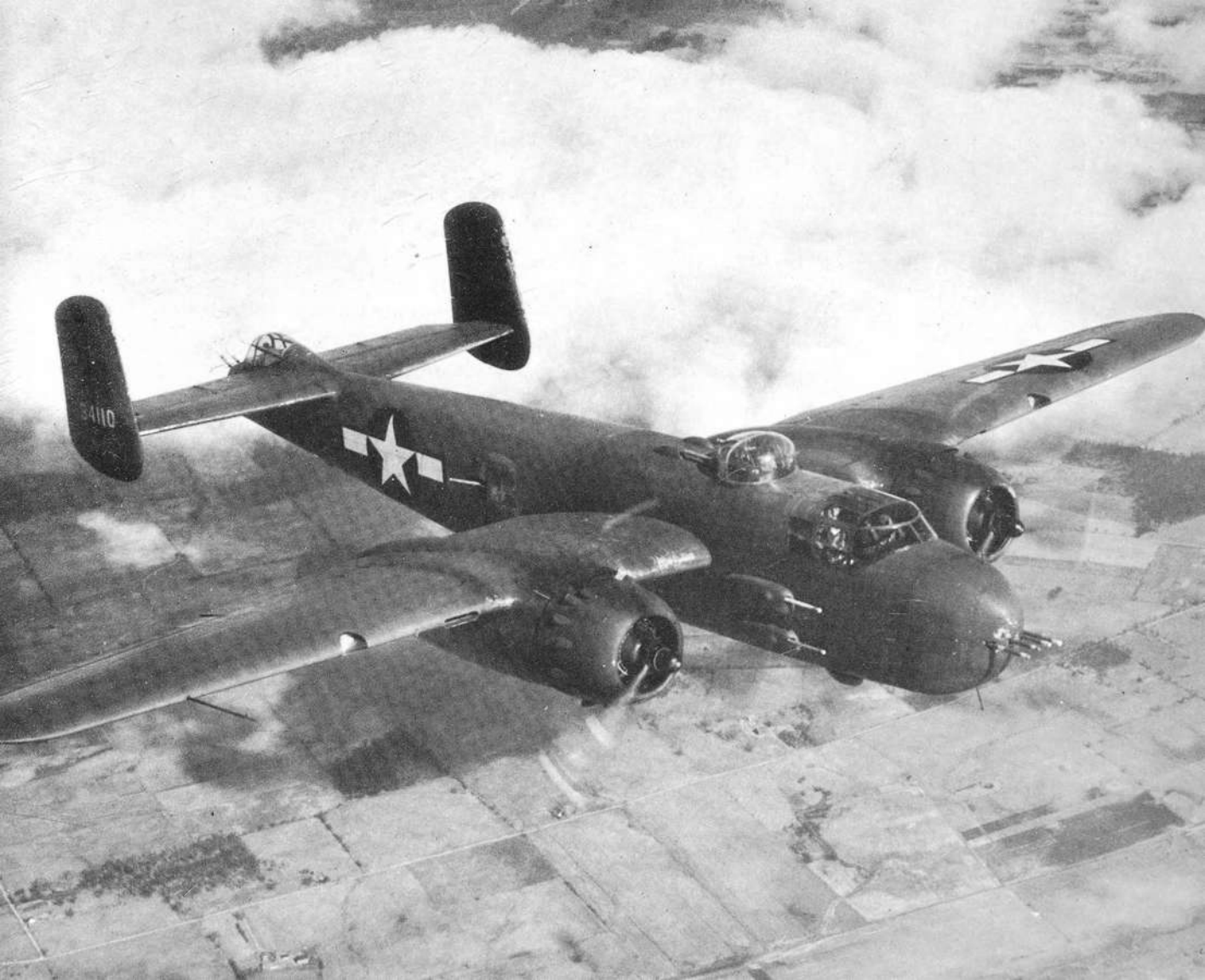
Forerunner of the B-25 was the North American NA-40, which was built to Army specifications of early 1939. The company was awarded a contract for one NA-40 on September 20, 1939, and the experimental model was taken up for its first flight on August 19, 1940. This original B-25 required 8,500 drawings and 195,000 engineering man-hours; many thousands of additional drawings and another 500,000 engineering man-hours were required to produce later modifications of the design.

The first Mitchell to enter service was the B-25A, which had one .50-caliber and three or four .30-caliber machine guns. This armament was soon found to be inadequate, and the tail of the plane was redesigned so that a power turret could be installed in the B-25B.

In 1944, after going through the C, D, E, and F models, the B-25G was produced. This was the first operational plane in the world to mount a 75-mm. cannon; two fixed, forward-firing .50-caliber machine guns were also installed in the nose. Next came the B-25H, which was the most heavily armed airplane ever built, carrying fourteen .50-caliber machine guns as well as the 75-mm. cannon.

Other data (B-25J): Wing span, 67 feet 7 inches; length, 53 feet 6 inches; engines, two 1,700 h.p. air-cooled radial Wright Cyclones; loaded weight, 27,051 pounds; maximum speed, 303 m.p.h.; service ceiling, 25,400 feet; armament, thirteen .50-caliber machine guns and 5,000 pounds of bombs.

The B-25H Mitchell was the most heavily armed war plane ever built. (U. S. Air Force)



MARTIN B-26 MARAUDER *United States*

Few airplanes attracted so much adverse criticism as the Martin B-26 Marauder. Known variously as the "widow-maker" and the "killer," both names coined as a result of many losses in crew training, the B-26 nevertheless proved to be one of the finest tactical bombers of World War II.

On January 25, 1939, the U. S. Army Air Corps issued a specification which called for a fast, medium-altitude bomber carrying a crew of five. Martin submitted the design of its Model 179 on July 5 the same year, and an order was immediately given for 1,100 of the machines.

The first production model (there was no XB-26) was taken into the air for its maiden flight on November 25, 1940. Like the earlier Martin MB-2 and B-10, the B-26 immediately proved itself to be an important weapon. The few "bugs" noted in this first plane were taken care of in production models coming down the line.

On December 8, 1941, the first group of Marauders was sent to the Pacific for war operations. They went into action the following summer over Port Moresby, and their speed and defensive firepower were a shock to Japanese fighter pilots.

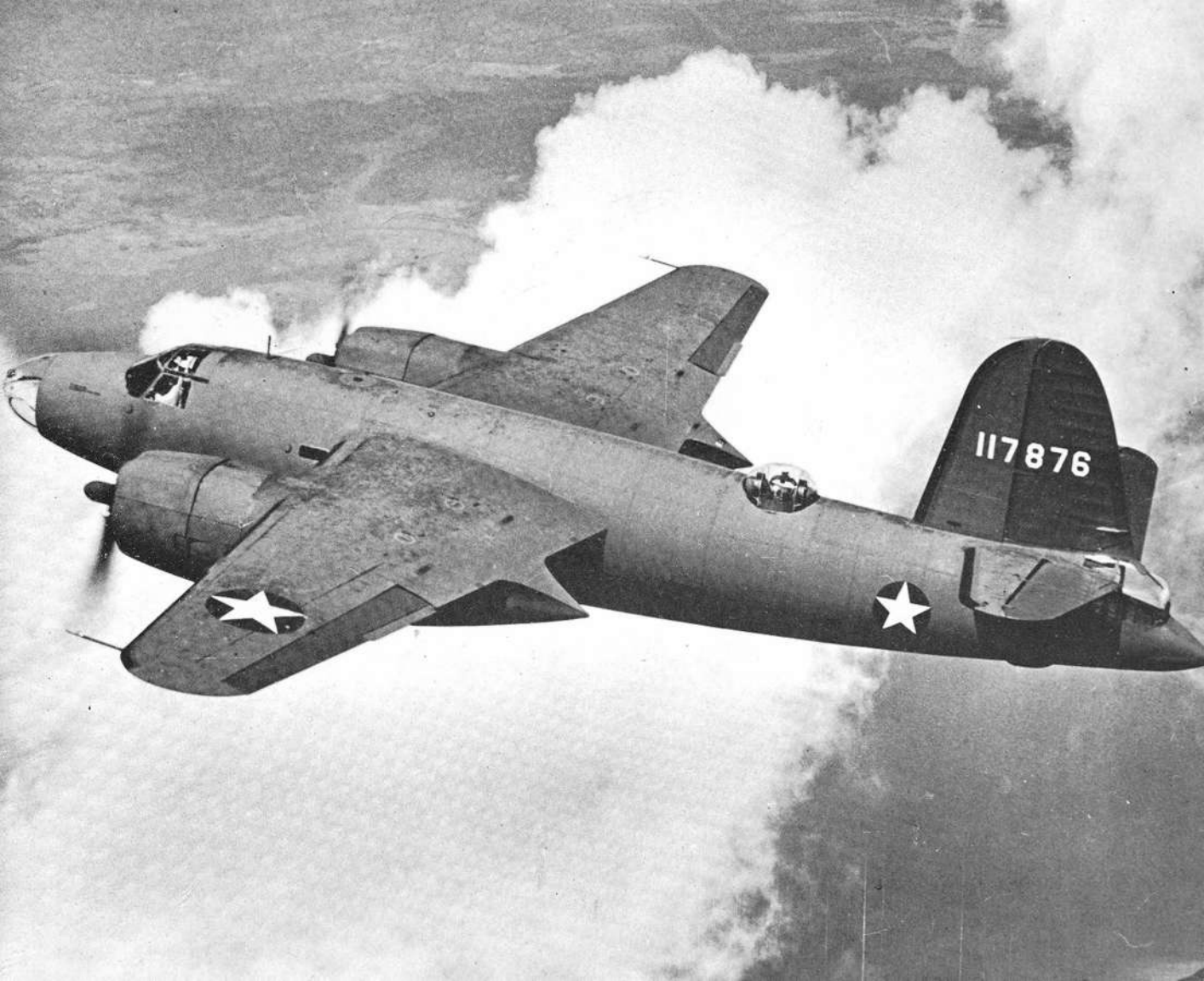
The B-26's started going to England early in 1943. Their first raid in the theatre was on May 14 against a generating plant at Ijmuiden, Holland.

Used by the U. S. Navy, R.A.F., and many other Allied air forces in addition to the U. S. Army Air Force, the B-26 was employed as a medium-altitude precision bomber, low-level support bomber, skip-bomber, torpedo-bomber, smoke-screen layer, and trainer.

Despite its early history as a pilot killer, the Marauder's loss-in-combat ratio was less than one-half of one per cent—the lowest of any Allied bomber. More than 250 B-26's completed 100 missions each. In all, 110,000 sorties were flown and 150,000 tons of bombs were dropped by B-26's.

Other data (B-26F): Wing span, 71 feet 3 inches; length, 58 feet 6 inches; engines, two 2,000 h.p. air-cooled radial Pratt & Whitney Double Wasps; loaded weight, 37,000 pounds; maximum speed, 323 m.p.h.; service ceiling, 19,800 feet; armament, up to twelve .50-caliber machine guns and 4,800 pounds of bombs.

The B-26 Marauder was one of the finest tactical bombers of World War II. (The Martin Co.)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BOEING B-29 SUPERFORTRESS *United States*

After the last shots had been fired in World War II, captured Japanese officials admitted that the Boeing B-29 Superfortress, more than any other weapon, had caused their defeat and surrender. This was the first time in the history of warfare that victory had been won from the air.

The story of the B-29 started in the winter of 1938, when the U. S. Army Air Corps asked Boeing to submit ideas for major changes in the B-17, which Boeing had introduced three years previously. But after making engineering studies, Boeing reported that these changes would not be practical.

Then, on January 29, 1940, the Air Corps asked Boeing to submit designs for an entirely new long-range heavy bomber. Eight months later the company was contracted to build three planes for test purposes. On May 17, 1941, six months before the first XB-29 had been completed, Boeing was authorized to build 250 of the planes. By the time the first experimental model was ready to fly in November, 1941, production orders had been increased to 1,664.

The B-29 saw its first war action on June 5, 1944, in a strike against Japanese bases at Bangkok, Thailand. Ten days later the Superfortresses hit Japan itself. This was the first attack against the Japanese mainland since the Doolittle raid in April, 1942.

B-29 attacks grew steadily in strength, until August 1, 1945, when 801 of the bombers were sent against Japan in a single night.

Then, on August 6, 1945, a B-29, named the Enola Gay, dropped the first atomic bomb on Hiroshima. Two days later Nagasaki was also struck by an atomic bomb. These attacks convinced the Japanese that they would have to surrender or be destroyed.

The Korean War added further laurels to the B-29. Superfortresses flew 1,076 days of the 1,106-day air war, dropping 160,000 tons of bombs—only eleven tons less than B-29's had dropped on Japan during World War II.

Other data (B-29A): Wing span, 141 feet 3 inches; length, 99 feet; engines, four 2,200 h.p. air-cooled radial Wright Cyclones; loaded weight, 140,000 pounds; maximum speed, 365 m.p.h.; service ceiling, 35,000 feet; armament, thirteen .50-caliber machine guns and 20,000 pounds of bombs.

The Boeing B-29 Superfortress dropped the world's first atomic bombs. (Boeing Airplane Co.)


293844

CONVAIR B-36 PEACEMAKER *United States*

The Convair B-36 Peacemaker's greatest claim to fame is that it was never used in war. Most aviation experts agree, in fact, that the B-36's threat to the Russian homeland actually prevented the cold war from coming to the shooting stage.

The development of the B-36 began in April, 1941. At that time German aggression in Europe was so successful that the United States was faced with the prospect of having to contest, single-handedly, the Hitler war machine. This possibility demanded the immediate development of a high-altitude aircraft with a heavy bomb load and sufficient range to fly from the United States to Germany and back without refueling.

Convair completed preliminary design studies for the B-36 early in 1941, and on November 15 the Army Air Force contracted the company to build two experimental models. During the summer of 1943, well before the first XB-36 had been built, the A.A.F. placed an order for 100 of the huge bombers. However, the change in the war situation slowed down work on the project, and the first flight of the XB-36 was not made until August 8, 1946. A year later the first production airplane came off the assembly line.

The B-36 could carry a heavier load of bombs a greater distance and at a higher altitude than any other airplane ever built. Operating from the United States, it could drop atomic bombs anywhere in the world and return again without refueling. Its maximum load for shorter distances was 84,000 pounds. Loaded with atomic bombs, one B-36 carried more destructive force than all of the bombs dropped on Germany during World War II.

The B-36 is often called "the mightiest bomber ever built." This statement is made not because it dropped bombs, but because it probably prevented the Russians from launching another disastrous war.

Other data (B-36J): Wing span, 230 feet; length, 162 feet 1 inch; engines, six 3,800 h.p. liquid-cooled Pratt & Whitney Wasp Majors and four 5,200-pounds-thrust General Electric J-47 turbojets; loaded weight, more than 400,000 pounds; maximum speed, more than 435 m.p.h.; service ceiling, more than 45,000 feet; armament, sixteen 20-mm. cannon and 10,000 pounds of bombs for 10,000 miles.

Convair's B-36 Peacemaker was faster than most World War II fighters. (Convair Aircraft Corp.)


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UNITED STATES AIR FORCE
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BOEING B-47 STRATOJET *United States*

The Boeing B-47 Stratojet was the first bomber in the U. S. Air Force designed "from the ground up" as a jet. The earlier North American B-45 Tornado, the first jet bomber to see Air Force squadron service, was an adaptation of a piston-engine design. The B-47 was also the first sweptwing bomber in the world ordered into quantity production.

Design work on the Boeing Model 450, which was to develop into the B-47, started in 1945 and was completed in June, 1946. The Air Force ordered two XB-47's, and one of these was taken up for its first flight on December 17, 1947—just forty-four years after the Wright brothers' very first flight!

After an extensive test program, ten B-47A's were ordered in November, 1948. These were powered by six 5,200-pounds-thrust General Electric turbojets.

Next in the building program was the B-47B, which appeared in 1951. Changes from the A model included 5,800-pounds-thrust engines, a square tip on the vertical stabilizer, and provisions for large external fuel tanks.

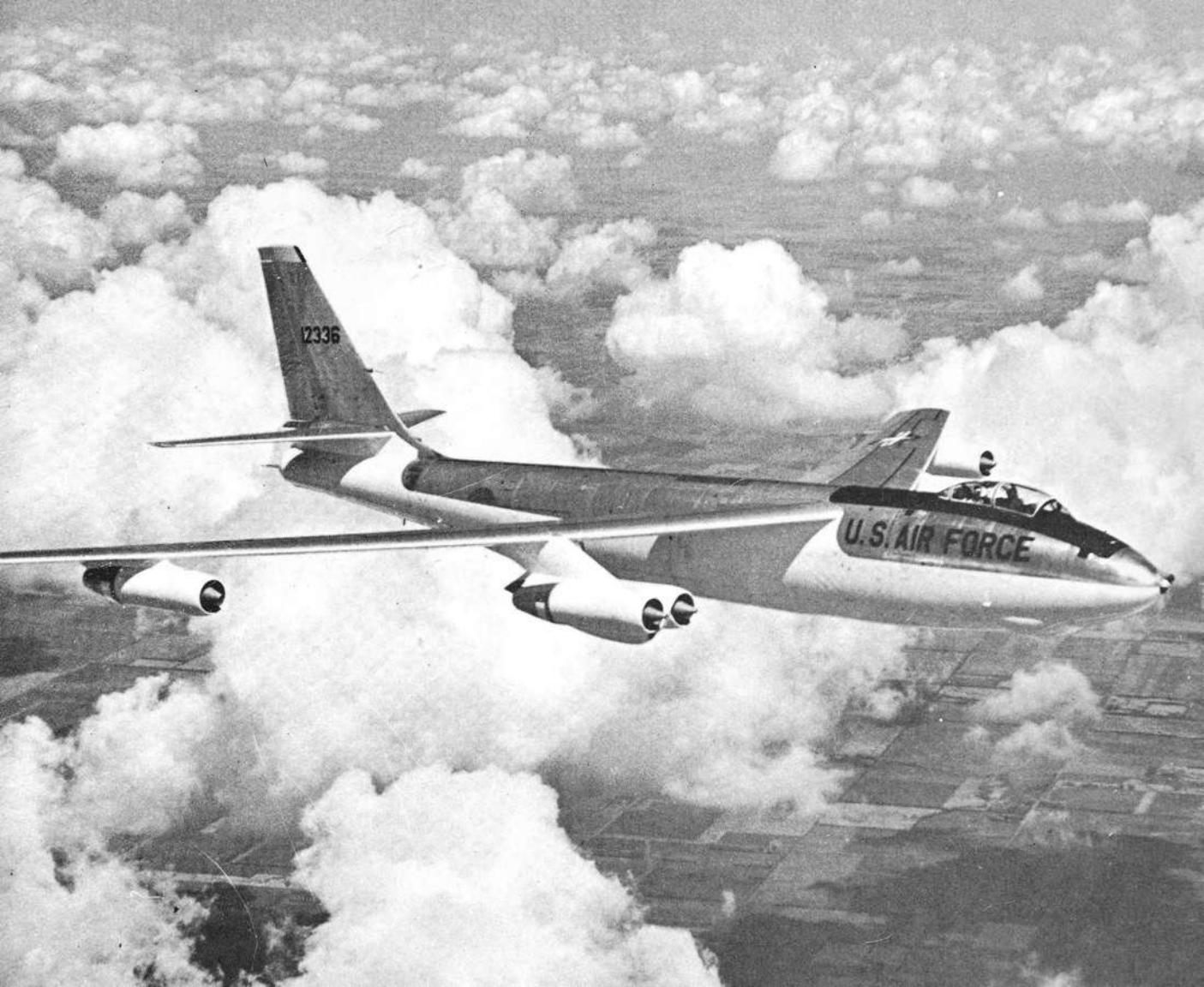
The third modification of the plane was the B-47C, which was planned to have 9,400-pounds-thrust engines; this version was not put into production. And then came the XB-47D, with two turbojets and two propjet engines turning four-bladed propellers. This model was built in an effort to give the machine a greater range. It was not put into production.

Fifth model of the Stratojet was the B-47E, which first flew in 1953. This version had still more powerful engines, a longer fuselage, and thirty-three booster rockets for use on take-off.

One of the first XB-47's shattered all transcontinental speed records in February, 1949, when it was flown 2,289 miles at an average speed of 607 m.p.h. A B-47E established another record by averaging 794 m.p.h. for thirty minutes. Still another record was a 21,000-mile flight in 47 hours and 35 minutes.

Other data (B-47E): Wing span, 116 feet; length, 106 feet 8 inches; engines, six 6,000-pounds-thrust General Electric J-47 turbojets; loaded weight, 200,000 pounds; maximum speed, 640 m.p.h.; service ceiling, more than 40,000 feet; armament, two 20-mm. cannon and up to 20,000 pounds of bombs.

Fifth model of the Stratojet was the B-47E, which carried a three-man crew. (Boeing Airplane Co.)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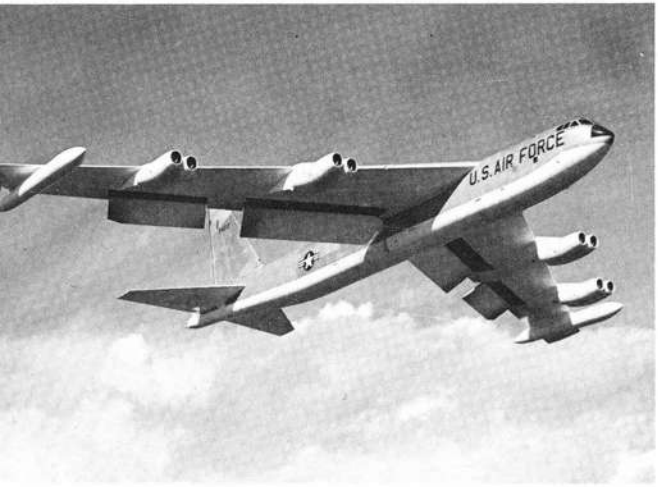
U.S. AIR FORCE

HISTORY MAKERS OF THE FUTURE



Above: Boeing's B-52 Stratofortress was the first American plane to drop a hydrogen bomb. Below: The Douglas B-66 Destroyer can fly more than 650 m.p.h.

Above: The Convair B-58 Hustler was the U. S. Air Force's first supersonic bomber. Below: The Douglas A4D Skyhawk is the U. S. Navy's smallest bomber.

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