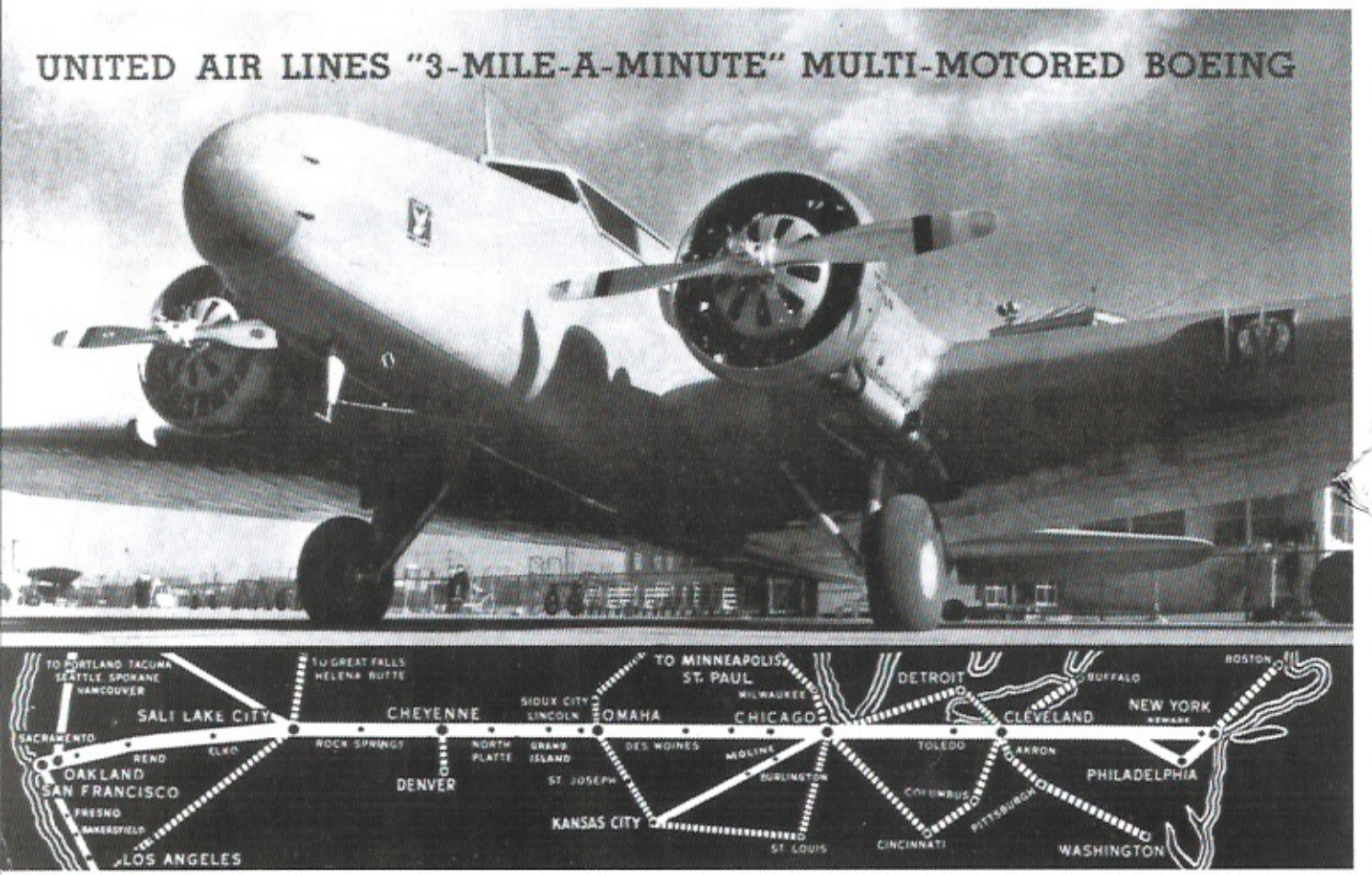


The Boeing 247 –

THE FIRST MODERN COMMERCIAL AIRLINER

By Henry M. Holden

THE DESIGN of an aircraft is not always the deciding factor in its success. The design of the Boeing 247 combined the technological developments arising at the time, with the social and economic needs in the United States, over three decades.

The Boeing 247's commercial lifespan was less than 10 years. Boeing did not make a lot of money out of it, and it was quickly overshadowed by what it had created – progress.

To understand how this aircraft came to be, we must go back to the beginning of the Boeing Company. Between 1916, when Boeing started building aircraft and 1926, the company built about 1 000 wood and canvas biplanes, as well as about 200 monoplanes.

The passage of the Kelly Bill on February. 2, 1925, authorised airmail flights by private operators. The Kelly Bill changed the Boeing Company drastically. The Bill authorised the US Postmaster General to contract with the private sector for airmail service.

Boeing found itself in a valuable position since military pursuit aircraft had much in common with mail planes, for example: size, range, and payload.

FIRST COMMERCIAL PASSENGER

On July 1, 1927, Boeing Air Transport (BAT) carried its first passenger, Miss Jane Eads, a reporter along with several sacks of mail.

She flew in a Model 40-A from Chicago to San Francisco in 23 hours, 50 minutes. The 1 950 miles was the longest route operated by one airline and it crossed mountains, deserts, and plains at speeds of over 100 mph., and at altitudes up to 15 000 feet.

The Model 80A trimotor biplane was to be the last word in luxurious air transportation. The 12-passenger transport had such features as forced-air ventilation, heat, and individual reading lamps. (Henry M. Holden)

Boeing's success at carrying passengers on the San Francisco-Chicago run prompted Boeing founder, William E. Boeing, to investigate the design of a larger aircraft, one that would carry twelve passengers and compete with the Ford and Fokker tri-motors, both of which were catching most of the commercial passengers' dollars.

THE BOEING 80A

In 1928, Boeing introduced America's first airliner designed specifically for passenger comfort and convenience. The Model 80's fuselage was made of welded-steel tubing covered with fabric.

Although the 80A never had a fatal accident, it was a stop-gap measure until technology caught up with Boeing's idea of what a passenger airliner should look like.

Boeing's first all-metal monoplane, the Monomail, a cargo and mail aircraft, was introduced in May 1930. It was a radical

departure from the traditional airplane construction. It had a sleek, aerodynamic low-wing design, with a retractable landing gear, a streamlined fuselage, and an engine covered by a cowling.

The Monomail was too advanced for the engines and propellers technology of the day. The airplane required a low-pitch propeller for takeoff, and climb and a high-pitch propeller to cruise.

Originally constructed for evaluation by the US Army, Model 200, (designated Y1C-18), failed to garner an army contract.

A second version of the Monomail was developed as the Model 221, with a fuselage stretched by 200 mm. It sacrificed some of its cargo capacity to carry six passengers in an enclosed cabin; however, the single pilot sat in an open cockpit.

This version first flew in August 1930. Both the Model 200 and the Model 221 were eventually modified for trans-continental service as the Model 221A.

THE 247 IS BORN

The original proposal of the Boeing 247D was the Model 280 with 14 seats and twin 700 hp Pratt & Whitney (P&W) Hornet engines. It went through several variants before a one-off, designated 247D for the MacRobertson Air Race; was later incorporated in production series bearing the same designation.

The 247 was the first twin-engined passenger transport able to fly on one engine. With controllable pitch propellers, the 247 could maintain 11 500 ft. at maximum gross takeoff weight.

The all-metal, low-winged monoplane, was powered by two 550-hp. P&W Wasp radial engines and had retractable landing gear. It could fly over at 180 mph, and could climb on one engine with a full load. It was also the first airliner to use wing flaps. I

In its final version, the 247D had variable-pitch propellers and improved performance at higher altitudes. It had room for 10 passengers, two pilots, and a flight attendant, plus mail, and baggage.

The first 247 flew on February 8, 1933. It went into service with United Air Lines on March 30.

The passenger cabin had sound-proofing, a lavatory, individual air vents, reading lights, and heating and cooling that were thermostatically controlled. Its navigation instruments included an autopilot and two-way radio.

MACROBERTSON AIR RACE

As the 247 proceeded through its test and development phase, the company decided to show off its capabilities by entering a long-distance air race from England to Australia, in 1934, the MacRobertson Air Race.

This race attracted aircraft entries from around the world including prototypes and production types. The course was exhausting, but considered an excellent proving ground, and an opportunity to gain worldwide attention.

The 247D was flown by Col. Roscoe Turner and Clyde Pangborn. They came in second place in the transport section (and third overall), behind the Boeing 247's eventual rival, the new Douglas DC-2.

Boeing modified the 247D for the race by adding additional fuel tanks, increasing the fuel capacity to 1 125 gallons.

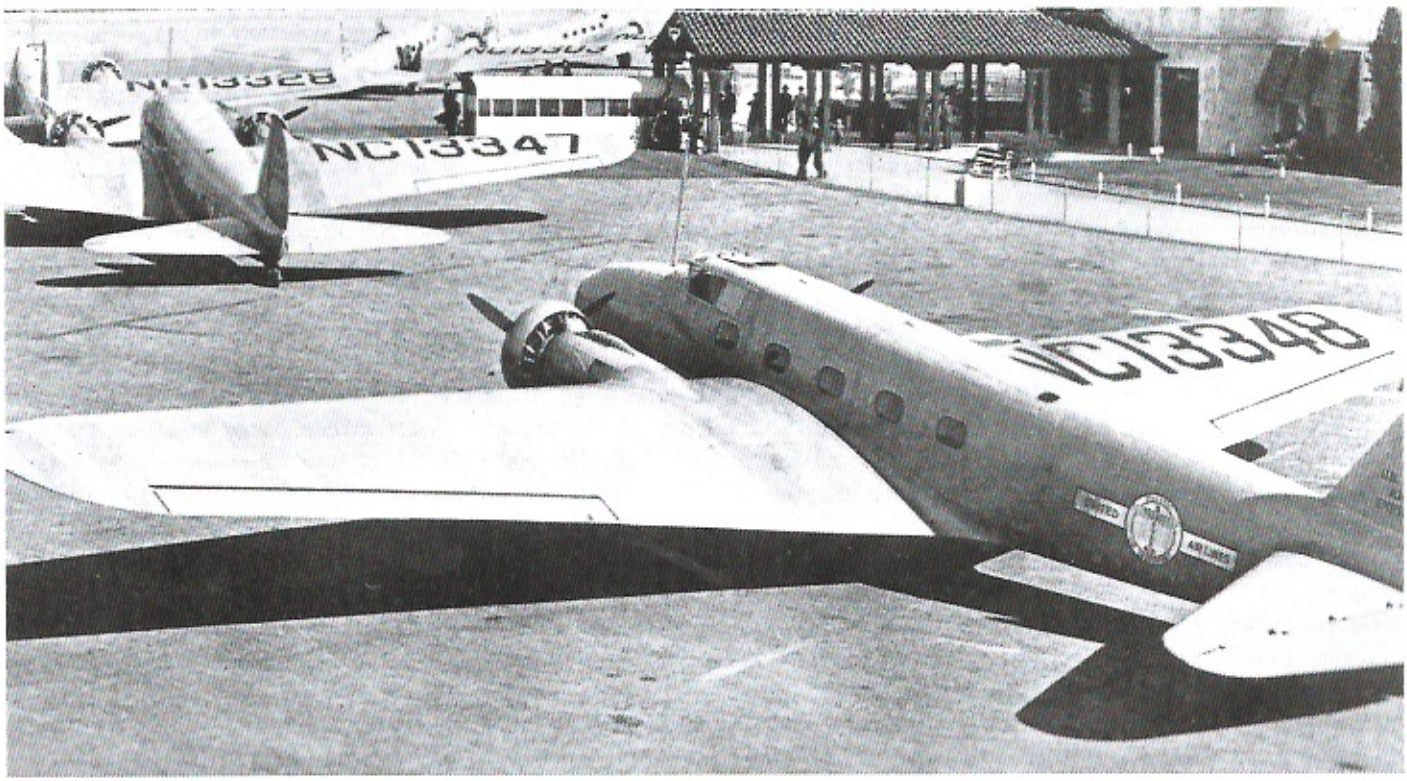
As predicted the British Comet won the race easily, but the 247 finished the race in 92 hours 22 minutes. Following close behind the KLM DC-2 which clocked in at 76 hours, 38 minutes.

PRODUCTION BEGINS

Boeing Air Transport, part of the United Aircraft and Transport Corporation, contracted with the Boeing Airplane Company to manufacture 60 copies.

Due to its success in the MacRobertson Air Race initial demand from US air carriers was high. Boeing Air Transport sold the first 60 247s, to United Airlines for $68 000 a copy with spares, for a then unprecedented $4,5-million. The Boeing 247 made United Air Lines the most popular airline in the world. United advertised the airplane as the "Three-

Opposite page: *On a flight between New York and Los Angeles, the 247 usually made seven stops on the 20-hour trip. However, because the 247 cruised at 188 mph, the trip was seven-and-a-half hours shorter than those made by other airliners.*
Below: *At the height of its popularity the 247 crowded all the other planes out. Shown here are five Boeing 247s at a Midwestern airport.* *(Boeing photos).*



Mile-a Minute Airliner."

The 247 was the answer to the teeth rattling and dangerous Fords and Fokkers. The streamlined stress-skin, monoplane possessed some of the creature comforts found in the 80A, but unheard of in the Ford Tri-Motor. The carpeted floors, reclining seats, steam heat, and a cabin insulated from weather and noise, led Boeing to say "This is the airliner that will put us in the Pullman business."

The Boeing 247 was an enigma. It was the same size as the big Ford 5-AT, but its shape only hinted at its performance. It was faster, and there was no mistake about its heritage. Its bloodlines are obvious. it was the first cousin to the Monomail and sister to the XP-9 bomber.

The two P&W Wasp engines, each delivered 550 hp. At 5 000 feet with 75% power, it cruised at 188 miles an hour making it the fastest multi-engine commercial transport aircraft in the world at the time.

The new Boeing was bristling with innovations and had vast improvements for the comfort of its passengers. The cabin was six feet high, richly appointed, and very comfortable by airline standards of 1933. The five seats on each side of the cabin allowed passengers to move freely in the aisle.

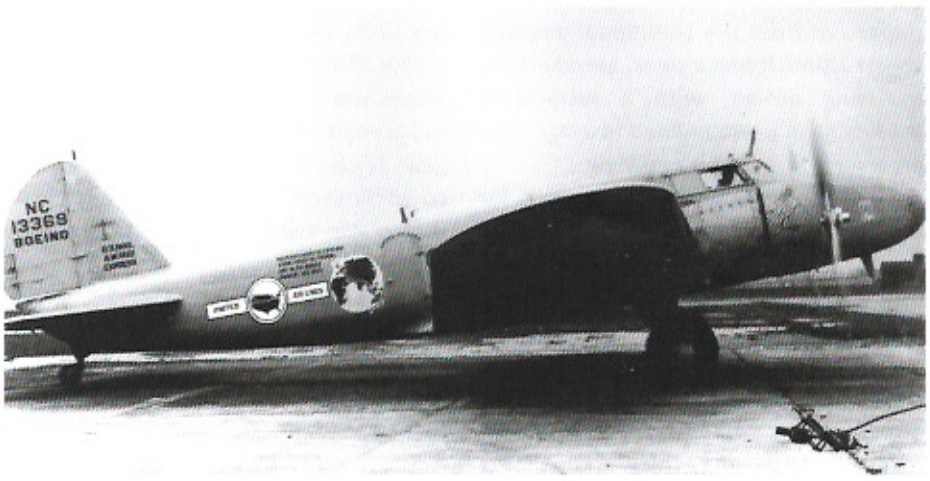
There was a major improvement in the cabin environment. Passengers no longer suffered from the chilling temperatures they had endured in the Ford. The insulation served as a blanket that kept the passengers warm and provided the soundproofing. Passengers could talk across the aisle in normal conversational tone, a welcome relief from the ear-splitting noise of the Ford and the Fokkers.

The 247's cockpit also maintained a higher standard. It had dual controls, and the main instrument panel had some 35 instruments, a vast improvement over the Ford.

The 247 was the first commercial multi-engine aircraft to have retractable landing gear, which increased speed by reducing drag. The gear was electrically or manually operated, and in an emergency the aircraft could land with the gear fully retracted since half of the wheel was extended beyond the wheel well.

The 247 was the first aircraft to solve a major and often fatal problem: wing icing. On the leading edge of each wing, and on the elevators, were pneumatic de-icing boots, rubber edges that flexed when filled with compressed air which broke off the ice.

The appearance of trim tabs on the 247 was another first for a commercial airliner. Engineers had borrowed the idea from the servo tabs on the XP-9 bomber. The small movable surfaces on the vertical and horizontal stabilisers used the aerodynamic force of the airstream to adjust the attitude of the plane. It was a welcome innovation for pilots who had to manoeuvre the plane using the yoke and rudder pedals, a physically exhausting task.



Above: *This is the aircraft that was placed second in the MacRobertson Air Race in the transport section (and third overall), behind the Boeing 247's eventual rival, the new Douglas DC-2. It was repainted to show off the victory.* (Boeing photo)

Below: *The Wyoming Air Service flight is parked on the ramp while its nose baggage compartment is loaded with mail and air express freight.* (Western Airlines photo)

The 247 weighed six tons, yet needed only 800 feet to takeoff, and landed within 500 feet, at a speed of 58 mph. It could reach 10 000 feet in less than 10 minutes.

Transcontinental & Western Air (TWA) tried to order the 247, but UATC declined the order, which resulted in TWA President, Jack Frye, sending out the requirements for a new airliner to Donald Douglas, which, in turn, resulted in the Douglas DC-1 prototype. From it came the historic and legendary DC-3.

Once in service, engineers discovered the Boeing 247 had a major limitation. Air carriers considered its limited capacity a drawback since it carried only ten passengers, plus a flight attendant. Compared with the more spacious DC-2 and later DC-3, the passenger count made it impossible to become a commercially viable airliner.

On a flight between New York and Los Angeles, the 247 usually made seven stops on the 20-hour trip. However, because the 247 cruised at 188 mph, the trip was 7,5 hours shorter than those made by other airliners.

In 1936, United Airlines began thinning out its 247 fleet as the Douglas DC-3 took over the main airways. It was logical to think that after United retired its 247s it would disappear from the commercial scene. On highly competitive routes like New York to Seattle, the DC-3 outflew and out-grossed the Boeing. However, on the smaller feeder routes with some airlines having a monopoly market, the Boeing fitted the requirements perfectly.

A year after the 247 flew, William Boeing was awarded to Daniel Guggenheim medal for "successful pioneering and achievement in aircraft manufacturing and air transport."

Seventy-five 247s were built. United flew 60, and the rest went to Deutsche Lufthansa and a private owner in China. The 247s remained in airline service until World War II, when several were converted into C-73 transports and trainers.

The last airworthy 247, C/N1722, N18E, departed the US in 1981, for its permanent home in the Science Museum in, Wroughton, UK. However, since then the Boeing Company has restored its 247 museum piece to airworthy condition, but it remains as a museum piece only. →