

## Yesterday's Wings:

■ ■ The 40th anniversary of coast-to-coast air passenger service, which started Sept. 1, 1927, invites a look at the equipment and service of the period and how it came to be.

Airliners in the present sense did not exist in this country. Attempts to operate scheduled passenger routes had been made since the end of World War I, but few covered significant distances and fewer managed to survive. Not until 1926 did the airlines as we know them begin to develop.

Scheduled flying of air mail was another matter. It was carried first by Army pilots and equipment and then by the Post Office Department. Begun May 15, 1918, this system expanded rapidly and reached from coast to coast by July 1924. However, it was strictly a mail route and passengers were not carried in the government-owned planes.

In 1925 and 1926, a few contract air mail routes were authorized. Private organizations were paid by the pound-mile for the mail they carried in their own equipment. One of the best known was the Robertson Aircraft Company, on whose St. Louis-to-Chicago run Charles A. Lindbergh got much of his early experience. The economics of some of these routes were so marginal that the operators have been quoted as saying that they sometimes made more money on a flight from the weight of the padlock on the mail sack than they did on the weight of the letters.

By late 1926, however, the success of contract mail routes convinced the Post Office that the entire air mail system could safely be turned over to private industry. The major government route at the time was from San Francisco to Chicago. The Post Office invited bids for operation of this route to start July 1, 1927.

To the consternation of the established industry, the route was awarded to an organization that did not exist as an airline at the time bids were sought. The Boeing Airplane Company, Seattle, Wash., submitted the lowest bid—\$1.50 a pound for the first 1,000 miles and 15 cents a pound for each

additional 100 miles for mail only. The competition was unanimous in declaring that Boeing would go broke in a few months at that rate. Even the Post Office was dubious, but it accepted the stipulated \$500,000 performance bond from Boeing and signed the contract on Jan. 28, 1927.

However, William E. Boeing and his engineers had a couple of aces up their sleeve that the opposition didn't know about. All the other bids were based on the use of large, single-seat biplanes powered with the 400 h.p. Liberty engine, a 12-cylinder water-cooled relic of World War I. More efficient air-cooled radial engines had appeared soon after the war, but the models available for commercial purposes by the end of 1926 produced only 220 h.p., not enough for carrying heavy mail loads over the mountains and through rough weather.

Most of the airplanes in use by the Post Office and some of the contract operators at the time were wartime de Havilland 4 (DH-4) observation planes modified for mail carrying. A newer design, the Douglas M, had won a Post Office mailplane design competition in 1925. Some of the contract routes were flown with this model, which was actually just another adaptation of an existing Army observation plane.

Boeing had been a runner-up in the 1925 mailplane contest with a wood veneer fuselage design, powered with the required Liberty engine and known as the Boeing Model 40. When the San Francisco-Chicago bid was announced, Boeing made a serious study of the prevailing mailplane situation and noted its shortcomings. Mainly, these were the Liberty engine as power plant and mail alone as revenue. While some contract operators let an occasional passenger ride on top of the mail sacks, it was not regular practice.

The basic Boeing 40 was a good enough plane to carry passengers and express as well as mail, but only if a more efficient engine than the Liberty were available. Such an engine appeared in 1926, the 420 h.p. Pratt and Whitney "Wasp," an air-cooled radial, developed under auspices of the U.S. Navy. With power matching that of the Liberty, the Wasp weighed 200 pounds less than the bare Liberty and did not require the

Cheesecake publicity for Pacific Air Transport Division of Boeing Air Transport System helped to popularize air travel in 1928.



# THE BOEING 40



The foresight of William E. Boeing and fierce competition for air mail contracts led to development of the Model 40 and the first scheduled coast-to-coast air passenger service

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Improved 1927 Model 40A, with steel-tube fuselage and air-cooled Pratt and Whitney Wasp engine. Mail hold is between pilot's cockpit and two-place passenger cabin between the wings.  
Photos from The Boeing Company

deadweight radiator, water, and associated plumbing.

The Wasp was the only logical engine for an improved mailplane, and there were a number on hand in the Boeing plant. However, they were for some Navy fighters then under construction. William Boeing dickered with Pratt and Whitney and the Navy, and got approval for commercial use of the Wasp.

With the tremendous competitive advantage of the Wasp secured, Boeing

put his engineers to work redesigning the Model 40 to use an improved steel tube fuselage and the Wasp engine. This new version, called the 40A, had greater mail capacity than its contemporaries and also had room to carry two passengers in an enclosed cabin. When Boeing's bid (based on the 40A's estimated operating costs and revenue potential) was accepted by the government, the factory immediately started construction of 25. Twenty-four were

The original Boeing Model 40 of 1925, featuring a wooden fuselage and water-cooled Liberty engine.

for the new Boeing Air Transport, Inc., that had been formed to operate the route and one was for Pratt and Whitney as a flying engine test bed. As evidence of the flexibility of the aircraft industry at that time, the 25 Model 40A's were started in February, the first was test-flown on May 20, and the last was delivered on June 29, 1927.

The 1,943-mile route was inaugurated by Boeing Air Transport on July 1 as scheduled and prospered from the start. In addition to revenue passengers who paid \$204 apiece for the 22½-hour trip, the 40A could carry up to 1,200 pounds of mail, compared to 500 pounds for the DH-4 and 1,000 for the later Douglas M-4's and Curtiss *Carrier Pigeons*.

The Wasp paid off handsomely. When asked how he could operate profitably at such low pound-per-mile rates, William Boeing was quoted as saying that his planes were carrying mail and passengers, not radiators and water, over the mountains.

Even though the cabin of the 40A was a luxurious innovation for a mailplane (there were *bona fide* passenger designs operating, but not on the mail routes) the passengers had a spartan time of it. While there were comfortable leather seats and cabin heat, and even an altimeter and an airspeed indicator on the forward wall, there was no effective soundproofing, no lavatory, and food service was limited to sandwiches and a thermos of coffee. The passengers could not communicate with the pilot since he still flew outside in an open cockpit because pilots were not yet convinced that they could get the essential "feel" of flight from the inside of a closed cabin.

Although the San Francisco-Chicago trip, with 10 en route stops, began in July, coast-to-coast travel was not yet a reality. The Chicago-New York segment, taken over by National Air Transport on Sept. 1, was primarily a mail route and the passenger had no assurance that he could get beyond Chicago by air.

National still used Liberty-powered planes of lesser capacity than the Boeing 40A and mail took priority over passengers, who had to share an open cockpit with the mail sacks. This 724-mile segment, with three en route stops, took another 10 hours and cost the passenger \$200 for a trip little more than a third of the Boeing route. If more mail came aboard along the way, the passenger got bumped. With passengers getting to Chicago in increasing numbers from the west, National eventually increased its effort on behalf of the passengers and coast-to-coast service became a reality rather than a gamble.

As good as the Wasp was, it still wasn't the optimum engine for a big ship like the 40A. When Pratt and Whitney made a larger engine available in 1928, the 525 h.p. "Hornet," Boeing quickly installed it in place of the Wasp

### Specifications and Performance

	BOEING 40	BOEING 40A	BOEING 40B-4
Span	44 ft. 2½ in.	44 ft. 2½ in.	44 ft. 2½ in.
Length	33 ft. 2½ in.	33 ft. 2½ in.	33 ft. 2½ in.
Wing Area	547 sq. ft.	547 sq. ft.	547 sq. ft.
Power Plant	Liberty 400 h.p.	P & W Wasp 420 h.p.	P & W Hornet 525 h.p.
Empty Weight	3425 lbs.	3531 lbs.	3722 lbs.
Gross Weight	5495 lbs.	6000 lbs.	6075 lbs.
Payload	1000 lbs. mail	1200 lbs. mail, 2 passengers	500 lbs. mail, 4 passengers
Top Speed	135 m.p.h.	128 m.p.h.	137 m.p.h.
Range	700 mi.	650 mi.	535 mi.

and redesignated the plane the 40B.

An improved 40A, with a four-place cabin, was under development in the factory at this time. Powered with the Wasp, it was designated Model 40C and 10 were built for Boeing-affiliated airlines in the western states. The higher power of the 40B and the larger cabin of the 40C offered a logical combination, so a new model, the 40B-4, was introduced. The older 40B's then became 40B-2 to reflect their two-passenger capacity.

The 40B-4 incorporated a number of refinements for both pilot and passengers—such items as balanced rudder, steerable tail wheel, hand operated brakes, and better cabin comfort and accommodations. The 40B-4, electrically bonded for the purpose, later introduced two-way voice radio communication to airline operations.

The 40B-4 became a major Boeing production model, 38 being delivered between 1929 and 1932 at an average price of \$24,500. Other variants, including 40H-4's, built in Boeing's Canadian plant and deluxe custom models sold for business use, brought Model 40 pro-

duction to 81 units, excluding the Liberty-powered wooden prototype. This was really large-scale production for the day.

Boeing Air Transport, meanwhile, continued to emphasize passenger service and developed the 12- and 16-place 80 and 80A trimotor biplane models to handle it, then built up a network of affiliated lines within the Boeing system.

In 1929 the parent Boeing Company merged with Pratt and Whitney, Hamilton propeller, and Chance Vought (military airplane manufacturer) to form United Aircraft and Transport Corporation. The airline operation, renamed United Air Lines but retaining its separate divisions under their original names, and the manufacturing operations were run as separate divisions of United until 1934, when the government outlawed manufacturer interest in airlines.

Boeing and some lesser firms left the manufacturing organization, which became United Aircraft Corporation, and the airlines were reorganized into a single unit that is the present-day United Airlines. □

Passengers board a Boeing 40B-4 for 22½-hour San Francisco-Chicago flight. Note the loading ramp and separate doors for the two sections of the four-place cabin.

