

YESTERDAY'S WINGS

The little-remembered C-3 was a competitor of the early Travel Air biplanes. In many respects, the two were look-alikes, a not-so-strange fact since Lloyd Carlton Stearman designed both

The Stearman C-3

by PETER M. BOWERS / AOPA 54408



Lloyd Stearman and the C-1 at Venice, Calif., in early 1927. Though using a tailskid, the C-1 had brakes on the wheels, an innovation at the time. Note the aileron strut and the nose radiator, deleted on subsequent Stearman models.

Photo by The Boeing Company

■ ■ Mention the name "Stearman" in general aviation circles today and most of those present will think of the famous *Kaydet* biplane of the WW-II years [Nov. 1967 *PILOT*, page 44]. A few others will recall the unique Stearman-Hammond Y safety plane of 1937 [Nov. 1963 *PILOT*, page 64]. A very few will recall the Stearman C-3 biplane series of 1927-1930 which was Stearman's principal product until World War II when big military orders made the *Kaydet* famous.

The "Stearman" label on airplanes and factories identifies Lloyd Carlton Stearman, who started his aeronautical engineering career with the old Laird Airplane Company of Wichita, Kan. When owner Matty Laird sold the plant to some of the employees and their backers and moved to Chicago, Stearman stayed behind. Since the plant had been building a plane known as the Laird *Swallow*, the new company that the purchasers formed in 1923 was called Swallow Aircraft Company. Its first product was a three-seat biplane designed by the new chief engineer, Lloyd Stearman. Except for its obsolescent wood-and-wire fuselage construction, this was the first of the modern general aviation designs to appear toward the end of the aeronautical doldrums that set in before World War II and it became a pace setter for the reviving industry.

When some of the Swallow personnel, particularly Walter Beech, tried to promote steel tube structures, top management turned them down. Believing that tubing was the only way to go, Beech left Swallow in 1924 and persuaded Lloyd Stearman to leave with him. Beech and Stearman then became two of the original three founders of the Travel Air Manufacturing Company, also of Wichita [Sept. 1971 *PILOT*, page 34].

At Travel Air, Stearman designed the three-seat biplane that was to become famous as the Travel Air 2000/3000/

4000 series [Nov. 1959 *PILOT*, page 72]. However, he did not stay there long; he left in 1926 to form his own firm, Stearman Aircraft, Inc., at Venice, Calif. Stearman used the facilities and personnel of the Lyle-Hoyt Airplane Company, a flying service well known to Stearman, since it was at that time the Travel Air distributor for the West Coast.

The first plane Stearman designed for his new firm was the C-1, which was a direct competitor to the Travel Air. It even looked like the Wichita product—Curtiss OX-5 engine, steel tube fuselage, two-seat front cockpit, and overhanging top wing (less the "Elephant Ear" balances). The similarity in appearance was only natural, since designers tend to carry the details of one good design on to their next.

The C-1 was somewhat underpowered with the 90 hp OX-5 engine and was soon refitted with a Menasco-Salmson. This was a water-cooled WW-I radial engine built in France and it delivered 240 hp. Menasco Motors of Los Angeles rebuilt some for sale on the American market. It is a tribute to the ruggedness of the C-1 that such a power increase could be made without extensive rebuilding of the airframe.

The C-1 was a one-only, and was never type-certificated. It was quickly followed by a refined C-2, which was initially powered with the OX-5. This had the radiator under the belly, instead of in the nose like the C-1. One notable change from the C-1 was the deletion of the Travel Air type of push rod from the lower wing to the ailerons in the upper wing. The C-2 used push rods directly from the cockpit to the center section of the upper wing, which then turned torque tubes aligned with the aileron hinges.

Other C-2s quickly followed, but featured more power, notably the 200 hp Wright J-4 "Whirlwind" engine. The second C-2, a J-4-powered mailplane, was sold to Varney Air Lines.

The C-2s were built at a time when pilots were still of diverse opinions as to whether the throttle should be on the left side of the cockpit or the right. While most of the C-2s had left-hand throttles, a few straddled the issue by having throttles on both sides of the same cockpit.

While Stearman had an excellent airplane, the Venice plant was small and not suited to significant production; when some of his old friends in Wichita invited him to relocate there, and backed up their request with the money needed to establish a new firm, he readily accepted. Reorganized as Stearman Aircraft Company, the firm moved into a refurbished factory complex, on the north side of Wichita, known as the Bridgeport Plant. Here, production of the C-2 was resumed; the first Wichita-built Stearman, another mailplane for Varney, rolled out in December 1927.

While the first 30 production Stearman airplanes were called C-2 when built, they were so similar to the following (and type-certificated) C-3 that they were easily adapted to C-3 standards and soon lost their C-2 identity.

The main competitor for the C-3 was still the Travel Air. While there were Travel Airs with the 200-220 hp "Whirlwind" engine, the majority sold with the old surplus OX-5. Stearman aimed for a higher-priced market, and the majority of the C-3s were C-3Bs with the 220 hp J-5 "Whirlwind." Named *Sport Commercial*, these were licensed under Approved Type Certificate (ATC) 55, issued July 27, 1928.

The principal variant of the C-3B was the C-3MB, 15 of which were built as single-seat mailplanes with a 33-cubic-foot mail pit replacing the front cockpit. These were licensed under ATC-137. As these relatively small mailplanes were

phased out of mail operations, they were converted to three-seat "C-3B Specials" and licensed under Memo Approval 2-159. One C-3B was sold as a twin-float seaplane under Memo 2-124.

Relatively little effort was made to develop lower-cost C-3s with war-surplus engines. Only two OX-5-powered C-3As were built (cost of an unused OX-5 engine in 1928 was \$500, compared to \$4,900 for a J-5). There were two C-3Cs (later redesignated C-3D) with the surplus 180 hp Wright E, a license-built version of the French Hispano-Suiza, or "Hisso." These were licensed under ATC-62. There was a single C-3H with an air-cooled Menasco conversion of the old Salmson. However, this was hardly a surplus engine when Menasco got through with it. It sold for over \$3,000 and the experimental C-3H was soon converted to a C-3B.

Abandoning surplus engines entirely, Stearman cast about for newer engines to satisfy customers who wanted less than 220 hp. Such things were scarce in the United States in early 1928, however, so he tried an import, the 125 hp German Siemens-Halske SH-12 air-cooled radial. This was marketed in the United States by T. Claude Ryan as the Ryan-Siemens. Only three Stearman C-3Ks used this engine, one being licensed under Memo 2-53 and the others under Memo 2-70.

Several new American radials appeared in 1928, but Stearman tried only one, the 130 hp "Comet," in the single C-3L. This flew experimentally for a while and was licensed under Memo 2-58, but it was eventually converted to a C-3B. Of 185 Stearman C-2/C-3 airplanes built, only 10 are known to have used engines other than the Wright "Whirlwind" and some of these were converted to the Wright.

The J-5 went out of production at the end of 1928 and was replaced by the 225 hp J-6-7. This was one of a family of radials with interchangeable parts for five, seven, or nine cylinder versions; the J-6-7 had seven. The passing of the J-5 ended production of the Stearman

NC566Y was the last Stearman C-3R built. It incorporated such "late" features as a steerable tailwheel and low-pressure tires. Advertised as the *Business Speedster*, 38 were built; 10 went to Peru as military airplanes.

Photo by Edgar Deigan

SPECIFICATIONS AND PERFORMANCE

Stearman C-3B

Span	35 ft.
Length	24 ft.
Wing area	297 sq. ft.
Powerplant	Wright J-5 220 hp @ 1,850 rpm
Empty weight	1,625 lbs.
Gross weight	2,650 lbs.
High speed	126 mph
Cruising speed	108 mph
Climb	1,000 ft./min.
Ceiling	18,000 ft.
Range	620 mi.
Price	\$8,970

C-3B in July 1929, but a new model, the C-3R, was quickly developed to use the J-6-7. This was essentially the C-3B airframe with relatively minor state-of-the-art improvements, a more rounded-out fuselage, larger tail surfaces, and a drag ring around the engine for better streamlining. Early versions used the tailskid and high-pressure tires; later ones had tailwheels and various low-pressure tires. The new model was named *Business Speedster* and was licensed as either a land or seaplane under ATC-251 issued Oct. 7, 1929.

The introduction of the C-3R was quite close to the advent of the 1929 depression and the beginning of the end of the biplane era, so production did not match that of the C-3B, which was a product of more prosperous times. Thirty-nine C-3Rs were built; the last one reverted to a J-5 engine under the designation of C-3P and was licensed as a two-seater under Memo 2-245. The factory tried hard to sell special-purpose versions, such as dusters, but these couldn't compete with the secondhand converted models that were the backbone of the business. With the airmail and express business expanding, there was no longer a market for 225 hp mailplanes.

In August 1929, Stearman Aircraft became part of the giant United Aircraft complex, which included the Boeing

Airplane Company, Pratt & Whitney engines, Hamilton-Standard propellers, and several airlines that were known collectively as United Air Lines. This led to a close association with Boeing and the purchase of some Boeing designs and technology by Stearman. Production of the C-3R ended in October 1931. At a time when other aircraft plants were closing, Stearman managed to stay in business by introducing larger and more expensive models, rather than by bringing out cheap, bare-minimum lightplanes as others were trying to do. Lloyd Stearman left his company in 1931 after United merged it with Northrop Aircraft of Burbank, Calif., and the surviving company moved the Northrop tooling to Wichita. He became associated briefly with Walter T. Varney in his airline ventures, then became president of the newly reorganized Lockheed Aircraft Corporation in 1933. He was with Stearman-Hammond in San Francisco from 1936 through 1938. Still active with his own companies at age 73, he was surprised recently to find his name on a memorial plaque to deceased Wichita aviation pioneers at the Wichita Municipal Airport.

The C-3s and other Stearman biplanes, though out of production, carried on through the 1930's in flying schools and business flying. Many of them ended up in that last resort of old biplanes, the cropduster business. A few held on in this field until well past World War II, when they were replaced by the cheap and plentiful Stearman/Boeing *Kaydet*. A few C-3s either avoided the cropdusters' fate altogether, or escaped from it when the antique airplane boom began in the early 1950's. These few are now restored to their original configuration under the loving care of the antiquers. The latest FAA figures show only six C-3s still active, but several others, long off the registration lists, are known to be in the hands of antiquers and will surely fly again. □

The Stearman C-3D, with war-surplus Wright E, or "Hisso," engine was an attempt to achieve a lower price through the use of a cheaper engine. This restoration, currently flying, was restored from a "basket case" by E. D. Carlson (AOPA 289708), Spokane, Wash. The only alteration is the addition of a steerable tailwheel.

Photo by Peter M. Bowers

