Yesterday's Wings

The Douglas Dolphin

Manufacturer of military aircraft made serious effort in 1930 to enter commercial market with its twin-engine amphibian. Success came later in civil market with advent of its famous 'DC' transport line

by PETER M. BOWERS / AOPA 54408

■ ■ "Douglas," to use a single word for the company that has successively been the Douglas-Davis Company, Douglas Aircraft Corporation, and McDonnell Douglas Corporation, was founded in 1920. Except for some mailplanes in 1926-27 and a few one-only prototypes of commercial designs, Douglas was exclusively a producer of military airplanes until 1930.

At that time, the company made a serious effort to enter the commercial market and introduced the twin-engine *Dolphin* amphibian. By the standards of the day, this was virtually an airliner, with a 60-foot wing, provision for pilot and copilot at dual controls, and seating for six passengers. (The slightly larger Ford and Fokker trimotors then serving the airlines carried 10 to 14 passengers.)

The layout was conventional, with the wing on top of the hull and the engines above the wings. While several contemporary flying boats and amphibians were pushers, with an inherent tendency toward tail heaviness, the *Dolphin* used tractor engines canted well ahead of the leading edge of the wing.

Construction was mixed. The wing followed the well-known Fokker pattern of one-piece cantilever wood construction with two parallel box spars, plywood web ribs, and plywood covering. The hull was all aluminum, with flat sides, vee-bottom, and rounded turtledeck covered with flat sheet. The tail surfaces were semi-monocoque, with corrugated sheet aluminum for covering. Throughout its development, the *Dolphin* was to undergo several changes in tail shape, including small auxiliary vertical fins on some models.

The landing gear retracted entirely outside the hull and wing, being raised merely to clear the water, not to improve the streamlining. The tailwheel (originally a tailskid) at the end of the second hull step was not retractable.

The original *Dolphin* powerplants were 330 h.p. Wright J-6-9 "Whirlwind" radials. On the prototype, the engine nacelles were faired into the wings, but this arrangement was soon modified. The engines were raised slightly to increase the propeller clearance from the water, and the supporting struts were left out in the open. Some additional lift was obtained by building a small extra wing between the engine nacelles and projecting it beyond the nacelles for a span of 19 feet and 47 square feet of additional wing area. As the design improved over the production years, more powerful engines up to the 575 h.p. Pratt & Whitney "Wasp" were installed.

For a new commercial airplane, particularly one at the very top of the general aviation price range, the timing of the *Dolphin* was most unfortunate. By the time the prototype flew in June 1930, the depression was well under way, and the aircraft industry, particularly civil production, was entering a period of very hard times that was to see many oldtime manufacturers go out of business entirely. Over a period of several years, Douglas sold only 12 commercial *Dolphins*. The best-known of these served on the famous short-haul operation from Wilmington, Calif., to Catalina Island from 1934 through 1941.

Military airplane production provided Douglas's livelihood in the early 1930s, before the advent of the famous "DC" (Douglas Commercial) transport line. Oddly, it proved to be the U.S. Armed Services that were the best customers for the first production Douglas commercial airplane. The Army, Navy, and Coast Guard all showed an immediate interest in the *Dolphin* as soon as it appeared.

The Coast Guard ordered three, the first under the designation of "RD" in an approximation of the current Navy aircraft designating system: "R" for transport, "D" for Douglas. In the Coast Guard system at the time, the designation was completed by adding the USCG serial number of the airplane, as RD-27. Although using transport designations, the USCG *Dolphins* were used as flying lifeboats along U.S. coastlines. Identification within the organization at the time was by a given name for the airplane rather than a number; CG-27 was named "Procyon."

The first Coast Guard *Dolphin* differed from standard in not being an amphibian. It was a true flying boat, but photos released by the factory gave the impression that it was amphibious because the beaching gear provided looked so much like the standard *Dolphin* landing gear. The other two RDs, an RD-1 and an RD-2 named "Sirius" and "Adhara," were delivered as amphibians, and the first was soon converted to one.

The Army, with a legitimate interest in amphibian transports because of operations in Hawaii, the Philippines, and Panama, placed an initial order for eight *Dolphins* with 350 h.p. Wright R-975 engines in 1932. These were designated Y1C-21. The "C-21" indicated the twenty-first model in the Army's C-for-Cargo (transport) series, the "Y" indicated Service test status (to prove the suitability of the design), and the figure "1" indicated procurement from special F-1 funds rather than the regular Air Corps appropriation. After delivery, these were transferred for a while to Treasury Department jurisdiction and used for Mexican border patrol under the designation of FP-1, for Frontier Patrol. Upon return from this work, they were redesignated plain C-21. Following reassignment from transport to observation duties in 1933, these became OA-3, for Observation Amphibian.

The C-21/OA-3s were followed in 1933 by two Y1C-26s, eight Y1C-26As, and six C-26Bs, all with 300 to 350 h.p. Pratt & Whitney R-985 "Wasp Jr." engines, for a total of 24 Army *Dolphins*. Two of the C-26Bs were redesignated C-29 when fitted with 575 h.p. Pratt & Whitney R-1340 "Wasp" engines. The Y1C-26s and 26As became FP-2s briefly before reverting to C-26 and 26A. These then became OA-4 and OA-4A, respectively, while the remaining C-26Bs became OA-4B. Seven various OA-4s became OA-4C in 1936 when fitted with new stainless steel wings that were considered more suitable for tropical operations than the original wooden wings. One OA-4A made a small contribution to design evolution at this time by being converted to tricycle landing gear to prove the suitability of that feature to large aircraft like the forthcoming Douglas DC-4 and XB-19.

The Navy ordered a single Wright-powered *Dolphin* under the designation of XRD-1 ("X" for experimental, since it was in effect the prototype of a new Navy type, even though a proven civil design). This was soon followed by three RD-2s with 450 h.p. "Wasps." One of these was fitted with a deluxe interior and a special paint job, ostensibly for the use of President Roosevelt, but was

SPECIFICATIONS AND PERFORMANCE

	1931 Dolphin	1934 Dolphin
Span	60 ft.	60 ft.
Length	45 ft. 2 in.	45 ft. 2 in.
Wing area	545 sq. ft. (plus 47 sq. ft. auxiliary)	592 sq. ft.
Powerplant	Wright J-6-9 "Whirlwind" 300 h.p. @ 2,000 r.p.m.	Pratt & Whitney "Wasp" S3D-1 450 h.p. @ 2,100 r.p.m.
Empty weight	5,625 lbs.	6,643 lbs.
Gross weight	8,200 lbs.	9,500 lbs.
High speed	141 m.p.h.	151 m.p.h. at sea level
Cruise speed	111 m.p.h.	135 m.p.h.
Landing speed	62 m.p.h.	58 m.p.h.
Climb	820 f.p.m.	900 f.p.m.
Service ceiling	14,600 ft.	15,000 ft.
Range	555 miles	425 miles

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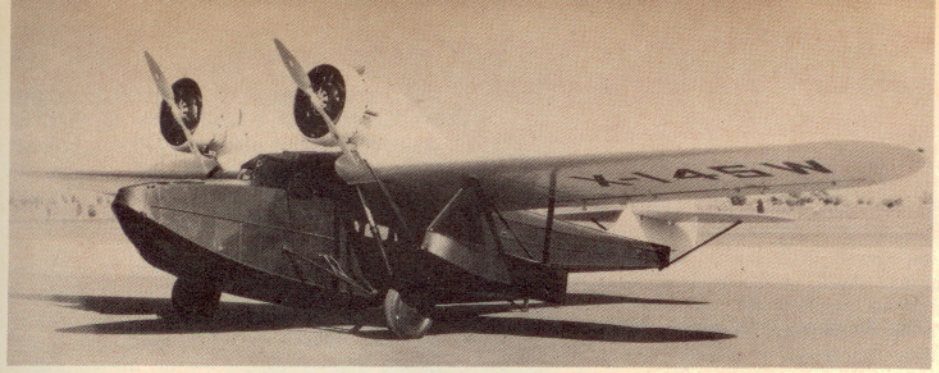

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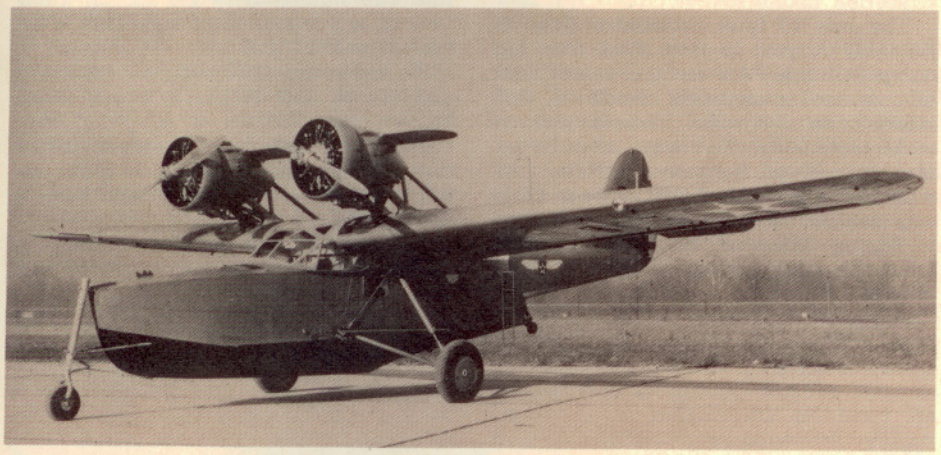

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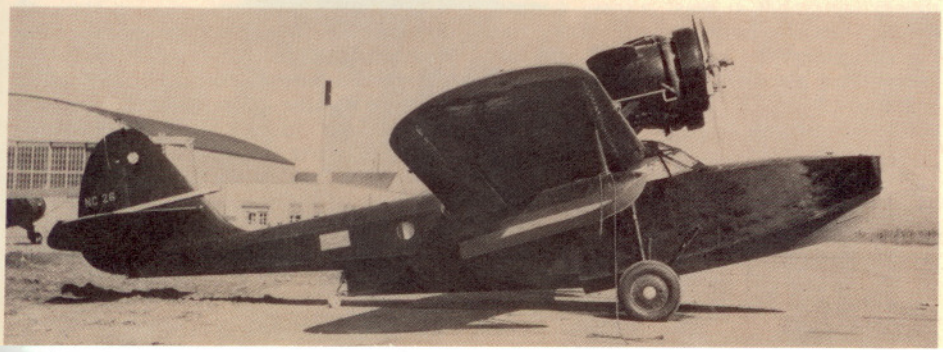

not used by him. Six similar RD-3s were delivered to the Navy in 1933. The final order for militarized *Dolphins*—10 RD-4s for the Coast Guard—was completed late in 1934, for a total of 23 Navy/USCG models. The Coast Guard, a branch of the Treasury Department, was placed under Navy jurisdiction after Pearl Harbor; the RD-4s then operated with the Navy on coastal patrol.

Of the 59 *Dolphins* built, only one shows up on FAA records today, although several survived World War II. This one has an interesting history. It was bought new by William E. Boeing in 1934. (He had used Boeing-built airplanes as his personal aircraft previously, but Boeing did not build amphibians at the time.) He named his Douglas "Rover." In 1940, his needs changed, and he bought the prototype DC-5 from Douglas (Boeing was only building four-engine models at this time) and sold the *Dolphin* to the U.S. Department of Commerce, which needed airplanes of that type for work in Alaska. The Government then canceled the original registration of NC14205 and assigned a new number from the Government's reserved block of low numbers, which are constantly reused on nonmilitary Government airplanes. The old "Rover" then became NC26.

After the war, it was sold as surplus. Instead of picking up its original registration or a new one, the Government number was merely altered to NC26K. The old *Dolphin* was used for a while on Commodore Airways' San Francisco-Lake Tahoe passenger service and then was out of service for a long time following a takeoff accident at Long Beach, Calif., in the hands of new owners. In 1969 the 35-year-old *Dolphin* was restored and left Long Beach for a new career of passenger carrying in the Caribbean. □

1. The prototype Douglas Dolphin in its original form, with low engines, faired nacelles, and wing floats located well inboard. Corrugated metal tail surfaces are strut-braced.

McDonnell Douglas photo

2. Early production Dolphin, with Wright engines, on the Wilmington-Catalina Airline. Note additional vertical tail area. The author, an occasional passenger, could never understand the choice of blue and gray for a low-level, overwater airline.

A. U. Schmidt photo

3. William E. Boeing's 1934 Dolphin, NC14205. Note the extra wing above the engines, standard for all Dolphins after modification of the prototype. Later models like this had smooth metal skins on wire-braced fin and stabilizer, fabric-covered rudder and elevators.

A. U. Schmidt photo

4. An Army OA-4A Dolphin converted to tricycle landing gear to test the suitability of this "new" arrangement for subsequent designs. Actually, this configuration had been common prior to World War I and only began to reappear in the mid-1930s.

U.S. Air Force photo

5. The former NC14205 in Government service during World War II with registration number NC26. Coloring is the standard black and orange used by the Department of Commerce and many other Government agencies at the time. The aircraft became NC26K when sold as surplus after the war.

Logan Coombs photo