

# The Fairchild Jungle Clipper

*Pan Am wanted a fast amphibian Clipper for the Amazon River route, so Fairchild designed the 91.*

BY PETER M. BOWERS

There were a few amphibious airliners in use back in the early 1930s. But until the Fairchild 91 came along, they were slowpokes compared to landplanes of similar power and capacity. They had all of the inherent handicaps of the type—a retractable landing gear that presented as much drag when raised as it did when down, the necessary strut-mounted wingtip floats and engines held above the wing or the hull by another maze of struts.

The Fairchild 91 was a major break with traditional amphibian design, and for a short time it was the world's fastest amphibian. This is even more remarkable in that the 91 was an eight-passenger

transport designed to airline requirements. It was also the largest and heaviest single-engine amphibian of the time.

This distinctive airplane has had an identity problem ever since it was introduced in 1935. Fairchild marketed it as the Model 91, indicating that it was a nine-place airplane (eight passengers and one pilot) and the company's first nine-seater. The government paperwork under which it was licensed, however, identified it as the A-942. This was a nonstandard military designation, and its use on a civil airplane should be explained.

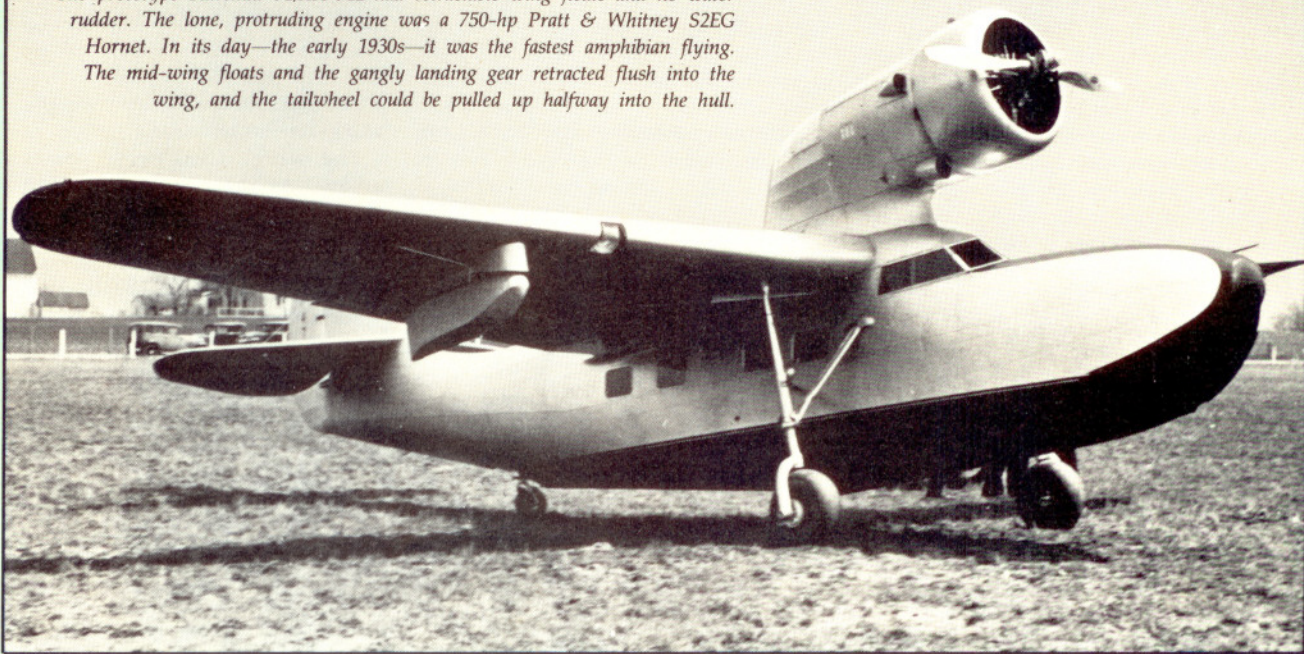
The number 942 was a continuation of the Army Air Corps Engineering Division's project numbers, dating back to 1917. These were separate from standard type and model numbers, and they often were assigned to privately owned aircraft

under test by the Army or to private design studies in which the Army was interested. At the time that the 91 was being designed, Fairchild also was developing a single-engine cargo airplane for the Army. It was identified by the Army and Fairchild as the XC-941 (X for experimental, C for cargo) before finally being purchased as the XC-31. The Army showed an interest in the 91, so recorded it as the XA-942 (A for amphibian). This reflected the Army's interest at the time in civil transports; its next transport purchase was an off-the-shelf Douglas airliner, a DC-2 that became the XC-32. Although the Army did not buy or even test the 91/XA-942, the military designation stuck to the engineering paperwork right through certification.

The 91 was designed from the start to

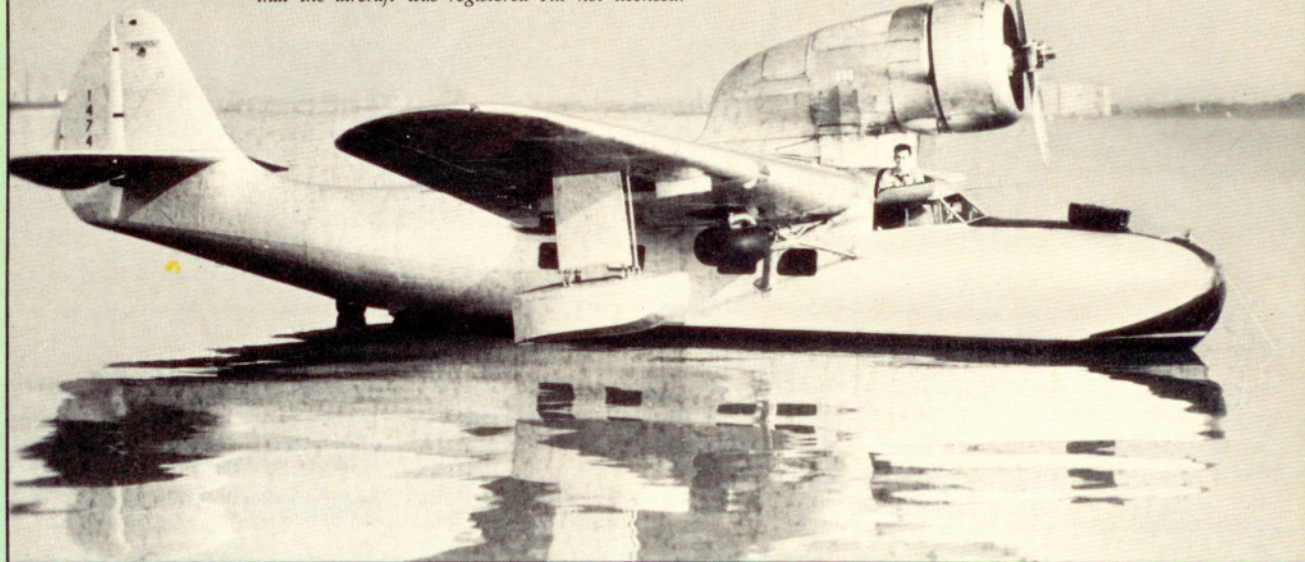
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*The prototype Fairchild 91/XA-942 had retractable wing floats and no water rudder. The lone, protruding engine was a 750-hp Pratt & Whitney S2EG Hornet. In its day—the early 1930s—it was the fastest amphibian flying. The mid-wing floats and the gangly landing gear retracted flush into the wing, and the tailwheel could be pulled up halfway into the hull.*





*In the water, the prototype Fairchild 91's landing gear is shown almost retracted, with the original wing floats down. Registration numbers (on rudder) without NC or NX indicate that the aircraft was registered but not licensed.*



the rigid requirements of Pan American Airways for use on the Amazon River by its subsidiary, PanAir do Brasil. Pan Am long had used amphibians, but at this date it needed a more modern type with better performance. The 91 was tailored to handle those specific South American route conditions. The aircraft used on the Amazon run, in keeping with the Pan Am tradition, were known as the Jungle Clipper.

Structurally, the 91 matched the all-metal cantilever construction of the latest land-based airliners. (Single-engine types still were acceptable in the transport category at the time.) The designer was Albert A. Gassner, who had been chief engineer of the Austrian Albatros Company during World War I. He joined the American Fokker organization in 1923 and left his position as chief engineer in 1932 to join Fairchild in a similar capacity.

A lot of his Fokker technology went into the Model 91, particularly the tapered cantilever wing. Unlike the Fokker designs, the Fairchild wing was metal, not wood. Another major departure from Fokker practice was the use of a center section integral with the hull and removable outer panels. The center section carried 180 gallons of fuel.

The hull was semi-monocoque metal construction with stressed aluminum skin over bulkheads and stringers. The fin and horizontal stabilizer were stressed-skin structures like the wing and flaps, but the movable control surfaces were metal frames with fabric covering. Although designed to be flown by one pilot like



*Explorer Richard Archbold's Fairchild was called Kong. It had standard floats, but still no water rudder.*

Fairchild's older Pilgrim airliner and the XC-32, the 91 ended up with two pilots at side-by-side dual controls. The eight passengers, who sat in two separate watertight compartments, entered the cabin through a hatch on top of the hull aft of the wing. A lavatory was located at the rear of the cabin.

The original powerplant was the 750-hp Pratt & Whitney S2EG Hornet fitted with the new Hamilton Standard two-position propeller that was just coming into commercial use. It was enormously advantageous for seaplane use in comparison with the old fixed-pitch type.

Through the use on Gassner's part of some ingenious gadgets, the 91 was the cleanest amphibian built until that time. Speed was enhanced in three ways: by fairing the engine nacelle into the hull, by retracting the wing floats and by performing the near-miracle of retracting the landing gear flush into the high wing, instead of merely raising the wheels

above the water line. The tailwheel retracted halfway into the hull at the second step. For steering on the water, a water rudder was attached to the hull alongside the tailwheel.

The wing floats were something unique. As their supporting struts retracted inboard through a 90-degree arc, the floats rotated relative to the struts to retain their vertical orientation. Instead of tucking into the wing as did the main wheels, the floats nested behind fixed fairings on the underside of the wing. It quickly was determined that the performance gain from this feature was not worth the added weight and complexity, so a fixed-float arrangement was adopted.

The prototype 91 made its first flight on April 5, 1935, and was awarded Approved Type Certificate (ATC) A-587 on November 22. The designation on the paperwork was A-942-A. Advertised price was \$42,060.

Pan Am had ordered six Fairchilds, but



## FAIRCHILD JUNGLE CLIPPER A-942-B

### Specifications

Powerplant	Wright SGR-1820-F52 Cyclone
	750 hp @ 2,100 rpm
	@ 5,600 ft (875 hp for takeoff)
Wingspan	65 ft
Length	46 ft 8 in
Height (on wheels)	17 ft
Wing area	483 sq ft
Wing loading	21.7 lb/sq ft
Power loading	13 lb/hp
Empty weight	6,500 lb
Gross weight	9,700 lb
	(increased to 10,500)

### Performance

High speed (5,800 ft)	175 mph
Cruise speed (75% power, sea level)	155 mph
Cruise speed (66% power, 8,000 ft)	151 mph
Landing speed (no flaps)	70 mph
Landing speed (with flaps)	63 mph
Initial climb	975 fpm
Service ceiling	17,900 ft
Range (75% power)	610 sm
Range (66% power)	720 sm

*Based on manufacturer's figures*

accepted only two at first. Changing conditions along the river route showed that there was little advantage to the amphibious feature. Airports for operation on wheels could be found only on the coast, and there were few places along the river where an amphibian could taxi up onto the shore. Therefore, the airline removed the wheels and converted the two A-942-As to pure flying boats. Not only did this allow a payload increase equal to the weight of the removed hardware, but the aircraft were authorized to operate at a 200-pound higher gross weight as boats than as amphibians.

Fairchild kept the prototype 91 for its own use and found new buyers for the remaining four. These were changed enough, however, to require a new ATC, A-605, which was awarded to the A-942-B on May 16, 1936. The major change was from the Hornet engine to a very similar 750-hp Wright F-series Cyclone. A lesser change was reversion to the original requirement for only one pilot. Gross weight and airspeed limitations remained the same. The A-model was eligible for

conversion to a B, and at least one unit was converted.

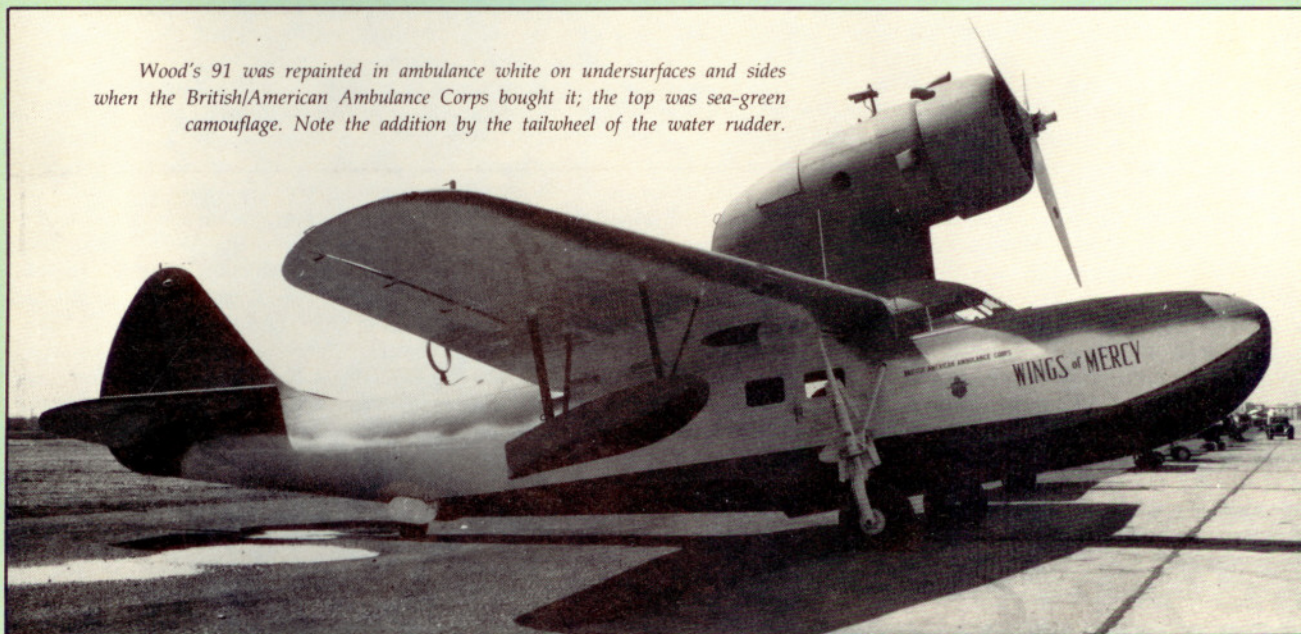
One of the final four aircraft was sold to Japan, and Pan Am picked up another. One was sold to explorer Richard Archbold of the New York Museum of Natural History. Because of the modifications needed for exploratory flights in New Guinea, his airplane, which he named *Kong*, operated on a restricted (NR) license. As an example of an individual's strong desire for a special number, Archbold obtained the out-of-sequence registration number 777 for his Fairchild. When he replaced it with a Consolidated flying boat, he had the number transferred to the new airplane. After he sold that to the Russians for an arctic rescue expedition, he obtained another Consolidated and again registered it 777.

Another 91/A-942-B that had an interesting career was NC16690, sold to speedboat king Gar Wood, a longtime user of luxury amphibians. He paid \$62,200, well over the established price of \$50,000 for his custom-furnished A-942-B. When World War II broke out, Wood sold his Fairchild to the British/American Ambulance Corps for air/sea rescue work in the English Channel. It was drafted into the Royal Air Force and eventually was lost in the Mediterranean.

The three Pan Am/PanAir ships plugged along at their routine jobs under primitive conditions for 10 years and finally were scrapped after the war. The wartime proliferation of landing strips throughout the world neutralized the one remaining advantage of the big commercial flying boat—its ability to deliver significant payloads to areas that equivalent landplanes could not reach. □



*Gar Wood owned this deluxe version. With landing gear down and passenger entry hatch open behind the wing, the 91/A-942-B is ready to be pulled ashore.*



*Wood's 91 was repainted in ambulance white on undersurfaces and sides when the British/American Ambulance Corps bought it; the top was sea-green camouflage. Note the addition by the tailwheel of the water rudder.*