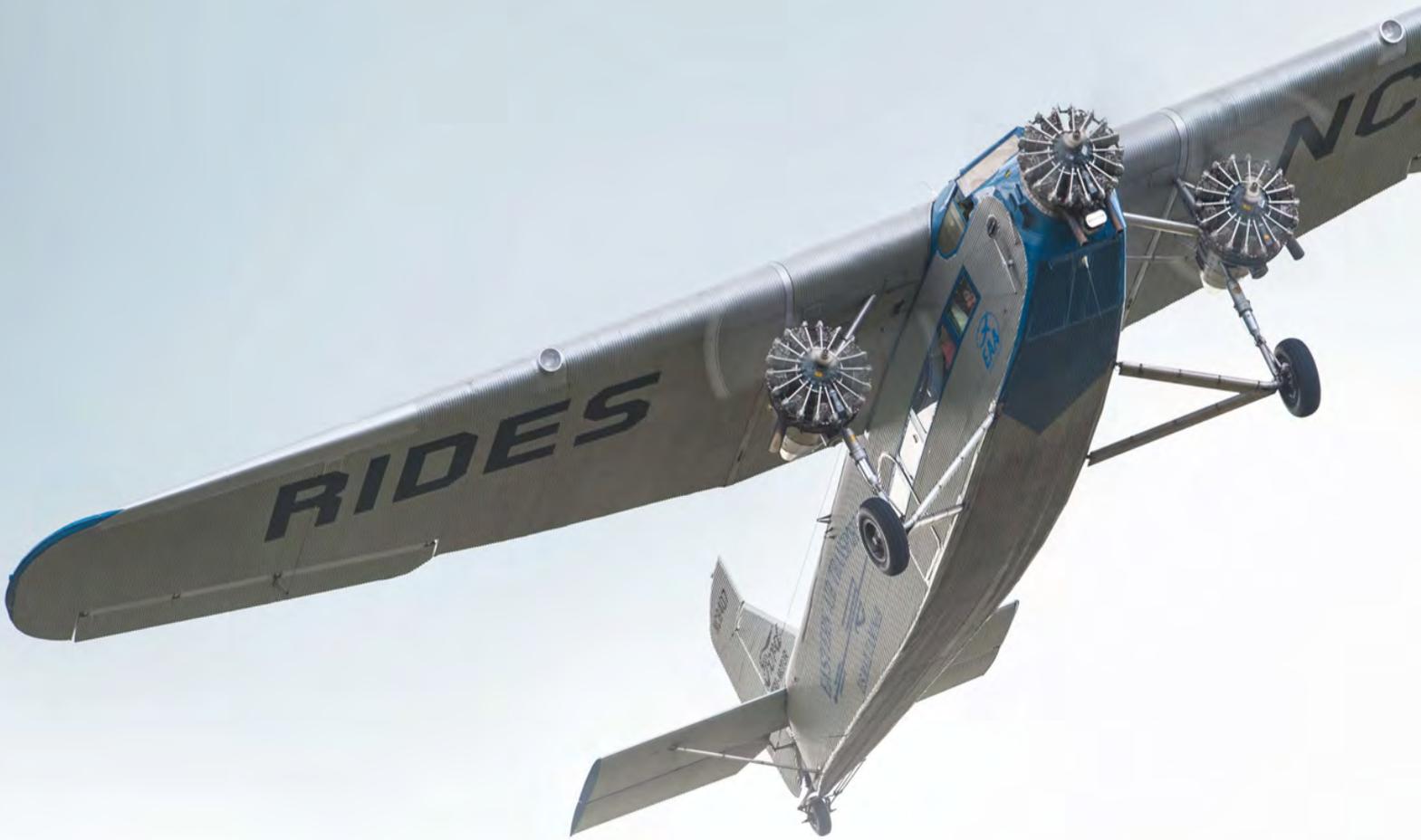




JEFF SKILES

COMMENTARY / CONTRAILS



The Tri-Motors

An era that will never be seen again

BY JEFF SKILES

IN THE DECADES SINCE the Wright brothers first flew there have been airplanes built with anywhere from no engine (gliders) to 12 engines (Dornier Do X). While the Dornier was certainly an aberration, there have been many airplanes designed and built with one, two, and even four engines. What hasn't been quite as popular, however, are airplanes built with three.

The term tri-motor will be forever associated with the venerable Ford Tri-Motor airliners, but other three-engined contemporaries of the Ford were built by Stinson, Boeing, Fokker, and Junkers. The early 1930s was the era of tri-motors. After 1935, however, three-engined airliners entered a period of dormancy lasting for 30 years until, in perhaps a last hurrah, jet-powered tri-engined airliners emanated from all three domestic manufacturers: Boeing, Douglas,

and Lockheed. Today, however, tri-motors are relatively rare in the skies over the United States.

Single-engine biplanes first inaugurated what passed for passenger service in the early days of aviation, but the need for more payload and performance demanded an increase in the number of propellers spinning on the airframe. There were at least five different tri-motor airliners that were produced in number, and they formed the backbone of airline fleets in the 1920s and early 1930s.



FOKKER TRI-MOTOR

The Fokker F.10 was produced by the Fokker Aircraft Corporation of America. Powered by three Pratt & Whitney Wasp engines, it carried 12 passengers; the improved F.10A carried 14. As many as 65 were ultimately manufactured and flew for a number of airlines of the day. In appearance the F.10 was a high-wing aircraft much in the mold of the Ford Tri-Motor, but its construction was quite different. Anthony Fokker followed a design philosophy very similar to early homebuilt aircraft leading to a fabric-covered, steel tube fuselage married to a wing of wood construction. The Achilles' heel of his methods, however, was the plywood covering of the wing.

Knute Rockne will forever be paired with the Fokker tri-motor in historical record. He was traveling over Kansas when the wooden wing failed on the Transcontinental and Western Airlines Fokker he was flying in. The ensuing crash took the life of the gridiron coach. The investigation found evidence that water had gotten into the wing causing its glue bonds to separate leading ultimately to the catastrophic in-flight failure of the wing. After the accident the resultant rigorous inspection schedule required by government regulators, and the negative public perception of wood airplanes in general, doomed the design and led to the adoption of all-metal airliner construction extending to the present day.

BOEING TRI-MOTOR

In the late 1920s Boeing Airplane Company had a sister company named Boeing Air Transport that carried freight, mail, and passengers on scheduled routes. For this service Boeing manufactured the most luxurious of the tri-motors, offering three-across seating with two passengers on one side of the central aisle and one on the other. The first four Boeing Model 80s carried 12 passengers. The subsequent Model 80A, with larger engines and an extended fuselage, carried 18 passengers in as opulent surroundings as the aeronautical world had to offer. The Boeing 80's passengers enjoyed leather seating, reading lamps, cabin heat, forced air ventilation, and a lavatory boasting hot and cold running water. Boeing Air Transport even inaugurated a new class of employment as unmarried registered nurses formed the first cadre of stewardesses serving the needs of the traveling passengers.

The Boeing 80 was unique among the airline tri-motors in being a biplane, the extra wing surface was felt necessary to land at the challenging, high-altitude airstrips of the western mountain states. One variant was initially built with an open cockpit, although it was later modified to the standard closed-cockpit construction. Only 16 of the Model 80s were produced, and they worked exclusively for William Boeing's passenger and freight airline. The aircraft soldiered on in the service of Boeing Air Transport, later United Airlines, until 1934 when they were replaced by the all-metal, low-wing Boeing Model 247.

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STINSON TRI-MOTORS

Stinson actually built three tri-motors that were flown by a number of airlines. The Stinson airliners were smaller than their contemporaries and were designed for feeder rather than mainline routes.

The Stinson SM-6000-B, also known as the Model T, was a 10-passenger, high-wing design looking very much like the Ford Tri-Motor but with more traditional construction. The aircraft had an enclosed cockpit, and the outboard engines were mounted on the main landing gear consistent with the design of the Ford. It was far lighter, however, with a gross weight of only 8,600 pounds allowing it to be powered by the relatively small Lycoming R-680, 215-hp engines. Ultimately, more than 50 airframes were produced before it was upgraded to the Model U.

The Model U Stinson was similar in appearance to the B but had the engines mounted on stub wings, called sesquiwings. The engines on the Model U were an upgraded version of the Lycoming R-680 producing 240 hp. The aircraft was a bit larger in all dimensions and had a gross weight of 9,300 to 9,400 pounds. More than 20 were produced before the design was eclipsed by faster all-metal airliners.

The Stinson Model A was an entirely different aircraft and was built to meet a request by American Airlines for a low-cost, short-field-capable, feeder airplane. It was designed a few years after the other Stinson tri-motors and made its first flight in 1934. With a low wing, retractable gear, and an enclosed cockpit sitting high above the passengers it had a unique look. The A carried eight passengers as fast as 163 mph and was said to be able to take off in 800 feet and land in as little as 400. More than 30 were produced and flew in this country and also, notably, in Australia.

FORD TRI-MOTOR

The Ford Tri-Motor was an outgrowth of Edsel Ford's interest in aviation and his father Henry Ford's desire to show the viability of airline transport. In a similar fashion the Ford Tri-Motor itself was an outgrowth of the earlier single-engine Stout 2-AT Pullman. The Ford Tri-Motor, along with its European counterpart the Junkers 52, was a metal airplane covered with a stressed corrugated aluminum alloy skin. In appearance it was very close to the design of the Fokker tri-motor — perhaps too close. Ford lost two patent infringement cases in Europe brought by Fokker as a result of its production of the Ford Tri-Motor. One only has to see a photo of the Stout 2-AT however to see that it, and not the Fokker, was the obvious ancestor of the Ford.

Two models were produced side by side on the assembly line to customer specifications, the 4-AT and the slightly larger 5-AT. EAA is proud to



operate one of each model. The Ford was produced in many variants sporting different engine combinations. There were both civil and military versions, and some models even had skis and floats. Eventually 199 aircraft rolled off the assembly lines and served airlines around the world.

The Ford Tri-Motor was in a perfect position to capitalize on the aftermath of the Knute Rockne Fokker crash and the traveling public's perception that metal airplanes were more safe than those of wood and fabric. It couldn't, however, compete with the new low-wing, fast, retractable-gear airliners coming on the market in the mid-1930s. Henry Ford had proven his point, however, and having shown that air transportation was viable and potentially profitable, he returned to building cars and never produced another Ford-designed aircraft.

THE END OF AN ERA

Aviation was moving at an exceedingly fast pace in the mid-1930s. With the introduction of the Boeing Model 247, Douglas DC-2, and later the DC-3, the older tri-motor airliners were almost instantly obsolete and rapidly faded from mainline service. Many continued on in foreign countries carrying passengers to remote locations or were converted for other purposes such as freight hauling, fire jumping, or crop dusting. In America, however, the tri-motor era had come to a close, and the airliners that built a nationwide transportation system would scarcely be seen again. *EAA*

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