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# Masters of the air

Cessna's little speedster—on floats

BY MIKE VIVION

**W**ith its deep-red paint and standing tall on its Wipline amphibious floats, the beautiful Cessna Airmaster parked amongst the Seabees, Grummans, and more contemporary Cessna amphibious aircraft at a fly-in was hard to miss.

But wait—a Cessna Airmaster on amphibious floats? Someone familiar with float installations and the difficulties of certification would simply have to find out more about this rare apparition. This is how I came to meet Glenn Larson, a Delta Air Lines Boeing 757 captain based in Minneapolis. Although he didn't know me, Larson gave me a tour of the airplane, explaining the float installation and its certification basis.

Then Larson reached into his airplane and retrieved a photograph, showing a vermilion Cessna Airmaster on straight floats parked in a river. The print was made from a 16-millimeter movie film taken by Larson's father, Brad, in 1942 along the banks of the Chena River in downtown Fairbanks, Alaska. The photo showed the only one of five Wien Alaska Airlines Airmasters that Wien ever operated on straight floats. The elder Larson was an air transport command pilot during World War II, and visited Fairbanks during the course of his travels. Hired by Northwest in 1942, Brad Larson retired as a 747 captain in 1975.

PHOTOGRAPHY COURTESY OF EAA





### The Airmasters

The name Airmaster has been applied—not necessarily accurately—to an entire series of aircraft built by Cessna in the late 1930s, but the true genesis of these sleek aircraft lies in the very early design efforts of Clyde Cessna. Cessna was an advocate of high-wing, cantilever-design monoplanes in an age when the biplane was king. Despite the best efforts of its founder, the Great Depression had taken its toll on the Cessna Aircraft Co., and in 1931, the company closed its plant. But in 1934, Cessna's nephew, Dwane Wallace, convinced the board of directors to reopen it.

Wallace set out to create an all-new aircraft based on early Cessna designs combined with several racing-aircraft designs that he and Eldon Cessna, son of founder Clyde, had developed in the early 1930s. In June 1935 the prototype of this new design was completed and test-flown, and the new aircraft received approved type certificate 573 later that summer. This aircraft, while officially designated as a model C-34, was the progenitor of the family of aircraft later referred to as Airmasters, and established the basic configuration for nearly



The Airmaster's original instruments have been replaced with a more modern panel (above). The tightly cowled engine (right) helps preserve the appearance and performance of a design that, in the 1930s, was synonymous with speed and flight efficiency.

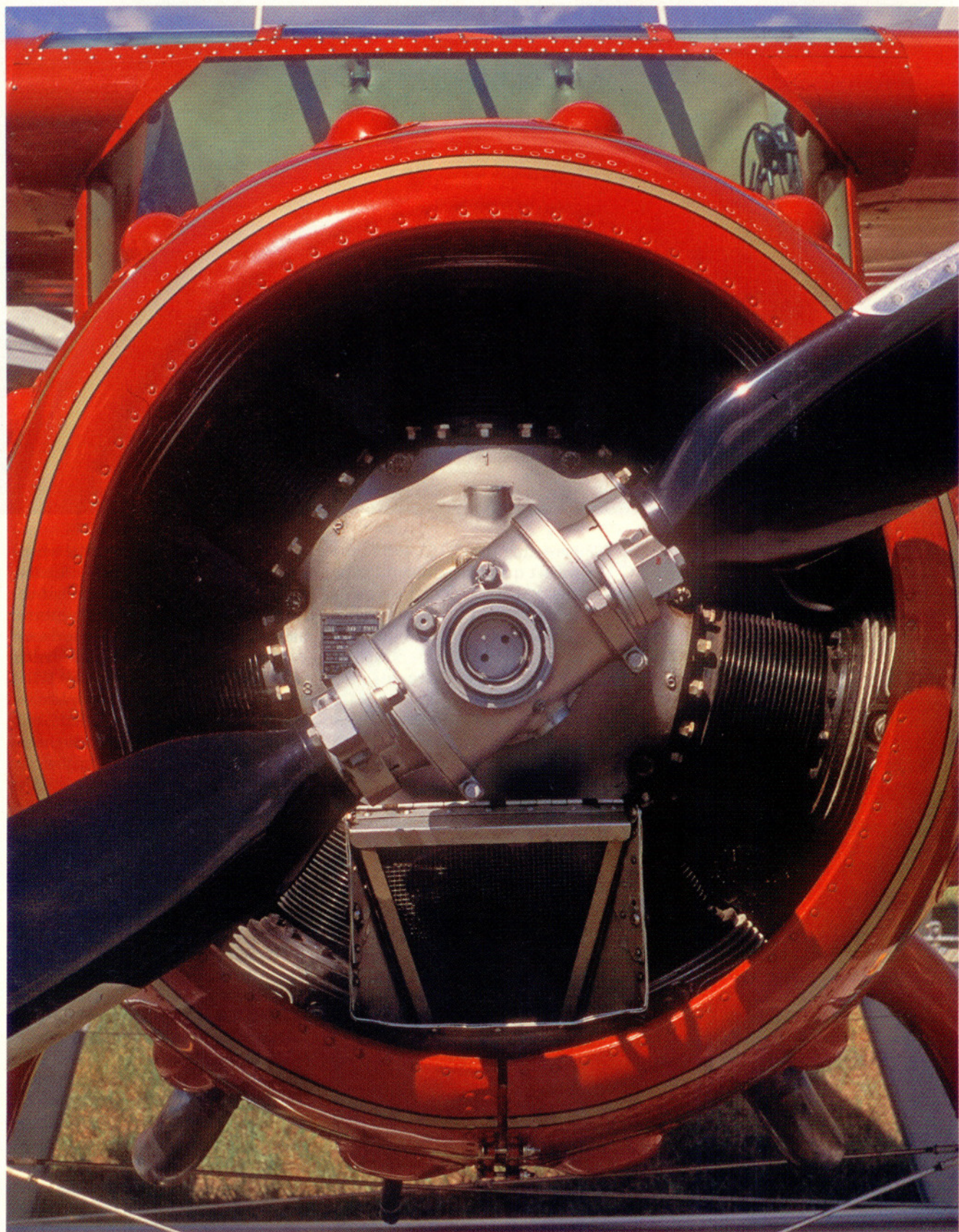
every single-engine Cessna aircraft built to this day.

The C-34 was equipped with a Warner Super Scarab seven-cylinder radial engine, rated at 145 horsepower, and tightly cowled in a NACA-style cowling. The top speed of this aerodynamically sleek little machine was 162 mph, and it cruised at 143 mph. Not many aircraft today can demonstrate a cruise speed matching its horsepower rating.

The fourth C-34 was entered in several events at the Cleveland National Air Races in 1935. The new airplane won the coveted *Detroit News* Trophy Race,

which involved tests of not only speed, but economy, passenger comfort, and safety, as well as takeoff and landing performance. Wallace flew another C-34 to an overall win in the *Detroit News* race at the 1936 All American Races at Miami. These races were focused on speed with efficiency, as opposed to races purely emphasizing speed. The title "World's Most Efficient Airplane" was attached to the Airmaster as a result of its performance in these races. That title stayed with the Airmasters throughout their production run and for years after production ended.









The C-34 continued in production until late 1936, when the design was slightly modified and redesignated the C-37. Perhaps this model's most significant difference from the earlier aircraft was that the upper portion of the C-37's passenger cabin was five inches wider than its predecessor's.

In 1938, more noticeable modifications were made to the design, culminating in the C-38, the first airplane in the series that was officially named Airmaster by Cessna. The landing-gear legs were bowed outward, providing nearly 11 inches greater tread width and significantly improving ground handling. The wing flaps were replaced by a hydraulically operated drag flap mounted between the gear legs on the belly of the aircraft. The vertical tail also was enlarged. The last C-38 built (serial number 415) became Wien's first Airmaster.

For the 1939 model year, Cessna continued to improve and fine-tune the Airmaster design, based largely on feedback from pilots. The drag flap on the belly was discarded in favor of a split-type flap assembly installed in the wings, and hydraulic brakes replaced earlier mechanical brakes that required a lot of maintenance. This model, the C-39, was first flown in September 1938, and soon after the designation was changed to C-145. Adding a larger version of the Warner Super Scarab engine

in 1939 creating the C-165. While the C-165 wasn't quite as efficient as the 145 model, its 75-percent cruise speed was a remarkable 157 mph. Finally, three C-165D models were produced in 1941; approved takeoff horsepower for the Warner engine was increased to 175 hp for short periods. A Hamilton Standard constant-speed propeller also was installed on these three aircraft.

The Airmaster introduced another feature that is still commonplace in modern Cessna singles: The C-37 Airmaster was the first Cessna converted to a seaplane by the addition of Edo 44-2425 straight floats, and eventually all of the Airmaster models received float approval. A Curtis Reed metal propeller was standard on the float-equipped aircraft, with greater diameter and flatter pitch for better takeoff performance. Maximum gross weight for the float-equipped Airmasters was 2,500 pounds.

#### The Wien connection

Wien Alaska Airlines operated five Airmasters, including both 145 and 165 models. Retired Wien pilot Holger Jorgensen recalls the Airmaster as being very fast for the day, an efficient airplane with an excellent useful load—making it nice for Alaska operations. Jorgensen never flew the float-equipped Airmaster, but he did fly the wheel- and ski-equipped airplanes extensively. Cliff Everts, also

an old-time Wien pilot, flew the wheel-equipped Airmasters as well. He notes that the aircraft was a fast cruiser but a "hot" airplane, referring to its ground handling, particularly on hard surfaces.

Merrill Wien, son of pioneer Alaskan pilot and airline founder Noel Wien, recalls a flight with his father to Nenana in the float-equipped Airmaster to pick up an expectant mother to take her to the hospital in Fairbanks. Merrill noted that the woman's husband insisted on accompanying her on the flight to Fairbanks. In the 8- to 10-knot current of the Tanana River, the foursome boarded the little floatplane for the trip to Fairbanks, some 35 miles up the Tanana River. Merrill's description of the takeoff was concise: "It got off the Tanana River OK, but it was a struggle." I suspect that may be somewhat of an understatement. The foursome landed in the Chena River near the hospital in Fairbanks, and the baby was born shortly thereafter.

Wien remembers the airplanes as being very efficient, with cruise speeds on wheels of around 140 mph with the 145 engine. He points out that the Cessna 170, which came out years later, could barely make 120 mph on similar horsepower. The first of the Wien Airmasters was a 145 and was equipped with conventional wing flaps. He notes that this was the best bush airplane of the five Wien Airmasters, because of the more effective flaps.



Merrill and his brother Richard recall several accidents involving the airline's Airmasters. Richard notes that at the time, the pilot-experience level at the airline was fairly low, and a fast airplane like the Airmaster could get a pilot in trouble quickly in bush operations. To this day, "the pilot's failure to attain/maintain flying speed" appears all too often in Alaska aviation accidents.

One of the Airmasters was lost while attempting to land. Another was destroyed when the pilot ran out of fuel in winter on skis, and tried to stretch his glide to a river. The propeller departed another Airmaster in flight. The sole float-equipped Airmaster was destroyed by fire on the ground, while parked behind the Wien hangar in Fairbanks when the hangar burned in 1948. The fate of the fifth Wien Airmaster is unknown.

### **The Larson Airmaster**

The Larson Airmaster is actually a C-165, serial number 467, produced in 1939. Brad Larson acquired the airplane in 1969 and flew it to his hangar at Flying Cloud Airport near Minneapolis, then stored it for several years. In the mid-1980s, the airplane was trucked to Santa Paula, California, where it was restored over a period of two and a half years. After the restoration, the elder Larson flew the Airmaster to events around the country, as did sons Glenn and Paul, who is also a Delta captain. Glenn Larson is a "snowbird," living in a Minnesota lake home during the summer months and annually "migrating" to a Florida winter home with his wife and young daughter. Glenn tried to convince Brad to allow him to install floats on the little Cessna.

The answer, obvious only to the younger Larson, was to "simply" install a set of *amphibious* floats on the Airmaster. Glenn approached Wipaire Inc., a manufacturer of aircraft floats located in Minnesota, about the project, and the die was cast. Most aviators have no idea of the difficulties involved in acquiring a supplemental type certificate for an installation as complex as a set of amphibious floats. Wipaire owner Bob Wiplinger went out of his way to facilitate the installation and approval of the amphibious floats. George Hindall in Florida took charge of the paperwork, and ensured that lines of communication remained open between the modifiers and the FAA's Atlanta Aircraft Certification Office. Since the Wipliner floats and the original Edo 2425 straight floats use very different struts and fittings, a good deal of engineering had

to be done to satisfy the FAA engineers. Finally, Wayne Muxlow, the owner of the prototype C-34 Airmaster, provided film of the original Edo float installation data, which was used to document stresses on the fuselage tubing to the FAA.

Most small amphibians don't have a great deal of useful load, so weight control is a significant and constant issue for most owners. Larson has gone to substantial lengths to lighten the empty weight of his Airmaster. For example, he located a supplier of an aircraft-approved interior material that closely resembles leather. He then removed the existing leather interior (yes, you read that correctly) and replaced it with the faux leather material, thus saving a whopping 40 pounds in the basic weight of the airplane.

### **Flying the Airmaster**

The combination of the little Cessna's small, efficient wing; a propeller optimized for cruise flight; and the absence of high-lift wing devices (the Larson Airmaster is equipped with split flaps) translates to a 15- to 20-second water run to get under way. While that's not particularly high performance compared to an aircraft like a Piper Super Cub, it's certainly not inordinately long either. But as I found, once the airplane is off the water, it is still one of the most efficient float-equipped airplanes around.

After takeoff, Larson and I climbed to 500 feet for a few circuits of the lake. Larson offered me the controls, and shortly after leveling off and establishing a cruise power setting, I was amazed to note the airspeed indicator wind up to 130 mph. Few small floatplanes can even come close to that speed. The Airmaster is a very stable airplane, and would be a comfortable cross-country machine. The cockpit is slightly narrower than a Cessna 150's, so occupants of average stature will be comfortable, but the cockpit might be a bit cramped for two large pilots. Landing the Airmaster is conventional, suggesting that the one-off float rigging design was done just about right the first time.

As is often the case in aviation, a chance observation—in this case, of a pretty little airplane in a faraway place in 1942—ignited a flame in a young pilot that continues to burn brightly today in two generations of a family of dedicated aviators. **ACPA**

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