

In the Museum: A French Treasure

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The Caudron G.4 served as a bomber and recon craft. The Museum's Caudron is one of only two in the world. (NASM NEG 2002-2589)

Squeeze past the mighty Boeing B-29 Enola Gay and the banana-yellow Northrop Flying Wing and you'll find the Caudron G.4, a French biplane bomber built in 1916. The Caudron is skewered on a cantilevered rack and braced against the corrugated walls of Building 20 at the Paul E. Garber Preservation, Restoration and Storage Facility in Suitland, Maryland. The Caudron and the dozens of other artifacts wedged inside are awaiting a 45-mile ride to Dulles International Airport in northern Virginia, where they'll take up residence at the National Air and Space Museum's Steven F. Udvar-Hazy Center next year.

For the past two years, Garber restoration specialists Ed Mautner, Scott Wood, and Caudron team leader Karl Heinzl have meticulously conserved and repaired the French bomber. Now, as preparation for the Caudron's eventual transport to Dulles, they've stripped its 7.7-mm machine gun, tail booms, dual propellers, and wingtips to streamline the load. And Heinzl is thinking outside the box. With a wingspan of just over 56 feet, "the Caudron airframe is eight inches too wide for a box trailer," he says. "But with a fabric-sided trailer, we can kind of stretch the truth."

On December 27, 1916, the two-week-old Caudron G.4, no. C4263, made its first flight, at Issy-les-Moulineaux, near Paris. The pilot climbed to 3,280 feet in seven minutes. Shortly after, C4263 was sent to the Réserve Générale of the Aviation Militaire Française. "As near as we can figure, it has no operational experience," says Heinzl. "They would have used castor oil to lubricate the rotary engine, and there's not a single streak."

The Museum's Caudron is a rare prize, among the oldest surviving bombers and the only very early multi-engine airplane in the Smithsonian collection. Only one other Caudron survives, a fully restored example at France's Musée de l'Air. The Caudron G.4 was one of the first Allied aircraft armed with a machine gun. By war's end, the Caudron, which had a top speed of 82 mph, was manufactured not only in France but also in England and Italy and was used by all Allied powers, from Belgium to China and Russia. Britain's Royal Flying Corps used Caudrons to bomb German seaplane and Zeppelin bases.

French brothers Gaston and René Caudron built the machine to pre-war norms. Lateral control was achieved through wing warping. A Caudron G.4 weighed only 1,616 pounds empty, was mechanically reliable, and was pleasant to fly, making it ideal for reconnaissance and flight training. The bomber version could carry 249 pounds of ordnance, and the trainer offered dual controls. Including all three variants, a total of 1,358 Caudrons were manufactured.

Early in 1917, Caudron no. C4263 was purchased by the U.S. government, and photographs show it at Langley Field in Hampton, Virginia, by July 26, 1917. Four months later, the U.S. ordered 10 more. "There was nothing particularly special about the Caudron," says Museum aeronautics curator Peter Jakab. "When we entered the war in 1917 there wasn't time to work on original designs. The thinking was to test established European designs and build one." By the time the Caudron was shipped to the United States and reassembled, it was obsolete. On July 12, 1918, the War Department offered the Caudron to the Smithsonian, and it was delivered to the Arts and Industries Museum two months later.

Heinzl fingers a 1916 drip of paint on the wing fabric. "The public thinks of restoration as shiny new and glossy, but a vintage aircraft in real wartime condition looks terrible," he says. Like most battlefield deliveries, the Caudron was hastily assembled in the field, then painted with a rough brush. "We restore them to historic accuracy," says Heinzl. "Museum visitors think we were just sloppy."

The first task was replacing the makeshift display engine. One 80-horsepower Le Rhône, original to the period, was found and installed. The second rotary engine was missing its nine copper intake pipes, so Heinzl and Jakab went prospecting. "When these engines were junk surplus in the 1930s, people scavenged them for the copper pipes," says Jakab. Now, he notes, "other museums need intake valves, so they are very desirable in the antique restoration market." The price in barter was too high. "Some individuals wanted us to trade whole engines for copper pipes," he says.

Heinzl leans in. "I'm full of secret tidbits," he whispers. "There is a cutaway engine at NASM of the FE-8, in the World War I exhibit. We took off those copper intakes, cast them in

resin, and reinstalled the casts [on the FE-8]. We did such an accurate reproduction you can't tell." Heinzl's team placed the real deals into the Caudron.

A propeller original to the period was found and installed, and Heinzl's team precisely copied its pattern in walnut wood for the other engine. Propeller decals will be duplicated to match those of the original French manufacturer, Gremont.

For now the props, original and copy, are in storage at Garber. Future generations will not be able to easily distinguish the original from recent craftsmanship. Except perhaps, for the stencil on the new propeller's center, which will be hidden when mounted. "NASM 2001 KLH" it reads. Karl L. Heinzl grins and glances at his feet.