

## Gossamer Condor - the first of its kind

A human-powered airplane built by Dr. Paul MacCready, Jr.

#### By Alyce Moncourtois, Content Marketing

Dr. Paul MacCready, Jr., had an unorthodox approach to aviation design, one that paid high dividends throughout his lifetime. His philosophy was to design and build for quick iteration, and he is quoted as saying, "Find a faster way to fail, recover, and try again." That methodology certainly worked for the design of the Gossamer Condor, the first successful human-powered aircraft.

In 1959, British industrialist Henry Kremer put out a challenge to build a human-powered airplane and attached a substantial monetary prize for the winner. For 18 years, nobody could do it. Dr. MacCready was up for the challenge. Only six months after attempting his aircraft design, a pilot successfully flew the Gossamer Condor. The difference? While others needed a year's worth of effort for each test flight, Dr. MacCready created a plane that he could fly, fix, and fly again in just a few hours.

Dr. MacCready first conceived the idea of building a human-powered aircraft in mid-July 1976. In relating his story, he referred to the Turkey Vultures he saw flying during a family road trip through the Western United States and drew inspiration from their wings. He began by considering how much energy a human could produce and then attempted to design a wing and aircraft around that power source. After creating several models to test structural designs, Dr. MacCready and his team began building the first complete aircraft in October. The first significant flight, one of 40 seconds, took place on December 26. Throughout the first part of 1977, modifications steadily improved control and efficiency. In August 1977, it was ready to be tested.

On August 23, 1977, the Gossamer Condor demonstrated sustained, maneuverable flight for 1.35 miles and earned the coveted Kremer Prize. The aircraft was piloted by Bryan Allen and took off from Shafter Airport, Shafter, Calif., at 7:30 a.m. It landed 7 minutes and 27.5 seconds later. The official route was a figure-8 course around pylons a halfmile apart. Its flight speed was between 10 and 11

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– Dr. Paul MacCready, Jr.

mph, with Allen, a championship bicyclist and hangglider enthusiast, developing one-third horsepower.

Dr. MacCready and Dr. Peter B. S. Lissaman, both of Pasadena, Calif., designed the Gossamer

#### Dr. Paul B. MacCready, Jr.

(September 29, 1925-August 28, 2007) was an American aeronautical engineer who devoted his life to developing more efficient transportation vehicles that could "do more with less." Dr. MacCready founded AeroVironment in 1971 based on this concept. He pioneered the use of alternate energy sources in aviation, developing vehicles and devices for both military and commercial use that struck a balance between nature and technology. His other credits include<sup>2</sup>:

- He was enshrined in the National Aviation Hall of Fame in 1991.
- He was named Engineer of the Century by the American Society of Mechanical Engineers.
- He was selected Graduate of the Decade by the California Institute of Technology.
- He was named one of the 100 greatest minds of the 20th century by Time Magazine.•





# PROCEED-WITH CEREMANY

Condor, which was made of thin aluminum tubes covered with Mylar plastic and braced with stainless steel wires. The leading edges were made of corrugated cardboard and styrene foam. Built according to his philosophy, the Gossamer Condor had a distinct advantage over previous manpowered aircraft because it could be quickly modified or repaired. After a crash, it could be returned to flying condition within twenty-four hours, enabling the aircraft to be tested extensively and easily improved. Dr. MacCready's team did not attempt to adopt the conventional wisdom, which was to adapt a traditional aircraft design for manpower; instead they designed an aircraft solely for its manpowered mission.

As Aza Raskin explains in his piece on Dr. MacCready's philosophical approach to the design and development of the Gossamer Condor<sup>1</sup>, "The problem was the problem. MacCready realized that what needed to be solved was not, in fact, humanpowered flight. That was a red herring. The problem was the process itself. And a negative side effect was the blind pursuit of a goal without a deeper understanding of how to tackle deeply difficult challenges. He came up with a new problem that he set out to solve: How can you build a plane that could be rebuilt in hours, not months? And he did. He built a plane with Mylar, aluminum tubing, and wire."

The award winning flight of the Gossamer Condor led to Dr. MacCready being nicknamed the "Father of Human-Powered Flight." In January 1978, the Gossamer Condor was donated to the Smithsonian Institution's National Air and Space Museum.

#### References

Wikipedia

 <sup>1</sup> Extracted from "How Nature and Naiveté Helped Paul MacCready Build a Human-Powered Airplane in Only Six Months"
<sup>2</sup> Avinc.com, press release, March 4, 2004, and



Gossamer Condor hangs in the Smithsonian Institution's National Air and Space Museum. Photo credit: NASM

