

American Institute of  
Aeronautics and Astronautics  
**HISTORIC AEROSPACE SITE**



**Pitcairn Field**  
Willow Grove,  
Pennsylvania



*The first rotary-wing flight in America, with Arthur Rawson flying a Cierva C.8W Autogiro at Willow Grove, 18 December 1928.*

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*Harold and Clara Pitcairn, summer, 1918.*

In 1920, an innovative Spanish aeronautical engineer and pilot named Juan de la Cierva had an idea for a single-rotor aircraft that would use the rotor to lift the craft vertically. In 1923, he developed the articulated rotor, which resulted in the world's first successful flight of a rotary-wing aircraft, his C.4 Autogiro. De la Cierva continued to refine his invention, and two years later, demonstrated his C.6 Autogiro in Britain, going on to found the Cierva Autogiro Company there in 1926. A still-later version, the C.8, was a refinement of the C.6 with a more powerful engine.

At the same time in the U.S., a young engineer of similar age named Harold F. Pitcairn was also developing an interest in aviation. Pitcairn's father, John Pitcairn Jr., was a Pennsylvania industrialist who co-founded the Pittsburgh Plate Glass Company (which later became PPG Industries). Harold Pitcairn began his aviation career as an apprentice with the Curtiss Aeroplane and Motor Company, but left to attend business school. Toward the end of the first world war, Harold Pitcairn began his flight training, and after the war realized the business sense of starting an air passenger and sightseeing company. In 1924 he established the Pitcairn Flying School and Passenger Service, and he eventually grew a thriving mail service business.

To increase his business, he decided to develop his own aircraft, and purchased some land near Horsham, Pennsylvania, which he named Pitcairn Field #2. There he started the Pitcairn Aircraft Company, whose first plane was the PA-1 Fleetwing. Agnew Larsen, an aircraft designer, whom Pitcairn had met

in flight school, left the Thomas Morse Aircraft company to join Pitcairn. In the late 1920s, they bid on and won a contract airmail route, C.A.M. 19, but soon realized that the aircraft of the time were too large and slow to be profitable, so they created the PA-5 Mailwing, which proved to be so popular for airmail that it was bought by thirteen other companies.



*A Pitcairn Aviation Mailwing in use delivering mail.*

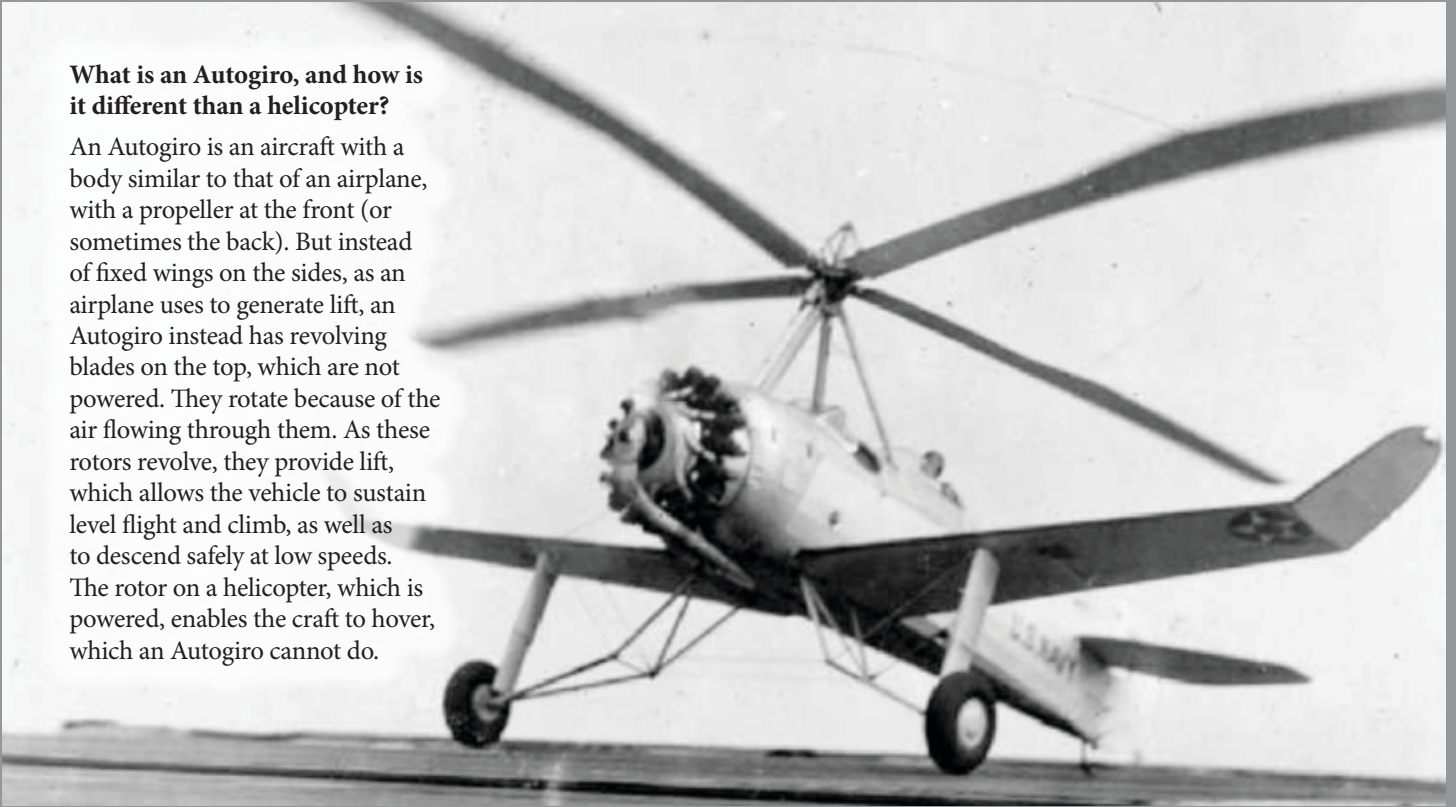
The two also continued to experiment with rotary-wing flight, which had fascinated them since their days in flight school. By this time Pitcairn had heard of the Cierva Autogiro Company, and he grew fascinated with Autogiros, the idea of vertical flight, and its implications for safe flight. In 1928, he purchased the rights to manufacture the Cierva Autogiro in the United States for \$300,000. A C.8 Autogiro, with an American Wright engine – resulting in the designation of C.8W – was transported to the U.S. and reassembled. On Tuesday, 18 December 1928, Cierva factory pilot Arthur Rawson, and then Harold Pitcairn, flew a Cierva C.8W Autogiro from Building # 3 at Pitcairn Field # 2 in Willow Grove. Flown almost 25 years to the day after the Wright brothers' historic Kitty Hawk flight, this was the first successful rotary-wing aircraft to fly in America, and it ushered in a new age of aeronautical development.



*Harold Pitcairn and Agnew Larsen, 1941.*

### What is an Autogiro, and how is it different than a helicopter?

An Autogiro is an aircraft with a body similar to that of an airplane, with a propeller at the front (or sometimes the back). But instead of fixed wings on the sides, as an airplane uses to generate lift, an Autogiro instead has revolving blades on the top, which are not powered. They rotate because of the air flowing through them. As these rotors revolve, they provide lift, which allows the vehicle to sustain level flight and climb, as well as to descend safely at low speeds. The rotor on a helicopter, which is powered, enables the craft to hover, which an Autogiro cannot do.



Almost immediately, Pitcairn began to tinker with the design, and concentrated most of his attention on Autogiros, which led to the formation of the Pitcairn-Cierva Autogiro Company (PCA). Building # 3, the only remaining structure from the Willow Grove field, became the center of American Autogiro manufacture. In order to fund his new company, Pitcairn decided to sell his airplane company. The buyer was C.M. Keys, who in 1930 renamed the company Eastern Air Transport, Inc., which a few years later became Eastern Airlines. The money Pitcairn received allowed him to fund his Autogiro work, and he dreamed of safe, fast, personal travel for everyone.

His first design, which he designated the PCA-1, modified the PA-5 Mailwing

fuselage. Pitcairn used this model to demonstrate the Autogiro's benefits, not only around the Willow Grove area, but farther afield – even flying to Langley, Virginia for a demonstration to the National Advisory Council on Aeronautics, the predecessor of NASA. While there, he also gave a demonstration to the Navy.

As Harold Pitcairn advanced rotary wing development through a series of original designs, including the PCA-2, PAA-1, PA-18, PA-19, PA-22, AC-35, and PA-36, he excited the public's imagination to the possibilities of such aircraft and amassed a portfolio of technical patents that would become vital to helicopter development in America.



*A PCA-1 and a PCA-2 flying over New York.*

One of the more unusual challenges was getting the vehicles certified by the FAA – there was no precedent for the vehicle – so the FAA had to build their entire rule book from their experience with Pitcairn's vehicles.



### The Collier Trophy

The Robert J. Collier Trophy is an annual award administered by the U.S. National Aeronautics Association (NAA), awarded “for the greatest achievement in aeronautics or astronautics in America, with respect to improving the performance, efficiency, and safety of air or space vehicles, the value of which has been thoroughly demonstrated by actual use during the preceding year.” The award, funded by Robert Collier, the publisher of *Collier’s Weekly* magazine, was originally given by the Aero Club of America and was called the Aero Club of America Trophy. It was renamed for Collier, who had died in 1918, when the Aero Club dissolved and the award was taken over by the NAA. The 525-pound trophy is on permanent display at the Smithsonian National Air and Space Museum in Washington, D.C.

*photo courtesy of NASA.*



*Pilot Jim Ray slowly landing a PCA-2 on the White House lawn, 22 April 1931.*

In April 1931, Pitcairn received a letter from an old friend, former U.S. Senator Hiram Bingham, who was by then the president of the National Aeronautics Association. The letter said:

*Dear Mr. Pitcairn:*

*I am pleased to advise you that upon unanimous report of the Collier Trophy Committee for the National Aeronautics Association, the Collier Trophy Award for 1930 is made to “Harold F. Pitcairn and his associates for their development and application of the Autogiro and the demonstration of its possibilities with a view to its use for safe aerial transport.”*

Pitcairn had now joined the likes of Orville Wright, Elmer Sperry, Glenn Curtiss, and other major names in aviation, with his small suburban airport and private company. Although Agnew Larsen and other company employees would be there, Pitcairn had hoped that Juan de la Cierva could also be there for the presentation. He was informed that the ceremony would be at the White House, by President Herbert Hoover at his convenience, and the date could not be changed. On the day of the presentation, one of Pitcairn’s pilots flew a PCA-2 to a perfect landing on the White House lawn, filmed by the press and later shown in movie houses all over the country.



*At the Collier Trophy ceremony (from left): Orville Wright, President Herbert Hoover, pilot Jim Ray, Assistant Secretary of Commerce for Air Clarence Young, Senator Hiram Bingham, and Harold Pitcairn.*



*Completed Autogiros lined up for delivery at the Pitcairn Willow Grove factory.*

In the late 1950s the company became embroiled in a number of patent law issues, and ultimately sued the U.S. government. The company eventually won the case and was awarded over \$32 million, but not until 1977, 17 years after Harold Pitcairn's death. In 1948, Pitcairn Field was sold to Tinius Olsen, a testing machine manufacturing company. The company renovated the existing manufacturing structures and proudly celebrates the accomplishments of the previous company.

Although during World War II the Autogiro was eclipsed by the helicopter, which could hover, helicopters were only successful due to the technologies invented by Juan de la Cierva. When Sikorsky began to manufacture the first helicopters in America, they each included a plate with the 39 patents licensed from Pitcairn's Autogiro Company of America. All of today's helicopters owe their existence to the first successful rotary-wing aircraft, and the large number of helicopter companies in the Philadelphia region, including Boeing, Piasecki, Sikorsky Global (formerly Keystone), and AgustaWestland, are a testament to that first Autogiro flight in America.

## FOR FURTHER READING

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## THE AIAA HISTORIC AEROSPACE SITES PROGRAM

For over 75 years, the American Institute of Aeronautics and Astronautics (AIAA) has served as the principal society of the aerospace engineer and scientist. Formed in 1963 through a merger of the American Rocket Society (ARS) and the Institute of the Aerospace Sciences (IAS), AIAA now serves a diverse range of more than 35,000 individual and corporate members from 80 countries.

AIAA's wide variety of programs keep our members at the cutting edge of new thinking, best practices, and stimulating idea exchanges. We convene the profession's most original thinkers and curate the essential research information our members rely on to inform and inspire their work. That may be why AIAA members have been involved in nearly every advancement in modern U.S. aerospace – from major space missions and the modernization of the aviation system to the many inventive uses of aerospace technology to improve everyday life.

At AIAA, we are dedicated to igniting and celebrating aerospace ingenuity and collaboration, which fulfills the human drive to explore, create, and be a part of something bigger than ourselves. It's all part of our shared commitment to inspire innovation and drive technological progress in the U.S. and throughout the world.

In honor of the long tradition of aerospace achievement, in January 2000 AIAA established the Historic Aerospace Sites Program, to promote the preservation and dissemination of knowledge about significant accomplishments of the aerospace profession. More than 35 historic aerospace sites have been officially recognized, including the site of the first balloon launch, in Annonay, France; Getafe Air Base in Spain, the site of the first Autogiro flight; "Aunt Effie's Farm" in Massachusetts, where Robert H. Goddard launched the first liquid-fueled rocket; Kitty Hawk, North Carolina, where the Wright brothers flew the first successful powered aircraft; and Tranquility Base, where humans first landed on the moon.

*Most photographs in this booklet are from Legacy of Wings: The Story of Harold F. Pitcairn, by Frank Kingston Smith.*



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