

Inventions of the Air

Series: Inventions in North Carolina



Francis Rogallo with hang glider, 1970s. Courtesy of the Outer Banks History Center, Manteo.

Imagination is an important aspect of flight. The Wright brothers studied birds and dreamed of flying. They made that dream a reality with hard work and experimentation, but imagination created the dream and provided the inspiration. Others, in North Carolina, have invented their own flying machines.

A rotary-type flyer, the gyrocopter, was built by Igor Bensen of Raleigh. Bensen was born on April 1, 1917, in Russia. He attended college in New Jersey in the late 1930s. In 1939, Bensen took a summer job with Igor Sikorsky, the father of the modern helicopter. Bensen worked as a research scientist

before starting his own company, Bensen Aircraft Corporation, near Raleigh-Durham Airport.

Bensen began building gyrocopters in 1953. In a gyrocopter, no power is used to turn the overhead blade. Instead, the engine powers a pusher prop that drives the machine forward. As the gyrocopter picks up speed increased airflow through the top rotor causes it to spin and creates lift. If the engine ever loses power, the overhead blades autorotate and the machine floats down like a parachute.

Bensen wanted to mass-produce a “People’s Flying Machine” so he designed his craft to be simple to assemble and operate, and inexpensive. Bensen sold around 10,000 gyrocopter kits. His clients included diamond prospectors in the Amazon, crop dusters in the United States, and James Bond! In the 1967 movie, *You Only Live Twice*, Bond piloted a highly-modified gyrocopter he called “Little Nellie.” The rocket-launchers and smoke screens used in the movie were not standard features in the gyrocopter kits.

Bensen set world records for speed (79 mph), altitude (7,275 feet), and distance (82.76 miles) in a gyrocopter named “Spirit of Kitty Hawk.” The Bensen Aircraft Corporation closed in 1989 but one of Bensen’s gyrocopters is on permanent display at the North Carolina Museum of History in Raleigh.

Another scientist who wanted to make flight possible for everyone is Francis M. Rogallo. Rogallo joined NASA, then known as the National Advisory Committee for Aeronautics (NACA), in 1936. He devoted himself to designing a flexible wing—one that could be applied to man-carrying devices such as gliders. With the help of his wife Gertrude, Rogallo built a wind tunnel at home and began testing wing models. In 1951 the Rogallos

were granted a patent on a flexible delta-shaped (triangular) wing. The prototype of today's hang glider was made from one of Gertrude's kitchen curtains!

The Rogallos tried to interest government and industry in their design, but were unsuccessful. Instead, they began producing flexible-wing kites as children's toys. The Rogallo Flexible Wing Flyer was one of the first products to use the plastic Mylar. Unlike standard kites, it could crash multiple times and not be damaged.

The Rogallos and their four children began flying the first full-scale, flexible-wing hang gliders in the sand dunes of the Outer Banks. The sport of hang gliding really took off in the early 1970s. Today, hang gliding events occur at places like Jockey's Ridge and Grandfather Mountain. Hang gliding enthusiasts everywhere honor the "father of hang gliding" Francis Rogallo.