



*Jud Hoover*

## FREDERICK JOHNSON HOOVEN

*1905–1985*

BY MYRON TRIBUS

**F**REDERICK JOHNSON HOOVEN died suddenly on February 5, 1985. At the time of his death, he was professor of engineering at Dartmouth College's Thayer School of Engineering.

Fred was born in Dayton, Ohio, on March 5, 1905, and grew up in Dayton near the home of the Wright Brothers, whom he came to know and admire. Nearly a half century later, he used data they had obtained in their wind tunnel to design the paper airplane that won the "professional" duration-aloft category (in a field of 10,000 entrants) in the Scientific American Great International Paper Airplane Contest.

Fred Hooven loved to invent things. He held thirty-eight U.S. patents and devised numerous other inventions he never bothered to patent. He invented the first radio compass (1936), which was the initial aircraft navigation system that permitted distinction between forward and backward direction.

Hooven was particularly unhappy that his new system was removed at the last minute from the airplane of his friend Amelia Earhart and replaced with the standard system of that time. Many people believe it was this less sophisticated navigation capability that caused her to overfly her destination and become lost. Of his invention, Hooven said: "It was my own idea and it completely dominated the scene for that kind of device for a time roughly corresponding to the life

of the DC-3. It's made it routine to cross the ocean, where before it was an adventure."

Other of his inventions included a bombing intervalometer (1944); an automobile ignition system; the shoran bombing computer (1948); the first heart-lung machine, which is still in use today in open-heart surgery (1952); the Harris intertype digital electronic phototypesetter (1955); and a front-end drive system for automobiles (1962).

Fred Hooven's engineering career started well before he graduated from the Massachusetts Institute of Technology (MIT) in 1927: In 1925, at DayFan Radio, he designed improved radio receivers. After his graduation from MIT, he joined the staff of General Motors (GM) and designed a brake shoe system that was installed on all GM vehicles for the next twenty-five years. After two years at GM, however, he left the company for a position at the Dayton Rubber Company, where from 1930 to 1931 he designed automobile suspension systems. He next worked in the field of aircraft performance for the U.S. Army Air Corps.

During 1931 and 1932, Hooven designed a blind aircraft landing system for the American Loth Company. Also in 1932 he independently produced the first successful high-fidelity crystal phonograph pickup. Then, as vice-president and chief engineer for Bendix's Radio Products Division from 1935 to 1937, he developed the first automatic steering system for an unmanned flight. From 1937 to 1957, Hooven was self-employed as an independent inventor, consultant, and contractor for new product research and development.

In 1957 Fred Hooven went to work for the Ford Motor Company. (A GM executive described him as a "Ford trade secret.") Yet, although he invented the front-end drive system used by GM on the Oldsmobile Toronado and Cadillac Eldorado, he could not persuade Ford to use this invention. Nevertheless, at Ford he supervised the design and development of the Falcon, Thunderbird, Fairlane, and Galaxie automobiles.

Recalling those years at Ford, Lee Iacocca writes:

The thing I remember most about Fred is that he said future cars would not be built the way cars were built then. Front-wheel-drive was the way of the future and rear-wheel-drive was antiquated. He would say, "It's silly to design cars the way we do. Why not put a power pack up front just like a horse? A horse will pull anything. Behind it you could put a fire truck, a station wagon, two people, four people, six people limousines." And of course it turned out that way, the way Fred said it would. We do have front-wheel-drive minivans today that were a glint in his eye then because he said that is the way to do efficient packaging.

Hooven left Ford in 1967 to once again become a consultant and also adjunct professor of engineering at the Thayer School of Engineering. He became a part-time professor in 1975 and remained in that capacity until his death.

Fred Hooven enjoyed engineering. In fact, he enjoyed everything he did. Hooven was interested in both model railroads and photography. He rebuilt a lens for a 35mm camera to provide extreme field depth and used it to produce a photograph of a model locomotive in front of the train station at White River Junction that was so skillfully done that it looked like an actual locomotive. (The photograph was even used on the cover of *Model Railroading* magazine.)

Hooven had fun with engineering; he built paper and balsa wood airplanes for his children and for the child he kept alive within himself. Some of these planes were propelled with carbon dioxide cartridges and were perhaps the first jet-propelled model airplanes. He also built a binary counter as a toy to amuse his grandchildren.

He liked to study whatever was new. He conversed intelligently with others about special relativity and quantum mechanics. While in his seventies, Fred Hooven continued his innovative work in the areas of prosthetic orthopedic bone replacements, music synthesizers, lightweight autos, and computerized medical diagnoses.

Fred was truly a classical engineer. He viewed the world's problems in terms of their potential solutions. His impact on students and associates was extraordinary. Fred could stretch the reach of others: He could make them broaden their horizons in terms of the problems they tackled and the ways in which they approached them. Fred Hooven was truly an inspiring teacher, colleague, and friend.

He gave of himself to others. A partial list of his public service activities includes the following: volunteer research associate in biochemistry and psychophysiology, FELS Institute for the Study of Human Development; member, Board of Education, Oakwood, Ohio; trustee, Miami Valley Hospital, Dayton, Ohio; trustee, Charles F. Kettering Foundation; founding member, Oakland University, Rochester, Michigan; member, visiting committee, MIT; member, Commerce Technical Advisory Board, Panel on Electric Automobile and Air Pollution; and reviewer for the UFO Sighting Committee.

Fred Hooven wrote numerous articles that were designed to demonstrate the historic significance of various inventions. He reviewed in detail the data from the Wright Brothers' wind tunnel, proving by computer simulation that their original design was unstable. He commented: "A bicycle is also unstable. They were bicycle makers so they could fly it."

Those of us who were fortunate enough to know him will remember him as a wise man—one of those fully developed human beings whom we are sometimes privileged to encounter during a lifetime. Fred Hooven was warm, sympathetic, and kindly. He would often take the other side of an argument just to make someone think a little harder. He would confront other people and their ideas in such a way as to make them go home and rethink their position—yet never in such a way as to make them love him less.

Fred Hooven was devoted to his wife Martha, with whom he had three sons and a daughter. I miss him deeply.

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