

Project Pioneer: Milt Davis, Sr., is premiere wind tunnel expert at AEDC

Shortly after 16-year-old Milt Davis, Sr. graduated from high school in 1942 and started working at his first "real" job; he knew the career he wanted to pursue. That first job, an under-aircraft model maker at National Advisor Committee for Aeronautics (NACA), the predecessor to NASA, lasted only six months, but it set the stage for a 40-year career in wind tunnel testing, design and development at the U.S. Air Force's Arnold Engineering Development Center (AEDC) and other places in the U.S. and abroad where cutting-edge aeronautical and aerodynamic research and ground testing was conducted.

Davis was one of eight children born to a father who was a Colorado rancher and a mother who took her children's education very seriously. His mother ensured her children had the best education, wherever it was locally available. Davis vividly recalled attending one school in rural Colorado that he jokingly referred to as the "smallest school in the United States."

When he turned 16, he sold his horse, borrowed \$50 from his father and headed across the country to Langley, Va., to begin that first job as a wind tunnel technician at NACA. The trip took him a long way from home, and it also introduced him to a new world he was soon to enter in earnest.

"I wanted to be an aeronautical engineer and work in wind tunnels," he said, recalling how he had learned of that first job at NACA, which had included Orville Wright as one of the organization's original founders. "It was advertised in the *Model Airplane News*. I applied for a job; they sent me a wire that said 'You're hired.'"

Six months later, Davis returned home to attend college. World War II had begun less than two years before, and, shortly after turning 18, he joined the Navy.

"I served in the V5 and V12 programs, Navy ROTC and I graduated from Georgia Tech as an ensign in 1946," he recalled. He started out training to become a pilot, but later the Navy transferred him to a curriculum geared for officers who would serve in the surface Navy. He ended up with two bachelor's degrees from Georgia Tech, one in basic engineering and the other in aeronautical engineering.

Prior to attending Georgia Tech, he had taken calculus courses at a couple of what were then referred to as teacher's colleges, one in Kansas and another in Colorado. Although he had high scores, Georgia Tech officials strongly advised him to retake the same math courses. They knew Georgia Tech's math curriculum was more demanding than what he had experienced in the other schools. But Davis didn't want to waste time.

"I insisted on going on, and, as a consequence, I got a bachelor's degree in basic engineering in '46 and another bachelor's degree in aeronautical engineering in '48," he said.

At age 21 he married his wife Valerie and they were soon raising a family. He went to work for United Aircraft Corp, in East Hartford, Conn. Jets had just begun to revolutionize the aircraft industry and it was his job to help conduct wind tunnel testing on propellers in an effort to compete with the emerging threat of jet engines.

Three years later, despite all the company's efforts, physics proved the futility of trying to get propellers to keep up with the speeds jets provided. Davis then went to work for the Sandia Corp., in what he described as the engineering arm of the nuclear weapon triad.

"I was in the wind tunnel group that was responsible for the aerodynamics of nuclear weapons. We were in the early throes of developing a thermonuclear, two-stage weapon - a hydrogen bomb."

In 1957 he came to AEDC, initially working for Heinrich Ramm, one of a core of scientists originally from Peenemunde, Germany's premiere scientific wind tunnel complex during World War II that conducted testing on the V2 rocket.

He went to work at the 16S wind tunnel, which was in the midst of being built.

"It had all been designed by Sverdrup and Parcel," he said. "We were working with the (Army) Corps of Engineers to construct it. We eventually, through the leadership of Dick Rebmann, AEDC fellow Rudy Hensel and Herman Collier and others, brought the tunnel into calibration."

Davis bluntly explained the challenge of working at PWT, saying, "The biggest supersonic wind tunnel, until they built the 16-foot supersonic wind tunnel, was about 24 inches. They would have been better off if they had built some intermediate sized ones before they went full scale. Heinrich Ramm had built the 20-inch or so tunnel at Peenemunde (Germany) where they developed the V2 rocket. He jumped from that to the head of the supersonic branch under Rudy Hensel, who had worked with Dr. Theodore von Kármán."

To prove he was up to the challenge of working at 16S, he was tasked to conduct an aerodynamic test on the T-38 (Talon jet trainer) in the center's 16-foot transonic tunnel. "They thought I had to at least do that in order to get educated on how to run tests in large wind tunnels."

A sense of pride, tempered by a desire to properly credit his co-workers and those who worked for him at AEDC, is evident when Davis is asked what he considers his greatest accomplishments. Bringing 16S into operation was one highlight of his career. He described the design of 16S's nozzle as an "engineering miracle." He is particularly proud of being "the father" of 4T, but he also listed a long list of former and current AEDCers who all played an important role in the development and success of 4T and the other facilities he worked on.

AEDC Fellow Dr. Edward Kraft considers Davis the center's premiere expert on the design and operation of wind tunnels. "Mr. Davis has been involved in more wind tunnel design studies than perhaps anyone in the country," he said.

In 1988, Davis retired from AEDC and went to South Africa to teach a Sverdrup-sponsored course on basic wind tunnel aerodynamics to young engineers with the South African Council for Scientific and Industrial Research.

He remained in South Africa for a year and a half, as a consultant to CSIR for Davis Engineering, his own company.

"I've been working for Davis Engineering ever since, whenever I can get a job," he said, adding, "I've been back to AEDC on several consulting contracts, as Davis Engineering."

In 1999 and 2000, his most recent work for AEDC involved researching, documenting and publishing all of his colleague's corporate knowledge of the 16S wind tunnel.

"All of that corporate knowledge has been almost lost because the people have retired, died or moved away," he said.

Milt Davis Sr.'s legacy goes beyond his accomplishments with advances in wind tunnel design, development and research. His son, Milt Davis, Jr. and grandson, Chris Davis, both work for Aerospace Testing Alliance at AEDC.

Milt Davis, Jr., who has a doctorate in Mechanical Engineering from Virginia Tech, is a gas turbine propulsion analyst and project manager working in the computational modeling and simulation section of the Applied Technology Branch of the Integrated Testing and Evaluation Department. Chris Davis is a computer scientist also working in the Applied Technology Branch supporting data acquisition and aiding in developing new test acquisition techniques.



From left, Milt Davis, Sr. and a machinist look at a variable-angle pitot probe at PWT in 1964.



From left, Chris Davis, Milt Davis, Sr., and Milt Davis, Jr., stand in front of PWT in 2003. As far as Mr. Davis, Sr., knows, his is the only family at AEDC with three generations employed at the same time by center contractors.