Frank H. Duke began his aviation career flying for the navy and the marine corps, starting first with fixed-wing aircraft and later moving to helicopters. During his career with Boeing as a test pilot, he flew four first flights and appeared on the cover of three issues of Aviation Week and Space Technology.

HFI: Frank, when and where were you born?

Duke: I was born on January 30, 1932, in our family home in Prospect Park, Pennsylvania. The town was very small — only 16 blocks by about three-quarters of a mile. The schools were very small; my 1949 graduating class consisted of 47 students. It was one of the smallest schools in the county.

HFI: What was your career outlook as a young man?

Duke: After high school, I had no clue what to make of my life. I did not immediately enter college, much to my parents’ dismay. To help me define my career path, my parents had me undergo testing at a nearby college. The testing concluded that the areas of real estate, art/architecture, and aviation might be good fits for me. While I was above average in art, I had never considered a career in aviation.

HFI: You initially chose the architecture career path.

Duke: After almost a year of working as a carpenter’s helper, my parents enrolled me at Pennsylvania State College (now Pennsylvania State University) in the architectural engineering program. I soon learned that included a five-year curriculum with classes six days per week. It was one of the most time-consuming majors on campus.
In the early 1960s, Duke made most of the test flights for Boeing’s CH-46 Sea Knight, including autorotations into the Patuxent River, with no power or flotation devices.
assigned to Advanced Flight School in Corpus Christi, Texas.

**HFI:** Upon completing flight training, all NAVCADS were given the option to serve in the navy or the marine corps.

**Duke:** All those to be assigned were gathered together and the officer in charge instructed all NAVCADS to leave the room, so the officer students who had been commissioned upon college graduation could be assigned. I opted for the navy. Returning to the classroom, all those who had not opted for the marine corps were requested to again leave for 15 minutes. That was a mystery, but not for long. There was also a requirement that, as needed, some navy cadets would be drafted into training for PBY seaplanes (nicknamed pigboats). And with no seaplanes in the marine corps, those candidates were separated out and were assigned to either the “fighter” or “attack” group.

For the five remaining students, the officer in charge informed us that one of us WILL be trained in the PBY. No one volunteered. So five paper chits were placed in a cap and we were to draw one.

I drew seaplanes. I was crushed. My cadet buddy picked fighters and was given a pilot’s crash helmet while I was issued sunglasses and a ball cap!

**HFI:** Did you seek a transfer?

**Duke:** I spent the next week or so trying everything I could think of to get a transfer, but nothing worked. The word was that no one could get a transfer out of seaplanes. I went to see the colonel in charge of marine corps candidates to volunteer for the corps. The colonel sympathetically replied, “What’s the problem, son? Did you get pigboats? We don’t take anyone on the rebound.”

**HFI:** So how did you get in?

**Duke:** After two weeks in seaplane training, I received a message to call a commander at home. When I did, I was asked if I was the cadet hoping to transfer out of seaplanes. The All-Weather Flight School on the base needed an additional student.

They needed an even number of students because two student pilots flew in a twin-engine SNB with an instructor and rotated into the cockpit during flight. But one student in the new class had special skills and was recalled to his duty station. That slot had to be filled, and I was reassigned.

**HFI:** You completed all-weather flight training and were assigned to the attack syllabus where you flew the Douglas A-1 Skyraider.

**Duke:** Yes, and upon completion, I was ready for commissioning. I resented seeing my career path selected by chits drawn from a hat, so I opted for a commission in the marine corps. I was accepted and pinned with 2nd lieutenant bars and navy wings of gold. I then took leave to return to Pennsylvania and became a married man.

**HFI:** Your next stop?

**Duke:** The marine corps assigned many newly commissioned pilots to the USMC Air Station Cherry Point, North Carolina, where I was fortunate to be transitioned to jet fighters in the
Grumman F9F-2 Panther and assigned to a fighter squadron flying the McDonnell F2H-4 Banshee. There, Betty and I enjoyed more camaraderie and a great social life with other pilots and their wives.

**HFI:** There was a turn of events that put you on a different career path.

**Duke:** The Korean conflict had recently ended, and pilots were no longer needed in Korea. Soon, with no pilots leaving and with newly commissioned pilots arriving from the Training Command, our squadron was overstaffed. Pilot monthly flight time took a big dive, and morale was poor.

**HFI:** How was the problem handled?

**Duke:** The marine corps offered three options to those who had been trained as fighter pilots. The choices were multi-engine propeller aircraft, the training command as an instructor (no guarantee of jets), or helicopter training.

I had decided not to be a career officer and felt there was a future for helicopters. So I volunteered for helicopter pilot training. My commanding officer thought I had lost my mind. “Fighter pilots don’t fly helicopters!” he said.

**HFI:** Tell us about your helicopter training.

**Duke:** I received orders to return to the Pensacola, Florida, area for helicopter pilot training. There, I flew approximately four different models, including single rotor and syncopter. Upon completion, I was sent to the Marine Corps Air Facility in Jacksonville, North Carolina, where, I became a transport helicopter pilot flying a Sikorsky HRS helicopter.

**HFI:** You soon found yourself at another career crossroad.

**Duke:** My four-year obligation was coming to an end, and it was a time for decision-making. My commanding officer counseled me to make the marine corps a career, but I was convinced that I should complete my college education and elected discharge. After briefly considering a career in the airlines, I opted for college. The GI Bill barely covered tuition, and we ended up in government-supported housing for those with low incomes.

I was hired by the Piasecki Aircraft Corporation as a student engineer working part-time. I was also able to supplement our income by flying the Grumman F9F-7 Cougar and the Piasecki HUP-2 helicopter as a weekend warrior at the Willow Grove Naval Air Station in Pennsylvania.

**HFI:** What did you do after graduation?

**Duke:** I graduated college with a bachelor of science degree in mechanical engineering. Betty and I also had two children during that time. I began looking for employment and sent out numerous resumes and attended campus interviews. The Piasecki Helicopter Corporation who had hired me part-time as a student engineer...
engineer interviewed me on campus and offered me a full-time job in engineering (they were not hiring pilots at that time).

HFI: There was a change at Piasecki.

Duke: The company had been purchased by Boeing, which added helicopters to their product line. After three months, I was contacted by the Kaman Aircraft Corporation in Connecticut and offered a test pilot position.

HFI: Tell us about the offer.

Duke: That was interesting, because at college students were advised to NOT bring up the subject of salary but neither did the interviewer. An offer was extended and accepted. When I received my first weekly paycheck, I multiplied it by 52 to determine my annual salary. Needless to say, I wanted the job!

HFI: What was it like at Kaman?

Duke: My supervisors at Kaman were among the best I had during my career. It was a relatively small company that had won a lucrative contract to build a new navy helicopter, the SH-2 Seasprite. I was assigned to that project.

The work schedule was very demanding. On many days, I commuted to work in the morning with my headlights on and returned home at night the same way. But the dedication and loyalty of my fellow employees was outstanding and never duplicated by any company.

HFI: Piasecki Aircraft was bought out by Boeing and became their helicopter division.

Duke: After one year at Kaman, I was contacted by Boeing, who inquired whether I would like to return to my Pennsylvania roots as a test pilot. Betty and I deliberated over that decision and elected to return to the Philadelphia area where I was assigned to the USMC CH-46 Sea Knight helicopter project at Boeing.

HFI: In 1962, you were selected to attend the U.S. Navy Test Pilot School at the Naval Air Test Center in Patuxent River, Maryland.

Duke: Yes. Only a small number of civilian test pilots were given this...
opportunity, and I was the first of only four Boeing Rotorcraft Division pilots to be selected.

**HFI:** Following the Test Pilot School, you were made senior project test pilot on the CH-46 program. What did that entail?

**Duke:** In this capacity, I was responsible for all Boeing test pilot activity on the program. During this period, I conducted most of the flights required to demonstrate specification compliance and structural airworthiness. This required putting the aircraft into dives, pullouts, hard landings, and flight conditions more rigorous than those anticipated to be flown by marine corps and navy pilots. Included in this testing was an unprecedented requirement to autorotate the helicopter into water of sea state 3 (with 2- to 3-foot waves and scattered whitecaps), with neither engine providing power and without supplemental flotation devices — and do it five times!

**HFI:** The highlight of a test pilot’s career is to be selected as the pilot to make a first flight — that is, to be the first pilot to fly a new model that has completed the design and ground test phase but has not yet taken to the air. You had that assignment.

**Duke:** I had four such flights in my career. In the early 1970s, I flew the first flight of the Boeing Vertol YUH-61A helicopter in a competition to replace the army’s venerable Bell UH-1 Iroquois “Huey.”

In the late 1970s, I flew the first flight in a Boeing research helicopter designated Model 347, a U.S. Army CH-47 Chinook derivative. The improvements included a stretched fuselage and increasing the height of the aft pylon to allow four-bladed rotors to replace the Chinook’s three-bladed configuration; advanced geometry rotor blade tips; retractable landing gear; increased soundproofing; and a state-of-the-art avionics suite.

On the first forward flight, my co-pilot and I flew the aircraft to its maximum level flight speed of approximately 170 mph, limited only by the drive system torque limit. The 347 was truly a pilot’s helicopter.

I also flew the first flight of the winged Model 347. This aircraft ultimately contributed to a new standard for flying qualities and to the design of future company models. The added wing was positioned vertically for hover and slow forward flight, to minimize the penalty that resulted from impingement of rotor wash in a horizontal position. As the aircraft accelerated, the wing rotated down to the conventional horizontal position to enhance maneuverability and relieve the rotor of in-flight structural loads.

**HFI:** You participated in a Farnborough Air Show.

**Duke:** In the 1970s, a fellow Boeing pilot and I were assigned to appear in the world-renowned Farnborough Air Show, in Farnborough, England. There we flew the U.S. Army’s Boeing CH-47 Chinook helicopter, demonstrating the tremendous weight-lifting capability of the aircraft by carrying a British tank from the cargo hook.

The commercial version of the CH-47 Chinook, the Boeing Model 234 was used by British Airways for offshore support. On this fly-by of Manhattan’s World Trade Center, three Dukes were present: Frank as captain, daughter Karin as flight attendant, and wife Betty as a passenger.
HFI: You were then promoted to director of the Flight Test Department. What were your new duties?

Duke: In the early 1980s, I was promoted to director of the Flight Test Department, responsible for the three components of flight testing: test engineers, instrumentation engineers, and test pilots. In that capacity, I could continue as a test pilot.

As such, I made another first flight in the Boeing Model 360. This was a research aircraft built almost entirely of composite materials. The fuselage, one main rotor shaft, the rotor blades, and rotor hubs were all made of composite material with the purpose of advancing the company’s knowledge and technical understanding of the advantages of composites as a replacement for conventional metal construction. Knowledge acquired during this program was applied in new designs. During testing, my copilot and I flew the helicopter over 245 mph, which at that time was believed to be the fastest speed of any helicopter built in the United States.

HFI: There was an emergency landing of the Model 360. Can you provide details?

Duke: Ron Mecklin and I were returning from a demonstration at Fort Eustis, Virginia, to our test facility at the Wilmington, Delaware, airport. Only about 5 miles from the airport, the frequency of the rotor noise increased significantly and approximately six warning lights came on bright red!

Ron declared an emergency, and I made a precautionary landing. On shutdown, the rotor coasted to a stop, but only after a loud clunk was heard. The helicopter was ground-transported back to the Boeing facility in Pennsylvania, where a disassembly revealed that a large gear in the drive system had failed.

HFI: In the aviation community, the most recognized periodical is Aviation Week and Space Technology. A sought-after achievement is to have the company’s latest model appear on the cover of this magazine. You appeared on the cover of three issues as the pilot in command of the YUH-61A, the winged Model 347, and the Model 360.

Duke: That is correct.

HFI: What do you consider to be your greatest accomplishment?

Duke: Having the good fortune to become a test pilot with two great companies — and to become the director of flight test while working with some of the best people in the industry.

HFI: After 32 years with Boeing, you elected to retire after a very rewarding career with an outstanding company.

Duke: In my 32 years, I had the opportunity to work with key people in the industry, such as Charles Kaman, Chuck Ellis, Bill Murray, Al Newton, Tee Johnson, Ken Grina, Leonard LaVassar, Bruce Blake, and Bill Peck. I also enjoyed the associated travel, which included Canada, England, Norway, Sweden, France, Germany, Iran, Japan, and Vietnam.

HFI: Your children have also been involved in aviation.

Duke: Yes, David, our third child, was born in 1964. He is currently a pilot with Homeland Security. Daughter Karin is a former airline flight attendant, now a retired school teacher. Son Frank, a retired airline captain, is now a Boeing 757 captain with a charter company.

HFI: The apple doesn’t fall far from the tree, Frank. Thank you for taking the time to share your career with us. Do you have any words of advice or encouragement for tomorrow’s young men and women considering entering the industry?

Duke: Realize that not everything in life will go according to plan. Stay positive and do not become discouraged. I always like this quote: “It is easy enough to be pleasant when life flows along like a song … but the one worthwhile is the one who can smile when everything goes dead wrong!”

Martin J. Pociask
is curator for Helicopter Foundation International.