



Robert C. Duncan

ROBERT C. DUNCAN

1923–2003

Elected in 1981

“For guiding two major technologically significant programs to successful application—Apollo’s guidance and control and the SX-70 camera systems.”

BY ROBERT C. SEAMANS JR.

ROBERT C. DUNCAN, nicknamed Cliff, naval officer, engineer, government official, and corporate officer, died in 2003 at the age of 79. Cliff was elected to the National Academy of Engineering in 1981. Born November 21, 1923, in Jonesville, Virginia, Cliff married Rosemary Flemming on March 18, 1949. They had four children: two girls, Babette (Wilson) and Melissa, and two boys, Robert and Scott.

Cliff received his B.S. from the U.S. Naval Academy in 1945 and was immediately assigned duty aboard the *USS Bremerton*. A year later, he was sent to Pensacola for flight training. While on flight status, he served in three squadrons, flying both fighters and heavy attack bombers. When he completed his flight duties in 1960, he was a Lt. Commander.

In 1952, Cliff commenced an intense educational program, first at the U.S. Naval Post Graduate School in Monterey, California, where he earned a second B.S. in 1953. He was then transferred directly to the Massachusetts Institute of Technology (MIT) for graduate studies. His academic work was conducted primarily in the Department of Aeronautical Engineering, now the Department of Aeronautics and Astronautics, from which he received degrees at the master’s and doctoral levels. His masters and doctoral theses had a direct influence on his future activities.

Cliff's master's thesis was titled "Fundamental Design Principles of an Attack Simulator for Airborne Fire Control Systems." During World War II, the performance of a fire-control system was tested by towing a target and counting the number of bullet holes. The speeds, altitudes, and target maneuvers were severely limited, and the effects of variations could not be determined. In his thesis, Cliff concluded that an airborne simulation that included a stabilized platform in the interceptor aircraft would solve the problem.

In his doctoral thesis, "Guidance Parameters and Constraints for Controlled Atmospheric Entry," Cliff's thinking advanced from test to design. Based on his experience as a pilot, he was a strong advocate for manned space flight. He said in his thesis, "the trained human being has the capacity to analyze problems never before encountered, and there is much expert opinion to substantiate the belief that he can exercise this function to a useful extent even at reentry velocities." He went on to discuss the operational phases of reentry and the guidance parameters for orbital flight, as well as the physical characteristics of the solar system, emphasizing the moon and nearby planets. This thesis proved to be an excellent introduction for his activities at the National Aeronautics and Space Administration (NASA), which soon followed.

Upon completion of his studies at MIT, Cliff served in the Pentagon from 1960 to 1964, first as chief of space programs for the chief of naval operations and then as staff assistant director for research and engineering. He retired from the Navy in 1965, by which time he had been assigned to NASA in Houston, Texas.

During his three years at the Manned Spacecraft Center (now the Johnson Spacecraft Center), Cliff was chief of the Guidance and Control Division. During this time, he held weekly sessions with Apollo contractors to ensure that the guidance systems in the capsule, produced by North American, and the lunar lander, produced by Grumman, would be compatible. Compatibility was desirable for crew operations, but was essential for keeping the systems synchronized throughout the mission. Without that compatibility, the Apollo 13 astronauts might not have been brought home safely.

Prior to leaving NASA, Cliff spent a year back in Cambridge, Massachusetts, as assistant director of the Electronics Research Center. When he left government employment in 1968, he became a vice president of the Polaroid Corporation in nearby Waltham, Massachusetts. He spent seven years at Polaroid as program manager of the SX-70 camera, with responsibilities for its design, engineering, and production. In 1975, he was elected Polaroid vice president of engineering.

Cliff returned to the government from 1985 to 1993, serving in a number of key positions. He first became director of the Defense Advanced Research Projects Agency (DARPA) and then, a year later, was confirmed in a dual capacity, assistant secretary of defense (research and technology) and continuing head of DARPA.

His final role in the Pentagon was a four-year tour as director of operational test and evaluation, where he was principal advisor to both the secretary of defense and the under secretary of defense for acquisitions. His master's thesis proved to be useful background for serving in this capacity. Cliff retired from the government in 1993 to become a vice president at Hicks and Associates, national security consultants.

By the time he retired, at age 77, he had done it all—on the ground and in the air, as a civilian and in military service, as an engineer and a manager. During his government service, his outside professional activities were restricted. From 1974 to 1985, however, while he was at Polaroid, he was a member of the board of the Charles S. Draper Laboratory, a nonprofit organization involved primarily in national security projects. He was also a trustee of the Forsyth Dental Center (Boston), a member of the Industrial and Professional Advisory Council of Pennsylvania State University, and a member of the Air Force Science Advisory Board.

Cliff's awards include the Legion of Merit (1964), Norman P. Hays Award for outstanding contributions in the field of inertial guidance control (1967), NASA Exceptional Service Medal (1968), Distinguished Eagle Scout Award (1984) from the Boy Scouts of America, and the U.S. Department of Defense Distinguished Public Service Award (1987 and 1989). Cliff was the

author of *Dynamics of Atmospheric Entry* (McGraw-Hill, 1962) and co-author of three other books; he also published a number of technical papers.

Cliff's passion for his career in engineering and public service was exceeded only by his love of his family. He was a devoted husband and father and is survived by his wife Rosemary of Pasadena, California, daughters Melissa of Sierra Madre, California, and Babette of Derry, New Hampshire, and sons Robert, Jr. of Austin, Texas, and Scott of Los Angeles, California. He was at his happiest when hiking and camping in the wilderness of New England, and was notorious for his delicious camp breakfasts and poor but enthusiastic campfire singing. Cliff had a positive influence on countless young men's lives as Scoutmaster of Boy Scout Troop 157 in Weston, Massachusetts. Himself an excellent shortstop up through his Naval Academy days, Cliff became an avid Red Sox fan during the Impossible Dream season of 1967. The sound of the Red Sox on the radio was ever-present at the Duncan house in the summer, and although Cliff had passed just a year before his team finally broke the Curse, Rosemary and the children are quite sure he had a front row seat for the whole thing.

