MALCOLM J. ABZUG, a leading aeronautical engineer who contributed to the development of many aircraft and published widely, died on May 23, 2007, at the age of 87. He was elected to NAE in 1996 "for contributions to aircraft and missile dynamics, control, and guidance."

Born in New York on April 13, 1920, Malcolm attended the Massachusetts Institute of Technology (MIT), where he earned an S.B. in aeronautical engineering in 1941. He pursued graduate studies at the University of California, Los Angeles (UCLA), where he was awarded an M.S.E. in 1959 and a Ph.D. in 1962. From 1962 to 1970, he was a lecturer and acting professor of engineering at UCLA. A decade later (from 1980 to 1986), he resumed teaching as an adjunct professor of engineering at the University of Southern California.

After graduating from MIT, Malcolm joined the U.S. Air Corps Aircraft Laboratory as an assistant aeronautical engineer. Commissioned as a naval officer in 1943, he worked with the Bureau of Aeronautics to improve aircraft-flying qualities until 1946. After World War II, he became an aerodynamicist at the Douglas Aircraft Company, then a project engineer at the Sperry Gyroscope Company. Malcolm returned to Douglas in 1952 to become chief engineer of the Advanced Flight Mechanics Department at the Missiles and Space Division, a position that he held until 1966.
While at Douglas, Malcolm was the lead stability and control engineer for the Douglas A2D-1 Skyshark and A4D-1 Skyhawk. As chief engineer, he contributed to the design and analyses of the F3D Skyknight and A3D Skywarrior. He quickly became known as an expert on control systems jets. In *Airplane Stability and Control: A History of the Technologies that Made Aviation Possible* (Cambridge University Press, 1997, 2002), a book he co-authored with E. Eugene Larrabee, Malcolm described the jet aircraft of this period as “jets at an awkward age.” He was working in an era when aerodynamic and propulsion technology enabled planes to fly higher and faster than their electromechanical control devices could handle.

In 1966, Malcolm became manager of the Controls Design and Development Department at TRW Systems. He left the company in 1972 to become president of ACA Systems Incorporated, a consulting firm he headed until his final years. As a consultant, he worked with numerous aerospace and research organizations, including Northrop Aircraft, Ford Aerospace, Brunswick, Sparta, Science Applications International Corporation, Pacific Sierra, DARPA, and the Canadair Corporation.

Malcolm kept advancing the state of the art, inventing new methods of analyzing aeroelastic and fuel-sloshing effects, the coupling of multi-axis motions, flight through wind shear, precise measurements of air data, and the control of spacecraft attitude. During his association with Northrop, Malcolm contributed to the development of the YA9-1 attack aircraft, YF-17A fighter (a precursor of the Navy’s F/A-18 Hornet), and the B-2 Spirit stealth bomber. In a career that lasted more than 50 years, he saw feedback flight-control systems evolve from non-existence to an afterthought to a necessity.

Malcolm wrote a number of books, not all of them technical. *Airplane Stability and Control* was a history of aviation, a compendium of the technical problems that arose during the development of airplanes, and a manual for solving stability and control problems. As a guide to the design of new aircraft, it is technical, complex, and deep, yet it rarely refers to equations. In this way, it adds a much needed dimension to the study of
aeronautical engineering, which has increasingly focused on mathematics and numerical methods. Malcolm saved the latter for another book, *Computational Flight Dynamics* (AIAA Education Series, 1998), which contains enough equations and computer programs to warm the heart of the most analytical reader.


A well-known figure in the aerospace community, Malcolm was an active member of the American Institute of Aeronautics and Astronautics (AIAA), serving as chairman of the Flight Mechanics Committee and the Los Angeles Section. He was elected an AIAA Fellow in 1974. He also served on numerous government and industry committees, including the NACA Subcommittees on Stability and Control and Automatic Stabilization and Control, the DARPA Forward Swept Wing (X-29) Committee, the Naval Advisory Panel on Remotely Piloted Vehicles, and the Northrop Blue Ribbon Committee for the YF-17A. He was the recipient of the Engineering Achievement and the Bayonet Program Awards from Douglas Aircraft in 1957 and 1964.

Aviation was Malcolm’s passion as well as the foundation of his career. As an MIT undergraduate, he designed an “all-balsa speedster of crashproof design,” as he described his Swallow model plane in an article for the April 1939 issue of Air Trails magazine. Not surprisingly, Malcolm was a pilot with more than 1,500 hours of flying time. He held a commercial pilot’s license, with multi-engine, instrument, and glider ratings, and he was a member of the American Soaring Society. His friend, Bill Rodden, remembers, “We both flew at Van Nuys in the Eight Ball Flying Club. . . . He was a good pilot—he could land much better than I.” According to Bill, Malcolm was noted for flying both very low and very high. He “buzzed” the Rose
Bowl one New Year’s Day, flying at an altitude of 2,000 feet when the minimum was 2,500 feet. He also set a glider altitude record over the Mojave Desert; however, the record was broken before he could record it, so his achievement was never officially recognized.

Malcolm’s community interests led him to serve on the boards of the Palisades Human Relations Council, Pacific Palisades Residents Association, No Oil, Inc., Graffiti Busters, the Village Green Committee, and the Temescal Canyon Association. He helped build and maintain hiking trails in the Santa Monica Mountains with a local Sierra Club crew, and he taught middle schoolers how to plant vegetable gardens. He received the Pacific Palisades Community Service Award in 1997 and the Trail Volunteer of the Year Award in 2001. On accepting the 1997 award, Malcolm remarked, “I enjoy giving to the community. The work means a great deal to me. I feel honored to be awarded for something I do with great pleasure.”

He is survived by his wife of 61 years, Gordon Breedon Abzug, two sons, Michael David Abzug of Los Angeles, California, and Mark McGregor Abzug of Scottsdale, Arizona, seven grandchildren, and one great grandson. His wife remembers that “Mal brought the same commitment and vigor to family life that he gave to his aeronautical career, but with a difference. He was a very loving husband, father, and grandfather, but with us, he was a relaxed and funny man. The family traveled, sailed, and biked together. He made many wooden toys and furniture for the children that they enjoyed more than their bought toys. His presence was keenly felt by his family then and now. He was a lovely man who will be missed.”