



James H. Mulligan

# JAMES HENRY MULLIGAN, JR.

1920–1996

Elected in 1974

*“For contributions to electrical network theory  
and to system theory and applications.”*

BY WILLIAM W. LANG

**J**AMES HENRY MULLIGAN, JR., the second Secretary of the National Academy of Engineering and its first Executive Officer, died on January 12, 1996, in his 75th year. With his broad range of interests, Jim had a distinguished career of service to the electrical engineering profession that spanned more than a half century as teacher, mentor, and technical leader.

Jim was born in Jersey City, New Jersey, on October 29, 1920. He received BEE (1943) and EE (1947) degrees from Cooper Union School of Engineering, an M.S. degree in electrical engineering in 1945 from Stevens Institute of Technology, and a Ph.D. degree in electrical engineering in 1948 from Columbia University. He subsequently pursued postdoctoral studies in mathematics and physics at Columbia University and New York University. His career included major engineering responsibilities in industrial, government, academic, and professional organizations.

Jim's first employment was as a member of the technical staff in the transmission development department of the Bell Telephone Laboratories and later as a member of the Combined Research Group of the Naval Research Laboratory contributing to the development of the Mark V radar IFF (Identify Friend or Foe) system. At the conclusion of World War II, he joined the Allen B. DuMont Laboratories where he was initially concerned with research and development on portable and studio television

camera and video equipment and subsequently was chief engineer of the television transmitter division. From 1949 to 1968, he was a member of the faculty of the Department of Electrical Engineering at New York University, serving as chairman of the department from 1952 to 1968.

His research centered on the design methodologies for electronic circuits and the development of analytical methods which underlie them. He worked on the design of electrical systems with lumped elements and distributed elements in combination that established the foundation for the design of analog electronic circuits with prescribed performance characteristics in many different applications. This methodology was responsible for state-of-the-art improvements in radar, television, and IFF systems. He also researched the systematic assessment of the quality of computer-aided designs for VLSI (Very Large Scale Integration) integrated circuits. For his technical contributions and his leadership of professional engineering societies, he was elected a member of the NAE in 1974.

In 1968, Jim moved to Washington to join the NAE as a full-time member of the staff in the position of secretary, succeeding Harold Work who had been the secretary from its founding in 1964. In 1958 Work, then associate dean of New York University's College of Engineering, proposed the very first concept that led to the founding of the National Academy of Engineering, but it wasn't until December 5, 1964, that the new Academy was born. Work became its first secretary. The decade following NAE's founding has been described in the "The Making of the NAE — The First 25 Years" as a decade of turmoil. As its secretary during the latter part of this decade, Jim was a witness to this turbulent era during which there were several reorganizations as the NAE struggled for autonomy within the National Academies' complex. The NAE Council recognized Jim's talents and effectiveness by appointing him the first NAE Executive Officer in 1968. By 1974, four presidents had occupied the office (Augustus Kinzel, Eric Walker, Clarence Linder, and Robert Seamans); and an acting NAE president (William Shoupp) was in the office as a search committee sought a replacement for

Seamans. Quoting from the above publication, "Not only would it be difficult to replace a man of Seamans' extraordinary qualifications and do it rapidly, but as James H. Mulligan, Jr., then Executive Officer of NAE noted, the position required someone who could deal comfortably with the multiple constituencies of industry, government, and academia represented by the Academy membership."

One of the unwritten principles of the NAE president and Executive Council was that no staff member should be elected to membership in the Academy. Harold Work, Jim's predecessor as secretary, played an important role in the formation of the Academy, became its first secretary, but was never elected to membership. Nonetheless, a small group of NAE members who were either serving on the NAE Council at the time or had served on it earlier, led by J. Ross Macdonald, recognized Jim's many professional accomplishments and successfully proposed him for NAE membership. Jim was the only NAE staff member who was not an NAE member at time of appointment ever to be elected to membership in the NAE.

Jim's participation in the activities of the Institute of Electrical and Electronics Engineers (IEEE) and its predecessors, the American Institute of Electrical Engineers (AIEE) and the Institute of Radio Engineers (IRE), extended throughout his professional career. In the late 1940s and the 1950s, he served as a section officer as well as a member or chairman of numerous technical committees. In the early 1960s, he was active in IRE technical activities, notably those dealing with circuit theory, and carried these volunteer activities into the merged organization, the IEEE, formed from the AIEE and the IRE in 1963. He served as vice president for IEEE technical activities in 1968 and 1969, was elected IEEE vice president in 1970, and served during 1971 as IEEE president. Jim is recognized within the IEEE as having been the principal architect for the organizational structure of technical activities within the institute. He was instrumental in changing the composition of the IEEE board of directors so that each technical specialty within the IEEE was properly represented on its board. After his presidency, he became the IEEE vice president responsible for

regional affairs in which role he worked diligently during the latter part of the decade of the 1970s to improve the regional structure of the IEEE membership.

In 1974, Jim left Washington to become the dean of the School of Engineering and professor of electrical engineering at the University of California, Irvine. During his first years in California, Jim continued to serve as secretary of the NAE on a part-time basis until 1978.

When he completed his term as dean in 1977, he continued as a professor in electrical engineering until his retirement from UC Irvine in 1991. He specialized in circuit theory and in designing and implementing courses in VLSI with responsibilities for the curriculum in this area. Jim was noted in his UC Irvine biography as being a "tough and thorough taskmaster demanding high performance and exacting perfection." From his students he demanded professional assistance, and immediate response from his staff. Although he was serious and formal with regard to his academic and professional activities, he loved people and enjoyed entertaining them in his home. He had a large blue automobile which aged into an unsightly "blue bomb," the paint faded and peeling with evidence of many scrapes. He delighted in driving his bomb to exclusive restaurants in his neighborhood and requesting valet parking.

During his career Jim received many honors. In addition to membership in the NAE, he was elected to the American Association for the Advancement of Science. He was a fellow of the IEEE and the IEE (London). He was the recipient of many prestigious awards: the 1974 IEEE Haraden-Pratt Award; the 1978 Professional Achievement Award of the IEEE United States Activities Board; the 1984 UC, Irvine, Lauds and Laurels award for professional achievement; the 1986 Distinguished Service Award of the IEEE Circuits and Systems Society; the 1986 Meritorious Service Award of the IEEE Education Society; the 1987 Linton E. Grinter distinguished service award of the Accreditation Board for Engineering and Technology; the 1988 ABET Fellow Award of the Accreditation Board for Engineering and Technology; and the 1988 Benjamin Garver Lamme award

of the American Society for Engineering Education. He also received several prize paper awards from the AIEE and the IEEE.

The IEEE James H. Mulligan, Jr., Education Medal was established in 1956 by the AIEE and continued by the IEEE board of directors to honor the past IEEE president. Presented annually for an exemplary career in education, the medal recognizes the importance of the educator's contributions to the vitality, imagination, and leadership of the members of the electrical engineering profession.

Jim was married to Jeanne, his wife of 49 years, and is survived by their two sons, James III and Richard.

Those who had the privilege of knowing Jim Mulligan will remember him as a warm person and a hard-driving team leader who accomplished much to shape the professional organizations in which he was an active participant and driver. His accomplishments are an inspiration to future generations of electrical engineers.