



William Brown

WILLIAM M. BROWN

1932–2008

Elected in 1992

*“For leadership and contributions to the
theory and practice of synthetic aperture radar.”*

BY (FLOYD) PAUL JOHNSON AND ED ZELNIO
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WILLIAM M. BROWN, perhaps best known as the founder and president of the Environmental Research Institute of Michigan (ERIM), died on February 23, 2008, at the age of 76, after a long career dedicated to the nation’s defense. He became an NAE member in 1992 for his work on linear systems analysis, random processes, and fine resolution radar.

“Bill,” as he was known to friends, family, and colleagues, was raised in Wheeling, West Virginia, the youngest of four children of John David Brown and Marjorie Jenny Walters. He had a great love for mathematics, which became apparent at Triadelphia High School in Wheeling, where his math score on the college entrance exam was the highest in three states. This early evidence of his brilliance coupled with his homegrown values continued to serve him and this nation well.

Bill enrolled at West Virginia University at the age of 17 and finished first in his class two and one half years later. He continued his education at The Johns Hopkins University where he received his M.S.E.E. in 1955.

Bill began his defense work at Westinghouse, Baltimore, while working on his D. Eng. at The Johns Hopkins University. He received his D.Eng. in electrical engineering in 1957. Subsequently, he studied sensor systems at the Institute for Defense Analysis at the Pentagon. This experience opened his

eyes to the untapped potential of sensing systems, which, in turn, set him off on a storied career advancing the state of the art in sensing and applying these advances to defense and civilian systems.

In 1958, Bill joined the engineering faculty at the University of Michigan (UM) where he headed the radar laboratories. During this time, he authored graduate-level texts based on his work in remote sensing: *Analysis of Linear Time-Invariant Systems* (McGraw-Hill, 1963), and with Carman J. Palermo, *Random Processes, Communications, and Radar* (McGraw-Hill, 1969). He was elected full professor in 1963 at the age of 31.

In 1970, Bill became director of the UM Willow Run Laboratories, which were conducting vitally important research for the U.S. Department of Defense. However, with the advent of the Vietnam War and student unrest at UM over the research at Willow Run, in 1972, Bill spearheaded the formation of ERIM, a not-for-profit successor organization to Willow Run Laboratories. The transition was a testament to Bill's dedication to the importance of the defense mission of Willow Run and to his ingenuity in navigating federal, state, and university minefields to succeed in this historic achievement.

Bill served as president of ERIM, which grew from an institute with 400 employees and an initial \$4 million annual budget to 850 employees and an annual budget of \$85 million. This growth, however, was a side effect of Bill and ERIM's more important contributions—revolutionary sensor inventions and their novel applications to defense missions. During these exciting times, ERIM innovated and demonstrated advances in synthetic-aperture radar (SAR) leading to practical high-resolution imaging systems from very long ranges. They invented and transitioned systems in 3D imaging using laser radar and interferometric SAR. They were also involved in the exploitation of these sensor systems and significantly contributed to massively parallel implementations of algorithms based on image morphology. For each of these significant technical contributions, Bill had been at the chalkboard hashing out new concepts, marketing ideas to customers, and finally guiding them into reality.

After retiring from ERIM in 1994, Bill shared his gifts with one of his most valued customers, the U.S. Air Force, first as head of the Electrical and Computer Engineering at the Air Force Institute of Technology (AFIT), located at Wright Patterson Air Force Base in Dayton, Ohio, and subsequently as chief scientist of the Sensors Directorate of the U.S. Air Force Research Laboratory (AFRL), where he continued to work on SAR, laser radar, and automatic target-recognition technologies until his retirement in 2006. Both AFIT and AFRL deeply appreciated the magnitude of his contributions to our nation's defense and his keen intellect and experience, as he continued to work out revolutionary ideas on the chalkboard that will guide sensor development for years to come.

Bill Brown was the recipient of numerous awards, including the Aviation Week Smithsonian Air and Space Museum Laureate Award, the IEEE AESS Pioneer Award, and the Military Sensing Symposia's Thomas B. Dowd Award. He was an NAE member and an IEEE fellow. His citation read: "For contributions to linear systems analysis, random processes, and fine resolution radar."

Bill served as the radar editor of the IEEE Transactions on Aerospace and Electronic Systems from its inception in 1965 to 1974 and as editor in chief until 1987. He was a member of many national-level panels, including the Army Science Board and Air Force Scientific Advisory Board, and was chairman of the board for the International Symposium on Remote Sensing of the Environment.

Bill's energy, dedication, and enthusiasm were not confined to his professional life. He was an avid skier, bicyclist, swimmer, and runner, competing in numerous marathons — including the Boston, and triathlons — including a 2nd place win for his age group in an iron man. He also loved music, particularly Broadway shows, and was even known to break into song from time to time, entertaining his friends and relatives with a medley of show tunes.

The passion and integrity that characterized his career were applied in equal measure in Bill's family life. He was a devoted husband to his wife, Norma, and their marriage was a source

of great joy and strength to him for 45 years. A trusted friend and mentor to his three children, Cheryl, Mark, and Jennifer, he taught them the importance of honesty, humility, decency, and fair play by demonstrating these qualities every day in his life. "Don't say you're coming, be there," he would tell them on occasion. And he always was.

As Bill reflected on his life, he noted that he never got out of bed in the morning without first deciding what challenge he would attack that day. He was brilliant and dedicated, yet always willing to share his wisdom and time with anyone who sought his advice. The following tribute by Charles M. Vest, president of the National Academy of Engineering, reflects the respect and feelings of all who had the honor of working with Bill.

Bill's contributions to the field of remote sensing are unique in their impact and breadth. He developed and served in this field of endeavor as a scientist, engineer, teacher, administrator, entrepreneur, and counselor. He advanced the state of the art in many dimensions over multiple technological generations. He single-handedly established ERIM and built it into a research organization of first rank. He served pressing needs in the defense sector and led the effort to transfer remote sensing technology from military to civilian applications.

The importance of the early technical work he led and the catalytic nature of the international community he built through symposia and organizations would be difficult to overstate. The span and complexity of Bill's contribution to remote sensing were made possible by his unusually strong intellect and his concentration on forming a philosophical basis for the development of both systems and organizations. The effective way in which he formulated and attained his vision both as a scientist/engineer, and as the leader of a major research institute, speak to his integrity and ingenuity.

Bill is remembered by his loving wife, Norma Hulett Brown; his children, Cheryl Lynn Brown, Mark William Brown, and Jennifer Christine Brown; his grandchildren, William Fryberger, Katherine Brown, Allison Brown, Gordon Brown and Alexander Brown; his great grandchildren, James Fryberger and Mary Jane Fryberger; his brother, John Brown and his sister, Mary Ellen Harmon.