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GEORGE E. SOLOMON

1925–2005

Elected in 1967

“For design and development of space and weapon systems.”

BY GERARD W. ELVERUM

GEOERGE E. SOLOMON, brilliant scientist, engineer, and retired leader of one of the nation’s premier astronautics technology and spacecraft products organizations, died on April 25, 2005.

George was born in Ballard, Washington, on July 14, 1925. In high school he was already focusing on engineering and took extra math and physics courses for college credit. He graduated from Ballard High School in 1942 and started attending the University of Washington. World War II interrupted his education plans when he volunteered at age 18 for the U.S. Army. He was severely wounded in 1945 during the Battle of the Bulge after volunteering to carry ammunition forward through heavy mortar fire to front-line infantry troops. Those injuries resulted in the loss of his right leg. He was awarded the Bronze Star for his heroic action, along with the Purple Heart.

After nearly a year of recovery and therapy in army hospitals, George returned to the University of Washington and earned a B.S. degree with honors in aeronautical engineering in 1949. He was accepted at the California Institute of Technology (Caltech), where he awarded an M.S. in 1950. For the next two years he studied under legendary Caltech aeronautics professor Hans Liepman and received his Ph.D. magna cum laude in 1952. Published in 1953, his thesis, “Transonic Flow

Past Cone-Cylinders," developed analytical and experimental data and methods that were subsequently used in the design of aircraft and missiles by several companies in the United States. George's academic achievements were recognized by membership in Tau Beta Pi, Phi Beta Kappa, and Sigma Xi.

In September 1953, Caltech Ph.D.s Simon Ramo (1936) and Dean Wooldrige (1936) formed Ramo Wooldrige, Inc., to pursue avionics systems for aircraft and missiles. By 1954 they set their sights on a much broader role in the evolving ballistic missiles race with the Soviet Union. They won a contract for ballistic missile systems engineering and technical direction from the Air Force and established a Guided Missile Research Division (GMRD) at Wooldrige. Dr. Ramo offered the young new fellow Caltech Ph.D. a job to focus his thesis expertise on the problems of supersonic launch vehicle trajectory control and nose cone reentry thermal protection and design for aerodynamic stability. That began a 33-year career of ever-increasing engineering and management responsibility for George until his retirement from his position as a corporate executive vice president and general manager of the Electronics and Defense Sector of TRW, Inc.

During the period 1954 to 1957, as director of the Systems Research and Analysis Department in the GMRD of Ramo Wooldrige, George had responsibility for the reentry vehicle of the Atlas guided missile. The Atlas was the nation's first intercontinental ballistic missile and was crucial to the U.S. defensive position versus the aggressive and belligerent Soviet Union during what became the start of the 40-year Cold War. In addition to his management responsibilities, he personally developed analyses of ablation of nose cone materials and dynamic trajectory dispersion of reentry vehicles. These technologies were exploited later in other U.S. missiles such as Thor, Titan, and Minuteman. National Aeronautics and Space Administration (NASA) programs such as Mercury, Gemini, and Apollo also benefited from the technologies in both launch vehicle and reentry vehicle design.

In 1957, GMRD was reorganized as the Space Technology Laboratories (STL) of Ramo Wooldrige, and George was

appointed director of the Systems Analysis Laboratory for STL, which in 1958 became the Aeromechanics Laboratory. As part of this role, he directed research on the critical effects of high-energy radiation and particles in space on the thermal control surfaces and solar cells of spacecraft. In the late 1950s and early 1960s, George's organization managed the systems engineering of several of the earliest successful U.S. spacecraft, including *Able IV* and V, NASA's interplanetary Pioneers, and the Orbiting Geophysical Observatory. In addition to scientific spacecraft, George had overall management responsibility for system design of one of the first U.S. defense satellites, *Vela*, to monitor for nuclear explosions on the ground and in space. These early space systems directly led over the next 50 years to STL's (later TRW's) diverse large family of scientific spacecraft systems for NASA and many military and surveillance satellites crucial to the nation's defense. Simon Ramo stated at the time that "George possessed a combination of personality, leadership, technical background, and integrity that made our team complete."

In May 1965, Space Technology Laboratories became TRW Systems Group, with Ruben Mettler as president. In 1970 George was made vice president and general manager of the Systems Group. George's 25 years of leadership and managerial accomplishments for TRW, and his engineering stature in both the United States and internationally was recognized by TRW's board of directors in 1981 when the board appointed him as a corporate executive vice president and made him general manager of the new Electronics and Defense Sector of TRW. This major business sector employed almost 40,000 scientists, engineers, and technical support and business management personnel in eight operating groups, with laboratories, manufacturing facilities, engineering test sites, and offices throughout the world.

Dr. Solomon was elected to the National Academy of Engineering (NAE) in 1967. He was an early chairman of the Aeronautics and Space Engineering Board of the National Research Council (NRC). In 1986–1987 he was chairman of the NAE Aeronautical/Astronautical Engineering Peer

Committee and also a member of the Committee to Perform Post-*Challenger* Assessment of Space Shuttle Flight Rates. Following his retirement from TRW, he served as a member of the Board on Army Science and Technology from 1988 through 1990 and from 1990 to 1992 was a senior member of the NRC's Strategic Technologies for the Army study.

George was a member of the board of governors and chairman of the aerospace technical council of the Aerospace Industries Association. He was elected a fellow of both the American Institute of Aeronautics and Astronautics and the American Astronautical Society. George's service to his country continued over the years through membership in the Armed Forces Communications and Electronics Association, Air Force Association, Association of the U.S. Army, Electronic Industries Association, National Security Industrial Association, Armed Forces Management Association, National Contract Management Association, and Veterans of Foreign Wars.

Dr. Solomon also maintained an active interest in the academic life of both of his alma maters—the University of Washington and the California Institute of Technology. He was a member of the engineering advisory group at the University of Washington and established the George E. Solomon Prize for Aerospace Engineering at the University of Washington for exceptional student performance. He received a University of Washington Distinguished Alumni Award in 1984. George also was honored with a Distinguished Alumni Award from Caltech in 1983.

In January 1959, I left Caltech's Jet Propulsion Laboratory to join George's Aeromechanics Laboratory at STL as head of the Advanced Propulsion Section. For the next 28 years until his retirement from TRW in 1987, it was my good fortune and privilege to carry out my career in organizations under the management of this brilliant scientist and engineer. George was more than a manager; he was a leader of the highest integrity and a gentle man who provided friendship and support to those who worked with him. His encouragement and guidance over all those years energized my efforts on

many difficult occasions, and I will always remember him with great fondness.

George married his second wife, Karen, in 1985. Following his retirement in 1987, they moved to the Santa Barbara suburb of Montecito, California. He and his wife joined the Greek Orthodox Church of Santa Barbara and, as one could have predicted, George became president of the parish council. While there, once again in typical service to the country he loved, he undertook reading technical books for Recordings for the Blind. In 1995 he and Karen moved to Boise, Idaho, where he lived the remaining years of his exceptional life. George E. Solomon passed away on April 25, 2005. He is survived by his wife Karen (who still lives in Boise); his son Cleve (a Caltech Ph.D.) and daughter Jane from his first marriage; his stepdaughter Denise; three grandsons, Derek-Lee, Troy, and James; and his sister Carmella and brother-in-law Bill.

George Solomon should be eulogized by recognition that from the time he left a leg at the Battle of the Bulge in World War II through 30 years of developing major missile and spacecraft systems critical to the defense of this nation, and additional years of aiding his fellow handicapped and underprivileged citizens, his life was dedicated to the service and protection of his country. He certainly deserves to be remembered as a premiere example of what has come to be designated in the United States as "The Greatest Generation."