



*W L Pritchard*

# WILBUR L. PRITCHARD

*1923-1999*

BY YVONNE BRILL AND JOHN F. KELLY

**DR.** WILBUR L. PRITCHARD, a pioneer in satellite engineering and the development of international satellite communications, died in Bethesda, Maryland, on March 18, 1999. Dr. Pritchard was president of W.L. Pritchard & Co., Inc., a Washington, D.C., consulting engineering firm doing technical and economic studies in telecommunications and specializing in satellite communications for clients around the world.

He was born in New York City and as a child had an enormous interest in how things worked, building crystal radio sets, taking apart telephones and clocks, and frequently putting them back together. He graduated in 1939 from Townsend Harris High School, a public school open only to the city's brightest students. He received a bachelor of electrical engineering from the City College of New York and did graduate work at the Massachusetts Institute of Technology. He started his career at the Philco Radio & TV Corporation before joining Raytheon in Massachusetts in 1947. While at Raytheon he helped develop a system for sending information by microwave transmission. Employing microwaves for a different purpose, he was among the engineers who invented the Radarange, the first microwave oven. For microwave ovens to work, difficult problems had to be solved, such as uniform heating and acceptable loading on the magnetrons despite the apparent short circuit presented by an empty oven. Bill and his colleagues solved these problems by a variety of in

genious methods, several of which were patented. During this “microwave” part of his career, Bill published a series of papers in the archival literature describing his work and ideas. He managed Raytheon's Wayland Laboratory in Waltham, Massachusetts, before moving in 1960 to Rome, Italy, to create the engineering department of Selenia S.p.A., an Italian engineering company Raytheon had purchased. While there, he developed radar systems for meteorological, navigational, and military purposes.

Bill entered the field of satellite communications in 1962 when he joined the Aerospace Corporation in California. Here, he directed the team that produced the nation's first operational military satellite system and assisted the North Atlantic Treaty Organization with its communications satellite program. Even at this early date, Bill was quick to recognize the potential of satellite communications and perceived their value for the direct broadcast of TV and audio to users with small terminals. Foreseeing the importance of satellites in communications, he urged Congress to keep the military and commercial satellite systems separate.

In 1967 he moved to the Washington, D.C., area to establish the Communications Satellite Corporation Laboratories, the Clarksburg, Maryland, research and development facility for COMSAT. Bill entered every phase of creating COMSAT Labs with gusto and skill. He supervised the construction of the building as well as its furnishings and staffing. The products of COMSAT Labs in its early days under Bill's leadership were prodigious: nickel-hydrogen batteries for satellites, high-efficiency (“violet”) solar cells, microwave filters and integrated circuits, digital multiple access and demand assignment systems, digital TV compression, and mobile and broadcast communications. These products all went from research and development, to design and engineering, then to operational systems. Today, these technologies are used throughout the world not only in satellite systems but also many in terrestrial applications as well. As vice-president of COMSAT, Bill represented the corporation as U.S. signatory to the INTELSAT agreement. He was also the U.S. delegate to the Technical Subcommittee of INTELSAT.

Bill was president of Fairchild Space and Electronics Com

pany in 1973 and 1974. He then started Satellite Systems Engineering, Inc., a consulting company that designed communications satellites and did work in the area of cellular mobile telephones. He was an early proponent of using satellites to transmit television programming directly into the home, a vision in the 1970s but now a common capability from such providers as Direct TV and PrimeStar. At the time of his death he was president of W.L. Pritchard & Co., Inc, a Bethesda-based consulting engineering firm doing technical and economic studies in telecommunications for private firms and governments.

The author of more than fifty conference articles and technical papers, Bill also cowrote four books, including *Satellite Communications Systems Engineering*, a standard textbook in the field. He taught courses in satellite communications at George Washington University and the Polytechnic University of New York. In 1993 he was awarded an honorary doctor of science degree by the City College of New York and in 1995 was elected to the National Academy of Engineering. He gave his expertise freely for public service. He was a member of a number of study groups and task forces on the uses of space: the National Research Council's (NRC) Engineering and Technical Systems Board of Telecommunications/Computer Applications; the NRC's Division of Engineering Space Applications Summer Study Panel 10: Broadcast; the National Aeronautics and Space Administration's Space Applications Advisory Committee and Earth Sciences Advisory Committee Task Force; and the NRC's Engineering and Technical Systems Committee on Antennas, Satellite Broadcasting and Emergency Preparedness for the Voice of America. He was a founder and past chairman of the board of the Society of Satellite Professionals International and was inducted into that organization's Hall of Fame in 1997. He was a member of the International Academy of Astronautics and actively supported it and the International Astronautical Federation (IAF) since their founding in the 1960s. He was elected a fellow of the Institute of Electrical and Electronics Engineers, the American Institute of Aeronautics and Astronautics (AIAA), and the British Interplanetary Society. He was a trustee of the American University of Rome and served on the advisory com

mittee in the City College of New York's School of Engineering. He belonged to Washington's Cosmos Club, was a member of the club's chess team, and was its 1998 co-champion. A contributor to numerous charitable causes, he was especially interested in preserving African wildlife and made several trips to Africa.

Bill was the recipient of many national and international awards in recognition of his outstanding contributions in the field of communication satellites. Notwithstanding, a shared Pritchard family anecdote relates that while Kathleen Pritchard was hospitalized for back surgery, daughter, Sarah who was fourteen at the time temporarily took over the task of household laundry. Bill liked to carry a fresh linen handkerchief in his pocket daily and Sarah directed him down to the basement where the handkerchiefs were said to be folded on top on the dryer. Seconds later Bill came bounding up the stairs with the query, "Sarah, which one is the dryer?" Sarah exclaimed, "Imagine the designer of global communication satellite systems not recognizing a clothes dryer!"

Bill had a unique and exceptional range of skills and talents. He was active in a large number of diverse fields, and contributed strongly in each one. He was an amateur astronomer and had traveled to observe and photograph five total eclipses on three continents. Bill's avocations included playing the banjo and the mandolin. While in California he studied under Sam Freeman (whose instrument can be heard on "Lara's Theme" in the film *Dr. Zhivago*) and played in the Los Angeles Mandolin Orchestra. In the Washington area he played with the Takoma Mandoleers. He made his first trip to China in 1979 with an AIAA-organized group of experts to survey space technology in China just as that country emerged from its Cultural Revolution. It was one of the first Western engineering groups to visit. At every stop, every evening for three weeks, there was a multicourse and multibeverage banquet in a formal setting with a rigid program. To liven things up, Bill and several American colleagues put on an American Act, with Bill on the mandolin and his long-time friend and colleague Burt Edelson on the harmonica. To this accompaniment, others from the AIAA group sang songs like "Red River Valley" and "Doe, a Deer" (from *The*

*Sound of Music*). The Chinese hosts loved it and responded by singing “People's Republic” propagandistic words they had been taught to the familiar American tunes. Similarly, impromptu musical performances by Bill Pritchard playing the mandolin and Bill Hilton playing the ukulele accompanied by audience sing-alongs became the standard welcomed “plus performance” through the years at many IAF meetings. (Dr. William Hilton first proposed 63-65 degree elliptic orbits for communication satellite systems, an orbit quickly adopted by the Russians as the *Molniya Orbit*.)

Bill Pritchard was also a collector of historic scientific and navigational instruments and of rare clocks and watches. He was a fellow of the National Association of Watch and Clock Collectors and often repaired broken timepieces in a fully functioning basement workshop. Bill was fluent in both Italian and French. When COMSAT Labs were consulting on Italian spacecraft, Bill insisted that his staff learn Italian. He is known to have dropped in on the Italian courses being taught to view progress and to the astonishment of the class, replacing the regular instructor to give an all-Italian lesson!

Survivors include his wife of nearly fifty years, Kathleen (Moss) Pritchard; and their son, Hugh, of College Park, Maryland; daughters, Sarah, of Santa Barbara, California, and Ruth of Silver Spring, Maryland; his brother, Hubert, of Matawan, New Jersey; and four grandchildren.

Bill Pritchard's death was untimely but his skills and talents, his spirit and wisdom live on as an inspiration to those who had the privilege of knowing him and to many others who have benefited from the implementation of his pioneering vision of satellite communications.