



J. R. Pevie

JOHN R. PIERCE

1910 –2002

Elected in 1965

“Leading electronics engineer and satellite communications expert.”

BY EDWARD E. DAVID

JOHN PIERCE, the “father” of modern communication satellites, died in April 2002. Three of his former colleagues wrote the following: “Above all, John Pierce was a man of strict integrity. He knew the difference between speculation, wishful thinking, and factual evidence. Pretence was not his way. These principles permeated his life, his contributions to science and technology, and his person. We will not often see his kind again.”¹

John Pierce was born March 27, 1910, in Des Moines, Iowa. He attended the California Institute of Technology, where he studied electrical engineering, earning a bachelor’s degree in 1933, master’s degree in 1934, and doctorate in 1936. He began working as an engineer for Bell Laboratories in Murray Hill, New Jersey in 1936.

Pierce’s career at Bell Telephone Laboratories lasted more than 35 years. He became director of electronics research in 1952 and research director of communications principles in 1958, and held the position of executive director, research, communication division upon his departure in 1971. His

¹John Robinson Pierce 1910-2002, *A Biographical Memoir* by Edward E. David, Jr., Max V. Mathews, and A. Michael Noll

devotion to Bell Labs was based on the organization's integrity and focus in developing the performance and scholarship of each individual. This principle reinforced his personal philosophy of strict ethics. He would have been distressed at the outcome of the federal lawsuit that broke up the Bell System and eventually fragmented Bell Labs, which is no longer the Goliath of research.

After retirement from Bell Labs, Pierce joined the California Institute of Technology (Cal Tech), his alma mater, where he spent the rest of his career in productive work and imaginative research, especially on computer music and sound perception. During this time, he was also chief technologist of Jet Propulsion Labs, a leader in space research in which he had a lasting interest.

In the 1980s, Pierce arrived at Stanford's Center for Computer Research in Music and Acoustics (CCRMA) to pursue his longtime interests in computer music and psychoacoustics. He held the title of visiting professor of music, emeritus, and "visited" for more than 12 years, bringing intellectual and much-needed financial support to the center.

John Pierce was the originator and developer of technologies that set the stage for the "digital revolution" and was instrumental in the development of early communications satellites, such as Echo and Telstar. But he always gave credit to Arthur C. Clarke, whose proposal preceded the concrete steps leading to the demonstration of actual satellite communications, which were performed by Pierce's colleagues at Bell Labs. Among the technological inventions and realizations in which Pierce had a hand (with Shannon and Oliver) was pulse-code modulation (PCM), which set the stage for the so-called digital revolution. Pierce originated and developed high-frequency microwave amplifiers in the form of travelling-wave tubes, reflex klystrons, and electron-multiplier tubes, which for many years were main components in electronics systems.

His many prizes and awards included the National Medal of Science, Japan Prize, and IEEE Medal of Honor, and he shared the prestigious Charles Stark Draper Prize with communications satellite collaborator Harold Rosen. He held 10 honorary doctoral degrees, in addition to his own "earned" one. He

participated in many NAE activities, as well as studies for federal government agencies and the White House Office of Science and Technology.

But Pierce was not all business. He loved to write fiction, and he published several imaginative studies under the pseudonym J. J. Coupling (after a physics concept). He was also a musician, both performer and composer. He was involved in early computer music and concerts, including recordings for playback. John was extremely creative; for example, he coined the word “transistor” to name the first solid-state amplifier. He was also an inventor; he held more than 80 significant patents, and many of his inventions are still in use.

Less tangible, but of prime significance, Pierce had the ability to lead and inspire people, especially engineers and scientists. In 1977, he received the National Academy of Engineering Founders Award for his scholarship “in documenting the disciplines involved [in the above contributions] and authoring treatises to encourage learning and accomplishment.” He always considered himself an engineer, although he recognized that science was a necessary handmaiden.

John Pierce’s example highlights the importance of individual contributions to engineering research and innovation.

Pierce is survived by his wife Brenda Woodard-Pierce of Palo Alto; a son, John Jeremy Pierce of Bloomfield, NJ; and a daughter, Elizabeth Anne Pierce of Summit, NJ.