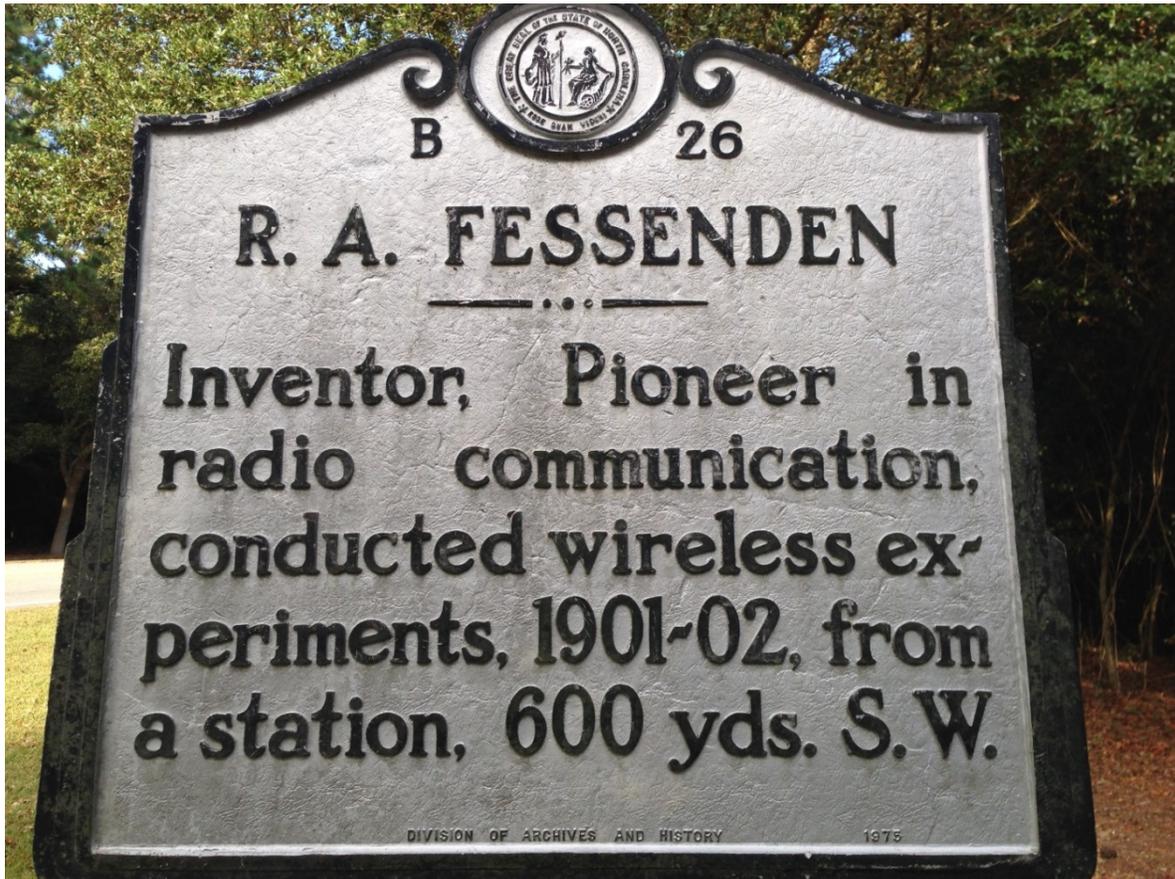


The Fessenden Story for Dummies



Upon entering Roanoke Island, North Carolina, on the northwest side off the Ulmstead Bridge, you encounter a memorial plaque. The QST article "Pioneers of Wireless" by Michael W. Marinaro, WN1M, in the October issue, aroused curiosity about one of the pioneers mentioned in the article: Reginald Aubrey Fessenden, (1866 – 1932).

After a stint as Chief Chemist for Thomas A. Edison, (1886 to 1892), R.A. Fessenden accepted a position as chair of the Department of Electrical Engineering; first at Purdue University and then Western University of Pennsylvania, now known as the University of Pittsburg (1892 – 1900).

His development of receiving equipment, in 1899, for the quest of wireless transmission of sound, had led him into the Weather Bureau's Service as Special Agent in Charge.

Willis L. Moore, director of the Weather Bureau hired RAF at an annual salary of \$3,000.00. Money for the purchase and construction of two fifty foot towers, one mile apart, and associated equipment set up on Cobb Island, Maryland, in 1900, paved the way for the first wireless telephony, on December 23, 1900.

R.A. Fessenden's pioneering developments, of the correct principles of communication by radio, persuaded the Chief of the Weather Bureau to fund the relocation of his laboratory, equipment and towers to be constructed at three locations: Cape Henry, Virginia, Roanoke Island & Buxton, North Carolina in 1901. By March, 1902, he was regularly transmitting wireless messages between Roanoke Island and Buxton, a distance of more than 50 miles; the longest two-way wireless communication to date. By August, 1902, disputes over patent rights and ownership resulted in RAF leaving the U.S. Weather Bureau.

Experiments conducted on Roanoke Island led to the first practical application of a successful, commercially-adaptable technique of radio communications in North America, and perhaps the entire world. The experiments he performed and the methods he developed were far in advance of the work of any of his contemporaries and were essential to the evolution of modern electronics.

One form of receiver he developed, the electrolytic detector, made radio-telephony both possible and practical. His direct-current arc and high-frequency alternator transmitters provided the key to undistorted, intelligible speech transmission. His work in interference prevention and selective tuning led to his discovery and use of the heterodyne principle, which is today the heart of every modern communications receiver, whether for standard broadcast, FM, TV radar, telemetry or other uses.

He established the first commercial trans-Atlantic two-way radio telegraph service in 1905, between Macrihanish, Scotland & Brant Rock Massachusetts, two years before Marconi.

On Christmas Eve, 1906, Fessenden's station at Brant Rock, Massachusetts, *broadcast the world's first entertainment radio program.*

Fessenden's genius produced more than 500 American patents, many of which were years ahead of their time and some were later attributed to or claimed by others.

Most notable were the fathometer, or sonic depth finder, that measured the depth under the keel. Spurred by the Titanic disaster, he developed the submarine iceberg detector, and submarine telephone, which saved the lives of sailors trapped in sunken submarines.

When America went to war, (WWI), Fessenden became a Lieutenant, Senior Grade, in the Naval Reserve. He perfected a *secret device*, sound and (SONAR) which enabled destroyers to track down submarines. The Fessenden Pelorus (radio compass) or "Metal Mike", was later carried to perfection by Sperry. He formulated a recognition signal that allowed allied ships to recognize friend from foe and prevent 200 allied submarines from being sunk by "friendly fire".

In 1921 the Institute of Radio Engineers awarded Fessenden its Medal of Honor. Likewise, in 1922, the Advisory Committee of the City of Philadelphia honored him with the John Scott Medal for his achievements in radio.

By 1928, he was awarded approximately \$3,000,000.00 by RCA, Westinghouse, etal; for patents in wireless radio-telephony and related fields. Fessenden then fulfilled a lifelong dream by purchasing a dwelling "by the sea", on Bermuda and lived there with his wife until his death, in 1932.

In 1929, he received the Award of the Scientific American Medal for Safety at Sea.

On March 9, 1943, a U. S. Navy destroyer the *USS Fessenden* (DE-142) was christened by the wife of his son, Reginald Kennelly Fessenden, at the Consolidated Steel Works, Orange, Texas.

Words found on a lintel above the tomb at St. Marks Church, Bermuda read:

“By his genius distant lands converse...And men sail unafraid of the deep.”

Some of RAF Patents:

Silicon Alloys 452,494 (1891); **Design & Construction of X Ray Equipment** 648,660 (1900); **Heterodyne Principle** 706,738 - 706,739 – 706,740 (1902), 1,050,441 (1913), 1,050,728 (1914); **Rectification** 706,736 (1902); **F. Alternator** 706,737 (1902); **Arc Oscillator (Mention)** 706,742 (1902); **Radio Telephone** 706,747 (1902); **Multiplexing** 715,203 (1902), 727,326 (1903), 981,406 (19011); **Point Contact Rectifier** 727,327 (1903); **Electrolytic Detector** 727,331 (1903); **Vertical Antenna** 793,651 (1905); **Anti-Static Device** 918,306 – 918,307 (1909); **Directive Antenna Array** 1,020,032 (1912); **Storage of Wheeled Vehicles** 1,114,975 (1914); **Internal Combustion Engine** 1,132,465 (1915); **Sound Production & Signaling** 1,108,895 (1914), 1,207,387 -1,207,388 – 1,311,157 (1916), 1,277,562 (1918), 1,384,855 (1920); **Submarine Signaling & Detection** 1,348,556 – 1,348,828 – 1,348,855 (1920), 1,429,497 (1922); **Subsurface Directive Signaling** 1,348,856 – 1,355,598 (1920); **Ship Location** 1,319,145 (1919); **Fathometer** 1,217,585 (1917); **Geophysical Prospecting With Sound** 1,240,328 (1917); **Water Storage & Power Generation** 1,214,531 (1910), 1,247,520 (1917); **Gun Location by Sound** 1,341,795

Sources: Michael L. Everette, Jr. Master’s Thesis NC State 1972; Fessenden – Builder of Tomorrows by Helen M. Fessenden (1940); “The Cosmic Inventor” by Frederick Seitz (1999); “Wireless Under Water” by Burton J. Hendrick (Aug. 1914); Outer Banks History Center, 1 Festival Park Boulevard, Manteo, NC.

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