Chapter Six:

Reginald Fessenden, Pioneer Of Wireless Radio

Reginald Fessenden, Photo: N.C. State Archives

Sadly enough much of the public knows the name Marconi as the "Father of Radio." However, few know that a year earlier, on December 23, 1900, an even more prolific technologist first transmitted human speech by radio. That person was Reginald Fessenden and he did it right here on the North Carolina Outer Banks.

In 1901, Reginald Fessenden, was one of the pioneers of wireless radio. Fessenden was an inventor and he was a leader in the race to perfect wireless communication -- the forerunner of today's AM radio. Thomas Edison, called Fessenden ‘‘Fezzy’‘ and made him his head chemist. Fessenden contributions included the radio direction finder (a type of compass), the submarine fathometer (an echo depth finder), and a turboelectric drive for battleships.
Fessenden was requested to come to North Carolina under contract with the Weather Bureau, he established his base in Manteo. Professor Reginald Fessenden created the air and publicly transmitted voice and music for the first time in history. Much of Fessenden’s pioneering research occurred between Hatteras and Roanoke Islands across the open waters of the sounds of North Carolina’s Outer Banks. [16]

Fessenden’s research led to numerous wireless inventions, including; the radio pager, sonar, the gyrocompass, loop antenna, radio direction finding, the television receiver, tracer bullets, the

[16] "Brimley Collection, Box 7, Cape Hatteras, F-10, Weather Station, Hatteras, ca. 1900" NC State Archives.

pheroscope, turbo-electric drive to power ships, ultrasonic methods for cleaning, electrical conduit, and the fathometer to measure the depth of water beneath the keel of a ship.
He brought along his wife and son and spent more than a year and a half on the Outer Banks at the turn of the century. Reginald Fessenden is credited to have been the first to transmit wireless telegraphy by tones over a 50 mile path between Buxton, NC (Cape Hatteras) and Manteo, NC (Roanoke Island) in the year 1902. Fessenden, isolated himself from the world for two years in at an exceptionally remote corner of the seacoast to conduct his wireless telegraph experiments. He was working for the United States Government in the Weather Bureau during this time period. US Naval officials were brought in to observe and were duly impressed. This system made an astronomical leap in distributing Weather Bureau signals and in obtaining data for making forecasts. Fessenden sent the transmissions between two fifty foot high towers he had built. Eventually sending telegraphy across the Ocean to Europe, he was a leader in the race to perfect wireless communication which was the forerunner of today's AM radio.

Being that the area was so very remote, you were likely to know your neighbors and while Fessenden was in Manteo, he became close lifetime friends with two other entrepreneurs who were inventors as well. The Wright brothers, Orville and Wilbur, were experimenting with gliders in nearby Kill Devil Hills in preparation for their powered flight experiments. One year later, they too would become world renown.

His central interest, however, kept returning to "wireless" and its technology. He tried and tested a number of methods seeking improvement on the Marconi way of generating wireless signals, which did have its crude points. By 1899, he had demonstrated a range of 50 miles from Cobb Island to Arlington, Virginia, and impressed the U. S. Weather Bureau into signing him to a contract for the (then) large sum of $3,000 per annum to develop wireless for weather information gathering.[17]

It was in that first year of the Weather Bureau work that he finally developed a method to get the frequency of an arc transmitter high enough to handle barely understandable speech. Modifying a phonograph cylinder with nearly microscopic slits, he was able to interrupt an arc at 10,000 times per second, and on December 23, 1900, transmit a barely readable voice message over a distance of one mile on Cobb Island. North Carolina

As well, he found contact radio detectors like the coherer too distorting and lacking in sensitivity for the reception of speech. He worked on a much more sensitive detector called the barrater, and fortuitously secured success in a second iteration by accidentally leaving a wire in an acid solution. The wire point in the cup of acid worked quite well. In fact, it worked well enough that Lee DeForest used it later in contravention of Fessenden’s patent, resulting in a protracted legal battle between the two.

The Weather Bureau renewed his contract for two more years, and expanded the work to include extending the wireless link to Cape Hatteras, North Carolina. During this time, Fessenden set General Electric to work on producing an AC generator that would emit frequencies high enough

[17] "Brimley Collection, Box 7, Cape Hatteras, F-10, Weather Station, Hatteras, ca. 1900" NC State Archives.

for use as voice-bearing wireless. The experiments were many and trying; it was only by using methods like Edison had shown in developing his light bulb that success occurred, bit by bit.

By 1902 General Electric had managed to produce a 10 kHz alternator for Fessenden. It was used to transmit telegraphy by tones over a 50 mile path between Buxton, NC (the town located at Cape Hatteras) and Manteo, N.C. Unfortunately, Fessenden got into a dispute over ownership of the ideas with Federal employees and he resigned the job in order to keep his personal inventions.