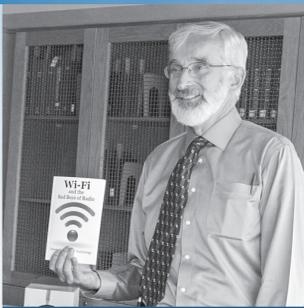


The Statewide Committee for Research honors Alaska's

Northern Innovators



Alex Hills

The Wireless Pioneer

Northern Innovators Hall of Fame Member

When he was shoving an antenna mast into a 40-mile-per-hour wind on an April day in the early 1970s, 30-year-old Alex Hills did not anticipate that the lessons he was learning on Little Diomedede would someday help people talk with each other using computers that fit in their pockets.

Hills, now 70, is a Palmer resident who learned the complexities of ham radio signals as a boy in a New Jersey attic and honed his skills while installing communications systems throughout Bush Alaska. He lived in Nome, Kotzebue and Bethel, flying to satellite villages of the big hubs as he helped improve the limited communications systems of the 1970s.

Tall as a point guard, the professorial Hills used his Alaska problem-solving skills to develop the first Wi-Fi network at Carnegie Mellon University in Pittsburgh. Hills did not invent Wi-Fi, but Wireless Andrew, the child of his imagination, became an extensive wireless network, one that techno geeks copied and improved upon.

On Little Diomedede Island, Hills was — with the help of locals more practiced at sticking to a metal roof in a big wind — installing a VHF radio system so villagers could have contact with mainlanders on the Seward Peninsula and the rest of the world. The very high frequency radios he was powering up replaced the village-staple shortwave radios, the signals of which bounced off the upper atmosphere. When a blazing aurora scrambled the ionosphere, it sometimes disabled the short-wave systems.

Little Diomedede, the home of about 115 people, is a unique place even among Alaska villages. The island, in the pinch-point of

Bering Strait, is a lonely mesa rising from a frozen plain of sea ice. Built on the only ground available, the village perches on a steep hillside. Its residents face west, toward Russia's Big Diomedede, a rock about 10 times the size of Little Diomedede.

That locale was a challenge for Hills and his technician partner, who battled the vagaries of radio signals to get village voice communications systems to work even when a mountain did not stand in the way.

"We couldn't install the antenna in a place with a clear view to the east, but we did the next best thing," Hills wrote in his book, *Wi-Fi and the Bad Boys of Radio*. "We aimed the antenna directly at the cliffs of Russia's Big Diomedede, where signals could be reflected back to the Alaska mainland."

In bouncing a signal off Russia, Hills used one of the difficulties of radio systems — the reflection of signals that often garbles a message — to solve a problem.

Twenty years later, Hills withdrew the Alaska lessons banked in his brain when he faced a pleasant dilemma: the development of a network of radio signals that would allow professors at Carnegie Mellon University in Pittsburgh to access the Internet with no cables connected to their computers.

With *Wireless Andrew*, (named after university benefactors Carnegie and Mellon) Hills and a team of engineers and students built a network that had to overcome all the radio problems — reflection, shadowing, refraction, scattering and diffraction — that he confronted on every installation of radio phones at Alaska villages.

"The big challenge of Wireless Andrew was how to get the radio coverage right," Hills says. "The things I learned in Bush Alaska about the odd behavior of radio waves were the key."

With memories of village triumphs over a great variety of radio-wave gremlins, Hills and his team created a pioneer wireless system. Professors were able to log on and stroll with their computers. The network grew until it covered the 140 acres of Carnegie-Mellon campus. If professors wandered off-campus, the network shifted them to Pittsburgh's mobile phone network without them knowing it.

Hills at first limited the network to the royalty of the university system, but the serfs found a way in.

"We had a password to restrict access to professors, and the students always asked me for it," Hills says. "I always gave them a great big 'No!' We worried that too many students would overload the network.

"But, of course, our students were very creative. They hacked their way on there. In a few years there were more students than professors on it."

Seeing students lounged on the campus mall surfing the Internet with no wires attached, Hills saw a dream realized. And he knew that *Wireless Andrew* was the start of something big.

"When you want to see the future, look at what young people are doing," Hills says. "When they think something is really cool, it's probably going to go somewhere."