

The Statewide Committee for Research honors Alaska's

# Northern Innovators



## Gene Strid The Echo Slayer

*Northern Innovators Hall of Fame Member*

Not long ago, Bush telephones had a problem that scared companies from providing cell service: if a girl were to pick up her cellphone in a village and call a friend in the same village, her voice needed to travel 88,000 miles before it rang the cell down the street.

Her phone signal would have had to zip first up to a satellite and then back down to Anchorage, and then back up to the satellite before it was finally relayed down to the same village. The effect of all that travel — 22,000 miles one-way to a satellite is a long way even at the speed of light — would be a ghostly delay from when someone spoke until when another heard her. It would make for an awkward conversation, with people talking over one another. It was a problem that could happen only one place in America.

“Alaska is the last place in the whole 50 states where satellites are used for lifeline communications,” says Gene Strid, vice president and chief engineer of network services at GCI Communication Corp. “Alaska is more like a developing third-world country. We had a lot more in common with Micronesia than the Lower 48.”

Strid was head of a team that found a solution to the Bush phone-delay problem, creating wireless local telephone service in places difficult to connect with wires.

In Alaska’s cities and towns on the road system, an organized spaghetti of fiber optic and copper-wire transmission systems make telephone connections seem instantaneous. But Alaska’s hundreds of villages are too distant from one another and separated by mountains and boglands that would make stringing lines difficult.

Satellite communications systems promised a step forward in Bush communications. Geostationary satellites launched into orbit 22,236 miles above Earth and following the planet’s rotation have the effect of being parked over the equator. This allows a village “earth station” to aim at it all day long, enabling communications between village cellphones and landlines. But this earth-station technology has the limitation of the delay, sometimes as much as eight-tenths of a second, between when someone talked on the phone until the recipient heard it.

“It would be quite annoying,” says Strid.

One possible solution from the company was to make every village into a mini Anchorage or Fairbanks, by installing an urban-type network switch in the center of town. Because those switches cost at least \$500,000, GCI executives dismissed the idea. Instead, company president Ron Duncan challenged Strid and his charges to solve the problem with technology.

Strid and his team of engineers executed by miniaturizing a big cellphone switch and other equipment typical of an Anchorage-type setup. They scaled it down to a size that allowed them to install the systems in more than 100 locations around Alaska. The team pulled it off by modifying and installing small computers that can run software that performs most of the functions of the big switch in Anchorage.

Those small switches, which cost less than \$50,000 compared to the half million of the urban switches, interconnected cellphone users in the villages as well as cellphones to landlines within the villages. Emergency calls also can go through the smaller, locally installed switch.

“We envisioned a wireless local telephone service,” Strid says. “We wanted to get a generic, off-the-shelf low-cost device for local phone service. By putting the switch in the village, someone could call the Village Public Safety Officer or fire department even if the satellite was down.”

After installing the new system, Strid’s team eliminated the satellite delay problem in much of rural Alaska. Now, most of all the satellite-served villages in the Aleutian, western, northwestern and arctic coast have the new systems of software-defined switches and base stations, servers and towers.