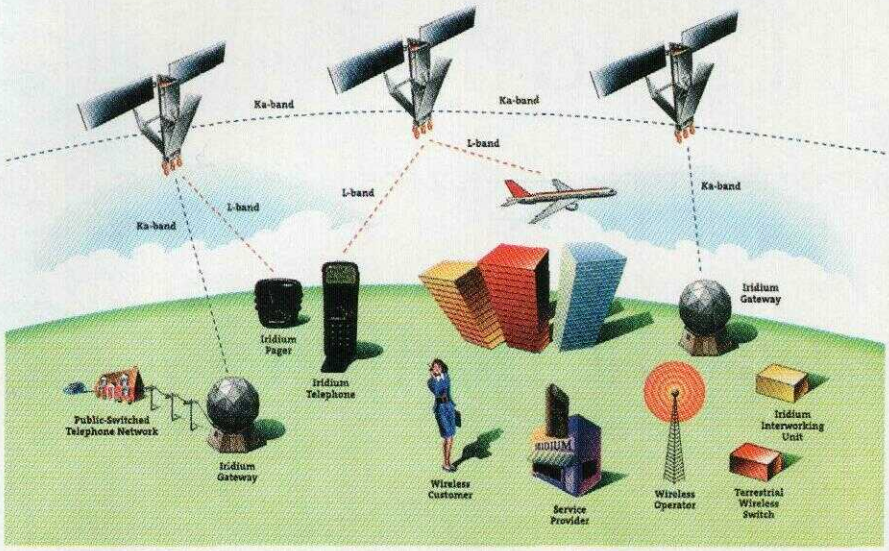
Technology.Today@worldnet.att.net Alan Pierce

The Iridium Constellation



THE cellular phone oftoday is as ubiquitous as the six-shooter of the Old West. It was reported in February of 1999 that over 67 million Americans are packing cellular phones. The way they carry these phones is also reminiscent of gunslingers of the Old West—people draw their phones at the slightest provocation. The simple ringing of a phone in a crowded room can almost raise panic as people practice their quick draw not to miss the incoming call.

Today, being out of range of a cell site is like being a gunslinger out of bullets. Some years ago, Motorola unveiled a major plan to remove spotty service by June of 1990. It called for the construction of a world system that would replace ground cell sites with a network of low earth-orbit satellites. Its system would carry all kinds of wireless communication to every point on our planet.

When first proposed, early 1990's communication technology required 77 satellites to complete Motorola's goal of blanketing the world with a seamless, handheld, wireless communication system. Since this projected number of satellites equaled the number of electrons circling the seventh element on the Periodic Table, the project was named *Iridium* after this earth element.

During May and June of 1997, the first 12 satellites were launched into space, and by June 1998 the remaining 54 satellites were launched to form the Iridium constellation. Advances in communication technology made it possible for Iridium LLC, the Motorola spin-off, to complete the system using 66 rather than 77 "birds."

When you start to make a call in an area without cellular service, the nearest satellite in the Iridium network picks up your signal. These satellites weigh 1,500 pounds and travel in a low earth orbit between 420 and 485 miles above the earth's surface. Note that these satellites are not parked in a geostationary orbit, which would be 22,300 miles above the earth's surface. Your call transfers from satellite to satellite until it reaches the correct Iridium Ground Station Gateway, which automatically transfers your call to its receiver.

The first official phone call using this $5 billion Iridium Satellite System was made by Vice President Al Gore to the great-grandson of Alexander Graham Bell. The entire system went online on November 1, 1998.

At this time, 60 percent of the world's population is located in rural areas far from telephone infrastructure. The cost of bringing land-based telephone communication to these areas is prohibitive. The environments of these areas coupled with, in many cases, low population densities makes it less expensive to bring phone service to these people through satellite systems. This is especially true since the infrastructure for a satellite communication system can deliver television, voice, and data at the same cost of construction. The projected market for this service is $2 billion per year. Financial analysts project that this technology will generate $29 billion in revenue by 2001.

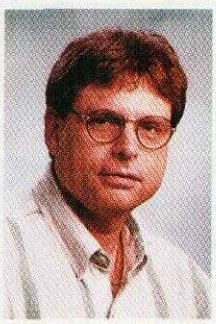
At this moment Iridium is alone in space. However, the Globalstar system is close to completion. England, Canada, and other countries all have communication companies with satellite systems on their drawing boards.

For more information on these systems you might start your research on the internet. You should find the following addresses helpful:

Iridium: www.iridium.com
Telcdesic: www.teledesic.com
SkyBridge: www.skybridgesatellite.com

Recalling the Facts

1. Why did Motorola name its satellite communication system Tridium?
2. How does this system differ from a standard cellular phone system?
3. Describe how this system works.
4. How many satellites are included in the Iridium Constellation? TD



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