

By Gerry Turcotte
President of Communications Research Centre Canada (CRC)



1996-present: President, Communications Research Centre Canada (CRC)

1984-96: President and Chief Executive Officer of Ottawa Centre for Research and Innovation, Ottawa, Canada

1974-84: Chair of various departments at Algonquin College, Ottawa, Canada, including Electronics, Computing Science, Computer Engineering and Physics

As President of Communications Research Centre Canada (CRC), I am pleased to offer an overview of satellite communications activities in Canada throughout the years, and my thoughts on their future.

Let me start by saying that Canada's communications needs are unique: here is a country with a population of 32 million people, dispersed across six time zones, on a land mass spanning a greater distance than the Pacific Ocean between Japan and North America. In addition, with Canada a northern country reaching to the Arctic, communication links are difficult to establish, whether via satellite or other means.

In the early 1960s, the Canadian space program recognized the advantages that satellites can bring in terms of conquering vast distances, a variety of landscapes and different climatic conditions. So in 1962, Canada launched its first satellite, Alouette 1, which made the country the third nation in space. This satellite helped researchers investigate the adverse effects of ionospheric activity in northern radio communications. CRC emerged from this program as a world leader in ionospheric phenomena. Ten years later, Telesat's Anik A satellite made Canada the first nation with a domestic geostationary satellite system. In 1976, Canada became the first country to test the concept of direct-to-home television broadcasting with the launch of Hermes. Many of the technologies, applications and propagation models were developed by CRC or in partnership with Canadian industry.

In the 1970s, Canada, the United States, France and Russia partnered to build Cospas-Sarsat, a satellite-aided search-and-rescue system that since its launch in 1982 has helped save more than 13,000 lives around the world. CRC helped pioneer the system and continues to contribute technical expertise to this day.

Throughout the 1980s, much of the satellite communications research at CRC became focused on mobile satellite communications. Some of the early developments demonstrated the technical feasibility of various sub-systems (e.g. voice coding, signal design, aeronautical antennas) and led to commercial implementation. In the mid-1990s, Canada and the United States partnered to

launch two MSAT satellites, which continue to provide mobile satellite communications services throughout North America to this day.

This year, the launch of Anik F2 with its Ka-Band multimedia payload will make broadband access possible throughout Canada. This payload results from a unique partnership that includes the Canadian Space Agency, CRC and companies Telesat, EMS Technologies and COM DEV.

As a federal government research centre, CRC's overall strategy is tied to the government's goal of promoting the social and economic well-being of Canadians by making Canada the most connected nation in the world, and one of the top five in terms of innovation. Central to this goal is to continue developing innovative technologies and applications and to get them to market quickly. CRC has, by far, one of the highest rates of technology transfer to industry of any Canadian government lab. Part of CRC's mission is to work with other government partners. For example, CRC helps the Department of National Defense meet their needs for advanced communications technologies. CRC also supports the Canadian Space Agency's space industry development programs by providing technologies and technical expertise in satellite communications.

With about a quarter of CRC's research efforts directed towards satellite communications, the agency is focused on advancing related technologies and applications for the future. Its radio propagation experts are studying Ka-Band and preparing for a measurement campaign needed to model the propagation environment at higher allocated frequency bands. CRC is also researching and developing more powerful and efficient coding and modulation techniques, protocols and RF subsystems that can reduce user cost, which is the major element in determining the success of multimedia satellite communications. In partnership with schools, hospitals and communities, CRC will continue to demonstrate applications that advanced satellite communications can provide to rural and remote areas.

Satellite communications hold much promise for Canadians. The ongoing research and development at CRC helps ensure that satellite communications technologies and services meet the needs of Canadians, now and in the future, and that they serve as a model for other countries to follow.

For more information about CRC, visit www.crc.ca.

SIDEBAR:

Milestones in Canadian Satellite Communications

- Canada becomes the third nation in space with the launch of Alouette 1 in 1962.
- Canada is the first to test direct-to-home television broadcasting via the Hermes satellite in 1976.
- Canada joins the United States, France and Russia to launch Cospas-Sarsat in 1982. The satellite-aided search-and-rescue system has helped save more than 13,000 lives.