

INTELSAT, pointed to the value of satellites for enhancing domestic communications in remote locations. In 1968 the federal government decided to develop a domestic satellite communications system in order to further Canada's growth, prosperity and unity.

Telesat Canada was incorporated by an Act of Parliament on September 1, 1969. Telesat is a unique commercial venture. It is neither a Crown corporation nor an agent of government, but an enterprise whose ownership is shared by the Canadian telecommunications carriers and the federal government.

Telesat's purpose is to establish and operate a commercial system of satellite communications to serve all points in Canada, both in the northern regions and in the south. In 1978 it added an Anik B geostationary satellite to the three Anik A satellites already in space and brought its total number of communications earth stations to 100.

The Telesat system has a reliability factor of better than 99 per cent. It provides such service as global television relay with local-area television distribution, multiple and single circuit telephone service, computer-data transfer, Teletype, facsimile and all forms and combinations of electronic information. Its major customers are the Trans-Canada Telephone System, Canadian National/Canadian Pacific Telecommunications, Bell Canada, Teleglobe Canada and the Canadian Broadcasting Corporation. The CBC uses three channels on a full-time basis, two for English and one for French network television.

ANIK A

Anik, in the Inuit (Eskimo) language, means brother.

Canada's commercial domestic communications satellites are called Anik. Those in the A series are interchangeable: each makes 12 microwave channels available throughout



NASA

Canada. (Each channel can carry one television program or 960 voice circuits.) All were placed in orbit from Cape Canaveral by three-stage Delta rockets provided by NASA. Anik A-I, launched on November 9, 1972, was the world's first domestic communications satellite to be placed in a geostationary orbit. Anik A-II and Anik A-III were orbited in April 1973 and May 1975. As in-space back-up for Anik A-I, they assured reliable, uninterrupted service and met requirements for increases in service. Today, Anik A-III is the primary operational satellite, and Anik A-II and A-I provide back-up and additional channel capacity.

Anik spacecraft are similar to the U.S.-built INTELSAT. They carry Canadian-built components and were specifically designed and built for Canadian domestic service by Hughes Aircraft Company of California. SPAR Aerospace Products Limited of Toronto and Northern Electric Company Limited of Lucerne, Québec, (Northern Telecom) were major Canadian sub-contractors to Hughes Aircraft.

The Anik A satellites have critical orbital speeds of 11,062 kilometres per hour. They are positioned 36,000 kilometres above the equator at 104°, 109° and 114° west longitude. Each is about 180 centimetres in diameter and 340 centimetres high. Each weighed approximately 570 kilograms when it was launched.

The design and space life of an Anik satellite is seven years. At present rates of consumption, fuel reserves for Anik A-I, II and III are estimated to be sufficient for operational capacity until 1980, 1981 and 1983 respectively.

TELESAT TECHNOLOGY

An Anik satellite "sees" all of Canada, instantly and reliably. It can connect two or more stations regardless of their locations in Canada. In the case of television, it provides point-to-multipoint service with no limit on the number of receivers.

Satellite communications networks are similar to ground microwave relay systems, but their relay stations are in outer space. A communications satellite receives microwave signals transmitted from an earth station; it amplifies them and re-transmits them to receiving stations on earth. These in turn send the signals out over local lines.

The Anik A satellites operate in the 6/4-gigahertz (GHz) frequency bands. Signals transmitted from the ground are received by the satellite in the 6-GHz (six billion cycles per second) band and retransmitted to the ground on frequencies in the 4-GHz band. Reliable service is guaranteed by the ability to switch operation from one of a satellite's 12 microwave channels to another. Should an Anik satellite cease operations, earth stations can realign their antennas to re-establish service using a back-up satellite.

The power of 6/4-GHz signals has to be kept relatively low so that they don't interfere with ground-based relays of long-distance telephone calls, television programs and data. More powerful signals can be sent in the 14/12 GHz bands, which are not used by existing ground communications. Anik B is the first Telesat satellite to use the higher frequency channels in addition to the 12 current ones.

In 1972 Anik A-1 became Canada's first commercial domestic communications satellite.