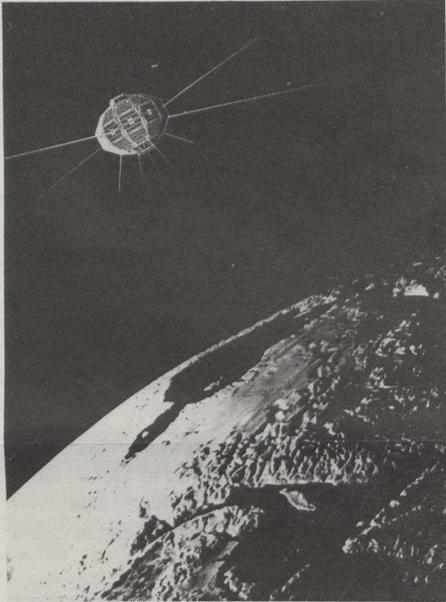


## Major milestones in Canada's space program



### 1962: Alouette I

Alouette I, Canada's first spacecraft in orbit, produced a wealth of information about the ionosphere, the electrically-charged layer of the upper atmosphere that affects, among other things, long-distance radio transmission. Designed to operate for one year, Alouette I transmitted useful data for more than ten years and helped open markets around the world for Canadian space technology.

### 1965: Alouette II

An agreement between the United States and Canada following the success of Alouette I led to a series of International Satellites for Ionospheric Studies (ISIS), designed and built in Canada and launched by the United States. Alouette II, the first of the ISIS scientific satellites, compiled data on the ionosphere for almost ten years.

### 1969 and 1971: ISIS I and II

More sophisticated than the Alouette satellites, the ISIS spacecraft made a comprehensive study of the upper section of the ionosphere and produced the first pictures of the aurora borealis from space. After Canadian needs had been met, operation of both satellites was transferred to Japan in 1984 for additional research.

### 1972: Anik A-1

Anik, the Inuit word meaning brother, is the name given to satellites launched by Telesat Canada, the world's first domestic communications satellite company. Anik A-1 was the first of three identical satellites providing Canada-wide, 24-hour-a-day telecom-

munications services. It could carry the equivalent of 11 520 one-way telephone circuits, or 12 television programs.

### 1973: Anik A-2

Anik A-2 was launched to bring network radio, TV and improved telephone services to Canadians living in the North. Both A-1 and A-2 were retired in 1982.

### 1975: Anik A-3

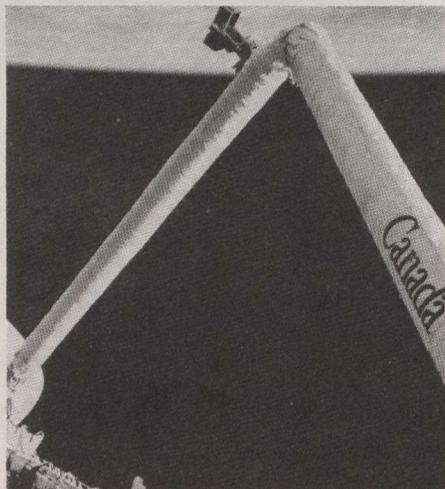
Telesat accomplished another world first by teaming Anik A-3 with A-2 in the same orbital position to permit the still usable channels on each satellite to be operated as if they were aboard a single spacecraft. Anik A-3 is scheduled to be retired later this year.

### 1976: Hermes

A research satellite launched in conjunction with the United States, Hermes revolutionized space communications by proving that spacecraft could operate at higher powers and frequencies. In four years of operation, Hermes explored new ways of using satellite technology and paved the way for many commercial services including direct broadcasting to individual homes.

### 1978: Anik B

Anik B not only replaced the Anik A series as a commercial satellite operating in the lower 6/4 Ghz frequencies, but was also used to continue the promising Hermes experiments using six channels in the higher frequency 14/12 Ghz range. When it was launched, Anik B was the world's first dual-band communications satellite. In 1982 all but a small portion of its capacity was turned over to Telesat for commercial use.



**1981: Canadarm launched with Columbia**  
Designed and made in Canada for the US space shuttle, Canadarm, a remote-

controlled mechanical arm, has shown its ability to not only pick up, manoeuvre and reposition delicate cargo with ease, but also to allow astronauts to perform satellite rescue and repair missions in space. Canadarm retrieved its first satellite in June 1983, and has since manoeuvred a payload of 4 000 kilograms. Its capacity is 30 000 kilograms. It was developed by the National Research Council with Spar Aerospace Limited of Toronto acting as the prime contractor. The first Canadarm was delivered to NASA in 1981, the second in 1983 and two more were scheduled for delivery in 1984.

### 1982: Anik D-1

The Anik D-1 and its sister satellite, D-2, to be launched in November 1984, are the biggest satellites with the greatest capacity built by Telesat. They will replace the Anik A and B series and form the base of Canada's domestic satellite communications system until the early 1990s.



### 1982: Anik C-3

Launched during the first shuttle mission to send satellites into orbit, Anik C-3 can carry the equivalent of 32 colour television signals or 21 504 voice circuits, twice the capacity of an Anik A satellite. The world's first direct broadcast satellite for commercial use, Anik C-3 is more powerful than previous satellites, allowing the use of smaller receiving dish antennas and transmissions to city centres without radio interference.

### 1983: Anik C-2

Anik C-2 followed Anik C-3 into orbit on the space shuttle. (The satellites are numbered according to when they were built.) The Anik C satellites are already delivering high-quality TV pictures to antennas only 1.2 metres in diameter as well as