

# Canada in space

The material in this article is based in part on the book *Spacebound* by Theodore R Harty and Irvine Paghis of the Department of Communications, published by the Ministry of Supply and Services, Canada, 1982.

It is a quarter of a century since the Soviet Union launched the first artificial satellite, Sputnik I. Observing the enormous potential for world communications Canada immediately embarked on its own program of satellite production.

Five years later in 1962 a US Thor-Agena rocket, belching brilliant orange and white flame, lifted off its launch pad in southern California pushing Alouette, Canada's first satellite, into orbit around the earth thereby propelling the country into the space age.

So many satellites have been launched since that notable day including ten other Canadian ones that many people have forgotten Alouette was the first spacecraft entirely designed and built by a nation other than the United States or the Soviet Union.

Why was Canada so keen to compete in this costly and hazardous activity? Could Canada, with its limited research resources, make a significant contribution, and what return could be expected from the investment? History provides favourable answers to these questions. The record shows that Canada's contribution to space technology has been significant and there have been substantial economic benefits as well. Canada has had a number of outstanding satellite programs whose achievements have won national and international acclaim. One of these is the Alouette-ISIS program which included four Canadian satellites; another is the Hermes program. Both programs have been successful and fruitful; indeed the position of prominence that Canada enjoys in space science and technology is, in a very large measure, a direct result.

Hermes was, in its time, the world's most powerful communications satellite. In April 1971, Canada's Department of Communications (DOC) and NASA agreed to develop it in order to conduct a variety of technical and social experiments in such fields as telemedicine. It was originally called the Communications Technology Satellite (CTS) and was to have a two-year mission life. Launched from the Kennedy Space Centre on 17 January 1976, it had an operational life of four years.

DOC was responsible for the overall management of the project. It designed and built the spacecraft at the Communications Research Centre (CRC) near Ottawa. The cost to Canada was about \$60 million, and eighty percent of the industrial contracts, by value, went to Canadian industry. NASA provided an experimental, high-powered (200-watt) transmitting tube, conducted pre-launch testing and launched the vehicle. Its costs were \$11.4 million for the Hermes program and \$10.8 million for the launch vehicle. The European Space Agency also provided several components.

The overall objective of the Hermes program was to advance the technology for space and ground components of satellite systems that use high-radiated radio frequency power. Toward this aim, Hermes used the 14/12-GHz frequency bands, which are reserved for broadcast satellites. An added Canadian objective was to develop advanced component and subsystem capacity in Canadian industry, both for Canadian use and export.

A Delta model 2914 vehicle launched Hermes into a geo-stationary orbit at 116° west longitude just west of South America. The experimental spacecraft was 188 centimetres high and 183 centimetres in diameter. It

Right: Anik D1 launch  
26 August 1982

Below: Shown under construction Anik C-3 the world's most powerful domestic communications satellite, towers some 6.43 metres (21 feet) tall with its 183-cm (72-inch) communications reflector (antenna) and lower solar panel deployed. The satellite has 16 transponders in the 14 and 12 Gigahertz radio bands.

