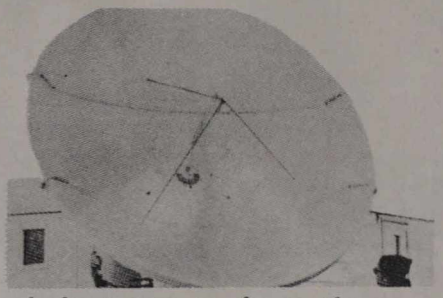
programming. Major earth stations with 30-foot antennas are located near Ottawa at the Communications Research Centre. One provides telemetry, tracking and command functions for the mission; the other is the communications control station.

Among the experimental communications services these terminals will make possible are community reception of radio and TV broadcasting in remote locations and interactive educational TV and tele-medicine. One experiment will help determine optimum uses of two way television in providing health care in remote rural areas. It will explore the extent to which the effectiveness of a medical team in a remote area can be increased through audio-visual and data links to specialists in urban areas. Results will help develop a model for a national urban-rural medical centre. Another experiment involves evaluation of curriculum-sharing. Carleton University Ottawa, and Stanford University California, will exchange courses by a digital-video-compression technique developed by NASA's Ames Research Centre.

The new satellite operates on a human scale, and this is the key to its flexibility. Conventional communications satellites, because they operate on frequencies used by existing terrestrial services, must be limited in the power they transmit. If they are too powerful they interfere with earth-based communications systems. To capture their relatively weak signals, ground stations must be large, expensive and normally fixed in one location. With CTS and the new generation of broadcasting satellite, all that is changed : operating on previously unused frequencies these satellites can be far more powerful than their predecessors without disturbing existing communications. Broad solar "arrays" folding out accordion-like from the satellite and equipped with thousands of solar cells, draw energy from the sun and give the CTS its increased power. And higher power in the satellite means smaller, more portable, less costly antennas on earth. With a dish as small as a metre in diameter, and with the cost of an entire ground stations eventually reduced to that of a colour television set, the possibilities for "person-to-person" communication are remarkable.

Whether it be through the experimental transmission of a native newspaper by facsimile to a number of remote locations : providing diagnosis or medical staff training and supervision from a distance; enabling students in widely separat-



ed classrooms to share the same professor and course; or extending the horizon of broadcasting, CTS is a major Canadian achievement.

More so considering that it is only a decade since Canada became the first nation to join the Soviet Union and the United States in the Space Club.

Beginning with Alouette 1, in 1962, and concluding with ISIS II, in 1971 four made-in-Canada scientific satellites established our place in space. They worked perfectly providing science with tremendous amounts of data to further man's knowledge of the ionosphere and giving both Canadian government and industry invaluable experience in the design, manufacture and operation of satellites and their subsystems. The space program entered a new phase in 1972 when the launch of Telesat Canada's Anik I gave Canadians the world's first domestic geo-stationary telecommunications satellite system. Anik's twin brother, AnikII was launched the following year.

The space program to-date has fulfilled completely the original Canadian commitment to seek peaceful ways of participating actively in space research despite the limited resources available. This commitment was made by two prime ministers—John Diefenbaker and Lester Pearson in quick succession after the launching of Sputnik began the space race in 1957. As a result, Canada has probably conducted more successful space research per dollar than any other country. Though sometimes short on glamour this space research has been long on knowledge--scientific knowledge of the "inner space" above us and practical knowledge of the design and construction of spacecraft.

Their northern geography has given Canadians a particular interest in the ionosphere which can be at its most disturbed in the region above Northern Canada. The phenomenon has provided the beauty of the aurora borealis or "northern lights" but has also led to special communications problems. In the past, the Canadian space program emphasized a search for improved understanding of the ionosphere as the medium of our often unreliable short wave radio links. Now we are seeking new solutions to old problems of keeping in touch by putting the skills acquired, building scientific satellites to work in a communication satellite program.

Ionospheric studies and satellite communications are two major parts of Canada's space effort. But experts at the Department of Communications and in other government departments are also participating in international satellite program for resource-mapping, navigation, military communications and meteorology. This expert knowledge and involvement put Canada in the best possible position to exploit space technology.