An earth station with fully collapsible ten-foot antenna, and its own generator, is small enough to be transported in a trailer.

and controlled by U.S. ground stations; then it will be turned over to engineers and technicians at Shirley Bay, the centre and focal point for satellite control, and for the experiments to follow.

Canadian groups of experimenters, whose interests include the fields of broadcasting technology, telemedicine, tele-education, community interaction, data transmission and government operations in remote areas, will begin 26 experiments in May. Experimenters include several major universities in central Canada and the Maritimes, the Quebec, Ontario and Manitoba governments, the Canadian Broadcasting Corporation, Bell Canada, Telesat Canada, the Alberta Native Communications Society and the Rural Health Society of Victoria, British Columbia.

Miniature ground stations

The CTS ground stations are as important as the satellite itself. Eighteen, small, lightweight terminals, designed and built by RCA Limited of Montreal and SED Systems of Saskatoon, Saskatchewan, have been supplied to the experimenters, who have agreed to provide the Communications Department with assessments at the conclusion of the program.

There are ten terminals with antennas of three-foot diameter and eight with "dish" antennas about twice that size. The smaller stations will be used for such purposes as reception of audio broadcasting (perhaps, under very favourable conditions, even television) and two-way voice communications.

The seven-foot terminals will be used for reception and transmission of community and educational television, as well as for other, simpler forms of communication.

SED Systems was chosen to supply two fully self-contained, transportable earth stations. Housed in a trailer, the earth station includes a collapsible ten-foot antenna and its own generator. The terminal can be transported to virtually any location in Canada by road, rail or (with equipment removed from the trailer) by light aircraft. It will be capable of providing a full-range of communications services, and will even be able to originate high-quality colour TV 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.

Experiments

Among the experimental communications services these terminals will make possible are community reception of radio and TV broadcasting in remote locations, interactive educational TV, and telemedicine. 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 the evaluation of curriculum-sharing. Carleton University, Ottawa, and Stanford University, California, will exchange courses by means of a digital video compression technique developed by NASA's Ames Research Center.

"Human" satellite

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 satellites, 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 satel-

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Canada's place in space

Little more than a decade has passed since Canada became the first nation to join the Soviet Union and the United States in the "space club".

Six successful Canadian scientific and communications satellites have now earned this country's space scientists and engineers a performance and reliability record respected throughout the world.

Beginning with *Alouette I,* in 1962, and concluding with *ISIS II,* in 1971, four scientific satellites established Canada's 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 Canadian space program entered a new phase in 1972, when the launch of Telesat Canada's *Anik I* gave Canadians the world's first domestic geostationary telecommunications satellite system. *Anik*'s twin, *Anik II,* was launched the following year.

Canada now stands on the threshold of a new venture in space with the launch of the Communications Technology Satellite, which will test the technology and applications of a new generation of high-powered satellites to meet the communications needs of the 1980s.