



**Telesat's two control stations at Allan Park, Ontario, (right and top left) and Lake Cowichan, British Columbia, (bottom left) have 30-metre antennas. The three smaller antennas at Allan Park provide tracking, telemetry and command functions. The satellite control system developed by Telesat has been used in the United States, Indonesia and Brazil.**

Twenty thousand silicon solar cells mounted on the body of the spacecraft provide the power for the electronic systems in the Aniks. In addition, batteries maintain full power when the moon or the earth comes between a satellite and the sun.

Using a new radio-beam system and computer controls, the Telesat System holds the position of each satellite within a tolerance of 0.5 degree latitude and longitude. Calculations for on-line satellite control are performed on Telesat's mini-computers at the Satellite Control Division in Ottawa. The data are processed through a large, commercial shared-use computer. This eliminates a substantial investment in large utility-type computers and gives the Telesat system the best possible level of cost effectiveness.

The ability to position and hold satellites precisely on station has also saved money. It enabled the Canadian system to become the first in the world to use less-expensive fixed non-tracking communications earth stations. Previous systems required earth stations capable of following the deviations of a satellite from its assigned position. Only three of Telesat's earth stations have tracking antennas. They are used during launch missions and for housekeeping manoeuvres. Two are at Telesat's main location at Allan Park, 120 kilometres northwest of Toronto; the other is at Lake Cowichan, British Columbia.

Telesat Canada's network of 100 earth stations includes installations of widely varying size and purpose. The two control stations at Allan Park and Lake Cowichan have 30-metre antennas. They are heavy route stations, fully staffed 24 hours a day. They distribute network quality television and radio programming. A high-density service links Vancouver and Toronto with two-way telephone circuits, and a medium-density message service links various northern stations to the

southern ground-based message network through Allan Park.

Stations with 10-metre antennas carry network television and northern communications; those with 5-metre antennas handle remote television reception and message service.

Transportable, semi-permanent earth stations, called Anikom, have been developed to meet the demand for telecommunications services in remote locations. Anikom stations have 4-metre antennas and weigh 953 kilograms, complete with shelter. They can be moved by aircraft, train or truck and assembled within a few hours. They provide voice, facsimile, Teletype and data services.

Another recent development is "Frontier TV Service". It brings radio and television to small communities in isolated locations that are not yet included in the national networks. A frontier station capable of receiving one of the three CBC-TV channels can be leased at a cost of \$14,000 per year. The first stations were in the Yukon. James Bay now has some, and more are planned for Saskatchewan, British Columbia and the Northwest Territories.

Over the next five years, the Northern Communications Assistance Program plans to provide basic local and long-distance telephone service in 28 of the remotest communities of the Northwest Territories. The program will be established by Telesat Canada. The federal government initiated the program and provided \$9 million to help fund it.

Telesat's system has established Canada as an internationally-acknowledged leader in domestic communications via satellite. The United States' Western Union WESTAR domestic satellite communications system was modelled on Telesat's satellite-control-system design approach, as was the Indonesian PALAPA system. The planned Brazilian system will also be patterned on Telesat's controls.