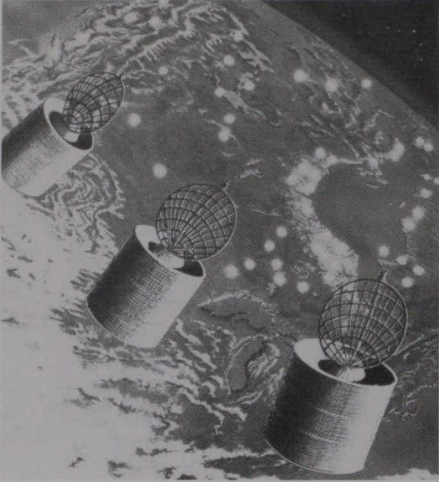


Cover shows artist's impression of the three Anik satellites which provide the basis for Canada's domestic communications system.

Canada Today



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Canada launches satellite of tomorrow

By Jenny Pearson

With three Anik satellites already spinning around the Earth and communications bouncing off them across Canada and the United States, the Canadian space programme is about to take another leap forward with a new spacecraft designed to explore future possibilities for space communication — in advance of anything so far attempted.

The Communications Technology Satellite (CTS), scheduled for launching from Cape Kennedy in Florida towards the end of this year, will be the most powerful communications satellite ever launched. It is not for commercial use as the three Aniks are. It is a test vehicle, equipped with high-powered orbiting transmitters that could bring the most sophisticated communications — at present limited to highly developed areas — to every part of Canada by the 1980s.

The powerful CTS satellite is expected to get over a lot of problems which inhibit further development of communication via the Aniks. Because the Anik systems operate in a frequency band (4-6GHz) shared with other systems on the ground, satellite power levels have at present to be restricted to prevent interference. This has been an important factor controlling the use of the large, expensive ground antennae which pick up signals from the Aniks.

More Earth terminals

The new satellite will be able to operate at much higher frequencies and higher power, so that it will become possible to establish a vast network of small, even portable Earth terminals, which will be simpler and much less costly to use. As the cost of ground stations comes down the number of people served by satellite communication will be able to rise much faster.

It will also vastly increase opportunities of making regional connections: for example, places in the remote north, which at present have their television beamed to them from cities in southern Canada, will be able to link up with one another. There is even talk of creating space links between Eskimo and Indian communities — a move which should satisfy those critics of the present situation who complain that television beamed north from the populous areas is helping to break down and destroy indigenous cultures.

In appearance, CTS has more in common with the birds and the bees than any of its predecessors, though its "wings" are not for flying with but for soaking up energy

from the sun. Light in weight and extending like concertinas from the main body of the spacecraft, these wings carry enough solar cells to provide an initial power output greater than one kilowatt. Other technological advances in the vehicle include a new kind of travelling wave tube; supplied by the United States' National Aeronautics and Space Administration (NASA), it should be capable of producing a 200-watt signal at 50 per cent efficiency (as compared with 30 per cent on the present generation of satellites); and it will be stabilized by three hydrazine jets and a momentum wheel, where its predecessors have been kept stable by spinning.

Social implications

During its expected two-year lifespan, CTS will be used in three kinds of experiment: to test new satellite design and components, to study ground station technology and to look into the social and economic implications of such systems.

The third area of investigation is in keeping with the Canadian Government's policy on space communications from the very beginning, which has been one of careful study and control of the space programme to ensure that its benefits were wisely and fairly distributed. A pamphlet on *Canada in Space*, published by the Department of Communications, says of CTS, "It is one thing to build such an advanced satellite — quite another to determine the wisest use for it. The social significance of the non-technical experiments planned for CTS cannot be over-emphasized."

Interested groups across Canada have been invited to suggest ways the satellite could be used and many will be participating directly by carrying out experiments selected from the original body of suggestions by an independent evaluation committee. Proposed experiments include remote medical diagnosis, community interaction and tele-education.

Thus even before it is launched CTS has started people thinking about new ways to solve their communication problems, acting as a catalyst for groups which might never have dreamed of using a communications satellite if the Government had not offered to put one at their disposal. It will be used by 20 organizations with a total of over 30 experimental services.

Right: Model of the new CTS with "wings" outstretched to capture solar energy.