*This earth station at Inuvik in the Northwest Territories is one of 100 in the national network of Telesat Canada, an enterprise owned jointly by the federal government and Canadian telecommunications carriers.*

*Canadians probably have access to more television than any other people. The Canadian broadcasting system is a mix of public and private, national and provincial networks. Above, a studio of the government-owned Ontario Educational Communications Authority, familiarly known as TVOntario.*

This mix of public and private ownership has served Canada well. Until the advent of the communications satellite, microwave was regarded as ideal on long-haul, high-density routes and for television transmission because of its capacity for carrying large quantities of information economically. In 1958, the Trans Canada Telephone System (TCTS) completed its cross-Canada microwave route, thereby permitting live nation-wide television programming. Now a CNCP route and a second TCTS one span the 6,500 kilometres of rough terrain between Canada's east and west coasts. Microwave towers, spaced about 50 kilometres apart and capable of amplifying and relaying signals, reach into Canada's North. One microwave channel can transmit more than 1,200 telegraph, data or telephone messages, and the system can carry radio and television programs, computer communications, telex and other telecommunications services. The microwave system is one of the two major components of Canada's electronic nervous system.

The other is the communications satellite. In 1973, Canada entered the space age with its own domestic commercial communications satellite service. The Canadian communications satellite system provides a complete range of telecommunications services and vital communications links for Canadians in remote areas – especially in the far north. New higher power Canadian satellites – the prototypes for the direct broadcast satellite of the future – have been tested, and will in the near future make possible a qualitative leap in the level of service to remote areas (See *Communications Satellites: The Canadian Experience*, another publication in this series).

The satellite is only one of many recent advances in communications technology which is challenging the assumptions of Canadian users and suppliers of telecommunications services. As the 1980s begin, even the traditional distinctions between the different modes of telecommunications are shifting and blurring.

Telegraphy, for example, is a diminishing part of the business of CNCP Telecommunications which, with its 16,000-kilometre microwave network, was Canada's telegrapher *par excellence*. Now the network is ever more an electronic highway for telex messages, computer data, an early and partial version of the prototypal electronic letter, television signals, facsimile, voice transmissions and other information being moved by industries, businesses and government.

Telephony is also no longer the only concern of Canadian telephone companies, even though they own and operate some 15 million telephones and 23 million kilometres of circuits. The major telephone companies now provide competition for telex, a wide variety of data services and the plant for distribution of television and radio signals. Bell Canada, the largest private telephone company in Canada, will soon be conducting field trials with a videotex or two-way TV system which could transform Canadian homes into electronic windows on the world.

The telephone network itself is being transformed. The digital electronic switch is gradually supplanting the electro-mechanical step-by-step and crossbar switching equipment. Electronic switching systems can handle calls faster and more economically. The first became operational in 1977 and they are now widely used in Canada. In January 1979, Bell Canada brought into service in Canada's capital a new digital multiplex telephone switching system, the DMS-200, with a capacity of 60,000 trunks – more than double the capacity of any analog switching system now in use. With the new digital technology, it is possible to carry simultaneously 24 conversations over one circuit at a transmission speed of 1,544 kilobits* a second. And the sound of a caller's voice will be much clearer and freer from interference than with the traditional analog system.

**a bit is the smallest unit of measurement of capacity in a memory storage device.*