## "Down to Earth" Space Technology

he tremendous potential of space technology to meet social and economic needs on earth has propelled Canada's space ventures from the beginning.

Canada's population of 26 million people is Scattered across a vast land mass and six time zones. Its rich resources are dispersed over a challenging geography where the climate ranges from the Arctic cold to the desert heat.

## Communications Satellites

It is no wonder that Canada has developed one of the world's most innovative and comprehensive communications networks.

The 1972 launch of the Anik A1 satellite set the nation on a course to providing 99 per cent of its population with dependable communications services. The Anik A1 was the world's first telecommunications satellite in geostationary orbit - that is, a satellite which moves in a ring around the equator in such a way that it remains in a fixed position above the earth. Remote communities that could not be reached by terrestrial systems were instantly brought into the mainstream of twentieth century communications. Through satellite transmission, television services also became available to the most isolated regions.

Significant pioneering developments followed. A major challenge was to lower the high costs of satellite transmissions and increase their accessibility. The answer lay in smaller and less-expensive earth stations, satellites broadcasting to cable networks, and direct access to broadcasts through home satellite dishes. The Hermes experimental satellite paved the way for these advances in 1976, followed by Anik B in 1978.

Today, virtually every Canadian community has telephone, radio and television services. Businesses have access to sophisticated telecommunications for data, voice and image transmission. Even computers can 'converse'' with one another. All this is achieved through Canada's present-day communications satellites — Anik C and Anik D.

These links will be expanded and improved with the next generation of satellites. Two Anik Es, to be launched in 1990, will be the largest and most powerful domestic communications satellites to date. MSAT, the mobile communications satellite scheduled for launch about 1992, will revolutionize mobile communications. Small terminals on board mobile vehicles on land, at sea, or in the air will join the extended network.

Tele-education

Universal access to educational opportunities is one of Canada's goals. Satellite communication has helped make this possible by offering an effective and economical means of reaching students cut off from traditional classrooms.

Receiving live satellitedelivered television broadcasts of lectures and seminars, students in remote locations join the electronic classroom over two-way telephone links. With increases in student interest and enrolment, teleconferencing now plays a vital role in distance education. One-third of Canada's 71 universities and some 35 community colleges use it as an integral part of their tele-education programs.

The outstanding success of these projects prompted the establishment of educational satellite television networks like TVOntario, which now reaches 95 per cent of Ontario's population via satellite network. Other educational satellite networks - Radio Québec, ACCESS Alberta, and British Columbia's Knowledge Network — meet regional needs. They have pioneered alternatives to the traditional classroom, providing preschool television for several hundreds of northern communities; in-school programs for elementary, secondary and postsecondary students: general interest and information broadcasts: as well as formal telecourses accredited by affiliated educational institutions.

The satellite network operations centre located near Toronto is the nerve centre for Telesat's Anik communications satellites. It relays long distance telephone calls, business data, and radio and television programming.

