

The ultimate application of satellite technology to broadcasting will be in "direct" broadcasting—the transmission of a satellite signal strong enough to be received directly by a low-cost (\$500 or less) home receiver about one metre wide. There are no satellites dedicated solely to direct broadcasting yet, but by the late 1980s several countries will have them. By the turn of the century, DBS could well become the most important function of communications satellites.

Canada pioneered direct broadcasting in 1976 with demonstrations using the high-power, high-frequency experimental satellite Hermes. Because of its power, and because its 14/12 GHz transmissions eliminated interference with 6/4 GHz ground telecommunications networks, its signals could be picked up in city centres by antennas less than one metre in diameter. (To avoid interference, earth stations oriented to 6/4 GHz satellites often have to be located away from urban areas and require relatively large dish antennas—three metres wide and larger.)

In January 1979 Canada became the first country to use the scaled-down earth stations (0.6 to 1.6 metres) in a long-term trial during the six-month TVOntario DBS experiment using Hermes. Field trials continued with the moderately-powered Anik B satellite, which could broadcast in both the 6/4 and 14/12 GHz mode. The first regular direct-to-home broadcasts began in September 1979, when Anik B started transmission of 94 hours of TVOntario programs a week. Two months later, the satellite started carrying 150 hours weekly to residents of western Canada for British Columbia TV Ltd., a private broadcaster, and the Canadian Broadcasting Corporation.

In 1981, the Department of Communications undertook a wide-ranging program of planning studies to assess all aspects of a full-fledged DBS system for Canada: technical and system requirements, as well as social, economic, regulatory and policy issues. These studies were completed in 1983 and indicated that a DBS system could be feasible to deliver a multi-channel television package to the approximately 1.8 million Canadian households in rural and remote areas that have limited access to broadcast services. (Most have three television channels or fewer.) These households could pick up DBS signals with a small dish antenna installed on the rooftop or in the backyard. With mass production, these antennas could cost as little as \$400.

None of the satellites now in operation is powerful enough to offer a 'true' DBS service, i.e. excellent reception on at least six channels using dishes smaller than one metre. However, the Anik C spacecraft, currently the strongest communications satellites, provide acceptable DBS home reception within certain limitations. Anik C channel capacity is being leased by an American company for the first commercial DBS system in the world. United Satellite Communications Inc. (USCI) delivers five television channels *via* Anik C to subscribers in the eastern United States who are not served by cable. The USCI service began in autumn 1983 and uses 1.2-metre dish antennas. In Canada, North Star Home Theatre Inc. plans in 1984 to market pay-TV *via* Anik C directly to homes with no access to a cable grid.

Anik C can provide a reasonably good interim DBS service in Canada until satellites specifically designed for that purpose are launched. However, systems using Anik C (or other satellites of similar power) and small receiver antennas suffer from occasional signal loss or degradation because of rain. To overcome this problem, true direct broadcasting satellites will be considerably more powerful than existing domestic communications satellites. Two such spacecraft would be needed to serve all Canada.

We lead the world in DBS technology, and are now poised to proceed with the final planning for our own system of satellites dedicated to direct broadcasting. At the July 1983 Regional Administrative Radio Conference, Canada was assigned the necessary six orbital positions for satellites that could be used in a full-fledged DBS system. Canadians are now awaiting Telesat Canada and the country's broadcasters to come up with a definitive proposal on how to set up an initial system. Whatever is proposed, it is certain to satisfy one of the principal objectives of the 1983 Broadcasting Strategy for Canada: "to provide a significantly increased choice of programming of all kinds in both official languages (English and French) in all parts of Canada".

A Canadian DBS service possibly would offer remote and rural users something besides the traditional commercial channels, pay-TV and public interest stations. It could also provide radio and many of the new services now being developed or considered for cable distribution: teletext, facsimile transmission, high-resolution TV and 'narrow-casting' services (specialized television programming aimed at small specific audiences, such as continuing education for professional groups).