Digital Leased Line Services

In recent years, more and more communications systems in Canada have been "going digital", bringing Canadians a wide range of exciting new services and stimulating our growing industry of digital communications products and services. In 1973, Telecom Canada (then called the TransCanada Telephone System) introduced the world's first commercially available nation-wide digital data transmission system — Dataroute. In the same year CNCP Telecommunications introduced its own nation-wide digital data transmission network — Infodat.

Both systems use time-division multiplexing, a technique which permits several users to employ the same transmission line by allotting each a unit of time on that channel. Dataroute and Infodat offer users point-to-point private line service. This kind of arrangement is suitable for organizations transmitting high volumes of data, but is costly for those with lesser transmission needs.

Digital Packet and Circuit Switching

The next step was to switched digital data networks which could accommodate a variety of user needs at much lower cost. In 1977, TransCanada Telephone System introduced its Datapac network which uses packet switching, while CNCP Telecommunications introduced Infoswitch, a network employing both packet and circuit switching.

In a circuit switched system, a connection is made between two terminals for the duration of a call. The user only pays for connection time whereas, with a leased line, a fixed charge is levied for the communications facility, whether or not it is being used.

In packet switching, messages are divided into electronic "packets", each with its own "address". A network of circuits is connected constantly and at each juncture a computer decides the most direct and open route through which an information packet will travel to its destination. The various packets that form a message may thus travel different routes to reach the same destination. All packets are checked for accuracy at points along the route. Packet switching is both efficient and economical because many users can share paths through a network, thus capacity is not wasted. Users are charged only for the amount of information sent, a further refinement in communications costing.

Virtually any data terminal in the country can access Datapac and Infoswitch. This is possible because there is a standard for interfacing terminals with packet switching networks. Without it the packet switching nodes in the networks might be unable to decipher coded instructions for handling packets, while terminals and computers might not be able to process packets received from the network. Telecom Canada led the way in developing an internationally recognized packet switching standard called X.25,

which has been ratified by the International Telegraph and Telephone Consultative Committee (CCITT). CNCP Telecommunications has also announced its support of X.25 devices.

Both Infoswitch and Datapac can be connected to numerous other countries through Teleglobe Canada's Globedat, an international data gateway, which routes both packet and circuit switched traffic and provides low-to-medium speed data transmission.

Digital Voice and Data Switching

The use of digital technology is increasing not only for data transmission but for all other forms of communications services as well. In telecommunications exchanges across the country, the digital electronic switch is gradually supplanting electro-mechancial step-by-step and crossbar switching equipment. Programs to eventually create fully integrated digital systems and networks carrying voice, data, messages and images are under way in every province of Canada. Telecom Canada expects its intertoll network to be entirely digital by the year 2000.

View of Mitel's manufacturing activities at Kanata, near Ottawa.