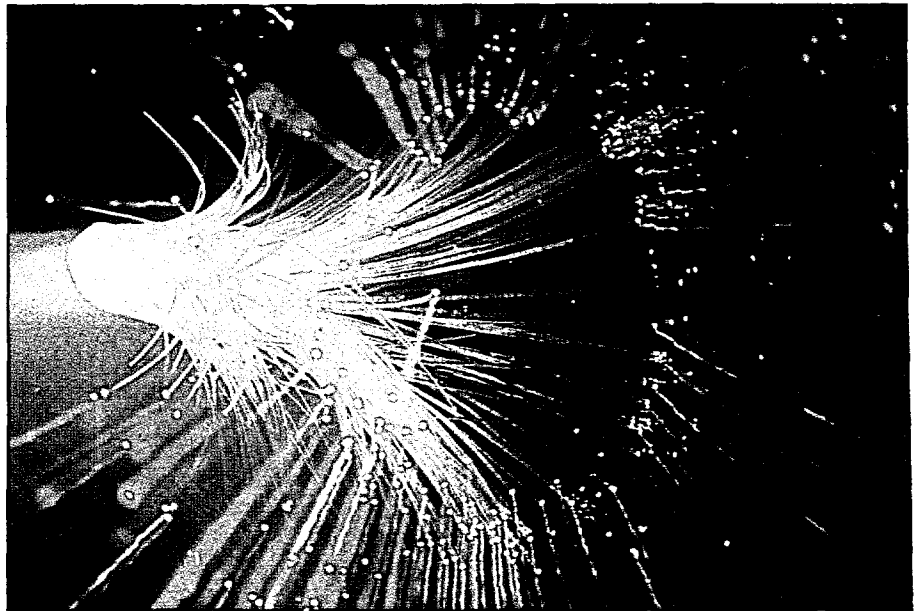


Fibre Optics . . . once a technology for the future, will soon form the backbone of a nationwide digital telecommunications network.



Some long-distance circuits have also been installed using 135 M bps technology, including cross-border connections to the United States. Experimental systems for building "wiring" and analogue transmission of television signals have all added to the experience.

The need for additional circuits in many major cross-sections of the national network coincided with the availability of 565 M bps systems from several manufacturers. This was the combination of circumstances which made possible the decision to use fibre optics.

PLACING AND ROUTE SELECTION

While the use of aerial cable has not been ruled out, the great majority of the fibre optic route will be buried or placed in underground ducts. As for location, this is a critical decision that must be approached on a kilometer-by-kilometer basis.

The main alternatives have been ranked in order of preference, based mainly on ensuring a secure route. The first choice is along limited access highways; the second, 100 m from a highway; and so on.

Conflicting with the need for security is the need for access, particularly in an emergency situation if the cable needs repairs. For this reason some of the more remote choices have been ruled out.

PROTECTION

The fibre optics section of the national network will have a two-level system for ensuring backup in case of interruptions, using devices called "protection channels".

Both levels of protection provide appropriate alarms to initiate maintenance action. Both also have levels of priority, so that a channel which has switched to protection can be forced back to its regular route if another channel fails completely.

RESTORATION

Despite these backup systems, and the precautions in locating and placing the cable, it must be expected that a system of 7000 km will experience more than one cut per year due to highway or other construction work. It must also be expected, based on experience with coaxial and other cable systems, that an outage will last several hours. This pattern is very different from microwave systems which rarely have a complete route failure.

To ensure continuity of service, arrangements are made to have circuits on failed fibre routes restored on other facilities, such as digital microwave radio. In most parts of the country, protection channels are available on these microwave systems.

Once the microwave capacity is exhausted, the only practical way of restoring will be on a second fibre route. These restoration needs will be the main trigger for building Telecom Canada's second coast-to-coast link.

For the members of Telecom Canada, fibre optic transmission will quickly become the main bearer system for the coast-to-coast network. Fibre optics links will provide high quality, high-capacity circuits, and with the inherent flexibility of digital technology, will be capable of meeting Canada's communications needs for many years.