

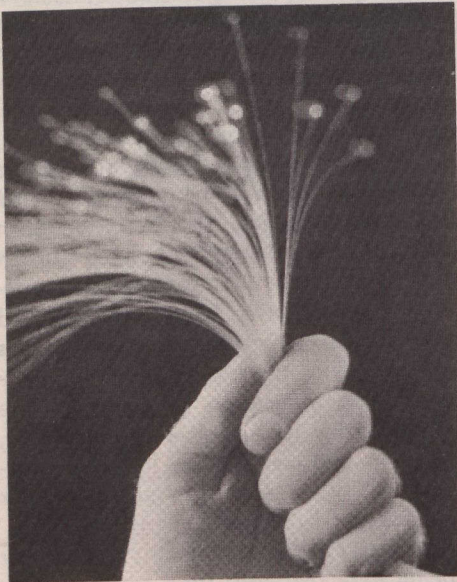
Telephone terminals have gone through a radical series of developments over the last few years and this evolution will accelerate. Increased use of electronic digital exchange switching and the addition of tone-to-pulse converters to many rotary dial phones have speeded the trend toward all-push-button telephones.

Various Canadian manufacturers offer state-of-the-art digital PBXs business communication systems and packet switching systems. Canada can provide low cost micro-processor-based units that combine data processing, word processing and communications capabilities in desk top models. A new large capacity business PBX has recently been announced for large corporations handling requirements from a few thousand to 30,000 telephone lines.

Highly professional consulting engineering firms provide a full range of services to the telephone industry. These include preliminary investigations, advisory services, design engineering, project management, traffic and rate studies, specialized design and development services.

Fibre optics systems

Fibre optics has been used in communications in Canada since 1976 and many field trials have been undertaken. As a result, Canadian industry has a leading position in this new technology. Applications include a residential area of Toronto where households are being used to show the practicability of simultaneous transmission of telephone, data and television



Because optical fibres carry light pulses rather than electricity, they are not disrupted by such things as lightning or power lines. They are made of silica, a basic constituent of ordinary sand.

in urban fibre loop facilities under working conditions. In the rural environment an extensive field trial co-sponsored by the Canadian Telecommunications Carriers Association, the Manitoba Government Telephone Company and the federal Department of Communications connects 150 rural homes with telephone, television, radio and data communications.

A major installation that is to carry more than 20,000 voice circuits in Alberta is being completed, one of many trunk systems. A project that will be one of the world's longest fibre optic broadband systems is being constructed in Saskatchewan carrying 12 video channels. The system is planned to ultimately reach most major communities in the province and will have a system length of 3,200 kilometres (1,800 miles).

Space communications

Among the member states of the International Telecommunications Satellite Consortium (INTELSAT), Canada ranks tenth in terms of its spacecraft investments.

Telesat Canada was formed on September 1, 1969 by an act of the Canadian Parliament to own and operate the world's first domestic satellite system, launched in 1972. With more than 100 Canadian manufactured satellite earth stations of about 14 different types and sizes ranging from large stations with 30-metre (100-foot) antennas to small transportable stations down to 1.2-metre (4-foot) antennas, Telesat now offers a wide variety of services to the remote areas of Canada, as well as the populated areas.

Its industrial centres are linked together and to the Canadian North through the Telesat network and to the rest of the world through Teleglobe facilities including satellites. The Canadian space industry has established a high reputation for standard of excellence and is particularly respected for strengths in the innovative design and manufacture of satellite earth stations and satellite antennas, transponders, and specialized spacecraft components and control subsystems.

Internationally, Canadian industry has co-operated in joint ventures with U.S. and European industry to the extent that Canadian content in the form of mechanical and electronic subsystems is to be found in most of the world's commercial communications satellites. An example is the U.S. Tracking and Data Relay Satellite Spacecraft which carries essential electronic subsystems designed and manufactured in Canada.

In co-operation with the National Aeronautics and Space Agency of the United States, Canada designed and manufactured for NASA the critical Remote Manipulator System (RMS) for the Space Shuttle Transportation System. RMS is a remotely-controlled mechanical arm, some 15-metre (50-foot) long with six degrees of freedom, which will be used to unload the payload from the Shuttle while in weightless orbit. Three additional RMS units are currently being manufactured for NASA.

During 1976, the Canadian space industry was consolidated to create an industrial structure capable of undertaking prime contracting responsibility for complete communications satellites. In addition, SPAR Aerospace Limited is currently under contract with Telesat Canada to provide the *Anik-D* series of two satellites. Canadian government agencies and Canadian companies are active in international co-operative space projects.

In addition to the work with NASA, Canada has a co-operative development agreement with the European Space Agency (ESA) and is strengthening its involvement in that agency's programs. Canada is currently taking part in the definition phase of ESA's L-SAT, a large communications satellite with a proposed 5.5 kilowatt power supply, intended to provide communications coverage of Europe for a range of services.

Cable television

Leaders in the cable television (CATV) industry since its inception, 526 Canadian CATV systems companies serve four million subscribers. Thirty per cent of the subscribers have access to 30 TV channels while the remainder have 12 channels available. Canadian companies design, manufacture, install and operate the Canadian CATV systems as well as providing equipment and services in Europe and the United States.

The world's largest coaxial CATV trunk system has been placed in service in the Manitoba Telephone System to link Winnipeg, Manitoba's capital city, to four rural communities. The cable system linking Manitoba's two largest cities, Winnipeg and Brandon, is 234 kilometres (146 miles) long and utilizes unique low distortion amplifiers developed in Canada to provide high quality bi-directional CATV signal transmission of up to eight channels in the forward direction and four in the reverse.

There are more than 75,000 kilometres (45,000 miles) of cable in place across