DEPARTMENT OF COMMUNICATIONS ANNUAL REPORT 1972-1973

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Submitted under the provisions of the
Communications Department Act

Information Canada
Ottawa, 1974

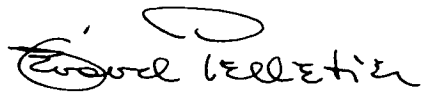
Cat. No.: Col-1973

To His Excellency the Right Honourable Jules Léger
Governor General and Commander-in-Chief of Canada

Your Excellency,

I have the honour to present the Annual Report of the Department of Communications for the fiscal year ending 31 March 1973.

Yours faithfully,



Gérard Pelletier

Minister of Communications

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FOREWORD

Communications is a field in which the future is constantly threatening to arrive prematurely. No one can judge precisely what effect the exploding technology of communications will have on everyday life. But it seems reasonable to assume that the impact will be at least as profound as the changes wrought by the introduction of the telephone or the advent of television. In their report on telecommunications in Canada, the authors of *Instant World* wrote that "... unremitting effort and attention will be needed to eliminate or at least control the possible anti-social by-products of the technological revolution, while at the same time striving to put new opportunities to best use."

In Canada, the development and control of new communications tools and techniques takes place against a background of perceived national goals. For example: How can Canada be assured of a reasonable variety of communications services and what must be done to ensure that at least basic services are available to all Canadians? What can be done to make Canadian communications systems more reliable and less costly? How can east-west communications links be strengthened to offset the pull of north-south ties? How can the telecommunications network be used to foster Canadian social and cultural values?

On November 9, 1972, Canada became the first country in the world to establish a geostationary domestic communications satellite upon the launch of Telesat Canada's Anik I. Five months later, the Minister of Communications tabled a Green Paper in the House of Commons, outlining proposals toward a national telecommunications policy. These two events — highlights of the 1972-1973 fiscal year covered in this annual report — were not directly related but they do emphasize two major and complementary responsibilities of the Department of Communications.

The Department of Communications has the responsibility of helping to ensure that Canadians obtain access to an expanding variety of telecommunications services. To that end, it undertakes and sponsors much of the relevant research conducted in Canada, and it promotes a wide range of studies designed to equip policy makers with an appreciation of the social, cultural and economic consequences of applying new technology.

Much of the department's research program is devoted to satellite technology, at least partly because satellites appear to be the only economic way of extending communications services to the far north and other isolated areas. Research is going forward on an ultra high frequency (UHF) satellite which could facilitate voice and data communications in the future. The department also continues to prepare for the mid-1970's launch of a Communications Technology Satellite (CTS) a possible forerunner to the next generation of communications satellites in the 1980's. Meanwhile, Alouette I, the first of six satellites sent aloft by Canada, celebrated its 10th year in space on September 29, 1972 — still transmitting scientific data back to earth.

Research also includes projects to define the scope of future communications requirements; experiments to improve the reliability and accuracy of radio spectrum navigational aids; and efforts to develop ways of overcoming radio interference at high latitudes. Work was underway during the year to exploit the capability of radar for several purposes, including mapping and measuring the thickness of winter ice in Canada's inland waterways.

The application of computer/communications is now becoming more common. A departmental task force studied computer/communications for more than a year and published a two volume report entitled *Branching Out* in August, 1972. The report contained a number of recommendations which have since formed the basis of a new Green Paper on computer/communications policy. The paper was in the final stages of preparation as the fiscal year drew to a close.

The implications of computer/communications are immense but not all of them are welcome. Perhaps the overriding danger is that this technique opens the door to the creation of new types of data bank containing large amounts of information on individuals. The Department of Communications, in collaboration with the Justice Department, studied this aspect of the problem and published a report, *Privacy and Computers*, in November, 1972.

The department undertook several major studies concerning the application of new technology during the year. In response to a request from the Maritime provinces, it sponsored a study into the possibility of employing computers to standardize certain government activities on a regional basis. It also undertook an economic forecast and assessment of the future demand for land-mobile telecommunications — such as taxi-cab companies and police forces use — in Toronto and Montreal.

Another aspect of the department's work concerns the overall planning of the telecommunications network and its component parts. During the year, groups within the department assessed the facilities available for inter-regional communications; began a review of the telecommunications equipment supply industry in Canada; and compiled and analyzed the corporate and financial statistics of Canada's major telephone companies. A number of experiments and studies were undertaken during the year to extend communications services to the north; to improve maritime communications systems; and to meet the demands for new and more sophisticated communications facilities in highly urbanized areas. Efforts were also made during the year to improve and expand the federal government's telecommunications facilities and services.

One of the department's most challenging problems is how to ensure that the best possible use is made of the electromagnetic spectrum, an important and limited national resource. It is the continuing responsibility of the department to license users, assign and register radio frequencies, inspect equipment, monitor the spectrum and set forth the procedures under which the resource is used.

Canadians are heavy users of communications services. Ninety-five per cent of Canadian homes contain a telephone: 97 per cent have a television set and 98 per cent are equipped with AM or FM radio receivers. Cable TV is expanding rapidly and 27.7 per cent of all Canadian households enjoyed this service by the end of 1972. The number of radio operating licences in Canada, excluding commercial broadcasting outlets, nudged the 300,000 mark during the fiscal year 1972-1973 — an increase of more than 10 per cent over the fiscal year 1971-1972.

Since the radio spectrum overlaps political boundaries and since international cooperation is essential in providing world-wide communications, the department takes an active role in international telecommunications. Canada hosted the Commonwealth Telecommunications Conference in Ottawa during November, 1972. A major event of the year in international communications affairs was the entry into force of definitive agreements establishing Intelsat, the International Telecommunications Satellite Organization. The agreements converted Intelsat from a loosely-knit consortium of participating countries — including Canada — into a permanent global satellite communications system. International communications facilities for Canada are operated by the Canadian Overseas Telecommunications Corporation (COTC) a Crown Corporation.

The activities of the department during fiscal year 1972-1973 are explored in more detail in the body of this report.

CONTROL OF THE FREQUENCY SPECTRUM

The Department of Communications has the overall responsibility of ensuring that the best use is made of the electromagnetic spectrum. To that end, it sets technical standards for equipment, assigns frequencies, licenses users of the resource, monitors the air waves, and investigates incidents of interference. The day-to-day management of the spectrum is handled by five regional offices — located in Vancouver, Winnipeg, Toronto, Montreal and Moncton — and a number of district offices. Regulations, standards and procedural criteria are developed at Ottawa.

LICENSING AND FREQUENCY ASSIGNMENTS

A total of 296,620 radio station licences were in force at the end of the fiscal year, excluding commercial broadcasting stations — an increase of 10.3 per cent over the previous year. The department instituted a computerized system of licensing and accounting to handle the increasing number of applications. A total of 518 applications for Technical Construction and Operating Certificates for cable TV and commercial broadcasting outlets were processed and co-ordinated with the Canadian Radio-Television Commission (CRTC) which licenses commercial broadcasting. One hundred twenty-three commercial broadcasting outlets either began operation or modified their facilities during the year.

There were 9,514 cancellations and 18,313 new frequency assignments processed during the year. The department also prepared and submitted 1,579 new, 677 amending and 683 deleting frequency assignment notifications to the International Frequency Registration Board (IFRB) for inclusion in the Master International Frequency Register. The department revised its methods of compiling frequency assignment and utilization statistics this year, in order to monitor growth patterns in areas of frequency congestion more effectively.

Some 95 engineering briefs were approved by the department concerning the operation of unattended transmitters, automatic programming methods and stereophonic and subsidiary communication operations of FM stations. The department scrutinized 763 notifications of allotment changes by countries which are signatory to broadcasting agreements with Canada. This work is necessary to ensure protection of Canadian channels.

In collaboration with the Ministry of Transport and the major aircraft companies, the department developed policies governing the inspection and control of aircraft radio workshops during the year. The policy was implemented on October 1, 1972.

Radio noise limits for industrial, scientific and medical radio frequency generators, and for domestic commercial electrical equipment and appliances were revised. Direction-finding equipment was installed at the monitoring stations at Almonte, Ont., Fort Smith, N.W.T., and Montague, P.E.I.

CABLE TELEVISION

The Department continued to certify new CATV systems during the year and took steps to modify standards governing their operation. CATV systems are required to submit technical performance assessment and proof reports under regulations developed by the department. The department approved an extension of one year for submission of these reports. Performance assessment reports by existing systems are now due between June 30, 1973 and September 30, 1974, while proofs of performance are due between March 31, 1975 and June 30, 1976.

Broadcast Procedure 24, a departmental document describing test procedures for various sizes of cable TV systems, was released in draft form on August 6, 1971. It has since been studied by the Canadian Radio Technical Planning Board (CRTPB) and a revised draft was under consideration as the fiscal year ended. On June 28, 1972, the department also released a draft supplement to Broadcast Procedure 23, dealing with technical standards, procedures, and channel arrangements for cable TV systems with augmented channel capacity; this is also being reviewed by the CRTPB.

STANDARDS AND REGULATIONS

A major review of regulatory and enforcement problems was launched during the fiscal year and several modifications of existing standards and procedures were promulgated. Among these activities were the following:

— The Canadian Table of Frequency Allocations was revised and re-issued.

— A new radiotelephone handbook was published for the operators of radiotelephone equipment and for candidates preparing for examination for radiotelephone certificates.

— A long-term study of landmobile requirements was undertaken to assess radio frequency congestion problems.

— A means of simultaneously monitoring many frequencies to determine channel loading and occupancy has long been required by the department and a draft of specifications for this equipment was prepared.

— Microwave systems may have to be expanded to accommodate the inter- and intracity requirements of community antenna television companies in the future and work was begun on formulating guidelines for the use of these systems by CATV undertakings.

— The department participated with the Ministry of Transport in the ongoing development of a joint Canadian-American very high frequency communications system for marine traffic control in contiguous waters off the west coast.

— The department is also participating with MOT in an effort to establish regulations for the compulsory carriage of emergency locator transmitters on board all registered Canadian aircraft.

— The use of various frequencies in satellite communications requires a complex coordination procedure. This coordination procedure was fully computerized in September, 1972.

A number of technical specifications governing radio equipment became effective during the fiscal year. Two of these applied to low and medium power mobile radiotelephone equipment; three pertained to higher-power mobile systems. In the medium frequency band, specifications applicable to land and coast station transmitters were revised. As well, the department continued to revise, update and consolidate the technical standards for single sideband modulation equipment used in land-mobile systems.

As the year ended, radio standard specifications were being finalized for garage door controls, burglar alarms, loop paging transmitters and wireless microphones.

New regulations, aimed at controlling interference to radio communications from electrical and electronic appliances and equipment, were established. For the first time, proposed amendments to the Radio Noise Limits Order were published in the Canada Gazette so that interested parties could comment on them prior to enactment. This policy of advance publication will be followed in future in the development of new regulations, standards and procedures.

Also published in the Gazette was a proposed amendment to the Radio Noise Limits Order for the suppression of interference from vehicles or devices fitted with spark ignition systems. The amendment applies to all vehicles other than aircraft and includes such devices as snowblowers, lawn mowers and chain saws.

The United States recently extended the radiotelephone segments of the U.S. radio amateur 75 and 40 metre bands. As a consequence, some radio amateurs have requested changes in the Canadian radiotelephone bands. The department distributed a questionnaire/ballot to all Canadian licensees to determine the wishes of the amateurs as a whole.

PLANNING THE NETWORKS AND SYSTEMS

The department has an obligation to ensure that the future communications environment foreshadowed by the huge range of new techniques and tools should not be allowed to develop without any regard for its impact on Canadian social and cultural values and the quality of life in Canada, as well as on the Canadian economy.

In most countries outside North America, the government itself is the provider of communications service and is therefore in total control of policy and plans. In Canada, there is a mix of public and private ownership in telecommunications facilities, and the exercise of regulatory authority is divided.

During March 1973, the Minister of Communications tabled in the House of Commons, a Green Paper entitled *Proposals for a Communications Policy for Canada: A Position Paper of the Government of Canada.* The paper outlined the federal government's thinking in respect of many issues, including: the division of federal and provincial authority in telecommunications; the protection of Canadian cultural and social values; regulation of the common carriers and cable systems; and measures to ensure Canadian ownership of these facilities.

The Green Paper outlined the general position of the government with regard to the development of national communications policy, together with suggestions for new federal legislation. Central to these proposals was the conviction that communications policy and regulation should be guided by a set of national objectives which would eventually be incorporated in a new Communications Act. Among the main questions dealt with in the Green Paper were:

— a commitment to the development of mechanisms for consultation and collaboration among the federal and provincial governments and regulatory bodies in the formulation and implementation of national policy objectives;

— a commitment to the principles of broadcasting policy contained in the Broadcasting Act;

— the development of means to ensure that technological advances, such as coaxial cable and satellites, are used to contribute to the capability of the Canadian broadcasting system to fulfill its responsibilities;

— a revision and consolidation of federal legislation relating to telecommunications;

— provision for more effective regulation of telecommunications carriers subject to federal authority; and

— the establishment of a single federal agency to regulate both broadcasting and the operations of the carriers subject to federal authority.

ANIK1

The launch of Anik I, November 9, 1972, added a new dimension to Canada's communication network. Telesat Canada, a corporation owned jointly by the federal government and the telecommunications carriers, assumed control of the satellite shortly after it achieved geostationary orbit on November 13, 1973. Anik I became fully operational on January 1, 1973, and relays television, voice and data to a network of 37 earth stations scattered across the country. Anik II, a back-up, was launched five months later.

The Aniks were the fifth and sixth Canadian satellites. The four previous ones -- Alouette I and II, ISIS I and ISIS II — were all experimental satellites used to study the ionosphere. Hughes Aircraft Co. of California was the main contractor for Anik but the firm relied heavily on Canadian industry for satellite and spacecraft technology. Northern Electric Co. Ltd. supplied the electrical subsystems and Spar Aerospace Products Ltd. of Toronto built the satellite structures.

A change in Telesat's act of incorporation during the year enabled the corporation to provide limited telecommunication service outside the country. The new letters patent, approved by Parliament in January, 1973, provide that service rendered to and between points outside Canada are subject to intergovernmental arrangement. Telesat is constrained to ensure that added business will be incidental and peripheral to its main enterprise, which is the provision of services between points in Canada. Technically, limited service to points outside Canada is possible because the satellite beam, although focused on Canada, unavoidably spills over and thus covers parts of the northern United States and Greenland.

NORTHERN COMMUNICATIONS

One of the department's continuing concerns is the extension of telecommunications services to the north. The inauguration of satellite service has brought some widely-publicized communications changes to some northern communities but the department continues to be involved in many other aspects of communications planning in the north. The department conducted a number of field experiments during the year, aimed at establishing communications needs and priorities and determining which types of communications systems could best meet these needs. As well, the department's Ontario Regional Office, in cooperation with the Ryerson Polytechnical Institute, has helped to develop project "Snowgoose", a facility for low cost but reliable FM broadcasting in isolated communities.

An experimental community radio service in the eastern Arctic was begun during February, 1973, when radio station CKQN started broadcasting at Baker Lake, N.W.T. The department was heavily involved in developing the concept of CKQN and in inaugurating its services. The FM station operates for three hours a day in two languages — Eskimo and English. Its programming includes phone-in shows, community discussions and local news supplemented by programs provided by the Canadian Broadcasting Corporation. It is operated by a group of local residents.

An inter-community radio-telephone system begun as a pilot project during August, 1972 now links the northern Ontario towns of Fort Severn, Sachigo, Round Lake, Big Trout Lake, Sandy Lake and Sioux Lookout. A similar system launched in the autumn of 1972 links five communities in the Keewatin District of the Northwest Territories: Baker Lake, Chesterfield Inlet, Rankin Inlet, Whale Cove and Eskimo Point. Another project, the Comminterphone — a system which allows on-air broadcasts via home telephones — is in operation at Rankin Inlet.

A new field office was opened in Fort Smith during the fiscal year to accept applications for radio station licences, inspect radio systems and investigate reports of interference to communications. The monitoring equipment at Fort Smith benefits those dependent on high frequencies for long distance point-to-point or air-ground communications. The use of high frequencies for communications has been increasing rapidly in the Territories, largely as a result of the search for northern oil. In addition, the department installed instruments at Fort Smith to determine the effects of rainfall on microwave systems.

ECONOMIC POLICY PLANNING

Economic policy planning involves the development of economic forecasts and evaluation of national communications policies. The department completed a comprehensive economic forecast of the industrial demand for landmobile telecommunications in the Toronto and Montreal regions during the year. Another study was completed on methods of forecasting the number of government calls that would occur between various pairs of cities, particularly, Ottawa, Montreal, Toronto and Quebec City.

SATELLITE COMMUNICATIONS PLANNING

The department's planning for potential future satellite communications applications includes a study in some depth of the feasibility of expanding the use of the unique capabilities of satellite systems for Canada. Particular attention has been given to the extent to which a multi-purpose satellite operating in the UHF bands could meet growing demands for voice and data communications, especially in the north. Contracts have been let to private industry to define the needs of Canada's remote areas and to determine whether a small terminal satellite system could meet them; to establish the technical feasibility of such a system; and to investigate the overall costs involved.

RCA Limited was awarded a contract for examining a UHF satellite model operating in two frequency bands, around 300 MHz and 2.5 GHz. This study anticipates that the system would be used mainly for government communications such as defence, health and welfare services to remote communities and for the monitoring and control of natural resources. Some public communications and radio broadcasting would also be possible, as well as monitoring for radio beacons indicating the occurrence of an emergency anywhere in Canada. The satellite channels could provide communications capacity equivalent to a single voice circuit and the terminals could be small enough to be manportable or for installation in aircraft or ships.

NETWORK DEVELOPMENT AND INTERCONNECTION

A working group formed in 1971 to study inter-regional telecommunications completed a large part of its work during the year. The group, representing the carriers and the provinces as well as the federal government, assessed existing facilities, forecast requirements to the year 1980 and conducted a general review of the way in which the carriers intend to meet these challenges. The study identified some of the investment, planning and network interconnection problems in the years ahead. The study will be valuable to participants in forthcoming consultations on regulatory and jurisdictional problems in inter-provincial and international telecommunications.

A major review of the telecommunications equipment supply industry was also started during the year. This project identified the major suppliers of telecommunications equipment, analysed the viability of these firms and assessed the influence of foreign manufacturers in Canada's telecommunications hardware industry. The survey will be presented as a working paper which will serve as a base for discussions between governments, carriers and manufacturers on the need for equipment and facilities in the future.

Interconnection, the attachment of equipment to telecommunications carriers' networks, is the subject of a study begun in the fall of 1971. A working paper on "Possible Interconnection of Non-Carrier Owned Terminal Equipment and Terminal Systems to the Public Switched Networks" was distributed to provincial governments and carriers during November, 1972. Under current practice, the right to provide terminal facilities is reserved to the carriers themselves. The department's inquiry examines the extent to which this practice is in the public interest. The first stage is designed to identify practical alternatives to the rules now in force and to develop a framework for future discussions. Responses to the working paper indicate support for liberalization of the rules. It is expected that discussions will continue with the provincial governments and the federally regulated carriers, aimed at firming up an interconnection policy.

TELECOMMUNICATIONS DATA BASE

As the telecommunications network grows, there is an ever increasing need for reliable statistical information to inform the policy making and network development roles of the department. During the year, the department began compiling a data base of Canadian telecommunications. This continuing effort entails the assembly and organization of a large variety of statistics on the financial resources and equipment available. The project involved cooperation with a number of other government agencies, notably Statistics Canada. One aspect of the project was the completion of financial statistics on Canada's major telephone carriers.

GOVERNMENT TELECOMMUNICATIONS

The Government Telecommunications Agency plans and manages the federal government's telecommunications facilities and services rented from the common carriers. This network carries government voice, message and data traffic to points throughout Canada and certain parts of the United States. Costs of the service are allocated to various government departments on the basis of usage. The economies of scale result in an estimated annual saving of more than $19 million.

The inter-city direct line circuit increased by 68,000 miles to a total of 436,000 miles during the year. The network carried 11.73 million calls, an increase of about 27 per cent over fiscal year 1971-1972. The network was also improved during the year. Edmonton was brought into the full direct-in-dial telephone system and plans were finalized for similar services at Rimouski, Quebec. The number of main stations in consolidated locations increased by 5,830 to a total of 46,700. Consolidations at Saint John, N.B., Kingston, Ont. and Calgary, Alta., are expected in the near future.

A national Zenith configuration service was established in January, 1973 for the Department of National Revenue and it handled an average of 59,200 public enquiries per month. A study of the Unemployment Insurance Commission's telecommunications needs was undertaken, and the department assisted the Canadian Penitentiary Service in improving its telecommunications facilities. In Ottawa, the first computerized government telephone directory was produced for the National Capital Region. The same service will be extended to all other consolidated government telephone systems in the near future.

RESEARCH IN TELECOMMUNICATIONS TECHNOLOGY

The Department of Communications conducts an extensive and continuing research program for two main reasons. First, advances in technology are the primary means of improving and expanding the telecommunications network and its services. Secondly, research serves as a base for the policy planning and program functions of the department.

Most of the department's in-house research is carried out at the Communications Research Centre (CRC), located 15 miles west of Ottawa. Generally the work undertaken complements and is often done in cooperation with research conducted by private industry and results are published for the common benefit of all interested parties. The department also helps to develop advanced research capability at Canadian universities through liaison and related contracts. A certain proportion of the department's research is undertaken for national defence purposes. A large part of the department's research efforts has been and continues to be directed to communications spacecraft research.

COMMUNICATIONS TECHNOLOGY SATELLITE

Work on the experimental Communications Technology Satellite (CTS), planned for launch in 1975, continued throughout the year. The CTS program began in 1971 after the Department of Communications and the U.S. National Aeronautics and Space Administration (NASA) signed a Memorandum of Understanding. Under the agreement, Canada is designing, building and will operate the experimental satellite. NASA is providing some advanced components and will launch the spacecraft. The ten-nation European Space Research Organization (ESRO) is also providing some components. Spar Aerospace of Toronto is under contract to develop spacecraft structures and RCA Ltd. of Montreal is providing the electronics.

Among other things, CTS will permit studies of the technological, economic and social benefits which could flow from the use of an extremely powerful communications satellite beaming to small, low-cost and even portable earth stations. Another important objective is the testing of advanced components capability under actual space conditions. One such component is a 200 watt travelling wave tube transmitter, provided by NASA.

Scientists at CRC concentrated on completing the engineering design phase of the CTS project during the year. This involved the production and test of various subsystem development models, including a complete dynamic/thermal model spacecraft. The model was subjected to vibration, shock, acceleration and thermal balance tests at NASA's facilities, with successful results.

The department has called on a number of interested Canadian groups to suggest technological and sociological experiments for CTS. Proposals have been received from federal departments and agencies, provincial governments, associations, industry, universities and native groups. Included in the proposals are suggested experiments involving the transmission of television broadcasts to community receiving terminals; television transmission from a remote portable terminal to a central receiver for network retransmission; FM sound broadcast to small receiver terminals: two-way voice telephone communications using small, portable terminals; and data transmission, distribution of wideband information.

Dr. Henry E. Duckworth, Past President of the Royal Society of Canada, was appointed Chairman of an independent three-man committee proposed to help select experimental projects for CTS. The department's Communications Research Centre is also scrutinizing the proposals from the standpoint of their technical feasibility.

COMMUNICATIONS SYSTEMS RESEARCH

Canada's space program depends in large measure on research into satellite communications systems. This work involves advanced electronics and space mechanics and it is fundamental to the successful development of satellite communications. The CRC is also active in the development of special antennae and satellite ground stations, and scientists at the Centre are studying new or improved electronic hardware and analysing satellite control systems.

Another line of research is concerned with the problems of communicating at extreme northern latitudes where natural phenomena frequently black out high frequency communications. During August, 1972, a UHF satellite communications terminal was activated on board HMCS *Protecteur* when the ship was on station off the coast of Labrador and in the Hudson Straits. Voice and teletype communications between the ship and Ottawa were achieved even during high-frequency blackout conditions from August 4 to 9, 1972.

Radiation from the sun ionizes the atmosphere and this in turn affects the long-distance propagation of radio waves. Several experiments designed to study this phenomenon were conducted during and after the July 10, 1972 solar eclipse. Four Black Brant rockets were fired into the ionosphere during the eclipse to assess radio transmission conditions from within the layer of atmosphere 30 to 60 miles up. Meanwhile, transmitters and receivers were used to study the ionosphere by measurements of reflected signals. At the same time, information was beamed back to earth from the Alouette and ISIS satellites which studied the ionosphere from above. Most of the information gained in these three related experiments was recorded on tape — the analysis of which takes several months.

LASER TRANSMISSION AND FIBRE OPTICS

Telephone conversations and computer data may some day be transmitted by means of tiny glass fibres in the form of light pulses. Scientists at CRC and at the Bell-Northern Research laboratories began experimenting with fibre optics during the fiscal year. Previously, the quality of glass fibres had limited the distance over which communications could be made, but there have been major advances in the purity of these fibres in recent years. As well, the improvement of laser beams has converted fibre optics from a theoretical to a practical possibility.

Out of the work begun this year will come a prototype link, perhaps several miles long. It will consist of a solid state laser to convert electrical signals into light pulses, with the pulses being sent through the fibres to a detector which will reconvert the light into electrical signals.

STUDIES AND REPORTS

The department is responsible for evaluating the long-term socio-economic impact of new or foreseen technological developments, and new communications applications. It undertakes or sponsors studies into specific problem areas such as the effect new technology will have on health care, privacy, education and urban lifestyles. A major preoccupation during the year concerned the development and control of computer communications — a rapidly growing field. New developments in computers, computer peripherals and data communications technology are continually monitored to analyse trends. Activities include comprehensive assessments of various systems and funding of selected research programs.

COMPUTER COMMUNICATIONS

The wedding of the information processing capabilities of computers with the ability of communications to deliver information almost instantly may form what has been described as the "central nervous system" of future societies. An independent Computer/Communications Task Force, created by the department in 1970, published its two-volume report, *Branching Out,* during August, 1972. The report's 39 recommendations urged the federal government to formulate policies which would develop and maintain a competitive computer/communications industry in Canada.

The report was prepared by a team of some 30 representatives from industry, government and the academic world. The report suggested that the first widespread impact of computer/communications on individuals may occur in the field of computerized financial systems. When it becomes feasible for banks to connect their computers to public utilities, department stores and other retail outlets, consumer purchases may be automatically debited to individual accounts, creating in some degree the long-predicted cashless society. Further in the future, the installation of computer terminals in the home may have even more profound implications, although the cost of computer/communications must be reduced substantially before these futuristic applications could take place.

After publication of the report, the department surveyed reaction by provincial governments, private industry and other interested parties. The recommendations subsequently formed the basis of a Green Paper on Computer/Communications. This outline of government policy was being prepared for tabling in the House of Commons as the fiscal year drew to a close.

COMPUTERS AND PRIVACY

A separate study, initiated to examine the effects of computer/communications on society, particularly in the area of privacy, was published during December, 1972. The *Privacy and Computers* report, prepared in cooperation with the Justice Department, was commissioned to discover and describe the practice and laws relating to privacy. The task force, made up of outside experts as well as officials from both departments, surveyed the operations of nearly 2,500 companies, institutions and government agencies in Canada, as well as a number of large data banks in the United States.

The task force had not been asked to make specific recommendations but it urged the federal government to take steps to ensure that the privacy of individuals was respected in the operation of all government data banks. The report suggested that specific privacy-protection rules should be developed to regulate these banks. A special interdepartmental committee has since been formed to draft such rules. The task force also suggested the need for an ombudsman able to ensure the right to privacy is respected. Yet another conclusion was that important data banks in the United States contain information on Canadian citizens and that some action may be necessary to monitor the flow of information across national borders.

COMPUTING RESOURCES IN THE MARITIME PROVINCES

The Council of Maritime Premiers requested departmental assistance in February, 1972 in the development of a regional approach to computer use in their area. The department subsequently provided financial and technical support to assist in studying the problem and making recommendations. One part of the study concluded that a uniform motor vehicle and driver licensing system for the Maritime provinces was technically feasible. Further, such a system would provide benefits — especially in terms of service to the public. Another part of the study assessed the current and projected availability of information and computers within the region.

TELECONFERENCING

The Department embarked during the year on an extensive study of teleconferencing — systems which permit widely scattered groups of individuals to communicate with each other. The study seeks to determine the value of teleconference systems for government purposes, as well as surveying the technical feasibility of such systems. Among other things, the study will enquire into the psychological and social factors that may affect the usefulness of meetings held through this medium.

OTHER PROJECTS

Scientists have been studying how long-distance communications can best be integrated into a mix of terrestrial and satellite facilities under a project entitled Domestic Long Distance Communications Network Study. Another project, the integrated Data Communications System, is aimed at describing the nature and scope of future data communications requirements and services. A team of 15 professionals, including communications engineers, management scientists and operational researchers, has been working on these projects.

INTERNATIONAL COOPERATION

The expansion of telecommunication networks and services, coupled with the necessity for the interconnection of our networks with those of other countries, has brought a greater awareness in Canada of the need for international cooperation in the communications field. Nations wishing to establish new services must take into account international technical standards and procedures relating to system design for interconnection and performance and for the avoidance of radio interference. Decisions in these areas affect the international saleability of telecommunications equipment and the mutual use of the air waves in border areas. Cooperation between countries is particularly important in the operation of international landline circuits, microwave systems, submarine cables and satellite telecommunication systems.

Canada is an active member in the International Telecommunications Union (ITU), the United Nations' specialized agency concerned with telecommunications, and a participant in the work of the Union's technical organs — the International Telephone and Telegraph Consultative Committee (CCITT) and the International Radio Consultative Committee (CCIR). The fifth Plenary Assembly of the CCITT was held in December, 1972, and the resolutions, technical recommendations and opinions passed reflect several technical contributions made by Canada.

The Definitive Agreements for Intelsat, the International Telecommunications Satellite Organization, entered into force in February, 1973. These agreements established Intelsat as a global satellite communications system, compared to the loosely-knit consortium it had been since its creation in 1964.

Canada hosted the Commonwealth Telecommunications Conference in Ottawa during November, 1972. A major accomplishment was an agreement to institute a unified system of accounting to provide for a more equitable allocation of costs among the participating countries. The new financial arrangements entered into force on April 1, 1973.

Representatives of Canada, the United States, Japan, Australia and the European Space Research Organization met during the fiscal year for further discussions on the possibility of developing an experimental aeronautical satellite for air traffic control and communications purposes.

Canada took part in the work of the Panel of Experts on Maritime Satellites under the aegis of the Inter-Governmental Maritime Consultative Organization (IMCO). The objective of this panel is to study the institutional, technical, and economic aspects under which an International Maritime Satellite system could operate.

Canada also participates in the United Nations Committee on the Peaceful Uses of Outer Space. During the fiscal year, the activities of the Committee included the establishment of an adequate system for the registration of space objects, and consideration of problems relating to direct broadcasting by satellite and the technical, legal, and organizational implications of remote sensing of the earth by satellite.

As a member of the North Atlantic Treaty Organization (NATO), Canada actively participates in its Allied Radio Frequency Agency. During the year, the department has been engaged in ARFA meetings dealing with various aspects of the 1974 World Administrative Radio Conference for Maritime Mobile Radiocommunications.

NEW FACILITIES

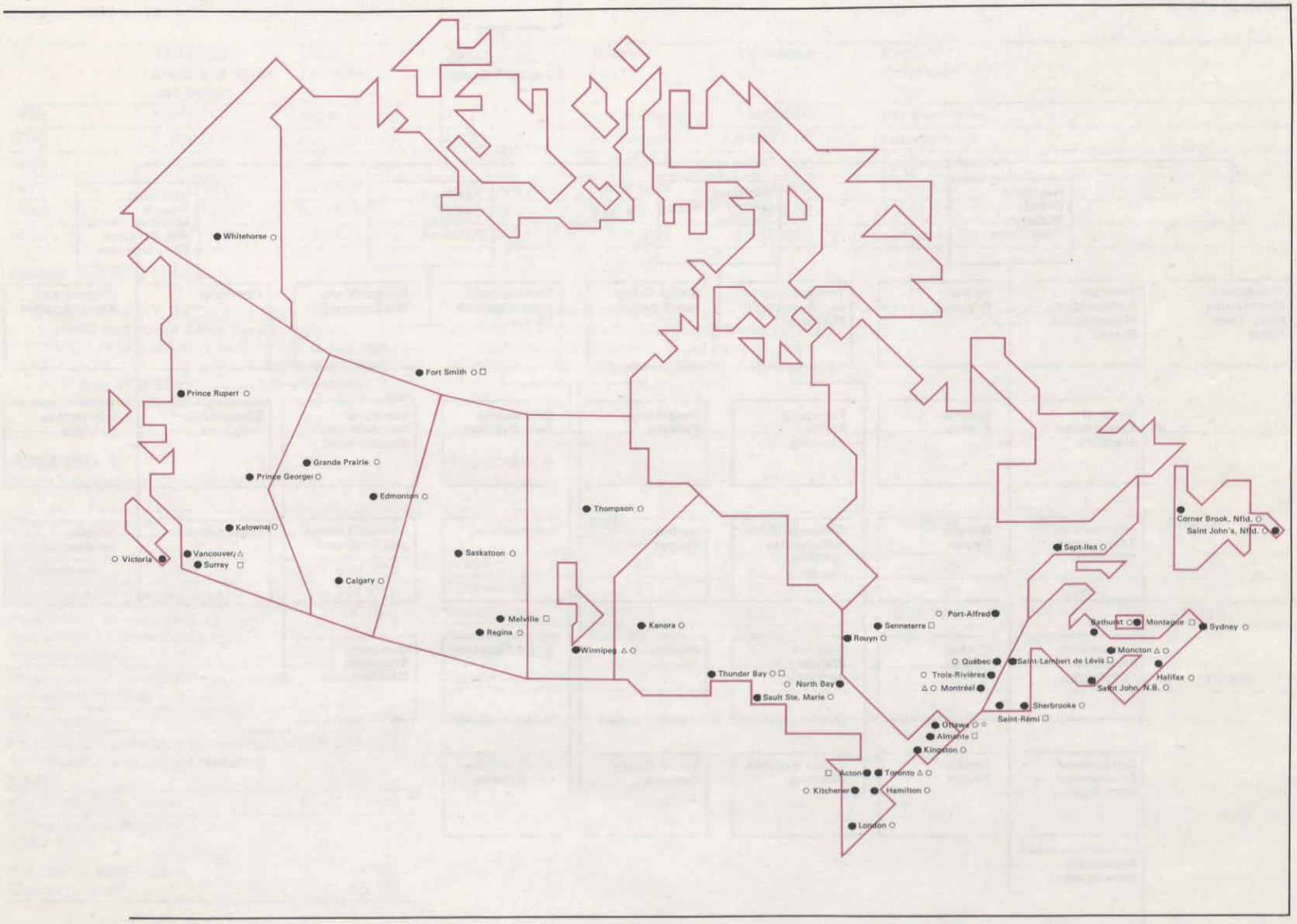
A new west coast earth station at Lake Cowichan, B.C. was inaugurated by the Minister of Communications in September, 1972. This station will permit the Canadian Overseas Telecommunications Corporation to utilize the Pacific Intelsat satellites and to furnish direct circuits to a greater number of countries bordering the Pacific Ocean.

The construction of a new 1840-circuit, trans-Atlantic submarine cable (CANTAT-2) between Canada and U.K., which is to be in service by April, 1974, is well underway. The COTC and the U.K. Post Office are joint owners of this new facility.

APPENDICES

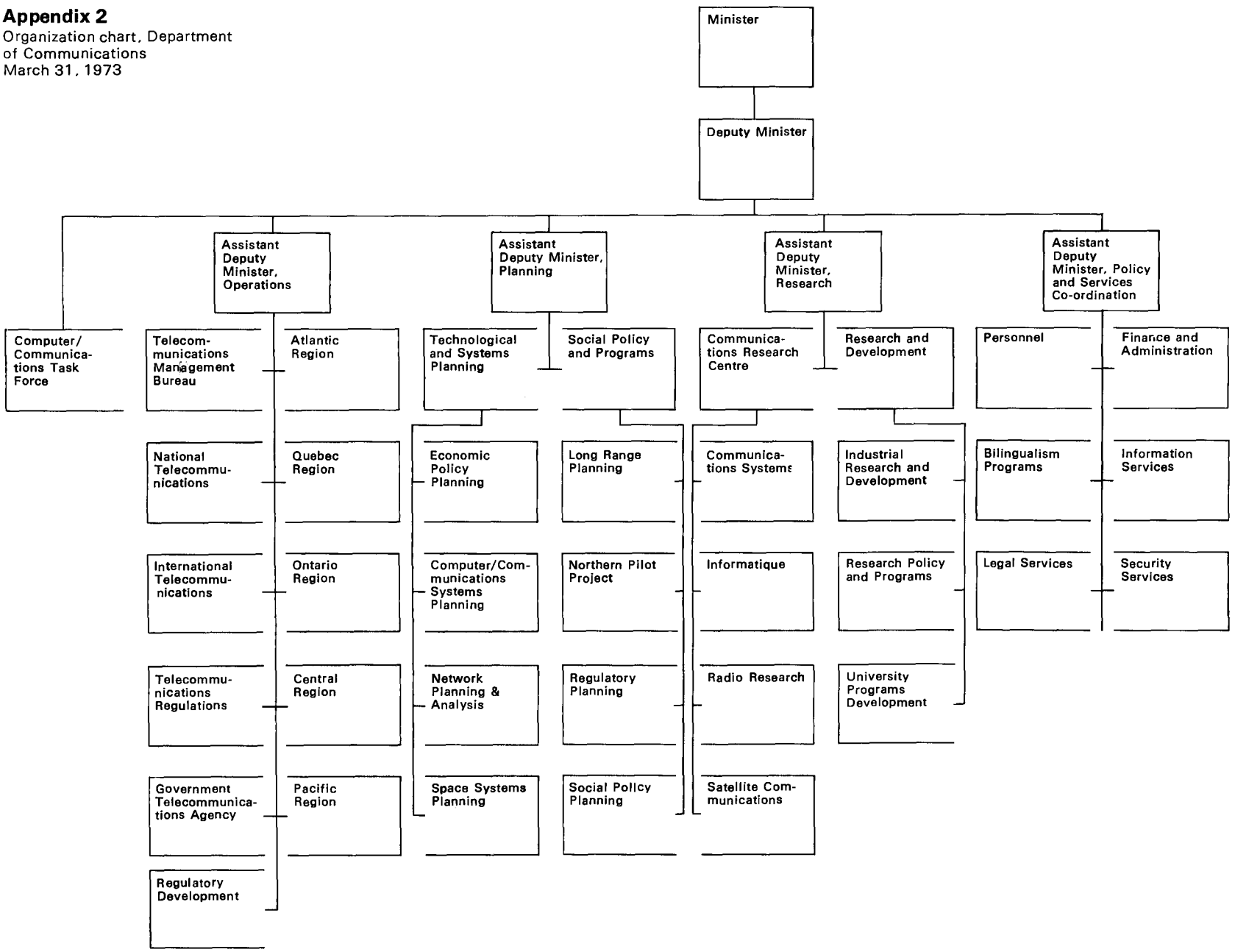
Appendix 1
Department of Communications: Locations across Canada

△ Regional Office ○ District Office □ Monitoring Station ☆ Headquarters



Appendix 2

Organization chart, Department of Communications
March 31, 1973



Appendix 3

Number of households with television receivers, radio receivers, telephones and cable television in Canada, 1955 to 1973.*

	Television black and white and colour	Colour Television	Radio AM & FM	Radio** FM	Telephone	Cable*** Television
1955	1,496,000	not available	3,712,000	not available	2,730,000	not available
1960	3,550,000	not available	4,236,000	not available	3,667,000	not available
1965	4,495,000	not available	4,663,000	1,109,000	4,341,000	not available
1970	5,419,000	686,000	5,489,000	2,989,000	5,304,000	1,164,187
1972	5,850,000	1,478,000	5,961,000	3,814,000	5,777,000	1,689,335
1973	6,017,000	2,081,000	6,124,000	4,213,000	5,955,000	not available

Source: Statistics Canada

*As of January 1, 1973, according to Statistics Canada and Radio Sales Bureau figures, 30,621,000 radio sets were in use in Canada. AM radio, FM radio and television reach 98%, 82% and 97% of the population of Canada, according to the CRTC annual report 1972-1973.

**These figures include combination AM and FM receivers, therefore, subtracting these figures from those in column 3 would not give the exact number of households with AM receivers.

***Number of subscribers

Appendix 4

Cable Television in Canada, as of August, 1972.

Operating systems	344
Companies	268
Subscribers	1,689,335
Households in licensed areas	3,711,649
Penetration (subscribers as percentage of households in licensed areas)	45.5%
Percentage of households in Canada connected to cable	27.7%
Total revenue	$82,464,000
Profit before provision for interest, amortization and taxes (operating profit)	$39,954,000
Net profit (after taxes)	$ 9,219,000
Average annual rate of growth 1967-1972	
Number of subscribers	26.9%
Operating profit	25.7%

Source: Statistics Canada

Appendix 5

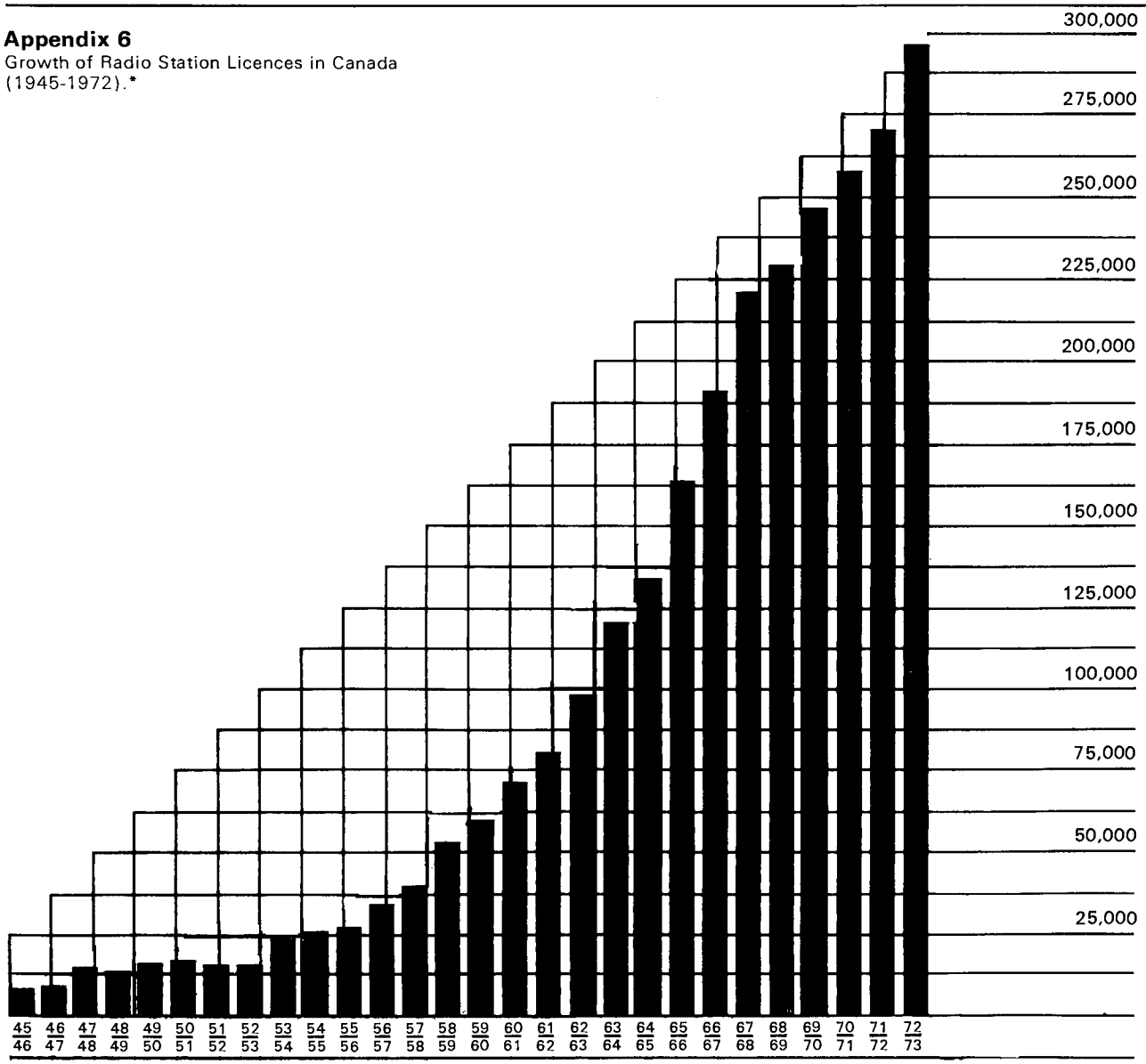
Cable Television in Canada by Region — 1972-73.*

	British Columbia	Prairies	Ontario	Québec	Atlantic
Systems	66	26	105	132	15
Companies	51	23	83	98	13
Subscribers	396,799	130,846	822,766	317,171	21,753
Households in licensed areas	543,622	481,968	1,628,558	965,945	91,556
Penetration	73%	27.1%	50.5%	32.8%	23.8%

Source: Statistics Canada/Service Bulletin Vol. 3, No. 9.

* Figures are for the period September 1, 1971 to August 31, 1972.

Appendix 6
Growth of Radio Station Licences in Canada
(1945-1972).*



Source: Department of Communications

*Figures before 1970/71 exclude auxiliary broadcasting service licences.

Appendix 7

Summary of Radio Station Licences in Canada, by Category, 1972-73.

Category	Number
Ship	10,384
Coast	65
Land	51,035
Mobile	156,520
Earth	56
Space	4
General Radio Service*	67,373 (26,871)
Sub-total	285,437
Issued to US licensees (certificates of registration)	11,183
Total	296,620
Net increase over preceding year	27,810
Per cent increase over preceding year	10.3%

Source: Department of Communications

*General Radio Service licences are valid for a three year period. The figure in brackets indicates the number of licences actually issued (new and renewed) during the 1972-73 fiscal year.

Appendix 8

Value of Radio Licences in Canada, by Category, 1972-73.

Category	Value
Coast/Land stations	$ 733,035.00
Mobile Stations	1,018,127.50
Ship Stations	146,125.00
Amateur Experimental	131,210.00
General Radio Service	268,710.00
Sub-Total	$2,297,207.50
Value of licence amendments	113,292.00
Grand Total	$2,410,499.50
Net Increase over previous year*	$ 199,062.50
Per cent increase over preceding year	9.4%

Source: Department of Communications

*Excludes value of amendments

Appendix 9

Number of Radio Stations by Service Category (1972-73).*

Service Category	STATIONS			
	Ship	Coast	Land	Mobile
Limited Maritime Mobile				
Private Maritime Mobile		65		
Public Commercial			1,619	12
Restricted Public Commercial			403	
Private Commercial			24,075	127,022
Federal Government			5,007	12,311
Provincial Government			6,674	19,302
Municipal**			1,677	1,896
Experimental			518	343
Amateur Experimental			13,121	
Public Commercial Receiving			79	
Private Commercial Receiving			422	143
Public Commercial Automatic Repeater			1,069	
Private Commercial Automatic Repeater			1,430	
Aircraft Navigational				4
Aeronautical Mobile			1,523	9,112
Ship Stations	10,384			
Ship Stations (Mobile)	427			

Source: Department of Communications

*A licence may show more than one service category.

**Indicates the number of licences issued. One licence (land) covers one or more land stations whereas one licence (mobile) covers one or more mobile stations.

Appendix 10

Major Users of Radio in Canada (1972-73).

User	No. of Licences
Telephone Systems	7,955
Electric Power Systems	11,007
Gas Disitribution Systems	1,433
Logging	8,141
Forestry Services	8,811
Mines & Mines Services	4,687
Farms & Agricultural Services	1,935
Fishery Services & Products	805
Petroleum & Gas Wells-Absorption Plants	1,927
Petroleum & Other Prospecting	4,243
Sawmills, Planning Mills, Wood Industries	2,047
Building & Other Construction & Trades	14,587
Highway, Bridge & Street Construction	3,980
Highway & Bridge Maintenance	5,180
Air Transport & Services	12,144
Ships & Water Transport Services	11,408
Railway Transport	8,302
Truck Transport	10,059
Bus & Urban Transit System	1,363
Taxi Systems	18,126
Pipeline Transport	1,320
Water & Other Utilities	884
Machinery & Equipment Wholesalers	1,098

User	No. of Licences
Lumber & Building Materials Wholesalers	712
Tire, Battery & Accessory Dealers	597
Gasoline Service Stations	481
Motor Vehicle Dealers & Repair Shops	646
Radio, T.V. & Electrical Appliance Repair Shops	571
Fuel Dealers	4,171
Insurance, Real Estate & Investment Cos.	1,035
Schools, Universities & Related Educational Services	1,335
Engineering & Scientific Services	1,376
Services to Business Management	3,617
Lodging Houses & Residential Clubs	766
Private Investigators	548
Police Services (Federal, Provincial, Municipal)	9,881
Fire Services (Provincial & Municipal)	876
Other Federal, Provincial & Municipal Services	9,317
Civil Defence (EMO Services)	961
Pulp & Paper Mills	2,059
Iron & Steel Mills	798
Communications Equipment Manufacturers	375
Ready Mix Concrete Manufacturers	3,834
Amateur Experimental Service	13,121
General Radio Service (including Certificates of Registration)	78,556

Source: Department of Communications

Appendix 11

Major Canadian Communications Carriers.*

*In order of number of telephones, followed by other telecommunications carriers.

Bell Canada

Size, operating territory, ownership
Canada's largest carrier; operates in Ontario and Quebec with 6,742,184 telephones; $1,125.4 million in operating revenues. Publicly held: 96% Canadian owned. AT&T interest is 1.8% of outstanding shares.

Regulatory agency responsible for general rate review; applicable statutes
Canadian Transport Commission (Telecommunication Committee). See Railway Act, R.S.C. 1970, c. R-2; National Transportation Act, R.S.C. 1970, c. N-17.

British Columbia Telephone Company

Size, operating territory, ownership
Operates in British Columbia with 1,113,563 telephones; $218,980 million in operating revenues. Controlled 50.69% by General Telephone & Electronics Corps., a New York company through a Quebec subsidiary, Anglo-Canadian Telephone Company.

Regulatory agency responsible for general rate review; applicable statutes
Canadian Transport Commission (Telecommunication Committee). See Railway Act, R.S.C. 1970, c. R-2; National Transportation Act, R.S.C. 1970, c. N-17.

Alberta Government Telephones

Size, operating territory, ownership
Operates in Alberta with 621,010 telephones; $141.4 million in operating revenues. A Crown Corporation of the province of Alberta.

Regulatory agency responsible for general rate review; applicable statutes
Alberta Public Utilities Board. See Public Utilities Board Act, R.S.A. 1970, c. 302, as amended.

Manitoba Telephone System

Size, operating territory, ownership
Operates in Manitoba with 488,019 telephones; $73.9 million in operating revenues. A Crown Corporation of the province of Manitoba.

Regulatory agency responsible for general rate review; applicable statutes
Manitoba Public Utilities Board. See Public Utilities Board Act, R.S.M. 1970, c. P-280.

Saskatchewan Telecommunications

Size, operating territory, ownership
Operates in Saskatchewan with 344,661 telephones; $59.8 million in operating revenues. A Crown corporation of the province of Saskatchewan.

Regulatory agency responsible for general rate review; applicable statutes
Self-regulated through cabinet-appointed board of directors, the Minister of Telephones, and a select standing committee of the Saskatchewan Legislature.

edmonton telephone

Size, operating territory, ownership
Operates in City of Edmonton with 280,000 telephones; $33.8 million in operating revenues. A municipal telephone system owned by the City of Edmonton.

Regulatory agency responsible for general rate review; applicable statutes
Rates fixed by the elected representatives of the City of Edmonton.

The New Brunswick Telephone Company Limited

Size, operating territory, ownership
Operates in New Brunswick with 275,000 telephones; $41 million in operating revenues. Owned 50.2% by Bell Canada.

Regulatory agency responsible for general rate review; applicable statutes
New Brunswick Board of Commissioners of Public Utilities. See Public Utilities Act, R.S.N.B. 1952, c. 186, as amended; Telephone Companies Act, R.S.N.B. 1952, c. 226, as amended.

Maritime Telephone & Telegraph Company Limited

Size, operating territory, ownership
Operates in Nova Scotia with 243,343 telephones; $51.9 million in operating revenues. Owned 52.4% by Bell Canada since 1966, subject to limitation of votes to 1,000 shares.

Regulatory agency responsible for general rate review; applicable statutes
Nova Scotia Board of Commissioners of Public Utilities. See Public Utilities Act, R.S.N.S. 1967, c. 258, as amended in 1970, c. 65.

Québec Téléphone

Size, operating territory, ownership
Operates in eastern Quebec with 176,897 telephones; $37.5 million in operating revenues. Controlled by General Telephone & Electronics Corp., a New York company, through a Quebec subsidiary, Anglo Canadian Telephone Company.

Regulatory agency responsible for general rate review; applicable statutes
Quebec Public Service Board, Act, R.S.Q. 1964, c. 229.

Newfoundland Telephone Company, Limited

Size, operating territory, ownership
Operates in Newfoundland with 119,914 telephones; $25.4 million in operating revenues. Owned 99.6% by Bell Canada since 1962.

Regulatory agency responsible for general rate review; applicable statutes
Newfoundland Board of Commissioners of Public Utilities. See Public Utilities Act, Stat., Nfld. 1964, no. 39, as amended in 1966, no. 26 and 1969, no. 7.

Okanagan Telephone Company

Size, operating territory, ownership
Operates in south central British Columbia with 66,775 telephones; $8.8 million in operating revenues. Owned 99.9% by B.C. Telephone Company since 1966.

Regulatory agency responsible for general rate review; applicable statutes
British Columbia Energy Commission. See Energy Act, M.B.C. 1973, c. 29.

Thunder Bay Telephone

Size, operating territory, ownership
Operates in the City of Thunder Bay with 63,434 telephones; $3.96 million in operating revenues. A municipal public utility owned by the City of Thunder Bay.

Regulatory agency responsible for general rate review; applicable statutes
Ontario Telephone Service Commission. See Telephone Act, R.S.O. 1970, c. 457; Public Utilities Act, R.S.O. 1970, c. 390 Parts III and IV.

Téléphone du Nord de Québec Inc.

Size, operating territory, ownership
Operates in northwestern Quebec with 60,505 telephones; $10.1 million in operating revenues. A subsidiary of Northern Telephone Limited, which is controlled by Bell Canada.

Regulatory agency responsible for general rate review; applicable statutes
Quebec Public Service Board. See Public Service Board Act, R.S.Q. 1964, c. 229.

Northern Telephone Limited

Size, operating territory, ownership
Operates in northern Ontario with 54,123 telephones; $5.4 million in operating revenues. Owned 88% by Bell Canada since 1966.

Regulatory agency responsible for general rate review; applicable statutes
Ontario-Telephone Service Commission. See Telephone Act, R.S.O. 1970, c. 457.

Island Telephone Company Limited

Size, operating territory, ownership
Operates in Prince Edward Island with 41,590 telephones; $6.6 million in operating revenues. Owned 56% by Maritime Telegraph & Telephone Co. Ltd.

Regulatory agency responsible for general rate review; applicable statutes
Prince Edward Island Public Utilities Commission. See Public Utilities Commission Act, R.S.P.E.I. 1951, c. 133, as amended: Electric Power and Telephone Act, R.S.P.E.I. 1951, c. 49.

Canadian National
Canadian Pacific Telecommunications

Size, operating territory, ownership
Provides a nationwide telecommunications service, including public message-telegraph, Telex and Broadband Exchange Service. CNT also offers public telephone service to 37,000 subscribers in parts of Newfoundland, Northern British Columbia, Yukon and N.W.T. $435.1 million in plant; $133.2 million in operating revenues. A consortium of the telecommunications departments of CNR (a federal Crown corporation) and CPR (a Canadian publicly-owned transportation company).

Regulatory agency responsible for general rate review; applicable statutes
Canadian Transport Commission (Telecommunication Committee). See Telegraphs Act, R.S.C. 1970, c. T-3; Railway Act, R.S.C. 1970, c. R-2; National Transportation Act, R.S.C. 1970, c. N-17.

Canadian Overseas Telecommunication Corporation

Size, operating territory, ownership
Provides a nationwide telecommunications links to most parts of the world, other than U.S., through interconnections with the global networks of submarine cables, HF radio circuits and the INTELSAT satellites, $154.2 million in plant, $43.9 million in operating revenues. A federal Crown corporation.
Regulatory agency responsible for general rate review; applicable statutes
Canadian Transport Commission (Telecommunication Committee). See Telegraphs Act, R.S.C. 1970, c. T-3, Parts III, Railway Act, R.S.C. 1970, c. R-2; National Transportation Act, R.S.C. 1970, c. N-17.

Telesat Canada

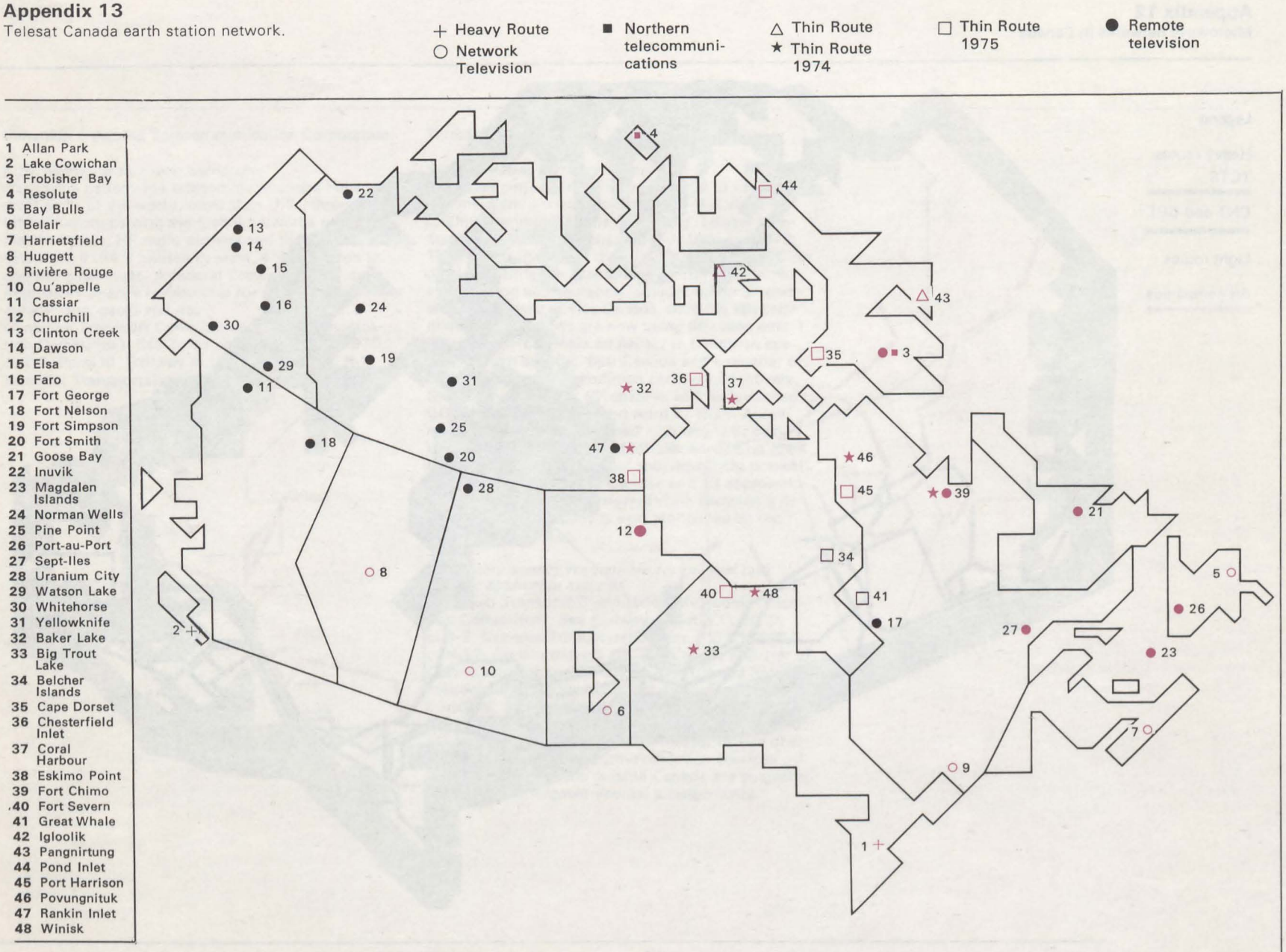
Size, operating territory, ownership
Canadian corporation created in 1969 to establish and maintain a commercial system of domestic satellite communications in Canada. Telesat commenced services, as scheduled, in January, 1973. The space segment of the system presently consists of two satellites in geostationary orbit. The initial earth station configuration includes some 37 earth stations located across Canada. Satellite telecommunication services are now being provided over 7 operating RF channels on ANIK I to Canadian customers such as CBC, Bell Canada and a number of telecommunications common carriers collectively. Service over another RF channel will be furnished to COTC commencing around April 1, 1974. Agreements have also been signed with two U.S. customers for the provision of interim service on ANIK II. $60 million share capital split equally at present between Government of Canada and 13 approved telecommunications carriers. Public ownership of shares in the Company is also authorized by the Telesat Canada Act.

Regulatory agency responsible for general rate review; applicable statutes
Canadian Transport Commission (Telecommunication Committee). See Railway Act, R.S.C. 1970, c. R-2; National Transportation Act, R.S.C. 1970, c. N-17. Certain powers are given to the Minister of Communications under the Telesat Canada Act to approve construction contracts, financing share transfers, and negotiations with foreign states. Telesat is also subject to licensing procedures under the Radio Act, R.S.C. 1970, c. R-1, for its use of rf spectrum. Satellite telecommunication services furnished to locations outside Canada are subject to appropriate intergovernmental arrangements.

Appendix 12
Microwave networks in Canada

Appendix 13

Telesat Canada earth station network.



Appendix 14

Canadian Satellites.

In orbit	Date launched	Use	Managed by
Alouette I	September 29, 1962	Ionospheric research	Communications Research Centre
Alouette II	November 29, 1965	Ionospheric research	Communications Research Centre
Isis I	January 28, 1969	Ionospheric research	Communications Research Centre
Isis II	March 31, 1971	Ionospheric research	Communications Research Centre
Anik I	November 9, 1972	Commercial communications services	Telesat Canada
Anik II	April 20, 1973	Commercial communications services	Telesat Canada
Being developed			
Communications Technology Satellite (CTS)	Anticipated launch date 1975	Experimental, non-commercial communications	Communications Research Centre

Source: Department of Communications

Appendix 15

International Organizations in which the Department of Communications participates.

ITU International Telecommunications Union including CCIR & CCITT
ICAO International Civil Aviation Organization
IMCO Inter-Governmental Maritime Consultative Organization
ICS International Chamber of Shipping
CIRM International Marine Radio Association
CISPR International Special Commission on Radio Interference
IEC International Electrotechnical Commission
ESRO European Space Research Organization
ISO International Organization for Standardization
OIRT International Radio & Television Organization
EBU European Broadcasting Union
IARU International Amateur Radio Union
URSI International Union Radio
INTELSAT International Telecommunications Satellite Consortium
NATO (ARFA) North Atlantic Treaty Organization/ Allied Radio Frequency Agency
CTO Commonwealth Telecommunications Organization
ECOSOC-UN Economic and Social Committee
UN/WG on DBS United Nations Working Groups Direct Broadcasting Satellite
UN Panel on Remote Sensing
CITEL Inter-American Telecommunications Conference
IUCAF International Union Commission on Allocation of Frequencies for Radio Astronomy & Space Science
ICSU International Council of Scientific Unions
IFIP International Federation of Information Processing

Source: Department of Communications

Appendix 16

Financial Summary.

Financial Management: Total expenditures for the Department of Communications for the fiscal year ending March 31, 1973 amounted to $42.9 million. Administrative and operating expenditures constituted 63.4 per cent of total expenditures compared to 35.2 per cent for capital expenditures and 1.4 per cent for grants and contributions. Personnel costs represented 64.9 per cent of operating expenditures while personnel equivalent to 1,651 man-years was utilized. Receipts and revenues reached $9.6 million bringing the net amount of expenditures to $33.3 million. The transactions in the Government Telecommunications Agency Revolving Fund amounted to $13.2 million, compared to recoveries of $13.3 million, leaving a balance of $0.1 million to be applied against the next fiscal year's expenditures.

Summary of the Income and Expenditures for the fiscal year ending March 31, 1973

	Millions of Dollars 1972-73
Administration, operation and maintenance expenditures	27.2
Capital expenditures	15.1
Grants and contributions	0.6
Total Expenditures of the Department	42.9
Less:	
Receipts and Revenues on account of credit	9.6
Net Expenditures of the Department	33.3