DEPARTMENT OF COMMUNICATIONS

ANNUAL REPORT 1973/74

DEPARTMENT OF COMMUNICATIONS

ANNUAL REPORT 1973/74

Submitted under the provisions of the *Communications Department Act*

Co-1-1974

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 March 1974.

Yours faithfully,

Gérard Pelletier

Minister of Communications

CONTENTS

FOREWORD

It has become commonplace to refer to the extent and sophistication of Canada's communications systems. Voice, picture and data transmissions travel along 35,000 miles of microwave routes; they are bounced thousands of miles through space and back to earth via the world's first domestic geostationary communications satellite; and they travel through millions of miles of telephone lines. More than 334,000 radio station licences of all types are in force throughout the country. Ninety-five per cent of all Canadian households have telephones, 96 per cent have television, and 98 per cent have one or more radio receivers. More than 33 per cent of Canadian households receive cable television.

The impact of electronic communications on everyday Canadian life is even larger than the sheer size of the systems would suggest. Telecommunications have become an essential and integral aspect of our society. And the impact is expected to become even more important with the spread of new technology in the future. Within the next decade, more advanced satellites, new cable television systems, and larger capacity microwave and digital transmission systems will be brought into service, all of which will have a continuing and growing effect on the day-to-day activities of Canadians.

The fulfillment of the role of the Department involves service to the public through the management of the radio spectrum, scientific research and policy and regulatory development. This can only be achieved through a close examination of the technical, social and economic factors which arise as patterns of communications change. How can the limited radio frequency spectrum be managed effectively in the face of competing national and international demands upon it? How can the communications systems be used to strengthen Canadian cultural values? How can the privacy of individual Canadians be guaranteed with the development of data banks linked together through communications systems? How can communications systems be made more reliable and more accessible?

The resolution of some of these questions is more complex in Canada than in other countries owing to the fact that there is a mixture of private and public ownership in the industry. Moreover, regulatory authority over some aspects of telecommunications is divided between the federal and provincial governments. Over the past several years, the Department has devoted a large and increasing part of its efforts to rationalizing the telecommunications environment and arriving at a set of agreed common objectives, which can be shared by the separately owned and regulated parts of the system.

During November, a Federal-Provincial Conference of Ministers responsible for Communications was held in Ottawa. This meeting, the first in Canadian history, was only one step in a continuing process of consultation between the federal and provincial authorities. Discussions centred on provincial submissions and on a federal Green Paper entitled *Proposals for a Communications Policy for Canada: A Position Paper of the Government of Canada.*

Consultation with the provinces is intended to lead to an improved legislative, regulatory and policy development framework, more in tune with the realities of communications today.

A Federal-Provincial Relations Branch was created within the Department October 1, 1973, to co-ordinate Department activities relating to consultations with the provinces and to develop mechanisms by which the two levels of government might better harmonize their policies and activities in the field of communications. The Branch did much of the preparatory work for the conference, began developing federal responses to positions expressed by the provinces and was also involved in preparations for the Minister's follow-up meetings with provincial authorities.

Perhaps the most visible continuing activity of the Department is its day-to-day regulation and management of the electromagnetic spectrum, a valuable and limited national resource. The Department assigns radio and broadcasting frequencies, licenses users of the air waves, monitors the spectrum, inspects equipment, investigates instances of interference and develops procedures under which the resource is used. While regulations and technical standards are developed at headquarters in Ottawa, the Department's regulatory function is decentralized and is executed through five regional offices located in Vancouver, Winnipeg, Toronto, Montreal and Moncton, and 42 district offices across the country.

The Department undertakes much of the telecommunications research conducted in Canada. A significant portion of the Department's research effort is carried out for other agencies of government such as the Department of National Defence, and the Department also sponsors research carried out by industry.

Preparations continued during the year for the launch, expected late in 1975, of the Communications Technology Satellite (CTS). This satellite, a joint project of the Department and the U.S. National Aeronautics and Space Administration (NASA), with participation by the European Space Research Organization (ESRO), will be Canada's eighth. CTS, entirely experimental, may be the forerunner of a new generation of communications satellites which Canada will require in the 1980s. Testing and assembly of the thermal model of CTS had been completed by the start of the fiscal year and preparations for assembly of the engineering model in the David Florida Laboratory, located at the Department's Communications Research Centre near Ottawa, were well underway by year's end. Anik I, the first domestic communications satellite, operated by Telesat Canada, celebrated its first year in space on November 13, 1973. Its twin, Anik II, was launched April 20, 1973. Meanwhile, Canada's earlier Alouette and ISIS scientific research satellites continued to provide data to communications researchers.

Although CTS is a priority research project of the Department of Communications, other studies are conducted in a variety of fields. The nature of radio waves, what influences them and what can be done to overcome sources of interference constitute a major series of continuing research projects. Work in this area is particularly significant in northern communications where disturbances due to natural causes are high. During the year, more attention was focussed on propagation in the microwave regions of the spectrum.

The Department also undertakes research in communications systems and on the behaviour of people as they use advanced telecommunications equipment. These latter studies are important to the efficient operation of teleconferencing systems, the use of electronic visual display units and computer/communications.

During the year, an Educational Technology Program was established and managed by the Department. Its purpose: to work with provincial education authorities to establish their needs for new communication technologies; to establish criteria and techniques for selecting and evaluating the best transmission systems to meet these needs; and to ensure that scarce communication spectrum resources for educational use are in the national interest.

Since electromagnetic transmissions are not restricted by national boundaries, a great deal of international cooperation is required to ensure the efficiency of world-wide communications. Departmental representatives prepared for and attended a number of international conferences during the year, including the Plenipotentiary Conference of the United Nations' International Telecommunication Union (ITU) in Torremolinos, Spain, and the World Administrative Telegraph and Telephone Conference in Geneva.

Canada continues to play a leading role in the United Nations Committee on the Peaceful Uses of Outer Space. With Sweden, Canada produced a draft declaration of principles to govern direct broadcasting from satellites. Consultations also continued on a proposal to develop an experimental satellite for air traffic control communications. This involves cooperation with the European Space Research Organization and the United States Federal Aviation Administration.

TELECOMMUNICATIONS NETWORKS AND SYSTEMS

Radio communications, including broadcasting, transmitting and receiving are regulated by the federal government, as are 75 per cent of all telephone and telegraph services mainly located in British Columbia, the Yukon and Northwest Territories and most of Ontario, Quebec and Newfoundland. The remainder of telephone services is regulated by provincial authorities.

While the several systems are interconnected, and while associations of private and public telephone companies have been remarkably successful in technical coordination and systems management, there has not always been enough opportunity for the expression of public interest at the national and regional levels. In order to deal with these anomalies, the federal government continues to consult with and seek the cooperation of the provinces in the drafting of an improved legislative and regulatory framework.

A major review of the telecommunications equipment supply industry, begun in the previous fiscal year, was completed during 1973-74. This survey, covering the major suppliers of communications equipment, is to be issued in the form of a working paper entitled *Canadian Telecommunications Carriers and Their Suppliers.* The paper will be the subject of discussions between governments, carriers and manufacturers on the need for equipment and facilities in the future. A survey of suppliers to the cable television industry was completed during the year.

Work continued on the development of an econometric model during the year. This is a national telecommunications policy and planning simulation model which will have the capacity to indicate, for example, the economic and financial implications of alternative traffic patterns and tariffs. Studies with this model can assist in formulating views regarding the optimum use of the national telecommunications system, the development of appropriate policies and regulatory patterns to foster this objective, and the design of administrative systems which will facilitate the process.

The selection of equipment to be attached to telecommunications networks is an activity reserved to the carriers under current practice. This practice is now under review by the Department in consultation with industry. The development of a policy concerning attachment of customer-provided terminal equipment to the networks of federally regulated carriers continued throughout the year.

An interconnection Technical Advisory Group was formed during the year to advise on the development of specifications and procedures for attachment of such equipment. A laboratory system plan was also inaugurated to test various types of terminal equipment including telephone answering and recording machines.

TELECOMMUNICATIONS DATA BASE

The creation of a specialized telecommunications databank has been undertaken to support the policy-making and network development roles of the Department. This databank, known as CANTEL, contains statistics on telephone company finances, operations, tariffs, investment and trade. At the end of fiscal year 1973-74, CANTEL comprised 10,282 separate statistical series requiring 15,600 entries per year. Plans are underway to include statistics on northern telecommunications and on technical information used by the Canadian Radio-Television Commission and the Telecommunication Regulatory Service of the Department.

SATELLITE COMMUNICATIONS PLANNING

Canada's requirement for satellite communications is expected to grow dramatically in the decades ahead. The development of adequate satellite systems to meet this need requires forward planning and timely decisions on funding and industrial development. One major area of study in this field concerns the cost-effectiveness of satellite technology to meet domestic broadcasting requirements. Another deals with the requirements for expanding communications services to isolated areas, particularly the north.

In cooperation with the Canadian Broadcasting Corporation, the Department explored the long-term potential of satellite technology to meet the broadcasting requirements of the CBC in the 1980s. A study was also made under departmental auspices of the potential availability of low-cost earth terminals for community or individual reception of broadcasting satellite service in the 2.5 and 12 GHz frequency bands by the end of this decade.

Engineering studies continued into the requirements of a proposed multi-purpose UHF satellite system for remote area and mobile communications. Such a satellite could meet the growing demand for low-capacity voice and data transmission systems in the north.

During 1973, the Department undertook a Domestic Long Distance Communications Network study, an examination of how satellite communications can best fit into a mixture of terrestrial and satellite facilities for providing long distance trunk transmission in the early to mid 1980s. Conclusion of this study is expected by the end of the 1974 calendar year.

GOVERNMENT TELECOMMUNICATIONS

The Government Telecommunications Agency plans and coordinates the establishment and management of the federal government's telecommunications facilities and services on a cost-recovery basis. The GTA inter-city network, serving points in Canada and the United States, expanded considerably during the year. Direct line circuit mileage increased by 102,000 miles to a total of 538,000 miles; traffic increased 17 per cent to an estimated 13.69 million calls and the number of main telephone stations in consolidated locations increased by 7,000 to a total of 54,000 during the year.

As the year came to a close, plans were underway to establish Data Network, a new government message and data communication service using computer switching techniques. This is a common user network and will offer users an improved service. The Unemployment Insurance Commission will be the initial customer on the system with an anticipated operational date of November, 1974. Other departments will be afforded the opportunity of joining this network in 1975.

The use of dedicated facilities (service provided for the exclusive use of a department or agency) has shown considerable growth. Expenditures for these facilities increased 80 per cent to $1.8 million. Decentralization programs throughout the government are a primary cause of this increase. Network and dedicated services obtained from the common carriers cost in excess of $14 million, but, through coordinated planning and development and bulk purchasing, resulted in an overall saving to the government of an estimated $21 million.

THE SPECTRUM

A new directorate for the development of radio spectrum utilization policy was established in October 1973. Its task is to develop and promote policies which will ensure effective management of the radio spectrum. Work began during the year on policies for optimizing the use of geostationary satellites, and high capacity microwave systems operating in frequency bands above 10 GHz. The general public is invited to comment on many of proposed policies through news releases and notices published in the Canada Gazette. Changes to more short-term operational policies, standards and regulations are similarly publicized.

While regulations, standards and procedural criteria are developed at Ottawa, the day-to-day assignment of radio frequencies, issuance of radio licences and monitoring of the air waves is conducted by the district and regional offices.

There was a total of 334,571 radio station licences in force during the 1973-74 year, excluding commercial broadcasting stations — an increase of 12.7 per cent over the previous year. A total of 940 Technical Construction and Operating Certificates for commercial broadcasting outlets and cable television were issued during the year, in coordination with the Canadian Radio-Television Commission which licenses commercial broadcasting and community antenna television (CATV). At the end of the year, there were 657 AM, 101 FM and 588 television broadcasting stations in operation, along with 387 operational CATV systems. The Department processed 10,778 cancellations and 20,424 new frequency assignments during the year.

CABLE TELEVISION

The technical evaluation of cable TV applications was a major preoccupation during the year. Both the Department and the CRTC received 406 new CATV applications. The industry in the Toronto area was faced with accommodating new television stations for which there was no further space among the standard 12 TV channels. As an interim measure, these stations used local station channels, resulting in appreciable interference. This situation would have become intolerable when TV transmitting stations had completed their move to the huge CN communications tower, but was resolved through rearrangement of channels. A requirement was issued for all systems in the greater Toronto and Niagara area to implement augmented channel capacity by the end of the year.

Work continued during the year to update Broadcast Procedure 24, a Departmental document released in 1971, which describes test procedures for various sizes of cable TV systems. This year, the Department made a detailed evaluation of recommendations made by the industry concerning the procedural and technical aspects of testing performance. Major systems, accounting for more than 50 per cent of Canadian subscribers, had submitted their preliminary performance reports by the end of the year.

The industry continues to grow steadily. About 2.1 million Canadian households subscribed to cable television service by year's end. As a result of the extension of CATV services there has been an increased demand for microwave networks to transport the required video signals. Meeting this demand will result in cable television becoming available to an ever-expanding Canadian audience.

STANDARDS AND REGULATIONS

The best possible use of the radio spectrum requires the Department to draw up and enforce standards and specifications for all users of the resource. A division responsible for broadcast standards and spectrum engineering was formed late in 1973-74 to confirm the technical needs and to develop and issue standards and technical procedures for all broadcast services.

During the year, Standard Radio System Plans were developed for high capacity, heavy-route, microwave point-to-point systems in the 4, 6 and 7 GHz bands. System standards were also developed for digital and cable TV relay systems and are due to be released later in 1974.

Two technical specifications governing radio equipment became effective during the fiscal year. One of these applies to land and coast station transmitters in the medium frequency band and the other to transmitters and receivers used in the General Radio Service.

Technical standards for very high frequency and single sideband land-mobile equipment were revised during the year. Draft specifications have been developed for wireless microphone and telemetry equipment, garage door controls and burglar alarm systems.

The Department received and evaluated 430 submissions for approval of various kinds of radio apparatus. This resulted in the certification of over 2,000 new units and their listing in the Radio Equipment List of approved radio apparatus.

RESEARCH IN TELECOMMUNICATIONS TECHNOLOGY

The Communications Research Centre (CRC), located 10 miles west of Ottawa, performs research and development in many areas of communications science. The research program is divided into four broad categories — spacecraft technology, the radio environment, communications systems and information sciences. As well, the Department supports outside research by universities and by industry, and seeks to develop an advanced communications research capability in the academic world.

COMMUNICATIONS TECHNOLOGY SATELLITE

A large part of the Department's research program is devoted to communications spacecraft research. Preparations for the launch of the experimental Communications Technology Satellite (CTS) in 1975 remain on target. The CTS program began in 1971 after the Department and NASA signed an agreement to cooperate in the venture. The Department designs, builds and will operate the satellite while NASA is providing some main components and the launch facility. The European Space Research Organization is also participating.

A full-size model of one of the two 30-foot long solar arrays, which will be deployed when the satellite achieves geostationary orbit, was constructed for testing during the year. These wing-like devices will unfold to draw power from the sun. The deployable solar array model successfully underwent tests designed to simulate the vibrations which CTS will encounter during launch and second-stage thrust firing.

Technological experiments during the life of CTS will test the technology and uses of this new breed of high-powered satellite. The Department earlier invited interested groups to suggest experiments in communications for the new satellite, and a total of 49 proposals were received. An independent evaluation committee appointed by the Minister met in April and July 1973 to make interim recommendations on the proposals. Among the proposals are experiments involving the transmission of television broadcasts to community receiving terminals and two-way voice telephone communications using small, portable terminals.

Research and development in the satellite area has produced a number of spinoffs into industry. One of these is a new scanning electron microscope, a device developed to aid research into advanced microscopic electronic circuits. A Canadian company, SEMCO, obtained a licence through Canadian Patents and Development Limited (CPDL) to pursue development of this technology. CPDL has also licensed a new high-accuracy attitude sensing system developed for CTS for use on the proposed Japanese broadcast satellite, scheduled for launch in 1977.

RADIO RESEARCH

The scope of radio research activity includes the investigation and measurement of man-made and natural interference; the interaction between physical media and radio waves; and the potential and restrictions that such interaction, interference and natural noise imply for radio systems. Research here is aimed at the development of techniques and technology for solving practical problems in this area.

During the year, radio research also concentrated on studying the higher portions of the radio spectrum. A program of investigation was initiated into the propagation of microwave frequencies in support of terrestrial communications systems. Radio climatology studies were begun, including the preparation of atlases of microwave refractivity and of microwave attenuation resulting from rainfall. One specific study concerned the specialized problems associated with maintaining communications with off-shore oil drilling rigs.

The two ISIS satellites continued to produce data during the year and experimenters in the field of ionospheric research made several gains. In general, new insights have been obtained concerning noise generation and the structure and behaviour of the ionosphere in the polar and equatorial regions.

COMMUNICATIONS SYSTEMS RESEARCH

The Department is also responsible for systems research and development. This work involved telecommunications, terrestrial and space communications systems, radar and remote sensing systems and their application.

During the past two years, the Department and the CBC have cooperated in a satellite broadcasting system study. A systems technology project at CRC has provided the technical background for this study, which investigates satellite system models and their costs. The final report of the system technology project was incorporated in an overall report submitted during 1974.

Several cooperative experiments were carried out during the year with Telesat Canada, operator of the Anik I and Anik II satellites. These experiments included the transmission of voice and teletype signals via the satellites to a CRC transportable earth station.

A Memorandum of Understanding was tentatively approved for the establishment of an experimental cooperative international aeronautical satellite program (Aerosat) by Canada, the United States and the European Space Research Organization. In support of this project, CRC is undertaking research and development on a wide range of communications techniques for the efficient use of this facility, designed to control air traffic over the North Atlantic. Work begun this year includes the development of ground station facilities and the preparation of experiments to evaluate communication reliability between satellites and aircraft.

Canadian participation in the Aerosat program is being carried out by the Ministry of Transport and the Department of Communications.

EDUCATIONAL TECHNOLOGY

The Educational Technology Branch, established May 12, 1973, began a number of programs during the fiscal year.

A program was defined and projects identified for a joint study with the Nova Scotia government of educational needs and technology applications in that province.

A program was defined and an equipment testing program identified to be jointly undertaken with the Alberta government.

A contract was signed with the National Film Board to augment its laboratory testing facilities and to produce test reports on a wide variety of audio and visual equipment. The test reports are intended for wide distribution to educational authorities.

The wired city laboratory at Carleton University was provided with a variety of equipment to permit the laboratory to undertake instruction and learning experiments through audio and visual technology applications in classrooms.

INTERNATIONAL PARTICIPATION

International cooperation is essential for the operation of world-wide communications. The establishment of most new communications services, especially a satellite system, requires cooperation on system design, interconnection, performance testing and radio interference limits. Agreements in these areas crucially affect the mutual use of the radio spectrum in border areas and the international saleability of equipment. Canada is therefore an active member of all major international bodies concerned with telecommunications.

During the year, Canada prepared proposals on a wide range of telecommunications matters for bilateral discussions with France, Japan, the Federal Republic of Germany, and Belgium. Canada also hosted visits by officials from a number of states, including Algeria, Australia, Sweden, Trinidad and Tobago, and Zaïre to discuss matters of specific interest.

The year under review marked the first full year of operation for the International Telecommunications Satellite Organization which operates the global communications satellite system established in February 1973. Canada has the sixth largest investment share in Intelsat, and is represented on the Intelsat Board of Governors.

The Canadian Transatlantic Telephone Cable, CANTAT II, linking Nova Scotia with Cornwall, England, entered into service on April 1, 1974. This cable, the first of a new generation of high capacity submarine cables, is jointly owned by the Canadian Overseas Telecommunication Corporation and the British Post Office.

Canada is an active member of the International Telecommunication Union (ITU), the United Nations specialized agency responsible for telecommunications. At the organization's Plenipotentiary Conference in Torremolinos, Spain, in September-October, Canada was re-elected as one of 36 countries sitting on the Administrative Council, the ITU's governing body.

Canada also played an active role in the World Administrative Telegraph and Telephone Conference which met in Geneva during April 1973 to revise the regulations governing international telephone and telegraph communications. New regulations will come into force on September 1, 1974.

In addition, Canada participated in the 12th session of the Inter-Governmental Maritime Consultative Organization (IMCO) Sub-Committee on Radio Communications in December 1973, and in the third and fourth sessions of the IMCO Panel of Experts on Maritime Satellites. The object of the panel is to study the institutional, technical and economic aspects under which an international maritime satellite could operate.

ONGOING STUDIES

Communications technology currently available or in the process of development will have a widely-recognized impact on the everyday life of Canadians. The unrestrained introduction of this technology could mean, at worst, the loss of personal privacy and serious limitations of freedom of choice. On the other hand, these attributes of Canadian society could be strengthened through communications technology. As well, emerging systems could help to deliver essential services more equitably to all parts of the country. The Department has a primary role in this area of evaluating the long-term socio-economic effects of communications technology and making recommendations to government policy makers.

COMPUTER/ COMMUNICATIONS

Computer/communications is a primary example of this emergent technology, for the linking of computers to existing and improved communications systems could be of profound importance to Canadians. Computers in the banking industry, for instance, may be connected with consumer retail outlets, leading to the long-predicted cashless society. In time, each household may be tied into this central system through an individual computer terminal, providing instant access to a wide range of information and services, from medical diagnosis to in-home shopping.

In April 1973, a green paper entitled *Computer/Communications Policy: A Position Statement by the Government of Canada* was published. The objective, as stated in the foreword, was to ". . . provide a positive basis for discussion with provincial governments and others who share the federal government's concern with this vital area."

As recommended in the Green Paper, an Interdepartmental Committee for Computer/Communications Program and Policy Coordination has been established. Some 40 departments and agencies have nominated representatives. Working groups have been established to consider problem areas and to develop recommendations for government action. Once recommendations have been made to the steering committee, they are referred, if approved, to specific departments for further action.

The overall goals of computer/communications policy were stated in the Green Paper: "It is important that computer/communications, as they affect both existing services and lead to the development of new ones, be oriented in such a way as to emphasize the national identity, the achievement of major economic and social aims, both national and regional, and the maximization of Canadian influences and control over the key activities and services."

Throughout the year, seven volumes including 16 background papers to the Computer/Communications Task Force Report were published. They are available through Information Canada.

During the year, the Department also conducted a study on the need for computer/communications in a possible university computer network program, undertook an analysis of the computer/communications industry in Canada and began a study of the application of computer/communications to health services.

COMPUTERS AND PRIVACY

An Inter-Departmental Committee on Privacy, consisting of seven departments under the co-chairmanship of the Departments of Communications and of Justice, was set up in 1973 following the publication of the Report of the Privacy and Computers Task Force. Its purpose has been to develop a comprehensive and enforceable series of rules which will ensure the proper treatment of personal information stored in data banks which are maintained by the federal government so that the privacy of individuals in relation to the use of that information will be protected.

This Committee, following consultations with other federal departments and the provinces, was drafting its final report to Cabinet as the year drew to a close. The Committee will continue to be a focus for policy work in this area.

TELECONFERENCING

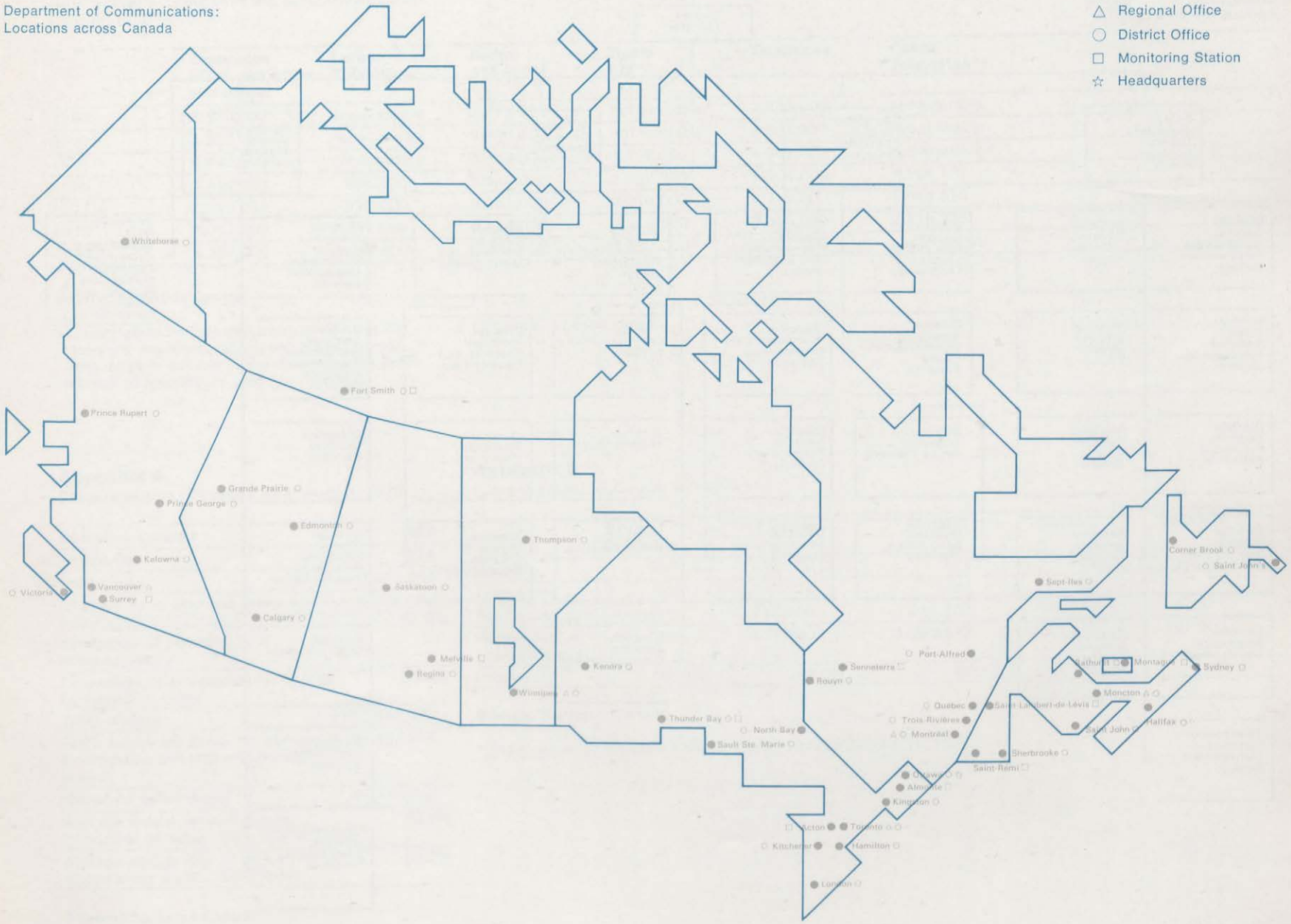
The Department continued an examination of teleconferencing during the fiscal year. Teleconferencing, the use of telecommunications to allow widely scattered groups to communicate with each other, is gaining interest since it may offer an alternative to travel in some instances. A pilot audio-teleconferencing system was built linking the Departmental headquarters with the Communications Research Centre. Several studies were conducted with this system. The first and second phases of behavioural research were completed and these results are now being used to evaluate the potential of teleconferencing systems for managerial use.

The 1973-74 annual report of the Department of Communications represents highlights of the programs and activities of the Department during the fiscal year. The appendices which follow offer relevant statistics on various aspects of communications in Canada.

APPENDICES

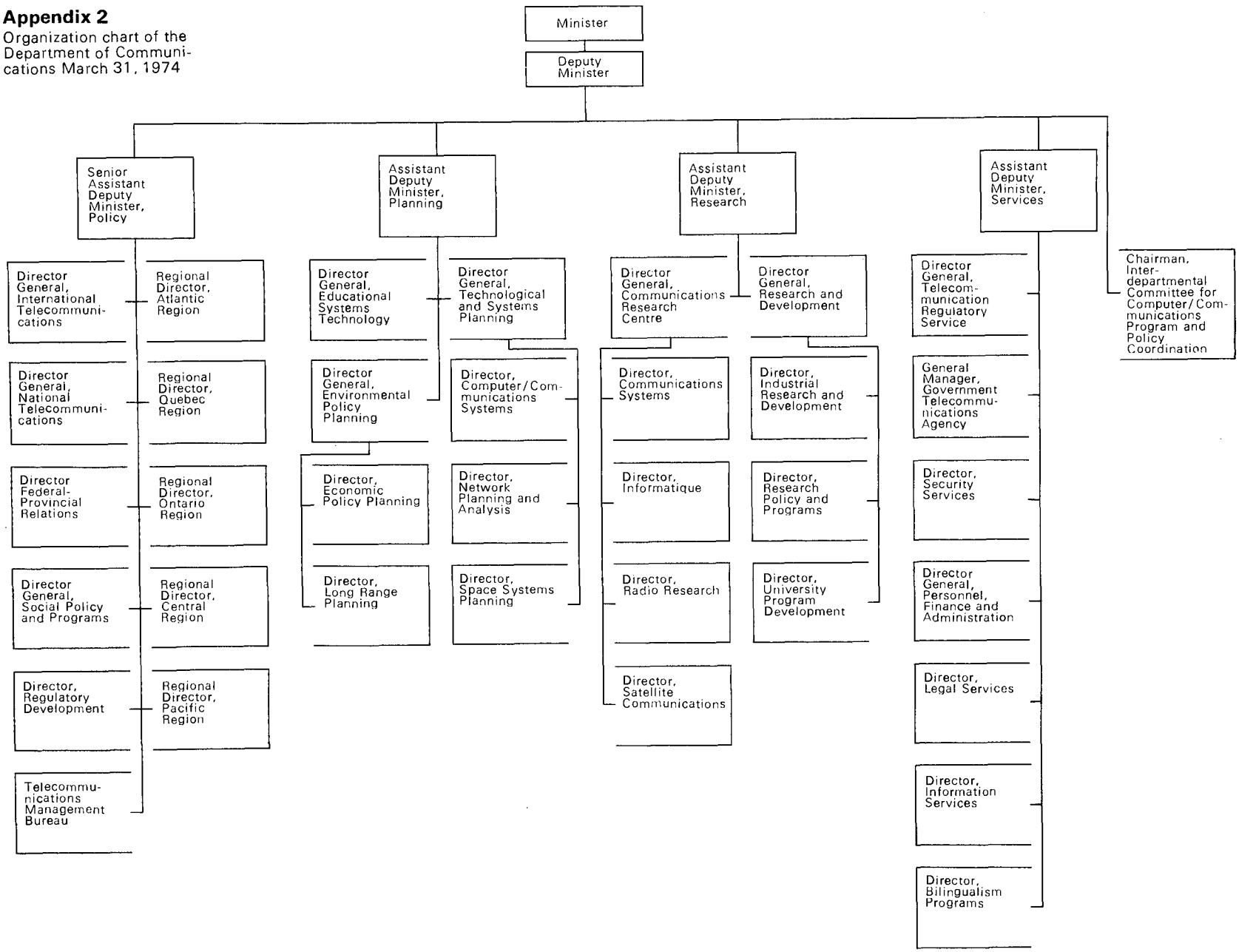
Appendix 1

Department of Communications:
Locations across Canada



Appendix 2

Organization chart of the Department of Communications March 31, 1974



Appendix 3

Number of households with television receivers, radio receivers, telephones and cable television in Canada, 1955 to 1974

	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	2,115,335
1974	6,257,000	2,892,000	6,374,000	4,652,000	6,222,000	not available

Source: Statistics Canada

*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, 1973

Operating systems	362
Companies	274
Subscribers	2,115,866
Households in licensed areas	4,079,483
Penetration (subscribers as percentage of households in licensed areas)	51.8%
Percentage of households in Canada connected to cable	33.8%
Total revenue	$106,972,590
Profit before provision for interest, amortization and taxes (operating profit)	$ 52,581,501
Net profit (after taxes)	$ 12,411,403
Average annual rate of growth in number of subscribers (1967-1973)	26.5%
Average annual rate of growth in operating profit (1967-1973)	35.7%

Source: Statistics Canada

Appendix 5

Cable television in Canada by region*

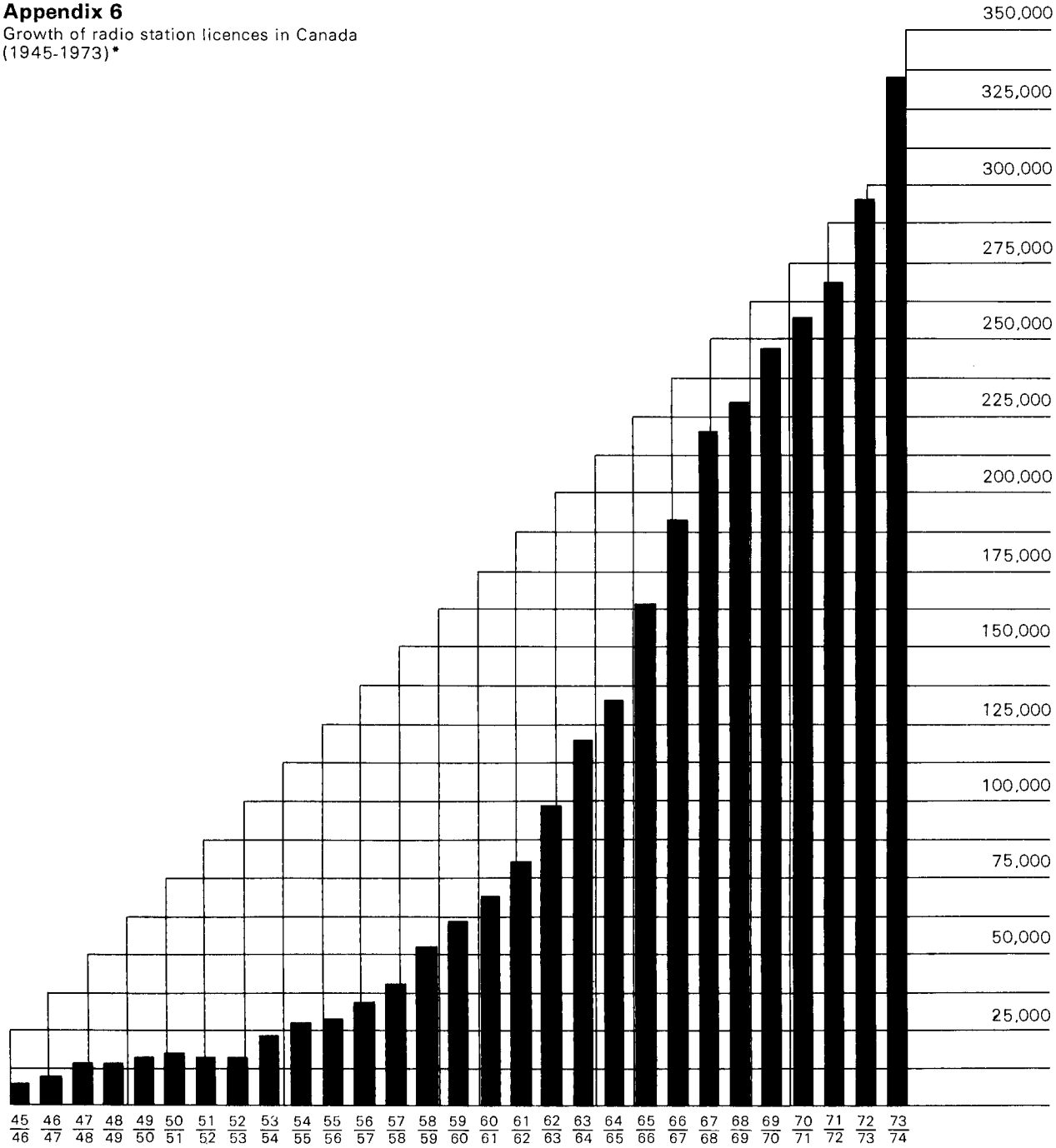
	British Columbia	Prairies	Ontario	Québec	Atlantic
Systems	65	30	112	139	16
Companies	52	24	87	98	13
Subscribers	449,416	212,165	1,016,708	394,950	42,627
Households in licensed areas	589,159	517,330	1,780,579	1,091,215	101,200
Penetration	76.3%	41.0%	57.1%	36.2%	42.1%

Source: Statistics Canada

* Figures are for the period September 1, 1972 to August 31, 1973.

Appendix 6

Growth of radio station licences in Canada (1945-1973)*



Source: Department of Communications

*Figures before 1970/71 exclude auxiliary broadcasting service licences

Appendix 7

Summary of radio station licences in Canada by category — 1973/74

Category	Number
Ship	10,896
Coast	81
Land	53,702
Mobile	175,959
Earth	66
Space	4
General Radio Service*	85,377 (36,413)
Sub-Total	326,085
Issued to United States licensees (Certificates of Registration)	8,486
Total	334,571
Net increase in licences over preceding year	37,951
Per cent increase over preceding year	12.7%

Source: Department of Communications

*General Radio Service licences are valid for a three year period. Figures in brackets indicate licences actually issued (new and renewed) during 1973/74 fiscal year.

Appendix 8

Value of radio licences in Canada by category — 1973/74

Category	Value
Coast/Land stations	$ 783,025.00
Mobile Stations	1,150,957.50
Ship Stations	153,970.00
Amateur Experimental	137,840.00
General Radio Service	364,130.00
Sub-Total	$2,589,922.50
Value of licence amendments	82,356.00
Grand Total	$2,672,278.50
Net Increase over previous year*	$ 292,715.00
Per cent increase over preceding year	12.7%

Source: Department of Communications

*Excludes value of amendments

Appendix 9

Number of radio stations by service category (1973-74)*

Service Category	Stations Ship	Stations Coast	Stations Land	Stations Mobile
Limited Maritime Mobile				
Private Maritime Mobile		81		
Public Commercial			1,692	14
Restricted Public Commercial			473	
Private Commercial			25,893	143,995
Federal Governement			5,318	13,686
Provincial Government			6,479	20,730
Municipal			2,522	23,001
Experimental			494	355
Amateur Experimental			13,784	
Public Commercial Receiving			79	
Private Commercial Receiving			459	149
Public Commercial Automatic Repeater			1,098	
Private Commercial Automatic Repeater			1,665	
Aircraft Navigational				6
Aeronautical Mobile			1,556	10,114
Ship Stations	10,896			
Ship Stations (Mobile)	436			

Source: Department of Communications

*A licence may show more than one service category.

Appendix 10

Major users of radio in Canada (1973-74)

User	Number of Licences
Telephone Systems	8,638
Electric Power Systems	11,415
Gas Distribution Systems	1,631
Logging	9,292
Forestry Services	8,965
Mines & Mines Services	5,582
Farms & Agricultural Services	2,324
Fishery Services & Products	949
Petroleum & Gas Wells-Absorption Plants	2,082
Petroleum & Other Prospecting	5,071
Sawmills, Planning Mills, Wood Industries	2,282
Building & Other Construction & Trades	17,036
Highway, Bridge & Street Construction	4,966
Highway & Bridge Maintenance	5,526
Air Transport & Services	13,394
Ships & Water Transport Services	11,914
Railway Transport	9,633
Truck Transport	11,999
Bus & Urban Transit System	1,635
Taxi Systems	18,904
Pipeline Transport	1,203
Water & Other Utilities	992
Machinery & Equipment Wholesalers	1,127

User	Number of Licences
Lumber & Building Materials Wholesalers	855
Tire Battery & Accessory Dealers	681
Gasoline Service Stations	564
Motor Vehicle Dealers & Repair Shops	684
Radio, T.V. & Electrical Appliance Repair Shops	567
Fuel Dealers	4,418
Insurance, Real Estate & Investment Companies	1,468
Schools, Universities & Related Educational Services	1,512
Engineering & Scientific Services	1,497
Services to Business Management	4,598
Lodging Houses & Residential Clubs	881
Private Investigators	663
Police Services (Federal, Provincial, Municipal)	10,655
Fire Services (Provincial & Municipal)	912
Other Federal, Provincial & Municipal Services	9,979
Civil Defence	1,103
Pulp & Paper Mills	2,322
Iron & Steel Mills	841
Communications Equipment Manufacturers	352
Ready Mix Concrete Manufacturers	4,019
Amateur Experimental Service	13,784
General Radio Service (including Certificates of Registration)	93,863

Source: Department of Communications

Appendix 11

Microwave networks in Canada

Legend

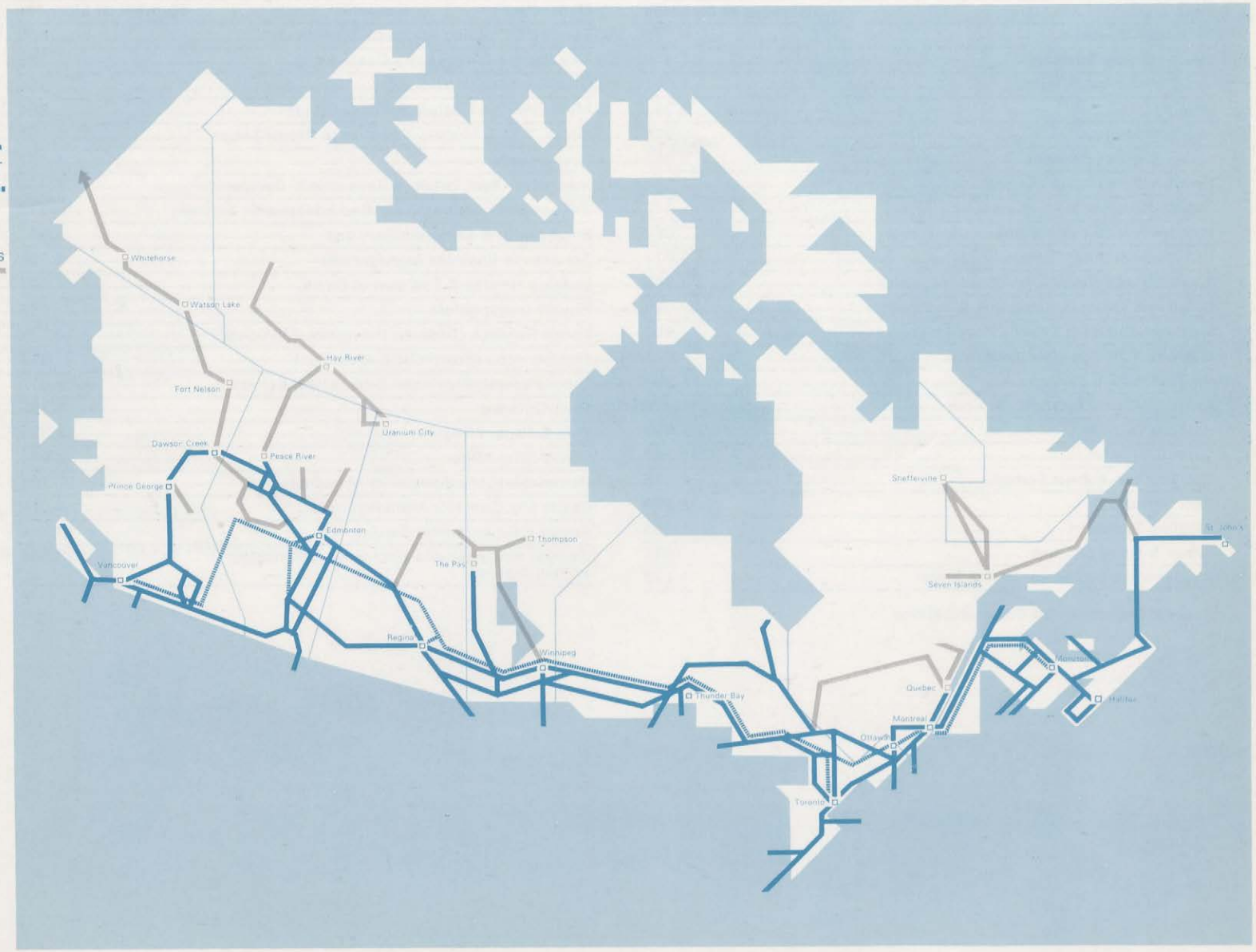
Heavy routes

TCTS

CNT and CPT

Light routes

All companies



Appendix 12

International organizations in which the Department of Communications participates

ITU International Telecommunication Union including CCIR & CCITT

ICAO International Civil Aviation Organization

IMCO Inter-Governmental Maritime Consultative Organization

ESRO European Space Research Organization

URSI International Union Radio

INTELSAT International Telecommunications Satellite Organization

NATO (ARFA) North Atlantic Treaty Organization/Allied Radio Frequency Agency

CTO Commonwealth Telecommunications Organization

CITEL Inter-American Telecommunications Conference

UN/CPUOS The United Nations Committee on the Peaceful uses of Outer Space

UNESCO The United Nations Educational, Scientific and Cultural Organization

ICSU International Council of Scientific Unions

OECD Organization for Economic Cooperation and Development

IFIP International Federation of Information Processing

IBI/ICC Inter-Governmental Bureau for Informatics/International Computation Center

Aerosat Council

Appendix 13

Financial summary

Financial Management: Total expenditures for the Department of Communications for the fiscal year ending March 31, 1974 amounted to $55.1 million. Administrative and operating expenditures constituted 59.5 per cent of total expenditures compared to 39.1 per cent for capital expenditures and 1.4 per cent for grants and contributions. Personnel costs represented 65.9 per cent of operating expenditures while personnel equivalent to 1,773 man-years was utilized. Receipts and revenues reached $10.4 million bringing the net amount of expenditures to $44.7 million. The transaction in the Government Telecommunications Agency Revolving Fund amounted to $16.4 million, compared to recoveries of $16.4 million, leaving a nil balance to be applied against the next fiscal year's operations.

Summary of the Income and Expenditures for the fiscal year ending March 31, 1974.

	Millions of Dollars 1973-74
Administration, operation and maintenance expenditures	32.8
Capital expenditures	21.5
Grants and contributions	0.8
Total Expenditures of the Department	55.1
Less:	
Receipts and Revenues on account of credit	10.4
Net Expenditures of the Department	44.7