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ANNUAL REPORT

DEPARTMENT OF COMMUNICATIONS

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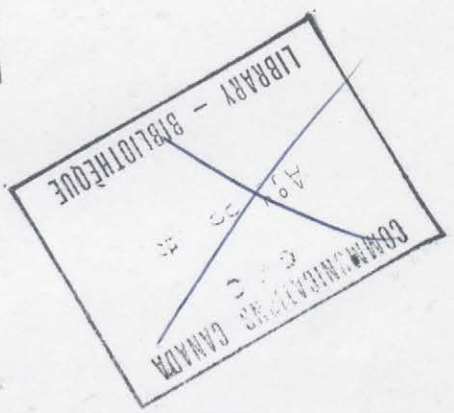
(submitted under the provisions of the
Department of Communications Act)



Government of Canada
Department of Communications

Gouvernement du Canada
Ministère des Communications

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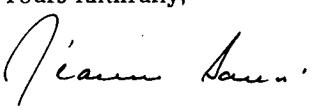
To His Excellency the Right Honourable Jules Léger, Governor General and Commander-in-Chief of Canada

Your Excellency,

I have the honour to present the Annual Report of the Department of Communications for the fiscal year ending March 1977.

Yours faithfully,



Jeanne Sauvé
Minister of Communications

1 INTRODUCTION

The 1976-77 fiscal year was a significant one for the Department of Communications: new telecommunications legislation was introduced in Parliament; progress was made in federal-provincial co-operation in the regulation of telecommunications; the first series of experiments using Hermes, the powerful new communications technology satellite, was successfully completed; and there were exciting advances in research and development. Also during the year, the federal government committed Canada to providing basic telecommunications services throughout the Northwest Territories. The explosive growth of radio licensing continued, particularly in the General Radio Service (GRS).

Telecommunications Bill C-43 was introduced in Parliament on March 22, 1977. It was the second phase of a two-step process to streamline the operation and regulation of telecommunications in Canada. The first phase was approval by Parliament of the Canadian Radio-television and Telecommunications Act, which entrusted the regulation of all federally regulated telecommunications carriers to the Canadian Radio-television and Telecommunications Commission (CRTC). This act came into force on April 1, 1976.

The proposed Telecommunications Act would consolidate and clarify existing legislation, replacing four statutes and parts of two others by a single body of national telecommunications law. Among other things, the act would clearly define the functions and responsibilities of the CRTC and the federal government in the regulation of telecommunications; provide a mechanism whereby provincial governments can contribute to the development of national telecommunications; and enshrine a clear expression of national telecommunications policy.

Cornerstone of the legislation is a set of 16 national objectives, the first of which declares:

efficient telecommunication systems are essential to the sovereignty and integrity of Canada, and telecommunication services and production resources should be developed and administered so as to safeguard, enrich and strengthen the cultural, political, social and economic fabric of Canada.

The act would allow the minister, with the consent of the governor-in-council, to enter into agreements with the provinces and would authorize the governor-in-council to delegate federal regulatory functions to provincial agencies. The act would also empower the government to issue broad policy directions to the CRTC with respect to national telecommunications policy, but not with respect to the issue, amendment or renewal of broadcasting licences, the content of programming, the application of standards of quality or the restriction of freedom of expression.

Under the act, the CRTC would be provided with more flexible and precise powers of regulation over federally regulated telecommunications carriers, such as Bell Canada, B.C. Telephone, CNCP Telecommunications, Telesat Canada and Teleglobe Canada. The agency would also be empowered to order new or extended services and the interconnection of equipment.

The bill was a major topic of discussion when the federal and provincial ministers responsible for communications met in Edmonton at the end of March 1977. Other topics discussed were the delegation of powers over cable television, and pay television.

In November 1976, an agreement was concluded between the federal government and Manitoba, providing for the orderly development of telecommunications services in that province. The two governments acknowledged that the federal government has responsibility for regulating and supervising all broadcasting and broadcast-related services (including pay TV) distributed by the Manitoba Telephone System, and that the province has responsibility for the regulation and supervision of other telecommunication services within its territory.

Pay television was a matter of much discussion during the year. The minister stated that the federal government was developing policies to ensure that it contributed positively to the Canadian broadcasting system. In a speech to the Canadian Cable Television Association on June 2, 1976, the minister stressed three objectives of government policy: pay TV must provide a range of programming which does not duplicate that now offered by broadcasters; it must ensure the production of programs which Canadians will want to watch; and it must ensure that high-quality programs are produced for sale internationally.

An important announcement of policy came on January 22, 1977, when the minister stated in Yellowknife, N.W.T., that every community in the Northwest Territories will have basic local and long-distance telephone service within five years. Under a funding program entitled Northern Communications Assistance Program (NCAP), the federal government will contribute about $9 million to cover the capital costs of facilities to bring long-distance telephone service to the N.W.T.

Experimental use of Canada's new communications technology satellite began May 20, 1976, with a 60-minute, two-way teleconference linking Ottawa with the National Aeronautics and Space Administration (NASA) facilities in Cleveland, Ohio. The $60 million spacecraft, Canada's eighth, is a forerunner of the direct broadcasting satellites planned for the 1980s. Named Hermes, the satellite was to carry out a planned program of 34 social and technical experiments. On August 3, 1976, NASA — which launched the satellite from the Kennedy Space Center on January 17, 1976 — declared the mission a success. Canada took the same action on October 22.

The following chapters provide highlights of the activities of the department during fiscal year 1976-77.

2 MANAGEMENT OF THE RADIO FREQUENCY SPECTRUM

It is not always recognized how valuable — and limited — the radio frequency spectrum is as a national resource. One of the department's major responsibilities is managing this resource in the national interest. To do this, the department develops broad spectrum policies which provide the framework within which it issues radio station licences; sets and conducts examinations for radio operators; regulates the use of frequencies; develops standards to control interference to radio reception; tests and approves equipment for use in Canada; and issues technical and operating certificates for broadcasting stations.

The department is constantly seeking ways and means to improve spectrum management. As an example, work continued during the fiscal year on developing a computer-assisted method of managing the spectrum. The computer will speed the licensing process and provide the department with rapid access to a variety of data, including account information, eligibility, preselection of possible frequencies for assignment, and the electromagnetic compatibility of stations.

Sophisticated management techniques have been made necessary by an ever-increasing volume of radio licensing. The number of radio stations licensed to transmit grew dramatically again in 1976-77. As of March, there were 893,781 licences in force, 73 per cent more than in March 1976. The total value of these licences was $8.5 million, an increase of about 70 per cent over the previous year.

The GRS, often referred to as Citizens' Band, has experienced particularly explosive growth. There were 491,651 GRS licences in force at the end of March 1977, up from 210,571 a year earlier. GRS now accounts for more than half of all radio licences in Canada.

Because of the unparalleled growth of GRS over the past three years, there has been an increase in congestion and a degradation of service. Effective April 1, 1977, the number of channels available for GRS increased from 22 to 40. At the same time, the department issued stricter standards for GRS equipment, aimed at lessening interference within the band and with broadcasting and other radio services.

On July 26, 1976, the department announced details of a new policy concerning the licensing of short-haul microwave systems using the spectrum between 12.7 and 12.95 gigahertz (GHz) and between 14.5 and 15.35 GHz. It was decided that constraints should be placed on licensing in the lower band, which may be needed for long-haul, intercity links in the future. Short-haul systems were licensed in the lower band only until January 1, 1978, and these licences will be valid only until January 1, 1983.

The department announced in August 1976 that it was examining use of the spectrum in the 406 to 960 megahertz (MHz) band, used by broadcasting stations, mobile radio systems, amateur radio and radio astronomy, among others. Users and all interested parties were invited to make submissions about use of this band.

Among other activities, the department:

- acquired mobile equipment to determine spectrum occupancy and use. A mini-computer and radio equipment carried in the same vehicle gather and analyse data necessary for ranking the suitability and availability of channels for shared use.
- developed policies and associated standards for use of the 7 and 8 GHz microwave bands for medium-capacity digital radio systems.
- issued new interference regulations for spark ignition systems, resulting in an overall reduction in interference in radio and television reception. The regulations affected auto makers, industrial implement manufacturers and small boat manufacturers.

3 REGIONAL OPERATIONS

Day-to-day management of the spectrum is conducted by offices in five administrative regions: Atlantic, Quebec, Ontario, Central and Pacific. Through district offices and monitoring stations, the department licenses and inspects radio facilities to ensure conformity with regulations, investigates sources of interference, monitors radio transmissions and conducts examinations for operators. Regional offices also co-operate in examining technical, social and economic factors contributing to the reliability and utilization of communications systems.

In addition to day-to-day spectrum management activities and the administration of Government Telecommunications Agency services across Canada, regional offices often undertake special projects or collaborate in programs with headquarters or with other regions. For example, during the year through its various regional offices the department developed a definitive regional overview of rural and remote communications, worked on the initiation of special radio systems in the North and helped to ensure effective communications for the Montreal Olympic Games.

4 BROADCASTING AND CABLE TV

The department conducts technical evaluations of all broadcasting and cable television licence applications and advises the CRTC whether a technical construction and operating certificate will be issued. The department also undertakes research supporting new policies and legislation concerned with national broadcasting and studies various aspects of broadcasting policy on a continuing basis.

During the fiscal year under review, the department studied the development of new services for cable systems, including pay television, multilingual broadcasting and community programming. Also under study were the social effects of television programming, including children shows, advertising, and violence on TV.

A major object of attention was measures to deal with the impact of U.S. television programming on the Canadian broadcasting system. Section 19.1 of the Income Tax Act came into effect during the year, disallowing income tax deductions for advertisements purchased on American stations and directed at the Canadian market.

Canadian and American officials met in October to discuss the deletion of commercial announcements from U.S. signals carried by cable TV licensees — a policy introduced by the CRTC in 1971. The government subsequently advised the CRTC that it favored postponing further implementation of this policy while a study was made of the possible impact of the broadcasting provisions of Bill C-58 on the advertising revenues of Canadian stations, and other methods of achieving Canadian broadcasting objectives, such as the Income Tax Act and program substitution, were assessed.

The department continued attempts to rationalize the structure of public and private broadcasting in Canada so that the structure meets national objectives. This effort involved close liaison and discussion with the provinces.

5 TELECOMMUNICATIONS SYSTEMS AND SERVICES

An important objective of the department is to ensure that the communications systems in Canada provide an acceptable level of service at a reasonable cost — locally, regionally and nationally. To this end, the department examines and analyses various aspects of the industry, including telecommunications networks, their corporate and financial structures and the intercorporate relationships of the carriers.

One of the major objectives of the department is to extend telephone service to remote and rural areas of Canada. The government is committed to seeing that residents in the North enjoy a level of communications service comparable to that available in the South. During the year, the minister announced that high-quality telephone service would be extended to all communities in the Northwest Territories within five years — establishing Canada as first among Arctic nations in the provision of public telephone service.

Under the NCAP, the federal government will contribute some $9 million to cover the capital cost of long-distance facilities. Bell Canada and CN Telecommunications will invest a similar amount in capital and operating funds for local exchange equipment and for operation of long-distance services. Long-distance service will be provided either through satellite ground stations or ground-based circuits.

The department created a new industry structure and services directorate during the year to develop and implement policies concerning structural elements of the telecommunications services industry. This group will be concerned with a wide range of issues including those associated with carrier interrelationships.

A thorough study was made of the availability of telephone and broadcasting communication facilities in rural areas of Canada. A report on this topic was issued during the year. Another important study concerned the requirement for commercial satellite communications in Canada in the future.

During the spring of 1976, the minister made a national tour of provincial capitals for meetings with her counterparts. The bilateral talks led to renewed activity between both levels of government focusing on the federal government's offer in the Grey Paper of 1975 to discuss practicable arrangements for the sharing of regulatory authority over coaxial cable systems and for the use of such systems. On November 10, 1976, an agreement was signed with Manitoba.

This agreement recognized the responsibility of the federal government for the regulation and supervision of all broadcasting and broadcast-related services (including pay TV) distributed by the Manitoba Telephone System, while at the same time recognizing the responsibility of the provincial government for the regulation and supervision of other telecommunications services distributed by this carrier. The federal government agreed that cable television operators may lease from the Manitoba Telephone System most of the cable and other equipment required to distribute signals through the streets and lanes to homes.

At a June meeting, the federal and Quebec ministers of communications agreed to set up a working group of officials to catalogue the positions and interests of the province and the federal government relating to overall objectives, broadcasting, common carriers, cable TV and international relations in the communications field.

6 COMPUTER COMMUNICATIONS

Canadian users spent an estimated $2.6 billion on goods and services related to computer communications during 1975. A study completed for DOC during the year estimates this total will increase to more than $5 billion by 1980 and to more than $8 billion by 1985. These figures indicate the tremendous growth taking place in this field as Canada moves into an information-based economy. This is a development of major significance, which directly affects Canadian citizens as well as corporations and which raises complicated policy issues for governments.

The orderly transition to this new information society requires co-operation between the federal and provincial governments and between the public and private sectors.

The department continued to be active in an interdepartmental committee established in 1973 to study these issues, and provided the secretariat for the committee.

During the year, the committee received four reports from working groups and forwarded recommendations to the Departments of Communications, Consumer and Corporate Affairs, Manpower and Immigration, and Supply and Services and to Statistics Canada. Information was also provided to the Department of Finance regarding the effects of certain tax measures on computer communications.

The committee accepted from its secretariat a report entitled "The Growth of Computer/Communications in Canada", which provided a user-oriented definition of the boundaries of computer communications and a model to help estimate the size of the principal components of the industry.

Recommendations of the committee were taken into account in the White Paper on the revision of the Bank Act, released in August 1976. It appeared likely that this revision would define the extent of participation by banking firms in using commercial computer services in the future.

One question of continuing concern is involvement of foreign companies in the information processing field in Canada. During the year, meetings were held with 19 private sector organizations and particular attention was given to obtaining the views of smaller, Canadian-owned producers of computer communications equipment.

Another important question under consideration is the control of and access to data files maintained within Canada and to files on Canadians held in other countries.

7 THE GOVERNMENT TELECOMMUNICATIONS AGENCY

The Government Telecommunications Agency plans, establishes and manages telecommunications facilities and services to satisfy the needs of federal departments and agencies on an economic basis. The federal government network now includes 21 consolidations, with the addition of Saskatoon this year. A total of 73,000 main telephones are now sharing common network services.

There were 20 million intercity calls through this network during the fiscal year. The average cost per call was 96 cents, down from $1.06 in 1975-76.

The Government Data Network was expanded in 1976-77 to serve 13 departments with 694 low-speed terminals. Additional capacity was arranged to enable future expansion up to 2,000 terminals. During the year, some 195.2 million words were processed on this network for a saving of about 15 per cent over normal commercial costs.

A number of telecommunications guidelines were developed during the year to assist government departments and agencies to better manage their telephone communications services. The guide was approved and issued in January.

Other projects underway include:
- development of an automated notices system for the Public Service Commission to improve the way in which employment and advancement opportunity notices are transmitted to federal government offices across Canada.
- development of an automated film booking system for the National Film Board; recommendations were submitted to the Film Board and design of the system is planned.
- design and implementation of a data base system for the Secretary of State to assist in the translation of both official languages by accessing standard translations of words or phrases.
- development of recommendations for the telecommunications requirements of Transport Canada's Training Institute; specifications were prepared and submitted to that department.

8 SPACE PROGRAMS

Satellite communications are important to Canada, with its vast land mass and thinly spread population. Domestic and international satellite systems routinely provide economical and reliable communications services to most parts of the country. Canada was a pioneer in space communications and Canadian industry has developed an expertise in this technology recognized around the world.

Three Anik satellites, operated by Telesat Canada, continue to provide east-west and north-south links, increasing the number of urban, rural and isolated northern communities that have telephone, radio, television or other services. International communications are provided through the system of the International Telecommunications Satellite Organization (INTELSAT) and Teleglobe Canada. The department's space sector is mainly concerned with assessing the suitability and performance of new technology, identifying technical problems in satellite communications and defining future communications needs involving satellites.

Canada's experimental communications technology satellite, the most powerful in the world, was launched by NASA from the Kennedy Space Center January 17, 1976. Control of the spacecraft was turned over to the department's Communications Research Centre (CRC) on January 29.

Communications experiments were inaugurated by the minister on May 20, 1976, when the spacecraft was officially named Hermes. The ceremony signalled the start of a two-year program planned to include 34 Canadian experiments, both social and technical, under the aegis of 20 different organizations.

Social experiments encompassed teleeducation, telemedicine, community interaction and administrative services. A typical educational experiment was the provision of communications links among the widely separated campuses of l'Université du Québec. Another was an exchange and sharing of university courses between Carleton University in Ottawa and Stanford University in California.

Hermes provided a linkup between three Ontario health care facilities — University Hospital in London, a general hospital in Moose Factory and a nursing outpost in Kashechewan. Satellite-aided medical examinations, consultations and decision-making were carried out. Electrocardiograms, x-rays, ultrasonic imagery and other forms of medical data were transmitted during the experiment, enabling doctors to obtain the advice of specialists at the London hospital.

The technical experiments included propagation studies, modulation trials, system demonstration, and testing and evaluation of terminals.

By the end of the fiscal year, 11 experiments had been completed, nine were in progress and plans were being made for six more. Each completed experiment has been rated a success by the experimenters and the department. In view of continuing interest in Hermes and the satisfactory performance of the satellite, the United States and Canada were actively planning to extend its operation beyond its original expected life.

Since April 1973, Canada has been participating in an international program of experimentation and evaluation of an aeronautical satellite. The department has been conducting related technical studies in association with Transport Canada. The program, called Aerosat, involves Canada, the United States, the European Space Agency and the U.S. Federal Aviation Agency. Aerosat will employ two geostationary satellites which will facilitate air traffic control. The basic design for the Canadian earth terminal required in the system has been completed; specifications have been published; a proposed method of access control has been developed; and a number of studies into traffic loading and ranging techniques have been carried out. Experiments to determine propagation effects and to measure the performance of voice/data transmission subsystems have also been completed.

Postponement of the Aerosat program occurred as a result of the failure of the U.S. Congress to appropriate the necessary funds for that country's participation.

Work on definition of requirements, consideration of system options and assessment of the feasibility of a multipurpose UHF satellite (MUSAT), intended to satisfy a wide range of

government communications requirements, continued during the fiscal year. A major effort is being devoted to assessing the technical feasibility of the transponder and antenna system which would be required for MUSAT.

Because of Canada's vast size and often inhospitable terrain and climate, the task of locating downed aircraft and rescuing survivors is often both lengthy and costly. A proposal to augment existing visual search methods with a satellite-aided search and rescue system (SARSAT) was evaluated during the year. The system would receive signals from emergency locator transmitters carried by general aviation aircraft. A prompt crash alert would pinpoint location of the wreck to within a few kilometres in a matter of minutes after the satellite pass. CRC tests of the system, using simulated crash signals, were made during the year and clearly demonstrated the concept's feasibility.

Other space projects include:
- a project to develop small low-cost terminals and to demonstrate the feasibility of using these terminals to receive direct television signals from satellites.
- studies into the impact of the U.S. space shuttle on the Canadian satellite program. The shuttle represents a significant advance in satellite launching techniques, permitting recovery and re-use of the launch vehicle. Use of this method will have an important impact on satellite design, at the same time reducing the cost of launches.
- studies on the electrostatic charging on external surfaces of satellites and how to prevent or control this phenomenon which can cause malfunctions.
- studies to develop the design technologies for heat pipes used to transfer heat from equipment hot-spots, such as high-power transmitter tubes.
- studies of the design of larger solar arrays for high-power satellites.

9 RESEARCH

The department, through its research sector, seeks to advance the state of the art in communications and to advise the department and other departments in policy planning. Broadly stated, this sector seeks to answer such questions as:
- how will Canadians communicate with each other in the 1980s and beyond?
- what new technologies could and should be introduced?
- what new demands will be placed on our communications system in the future and how can they be met?

The department undertakes research directly at its Communications Research Centre near Ottawa and indirectly through contracts with industry and academic institutions.

With increasing use of radio, congestion of the radio frequency spectrum has become a major problem. Research into the use of the upper end of the spectrum, where bandwidths for expanding services may be found, is therefore important. Digital communications, short- and long-haul radio relay, cable television trunk circuits, radar and satellite communications are all competing for new microwave allocations.

This situation demands long-range policy decisions but planning of communications systems must be based on a thorough understanding of the manner in which such radio waves work. Radio waves may be attenuated and depolarized by precipitation and tropospheric refraction. Thus the department has undertaken several studies to investigate these effects. During the year, the first draft of an atlas of refractivity data was prepared and statistics of rain rates were derived.

The ability to predict accurately the signal strength, at any location, that would result from existing or proposed transmitters is vital to the planning and management of the VHF/UHF region of the radio spectrum. A project to develop a computer-based VHF/UHF propagation model was undertaken in 1975. First stages of this project were completed in 1976 and a start was made on extending the validity range of the model to the Arctic.

Canada's northern native people are largely dependent on land resources. Inuit and Indian people must frequently leave settlements to hunt, fish and trap. Specialized communications between settlements, trail parties and remote camps improve conditions of survival. Responding to a request from the Northern Quebec Inuit Association, the department undertook an experimental project in 1975 to explore various means of providing reliable trail communications and to demonstrate a suitable prototype system. During 1976, a repeater was installed, along with a transceiver, in the area of Koartac, Quebec, to demonstrate the feasibility of such a system. Further equipment development will be required to provide permanent installations for additional native communities.

CRC has been active for some time in measuring and characterizing noise pollution affecting the radio spectrum. Some of the major sources of noise are corona and spark discharges on extra-high voltage power lines, automobile ignition systems and lightning. Studies are now being extended upwards to the 1,000 MHz range to cover the television and land mobile bands.

The research centre contributes to the planning of airborne and satellite-borne remote sensing systems. It provides technical support to an interdepartmental task force on surveillance satellites and detailed program planning for proposed Canadian participation in the American Seasat-A experimental satellite program. This work has been vital to a number of decisions concerning the data processing system for Canadian involvement with the Seasat-A experiment.

Development of a new mobile radio data system was initiated in 1976. This project is designed to provide Canadian police forces with a computer-aided dispatch and data retrieval system. Of particular interest is work on in-car terminals and on development of a low-cost microcomputer to control communications. The system will be completed in 1978.

Studies on the technology required to deliver new communications services to individual homes began during the year. This work is a prelude to policy formulation and consideration of regulatory questions within the department. One study examined the implications of introducing Viewdata and Teletext, developed by the British Post Office and the British Broadcasting Corporation, into Canada. These systems offer a wide variety of services to the television subscriber, including news, education, weather, travel and hobby information.

Research into optical fibre communications continued. This technology, which features the transmission of communications by light through thin glass threads, is expected to grow dramatically in the next decade. Fibre-optics technology holds the promise of reducing costs of conventional wired systems, with greater transmission capacity and less interference. During the year, significant advances in the study of sources and detectors for the analog transmission of television signals through glass fibres were made. High-performance fibre-optic couplers were developed at CRC. Use of these components in fibre-optic networks may reduce the quantity of fibre needed to deliver telecommunications services to subscribers.

A major research program was launched into improving communications in rural areas. This program began with a preliminary assessment of rural communications and initiation of other studies into forecasting needs and costs. Unit costs of delivering services to rural areas can likely be substantially reduced through more effective use of present technology, introduction of new technology and identification of a broader market.

The department continued its program of general research for the Department of National Defence in radar and high frequency communications.

10 INTERNATIONAL COMMUNICATIONS

Through the Department of Communications, Canada participates in the work of some 20 international organizations concerned with the orderly development and use of world-wide telecommunications links, with the promotion of technological co-operation and with improving frequency spectrum regulation.

During the year, the department participated in many of the activities of the International Telecommunication Union (ITU), a specialized UN agency whose founding date precedes that of the UN by more than 80 years. Among the most important was the Administrative Council where priorities were rearranged and commitments adjusted so that the budget limits established by the Malaga-Torremolinos Conference in 1973 could be met.

Extensive preparations and wide consultations both within and outside of Canada enabled the Canadian participants to play a leading role at the World Administrative Radio Conference for the planning of broadcast satellite services in the 12 GHz band. Since in Region 2 (the Americas) this band is shared with the fixed services, it was important to obtain a result that would permit adequate arrangements for both services. This was achieved.

Canada was represented at a number of meetings of the International Telegraph and Telephone Consultative Committee (CCITT) of the ITU. The sixth plenary assembly of this organization, which met in Geneva from September 27 to October 8, 1976, brought to a close a study period which began in 1973. The Canadian National Organization for the CCITT co-ordinated Canadian participation at the many CCITT study group meetings as well as at the sixth plenary assembly.

The department also participated in the International Frequency Registration Board seminar in Geneva on frequency management and use of the radio frequency spectrum. A paper entitled "Propagation Considerations in the Use of Frequency Bands above 10 GHz" was presented. The department also attended the ITU seminars on satellite broadcasting in the 12 GHz band in Rio de Janeiro, Brazil; Kyoto, Japan; and Khartoum, Sudan.

The department responded to requests for information on telecommunications matters from India, Ghana, Finland, Greece, Australia, Japan and the Federal Republic of Germany. These requests concerned such diverse matters as high frequency radio links, financial appraisal methods and push-button telephones.

The department did the preparatory work for a program of co-operation between Canada and France in telecommunications. This preparation culminated in a meeting in October 1976 between the minister of communications and the French Secrétaire d'Etat aux Postes et Télécommunications, Norbert Ségard. Officials of both countries were instructed to develop a program of co-operation in telecommunications in areas of mutual interest which were identified during the meeting. This program was launched in February 1977.

Canada also continued to play a leading role in the United Nations Committee on the Peaceful Uses of Outer Space, especially (with Sweden) in the development of legal principles to govern the use of direct television broadcasting by satellite.

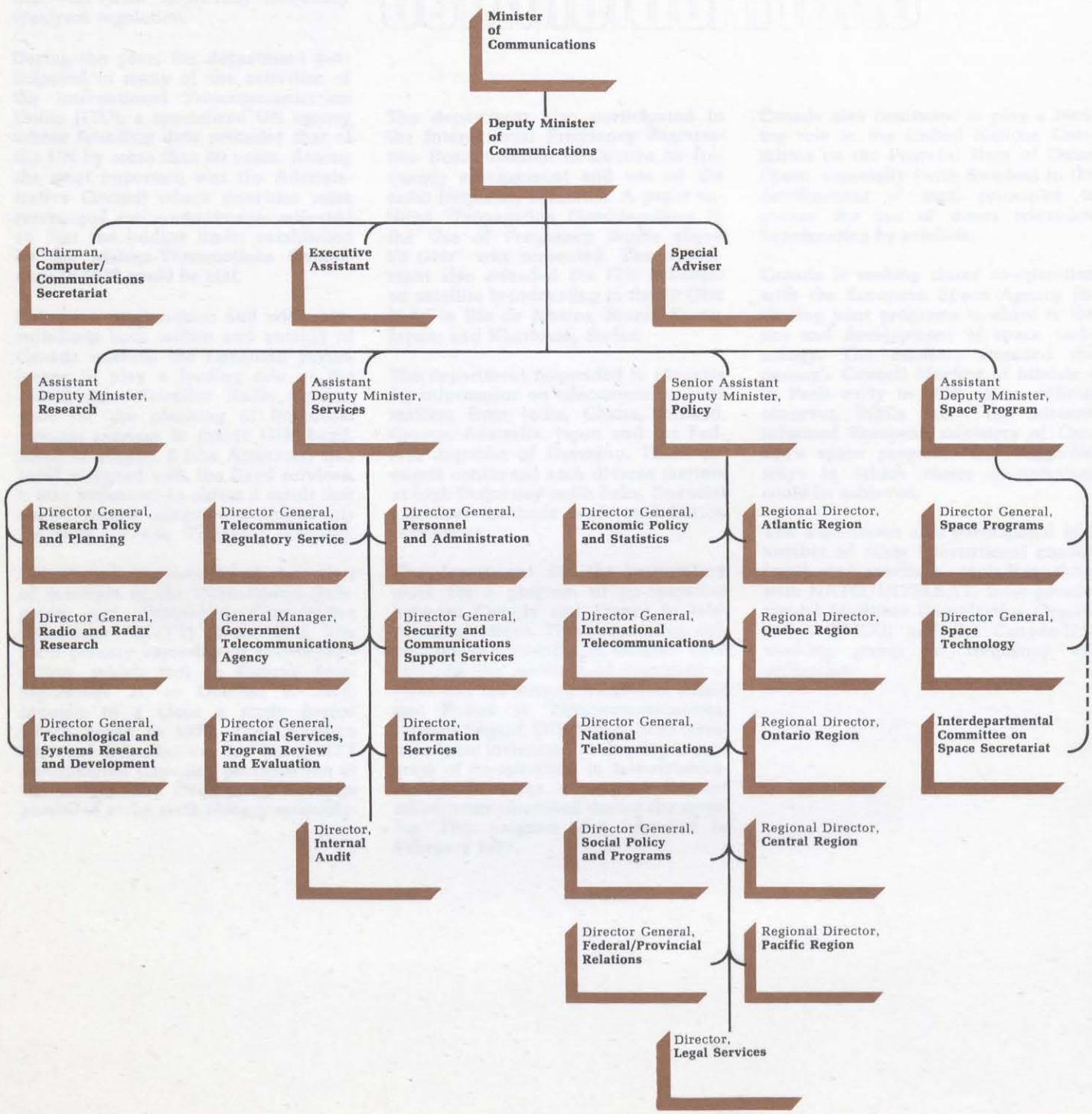
Canada is seeking closer co-operation with the European Space Agency including joint programs to share in the use and development of space technology. The minister attended the agency's Council Meeting of Ministers in Paris early in 1977 as an official observer. While there, the minister informed European ministers of Canada's space programs and suggested ways in which closer co-operation could be achieved.

The department also participated in a number of other international conferences and meetings, including those with NATO, INTELSAT, Inter-governmental Maritime Consultative Organization (IMCO) and the Canada-U.S. working group on frequency co-ordination.

APPENDICES

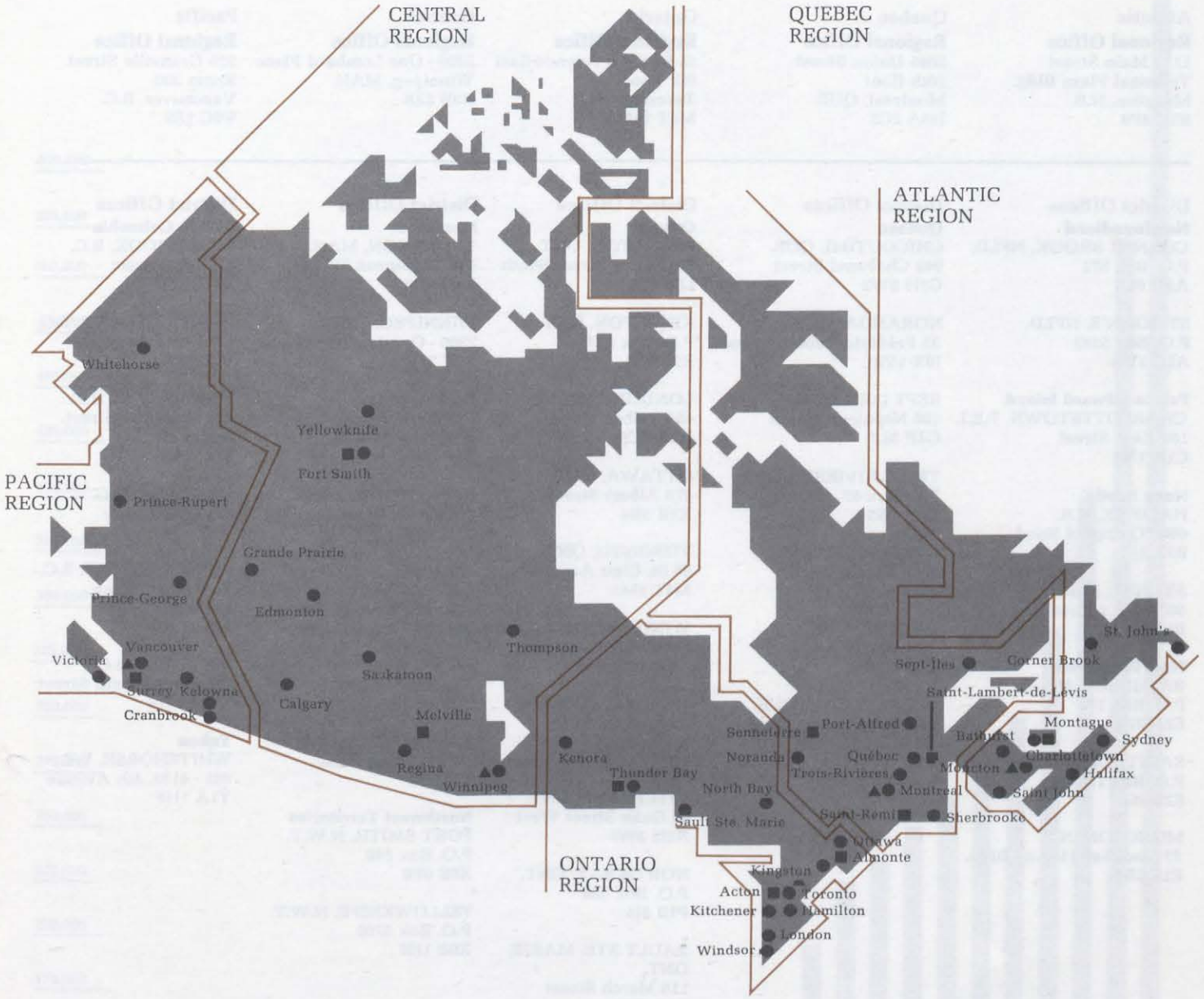
Appendix I

Department of Communications
Organization Chart



Appendix II

Department of Communications
Locations across Canada



Appendix III

Addresses of regional and district offices of the Department of Communications

Atlantic
Regional Office
1222 Main Street
Terminal Plaza Bldg.
Moncton, N.B.
E1C 8P9

Quebec
Regional Office
2085 Union Street
20th floor
Montreal, QUE.
H3A 2C3

Ontario
Regional Office
55 St. Clair Avenue East
9th floor
Toronto, ONT.
M4T 1M2

Central
Regional Office
2300 - One Lombard Place
Winnipeg, MAN.
R3B 2Z8

Pacific
Regional Office
325 Granville Street
Room 300
Vancouver, B.C.
V6C 1S5

District Offices
Newfoundland
CORNER BROOK, NFLD.
P.O. Box 572
A2H 6G1

ST. JOHN'S, NFLD.
P.O. Box 5273
A1C 5W1

Prince Edward Island
CHARLOTTETOWN, P.E.I.
180 Kent Street
C1A 1N7

Nova Scotia
HALIFAX, N.S.
6009 Quinpool Road
B3K 5J7

SYDNEY, N.S.
500 King's Road
B1S 1B2

New Brunswick
BATHURST, N.B.
P.O. Box 155
E2A 3Z1

SAINT JOHN, N.B.
P.O. Box 1285
E2L 4G7

MONCTON, N.B.
77 Vaughan Harvey Blvd.
E1E 2B4

District Offices
Quebec
CHICOUTIMI, QUE.
942 Chabanel Street
G7H 5W2

NORANDA, QUE.
32 Frédéric Hébert Avenue
J9X 1V2

SEPT ILES, QUE.
106 Napoleon Street
G4R 3L7

TROIS RIVIERES, QUE.
P.O. Box 67
G9A 5E3

MONTREAL, QUE.
2085 Union Street
H3A 2C3

QUEBEC, QUE.
2 Place Québec
G1R 2B5

SHERBROOKE, QUE.
1650 King Street West
J1J 2C3

District Offices
Ontario
HAMILTON, ONT.
135 James Street South
L8P 2Z6

KINGSTON, ONT.
P.O. Box 633
K7L 4X1

LONDON, ONT.
451 Talbot Street
N6A 5C9

OTTAWA, ONT.
473 Albert Street
K1R 5B4

TORONTO, ONT.
55 St. Clair Avenue East
M4T 1M2

WINDSOR, ONT.
880 Ouellette Street
N9A 1C7

KENORA, ONT.
Federal Building,
Room 154
P9N 2X9

KITCHENER, ONT.
30 Duke Street West
N2H 3W5

NORTH BAY, ONT.
P.O. Box 596
P1B 8J5

SAULT STE. MARIE, ONT.
118 March Street
P6A 5N5

THUNDER BAY, ONT.
33 Court Street South
P7B 2W6

District Offices
Manitoba
THOMPSON, MAN.
436 Thompson Drive
R8N 0C6

WINNIPEG, MAN.
2300 - One Lombard Place
R3B 2Z8

Saskatchewan
REGINA, SASK.
2101 Scarth Street
S4P 2H9

SASKATOON, SASK.
206 Circle Drive East
S7K 0T5

Alberta
CALGARY, ALTA.
205 - 8th Avenue, S.E.
T2G 0K9

GRANDE PRAIRIE, ALTA.
Federal Building
T8V 0X9

EDMONTON, ALTA.
10621 - 100 Avenue
T5J 0B4

Northwest Territories
FORT SMITH, N.W.T.
P.O. Box 540
X0E 0P0

YELLOWKNIFE, N.W.T.
P.O. Box 2700
X0E 1H0

District Offices
British Columbia
CRANBROOK, B.C.
11 - 14th Street
V1C 2W9

PRINCE GEORGE, B.C.
1294 - 3rd Avenue
V2L 3E7

VANCOUVER, B.C.
325 Granville Street,
Room 300
V6C 1S5

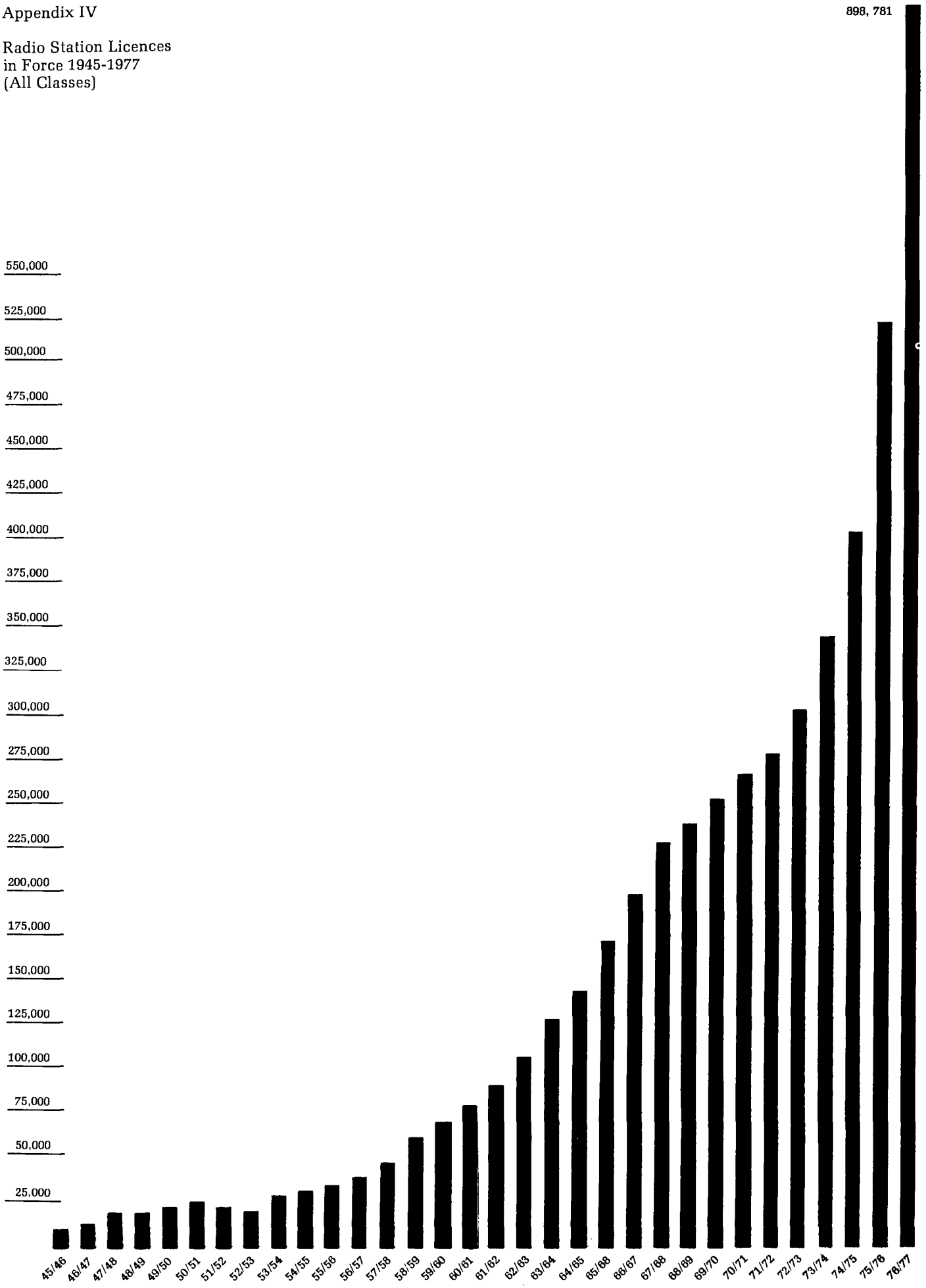
KELOWNA, B.C.
471 Queensway
V1Y 6S5

PRINCE RUPERT, B.C.
Federal Building,
Room 227
V8J 1G8

VICTORIA, B.C.
816 Government Street
V8W 1W9

Yukon
WHITEHORSE, Y.T.
201 - 4133, 4th Avenue
Y1A 1H8

Radio Station Licences
in Force 1945-1977
(All Classes)



Appendix V

Summary of Radio Station Licences in Canada by Category, 1977

Ship	14,204	
Coast	102	
Land	66,307	
Mobile	255,983	
Earth	133	
Space	6	
General Radio Service*	491,651	(334,447)
Sub-total	828,386	
Issued to United States licensees (Certificates of Registration)	65,395	
Total licences in force during the year ending March 31, 1975	893,781	
Net increase in licences over preceding year	378,559	
Per cent increase over preceding year	73.4%	

*General Radio Service licences are valid for a three-year period. Figures in brackets indicate licences actually issued (new and renewed) during 1976/77 fiscal year.

Source
Department of Communications

Appendix VI

Value of Radio Station Licences by Category, 1977

Coast/Land Stations	$1,296,073
Mobile Stations	$2,198,501
Ship Stations	$ 270,486
Amateur Experimental	$ 215,449
General Radio Service	$4,515,034
Sub-total	$8,495,543
Value of licence amendments	$ 85,272
Total	$8,580,815
Net increase over previous year*	$3,511,418
Per cent increase over previous year	70.4%

*Excludes value of amendments.

Source
Department of Communications

Appendix VII

Number of Radio Stations by Service Category, 1977*

Service Category	Ship	Coast	Land	Mobile
Limited Maritime Mobile				
Private Maritime Mobile		102		
Public Commercial			1,970	16
Restricted Public Commercial			813	
Private Commercial			33,510	209,120
Federal Government			6,325	21,162
Provincial Government			6,995	30,952
Municipal			3,339	32,890
Experimental			541	589
Amateur Experimental			16,573	
Public Commercial Receiving			108	
Private Commercial Receiving			620	174
Public Commercial Automatic Repeater			1,176	
Private Commercial Automatic Repeater			2,384	
Aircraft Navigation				13
Aeronautical Mobile			1,675	14,126
Ship Stations	14,204			
Ship Stations (Mobile)	399			

*A licence may show more than one service category.

Source
Department of Communications

Appendix VIII

Major Users of Radio in Canada, 1976/1977

User	Number of Licences
General Radio Service	491,651
Certificates of Registration	65,395
Building and Other Construction and Trades	31,740
Federal, Provincial and Municipal Services	27,193
Taxi Systems	20,833
Truck Transport	17,035
Air Transport and Services	16,884
Amateur Experimental Service	16,573
Ships and Water Transport Services	15,683
Electric Power Systems	14,755
Railway Transport	12,258
Logging	11,548
Telephone Systems	10,924
Forestry Services	9,837
Engineering and Scientific Services	8,345
Highway and Bridge Maintenance	8,256
Mines and Mine Services	7,735
Services to Business Management	5,995
Farms and Agricultural Services	5,800
Highway, Bridge and Street Construction	5,642
Police Services (Provincial and Municipal)	5,034
Ready Mix Concrete Manufacturers	4,940
Radio and Television Broadcasting	3,702
Pulp and Paper Mills	3,238
Crude Petroleum and Natural Gas Industry	3,070
Sawmills, Planing Mills, Wood Industries	2,920
Insurance, Real Estate and Investment Companies	2,654
Schools, Universities and Related Educational Services	2,399
Gas Distribution Systems	2,325
Petroleum Refineries	1,788
Bus Transport, Interurban and Rural	1,737
Lumber and Building Material Wholesalers	1,572
Pipeline Transport	1,562
Water and Other Utilities	1,470
Gasoline Service Stations	1,465
Security and Investigation Services	1,427
Fishery Services and Products	1,400
Petroleum and Other Drilling	1,345
Iron and Steel Mills	1,322
Machinery and Equipment Wholesalers	1,173
Motor Vehicle Dealers and Repair Shops	1,148
Fire Services (Provincial and Municipal)	1,148
Tire, Battery and Accessory Dealers	898
Lodging Houses and Residential Clubs	848
Radio, TV and Electrical Appliance Repair Shops	738

Source
Department of Communications

Appendix IX

Use and Availability of Communication Services, May 1977

	Number of Households	Percent of Total Households	Increase (Decrease) over 1976	
			Number	Percentage
Television*	6,822,000	97.2	138,000	2.1
Color	4,764,000	67.9	571,000	13.6
Black & White	3,952,000	56.3	(366,000)	(8.5)
Radio				
AM & FM**	6,882,000	98.0	65,000	1.0
Telephones***	6,771,000	96.4	94,000	1.4
Total Canadian Households	7,022,000	100.0	104,000	1.5

*Because some households have more than one television receiver, combining households with color television and those with black and white television does does not equal total households with television receivers.

**Includes households with one or more receivers.

***Includes households with one or more telephones.

Source
Statistics Canada

Appendix X

Cable Television in Canada by Region*

	Pacific**	Prairies	Ontario	Quebec	Atlantic	Canada
Systems	68	31	116	139	33	387
Subscribers	652,378	427,025	1,538,023	689,353	137,916	3,444,695
Households in Licensed Areas	780,928	693,544	2,187,205	1,519,988	239,849	5,421,514
Penetration (%)	83.5	61.6	70.3	45.4	57.5	63.5

Source
Department of Communications

*Figures are for the period Sept. 1, 1976 to Aug. 31, 1977. Data includes non-profit organizations.

**Includes British Columbia, the Yukon and Northwest Territories.

Appendix XI

Department of Communications
1976/77 Expenditures by Activities (thousands of dollars)

	Operating	Capital	Grants and Contributions	Total
	Expenditures	Expenditures	Expenditures	Expenditures
Departmental administration	8,291	65		8,356
Telecommunications research	8,536	3,697		12,233
National telecommunications development	2,632		170	2,802
International participation	566		928	1,494
Management of the radio frequency spectrum	18,920	1,536	11	20,467
Space applications	9,211	2,251		11,462
Contributions to employee benefit plans	3,360			3,360
	51,516	7,549	1,109	60,174
Less: receipts and revenues credited to the vote	20,994			20,994
	30,522	7,549	1,109	39,180
Less: receipts credited to revenue	2,378			2,378
Add: services provided by other departments	3,624			3,624
accommodation provided by this department	1,474			1,474
Total cost of program	33,242	7,549	1,109	41,900

Source
Public Accounts of Canada 1976-77