with the
compliments of

avec les
hommages du

Government of Canada
Department of Communications

Gouvernement du Canada
Ministère des Communications

Annual Report 1983/84

Canada

Department of Communications

Annual Report
1983/84

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

Cat. no. Col-1984

ISBN 0-662-53495-6

To:
Her Excellency the Right
Honourable Jeanne Sauvé,
P.C., C.C., C.M.M., C.D.,
D.H.L., D.S., D.L.,
Governor General and
Commander-in-Chief of Canada

Your Excellency:

I have the honor to present the
Annual Report of the Department
of Communications for the fiscal
year ending March 1984.

I remain,
Your Excellency's obedient servant,

Marcel Masse,
Minister of Communications

Contents

Introduction

1

The department underwent a major transformation in 1983/84, to meet the challenges of a changing communications and information environment. The reorganization was made necessary by continuing advances in technology -- in the workplace, in the marketplace, and in the home.

The economic impact of communications technology is enormous. Some $22 billion dollars is invested in Canada's telecommunications industry -- mostly in telephone systems -- directly producing annual revenues of more than $10 billion. Some $350 million is invested in private television and more than $150 million in private radio, yielding annual revenues exceeding $750 million and $480 million respectively. Canada's cable industry, with an investment of some $500 million, produces revenues close to $500 million.

Another $491 million in revenues comes from film production and distribution. The sound recording industry yields more than $325 million annually, book publishing over a billion dollars, and newspapers and periodicals close to $3.3 billion.

The Minister of Communications is responsible for expenditures totalling $1.6 billion a year. More than half of this -- over $800 million -- is spent by the Canadian Broadcasting Corporation (CBC) and $376 million by the department itself. The rest is spent by eight cultural agencies and the Canadian Radio-television and Telecommunications Commission (CRTC).

In 1983/84 the Canada Council accounted for $66 million, the National Film Board $78 million, the National Museums $70 million, Telefilm Canada $16 million, the Public Archives $39 million, the National Library $30 million, the National Arts Centre $14 million, the CRTC $24 million and the Social Sciences and Humanities Research Council $60 million.

In addition, the Minister is responsible for administering 10 separate statutes covering almost the whole area of federal authority on telecommunications, broadcasting and culture. In particular, the responsibility for the management of the spectrum is vested solely with the Minister under the Radio Act. The investment in Canada associated with the use of radio is estimated to be in excess of $10 billion.

Because of the rapid pace of technological change, the environment in which the department operates has greatly altered. In response to this change -- to focus its activities more clearly in policy development, research, support for industry, culture and the arts -- the department has been reorganized into five sectors: Policy, Spectrum Management, Research, Technology and Industry, and Cultural Affairs.

The Policy Sector itself was also reorganized, with three main objectives:

- to clarify the sector's leadership role in policy development;
- to redeploy resources to meet work requirements more effectively; and
- to provide a strategic focus on department policies and programs by establishing a corporate planning function.

Telecommunications and information technologies are advancing at an enormous pace. The development and application of these technologies have major implications for economic and social development. The Department of Communications, through its policy, regulatory, R&D and common services functions, can and does have a major impact on the industries creating and using these technologies. Also, the nature of the technological developments can dictate policy and regulatory options.

The Technology and Industry Sector is responsible for assessing the implications of the department's varied activities on Canadian industry and, in turn, developing and implementing strategies and programs to optimize the industrial and economic benefits of those activities. The department has in place the organization to assess these impacts. It also has a number of finely tailored programs to help industry take advantage of specific opportunities created or identified through departmental activities. The sector also includes the Government Telecommunications Agency, which provides the internal shared telecommunications services for the federal government across Canada.

Research programs of the former Space Sector were consolidated with those of the Research Sector itself, to form a strengthened and coordinated research organization. This made one Assistant Deputy Minister responsible for all technological research in the department.

Meanwhile, the program of the Arts and Culture Sector -- until 1980 part of Secretary of State -- was merged with the department's communications program. Previously the two programs had been separately administered, requiring separate parliamentary votes. The sector itself was renamed the Cultural Affairs Sector, reorganized to serve two areas of responsibility:

- to develop policies concerned with social issues, the arts and heritage, sound recording, films and publishing; and
- to manage cultural support programs such as the Special Program for Cultural Initiatives, the Movable Cultural Property Program and the Capital Cost Allowance Program.

The creation of a Social Policy Directorate underlined the sector's new capability to investigate social issues. This directorate is concerned with the social impact of information technologies on the Canadian public, and the implications of new technologies for the arts communities.

Highlights of the year

The Policy Sector concentrated largely on broadcast policy, in response to the concerns of the Applebaum-Hébert Committee. The country's broadcasting industry, employing more than 75,000 people, now serves more than 99 per cent of our population. Radio and television absorb more of the public's leisure time than any other interest and receive the largest share of the federal government's cultural expenditures.

Steps were taken to implement the Broadcasting Policy announced in March 1983. Work started on developing a comprehensive radio broadcasting policy, with the establishment of a radio policy task force that included representatives of the radio broadcasting and sound-recording industries. Meanwhile, a study was completed showing the feasibility of establishing a second French-language private television network.

The Canadian Broadcast Program Development Fund became operational, administered by Telefilm Canada (Canadian Film Development Corporation). This fund was established to assist in the production of commercially competitive, quality television programs by independent producers and production companies.

In another important initiative, the department began a wide-ranging review of telecommunications policy, in recognition of the fact that the trend toward more competition in the provision of telecommunications products and services will have important implications for the structure of the nation's telecommunications industry. As part of the review process, in January 1984 the department invited submissions from the public and interested parties.

The department convened a new Consultative Committee on Communications and Physical Disability, to advise the Deputy Minister on the promotion of technologies especially useful to the handicapped. The committee included representatives of all the major national organizations for the disabled.

The performance and reliability of Canadian satellites continued to impress scientists and other observers. In March 1984, the department ceased operating its two ISIS research satellites, launched in 1969 and 1971; but Japan continued to collect data from them, far beyond the expected operating life of these satellites. With the encouraging life-saving results of satellite-aided search and rescue (SARSAT), Canada, the United States, France and the Soviet Union continued to work toward the ultimate goal of a single international system.

The department's Anik B satellite communications trials also ended in March. These trials showed the feasibility of satellite communications for tele-education, telemedicine, government administration and local communications.

In November 1983, construction of the new Canadian Workplace Automation Research Centre started in Laval, Quebec. Research at this centre will mainly be concerned with improving office systems, hardware and software, and with the organizational and social impact of this technology.

Telidon, the widely acclaimed videotex system developed at the department's Communications Research Centre, moved closer to acceptance as a world standard. In December 1983, the Canadian Standards Association and the American National Standards Institute recognized Telidon as the North American standard for videotex and teletext. It is also one of the standards recommended by the International Telegraph and Telephone Consultative Committee.

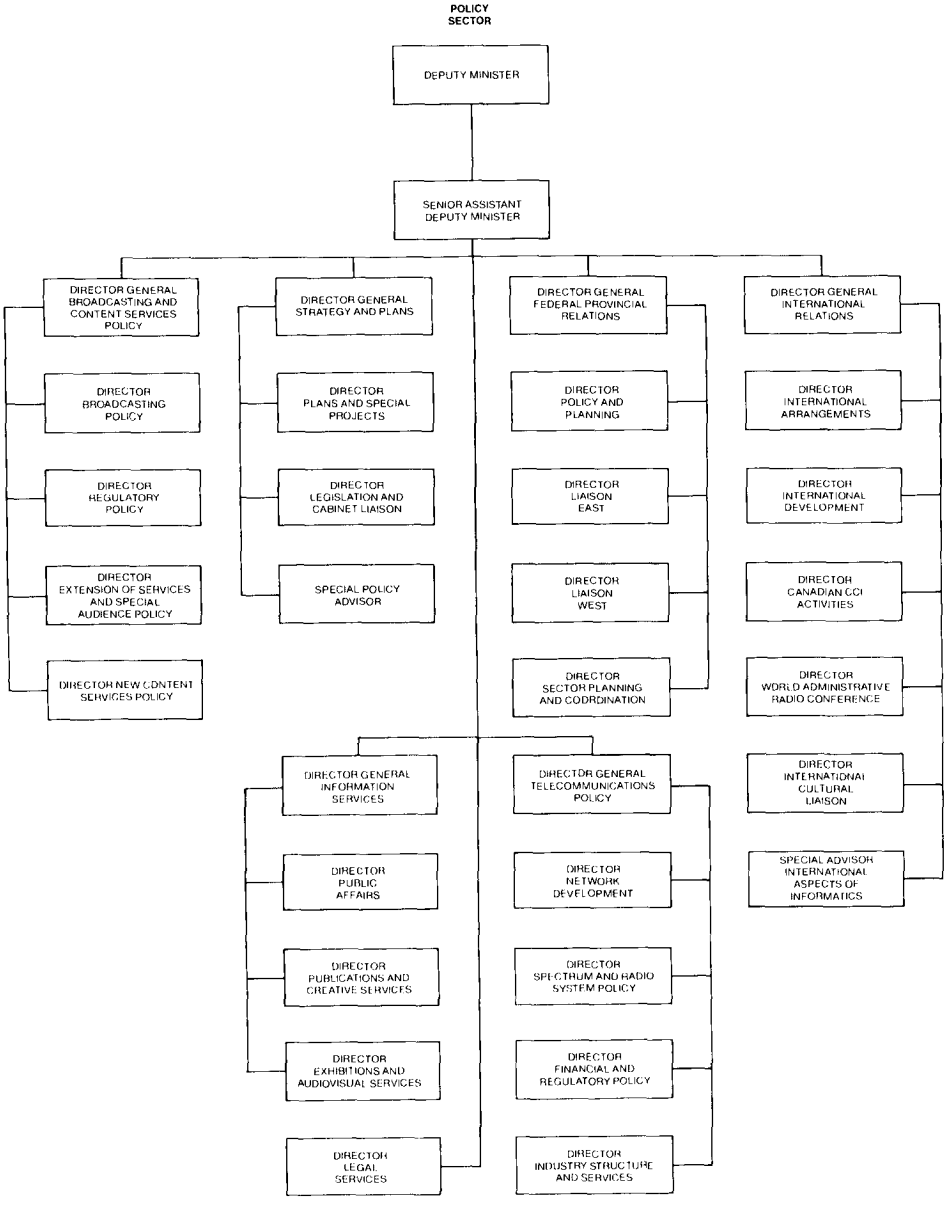
Meanwhile, the department continued to manage the training program for Brazilian engineers and technicians who will operate Brazil's Canadian-made communications satellites. The $8 million program is funded by the Canadian International Development Agency (CIDA).

The department is also participating in the European Space Agency's OLYMPUS satellite program, formerly called the L-SAT program. This was aimed at developing a large communications satellite platform, scheduled for launch in 1987. Two Canadian companies are involved in its manufacture, and the department's David Florida Laboratory will be used in the environmental testing of the spacecraft.

The automated Spectrum Management System was made operational during the year. This system has increased the department's efficiency in processing applications and issuing radio licences. The system has also generated international interest and export opportunities. Another important development in the Spectrum Management Sector was the signing of a new agreement with the United States on the sharing of AM radio frequencies. This agreement provides for more than 100 new AM station allotments in Canada.

In the Cultural Affairs Sector, the Copyright Directorate concentrated on developing legislative proposals to replace the outdated Copyright Act of 1924. Working closely with the Department of Consumer and Corporate Affairs, it explored ways to make the new legislation reflect modern social conditions and recent technological changes. The two departments completed a White Paper, From Gutenberg to Telidon, for release in May 1984. As well, in response to the challenges and opportunities faced by the film and video sector, the Film, Sound Recording and Publishing Directorate worked extensively on the Film and Video Policy for release in May 1984.

Thus the department was closely concerned with a wide range of technical, social and cultural matters. As the fiscal year ended, it was organized and prepared to face new challenges and responsibilities.


POLICY SECTOR
DEPUTY MINISTER
SENIOR ASSISTANT DEPUTY MINISTER
DIRECTOR GENERAL BROADCASTING AND CONTENT SERVICES POLICY
DIRECTOR BROADCASTING POLICY
DIRECTOR REGULATORY POLICY
DIRECTOR EXTENSION OF SERVICES AND SPECIAL AUDIENCE POLICY
DIRECTOR NEW CONTENT SERVICES POLICY
DIRECTOR GENERAL STRATEGY AND PLANS
DIRECTOR PLANS AND SPECIAL PROJECTS
DIRECTOR LEGISLATION AND CABINET LIAISON
SPECIAL POLICY ADVISOR
DIRECTOR GENERAL FEDERAL PROVINCIAL RELATIONS
DIRECTOR POLICY AND PLANNING
DIRECTOR LIAISON EAST
DIRECTOR LIAISON WEST
DIRECTOR SECTOR PLANNING AND COORDINATION
DIRECTOR GENERAL INTERNATIONAL RELATIONS
DIRECTOR INTERNATIONAL ARRANGEMENTS
DIRECTOR INTERNATIONAL DEVELOPMENT
DIRECTOR CANADIAN CCI ACTIVITIES
DIRECTOR WORLD ADMINISTRATIVE RADIO CONFERENCE
DIRECTOR GENERAL INFORMATION SERVICES
DIRECTOR PUBLIC AFFAIRS
DIRECTOR PUBLICATIONS AND CREATIVE SERVICES
DIRECTOR EXHIBITIONS AND AUDIOVISUAL SERVICES
DIRECTOR LEGAL SERVICES
DIRECTOR GENERAL TELECOMMUNICATIONS POLICY
DIRECTOR NETWORK DEVELOPMENT
DIRECTOR SPECTRUM AND RADIO SYSTEM POLICY
DIRECTOR FINANCIAL AND REGULATORY POLICY
DIRECTOR INDUSTRY STRUCTURE AND SERVICES
DIRECTOR INTERNATIONAL CULTURAL LIAISON
SPECIAL ADVISOR INTERNATIONAL ASPECTS OF INFORMATICS

Policy Sector

2

The reorganization of the department's Policy Sector was governed by two underlying objectives: the clarification of responsibilities for policy development and redeployment of resources to better meet work requirements, and the establishment of a corporate planning function to provide a strategic focus on the department's policies and programs.

STRATEGY AND PLANS BRANCH

The department's new Strategy and Plans Branch was established in June 1983 to serve as a central focal point in regard to all policy matters affecting communications and culture. The branch's primary purpose is to define strategic priorities for the department as a whole, and to ensure that these are consistent with the government's priorities. It also provides overall direction in the development of policy and legislation, carries out special planning projects and prepares briefings on key matters before the Cabinet and Parliament.

Within this context, the branch has three objectives:

- to ensure that the department develops compatible policies, programs, regulations, and legislation designed to promote Canadian cultural development and the evolution, establishment and efficient operation of telecommunications and broadcasting services;

- to set up a corporate planning framework for all departmental policy endeavours; and

- to instill a clear and consistent sense of objectives and priorities throughout the department.

The Minister of Communications is responsible for a portfolio that involves a total budget of $1.6 billion per annum, including agencies such as the Canadian Broadcasting Corporation and the Canada Council. In addition, the Minister is responsible for 10 Acts of Parliament that cover virtually all matters of federal authority in the areas of telecommunications, radio, broadcasting and culture.

Due to rapid technological change, all aspects of Canada's culture and communications are becoming increasingly interdependent in new and complicated ways. To handle this complexity and pace of change, the Strategy and Plans Branch has the primary responsibility for designing, managing and coordinating the department's global policy and program strategy to integrate each sector's activities and ensure that critical linkages are taken into account as the department's sectors plan their work. This responsibility extends to reviewing the various agencies' activities so that the Minister is able to manage the culture and communications portfolio effectively.

During its first year, the branch provided Ministerial briefings on all major departmental and agency proposals that went to Cabinet, as well as on those originating in other departments that had implications for the department or the agencies. This involved:

- designing and managing corporate policy and strategic plans for the department as a whole;
- developing and managing a coherent fiscal policy consistent with departmental priorities, including guidance to the Senior Management Committee for multi-year and budget-year operational planning;
- providing guidance to the Senior Management Committee and senior management throughout the department in the preparation of all Memoranda to Cabinet, Strategic Overviews and Treasury Board Submissions;
- managing the department's activities involving legislation and regulatory reform, such as amendments to broadcasting and telecommunications legislation;
- managing Cabinet business for the department, including day to day liaison with the Central Agencies;
- identifying and managing the linkages among departmental priorities that have a cross-sectoral or cross-departmental nature; and
- developing and maintaining a corporate planning data base.

Plans for the 1984/85 fiscal year cover a wide range of activities. One major undertaking will be an assessment of the economic and political domestic and international environment within which the department operates. In light of this assessment, there will be a review of the activities required of the department over the next five years; an examination of major activities under way in the department; and an investigation into the effectiveness of policy instruments available for meeting departmental objectives. The assessment will result in preparation of a set of departmental priorities that will set its direction over the next three to five years. Other 1984/85 activities will include a comprehensive financial review of the department, and a review of its role in communications research.

BROADCASTING AND CONTENT SERVICES POLICY BRANCH

The programming of Canada's broadcasting system reaches over 99 per cent of the population and absorbs more of the leisure time of most Canadians than any other single activity. Broadcasting also takes the lion's share of the federal government's expenditures on cultural activities. The system generates over $2 billion in revenues each year and, together with the associated content production industries, employs over 75,000 Canadians.

The environment in which the broadcasting system operates is evolving rapidly as a result of technological developments that are expanding choice and flexibility for audiences. At the same time, the emergence of international competition poses unprecedented threats and opportunities. This presents the federal government with the challenge of maintaining the broadcasting system as an effective vehicle of national public policy and ensuring a smooth and dynamic transition to a much more competitive mixed environment offering a variety of both programming and non-programming services.

The Broadcasting and Content Services Policy Branch has the primary responsibility for designing and conducting policy and program analysis and development in relation to the social, cultural, economic, industrial and institutional aspects of broadcasting and associated delivery technologies. It develops appropriate legislation related to these policies, and also advises on the policy implications of developments in these areas. An extensive policy research, analysis and statistics program supports these functions. The branch also serves as the central point for all policy and planning matters related to the Canadian Broadcasting Corporation.

The branch consists of four directorates: Broadcasting Policy, Regulatory Policy, Extension of Services and Special Audiences Policy, and New Content Services Policy.

Broadcasting Policy Directorate

This directorate is concerned with a broad range of policy issues pertaining to Canadian broadcasting. During 1983/84 these issues included:

- the evolution of objectives for Canadian broadcasting;
- the development of quality Canadian programming for mass and specialized audiences;
- the role and financing of the Canadian Broadcasting Corporation;
- the fostering of an internationally competitive domestic television production agency;
- the ever-changing structure of the broadcasting industry and its corporate interrelationships; and
- broadcasting issues involving Canada and the United States.

The Canadian Broadcasting Corporation (CBC)

The CBC was a major focus of attention during fiscal 1983/84. On October 24, 1983, the Minister of Communications introduced the government's new policies regarding the CBC. In the following month, he announced the beginning of a developmental process to consolidate CBC Toronto operations in a new complex. On February 8, 1984, Bill C-20, updating broadcasting and telecommunications legislation and including amendments to the CBC's mandate and structure, was tabled in Parliament and given first reading.

Much of 1983/84 was taken up with implementation of the government's Broadcasting Strategy (announced March 1, 1983). The Canadian Broadcast Program Development Fund, which is described in the strategy and is designed to assist private production companies and independent television producers to produce competitive drama, variety and children's television programs, became operational during the 1983/84 fiscal year. The fund is administered by the Telefilm Canada (Canadian Film Development Corporation). The Broadcasting Policy Directorate secured the necessary funding from Treasury Board, and is responsible for monitoring the fund's performance. In 1983/84, nearly $100 million of production was undertaken as a result of the fund.

The directorate also initiated work on a comprehensive radio broadcasting policy through the establishment of a radio policy task force comprising representatives of the radio broadcasting and sound recording industries.

The directorate completed and published the results of a study regarding the feasibility of establishing a second, private, French television network. Early in 1984/85, the Minister invited entrepreneurs to submit applications to the Canadian Radio-television and Telecommunications Commission (CRTC) for such a service.

The directorate contributed to a revised definition of what constitutes a Canadian television program. This involved consultations with industry and the CRTC as well as participation in two workshops sponsored by the commission. As well, the directorate developed criteria for consideration by Cabinet concerning requests for the provision of host broadcasting services, that is, basic broadcasting coverage of major international events held in Canada to which foreign electronic reporters then add their own commentary.

As a result of the departmental reorganization, the directorate became responsible for maintaining a broadcasting statistical data base, and began implementing plans for several internal publications having to do with cable, pay television and other statistics.

During the year, the directorate commissioned the following reports, available upon request:

- The CBC as an instrument for industrial development within the communications sector;
- A study of the United States market for television programs;
- French-speaking Canadians and English-language television: Viewing trends from 1976 to 1981;
- Étude de faisabilité relative à l'introduction d'un deuxième réseau de télévision privé de langue française;
- Television advertising and the Income Tax Act: An economic analysis of Bill C-58;
- Cable TV handbook (1982); and
- Audio programming.

At year-end, the ongoing areas of policy concern continued to be development and refinement of the various initiatives of the broadcasting strategy and the government's policy regarding the CBC. This includes completion of the review of radio, and a review of the role of cable television (within the context of the Telecommunications Policy Review.)

Regulatory Policy Directorate

The objective of this directorate is to promote measures to ensure that the regulatory system governing radio and television broadcasting and cable television (as well as the legislation on which the system is based) constantly take into consideration cultural, social, technological and economic changes, as well as the interests of consumers, the public in general and the need for the communications industry to remain commercially viable.

The Regulatory Policy Directorate carries out this objective through policy analysis, which in 1983/84 included advice on submissions to the Governor in Council pursuant to Section 23 of the Broadcasting Act, proposals for amendments to broadcasting legislation, and an examination of the regulatory status of cable television.

Under Section 23(1) of the Broadcasting Act, the Governor in Council may, within 60 days, set aside or refer back to the CRTC any issue, amendment or renewal of a broadcasting licence by the commission.

In September 1983, the Governor in Council referred Decision CRTC 83-576 back to the commission for reconsideration and public hearing. In the decision, the CRTC had approved an application by Allarcom Ltd. to provide a regional, general-interest, pay-television service to Manitoba, Saskatchewan and the Northwest Territories by amending Allarcom's licence to serve Alberta.

The hearing to reconsider the matter was held in Vancouver from November 29 to December 2, 1983. This provided an opportunity for public discussion on the evolution of the Canadian pay-television industry within the context of the general framework outlined in the March 1982 Decision CRTC 82-240. On January 5, 1984, the commission issued Decision CRTC 84-1, which confirmed without change the amendment of Allarcom's pay-television licence authorized by Decision CRTC 83-576.

Broadcasting legislation

House of Commons Bill C-20, announced in February 1984 as part of the government's previously published Broadcasting Strategy and CBC Policy, included provisions that would enable the Governor in Council to issue broad policy directives to the CRTC; would make unambiguous the commission's regulation of master antenna television systems that receive satellite signals; and would alter the role and structure of the CBC and the mandate of the Canadian Film Development Corporation.

In addition to work on Bill C-20, during the 1983/84 fiscal year the Regulatory Policy Directorate prepared documents that were to be used early in 1984/85 to announce a proposed amendment to Bill C-20 to deal with the problem of abusive programming, particularly as it relates to women. This amendment would have made explicit the government's commitment to the principle that all Canadians have the right to programming that respects the dignity and equality of groups and individuals.

Regulatory status of cable television

The 1983 Broadcasting Strategy for Canada provided that expanded programming choice for Canadian viewers would be delivered primarily, but not exclusively, by cable systems, and that cable operators would be encouraged to provide new, non-programming services. Also, the strategy proposed that the CRTC should have clear legislative authority to compel cable operators to lease channels to providers of new programming and non-programming services, sometimes in competition with cable operators themselves.

As part of the department's continuing study of cable's role in both the new broadcasting and telecommunications environments, it asked independent consultants to examine the issue. The consulting firm of CEGIR of Montreal, Quebec, was chosen by tender to undertake this work, which included interviews across Canada with representatives of the cable, telephone and broadcasting industries. CEGIR's final report was completed by the end of the 1983/84 fiscal year and is available to the public.

Looking ahead to the 1984/85 fiscal year, the directorate's policy concerns will include broadcasting legislation, simplification and streamlining of the regulatory process, regulatory reform, review of cable's role within the context of the Telecommunications Policy Review, regulatory aspects of the teletext and videotex services, and a review of the relationship of the CBC to the CRTC and government.

Extension of Services and Special Audience Policy Directorate

Extension of services

The department contributes to improvements in broadcast programming choice for Canadian audiences through policy initiatives designed to encourage industry to broaden its services. Through its regional and district offices, the department provides advice to groups applying to the CRTC for licences to distribute the package of radio and television signals available from Canadian Satellite Communications Inc. (CANCOM).

By March 1984, the CANCOM service had been licensed to deliver by satellite Canadian programming to 825 communities in remote or rural markets. In addition, CANCOM delivers United States network signals to 135 remote or rural communities as well as to 196 existing distribution systems which do not have access by terrestrial means to all four United States' network signals.

Following the publication of a report on direct-to-home satellite broadcasting (DBS) for Canada, in October 1983 the branch placed a notice in the Canada Gazette calling for public comment on both long- and short-term issues surrounding the introduction of a DBS service. The department received 22 submissions in response, from the broadcasting and cable industries, common carriers, equipment suppliers, and several provinces. Under the leadership of the directorate, a working group was formed to analyze the responses and prepare a report.

Northern broadcasting policy

During 1983/84 the directorate participated with other departments and agencies in the implementation of the Northern Native Broadcast Access Program, applicable to the Yukon and Northwest Territories as well as the northern regions of seven provinces. The program provides funds to 13 native communications societies in the North to produce radio and television programming, mainly in native languages. From the federal funds allocated, initial operating grants were made to five of these communications societies, while seven other organizations were awarded research grants.

Services to the disabled

Today's communications technologies have the potential to vastly improve the quality of life for the disabled, through, for example, increased opportunities to participate in the work force. To advise the Deputy Minister regarding the development of a national policy that will promote technologies especially useful to the disabled, the department convened a Consultative Committee on Communications and Physical Disability. The committee, which includes a representative from each of the major national organizations for the disabled, meets twice a year and is expected to present its report to the Deputy Minister in September 1984.

In the year ahead, the department will be considering the use of other technologies, particularly satellite direct-to-home broadcasting (DBS) and the 2500 MHz band of the radio spectrum (MDS) to extend further broadcasting services to under-served areas and populations. Other projected areas of activity include the implementation and review of the Northern Broadcasting Policy, further development of the national policy on communications and disability, and consideration of issues related to the extension of multicultural programming to audiences with various linguistic and ethnic backgrounds.

New Content Services Policy Directorate

During 1983/84, the Broadcasting and Content Services Policy Branch was reorganized to create the New Content Services Policy Directorate. The new directorate's objective is to analyze issues and opportunities in the development and delivery of new content services and products in Canada via the broadcasting system. The directorate develops policy initiatives to promote the timely development and diffusion of such services as videotex, teletext and cable non-programming services. It also participates in the research of products related to new media and technology, such as instructional technology.

The scope of the directorate's mandate is broad. For 1983/84, the directorate concentrated primarily, but not exclusively, on the following areas:

- elaboration of policy respecting establishment of a developmental public teletext service to follow the CBC IRIS Trial;
- analysis of the application of new technologies to education and training;
- analysis of policies respecting the maintenance and deposit of machine-readable data of cultural and archival value, and public access to such information; and
- planning, implementation and evaluation of an on-site field trial of office communications systems.

Office Communications Systems (OCS) trial

This trial, conducted under the department's OCS Program, will test a fully integrated office automation system in which at least 70 intelligent workstations, linked in a local area network, will be used by senior departmental executives and personnel at all levels in the department's Policy Sector. Comterm Inc., of Pointe Claire, Quebec, is the supplier to the field trial. The department will contribute, in fiscal year 1984/85, $500,000 in direct expenditures towards the total cost of the project, while Comterm is supplying $1 million worth of integrated hardware and software systems designed for the department.

Researchers from Mount Saint Vincent University in Halifax, Nova Scotia, l'Université de Montréal, Quebec, and Queen's University, Kingston, Ontario, have been allocated more than $200,000 over two years for impact assessment studies related to the trial. They will emphasize research into the human and social aspects of office automation, including effects on organizational behaviour and productivity.

As part of the impact assessment, the Public Archives of Canada will examine the effects of office automation on policies and procedures for the management and archiving of electronically processed information, as well as its implications for the Access to Information and Privacy legislation. In addition, the Department of Public Works will study the physical and environmental factors related to office automation, including furniture and space design, acoustics, heating, lighting and air quality.

In the upcoming fiscal year, in addition to further implementation and assessment of the OCS field trial, the directorate will concentrate on the development of a policy framework respecting new content services such as videotex and teletext, and the development of policy respecting federal support for the application of new technologies in the area of education and training.

FEDERAL PROVINCIAL RELATIONS BRANCH

This branch consults with the provinces on a wide range of activities such as cooperative ventures, information exchanges, and policy and program matters to encourage provincial awareness of and participation in the government's objectives and priorities for communications and culture. The department has also implemented an action plan to promote regional sensitivity with regard to policy development and program delivery.

Communications

During 1983/84, the British Columbia, Quebec, and Atlantic Consultative Committees on Communications considered several telecommunications and broadcasting issues of interest to the provinces and the federal government. These bodies bring provincial representatives together with regional and headquarters officials from the department and from the CRTC to exchange information.

Departmental officials met with all the provinces bilaterally to discuss the Telecommunications Policy Review. The MSAT Working Group, composed of both provincial and departmental representatives, met once during the year. In addition, the Minister met with his Manitoba counterpart, and senior departmental officials met with Ontario representatives to discuss various communications issues.

Culture and historical resources

The branch established a new consultative mechanism for cultural issues involving departmental officials and senior officials from the four Atlantic provinces. This group met twice during the year. Departmental officials also met with the provinces to discuss the implementation of a national Travelling Exhibition Insurance Program and bilateral meetings were held with all provinces and territories with respect to various related cultural issues.

Cooperative ventures

Federal-provincial cooperation in the field of communications and culture encompasses a diverse range of activities, from bilateral programs to unique multi-organizational undertakings such as the Elie-St. Eustache fibre optics field trial in Manitoba. The department, within the context of Economic and Regional Development Agreements, participated in the development and negotiation with the provinces of subsidiary agreements respecting communications and cultural industries.

INTERNATIONAL RELATIONS BRANCH

The International Relations Branch performs three main functions:

- It develops appropriate policy recommendations for international telecommunications and cultural requirements, and implements agreed-upon policies.

- It defines and promotes Canadian interests internationally and ensures that the Canadian communications, information and cultural sectors are able to operate, within Canada and abroad, in an environment that takes into account special Canadian interests and requirements.

- In a manner that safeguards and fosters Canadian objectives and reflects the interaction between the domestic and international areas, the branch establishes telecommunications and cultural relations with other countries and with institutions such as the International Telecommunication Union, the Organization for Economic Cooperation and Development, and the United Nations Educational, Scientific and Cultural Organization.

International Telecommunication Union (ITU)

International telecommunications are coordinated and regulated by this organization, which is a specialized agency of the United Nations. During 1983/84, Canada continued to hold one of the 41 seats on the ITU Administrative Council, which, on behalf of the ITU's 158 members, directs the union's affairs in periods between plenipotentiary conferences. The 38th session of the council was held in Geneva in May 1983. Principal issues considered were future ITU conferences and meetings, technical cooperation activities, and budgetary and personnel matters.

World Communications Year (WCY '83)

By proclamation of the United Nations, 1983 was World Communications Year. The ITU acted as the lead agency for the international community. The year's theme focused on the development of communications infrastructures, a theme that called attention to the importance of communications and emphasized the needs of less developed nations.

A National Steering Committee chaired by the department developed a program of activities to underline WCY '83 in Canada. A number of the provinces also marked the year, as did many institutions in the private sector, including universities, professional organizations, and the business community.

Administrative radio conferences

The ITU has scheduled three World Administrative Radio Conferences (WARCs) to take place during the 1980s. These deal with mobile services, shortwave broadcasting and space services, as highlighted in the following material. The ITU has also scheduled a number of Regional Administrative Radio Conferences (RARCs). One, on the broadcasting satellite service in the Americas was successfully completed in July 1983, and another to be held in 1986 on AM broadcasting in the medium frequency extended band (1605-1705 kHz) are of particular interest to Canada. Two other conferences may have an impact on the use of this frequency band in Canada: both will deal with the use, mainly in Europe, of the medium frequency band by the maritime mobile, maritime radionavigation, and aeronautical radionavigation services.

Mobile services

The 1983 Mobile Services Conference made extensive revisions to the international regulations, particularly those related to distress and safety. It also laid the foundation for a general revision of the mobile regulations at the 1987 Mobile Conference. The International Maritime Organization (IMO) and the International Civil Aviation Organization (ICAO) have begun working on their preparations for the 1987 conference. This conference should lead to the establishment of a fully operational global maritime distress and safety system based upon a revision of IMO-based proposals which were considered at WARC-83. The 1987 conference will also need to revise the use of all the high frequency (HF) spectrum allocated to the maritime mobile service.

Shortwave broadcasting

The first session of the HF Broadcasting WARC was held in January 1984 to plan the high frequency bands used for shortwave radio broadcasting. The session ended successfully after very difficult negotiations that concentrated on the needs of developing and developed countries, and on the political aspects of HF broadcasting.

During the conference, Canada pressed for free and equitable use of the HF broadcasting bands and recommended that planning be based on broadcasting requirements rather than on frequency requests (the method currently in use). Frequency assignments to satisfy requirements would be determined through use of a computer program to be developed by the ITU during the intersessional period 1984/86. These Canadian proposals were well received and are part of the intersessional activities. Canada will now concentrate on the final phase of its preparations for the 1987 session of the conference.

Space services

Canada has spent three years preparing for the first session of the 1985 Space WARC on the use of geostationary-satellite orbit and the planning of space services. The second session will be held in 1988. The decision to hold a conference on space services was made at the 1979 World Administrative Radio Conference. The developing countries strongly supported a conference to "guarantee in practice, for all countries, equitable access to the geostationary satellite orbit and the frequency bands allocated to the space services utilizing it." They fear that the large number of geostationary satellites currently in use, and the existing regulatory regime of "first come, first served" could preclude the future availability of orbit positions to meet their own needs.

Region 2 broadcasting satellite service

A Regional Administrative Radio Conference was held in early summer of 1983 to plan the broadcasting-satellite service in Region 2, the Americas. The conference allocated orbit locations and established a frequency assignment plan for the 12 GHz band that could remain in use beyond the end of the century.

Due to the diversity of opinions of how the band should be shared, Canada held lengthy and detailed negotiations with regional administrations during preparations for the conference. In addition to several meetings with officials of the United States, there were extensive meetings with Latin American countries to ensure that Canadian proposals to the conference were compatible with the interests of the United States and accommodated the needs of the Latin American countries. The final outcome was favourable to Canada, ensuring our ability to effectively utilize broadcasting-satellite systems.

AM broadcasting

A Regional Administrative Radio Conference to plan the broadcasting service in the newly allocated (1979) frequency band of 1605-1705 kHz in Region 2 is scheduled to be held in two sessions in 1986 and 1988. Canadian preparations for this conference began in 1983/84. A first draft of Canada's proposals will be available in 1985 for public comment.

Other regional conferences

Two other regional conferences are of interest to Canada. One, scheduled for March 1985, is on maritime radio beacons in the European maritime area. The outcome of this conference will affect Canada, since much of the world's commerce is handled through the North Atlantic shipping lanes and Canadian ships will need to comply with changes made to European maritime radio beacons. The other conference that will affect Canada is the Conference on Maritime Mobile Service and Aeronautical Radionavigation Service in Region 1 (Geneva, Switzerland) scheduled for 1985. Canada will survey developments in both areas to ensure that operational concerns are protected.

International consultative committees

Much of the work of the ITU is carried out through two consultative committees, the International Telegraph and Telephone Consultative Committee (CCITT) and the International Radio Consultative Committee (CCIR). The CCITT studies technical, operating, and tariff questions relating to telegraphy, telephony, data and telematic services, while the CCIR studies technical and operating questions relating to radio communications. Both committees issue recommendations. The basis of their work is provided by a wide range of studies in which governments, private agencies and the industrial and scientific organizations participate.

In 1983, Microtel Pacific Research of Burnaby, British Columbia, and Motorola Informations Systems of Toronto joined the following other Canadian members of the CCITT: Teleglobe Canada, Telecom Canada, CNCP Telecommunications, Canadian Marconi, Bell-Northern Research and Memotec. Canadian members of the CCIR during 1983 were the Canadian Association of Broadcasters, the CBC, Telecom Canada, Telesat Canada, Bell-Northern Research and Spar Aerospace.

The department continued to hold membership in both organizations internationally and through these memberships other federal government departments and agencies were also able to participate internationally.

CCITT activities

The 1983/84 year was extremely busy for the CCITT because the committee is approaching the end of the study cycle leading up to its plenary session in late 1984. At that time all the work that has been undertaken during the past four years is to be concluded, agreed upon, and documented for publication. Since some of the urgently required recommendations were far from being completed, some study groups and working parties scheduled additional international meetings during the year. To accommodate these special requirements, Canada cooperated with the CCITT to host a joint meeting of the Universal Postal Union and the CCITT to discuss electronic mail service, intelpost, and telematic services.

During the year, Canada completed its preparations for the final meetings of the CCITT. Canadian positions were developed in consultation with various groups within the National Organization for CCITT Activities. Late in the year, Canada participated in some of the final meetings of the CCITT study groups. The remaining study groups will meet during the first quarter of the next year.

Preparatory work for the 1984 Plenary Assembly was begun. A special committee was formed by the National Steering Committee to develop positions and papers on a number of issues: study group structures, working methods, preparations for the World Administrative Telegraph and Telephone Conference, publication policy, technical cooperation, and elections of the director of CCITT, study group chairpersons and vice-chairpersons.

CCIR activities

During the first half of 1983/84, the National Organization for CCIR Activities was busy with preparations for and participation in the CCIR's Block A Interim Meetings, where Canada was primarily interested in spectrum management, space research, propagation, sound and television broadcasting, and time and frequency standards.

The second half of the year was occupied with extensive preparations for Block B Interim Meetings. Canadian interest there was in fixed satellite systems, radio-relay and VHF systems, land mobile (particularly cellular) and maritime mobile systems, and mobile satellite systems, including those used for search-and-rescue (COSPAS/SARSAT, Inmarsat, MSAT). Together with Transport Canada, the department prepared for the Joint Interim Working Party of Group 8 (mobile) and Study Group 10 (FM broadcast) to deal with problems associated with interference caused by FM broadcasting stations to aeronautical radionavigation instrumentation and the possible need for tighter controls on FM broadcasting transmissions in some cases. Several bilateral meetings to develop Canada's proposals were held with other countries as well as within other international organizations, such as the International Civil Aviation Organization (ICAO).

Most of the international study groups were involved in providing input to the CCIR Conference Preparatory Meeting to be held in mid-1984 for the World Administrative Radio Conference for Space (ORB '85). Canadian preparations for this conference have been extensive.

International Telecommunications Satellite Organization (INTELSAT)

This organization held its eighth Assembly of Parties in Washington, D.C., in October 1983. The Canadian government was represented by officials from the department, External Affairs and Teleglobe Canada. Among the issues dealt with was a review of developments concerning the possible establishment of competing international satellite facilities.

International Maritime Satellite Organization (INMARSAT)

The third session for the Assembly of Parties for INMARSAT was held in London, England, in October 1983. Officials from the department, Transport Canada and Teleglobe Canada represented the government. The three main issues discussed were the possible inclusion of a 406 MHz emergency position indicating radio beacon (EPIRB) transponder in INMARSAT's second-generation space segment; a draft international agreement on the use of ship earth stations in harbours and territorial waters; and the possible future provision of aeronautical satellite communications by INMARSAT.

International aspects of informatics

During 1983, work focused on the range of issues raised under the label of "transborder data flow". The Director General of the International Relations Branch gave a keynote address to the Symposium on Transborder Data Flow planned by the Organization for Economic Cooperation and Development (OECD) and hosted by the United Kingdom. The meeting was held in London, England, November 30 to December 2, 1983.

The speech summarized current thinking in Ottawa regarding issues raised by transborder data flow and highlighted the increasing attention likely to be given to the international telecommunications infrastructure, especially in view of growing competition in the provision of services in the international arena.

Attention would also likely focus on trade in computing services, where new concepts must be devised to deal with the ephemeral nature of data and information. The speech also identified a potential cause for concern over the ease with which data-related functions in a corporation could be relocated abroad. It then highlighted the concern of different governments regarding conflicting requirements placed on multinational corporations, a problem likely to be exacerbated by transborder data flow if consultation and other appropriate measures are not taken.

The symposium was planned by the OECD Working Party on Transborder Data Flow, chaired by an official of the Department of Communications. Joint efforts by the working party and the Business and Industry Advisory Committee through OEDC produced an interesting and useful report on industry's use of transborder data flow. The joint work, and the report itself, helped break down some of the reserve between the two groups and improve relations between industry and governments.

The department is increasing its contacts with the Canadian private sector to discuss issues raised by transborder data flow, and to solicit views on directions the government might take internationally and in Canada. Particular effort was placed on clarifying current misunderstandings and misrepresentations of government policies in Canada and the United States. Discussions with U.S. industry have led to recognition that their earlier fears and complaints about Canadian attitudes to transborder data flow were largely unfounded. Progress is being made in focusing more meaningful attention on the issues in the international debate on transborder data flow.

UNESCO

At the 22nd General Conference held in Paris, France, in November 1983, the department participated in the Canadian delegation to deal with UNESCO's communications and cultural programs. The conference approved the program and budget for 1984 and 1985. However, the decisions approved by the General Conference must be reviewed because of the announcement of the United States' subsequent intention to withdraw from UNESCO at the end of 1984.

At the same conference, Canada was re-elected to the 35-member intergovernmental council for the International Program for the Development of Communication (IPDC). The department is part of the Canadian delegation to the council meetings, which approve funding for projects designed to meet the communications needs of developing countries. The fourth council meeting was held in Tashkent, USSR, in September 1983. Canada was also elected to the 20-member Intergovernmental Committee for Promoting the Return of Cultural Property to its Countries of Origin or its Restitution in Case of Illicit Appropriation.

Council of Europe

The department maintains relations with the Council for Cultural Cooperation of the Council of Europe. Consequently, it coordinated Canada's participation in a symposium on "Technological Development and New Challenges of Cultural Policy" held in Strasbourg, France, in November 1983. This symposium was held in preparation for the fourth Conference of European Ministers of Culture to be held in Berlin, Federal Republic of Germany, in May 1984. Canada has been invited as an observer.

Bilateral relations

The United States of America

Canada and the United States share a very complex and sophisticated communications and cultural relationship. Balancing a highly integrated telecommunications system with different domestic objectives and philosophies provides one of the major challenges in managing the myriad and growing issues that fall beneath the broad umbrella of communications. Day-to-day telecommunications matters are aided by numerous long-standing agreements and arrangements. In 1983, the two countries signed a new agreement on FM broadcasting, giving Canada access to more than 100 new FM assignments. On more contentious bilateral communications matters, senior communications officials of both nations meet regularly and informally to discuss policy-related issues. The next bilateral meeting will take place in May 1984.

France

On May 30, 1983, the Minister of Communications and the French Ambassador signed an Agreement on Cinematographic Relations. In addition, during a July 1983 visit to Paris, the Minister and the French Secretary of State responsible for the Technical Aspects of Communication signed an Agreement on Television Relations, and he and the French Minister for Culture signed an agreement concerning the promotion of co-produced cinematographic projects.

In February 1984 the Minister returned to Paris to meet with various members of the French government, including the Minister of Culture and the Minister for Posts, Telecommunications and Broadcasting (PTT). The purpose of this visit was to expand relations between Canada and France in the fields of culture, telecommunications and space, and film and video. The visit resulted in an agreement-in-principle to present France/Canada awards to the creators of film and video productions from both countries; to present a Canadian film and video festival in Paris in 1985; and to sign co-production agreements in the fields of animation and computer imagery.

During the course of the year, the Minister received a number of visitors from France, including parliamentarians, members of the École supérieure des PTT (an advanced school operated by the PTT) and Mr. Jean-Jacques Servan-Schreiber, President of the Centre Mondial (World Centre) in Paris. The Minister and Mr. Servan-Schreiber agreed on a cooperative program between the department and the Centre Mondial.

United Kingdom

In response to an invitation from the Deputy Minister, the Deputy Secretary of the United Kingdom's Department of Trade and Industry visited Canada in September 1983. The visit included discussions with senior officials of the department and the CRTC on broadcasting policies, and visits to major Canadian suppliers of telecommunications equipment, software and aerospace products. In addition, the Director of the BBC's North American Operations met with senior departmental officials in March 1984 to discuss broadcasting policies, cable television and direct-to-home satellite broadcasting.

The Minister of Communications travelled to London in February 1984 to meet with the British Secretary of State for Trade and Industry. The two Ministers agreed in principle on concluding a television co-production agreement as quickly as possible.

Belgium

On February 24, 1984, the Minister of Communications and Belgium's Minister of Economic Affairs met in Brussels, where they signed an agreement between the Government of Canada and the Government of the Kingdom of Belgium regarding assistance to the film industry.

Scandinavia

Canada also entertained a number of visitors from Scandinavia, including the Assistant Deputy Minister (Cultural Sector) of the Norwegian Ministry of Culture and Science; a seventeen-member Swedish Parliamentary delegation (members of the Standing Committee on Communications and Cultural Affairs); a delegation from the Swedish Secretariat for Futures Studies; and a ten-member study group from the Danish Datacentralen. These visitors were briefed on developments and policies of the Canadian broadcasting system, new information technology and office automation.

Italy

In January 1984, the Senior Assistant Deputy Minister of Communications headed a Canadian delegation to Rome, where they attended a meeting of the Canada-Italy Film Joint Commission. The two delegations were agreed on a number of issues; for example, that the application of the 1970 Film Co-production Agreement should be extended to all film and video co-productions.

Australia

A number of Australian telecommunications officials visited the department, including the Chief General Manager of Telecom Australia, the Australian Opposition Communications Critic, the chairmen of the Australian Broadcasting Tribunal and the Australian Broadcasting Corporation, and an official of the Federation of Australian Broadcasters. Subjects discussed included broadcasting policy, cable television, direct-to-home satellite broadcasting, videotex and space.

Throughout 1983/84, a number of senior public servants from the Australian Department of Home Affairs and Environment and the Australian Film Board visited the department to discuss the possibility of concluding a film and video co-production agreement. In addition, in October 1983, an official from the department went to New York to meet with the Australian Minister of the Department of Home Affairs and Environment to further discuss the possible audiovisual co-production agreement.

Algeria

In May 1983 the department sent a planning mission to Algeria to identify telecommunications and broadcasting projects on which the two countries could cooperate, and which would be financed by the Canadian International Development Agency (CIDA) under the Memorandum of Understanding signed by Algeria and Canada in November 1982. The objective of the program is to promote the development of Algeria's technical and scientific work force by sending experts to Algeria, by conducting ad hoc studies, and by providing technical training.

In the telecommunications field, the Algerians selected Bell Canada International to carry out three telecommunications projects: traffic management, planning of the Algiers network, and planning of the national network. In radio broadcasting, the Canadian Broadcasting Corporation is in the process of organizing short- and long-term periods of instruction in Canada as well as producing training aids and arranging seminars which are to be conducted in Algeria on the new technologies. There are also plans to provide special technical assistance to Radio Télévision Algérienne (RTA) with a view to establishing a climate conducive to the implementation of larger projects.

In the cultural field, the Algerians are interested in training in librarianship, archives management and museology. In addition, draft film and television co-production agreements were submitted to Algeria in November 1983.

Israel

In March 1984, the Senior Assistant Deputy Minister of Communications headed a delegation to Israel to negotiate a film and video co-production agreement with the Israeli Government. The resulting agreement will be signed during 1984/85.

Kuwait

The Minister of Communications from Kuwait visited Canada in October 1983. The program included visits to industry in Ottawa, Toronto and Montreal, briefings at the department, and discussions with the Minister.

Senegal

The Vice-president of the National Assembly of Senegal visited Ottawa in December 1983, and was briefed on videotex, broadcasting policy and strategic planning.

People's Republic of China

At the department's invitation, an eight-member delegation from the People's Republic of China, headed by the Vice Minister of Electronics Industry, visited the department and various high-technology, telecommunications and space industries across the country.

Japan

Two Japanese delegations visited during the summer of 1983: a 22-member study group from the International Science Club of Osaka was briefed on information technology and SARSAT; and a delegation from Nippon Telephone and Telegraph discussed industry relations, research, videotex and space programs.

In the late summer of 1983, the Minister and several senior departmental officials visited the Far East (Japan, China, Republic of Korea and Hong Kong). This highly successful visit enabled the Minister to familiarize host countries with Canadian expertise and capabilities in communications high technology. The visit sought to underline that Canada is not solely an exporter of raw materials, but also a manufacturer of world-class communications equipment. The visits supported the efforts of Canadian companies already operating in or attempting to penetrate markets in these countries. At the same time, the Minister explored avenues for increased cultural and scientific relations between Canada and the host countries. To date, the visits have resulted in concrete proposals for cooperation with China and Japan.

Colombia

In February 1984, the department arranged briefings on videotex and a Telidon demonstration for the Foreign Minister from Colombia.

Brazil

The Director General of Abril Video from Brazil visited the department in February 1984, and was briefed on Telidon and Brasilsat, the satellite Canada is producing for Brazil.

Official cultural consultations

Bilateral cultural relations were the subject of a number of official consultations and joint commissions in which the department took part during 1983/84 with Belgium, Japan, Mexico, the People's Republic of China and the United Kingdom. The purpose of these talks was to approve a program of cultural exchanges between Canada and these countries for a two- to three-year period. Other topics, such as increased cooperation in cultural industries, were also discussed.

International study days

Three study days were arranged in summer 1983 for visitors from foreign countries taking part in international seminars. These visitors were participants in the Conference on Communications and International Development organized by the University of Ottawa; in the seminar on "Communications: New Technologies, New Challenges" organized by l'Institut international de la communication; or in the 10th International Teletraffic Congress. During visits to the department and the Communications Research Centre, delegates received briefings on a variety of communications matters.

Science and technology

The department's international activities in this area were coordinated, and a review and inventory of these activities was drafted as a basis for departmental discussion on management of these programs.

The seventh Canada-Federal Republic of Germany Consultative Committee Meeting in Science and Technology took place in Ottawa in May 1983. Communications subjects discussed included optical communications, videotex systems, socio-economic impact, signal coding and spectrum management systems. The German participants visited the Communications Research Centre following the official meetings.

The department also participated in a high-level science and technology meeting in the United Kingdom which established a more structured framework for future Canada/United Kingdom science and technology activities.

TELECOMMUNICATIONS POLICY BRANCH

The telecommunications industry, comprising the telecommunications carriers, cable television and broadcasting represents a total investment of approximately $22 billion and has annual revenues exceeding $10 billion or about 3 per cent of GNP. The industry is on the threshold of significant change in the next decade brought about by such technological developments as satellites, fibre optics and micro-electronics; the advent of the information revolution; and the concurrent move toward the provision of both new and traditional telecommunications services on a competitive rather than a monopoly basis. During this period major new investments are likely to be made in the telecommunications infrastructure and the roles of existing institutions may be changed in ways that will affect the future costs and universal availability of telecommunications services.

The Telecommunications Policy Branch formulates policies, recommendations, regulations and legislation governing and promoting the orderly development and efficient operation of the telecommunication facilities and services required by Canadians for national and international communications, including the present and future use of the radio frequency spectrum.

The objectives of the branch are to develop and propose timely and relevant policies to enhance the provision of efficient telecommunications services and facilities to all Canadians.

Network Development Directorate

This directorate has five main objectives:

- the analysis and evaluation of existing and planned domestic and international telecommunications networks;
- the formulation of policies that will lead to optimum integration and use of these networks, and that respond to policies on institutional relationships among telecommunications carriers, so that a national network of facilities develops;
- the development of the basic regulatory principles that are necessary for implementation of approved network-related policies;
- recommendations on Canada's position within national and international organizations or committees such as the International Telephone and Telegraph Consultative Committee (CCITT) when matters related to network development and standards are discussed; and
- the provision of staff support and recommendations on major network planning and radio licensing decisions for which the Minister of Communications has statutory responsibilities.

Earth station licensing

On May 19, 1983, as outlined in Towards a New Broadcasting Policy for Canada, the government's earth station licensing policy was changed so that satellite services could be made available to more Canadians. These changes allow single individuals to own and operate television receive-only earth stations (TVROs) for their own use, without a licence from the department. Furthermore, establishments such as bars and taverns, which display but do not distribute satellite signals, may also operate earth stations without a radio licence.

Broadcasters and cable TV systems may operate earth stations without a radio licence, provided that the CRTC has approved the distribution of the signals received from Canadian satellites. These changes were put into effect by means of a regulation published in the Canada Gazette of May 25, 1983.

In addition, work was completed on the policy analysis and recommendations for licensing transmit earth stations operating with Telesat Anik satellites.

Telecommunications standards

National and international telecommunications standards are essential to the orderly and effective growth of Canada's telecommunications networks. During the 1983/84 fiscal year, the directorate gave careful consideration to a consultant's report on the department's role in the standardization of telecommunications and information technology.

The department continued to promote study of open systems interconnection (OSI) by hosting a special international conference and workshop that focused on the introduction and implementation of OSI standards. The conference and workshop gave delegates from twelve countries the opportunity to share information about their national policies on the introduction, conformance testing, manufacturers' viewpoints, and the status of OSI implementation procedures in the participating countries.

The directorate also continued its high level of participation in the related work of the Canadian Standards Association, as well as with the technical consultative committees of the International Telecommunication Union and other standards forums.

In the upcoming fiscal year, work will proceed on the regulatory and operational parameters that will apply to installation and operation of transmit earth stations licensed to persons who are not telecommunications carriers. The directorte will also undertake an examination of the impact on intra-city networks of recent advances in satellite, microwave radio and fibre optics technology.

Spectrum and Radio System Policy Directorate

The department's policies relating to spectrum utilization (the particular use to be made of a given frequency band) and radio systems (the generic types and developments in radio equipment to be encouraged in Canada) are formulated as a result of a public consultation process. As a means of forming a convenient permanent record of these policies, the department has developed a Spectrum Policy (SP) series of documents that contain both new policies and updated versions of existing policies.

For example, the SP-300 series of spectrum utilization policies contain band-by-band extracts of the December 1982 documents entitled "Policy for the utilization of the 0.890-10.68 GHz radio spectrum by the fixed service." The SP-300 series also contains other policy documents with different issue dates according to when the policy for that band was issued in final form.

The general public can obtain the series of documents from departmental offices.

VLC point-to-point links

In October 1983, the department published its radio systems policy for licensing of very low capacity (VLC) point-to-point links in the 30-890 MHz band. Under this policy, preference is given to provide and extend services to the greatest number of subscribers as well as to proposed paging or mobile radio systems that use greater technical sophistication to increase the efficiency of frequency use and hence the number of subscribers served. In paging systems, this could lead to a preference for digital, rather than tone-only, and tone-only, rather than tone-and-voice systems, in the assignment of frequencies for VLC links. Similarly, preference is given for public access systems, rather than private systems in which use is restricted to a select group of subscribers.

Shared use of the 2548-2686 MHz band

In March 1984, the department issued the proposed spectrum utilization policy document entitled "The shared use of the 2548-2686 MHz band for broadcasting, radiolocation and fixed systems." The main policy initiative contained in this document was consideration for the use of this band in various areas for direct broadcast to the home (when cable or other alternatives are not practical or economically viable). The proposed use of the band for broadcasting is in response to the equilization thrust of the Broadcast Strategy announced in March 1983. The strategy recommends that all available distribution technologies, including microwave and Canadian satellites, should be used to equalize the availability of broadcasting services throughout the country.

Radio Act review

The directorate assumed the lead responsibility in the department's review of the Radio Act. The purpose of the review is to render the Act more consistent with the realities of the highly dynamic and technically progressive telecommunications environment. Among the considerations that form part of the review are determination of whether the Act must be revised to take into account spectrum requirements created by changes in technology; reexamination of the Minister's discretionary powers to exclude certain radio apparatus from licensing; and determination of the best means of dealing with applications that do not conform to definitions encompassed in the current Act.

During the 1983/84 fiscal year, the directorate also initiated a document on spectrum policy principles. Expected to be released for public comment in autumn of 1984, it will become part of SP GEN, the publication that contains general information related to spectrum utilization and radio systems policies.

The 1983/84 fiscal year has also included the initiation of a spectrum utilization policy to establish future use for each band segment in the 10-30 GHz frequency range; the development of a policy for licensing nation-wide paging systems sharing one or more frequency channels; and revision of the 890-960 MHz spectrum utilization policy to provide for the future introduction of mobile radio and other radio services.

Financial and Regulatory Policy Directorate

Regulatory Affairs Division

The communications industry is a key component of the social and economic infrastructure of Canada. Consequently, the laws and regulations governing telecommunications and broadcasting must take into account cultural, social, economic and technological changes. They must also balance the need for a commercially viable communications industry with the interests of consumers and the public at large.

Based on its analysis of decisions made by independent regulatory bodies, along with assessments of industry concerns and the public interest, the Regulatory Affairs Division of the Financial and Regulatory Policy Directorate provides advice to the Minister of Communications within the context of overall government policy on regulatory matters for which he or she is responsible. Department staff also assist senior officers of the department in their capacities as directors of Teleglobe and Telesat Canada.

The division analyzes rate increase proceedings and special-issue hearings. It also conducts studies pertaining to regulatory developments, whether within provincial jurisdictions, the United States or in countries of Western Europe.

Monitoring of CRTC hearings

In 1983/84, the division monitored CRTC rate proceedings for B.C. Tel and Terra Nova Tel and reviewed the construction programs and overall operational performance of all federally regulated carriers.

Beginning in October 1983, the CRTC commenced a public hearing to consider Telesat Canada's application for approval of rates for its 14-12 GHz series of satellites. Departmental officials reviewed the company's application, interrogatories, responses and other evidence, including monitoring the public hearing. The rates approved came into effect in February 1984, at a level close to Telesat's application. Because of Telesat's unique business, the commission approved future rate escalations of 5.5 per cent for July 1, 1985 and for January 1 of each of the following years, until 1990 inclusive.

On October 21, 1983, the Minister announced that the government would review the recommendations of the CRTC regarding the reorganization of Bell Canada, with the intention of making appropriate legislative amendments. Following completion of the review, draft legislation was prepared and introduced in the House of Commons (Bill C-20) on February 8, 1984.

Regulation and its mechanisms

In May 1982, the federal and provincial Ministers of Communications mandated a task force to explore possible mechanisms for coordinating regulatory activities in telecommunications. The task force, co-chaired by the federal government, completed its work and presented a report to the Ministers in July 1983.

On September 8, 1983, the CRTC announced a review of the General Regulations for telecommunications carriers under its jurisdiction. It also released a discussion paper that examines the regulations and calls for public comment. Departmental officials reviewed the comments filed with the commission. A decision by the CRTC will be given pending the need for a further hearing.

On January 3, 1984, as part of a major review of telecommunications policy, the department invited comments from interested parties. The review follows an earlier statement by the Minister to the House of Commons Standing Committee on Communications and Culture: the Minister pointed out that the provision of communications products and services will have important implications for the structure of the telecommunications industry, and that the public's right to basic telecommunications services at reasonable rates must not be eroded.

During 1983/84, the division began the process of initiating studies as part of the telecommunications policy review. One area of special concern entails the issue of competition in the long-distance service markets and the effects it would have on other services. In cooperation with a number of provinces, the department is sponsoring a consultant study to determine the impact of competition in message toll service.

As part of its responsibilities under the Administered Prices Program, the division monitors all telephone and cable television rate decisions of the CRTC and identifies all increases that exceed the guidelines. In February 1984, the Administered Prices Program was extended for another year. The division will continue to review the CRTC's decisions on rates for telecommunications services to ensure they comply with the objectives of the program.

Industry Structure and Services Directorate

This directorate undertakes policy development and implementation planning related to services; user requirements for these services; and the institutional, corporate and intercorporate structures and relationships of the telecommunications industry.

Cellular mobile radio policy

Following an in-depth departmental analysis of applications for radio licences to provide cellular mobile radiotelephone service, the Minister of Communications announced in December 1983 that CANTEL Cellular Radio Group, Inc., was the successful non-telecommunications applicant to be awarded cellular radio licences for 23 cities across Canada. In March 1984, the Minister announced that the official start-up date for the first of these services would be July 1, 1985.

Telecommunications policy review

In January 1984, the directorate arranged for publication of a Canada Gazette notice that invited interested parties to participate in the department's telecommunications policy review. The department's aim was to promote competition in the provision of services and provide opportunities for product innovation in Canadian industry. Written comments were to be submitted by May 14, 1984.

The directorate held briefings with the provinces, business labour and consumer organizations and associations. In addition, the directorate began coordination of telecommunications policy papers that will set out a range of historical, current and future factors that the review should take into account.

Access of the hearing-impaired to telecommunications services

In February 1983, the Public Interest Advocacy Centre petitioned the Governor in Council to vary the CRTC decision on terminal attachment to provide for the compatibility of all new telephone sets with hearing aids that are equipped with a telecoil. The directorate developed recommendations for the Minister's consideration, which were approved by Cabinet in November 1983. Among the recommendations was the establishment of an ad hoc technical committee to recommend measures to improve the access to telephone service by hearing-impaired persons. An independent study of the coupling of telephones and hearing aids provided a common reference ground to the committee, allowing them to complete the report by March 1984.

Canadian telecommunications overview publication

In September 1983, the directorate issued Canadian telecommunications: An overview of the Canadian telecommunications carriage industry. The document provides background information on the structure of the industry, telecommunications services, and regulatory structure, as well as on several recent policy developments. It provides a description of the Canadian telecommunications carriage industry that is useful for visiting foreign delegations, and has also proved a help to departmental staff, External Affairs staff and journalists.

Terminal Attachment Program and Canadian standards activities

The directorate provides policy advice to the Terminal Attachment Program through its membership in the Terminal Attachment Program Advisory Committee (TAPAC). In fall 1983, TAPAC was designated as the Canadian Standards Association Technical Committee on Network Protection. TAPAC continues to function for an interim period to discharge its administrative responsibilities. Thus the TAPAC and Canadian Standards Association committees operate in parallel, with a common membership, but no duplication of work. Future activities under the Terminal Attachment Program will include standards for digital equipment and a determination of how Canadian Standards Association standards could be used in the certification process.

Legislative development

The directorate contributed to the preparation of Bill C-20, an Act respecting Bell Canada and other matters, which received first reading in the House of Commons in February 1984. Subsequently an amendment was proposed to Part 2 of the Bill, respecting a directive power of the Governor in Council over the CRTC, by incorporating the power to order the CRTC to forebear from regulating competitive telecommunications services.

International activities

For the past 18 months, the directorate has taken part in the informal discussions between Canada and the United States on a multilateral trade agreement in telecommunications terminal equipment first proposed by the United States. In February 1984 these discussions were widened to include Japan, and the European Economic Community (EEC).

The directorate also provided policy advice on international matters, and participated in International Telegraph and Telephone Consultative Committee (CCITT) Study Groups I (Telegraph Operations and Quality of Services) and III (General Tariff Principles).

Future activities

During the 1984/85 fiscal year, the directorate will continue its analytical work relative to the telecommunications policy review and develop appropriate policy papers; continue its ongoing regulatory and administrative responsibilities regarding cellular radio service; review the ad hoc technical committee's recommendations for access of the hearing-impaired to telecommunications services and implement those that the Minister approves; and continue working on policy issues and advice related to terminal attachment and Canadian technical standards in communications.

On an ongoing basis, the directorate will continue its responsibilities with respect to new and enhanced services, legislative development, federal-provincial matters and senior management support. It will continue to provide policy advice on regulatory and inter-governmental matters, and take part in international activities related to telecommunications services and institutional and structural matters.

INFORMATION SERVICES BRANCH

The Government of Canada feels that if all Canadians are to exercise their rights of citizenship and fully take part in the democratic process they must have complete, accurate and timely information about their government. Within the department, the Information Services Branch supports and assists all directorates and regional offices to carry out information activities that promote national and international awareness and understanding of the department's policies, programs and activities.

Public information programs

Information Services plans and implements public information programs on behalf of the department as a whole, and provides support for the communications activities of other directorates in advertising, media relations, publishing, trade publicity, research, writing, editing, and the development of audiovisual, exhibit and training materials. The branch also assists the Department of External Affairs with international information activities and contributes to internal departmental communications through vehicles such as "Communications Express," the employee newsletter.

During 1983/84, the department published 116 news releases, 62 speeches, a total of 70 articles, as well as fact sheets and related materials, and a number of other information tools ranging from brochures and posters to Communications Research Centre technical notes. New audiovisual presentations using videotape and Telidon graphics technologies were prepared for internal use, public exhibition, and national and international marketing programs. Videotapes were loaned to more than 2,000 users over the year, and approximately 2,000 photos and slides were copied at the request of newspapers, magazines and other publications.

The department participated in regional and national exhibitions such as the Canadian National and Pacific National Exhibitions and Exposition provinciale de Quebec, as well as in institutional exhibitions at 16 sites. The department also supported Canadian industry at international conferences and trade shows.

During the year, a correspondence unit was created to respond to all letter writing campaigns directed at the Minister of Communications and the department. In this first year, the unit prepared replies to more than 13,000 letters.

Special initiatives during the year included the implementation of a public information program to raise Canadian awareness of the goals and activities of World Communications Year and participation in Telecom '83 in Geneva, Switzerland. In addition, the branch undertook the planning and management of the installation of state-of-the-art communications equipment in the department's Briefing Centre. A special-project office was also established to plan the department's participation in Expo '86, the Vancouver World's Fair, which has transportation and communication as its themes.

In 1984, the Information Services Institute, an organization of public service information specialists, honored a number of Information Services initiatives. Awards were presented for a feature article entitled "Telidon: the Mass Media Meets the Computer," appearing in Forces magazine; information packages on two policy statements, Towards a New National Broadcasting Strategy and Building for the future: towards a distinctive CBC; and the audiovisual presentation, Communications is..., which also won the bronze award in the Corporate Image category at the 26th Annual International Film and Television Festival in New York. In addition, the Canadian Public Relations Society, as part of its annual Awards Program, presented a citation to the branch for the Canada in space poster, which was judged in a national competition.

Publications

During the year, the department produced 169 publications, at a cost of $750,000. This figure includes technical notes, newsletters, behavioural and scientific research reports, and policy proposals such as Building for the future: towards a distinctive CBC. Among the department's most significant publications were Direct-to-home satellite broadcasting for Canada, which presents the results of detailed planning studies on a possible direct broadcasting service for Canada; Suppliers of equipment and services to the cable television industry in Canada, a profile and analysis of Canadian suppliers; The telecommunications equipment demand of the Canadian telecommunications carriers, 1981-1984, which compares the manufacturers' of the domestic market with users' planned expenditures; and The supply of and demand for computer/ communications equipment. New materials on the Special Program of Cultural Initiatives include a general descriptive brochure, a guide for organizations seeking funding, and a colour poster. Other new posters are Canada's cultural industries are big business, Canada in space (an illustration of Canada's satellites), and 1534-1984 -- The frontiers of discovery, prepared as part of the 450th anniversary celebrations marking Jacques Cartier's discovery of Canada.

Exhibits and audiovisual services

The branch gave high priority to the development of new audiovisual documents and exhibit materials to support the information activities of the department's regional and district offices at seminars, conferences and public exhibits. These new materials reflect the integration of the Cultural Affairs Sector with the department and the creation of the Technology and Industry Sector.

New presentations include MSAT, a sixteen-minute tape describing the benefits of mobile communications satellites; Communications is..., a fifteen-minute item describing the department and its programs, particularly the link between communications technologies and cultural industries; Sarsat, a short production on the international cooperation program that uses satellite technology to detect downed or missing aircraft and ships; and Beyond Words, a fifty-minute international marketing tool consisting of modules on various areas of Canadian expertise in high technology.

In conjunction with other branches of the department, the branch also provided planning, technical and public relations support to Canadian companies taking part in a number of important international trade fairs, exhibitions and conferences, including Videotex '83 in New York, Communicaciones '83 in Miami and planning for Videotex '84 in Chicago.

LEGAL SERVICES BRANCH

The Legal Services Branch, which has six lawyers on staff, provides a range of services to the department, the National Museums Corporation, Public Archives and the National Library. Its major role is to provide legal opinions and draft agreements, contracts, conventions, regulations and other regulatory instruments. It also advises the department on a broad range of issues, including legislation, litigation and cases before the courts, and the development of guidelines.

Its lawyers are seconded from the Department of Justice to the Department of Communications.

In 1983/84, the major issues handled by the branch were as follows:

> Bill C-20, concerning the reorganization of Bell Canada and certain amendments to broadcasting and telecommunications legislation; the bill was tabled in the House of Commons on February 8, 1984.

- Orders in Council under section 64 of the National Transportation Act regarding implementation of the 6 per cent and 5 per cent program;
- Regulations and other regulatory instruments relating to the Radio Act and the Broadcasting Act;
- The Canadian Broadcast Development Fund;
- International film and video co-production agreements;
- The satellite dish policy;
- Review of the Radio Act and the telecommunications policy;
- Cellular mobile radio;
- Economic Regional Development Agreements (ERDA);
- Revisions to the Copyright Act; and
- Programs in support of the high technology industry.

REGIONAL OPERATIONS

Pacific

The region's Program Development and Policy Analysis (PAPD) unit was extremely busy during 1983/84, carrying out activities on behalf of the Policy, Research, Technology and Industry, and Cultural Affairs sectors, as well as activities in support of Information Services and Emergency Planning.

A major project of the unit was the coordination of a large-scale World Communications Year stationary and mobile display. The group also undertook a wide range of cultural and economic development initiatives in relation to Expo '86. Other activities included support for a New Employment Expansion and Development (NEED) project, which generated a computer-based emergency inventory listing; an environmental assessment of the British Columbia communications industry; a videotex workshop for artists; development of information materials; and summer student projects for native communities.

The region participates in the Pacific Council of Senior Federal Officials. This participation has fostered a coordinated and rational approach by federal agencies towards addressing regional issues and problems that have an impact on the department. Additionally, the region has maintained active involvement with the Federal Economic Development Coordinator for the Pacific Region, with resulting specific activities undertaken to enhance the establishment and growth of industries associated with the communications sector of British Columbia and the Yukon Territory.

Central

The region took major steps to implement an integrated radio communications system throughout the Northwest Territories. All levels of government, together with NorthwesTel, took part in the program.

Of particular interest in the area of intergovernmental affairs were the region's initiatives regarding two sub-agreements: one in Manitoba, on the development of communications and cultural enterprises; and one in Saskatchewan, on development of technology strategy.

Ontario

Throughout the region, there were meetings with users, clubs, broadcasters, colleges, politicians and Federal Communications Commission (FCC) officials to develop a greater awareness of the department's role, policies, and regulations.

The region also completed an information brochure for maritime mobile licence applicants, and a licensing package for those applying for aeronautical licences.

Quebec

The region has been involved in two programs designed to meet the special broadcasting and programming needs of native people. The first, in support of native broadcasting, was continued from previous years. The Attikamek-Montagnais community received financial support to consolidate its broadcasting operations and to continue training personnel. The second program involved testing and implementing a computer program evaluation analysis that would be used to identify broadcasting requirements and measure the extent to which needs are being met.

Atlantic

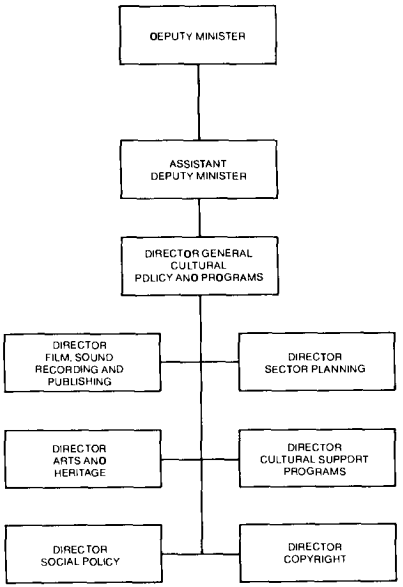
Federal-provincial relations were a continuing priority. During the year, the region held four meetings of the Atlantic Consultative Committee on Communications in Halifax, Brudenell, Ottawa and Fredericton. These meetings were chaired by Mr. Fred Waller, who represented the Council of Maritime Premiers.

The Regional Director represented the department at the bi-monthly meetings of the New Brunswick Federal Economic Development Coordinator (FEDC). It was not established during 1983/84 whether the department would participate in the formal committees of the other three Atlantic Provinces. (The region already represents the department as a regular member of the Communications Committee set up by the Communications Coordinator of the FEDC's New Brunswick office, and was invited to serve on a similar committee in Prince Edward Island.)

Economic Regional Development Agreement (ERDA)

In the fall of 1983, the region began consultations with provincial officials responsible for matters dealing with communications and culture in each of the four Atlantic Provinces, following which a list and description of possible initiatives was prepared in collaboration with the Director General of Federal Provincial Relations. To increase interest in ERDAs, the region sent a comprehensive information package to each Federal Economic Development Coordinator in the four Atlantic Provinces. As of March 1984, while no ERDAs had been signed in Atlantic Canada, optimistic discussions were underway with the provinces.

CULTURAL AFFAIRS SECTOR



Cultural Affairs Sector

3

In very large part, a nation's identity is both reflected in and results from the way its people are depicted in its literature, art, music, films, and radio and television programming. Moreover, in technologically sophisticated society like Canada, this artistic culture is closely linked with the communications technologies that deliver these forms of information and cultural products.

In recognition of this important relationship, in 1980 the federal government transferred responsibility for its arts and culture programs from the Secretary of State to the Department of Communications. The move has facilitated the taking into account of cultural implications during the formulation of communications policies and programs; at the same time, it has also assisted planners of cultural policies and programs to keep in mind the full range of opportunities offered by the new communications technologies.

The mandate of the Arts and Culture Sector encompassed the development of policies that would foster new opportunities for the expression of Canadian creativity and talent, and that would enhance national, as well as individual, identity by encouraging Canada's artists in every field to create, produce, disseminate and conserve cultural products ranging from literature through music and dance to the visual arts.

In 1983, the sector undertook a review of its organizational structure and concluded that it could better meet its objectives by reorganizing to serve two areas of responsibility: one to develop the policies related to social, arts and heritage, sound recording, and film and publishing issues; and one to administer and manage cultural support programs such as the Special Program of Cultural Initiatives, the Movable Cultural Property Program, and the Capital Cost Allowance Program. Under the new format, the Arts and Culture Sector was renamed Cultural Affairs.

CULTURAL POLICY AND PROGRAMS BRANCH

Arts and Heritage Directorate

This directorate develops the policy framework for achieving federal cultural objectives in the fields of arts and heritage. It ensures that policy proposals address specific arts and heritage issues and promote increased access by and for Canadians to their past and current arts and culture heritage The directorate's work includes undertaking research projects that assist in policy development and decision making.

Arts

During 1983/84, the government increased the budget of the Canada Council by $3 million and, under the program of sustaining grants to national cultural organizations, continued its support for the Canadian Conference of the Arts with a grant of $555,000, and for the Canadian Crafts Council with a grant of $140,000.

Among the particular issues examined during the year were the taxation of artists; the proposal to establish a program to compensate authors for the free use of their works through public libraries; increased access to federal training and employment programs by artists and arts organizations; and the implications of proposed amendments to the laws governing the control and accountability of Crown corporations for the cultural agencies.

Heritage

The department convened an Interdepartmental Heritage Committee to consider the development of heritage policy. Chaired by the Assistant Deputy Minister, Cultural Affairs, the committee includes the heads of federal cultural agencies with heritage responsibilities.

With a view to drafting new legislation to replace the outdated Public Archives Act of 1912, the directorate undertook extensive consultations with other interested departments.

The budget of the Social Sciences and Humanities Research Council of Canada was increased by $2 million. The government approved an insurance program for major travelling exhibitions evaluated at $1 million or more.

Research

The directorate also carried out three research studies. The first, entitled Social, Cultural and Economic Impact Study of Orchestras, examines the socio-economic characteristics of orchestra supporters (subscribers or concert-goers); determines how musicians become involved in their communities, and evaluates the socio-economic impact of Canadian symphony orchestras. The study was funded by the Department of Communications, the Government of Ontario and the private-sector Council for Business and the Arts. It will be available to the public through the Association of Canadian Orchestras.

The second study, L'Art comme véhicule des valeurs sociales : la programmation télévisée, examines the social and cultural values of the Acadians through their television program viewing preferences. Respondents were asked to name the programs they most frequently viewed and to justify their motives for choosing these programs. Funded through the Centres of Excellence Program, this study is also completed but will not be published.

The directorate initiated a third study, Review of Current Federal Heritage Activity, to compile data on personnel, legislation, grants, use of collections, touring, conservation, and the new technology's role in education and applied research. The study, which will assist with heritage policy development, has now been completed.

Policy plans for the 1984/85 fiscal year reflect the department's sector-by-sector approach to review and further develop cultural policy: the directorate is developing a statement on federal heritage policy. Specific heritage-related plans include more work towards the National Library's establishment of a national bibliographic and information network, and the authority to draft new legislation for the Public Archives of Canada.

In the field of the arts, plans include a general review of federal policies and programs related to the arts sector; completion of a close examination of the mandate and effectiveness of the Canada Council; and continued participation in the discussion of taxation, training and employment, immigration, and international development of artists and arts organizations.

Film, Sound Recording and Publishing Directorate

Film policy

In the course of fulfilling its mandate to formulate, develop and coordinate film and video policies determined by the government, the Film Policy Section of the Film, Sound Recording and Publishing Directorate analyzes, coordinates and advises the Minister of Communications on all proposals and submissions of the National Film Board and Telefilm Canada, and advises on all policy and administrative matters affecting these agencies.

During 1983/84 the Film and Policy Section worked extensively on the Film and Video Policy which was announced soon after the end of the 1983/84 fiscal year (May 1984). The policy represented the first comprehensive response of the Government of Canada to the challenges and opportunities faced by the film and video sector. The new policy emphasized a carefully coordinated series of initiatives designed to build up the strength of Canada's private and public film and video industries. This policy should ensure that Canadian productions are strong additions to the various film and video products available to Canadian consumers.

The policy has a two-pronged approach: one directed towards the public sector, to ensure that the sector (particularly the National Film Board) develops a more focused and effective cultural role; the other directed towards the private sector, to ensure economic development of a strong private domestic film and video industry.

Under the new policy, the National Film Board's mandate was revised to ensure its role as the government's principal cultural agency in the Canadian film and video sector. This new mandate will allow it to have a more effective role as a world-class centre of excellence in film and video production, and as a national training centre for advanced research, development, and training in the art and technology of film and video.

With the National Film and Video Policy, the Canadian Film Development Corporation (CFDC) changed its name to Telefilm Canada and became the principal government agency to support the development of the Canadian film and video industry. Additional resources were allocated for programs administrated by Telefilm Canada to provide script and project development, interim financing, domestic test marketing, domestic promotion and advertising, and foreign market promotion support to the Canadian industry. Responsibility for the Film Festivals Bureau was also transferred from the department to Telefilm Canada.

During the 1984/85 fiscal year, the Film Policy Section will concentrate on implementing the National Film and Video Policy, and will continue important policy development work required to ensure that the Canadian film and video industry can adequately respond to the changing communications environment.

Sound recording

The Canadian sound recording industry is facing similar challenges to those affecting the development of Canada's film and video sector. New technologies and shifting consumer trends are affecting Canadians' access to music. Compact discs and music videos represent two new formats that will have a profound effect on the Canadian recording industry in the decade ahead.

The department has undertaken extensive policy development work to examine the major issues affecting the future development of Canadian recorded music, with a view to assessing the government's role in ensuring that the Canadian recording industry is favourably positioned to respond to new opportunities arising from the expanded markets in the home entertainment media for recorded music and music video productions.

In April 1984, in recognition of the rapidly developing music video phenomenom, the Canadian Radio-television and Telecommunications Commission (CRTC) awarded a licence to establish a Canadian specialty music video channel in the Canadian home entertainment environment. The licence required 10 per cent of the channel's music video programming to contain Canadian content in the first two years, increasing to 30 per cent within five years.

In March 1984, the CRTC released the Public Notice on Canadian content definitions. In this notice, television programs consisting predominatly of music videos will be recognized as Canadian programming only if a minimum of 30 per cent of the music videos are Canadian.

These initiatives will require the Canadian record production sector to develop and market an adequate supply of high-quality Canadian music video productions and sound recordings.

In recognition of the major role music plays in the cultural and social experience of Canadians, and in response to the opportunities for economic growth in this sector, the department has established a clear policy mandate in the directorate for Canada's sound recording industry. The Sound Recording Policy Section is responsible for developing new policies and coordinating existing government policies and programs to support Canadian recorded music.

During 1983/84, the department chaired a task force comprised of government officials and representatives from both the radio broadcasting and sound recording sectors to review major issues affecting those industries. The resulting input will play an important part in the formulation of government policies.

Book publishing policy

In view of the March 31, 1985 expiry of the current Book Publishing Development Program, the government initiated a review of federal support to book publishing in 1983/84. The Minister of Communications was asked to prepare a comprehensive book publishing strategy covering all federal initiatives. The objectives of the current policy are:

- to ensure a viable Canadian-owned publishing industry;
- to provide Canadian readers and those in other countries with maximum accessibility to books by Canadian authors; and
- to foster a Canadian-based publishing industry to serve the needs of the Canadian market.

The policy review is expected to be completed during 1984/85 with the announcement of a federal publishing support strategy. The work plan includes:

- consultations with industry members and analysis of briefs and reports on the role of the federal government in support of publishing;
- evaluation of the book publishing development program; and
- an internal review of other federal support programs.

Since focusing exclusively on book publishers does not ensure maximum accessibility to books by Canadian authors, the department has also assumed the broader mandate of developing a strategy for the book trade as a whole. If Canadian books are to achieve their market potential, the government must also address distribution and the availability of Canadian titles through various channels. Consequently, the department has commissioned four studies to examine distribution issues: one on retail bookstores; one on Canadian collections in private libraries; one on direct mail marketing; and one on the development of options for action in key sectors of Canadian book distribution. Initiatives resulting from these studies, which will be completed in 1984/85, will complement the government's publishing support strategy. These reports, when completed, will be available for public distribution.

Newspapers and periodicals

During the 1983/84 fiscal year, the department contributed $53 million to the Canada Post Corporation (CPC) to underwrite the preferential postal rates program for libraries and publishers of newspapers, periodicals and books.

In view of the expiration of the federal government's 4 per cent pricing guidelines, the department and the CPC initiated negotiations to establish new procedures and mechanisms for purchasing discounts for the revised rates that the CPC would propose.

In July of 1983, the Minister announced that DOC would no longer purchase postal rate discounts for non-Canadian publications. He also announced that the federal government was asking the CPC to phase in commercial rates for these categories, which are now closed to new applicants.

As part of the work involved in preparing national policies for Cabinet consideration in support of this sector, the department commissioned the firm of Woods Gordon to study the Canadian periodicals industry. The study's findings, which are available to the public, will be useful in the inter-departmental and industry consultations that will take place as part of the policy development process.

Other work related to the periodicals policy involved an analysis of historical data generated from Statistics Canada's Census of Manufacturers for those firms that were surveyed and that reported revenues from the sale of periodicals from 1971 to 1982. The Periodicals Section also carried out, for internal use only, in cooperation with the International Relations Branch, a comparison of selected foreign countries' policies and support for periodical publishers. Another joint project, this time with Statistics Canada, was launched to develop a questionnaire for a periodical publishers' survey expected to begin in 1985.

Copyright Directorate

In recent years the Copyright Directorate, which develops and formulates departmental copyright policy, has been involved with proposals to revise current copyright legislation to reinforce Canadian cultural development and identity by providing greater protection to creators, and to the cultural and entertainment industries. These industries, which rely on copyright protection, contribute 2.2 per cent to the Gross Domestic Product — an estimated $8 billion.

The existing Copyright Act came into force in 1924. Although amended several times, it has never been revised to reflect contemporary cultural conditions, technological development or social change. During 1983/84, the department worked closely with Consumer and Corporate Affairs Canada (which administers the Copyright Act) to secure Cabinet approval for legislative revision. The Speech from the Throne, in December 1983, announced the government's intention to proceed with revisions. By the fiscal year-end, the two departments had completed a White Paper, From Gutenberg to Telidon, for release in May 1984.

In the upcoming fiscal year the directorate's activities will centre on having in place a revised copyright law that will be both responsive to the communications age, and act as a policy mechanism.

Social Policy Directorate

The Social Policy Directorate is charged with responsibility for defining priorities and formulating policy positions relating to the social impact of communications and information technologies on the Canadian public, and particularly, regular assessment of the implications of new technologies for the arts communities.

Since its formation in November of 1983, the directorate has been active in a number of areas. It was heavily involved in the work related to the government's decision to provide supplementary funding for the Social Sciences and Humanities Research Council, and chaired, in preparation for an international conference on the status of women, an Interdepartmental Subcommittee on Images of Women in Media. The directorate also served as the departmental and cultural agency contact for the International Year of the Child, handled the follow-up activity to the International Youth Year, and participated in the Interdepartmental Committee on Human Rights.

During the 1984/85 fiscal year the directorate will focus on the broad social impact of technological change in such areas as employment, the family, the individual, and institutional structures. As part of the policy development process, the directorate will represent the Department of Communications on the International Review Committee of the Labour Canada Research Fund for Human and Social Impact of Technological Change in the Workplace; coordinate the department's response to Equality Now, the report of the House of Commons Special Committee on Visible Minorities in Canadian Society; participate in the Executive Committee of the Culture Statistics Program that has been jointly undertaken by the Department of Communications and Statistics Canada; and develop policy recommendations relating to the social dimension of the department's comprehensive telecommunications policy review.

Sector Planning Directorate

Coordination and implementation of the sector's specific plans is the responsibility of the new Sector Planning Directorate, which handles such tasks as the preparation and review of Strategic Overviews, cabinet documents, Multi-year Operational Plans and other internal work plans. It also coordinates the sector's implementation of audits and program evaluation studies, and provides advice on policy and planning matters within the cultural portfolio. During 1983/84, these responsibilities included analyzing and advising the sector on the government's social policy priorities and preparing an environmental assessment for the cultural sector; advising on and preparing a number of special projects such as federal-provincial financial contributions to cultural activities, and representing the sector on committees for special projects such as Expo '86 and Obstacles, the federal response to the Special Parliamentary Committee on the Disabled.

In addition to cyclical planning exercises such as preparation of operational plans, Sector Planning activities for the 1984/85 fiscal year will include implementation of the audit and evaluation studies, and departmental representation on inter-departmental committees such as the Communications Working Group for the 1988 Calgary Winter Olympic Games.

Cultural Support Programs Directorate

Special Program of Cultural Initiatives (SPCI)

Created following Cabinet's 1980 decision to authorize $13.2 million annually from lottery revenues to assist activities related to the arts in Canada, this three-year program was renewed in 1983 for an additional two years. Not only has the program provided funds for a large number of cultural activities of national importance, it has also assisted many cultural organizations with deficit reduction, improvement of corporate management, and construction, renovation or improvement of facilities.

During 1983/84, 160 grants totalling more than $8 million were awarded under the program.

- Fifty-seven organizations received $3.5 million in assistance for special celebrations and artistic or cultural events in which Canadians from many regions took part, including the World University Games in Edmonton, the Equity Showcase Theatre in Toronto, and the Concours de musique du Canada in Montreal.

- Twenty-eight cultural institutions were awarded a total of $4.2 million for capital projects such as construction, renovation, or improvement of professional performance halls or buildings housing museological or visual arts collections.

- Fourteen performing arts organizations received grants totalling $172,259 for improving corporate management.

- Four organizations used a total of $220,000 in awards for innovative arts and technology projects.

- Thirteen organizations received contributions totalling $213,619 to assist in purchasing computerized equipment.

Book Publishing Development Program

Through this program, which encourages Canadian publishers to increase their share of Canadian and foreign markets, $8.2 million of assistance was made available to Canadian book publishers during 1983/84. By strengthening the economic base of the industry, the government is determined to make Canadian publishers -- who produce the majority of Canadian-authored books -- the dominant force in our domestic market.

Financial assistance was distributed as follows: $2.1 million in incentives for publication of Canadian text books; $4.3 million in incentives for books intended for general readership (trade books); and $1.8 million for company projects and other initiatives, such as training and management development activities to benefit the industry as a whole.

Major projects that received assistance under the program included a feasibility study for an on-line ordering system for the Canadian book trades, and the continued development of a comprehensive list of French-language titles available in Canada.

In addition, an evaluation of the Book Publishing Development Program was completed.

Canadian Film and Videotape Certification Office

This office determines whether Canadian film and videotape productions are eligible for the 100 per cent Capital Cost Allowance, a program that is universally available to all Canadian producers and has played a pivotal role with the entire industry for successful financing of films and videotapes.

The Capital Cost Allowance continued as an important federal policy instrument in the production field. Producers' initial concerns that their involvement with the new Canadian Broadcast Program Development Fund might render them ineligible for the Capital Cost Allowance were alleviated by the Minister's October 1983 announcement on Revenue Guarantees. The signing of an agreement for broadcasting of a film or videotape with a private broadcaster or with the CBC, as required under the new Canadian Broadcast Program Development Fund, will not necessarily render the production ineligible for the full capital cost deduction. The Minister also announced that the necessary down payment had been reduced from 20 per cent to 5 per cent, increasing the Capital Cost Allowance's appeal to investors.

The Certification Office assisted L'institut québécois du cinéma to establish its own provincial capital cost allowance program. It also played an active role in the CRTC's review of its Canadian content definition for production programming. Workshops were held in April and December with representatives from both offices in attendance, along with members of the film and video production industry. Considerable progress was made in moving towards a common definition of a "Canadian" production. The CRTC largely adopted the Certification Office's criteria, although particular areas of difference were identified in relation to the priorities of each office.

A statistical analysis of certified Canadian production during the period between 1974 and 1983 neared completion. This study, which will provide comprehensive figures on trends in Canadian film production, utilized the computer data base developed by the Certification Office.

Certification criteria are intended to promote Canadian participation in and control of all aspects of production. In 1983, the office certified 32 features with a production value of $21.3 million, and 219 shorts with a production value of $16.0 million.

The 1983/84 fiscal year saw the continuing trend of greater participation in key creative personnel positions: Canadians held an average 93.6 per cent of these positions in feature productions in 1983 (an increase over 1982 of 5.7 per cent).

Canadians in Key Creative Positions

Key Creative Position	Total	Canadians	Percentage
Director	30	29	96.7
Screenwriter	32	29	90.6
Music Composer	18	17	94.4
Art Director	16	16	100.0
Picture Editor	30	30	100.0
Director of Photography	25	25	100.0
Highest Paid Actor/Actress	20	15	75.0
Second Highest Paid Actor/ Actress	18	16	88.9

Looking towards the 1984/85 fiscal year, the Certification Office will continue its re-assessment of the Capital Cost Allowance Program, along with analysis of other existing and potential tax incentive programs. The office will also continue its consultations with the CRTC to move to a uniform definition of a "Canadian" production.

Film Festivals Bureau

During 1983/84, the bureau was instrumental in encouraging the submission of over 2,332 Canadian films to 190 festivals (a mean increase of 20 per cent over 1982/83). Of these entries, 1,783 films were selected for screening, and 302 won awards.

The bureau, in cooperation with other government departments and agencies, organized 13 special "prestige" events abroad involving 232 Canadian feature films and 66 shorts. To promote Canadian films more actively, the bureau established an information stand at the Berlin International Film Festival and published, for worldwide distribution, a Directory of the Canadian Film Industry. In addition, the bureau administered a grant program totalling $350,000, which was shared in 1983/84 by 14 Canadian festivals.

Movable Cultural Property

This program is responsible for the administration of the Cultural Property Export and Import Act, which was created to preserve in Canada the best examples of Canadian heritage in movable cultural property. The legislation covers items such as decorative and fine art objects, historical artifacts, books and archival material, and mineral and fossil specimens. The Act is administered jointly by the Minister of Communications and the Canadian Cultural Property Export Review Board. The department's Movable Cultural Property Secretariat carries out Ministerial duties and provides administrative and advisory services for the Review Board.

The program complements other government programs dedicated to the preservation of cultural property and its display in institutions. Expert advice is provided to the program by curators in these institutions. Import and export controls are implemented with the assistance of Revenue Canada (Customs), which is responsible for exercising similar controls over other types of objects. The Royal Canadian Mounted Police (including INTERPOL Branch) is also involved in enforcement. Liaison with Revenue Canada (Taxation) is required in relation to tax incentives. Because of the international scope of the program, there is contact with External Affairs and UNESCO.

The secretariat processed 151 applications for cultural property export permits during 1983/84. A total of four objects were retained in Canada as a result of the export control system. Two cultural property general permits were granted. The value limits of the Cultural Property Control List were revised, but the changes had not been approved by the Governor in Council before the fiscal year-end.

To apply for cultural property tax certificates or grants and loans, institutions and public authorities must be "designated" according to particular categories, satisfying the Minister that they meet certain criteria, such as public ownership and curatorial professionalism. During 1983/84, a total of 36 institutions were granted designation under the two administrative categories.

The secretariat received 27 applications for cultural property grants and one application for a loan. A total of 22 grant applications were approved and paid, with a total expenditure of $1,507,586.23. One loan was approved in the amount of $4,902.55.

One illegally imported collection of pre-Columbian ceramics was returned to its country of origin, and two requests for restitution were still pending at fiscal year-end.

The secretariat prepared several informative brochures and documents, available to the public upon request.

REGIONAL OPERATIONS

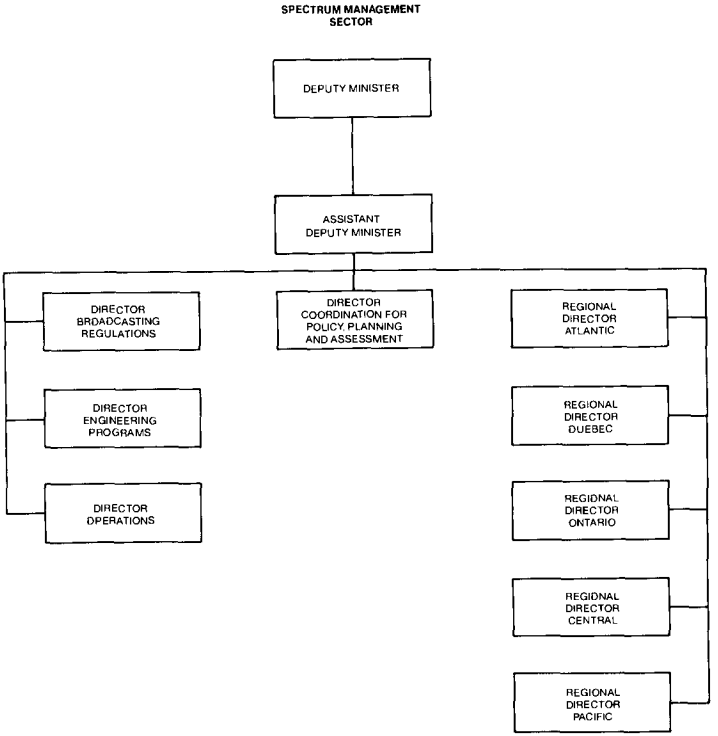
Each regional office assists, as applicable, in the Cultural Affairs Sector's ongoing programs. Moreover, departmental staff periodically visit the regions. During 1983/84, the Assistant Deputy Minister for Cultural Affairs visited all the regions and held extensive consultative meetings with his provincial counterparts and members of the cultural communities. These visits have triggered, as was the case in the Altantic Region, further activity with the cultural communities.

Atlantic Cultural Exchange '84

There has been a real awakening in the Atlantic Region to the department's cultural activities. The two main factors contributing to this phenomenom were the regional tour of the Assistant Deputy Minister of Cultural Affairs, and Cultural Exchange '84.

Assistant Deputy Minister David Silcox toured the region in April. During his visits to the four provincial capitals, he met with provincial officials responsible for cultural activities, as well as with representatives of at least 25 cultural institutions or organizations.

Atlantic Cultural Exchange '84, organized by the regional office, was attended by approximately 50 major cultural councils or federations from the four Atlantic Provinces, as well as by provincial officials from Nova Scotia and New Brunswick. The department was represented by officials from the Cultural Affairs Sector, Federal Provincial Relations Branch, and Broadcasting and Content Services Policy Branch. There were also representatives from the Canada Council and Telefilm Canada. The exchange provided an opportunity to increase the Atlantic cultural organizations' awareness of departmental and agency programs, while simultaneously enabling them to draw the attention of representatives from the federal organizations to their needs and aspirations.


SPECTRUM MANAGEMENT SECTOR
DEPUTY MINISTER
ASSISTANT DEPUTY MINISTER
DIRECTOR BROADCASTING REGULATIONS
DIRECTOR ENGINEERING PROGRAMS
DIRECTOR OPERATIONS
DIRECTOR COORDINATION FOR POLICY PLANNING AND ASSESSMENT
REGIONAL DIRECTOR ATLANTIC
REGIONAL DIRECTOR QUEBEC
REGIONAL DIRECTOR ONTARIO
REGIONAL DIRECTOR CENTRAL
REGIONAL DIRECTOR PACIFIC

Spectrum Management Sector

4

The recent department-wide reorganization has affected the structure of the Spectrum Management Sector in only one aspect: the Government Telecommunications Agency has been moved to the Technology and Industry Sector.

The sector consists of the Engineering Programs Branch, the Operations Branch, the Broadcast Regulations Branch and the five regional operational centres.

All radio systems, including broadcasting, radar, satellite, and mobile radio, depend on a limited but renewable resource -- the radio spectrum. Spectrum management is the planning and application of technical rules and regulations to ensure that radio systems are operated efficiently and assures that an adequate grade of service is available to users by protecting them from interference.

Under the Radio Act, spectrum management is the responsibility of the Department of Communications. Specific spectrum management activities include:

- licensing and controlling the use of all radio stations including mobile radio systems, amateur stations, General Radio Service (GRS) or (CB - the American equivalent) radio stations and microwave stations;
- developing standards for radio equipment;
- testing and approving radio apparatus for use in Canada;
- establishing operating procedures;
- conducting examinations for radio operator certificates;
- issuing technical and operating certificates for broadcasting stations.

Licensing and control are key functions in spectrum management. Most radio transmitters in Canada must be licensed, and certain categories of radio operators must be certified. This ensures that radio transmitters are operated properly, on assigned frequencies, according to established technical standards and procedures. The department uses advanced computer systems to manage the spectrum, and employs inspectors throughout Canada to issue licences and make sure that the conditions required by the licences are adhered to. The regionalized delivery of the Spectrum Management System program allows the department to assess local and regional factors in licensing communications systems, an important capacity given Canada's reliance on communications, particularly in the less populated areas.

ENGINEERING PROGRAMS BRANCH

This branch's objectives are embodied in eight functions:

- It develops such spectrum management tools as frequency plans and allocations, and technical policies, procedures, practices and standards for all non-broadcasting services. It also carries out a radio equipment type approval program for licensed and non-licensed services.

- It plans, develops and implements computer and microcomputer-based systems for the effective utilization and efficient management of the radio spectrum.

- It continually evaluates coordination procedures and operational and technical systems in order to recommend modifications as needed.

- It conducts international planning to ensure that Canada's spectrum requirements are best met by participating in international fora (e.g., CCIR and ITU) and helps conclude bilateral and multilateral frequency sharing and methodology agreements with other countries and thus enhances the export opportunities for the Canadian electronic industry.

- In conjunction with federally regulated telecommunications carriers, affected provinces, and equipment supply industries, it develops technical standards that will facilitate interconnection between the carriers' facilities and customer-owned telephone or other terminal equipment, and also certifies such equipment.

- In view of rapid expansion in the use of electronic communications devices, the branch seeks to minimize interferences by developing practical techniques for predicting, preventing or ameliorating electromagnetic interference.

- It maintains and operates a technical laboratory in support of the Department of Communications' headquarters and five regions. The laboratory develops equipment test methods, calibrates and overhauls equipment used for testing, and carries out equipment type-approval testing and interconnection tests.

- It provides product and specialist support to the department's Technology and Industry Sector, and transfers spectrum management technology to the Canadian electronics and telecommunications industry, thereby assisting them to strengthen their competitive position in international markets.

The different types of communications systems that make use of the radio spectrum are categorized by Radio Services. The most common are the mobile, fixed and space services.

Mobile service

The mobile service consists of all radiocommunications services between mobile and land stations or between mobile stations such as radios located in automobiles, ships or aircraft.

The establishment of a framework for the licensing of cellular radio systems was a major activity during 1983/84. The branch carried out technical evaluation of applications for cellular licences and provided technical assessment of the capabilities of several manufacturers of cellular exchange switches. The branch, in consultation with Canadian industry and spectrum users, developed and released specifications for certifying cellular radio equipment, including a North American compatibility standard. A draft document was developed to provide technical information for the second stage of cellular licensing.

The branch, in cooperation with the Policy Sector's Spectrum and Radio System Policy Directorate and the Director of Broadcasting Regulations (DBC) of the Spectrum Management Sector, reviewed the possibility of delaying assignment of TV channels 66 and 68 in Victoria and Vancouver to avoid potential image interference problems from cellular systems. Consultation with DBC and the Canadian Radio-television and Telecommunications Commission (CRTC) is still in progress on this matter.

During the year, the Engineering Programs Branch prepared and released two Telecommunications Regulatory Circulars, one establishing limits on the use of mobile synthesized transmitters, and the other giving provisional authorization of 46/49 MHz frequencies for cordless telephones.

The branch prepared intermediate guidelines for the department's regional offices for licensing mobile radio equipment using indirect digital modulations and amplitude companded single side band (ACSB) techniques.

On the basis of comments from the Radio Advisory Board of Canada (RABC), the branch revised a document for the technical acceptance of ACSB equipment. The revised document, which was submitted to the RABC Ad Hoc Group, will eventually result in a Telecommunications Regulatory Circular.

The branch developed and released a specification for emergency locator transmitters (ELTs). A specification for emergency position indicating radio beacons (EPIRBs) was prepared and will be released after the department's regulations concerning use of radio frequencies for ELTs and EPIRBs have been amended.

During the year, the branch carried out an analysis and evaluation of the current use of, and potential demand for Personal Radio Service (PRS), paging, and air-to-ground (A/G) services. The examination resulted in proposals for the future re-allocation of the spectrum in the 900 MHz band. In this connection, the branch is evaluating the impact on existing radio stations in the fixed service of the operation of experimental A/G stations. Lastly, it established the technical bases of the draft spectrum policy proposals for the 890-960 MHz band being prepared by the department's Spectrum and Radio System Policy group.

Fixed service

The fixed service consists of radiocommunication services between specified fixed points such as microwave radio systems. In the fixed services area, effort has been concentrated on the provision and updating of the Standard Radio System Plans (SRSP) to reflect the changes in the use of the spectrum in the 1-10 GHz band arising from the policy announced for this band. The department released for public comment two draft SRSPs for the 2548-2686 and 7725-8275 MHz bands. The final SRSPs are scheduled for release in the second quarter of 1984. Channeling plans and interim guidelines for the 450-2500 MHz band (electronic news gathering operations) and 1700-1710 MHz band (AM stereo studio-transmitter links) were developed and issued to the regions, and channeling plans for fixed services in the 890-960, 1427-1535, and 1710-1900 MHz bands were formulated and presented to Radio Advisory Board of Canada for comments.

Engineering programs staff provided technical support for the preparation and review of the proposed policy paper on 10-30 GHz, which was gazetted jointly with the Telecommunications Policy Branch in March 1984. Simultaneously, the department released a final SRSP for the 14.5-15.35 GHz band.

The branch continued its ongoing activities associated with Canada/United States coordination of the services in the upper 4 GHz band, as well as proposals for paging services in the 900 MHz band. An interim procedure to coordinate applications from the United States for 900 MHz has been established and interim guidelines for licensing very low capacity paging links were sent to the regional offices.

Space service

The space service consists of radiocommunications services related to space stations such as satellites and earth stations. The department released final versions of Issue 2 of earth station licensing procedures. These procedures cover both earth stations for which full coordination has been carried out, such as those operated by Telesat Canada and the Canadian Broadcasting Corporation, and those earth stations for television receive-only (TVRO) operated by cable-TV undertakings and others, for which no coordination is required.

A number of other activities during the year related to the department's Mobile Satellite program (MSAT). These dealt mainly with MSAT spectrum options, and included a report on sharing the 821-825 MHz and 845-851 MHz bands between Canadian MSAT and United States cellular systems; and a report on the possible use of "inverted" amplitude companded single side band modulation for MSAT.

Technical support was provided to the Network Development Directorate, Policy Sector, in the preparation of the revised earth station ownership policy.

International activities

The branch took an active part in the Mobile session of the 1983 World Administrative Radio Conference (WARC-83), chairing two out of seventeen working groups. The branch also contributed to preparations for the Space WARC coming up in 1985/86. In addition, staff was involved in the intensive preparation for the 1983 Regional Administrative Radio Conference (RARC '83), and took part in both the RARC '83 meeting and the Interim Working Parties on Fixed Satellite Service and the Integrated Services Digital Network.

During the year, the Engineering Programs Branch also conducted several liaison meetings to establish administrative mechanisms between the Federal Communications Commission, the National Telecommunications Information Agency and the department defining the parameters of technical coordination between the United States and Canada in the upper 4 GHz, Multipoint Distribution System (MDS) and MSAT. These will form the basis for spectrum sharing arrangements between United States and Canada.

The branch's activities with regard to the International Telegraph and Telephone Consultative Committee (CCITT) and the International Radio Consultative Committee (CCIR) included preparation for and participation in the Interim Meetings of the International Study Groups (1, 2, 4, 8, 9 and 10, 11) and related Interim Working Parties, as well as participation in the activities of the Canadian National Study Groups. The branch also reviewed contributions to the CCITT leading to the 1984 Plenary Meeting.

Electromagnetic interference/electromagnetic compatibility

Throughout the year, the branch continued to develop standards and regulations to control radio interference. All proposed regulations have been included in the department's Regulatory Agenda. The branch prepared amendments to the regulations for industrial, scientific and medical equipment, digital apparatus and power line interference, which at the end of 1983/84 were undergoing Privy Council review. In cooperation with the Canadian Standards Association, a voluntary standard for low voltage appliances is under development.

Systems engineering

Microcomputer systems development efforts during 1983/84 brought the Canada/United States Coordination Automation Project to a stage at which users in the Operations group could parallel manual coordination operations with computer-assisted operations. This project should streamline tedious manual procedures.

Two multi-user microcomputer systems were requisitioned and installed in the Engineering Programs and Operations branches. Training sessions were organized and conducted for engineering, clerical and secretarial staff. The systems were fully utilized by the end of the fiscal year and preliminary evaluation shows that employee computer literacy has improved.

Spectrum Management System

The development of computer assistance to the spectrum management function of the department is an on-going activity to increase operational efficiency and to respond to the technological changes in radio systems. During the year, the main focus of activity was the continuing development of a system for the technical analysis for microwave radio relay systems, satellite systems and earth stations.

The functional specifications for the computer-assisted microwave licensing system were completed, reviewed and signed off. Detailed design work has been somewhat delayed, but a phased implementation plan has been developed to meet agreed-upon schedules.

In support of operations and ongoing activities, the training of the Operations Branch's staff to enable the transfer of maintenance duties to this group progressed well during the fiscal year. There were major results in the on-line data entry project, the regional microcomputer project, the preparation of the Contract Review Board package for facilities management, the implementation of the spectrum control extracts, the post-implementation audit, and in performance improvements in the EDIT/UPDATE sub-system. There was also progress in enhancing the current systems in the areas of filter processing, reporting systems, and policy coordination between Canada and the United States. However, further work remains in these areas for the upcoming fiscal year.

The branch demonstrated mainframe and computer-based spectrum management aids to visitors from Peru, Brazil, Chile, Argentina, Australia and Hong Kong, and provided necessary technical support to the department's Technology and Industry Sector for the export of these systems by Canadian private industry.

Terminal Attachment Program

Activities during 1983/84 parallel the evolutionary trend of network and terminal equipment from an analog to a digital environment. The Terminal Attachment Program Advisory Committee (TAPAC), which is chaired by the department, develops technical standards for terminal equipment attached to the public switched telephone network (PSTN). One of the program's objectives is to develop terminal attachment standards for nationwide adoption. The certification standards developed so far have been fully supported by the CRTC and have been adopted by some of the non-federally regulated carriers.

To achieve its goal of nationwide adoption of its standards, TAPAC was designated as the Canadian Standards Association (CSA) Technical Committee on Network Protection under the recently formed CSA Steering Committee on Telecommunications (SCOT). This joint committee must now reformat, develop and revise national standards for network protection aspects of terminal equipment attached to the public switched networks. The committee is in the process of converting TAPAC certification standards into CSA standards. The CSA standards could then be presented in international fora as national standards to influence the former to the benefit of Canadian industry.

During 1983/84, TAPAC published draft Certification Standards CS-03, Issue 5, for network addressing terminal equipment; Certification Procedure CP-01, Issue 4; standards for terminals for the Teletypewriter Exchange (TWX) Services Network (as part of CS-03) and the Canadian Telex Network (CS-05). Technical standards to enable certification for cordless telephones against network harm were also included in the latest issue of CS-03.

As a supplement to CS-03, TAPAC developed technical requirements for terminal equipment attached to high-speed digital lines (1.544 megabits per second). The committee is also developing standards for 64 kilobit lines (either point-to-point or switched).

Clyde Avenue Laboratory

Throughout 1983/84, the laboratory met all requirements from headquarters and the five regions for the development of test methods and test equipment calibration and overhaul; testing of radio equipment type for approval of terminal and broadcasting equipment; and for ionospheric data for the Department of National Defence and other national and international users.

Revenues

Certain activities in the Engineering Programs Branch are carried out on a cost-recovery basis. These include type-approval of radio equipment, testing of equipment for such approval, testing and certification of terminal equipment and its labelling, and electromagnetic compatibility testing. These activities resulted in a total revenue of $1,040,000 during the year, credited to the Consolidated Revenue Fund.

OPERATIONS BRANCH

The Operations Branch ensures that regulations, operational standards and procedures are available to the department's field staff to enable them to effectively manage the radio spectrum. The branch manages the department's computer-based licensing system, issues all licences, renewal notices and collects the associated fees. In addition to this, the branch effects international coordination of Canadian frequency assignments and analyzes foreign assignments with regard to their potential impact on Canadian spectrum utilization.

Licensing

In Canada, the radio spectrum is used for business, safety, emergency government and experimental communications. Despite the restrained economy, during 1983/84, licences in these categories increased by 7.76 per cent, achieving an all-time high of 642,428. The upward trend is expected to continue making the assignment of new frequencies in already congested metropolitan areas a more time consuming and difficult task requiring close coordination with existing spectrum users and careful attention to system design.

The radio spectrum is also used by the public for personal communications, in what is known in Canada as the "General Radio Service" or GRS ("Citizens' Band", or CB, is the American equivalent). As of March 31, 1984, there were 428,585 GRS licences in force, a drop of 2.3 per cent from the previous year. The number of GRS licences has been decreasing steadily since 1978/79, when it approached the one million mark. Appendix VIII illustrates the number of licences in force each year since 1973/74.

Radio use must also be coordinated at the international level. In 1983/84, the department notified 1,545 terrestrial frequency assignments to the International Frequency Registration Board (IFRB) in Geneva. The IFRB is a permanent organ of the International Telecommunication Union (ITU). This notification process protects Canadian stations in the event of interference from other stations. The department also made 400 notifications to update the ITU's international service documents such as the Lists of Ship Stations, Coast Stations, Radio Astronomy and Special Service Stations. Because of this operational relationship with the ITU, the branch contributed to preparations for and participated in several World and Regional Administrative Conferences of the ITU, such as the 1983 Mobile Conference, the 1983 Broadcasting Satellite Conference and the 1985 Space Conference.

In addition, the department examined 7,328 frequency proposals from foreign countries (mainly from the United States), to ensure that the proposed frequency assignments would not interfere with existing or planned Canadian assignments. The department also coordinated with foreign agencies 6,992 frequencies to be assigned in Canada. In addition, 69 inter-station interference complaints involving foreign radio stations were investigated.

Radio regulation

The department develops regulations, policies, procedures, rules and standards to ensure the efficient and orderly use of the radio frequency spectrum. The Spectrum Management Sector's regulatory initiatives, including spectrum management policy reviews and analyses that may lead to initiatives, are outlined in the department's portion of the "Regulatory Agenda", published twice yearly in a supplement to Part I of the Canada Gazette. An essential part of this process is public consultation, following which the department drafts proposed regulations or policies, announces them in the Canada Gazette, and invites public comment within a specified period. All comments thus received are considered before final implementation of proposed policies or regulations.

Radio Operator Task Force

Within its mandate to establish certificate and certification requirements, the Radio Operator Task Force developed requirements for two classes of shipboard radio telegraphy operators, for aeronautical and land radio telephone operators, and for two classes of Department of Transport radio operators. In addition, standards have been developed for operators of ship earth stations and for operators who maintain marine radar equipment. All requirements will be made available for public comment and should be finalized in 1984/85. The task force is also proceeding to embody its recommendations in the Radio Regulations.

Changes in regulations

Amendments to the General Radio Regulations included:

- revision of the radio licence fee schedule;
- elimination of the requirement for amateur radio operators to maintain radio logs;
- granting of temporary advanced amateur privileges to radio amateurs in isolated locations;

- deletion of channels 70 to 83 from television receivers, thereby permitting the manufacture and importation of television sets that receive only channels 2 to 69.

The department also published, for public comment, further changes to the regulations affecting the amateur service.

Spectrum control

Spectrum control activities are divided into two main categories: services and quality control. This program is directed by the Operations Branch and implemented by the department's operational field staff.

Service activities include investigations to locate and eliminate interference, and inspection of vessels compulsorily fitted with radio equipment. Technical inspections of broadcast stations and investigations of specialized radio systems are also part of this activity.

Spectrum quality control activities seek to ensure that access to the spectrum and the interest of the general public are maintained. These activities include such traditional tasks as spectrum surveillance, land station inspections and enforcement. During 1983/84, 33,996 inquiries and investigations, 2,233 ship inspections, 5,598 land station inspections and 303 inspections of broadcasting facilities were carried out.

In addition, spectrum quality control personnel represented the department at trade and industry shows, and commercial and non-commercial user organizations, all of which provide numerous opportunities to present the various departmental activities associated with the spectrum management program and, through education, to encourage self-regulation.

BROADCASTING REGULATIONS BRANCH

In the area of broadcasting, the branch is responsible for the management of the broadcast frequency spectrum and for analyzing, evaluating and certifying the technical and engineering aspects of all broadcast and cable television licence applications to the CRTC. It also regulates the technical operation of all approved broadcast and cable television systems in Canada. In addition, the branch is responsible for formulating rules, procedures and standards having as their main objectives interference-free operation of broadcast undertakings in Canada, and for the development of plans for efficient broadcast spectrum utilization and the protection of Canada's interests in international negotiations.

Technical Construction and Operating Certificates (TCOC)

During 1983/84, the branch evaluated the technical characteristics, electromagnetic compatibility aspects and service area of 55 (33)* applications for AM radio stations, 79 (117) for FM stations, 350 (392) for TV stations, and 1,826 (804) for cable television. The cable television figure includes 381 pay-TV applications and 517 applications to distribute Canadian Satellite Communications Inc. (CANCOM) signals. The branch also processed 3,154 (2,430) broadcasting proposals from foreign countries, most of which came from the United States.

Experimental authorizations were issued to 42 AM broadcast stations for AM stereophonic transmissions. The branch is developing AM stereo standards and procedures for this new service.

Bilateral agreement and negotiations

Following lengthy negotiations, on January 17, 1984, the Minister of Communications and the United States Ambassador Paul Robinson signed an AM Broadcasting Bilateral Agreement that provides for more than 100 new AM station allotments in Canada. The new agreement, which replaces the North American Regional Broadcasting Agreement of 1950, complements the recently adopted International Telecommunication Union (ITU) Region 2 MF Broadcasting Agreement. The department began accepting applications for the use of these new channels shortly after the signature of the agreement. Negotiations were held with the United States for the purpose of reaching agreement on revised working arrangements for the coordinated use of FM and TV channels.

FM interference concerns

During the year, the branch was active in seeking solutions to the potential for interference to aeronautical navigation and communications services (NAV/COM) from FM broadcast stations. The branch participated in the Joint Interim Working Party (JIWP 8/12) of the International Radio Consultative Committee (CCIR). The working party included international experts who developed recommendations on criteria to assess compatibility between the two services. The branch also undertook studies with Transport Canada to formulate a procedure to insure compatibility between FM broadcast and NAV/COM assignments in Canada.

---

* 1982/83 figures in ( ).

Lastly, joint experiments with the Federal Aviation Agency of the United States formed the basis of Canadian papers that were to be submitted to a meeting of the CCIR JIWP to be held in Geneva in May 1984. The meeting is to involve broadcast and aeronautical interests whose objective is to review and amend previous work in the light of new data.

Technical investigations

Each year, it is necessary for the branch to carry out special technical investigations to resolve unforeseeable or unusual problems or questions that arise concerning existing or proposed domestic and international broadcast matters. Such investigations typically involve difficult interference problems, special technical support to CRTC licensing activities, cooperation with other countries (particularly the United States) to ensure mutual compatibility of broadcast operations and preparation of special technical positions on matters arising in on-going international regulatory negotiations.

New and revised regulations

The branch issued new or revised broadcast rules, procedures and standards in the following areas:

- revision and consolidation of AM rules and procedures in line with the new Region 2 and Canada/United States agreements;
- update and revision of rules concerning UHF and VHF-TV operations for both regular and low-power television stations;
- update of standards for AM, FM and television transmission equipment, in line with state-of-the-art improvements.

New teletext standard: NABTS

Through the Canadian Videotex Consultative Committee (CVCC) in Canada, and the Electronic Industries Association (EIA) in the United States, the branch took a leading role in studies and discussions that lead to agreement on an international teletext standard. This new standard, the "North American Basic Teletext Specifications" (NABTS) is based largely on the department's Broadcast Specification (BS) 14. The NABTS has already been adopted by key broadcast organizations and is about to become an international standard.

To support a new standard on cable television systems, the branch performed extensive field tests to pinpoint the particular problems inherent in large distributed networks. Follow-up action will continue in the 1984/85 fiscal year.

Industry assistance

In response to industry requests, the branch undertook studies that may lead to the use of a new television frequency band (2.5 to 2.6 MHz) for low-power multiple television transmissions.

The branch also initiated a microcomputer system to provide computerized data to the Canadian broadcasting industry.

REGIONAL OPERATIONS

A network of district and sub-district offices located in all areas of the country provides the focal point for most of the department's direct contact with the public. This public includes radio users, suppliers, manufacturers, universities, the media, artists and performers, and supporters of the artistic community.

Regional activities are administered through five regional offices located in Moncton, Montreal, Toronto, Winnipeg and Vancouver.

The major role of regional operations is to deliver the Spectrum Management Program. In addition, they also make significant and increasing contributions to the overall work of the department by participating in the development, as well as the delivery, of departmental programs.

With the continuing increase in radio spectrum usage by Canadians, the task of ensuring electromagnetic compatibility between current systems and those seeking access to the spectrum is becoming ever more challenging. In order to achieve compatibility between systems, the department's regional offices provide advice and guidance to potential users of the radio spectrum in selecting appropriate services to meet their communications needs. Such consultation usually results in the submission of formal applications for spectrum assignments.

In the licensing process, the regional offices assess the eligibility and compatibility of proposals in the context of the existing electromagnetic environment, using a nationwide computerized data base to model the impact of the proposal. Once applications are approved, radio licences are issued. To help maintain proper radio operating discipline, people wishing to use some types of radio service are required to take radio operator examinations set by the department. Certificates of proficiency as radio operators are issued to successful candidates.

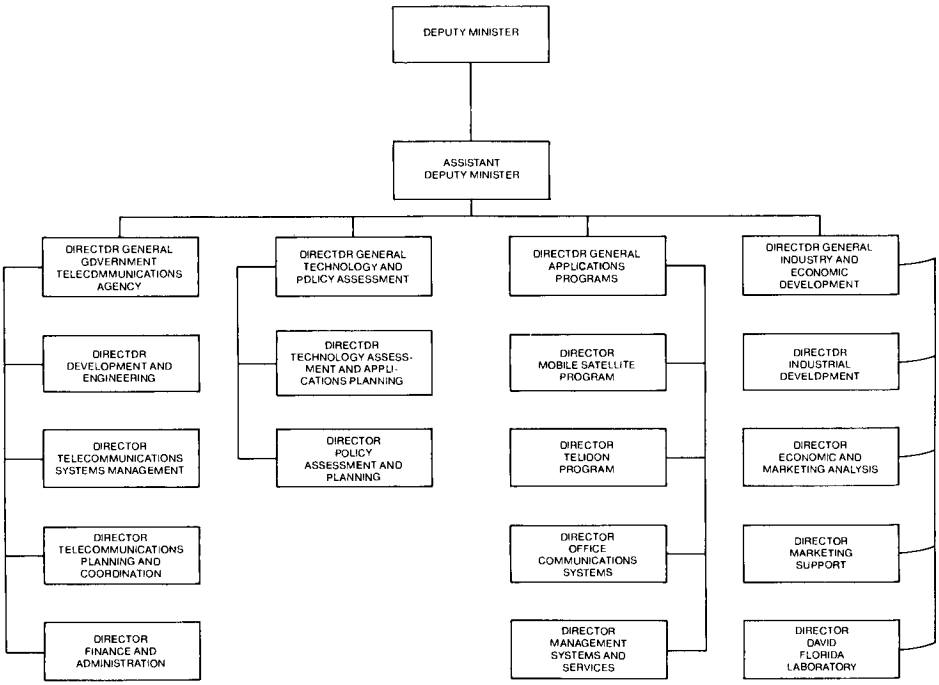
It is in the licensing process of the regional operations that the use of automation in spectrum management has been particularly effective in achieving productivity gains. These aids enable the regions to provide service to their expanding clientele while continuing to manage the ever more complex radio spectrum without increasing the resources dedicated to these tasks.

An essential aspect of spectrum management is ensuring that the radio frequencies are properly and effectively utilized. For this reason, the department, through the regional offices, inspects radio installations and monitors the use of the airwaves. This activity helps the department to identify and eliminate potential sources of interference, and enables it to maintain an accurate licensing data base against which new proposals can be evaluated.

Service to spectrum users and the general public is also provided in the form of interference investigation and technical advice. These investigations often relate to interference to safety services such as aeronautical communication systems, international distress frequencies and ambulance, police and fire communications systems. In addition to interference cases, the regional operations often assist search and rescue operations by locating activated aircraft emergency locator transmitters (ELTs). These are often activated because of equipment faults or by accident in non-critical situations. Locating such falsely-activated ELTs is essential to avoid hindering actual search and rescue operations. Activated ELTs have been located by department staff in houses, post offices and, of course, in parked aircraft.

The regional operations are also involved in maritime safety where they inspect radio installations on board domestic and foreign ships and issue safety certificates in accordance with the requirements of the Canada Shipping Act and the Safety of Life at Sea Convention.

TECHNOLOGY AND INDUSTRY SECTOR



Technology and Industry Sector

5

The Technology and Industry Sector is responsible for assessing the implications of the department's varied activities on Canadian industry and, in turn, developing and implementing strategies and programs to optimize the industrial and economic benefits of those activities.

TECHNOLOGY AND POLICY ASSESSMENT BRANCH

The Technology and Policy Assessment Branch identifies and assesses new information and telecommunications technologies that represent major opportunities for realizing Canada's economic and social objectives. On the basis of these assessments it makes recommendations regarding R&D priorities, applications programs, industry support measures and public policy.

The branch has begun a program to track technology trends and assign priorities for future work. In addition, it has undertaken a series of assessment studies to identify potential opportunities for innovative uses of technologies that have already been given priority status, along with their research, industrial development standards and policy implications.

In the area of telecommunications technology assessment, the branch identified two priorities for in-depth analysis in 1984/85: advanced television technologies and stationary high altitude platforms (SHARP).

In the area of informatics, studies were launched in 1983/84 to assess natural language processing, machine translation and other applications of artificial intelligence as well as possible future directions of teletext/videotex and office communications technologies.

During fiscal 1984/85, the branch's policy assessment program will focus on two main areas: the implications of technological trends for future telecommunications policy and legislative requirements, and a review of public policy issues raised by informatics.

The branch will also continue planning application projects that will encourage industry to develop innovative applications of telecommunications and informatics technologies, from both supplier and user aspects.

Space communications applications development

Throughout 1983/84 the department continued to explore innovative ways to use advanced satellite technology so that Canadian space initiatives can more fully contribute to the achievement of Canada's industrial and economic goals.

To promote awareness among communications users, the department initiated satellite applications development by conducting market requirement surveys and evaluating the effectiveness of satellite systems in meeting national communications needs.

One of the completed studies identified the requirements for satellite-based, one-way data distribution services. Finding that there is a Canadian demand for such a service, the study concluded that the service could be commercially viable if based on spread-spectrum modulation technology. Telesat Canada and Telecom Canada have conducted technical trials for such a service and are considering providing it as a general service offering.

Another study examined telecommunications requirements in the health care industry. It reviewed the health care environment in Canada and the role of telecommunications within the industry. Several telecommunications system concepts were identified as having potential for meeting the telecommunications needs of the Canadian health care system: a number of these made use of advanced computer communications technologies and teleconferencing techniques.

In the spring of 1984, the department and the University of Saskatchewan began a jointly sponsored field trail to evaluate the economic and operational viability of using satellites to deliver continuing education courses to veterinarians in the four western provinces.

Because of the rapidly evolving use of satellite communications, a scarcity of frequency spectrum and oribital slots is being forecast in the 6/4 and 14/12 GHz bands. The department conducted a study to determine the Canadian requirements for utilizing the extremely high frequency (EHF) band. The results indicated that while long-term requirements for the EHF band could develop, short-term EHF requirements have been projected for military applications.

Direct broadcasting by satellite

Motivated by the need to improve television services to those Canadians presently underserved, and encouraged by successful Direct Broadcasting (DBS) field trials on the lower-powered Anik B satellite, the department conducted a DBS study program to address the many variables that must be taken into account in planning for the possible establishment of a Canadian DBS system. The multi-disciplinary program, which began in April 1981 and ended in March of 1983, covered system requirements as well as socio-economic, institutional, policy, regulatory and technical issues.

Documents resulting from the study included detailed statistics on requirements for improved quantity and quality of television broadcasting services, and market surveys to determine what people would be willing to pay for the service. This information has been useful in analyzing the economic viability of a DBS service.

The studies also provided information concerning the impact of a DBS service on the broadcasting, manufacturing and program production industries, and on the potential impact of those DBS services that will spill over into Canada from United States systems. The technical and cost studies, the studies of social factors associated with regional needs, and the studies of the need for programming provided sufficient information to assess the viability of a Canadian DBS service, and to determine which system would best meet Canadian needs.

In 1983, the department released an information report based on these studies. Following the report's publication, the department invited the broadcasting industry and other interested parties from the communications industry to comment on the establishment of a DBS system, and particularly on the concept of the evolutionary approach of beginning an interim DBS service using existing Anik C satellites to determine market development prior to investment in high-powered satellites. The submissions received in response, which indicated significant support for this approach, are being studied with a view to making recommendations for government DBS policy.

GOVERNMENT TELECOMMUNICATIONS AGENCY

To ensure that government telecommunications resources are acquired and administered effectively and economically the Government Telecommunications Agency (GTA), a mandatory common service organization, plans, establishes and manages cost-effective telecommunications facilities and services for the federal government. Operating on a full-cost, revenue-dependent basis, GTA provides more than 100 departments and agencies with a wide range of telecommunications services, including shared and customized voice and data, and consulting and advisory services.

Fiscal 1983/84 saw significant growth in the provision of telecommunications services to government users, particularly in the area of intercity shared and customized services. Recoveries for the year totalled $130.2 million, compared with $116.4 million for 1982/83.

During 1983/84, the agency made important strides towards modernizing existing and developing a number of new services made possible by the advanced technology now available from the telecommunications industry.

Further development of corporate level information processing systems continued during the year. When fully implemented, they will enable the agency to provide client departments with better service in such areas as order entry, telecommunications, inventory, usage measurement, cost allocation, directory production and information services. The agency is also developing a new call-detail reporting service for Ottawa-Hull subscribers and all other locations where digital technology switches are used.

Telephone network modernization

The introduction in the National Capital Region of the Enhanced Exchange Wide Dial (EEWD) service was a major step in the modernization of the government's telephone network. Based on advanced digital switching equipment designed and manufactured entirely in Canada, the new system paves the way for the development of integrated office communications systems, point-to-point digital services and enables the government to provide better service to the public while simultaneously improving internal communications.

The first step in EEWD implementation took place in January 1984. Its introduction represents the largest subscriber cutover in Canadian telecommunications history, affecting some 90,000 government users in the Ottawa-Hull area. Similar modernization projects are underway in Montreal, Toronto, Vancouver and Victoria. Modernization has been completed in Charlottetown, Rimouski, Winnipeg, Abbotsford, Nanaimo, and Penticton.

Government satellite network

During the year, trials of the time division multiple access (TDMA) network carried out in conjunction with CNCP and Telecom Canada were completed. The experience gained in the trials, combined with network planning and economic studies, led to the development of specifications preparatory to the April 1984 request for a proposal for a TDMA voice and data applications network over the major routes. Pending the realization of the economic expectations, the plan is to establish a TDMA network with between five and eight nodes.

Planning is underway for the development of a government single channel per carrier (SCPC) network to provide "thin route" voice and data communications. Planning activities include market and demand analysis and a pilot network trial to evaluate various aspects of providing an SCPC satellite based service. The pilot network will consist of Microtel's SPACETEL earth stations and a common control system, and will run for a period of six months beginning January 1985.

Discussions to define GTA's participation in an MSAT satellite network trial continued throughout the fiscal year.

Enhanced communications and services

GTA also plans and develops enhanced communications and services that facilitate office communications.

In March 1984 the agency launched the first phase of the Government Text Communication Service, which facilitates and promotes the use of existing word processors for the transmission of documents within the government. GTA developed the service after consultation with departments and a trial project indicated that word processors are cost-effective for text transmission. Dissimilar terminals communicate text by using conversion tables and operating procedures developed by GTA. The agency plans to extend the service to provide interconnection with various electronic text and message networks.

Voiceconferencing is gaining rapid and enthusiastic acceptance within the National Capital Region: in the first nine months of 1983/84, use of teleconferencing facilities increased 100 per cent over the same 1982/83 period. The agency has published a report on teleconferencing and productivity.

Shared data network

The agency has conducted a study to determine the feasibility of a shared data network that would meet the government's data transmission and messaging requirements. The study concluded that the government could benefit from economies of scale if it consolidated data networks in a manner similar to its consolidation of voice networks. Implementation of the initial system is planned to commence in 1985, following completion of the definition phase which is now underway. An initial operational capability will be provided in the first quarter of 1986.

Planning and coordination

To provide planning and coordination support to the government telecommunications community as a whole, in January 1984, GTA developed and issued the first edition of the Government Telecommunications Planning Document. This publication describes GTA's plans for the evolution of common telecommunications services. Intended to complement the Annual Review of Telecommunications in the Government of Canada, its objective is to assist departments in planning and forecasting their telecommunications requirements.

The agency continued to develop and enhance the Telecommunications Management Manual, which is aimed at fostering improved telecommunications within the federal government. Use of the manual as a vehicle for the issue of administrative policies and practices has received support from the Telecommunications Advisory Committee, and has been referred to the Treasury Board for further direction.

Telecommunications Advisory Committee (TAC)

The GTA provides support to and participates in the work of the TAC, which advises the Department of Communications on long-range planning and coordination of telecommunications on a government-wide basis. In its annual report, the committee executive notes that in 1983/84 high priority was placed on examination of the overall planning process and better harmonization of GTA and departmental plans.

APPLICATIONS PROGRAMS BRANCH

This branch is responsible for the planning and management of space telecommunications and informatics programs aimed at the development of services, systems, technologies and industrial capabilities that will meet Canadian needs.

Brazil/Canada agreement

During 1983/84, the department continued its management of the $8 million Spar-Embratel Training Program funded by the Canadian International Development Agency (CIDA) to train Brazilian engineers and technicians to operate and maintain the communications satellites that Brazil is purchasing from Spar Aerospace Limited. Training is undertaken at Spar, SED Systems, Telesat, Hughes Aircraft Corp. and also at the site of the ground terminal near Rio de Janeiro, Brazil. Approximately 32 trainees are involved in the North American phase of training and 47 in the on-site phase in Brazil. The program is scheduled for completion in December 1985.

The department also manages the Government Technical Cooperation Program. Involving both long- and short-term commitments, the program is to be supported by $3 million of CIDA funding for training Brazilian engineers at Canadian telecommunications facilities, including the Communications Research Centre.

The agreement with Brazil for this program was initiated in July 1983, with a full exchange of diplomatic notes occurring in September 1984.

OLYMPUS (L-SAT)

Canada is a participant in the OLYMPUS communications satellite program of the European Space Agency (ESA). The program's purpose is to develop and demonstrate a large communications satellite platform (OLYMPUS, previously known as L-SAT) capable of carrying a wide range of communications and other equipment. The demonstration satellite (OLYMPUS I) is scheduled for launching in 1987, for five years of in-orbit operation. The Canadian government's contribution is estimated at 11 per cent of the overall program.

During 1983/84 Canada continued to participate in the L-SAT development and manufacturing phases, along with other ESA countries such as Italy, the Netherlands and the United Kingdom.

The prime contractor for OLYMPUS is British Aerospace Ltd. Spar Aerospace Limited is a major subcontractor, while COM DEV Ltd. is providing specialized components. Spar is building the solar arrays for OLYMPUS and has major responsibilities for environmental testing of the spacecraft at the department's David Florida Laboratory, which was chosen over European facilities. Both Spar and COM DEV are producing payload components.

Canada's main interest in the program is with the spacecraft's platform, rather than the demonstration payloads (which are mostly oriented towards Europe). However, Canada may use OLYMPUS to perform business communications experiments at 20/30 GHz.

Canada's participation will give Canadian industry a role in the commercial exploitation of the satellite, as well as the right to use the OLYMPUS platform for later domestic purposes such as MSAT, DBS and RADARSAT satellites. Major subcontractors in Canada, Italy and the Netherlands have joined with British Aerospace to form a consortium to build and market OLYMPUS satellites.

Mobile Satellite Program

Canada has a requirement for improved public and government mobile communications in under-served and unserved areas of the country. To meet this need, the department's Mobile Satellite Program is supporting industry in plans for the establishment by 1988 of an initial commercial MSAT communications system with a variety of related mobile radio, mobile telephone and data services. In the process, the department will be fostering the development of private-sector space systems technology, including engineering skills and expertise in the labour force.

During the year, some 40 contracts for the project definition phase (Phase B) of the MSAT Program were completed or were nearing completion, at a budgeted $9.6 million. By the end of 1983/84 a number of milestones were in sight. The major spacecraft definition and design contract with Spar Aerospace Limited was nearly complete (completion expected by July 1984). The Telesat Canada commercial viability study was also nearing completion; preliminary results appeared favourable towards implementation of a commercial system. Several other studies were largely finished: an in-depth look at the market for MSAT services (its results incorporated into the commercial viability study), and a series of studies on the socio-economic impact of MSAT. The latter included examinations of the

impact on telephone companies, radio common carriers, and the manufacturing industry, as well as assessments of the social benefits to Canada. (An "overall" impact study was also initiated to quantify the total effect on the Canadian economy.)

In addition, the department devised an MSAT Post-launch Communications Program for which applications from over 100 potential users have already been received.

A major area of policy concern during the year was the domestic allocation and international coordination of frequencies for mobile satellite services. Progress by March 1984 has been encouraging, and efforts will continue towards obtaining agreement with the United States Federal Communications Commission regarding frequency coordination.

Looking ahead, the prognosis for a first-generation commercial MSAT system with government support is favourable, due to promising market and commercial viability results and evidence of very substantial economic benefits.

Telidon Program

Ever since the 1978 announcement of its development at the department's Communications Research Centre, Telidon, the interactive videotex system, has been a leader in world videotex technology. At the heart of this sophisticated communications tool is a highly efficient system of picture-description instructions. These instructions permit encoding of pictorial information in a compact form ideally suited for gaining access to information data banks by telephone, cable television systems, satellite links, and optical fibres. This has opened a vast field of potential applications, among which the following have already been put to use:

- electronic messaging and mail services, especially those containing graphics;
- audiovisual presentation systems;
- computer-aided learning systems;
- transactional services for banking, shopping or making reservations;
- tourist and public information systems;

- graphic presentation of information stored in alpha-numeric data bases;

- teleconferencing that includes sharing of both voice and graphic images.

The department has successfully promoted Telidon as an international standard for videotex. It is one of the standards recommended by the International Telegraph and Telephone Consultative Committee. In a joint publication in December 1983, the Canadian Standards Association and the American National Standards Institute recognized Telidon as the North American standard. This publication ended several years of changes that had hampered industrial development. A consequent more rapid growth of videotex services is already evident. In addition, the government has funded incentive programs designed to assist the development of the Canadian videotex industry.

The growing use of microcomputers as videotex terminals has also become evident this year. A number of Canadian software companies have produced software packages that decode Telidon signals and run on popular microcomputers. Most of these companies are finding their products welcomed in the marketplace.

In 1983 the government followed its first promotional Telidon Program with the Telidon Exploitation Program, a joint program with the departments of Supply and Services and External Affairs, designed to build on the previously established capabilities in Canadian industry. The Department of Communications' portion of the program was approved in May 1983. Various sub-programs have subsequently been undertaken with the following results:

- The Content Development Program is well underway. In August of 1983, the Minister called for proposals for projects that would increase the amount of content available in the Telidon format. Under the $5 million program, the government contributes up to 30 per cent of the eligible costs of each project, with a maximum of $500,000 and a minimum of $15,000 per project. In January 1984, the Minister announced that of the 150 applications received, twenty-seven proposals, ranging from the development of consumer and community information systems to health care advice and entertainment, had been chosen. By the end of the fiscal year, funding agreements with organizations were either in progress or complete.

- A test package has been developed and placed on the departmental data base to assist industry to develop decoders and software that conform to the Telidon standard. This package, which also includes photographs and other documentation, will be distributed by the Canadian Advanced Technology Association.

- The Information Relayed Instantly from the Source (IRIS) teletext trial administered by the CBC was successfully concluded in December 1983. The project tested sophisticated applications of teletext, the broadcast form of Telidon technology. The department provided the CBC with support totalling $6 million for the purchase of page creation systems, teletext encoding equipment and approximately 500 terminals that were installed in selected homes and public places in Montreal, Toronto and Calgary. Attached to ordinary televisions, the terminals allowed viewers to call up electronic pages of text and graphics from a "teletext" magazine of information encoded in the regular broadcast signal: some 250 pages of easily updated national, regional and local news, weather, sports scores, community bulletin boards, and pages aimed at special-interest groups.

- As part of the department's mandate for the Telidon Exploitation Program, technical support was provided to both the Department of Supply and Services and External Affairs to assist them in carrying out their portion of the program. Supply and Services was responsible for fostering the use of Telidon in government departments and External Affairs assisted industries with developing international markets.

- There has been increasing emphasis on using the department's Telidon data base for providing information on the Telidon industry and using it as a test base for applications development. The data base has also been a resource of test demonstration pages for the industry.

The integration of Telidon with other information technology is proceeding naturally, as predicted, and is expected to continue in the future. Consequently, the department is examining what the government's role should be to encourage the continuing development of a strong and competitive informatics sector in Canada.

Office Communications Systems Program

Concerned with the development and application of Canadian-produced information technology for business offices, the Office Communications Systems Program was established in late 1980 as a "sunset initiative" of the department, co-sponsored by the Department of Industry, Trade and Commerce. The program focuses on industrial development, office productivity and product awareness. Its main objective is to provide Canadian-based companies with opportunities to field-test new products and services in selected government locations prior to their commercial introduction.

The current phase of the program was authorized in July 1982 and was originally scheduled to end on March 31, 1985. However, in March 1984, the program was extended for up to one year to permit the completion of field trials at the Department of National Defence, which had experienced delays in production of some software.

The program's objectives are:

- to develop an industrial capability in Canada for developing, manufacturing and marketing integrated electronic office systems for domestic and world markets;
- to determine the social, behavioural and economic implications of office automation;
- to ensure that integrated electronic office systems contribute to a better quality of work life and higher productivity for office workers;
- to educate the public and promote Canadian systems; and
- to ensure that the technology will be used effectively in the government.

The rationale behind funding of the program was and continues to be motivated by a number of factors, including the strength of Canadian companies, particularly in office support systems and telecommunications; the potentially large domestic and international markets and related employment opportunities; a large and rapidly growing trade deficit in the electronic sector; and the apparent decrease in the productivity growth rate of Canadian labour.

The first phase of the current program, completed in the first quarter of 1982, involved testing the feasiblity of field trials as a vehicle for industrial development, and if feasible, to plan the trials. In addition, the program conducted limited industrial, behavioural and systems research and public awareness activities.

Phase II consisted of field trials in other federal departments, program evaluation, research programs, public awareness and information dissemination, and program management and administration.

The field trials, some of which began during 1982, with the balance beginning in 1983, tested integrated electronic office systems under development by Canadian industry. The program supports five major trials, each based on a different technology and systems integration scheme, each in a different federal department, and each by a different vendor.

Participating departments included Environment, which is testing equipment by OCRA Communications, Inc.; Revenue Canada, Customs and Excise, testing equipment developed by Bell-Northern Research and supported by Bell Canada and Northern Telecom; and National Defence, testing Systemhouse Ltd. equipment. Trials in these three departments were conducted with several occupational groups. A fourth, smaller trial at Energy, Mines and Resources tested an electronic business manual system by Officesmiths that augments more specific tasks but can later be expanded and developed into a larger, integrated system. The Department of Communications is also carrying out its own integrated field trial involving executives and professionals who are using workstations by Comterm Inc. The department had in addition provided assistance to Treasury Board for completion of a small feasibility study initiated during Phase I.

Two types of field trial evaluation have already begun: an impact assessment to determine how the technology affected the host departments, and an examination of how well the program has achieved its industrial development and other objectives. The key objective to be assessed is the program's contribution to industrial development, especially in terms of the next generation of electronic office systems.

The research programs' purpose is to identify and investigate the various technological, social, human, economic and productivity issues related to office automation. This information enables the department to forecast trends and developments. Included among the issues are industrial and marketing concerns; employment and retraining, technological and systems research, behavioural research, and health and safety research.

To promote public awareness, the program continues to compile a number of highly technical reports, including feasibility studies, user needs analyses, implementation methods, and behavioural and social impact studies. Once the field trials have been completed and assessed, other reports will follow.

Program management and administration in the industry have benefitted from both the incentive created by the program itself and the high level of expertise acquired by participating industry personnel. A number of new Canadian companies have evolved over the last three or four years as a result of interest created by the program. For example, OCRA Communications Inc. was formed by a consortium of Canadian companies that have pooled their respective expertise and products to effectively carry out the Environment Canada field trial.

Expected results of the completed evaluations include:

- development of competitive products and systems;
- identification and development of product markets;
- increased domestic and international sales of Canadian electronic systems;
- increased employment opportunities in the electronics manufacturing sector;

- increased efficiency and effectiveness of managerial and clerical activities in government departments;
- more informed government procurement decisions and policy development related to integrated electronic office systems; and
- improved techniques for introducing new office technology aimed at enhancing the quality of work life.

INDUSTRY AND ECONOMIC DEVELOPMENT BRANCH

The Industry and Economic Development Branch, assesses the implications of the department's varied activities on the Canadian space, telecommunications and informatics industries and develops strategies which attempt to optimize the industrial and economic benefits to be derived from those activities. It also develops programs to assist industry to capitalize on specific opportunities created or identified through departmental activities.

The complementary activities of four directorates -- Industrial Development, Economic and Marketing Analysis, Marketing Support, and the David Florida Laboratory -- enable the branch as a whole to identify and explore domestic and foreign opportunities in which the department may support and assist these sectors. Through the coordination of government economic and trade development activities and direct interaction with industry, the directorates of the branch carried out a number of activities during the 1983/84 period.

Satellite prime contractor

A long-standing objective of the department has been to assist in the development of a Canadian prime contractor for communications satellites that will be capable of successfully competing for both domestic and export contracts. Through a series of technology development programs as well as industrial and international marketing assistance, the department has strongly supported the emergence of Spar Aerospace Limited in this role.

In 1983/84, the department awarded contracts valued at $12.8 million over two years to Spar for R&D work on satellite communications equipment. This project will enable Spar to meet Telesat Canada's requirements for the next generation of domestic communications satellites to replace the Anik series. In addition, the funding will be used to develop Spar's expertise in monitoring the spacecraft through launch and in orbit. The company will also develop and maintain a data bank of international communications satellite systems. These new capabilities will be required for Spar's continued success as a satellite prime contractor in international markets.

Earth terminal industry development

In 1983/84, the branch, in consultation with industry, worked to develop strategies to ensure that the department's policy, regulatory, R&D and common service functions are coordinated in order to support the earth station industry.

The department also continued its support of the development by Microtel Pacific Research (the R&D subsidiary for Microtel Ltd., owned by B.C. Tel) of Spacetel, a satellite telephone system designed to link remote communities and resource camps with national and international telecommunications networks. The system, developed initially to cope with problems of terrain and population distribution in western Canada, is readily adaptable to use as a private voice and data network for businesses. Spacetel also holds potential for export sales to the United States and other countries.

Economic and trade policy development

Through its economic and trade development research and related policy work, the branch continued to assess trends in the communications sector and the economy as a whole and to examine options for departmental contributions to communications policies in these areas.

Numerous studies on the capabilities of the Canadian communications industry were conducted and results, where appropriate, were made available to industry. These studies will contribute to the formulation of mid-term industrial and trade development strategies:

- Suppliers of equipment and services to the cable television industry in Canada;
- The supply of computer communications equipment in Canada;
- Supply of and demand for equipment in the Canadian cable television industry;
- The supply of and demand for computer/communications equipment;
- The telecommunications equipment demand of the Canadian telecommunications carriers, 1981-1984;
- The world telecommunications market: (characteristics, structures and trends);
- An economic analysis of enhanced services;
- An economic analysis of computer/communications services for the mass consumer market.

All these studies are available to the public upon request.

Marketing support

In cooperation with External Affairs, the branch provides technical marketing support to assist Canadian space, telecommunications and informatics firms in penetrating foreign markets. The ministries of Communications and PTTs (Posts, Telecommunications and Broadcasting agencies) of foreign countries are often the customers or are directly involved in the provision of communications facilities and services and prefer to deal with their Canadian counterpart, the Department of Communications.

In 1983/84, marketing support activities coordinated by the branch in the area of space communications included assistance to Canadian firms endeavouring to win export contracts in countries such as the Republic of Korea, China, Papua New Guinea, Nigeria, Colombia and Argentina. One of the year's major successes resulted from support provided to Spar in their endeavour to sell earth stations and related technology to the People's Republic of China. The combined industry/government effort culminated in Canada's largest sale ever of Canadian-designed telecommunications equipment to China. The contract, valued at more than $20 million, includes the sale of 26 earth stations, the formation of a joint venture to transfer the earth station technology to China, and a cooperative development program for the production and sale of further earth stations to users throughout China.

Canadian companies were also supported in their marketing activities for telecommunications equipment and services in Europe, Africa, the Middle East, the United Kingdom, Iceland, China and the Phillipines. Support in these areas is ongoing.

A major survey of the future domestic market potential for satellite services, both in the public and private sectors, was completed. This survey will be used to establish user plans and to identify requirements in order to assist Canadian suppliers in retaining a major share of the domestic market. Reports on the regions of the Americas, the Caribbean, Europe, Africa, the Middle East, Asia, and the Pacific were also completed, and are available to all interested parties, including manufacturers and carriers.

David Florida Laboratory

Built in the early 1970s to support the integration and testing of the Communications Technology Satellite (Hermes), the David Florida Laboratory has since undergone a major expansion and now provides environmental testing and integration services for complete spacecraft such as those designed for launch on the U.S. space shuttles. The laboratory's facilities are available on a cost-recovery basis for government agencies and companies from the Canadian aerospace and communications industries that wish to test their products environmentally. Use of the facility by the Canadian industrial community at large is also possible, pending commitments in the aerospace field.

The 1983/84 fiscal year has encompassed a transition period in the laboratory's program. With the completion of integration and testing of the Anik D-1 and D-2 satellites during 1982/83, and the onset of the Brasilsat and L-SAT (OLYMPUS) programs, the laboratory had to undergo a number of changes to both facility and equipment. L-SAT in particular, due mainly to its size and specialized test requirements, required the laboratory to undertake major upgradings, modifications and acquisitions to adequately accommodate this major program.

The David Florida Laboratory has experienced a marked growth in environmental testing requests during 1983/84, substantiated by a corresponding increase in the number of commercial customers. Although Spar Aerospace Limited, Canada's prime contractor for communications satellites, remains the laboratory's largest single customer, others, such as Canadian Astronautics Limited (CAL) and COM DEV Ltd. are also becoming frequent users. In 1983/84, some 30 customers brought more than 70 projects to the laboratory for testing, up by a factor of three over 1981/82 levels.

The total value of testing performed in 1983/84 is close to $1 million. This figure includes fees waived due to exceptional circumstances, for specific programs such as Brasilsat and Skynet, which are considered essential to continued development of a strong aerospace industry in Canada. Additional value could be assigned to facility improvements during the year, and to support provided to the Department of Communications own program.

The laboratory's major programs during the 1983/84 fiscal year comprised:

- Primary testing activities
  - initiation and continuation of integration and testing of the Brasilsat and the L-SAT programs;
  - continuation of support for the integration and environmental testing of the Skynet 4 UHF antenna and Canadarm; and
  - initiation of thermal vacuum and vibration testing of Skynet 4 SHF antennas.

° Development of new test techniques and equipment

- Mass properties measurements: work continued on the building and development of a Horizontal Axis Measurement System (HAMS) which will be used to determine the mass properties of spacecraft and will receive its initiation during L-SAT testing.

- Infrared (IR) testing: the laboratory has undertaken feasibility studies for developing an IR testing capability to provide thermal balance testing of large spacecraft such as the L-SAT and its descendants.

- Modal testing and analysis: the laboratory has been involved with Space Mechanics Directorate, Spar Aerospace Limited and National Research Council representatives to develop a comprehensive modal testing capability at the laboratory, possibly involving a collaborative venture with the Federal Republic of Germany and, in particular, the Deutsche Forschungs and Versuchsamstalt fur Luft und Raumfahrt (DFVLR).

° Promotion of testing facilities and activities

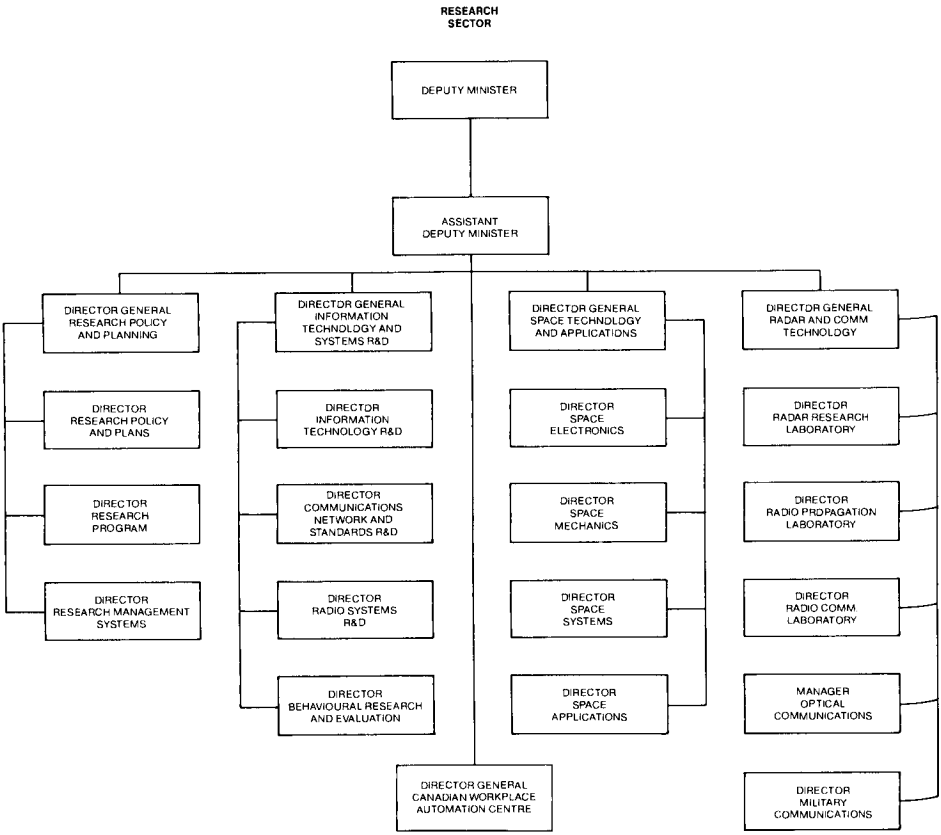
- Tours and media events were used to publicize the laboratory's highly developed facilities. The signing of the Skynet 4 UHF antenna contract between Canadian Astronautics Ltd. and Marconi Space and Defence Systems of the United Kingdom brought in many media and armed forces representatives. The Telesat Getaway Special Competition, which offered environmental testing of the winning student's experiment, brought good press coverage. The widely circulated publication, Aerospace Canada International, featured an article on the laboratory. Marketing-related tours were given to representatives of China, Korea, Nigeria and several other nations.

- A closer working relationship with Europe was helped by the attention accorded visitors from European organizations such as the European Space Research and Technology Centre (ESTEC), British Aerospace (BAe), Marconi Space and Defence Systems (MSDS), and the governments of Holland, Germany, Belgium, France, Britain, Sweden and Italy. Representatives from the German DFVLR, the Space Agency of Israel, the Instituto Nacional Pesquisas Espaciasis (INPE) of Brazil, and the government of Belgium have all suggested collaboration in the domains of space simulation and integration. Each proposal is under consideration, although their potential value to the laboratory varies considerably.

° General facility upgradings and improvements

- A number of improvements were made to the facilities at large, including: the development of a system for automatically calibrating a standard gain horn antenna; the implementation of a colour graphics system; the commissioning of improved data processing facilities; and major modifications to the 8 x 8 and 3 x 3 thermal vacuum chambers.

- In addition, the laboratory received the necessary authorization to begin construction of a new, high bay clear room integration and storage area, presently scheduled for completion in May 1985.


RESEARCH SECTOR
DEPUTY MINISTER
ASSISTANT DEPUTY MINISTER
DIRECTOR GENERAL RESEARCH POLICY AND PLANNING
DIRECTOR RESEARCH POLICY AND PLANS
DIRECTOR RESEARCH PROGRAM
DIRECTOR RESEARCH MANAGEMENT SYSTEMS
DIRECTOR GENERAL INFORMATION TECHNOLOGY AND SYSTEMS R&D
DIRECTOR INFORMATION TECHNOLOGY R&D
DIRECTOR COMMUNICATIONS NETWORK AND STANDARDS R&D
DIRECTOR RADIO SYSTEMS R&D
DIRECTOR BEHAVIOURAL RESEARCH AND EVALUATION
DIRECTOR GENERAL SPACE TECHNOLOGY AND APPLICATIONS
DIRECTOR SPACE ELECTRONICS
DIRECTOR SPACE MECHANICS
DIRECTOR SPACE SYSTEMS
DIRECTOR SPACE APPLICATIONS
DIRECTOR GENERAL RADAR AND COMM TECHNOLOGY
DIRECTOR RADAR RESEARCH LABORATORY
DIRECTOR RADIO PROPAGATION LABORATORY
DIRECTOR RADIO COMM. LABORATORY
MANAGER OPTICAL COMMUNICATIONS
DIRECTOR MILITARY COMMUNICATIONS
DIRECTOR GENERAL CANADIAN WORKPLACE AUTOMATION CENTRE

Research Sector

6

The objective of the Research Sector is to advance Canada's research and development in the areas of telecommunications, space, and information science and technology.

Research activities are carried out within four branches: the Research Policy and Planning Branch, the Radar and Communications Technology Branch, the Information Technology and Systems R&D Branch, and the Space Technology and Applications Branch. All four branches are located at the Communications Research Centre, Shirley Bay, Ontario. Research will also be carried out in Laval, Quebec, at the new Canadian Workplace Automation Research Centre, for which the government gave final approval in 1983.

Under the departmental reorganization that took place in 1983, the Space Technology and Applications Branch was transferred from the Space Sector to the Research Sector to ensure that all technological research carried out in the department is under the responsibility of one Assistant Deputy Minister.

RESEARCH POLICY AND PLANNING BRANCH

This branch is responsible for planning, coordination, policy formulation and resource management related to the department's research program. It is also responsible for international scientific collaboration, and for the management of both university and industrial research programs.

Research policy, planning and management

The objectives of the Research Policy and Plans Directorate are:

- to identify R&D priorities and plans, and to coordinate programs that ensure a consistent and unified approach to the achievement of sector objectives;
- to enhance the effectiveness of the Communications Research Centre as a national centre of excellence in communications, information, and space technology R&D;
- to determine the optimum mix of research and development projects among Canadian research facilities to ensure the most effective use of resources, and to foster the growth of Canadian research capacity and expertise;

- to develop and maintain an awareness of civilian and military R&D activities in domestic and international research communities and to assess their implications for Canada; and

- to monitor the progress and effectiveness of sector R&D activities and to provide the data essential for management decision-making.

International collaboration

At the Economic Summit in Versailles in June 1982, the participants -- Canada, the United States, Japan, France, Italy, Great Britain, the Federal Republic of Germany and the European communities -- discussed the importance of international cooperation in order to take advantage of the vast opportunities offered by the new technologies.

In accordance with the aims set at Versailles, a working group was established to consider the opportunities, problems and challenges presented by technology, with special regard to growth and employment. The working group examined a number of scientific and technical issues, with a view towards determining where international collaboration could best contribute to improving social and economic conditions.

In a report ratified by the participants at the June 1983 Economic Summit in Williamsburg, Virginia, the group proposed cooperation projects to promote growth conditions through better management of energy sources, to ensure better management of food supplies, to improve living conditions and employment, and to encourage general progress in fundamental research.

Included in the report was a project for the application of new technologies for education, vocational training and culture. The major aim of this project is to encourage collaboration between teams in various countries that wish to:

- apply technology more successfully to education, vocational training and culture, through sharing of information, expertise, resources, and recent innovations and discoveries;

- extend and test the transferability and portability of technology applied in these domains; and

- increase productive contacts with individuals and groups with similar interests in other countries.

An International Coordinating Committee was formed to carry out this project. Canada and France are the co-leaders, with Italy and Great Britain as members. A Canadian Coordinating Committee has also been established to manage Canada's contribution. The department, through the Research Policy and Planning Branch, is responsible for co-chairing the international coordinating group and chairing the national one.

University research support

University Research Program

In 1971, the department established a program to enable it to award research contracts to Canadian universities with expertise in the various areas of communications. The program began modestly in fiscal 1971/72 with a budget of $375,000, which has grown to an annual budget of $800,000.

Although the program was established primarily to support the department's in-house research programs, it also promotes competence in various areas of communications in Canadian universities.

During fiscal 1983/84, the University Research Program enabled the department to award 40 university contracts totalling $819,000 to 26 Canadian universities. The contracts assisted research in areas supporting government priorities in communications technologies, systems and networks, and the social and economic aspects of culture and communications.

University research contracts awarded in 1983/84

Region	Number	Value
Atlantic	8	$ 173,772
Quebec	10	218,315
Ontario	15	278,574
Manitoba	1	23,000
Saskatchewan	2	27,200
Alberta	1	38,500
British Columbia	3	60,000
Total	40	819,361

Centres of Excellence Program

Studies of the department undertaken by the Office of the Commissioner of Official Languages and by the department's own Official Languages Directorate in 1976/77 revealed that the percentage of Francophone representation in the technical and scientific fields was low. Admittedly, the department found it difficult to recruit Francophone specialists in certain categories and to ensure an equitable representation of the two official language communities.

It was therefore decided to institute a program that would favour the growth of French-language Centres of Excellence in the hope of increasing the number of Francophone technicians and scientists in contact with the department. Since its implementation, the program, with an annual budget of $350,000, has proven to be successful.

In fiscal 1983/84, 16 contracts totalling $350,000 were awarded to seven Francophone universities located in the provinces of New Brunswick, Quebec and Ontario. Research was carried out in areas similar to those described under the University Research Program.

Centres of Excellence contracts awarded in 1983/84

Region	Number	Value
New Brunswick	2	$ 39,000
Quebec	13	286,000
Ontario	1	25,000
Total	16	350,000

Industrial support programs

Development of Space Subsystems and Components (DSSC) Program

This program supports Canadian industry through R&D contracts to develop subsystems, components and processes for satellite communications systems. Many of these projects are co-funded through the Department of Supply and Services' Unsolicited Proposal Program.

During 1983/84, the Bureau of Management Consulting (BMC) evaluated the DSSC Program and found it to be viable and appropriately structured, both as an instrument of space industry development and to encourage the availability of appropriate technology. The report also revealed a need for additional staff at the program level to centrally manage and control the program. Accordingly, the Research Program Directorate identified a staffing requirement in its submission to the Multi-year Operational Plan.

During 1983/84, a total of 25 contracts amounting to $2,953,614 were awarded to Canadian industry. Approximately 40 per cent of this amount was jointly funded by the Unsolicited Proposal Program. Fifteen contracts were successfully completed during the fiscal year, with a total of 21 technical reports submitted by the contractors. These reports are normally disseminated to outside users through licensing arrangements concluded through Canadian Patents and Development Ltd.

Program for Industry/Laboratory Projects (PILP)

The purpose of this interdepartmental program, which in 1983/84 had a budget of $20.5 million, is to promote the application and use in Canadian industry of selected scientific and engineering knowledge originating in government laboratories or universities. Although the program is administered by the National Research Council, the Department of Communications is responsible for managing all PILP projects related to communications, space and informatics. The department also participates as a voting member of the Interdepartmental PILP Selection Committee, which reviews and approves transfer-of-technology proposals.

Six Department of Communications related PILP contribution arrangements totalling $907,169 were awarded during the fiscal year, bringing to 13 the total number of PILP projects managed by the department in 1983/84. Seven projects were completed, among the most noteworthy of which were COM DEV Ltd.'s surface acoustic wave products, Bristol Aerospace Ltd.'s electronics for 406 MHz beacons, and Canadian Marconi Co.'s hybrid spiral antenna.

Unsolicited Proposal (UP) Program

As an adjunct to the federal government's "make or buy" contracting-out policy, the Unsolicited Proposal Program administered by the Department of Supply and Services enables the government to respond promptly to sound and unique proposals from industry that support the government's science and technology objectives. The UP Program's budget for 1983/84 was $15 million. The Research Policy and Planning Branch is responsible for coordinating the internal distribution, reviews, and assessment of all unsolicited proposals submitted to the department. During the year the department processed 79 unsolicited proposals, eighteen of which resulted in contracts awarded to Canadian industry amounting to $5.3 million. Of this amount, the department contributed $2.8 million, or 53 per cent of the total, and Supply and Services contributed the remainder, or 47 per cent.

Support to other government departments

The capabilities of the department's research centre are also used to support the communications research and development needs of other government departments. Projects are underway for the Department of National Defence in satellite communications, radar, and both tactical and strategic radio communications to meet the requirements of the Canadian Forces. There is in addition a steady spin-off of results from these defence projects into civil applications. Projects are also underway to meet the specific requirements of departments such as Energy, Mines and Resources; Fisheries and Oceans and Transport Canada. Some of these projects are described in other sections of this Annual Report.

INFORMATION TECHNOLOGY AND SYSTEMS R&D BRANCH

The Information Technology and Systems R&D Branch contributes to the department's role by maintaining a base of technological and behavioural expertise, and carrying out relevant, selected R&D in response to clearly defined needs.

Through the Information Communications Program, the Branch focuses on topics relating to the 'logical' processing and conveyance of information and related man-machine interaction. The range of activities includes the technical and behavioural aspects of acquiring, representing, creating, inputting, storing, encoding, decoding, presenting, assimilating and interacting with visual and aural information. An important element of the work is to address compatibility issues and to contribute to the development and promotion of relevant national and international standards in telematics.

Research and development is carried out cooperatively by four directorates:

- Information Technology R&D;
- Communications Networks and Standards R&D;
- Radio Systems R&D;
- Behavioural Research and Evaluation.

The program is supplemented from time to time to achieve specific and extraordinary objectives by sunset resources such as those provided under various Telidon-related programs.

Fiscal 1983/84 began the Telidon Exploitation Program (TEP), which extended fundamental Telidon research by two more years. The program has enabled the directorate to advance work in Common Visual Space (CVS) interactive teleconferencing and in Telidon-voice accompaniment.

Towards the end of the fiscal year and in response to changes that became evident during the course of the work, the directorate prepared to extend both the Telidon Exploitation Program and the Telidon Program Extension into 1984/85. In addition, plans were made for more fundamental and advanced research in information technology where priorities and potential are rising rapidly.

Information Technology R&D

This directorate, researches and develops new computer-based technology and systems for acquiring, creating, delivering and presenting information and interacting with it in an advanced computer communications environment to improve service to the Canadian public. It further transfers the results to Canadian industry for exploitation and provides technical expertise to government departments and other organizations.

Through Telidon Exploitation Program contract assistance, the Common Visual Space Network (CVSNET) in-house research was completed by the end of the year except for final documentation. A joint contract between the Communications Research Centre (CRC) and Norpak Corp. of Kanata, Ontario, resulted in research on Telidon-compatible voice coding to provide voice accompaniment for Telidon, and the production of a draft Sound Description Instruction (SDI) standards document. Final documentation for both should be completed during 1984/85.

Under the Telidon Program Extension, the CRC/Norpak Telidon VLSI (Very Large Scale Integrated) chip development project continued. During the year, while Norpak developed the design of the chip circuitry and a chip test facility, Norpak announced a licensing arrangement with Rockwell International of Newport Beach, California, to fabricate the prototypes and produce VSLI chips for low-cost decoders conforming to the NAPLPS (North American Presentation Level Protocol Syntax) standard. NAPLPS, which was founded on Telidon, became the videotex standard for North America in 1983.

Through a contract with Carleton University in Ottawa, Ontario, a new, higher-speed display architecture referred to as YUV was developed and patent action taken. A patent is pending.

Throughout the year, numerous visitors toured the Telidon research facilities. Areas of keen interest were CVSNET, Telidon with voice accompaniment, and the photographic display related to the new higher-speed display architecture.

Communications Networks and Standards R&D Directorate

This directorate researches advanced copper wire, coaxial cable and fibre optic networks technology and contributes towards national and international standards development in communications and computer protocols. The research is concentrated on telematic services, computer communications protocols and standards, fibre optics and broadband systems, and networks and services.

Telematic services

This activity fosters orderly development of telematic services and standards at both the national and international levels, with particular attention to the new Telidon-based standards (a description of which follows.)

During 1983, the Telidon standard was broadened into a joint United States/Canada standard. The Communications Networks and Standards R&D Directorate chaired the work of a joint committee of the American National Standards Institute (ANSI) and the Canadian Standards Association (CSA). By November, the two organizations had approved a standard referred to as the joint United States/Canada Videotex/Teletext Presentation Level Protocol Syntax.

On the broader international level, both nations submitted a proposal to the International Telegraph and Telephone Consultative Committee (CCITT) Study Group on videotex to adopt the North American Presentation Level Protocol Syntax (NAPLPS) standard for incorporation in the new CCITT Videotex Recommendations as part of the world videotex systems standards. The study group approved this submission in March 1984 to make NAPLPS one of three data syntaxes of the CCITT draft recommendation on videotex.

A Telidon NAPLPS test slide package was developed jointly with industry, approved by the Canadian Videotex Consultative Committee (CVCC), Canadian Standards Association (CSA) and CVCC/CSA Working Group and is now being marketed by the Canadian Advanced Technology Association (CATA) under licence from the department.

An Application Level Protocol for Videotex was also developed. The documentation has been distributed to CVCC and CVCC/CSA Working Group members for review and comment.

Computer communications protocols and standards

This area conducts research and development in computer communications interconnection, network design, and evolution of standards. Particular emphasis since 1980 has been on Open Systems Interconnection (OSI), an internationally accepted approach for dealing with the current incompatibility in computer systems interconnection, with the development of the Basic Reference Model for OSI as a first objective.

During 1983/84, the directorate, seeking an approach to standardizing conformance testing of complex protocols, developed a generalized OSI protocol test methodology and tested it successfully over links to other laboratories, thereby gaining acceptance by the International Standards Organization (ISO).

To accelerate the establishment of OSI standards, the division continued close active technical collaboration with laboratories in the United Kingdom and France, at the United States National Bureau of Standards (NBS) and in Australia. This work resulted in a number of world firsts in international experiments demonstrating OSI interworking capability. The directorate provided additional support through an extensive role in federal, national and international committees toward the establishment of OSI standards. The International Standards Organization forum has now completed its work on the development of a Basic Reference Model for data communications comprised of seven levels or layers of protocols. The next step is to obtain international agreement on the standards for the various protocol layers of the Basic Reference Model.

Fibre optics and broadband R&D

Research and development in this area focuses on new system and network concepts in fibre optic and other broadband local area networks (LANs), making industry aware of innovative approaches to broadband communications systems and providing advice to consultants.

The division provided consultative support to the National Museum of Man for its broadband network requirement and to the Ontario Ministry of Transport and Communications with respect to their decision to use fibre optics technology for the Highway 401 monitoring project.

Work included taking part in the successfully-completed extended Telidon Program trial of the Elie Fibre Optic Trial System with Manitoba Telephone System (MTS), which saw the addition of several interactive services such as electronic banking. In November, Treasury Board approved the transfer of the Elie Fibre Optic Trial System assets to MTS so that the trial system would continue to serve as a national operational testbed for related new technologies and services.

The directorate contracted two studies: "The Application of Fibre Optic Technology to the Access Network Evolution," completed by Bell-Northern Research for the department for distribution in 1984/85; and "Cable Data Communications Systems," completed by the Cable Telecommunications Research Institute (CTRI). These studies were distributed to interested parties in government and industry and were followed by a meeting to discuss requirements for and cooperative development of essential cable data system standards.

Networks and services

This area of the directorate focuses on research into the interworking of networks and systems related to information technology in order to encourage the orderly interworking of the different networks and systems found in local area network, text and office systems. Five research studies were contracted out with respect to system interfaces, protocols, and technical contributions to national and international standards for text and office systems.

Radio Systems R&D Directorate

This directorate researches and develops new radio and other wideband systems for improved services to the Canadian public, transfers the results to Canadian industry for exploitation, and provides technical expertise to government departments and other organizations.

During 1983/84, a low-cost, high-frequency (HF), digital, data terminal was developed, proved and transferred under licence to Glenayre Electronics of Vancouver, British Columbia. The terminal has been purchased by such government departments as External Affairs, Environment Canada, Fisheries and Oceans, and National Defence for use in remote areas and on ships. Over 50 terminals were delivered to customers.

The directorate carried out several cooperative programs to test the HF data terminal under actual operating conditions, including demonstrations of data transmissions from Canada's European and South American embassies and ship-to-shore Coast Guard communications from the Arctic to Ottawa. In addition, a trial involving Health and Welfare Canada medical stations was begun in the Arctic.

There were also research programs to improve the reliability and speed of the HF data transmissions. Among the promising techniques tried were error-correcting coding and special modulation. Improved frequency prediction techniques were also investigated.

During 1983/84, the RACE radio system was tested, and transferred under licence to Canadian Marconi. This system is becoming a commercial success with Marconi reporting the delivery of a $1 million RACE system to an African country and a $4 million RACE system being built for delivery to customers on several continents.

Wideband systems

This area developed, tested and evaluated the hardware and software of an experimental system used in the Communications Research Centre's teletext broadcast tests. It also designed, constructed and tested a teletext distortion/error rate meter that is used in such tests. This instrument measures the data amplitudes and "eye heights" of teletext signals, as well as the bit-error and packet-error rates. Licensing of the technology is pending with Canadian Patents and Development Limited (CPDL).

Other activities included a report on computer simulation of teletext transmission carried out for the United States Electronics Industries Association (EIA) Subcommittee on Teletext; and a specification and request for proposal for the development of a prototype mobile Telidon system for transmission of text and graphics over mobile radio channels. The latter also incorporates a request for a market survey. Following competitive selection, Mobile Data International (MDI), of Richmond, British Columbia was awarded the contract. A mini-data base was developed to facilitate the mobile Telidon contract. It includes several test pages and a communication protocol to ease interfacing with contractor equipment.

Another development was a simulated radio frequency (RF) link that includes a modified fading simulator and a computer system. The latter generates data and pseudo-random bit sequences, records errors, and measures the error rate.

Broadcast systems

This area carries out teletext research and development. It's main activities during 1983/84 were contributing to national and international standards development, measuring teletext signal reception in the Ottawa area, and providing support to the Canadian Caption Development Agency (CCDA) by way of industrial contracts toward the development of caption creation and encoding equipment.

Major contributions to standards activities led to an agreement between the Teletext Subcommittee of the Canadian Videotex Consultative Committee and the Electronics Industries Association of the United States. As a result, a specification, based on Telidon, has been adopted in Canada and the United States as a Teletext Service Reference Model that allows broadcasters to broadcast a defined level of service and manufacturers to build decoders to a corresponding defined level of performance. Being based on Telidon, the specification gives Canadian manufacturers of teletext systems a slight edge in providing transmission and receiving equipment.

Off-air measurements of Channel 13 television broadcasts carrying teletext signals were made at over 100 sites in downtown Ottawa and surrounding area. The measurements are now being analyzed to provide statistics on teletext coverage in the Ottawa area. A mobile laboratory was designed in-house to carry out similar tests in other parts of Canada. The measurements will be used to determine what improvements are needed to provide teletext coverage to a larger proportion of the Canadian public than can presently receive the signals.

In the Canadian captioning project, consultative services were provided to the CCDA for the development of caption creation and caption encoding equipment to prepare and transmit captioning information for television viewers with impaired hearing. The department's participation ensures the development of a dual system capability to permit the transmission of Telidon-based signals to future teletext decoders as well as the transmission of signals for present Sears Captioning Decoders based on the present Line-21 system.

Behavioural Research and Evaluation Directorate

In this directorate, behavioural research is conducted into human responses to the terminal and system designs of information technology. Research is also carried out in support of the Telidon Exploitation Program (TEP) and the Office Communications Systems (OCS) Program.

Telidon Exploitation Program research focused on the behavioural aspects of information retrieval, teletext service quality, the design of Telidon content (especially in relation to graphics), and enhancement of the user interface.

Office Communications Systems Program research focused on the social impact of office automation, the design of user manuals, the implementation of the new technology, and modelling of the office as an information processing system. Studies of performance monitoring, control systems and social communications for evaluating the automated office were initiated.

Also initiated was a study on human problem solving and human visual perception in relation to information technology and graphic images.

A study was completed on knowledge acquisition for expert systems to increase the range of usefulness of interactive information systems and services.

The directorate published well over 40 scientific papers in behavioural research. Requests for selections were received from within Canada and worldwide.

SPACE TECHNOLOGY AND APPLICATIONS BRANCH

Space Systems Directorate

Satellite-aided Search and Rescue (SARSAT)

Since the 1970s plans have been underway to use satellites to detect and locate emergency transmissions from aircraft or ships in distress. The department carried out the early experimental work and collaborated with the Department of National Defence in the development of an international experimental project called SARSAT. Canada, the United States and France agreed in 1979 to cooperate in a search-and-rescue satellite program. They have since been joined by Norway, Sweden and Finland, and discussions are underway with Denmark.

The SARSAT partners are also cooperating with the Soviet Union, which has implemented a compatible satellite-aided search-and-rescue program known as COSPAS. The aim is to achieve extended cooperation: utimately, a single international system. Two Soviet satellites have been launched for this purpose. Both have been operating successfully and have been made available for use by the SARSAT participants.

Under the SARSAT agreement, Canada has supplied radio repeaters built by Spar Aerospace Limited for installation on three American polar-orbiting weather satellites. The first was successfully launched in March 1983.

Since experimental operation began in September 1982 with the first Soviet satellite, there have been 88 major air or marine distress incidents involving 121.5 MHz alert and location data from COSPAS-SARSAT. A total of 241 persons were involved, 216 of whom survived. Twenty-five of these incidents occurred in Canada; 54 people were involved and 45 survived.

With these encouraging initial results, plans are being made to equip three additional American weather satellites (for an eventual total of six) with search-and-rescue instrumentation. Including satellites provided by COSPAS, it is expected that the cooperative program will be able to maintain two to four satellites in orbit until 1990, when a fully operational future system under international auspices can be established.

Mobile communications via satellite

The mobile studies group performed research and technology development in support of two main projects. The first was the department's mobile satellite project (MSAT) to provide mobile radio and radiotelephone service to users in rural and remote areas operating in 806-896 MHz band. The second was a program to investigate the feasibility of various types of mobile communications systems operation in the 1.5/1.6 GHz satellite mobile band. Part of this latter program was conducted in cooperation with Transport Canada and had the objective of investigating low-rate data and voice communications by satellite for trans-oceanic aircraft. Interest in this system is mainly for air traffic control purposes; the proposal is to use existing INMARSAT satellite and ground station facilities, thereby providing a very economical service. INMARSAT is an international organization created to provide communication to ships at sea. The MARECS spacecraft comprises part of the INMARSAT space segment and is used as a facility in this experimental program.

Over the last year, the mobile studies group has completed the following measurement campaigns:

- characterization of propagation effects for land-mobile communications by satellite at 871 MHz and 1542 MHz; and
- field trials of various equipment prototypes, using INMARSAT's MARECS satellite for both land and aeronautical mobiles.

In addition, the design, parts procurement and construction of a mobile satellite communications link simulator have been completed. A major part of this facility, the fading and shadowing simulator, was custom built under contract by Miller Communications Systems Ltd. of Kanata, Ontario. This device has already proved its value as a tool for testing mobile radio equipment in the laboratory.

To investigate the problems of developing a high-gain road vehicle antenna, a contract was awarded to Antech Antenna Technologies of Kirkland, Quebec. The antenna performance was evaluated using a helicopter to carry a signal source. One of the demanding areas of technology development for MSAT is that of the modems required to use efficiently the very limited available spectrum. Work has begun on two schemes, both to be implemented on a microprocessor, and both of which use bandwidths less than 5 kHz. The schemes are amplitude companded single side band and differential minimum shift keying.

Space Applications Directorate

Anik B

The Anik B program of satellite communications trials (which began in Feburary 1979) was completed in March 1984. The trials covered exploration of the use of 14/12 GHz satellite communications for tele-education, tele-health, government administration and community communications. On the basis of the results, TVOntario, the Knowledge Network in British Columbia, La Sette (a cable TV company in Quebec), and the pay-TV companies decided to use Telesat Canada's Anik C satellites for television distribution beginning in 1983.

Direct-to-home television trials led United Satellite Communications Inc. to lease five Anik C transponders for an early-entry Direct Broadcasting Satellite (DBS) service in the United States. Teleconferencing trials resulted in plans by the Government of Ontario to introduce video teleconferencing links between Toronto, Oshawa, and Thunder Bay, as well as extensive audio teleconferencing and electronic mail services. Thin-route time division multiple access (TDMA) trials resulted in the Government Telecommunications Agency's decision to contract for a TDMA service beginning in 1985.

During 1983/84, the focus was on the development and application of narrow-band systems. Test results proved the feasibility of stabilized antenna platforms for use on semi-submersible drilling rigs off Canada's east coast. Their use for voice and data communications and telemedical services was demonstrated. A contract has been placed with Spar Aerospace Limited to develop a commercial version of the terminal under the National Research Council's PILP Program.

To illustrate improved access to high school course material for remotely located schools, TVOntario tested a seven-terminal network for voice conferencing and access to Telidon educational data bases. This capability may be incorporated into a more extensive network being designed by the Government of Ontario.

Spar Aerospace of Montreal, Quebec, Skyswitch of Kanata, Ontario, and AEL Microtel Pacific Research of Burnaby, British Columbia, were provided with access to Anik B and Anik C transponders for testing and for user demonstrations of single-channel-per-carrier telephony terminals. These developments could become very important for operational private network services with the phased liberalization of earth station ownership in April 1985 for experimental purposes and 1986 for operational services.

In January 1984, the University of Saskatchewan began a three-month trial of satellite distribution of educational television programs to aid their assessment of satellite distribution for distance education.

A Satellite Communication Application Program has been approved, as part of the 1984/87 Space Plan, to enable the department to continue to explore new technologies for satellite communications and how they may be employed to improve the delivery of telecommunications services.

RADARSAT satellite program

During 1983/84, a team at the Communications Research Centre (CRC) managed technical studies for the Department of Energy, Mines and Resources (EMR) in the preliminary definition (Phase A) of a remote sensing satellite which could be launched by 1990. CRC will continue to provide support to EMR during the detailed planning phase (Phase B) of the program, which will take place between September 1984 and December 1986.

Space Electronics Directorate

The space environment imposes special requirements on electronic components, and reliability is particularly important since repair of failed components is generally not possible. During 1983/84 the Space Electronics Directorate of the department carried out or supported research and development in a number of key areas of technology, including the following:

- gallium arsenide and circuit technology for application to microwave, opto-electronic and high-speed logic components in satellite applications;
- reliability techniques to determine failure modes of devices and circuits used in spacecraft;
- analysis of compound semiconductor material for use in microwave circuit fabrication;
- reliability studies on commercial microprocessor devices when operating in a space-radiation environment;
- power converter circuitry for use in future high-power satellites;
- microwave components for application to the 20/30 GHz frequency band;
- modems for satellite-switched/time-division-multiple-access in the 12/14 GHz band;
- fin-line technology development for hybrid microwave components;
- electronically-steered phased-array antennas.

An important aspect of the work in gallium arsenide (GaAs) technology is the development of monolithic microwave integrated circuits (MMIC). These circuits will enable critical satellite transponder and earth terminal components such as receivers, amplifiers, oscillators, and mixers to be fabricated on a single chip of gallium arsenide, thereby providing considerable advantages in cost, size, weight, and reliability over present-day components. During the year, significant progress was made both in-house and through industrial contracts with Optotek Ltd., Ottawa, and Bell-Northern Research in the processing and fabrication of gallium arsenide field-effect transistors having 1 micrometre gate lengths which are key elements in MMIC development. Valuable technical design

information was obtained through a contract with the University of Waterloo for computer modelling of GaAs MMIC passive circuit elements and optimum interconnects to avoid parasitic effects.

Current forecasts for future satellite communications indicate that by the end of the 1990s there will be a shortage of available capacity in the 6/4 and 14/12 GHz frequency bands and both operators and users will be required to utilize the next highest band at 30/20 GHz. To prepare for this, plans have been made to undertake trials using the European Space Agency OLYMPUS satellite to explore the utilization of this frequency band. The trials will involve the use of three prototype earth terminals, to be produced through a program of in-house R&D and industrial contracts. During the year, work was initiated on the in-house development of components for the receive and transmit portions using several transmission line techniques, and a contract was awarded to Varian Canada for the development of a high-power 30 GHz travelling wave tube.

Space Mechanics Directorate

Future generations of satellites and space systems will be larger and more complex than present designs. To meet the stringent requirements in the mechanics areas, the directorate conducts R&D activities on the following topics: orbit and attitude determination and prediction, satellite/antenna attitude control and pointing, on-board microprocessor-based systems, structures and mechanisms, thermal modeling and control, space materials, and structural dynamics. The directorate also has facilities for dedicated real-time computer simulation and for development and test of attitude control components.

In 1983/84, the directorate made substantial progress in establishing new computer-aided methods of structural modeling, analysis, and testing at CRC, Spar and the universities of Sherbrooke and Toronto. Also through a coordinated in-house, industrial and university program, new techniques and software have been developed for control of next-generation large flexible spacecraft.

The directorate completed real-time simulations for the attitude and orbit control system and the on-board processing system which are being considered for use on a future Canadian mobile communications satellite. In addition it carried out dynamics and control research for the 300 m tip-to-tip shuttle-attached antenna system for the NRC-managed WISP (Waves in Space Plasma) Program.

In order to monitor material specimens on board the NASA Long Duration Exposure Facility (LDEF), the directorate designed and developed a data acquisition system and launched it as part of the NASA Space Shuttle Flight STS-41D. In conjunction with the Canadian Payload Specialist (Astronaut) Program, a proposal to expose advanced composite materials specimens to the effects of atomic oxygen in low earth orbit was prepared and accepted for flight in October 1984.

The directorate successfully completed and delivered a large cradle employing new pitch-based carbon-epoxy composite material to the David Florida Laboratory for integration into the Horizontal Axis Measurement System (HAMS) that is used for measurement of mass properties of satellites. Parameter estimation methods for reduction of mass properties from basic data by minicomputer were also developed.

A new linear thermal actuator, for the deployment and position control of antennas and other appendages, progressed from the conceptual design stage to the manufactured and tested hardware stage, through contracts in industry. As well, a new concept for a very efficient heat pump, with substantial potential for terrestrial spin-off applications, was developed for use in spacecraft cooling systems.

During 1983/84 the directorate also:

- established proof-of-concept of a retractable solar array through development of breadboard hardware;
- carried out R&D on intelligent fault-tolerant on-board computer systems to cope with increased mission complexity, to improve reliability and to reduce spacecraft operating costs;
- completed a multi-year research program at the University of Toronto Institute for Aerospace Studies on improved methods for calculating spacecraft orbit and attitude parameters; and
- completed the initial development stage of the Control Systems Laboratory, capable of testing and evaluating space quality inertial systems (gyroscopes, etc.), which was funded by a special three year Treasury Board Capital allocation.

These areas and progress contribute to the overall technology base required for future use on satellite communications missions and for other space missions. Much of the technology is developed through contracts with industry and universities.

New signal processing techniques

The European Broadcasting Union has adopted a new broadcasting standard based on multiplexed analog components for direct broadcast television by satellite. The Communications Research Centre made comparisons between this proposed new standard and the present broadcast transmission standards and has concluded that it has considerable merit for future development. It appears to have significant advantages for the transmission of scrambled signals for pay-TV and could result in a general improvement in the quality of television reception.

The communications processing section produced the following technical developments during 1983/84:

- improved techniques for converting analog voice signals to and from digital data streams, using microprocessors, at a data rate of 4800 bits per second;
- software realizations of techniques for impressing or extracting digital information on a radio carrier, with particular emphasis on the mobile radio environment; and
- techniques for scrambling voice and data transmissions over radio systems, to ensure privacy.

Transfer of technology to Canadian industry

As part of the department's policy to transfer technology to industry for further development and marketing, the LPC digital voice codec developed at the Communications Research Centre was licensed to Glenayre of British Columbia and Canadian Marconi of Ontario.

COM DEV Ltd. of Cambridge, Ontario, successfully completed a program that resulted in the transfer of surface acoustic wave (SAW) device technology from the Communications Research Centre labs to their facility. COM DEV Ltd. is now a supplier of such components for space and other communications applications. With the assistance of the Communications Research Centre, Optotek Ltd. of Ottawa, Ontario, continued development of a gallium arsenide (GaAs) device technology base, and, under the National Research Council's PILP Program, Linear Technology of Burlington, Ontario, continued development of UHF transistors and integrated circuits. A $7.5 million PILP contribution has also been awarded to Bell-Northern Research for development of high-speed digital gallium arsenide integrated circuits.

This contribution will be accompanied by a transfer of technology from both the Communications Research Centre and the National Research Council laboratories over the three year life of the project.

Support for DND

On behalf of, and under the sponsorship of the Department of National Defence, technology and systems concepts are under development to permit the use of extremely high frequencies (EHF) to meet a possible future requirement for survivable satellite communications. A 44/20 GHz and a 36/38 GHz ground station have been established at Shirley Bay, Ontario, for respective use with a 16 km test range and the Lincoln Experimental Satellites (LES) 8 and 9. The test range makes use of a simulated satellite located at Kingsmere, in the Gatineau Hills of western Quebec. These satellites are advanced experimental satellites in inclined, geosynchronous orbits over North America.

In addition to the laboratory experiments at Shirley Bay, a number of technology developments are now underway within Canadian industry. They include:

- millimetre-wave components and subsystems;
- surface-acoustic-wave signal processing devices;
- a high-speed, frequency-hopping frequency synthesizer;
- a free space laser communications system;
- extremely high frequency (EHF) multiple beam and null steering antenna technology.

This development will help build the technology base that is likely to be required by the Department of National Defence. It will also serve as a base for developing commercial non-military uses of millimetre-wave technology.

ISIS 1 and ISIS 2 operations discontinued

In March 1984, the department ceased operation of the ISIS 1 and ISIS 2 satellites launched in 1969 and 1971 respectively. This brought to an end some 22 years of satellite data collection on phenomena taking place in the region of maximum ionization in the ionosphere. However, Japan's Radio Research Laboratories have requested permission to continue operating the satellites to gather

data until March 1985 for a Middle Atmosphere Program. Attention in the department is now directed towards the measurements that can be made with a new generation of instruments that can be carried on board the Space Shuttle in 1989-90 for the Waves in Space Plasma (WISP) Program.

ITU Regional Administrative Conference

In March 1983 the Communications Research Centre provided extensive technical support to the department for the ITU Regional Administrative Radio Conference on DBS held in Geneva in June and July of 1983. The purpose of this conference was to plan orbit slots and channels for Direct Broadcasting Satellites operating in the 12.2 - 12.7 GHz band in Region 2 (the Americas). The department's experience with Hermes and Anik B provided a strong foundation for the Canadian positions, and Canada achieved most of its national objectives at the conference.

RADAR AND COMMUNICATIONS TECHNOLOGY BRANCH

Radio communications

The Radio Communications Laboratory is responsible for:

- R&D in radio communications technology, with subsequent transfer of technology to industry;
- research into interference and compatibility;
- research support for the department's spectrum planning, licensing and regulation activities;
- research into radio communications technology for the Department of National Defence.

Radio communications technology

Research in this area has concentrated on the areas of HF/VHF radio-to-telephone interconnect; VHF/UHF mobile radio communications, and in particular research on the application and development of an emerging technology amplitude companded single side band (ACSB); and rectenna technology research (a rectifying antenna) for reception of microwave power transmitted over a long distance.

In 1978, the North Quebec Inuit presented a brief outlining their communications needs to the Department of Indian and Northern Affairs, the Secretary of State and the Department of Communications. One requirement was for communications from the land to the community (trail and remote-camp radio). In response to related communications requirements, industry had developed remote mountain-top VHF repeater systems and HF "bush radios". What was needed was to integrate these technologies into an automated system requiring no radio operator, and to develop or adapt portable radio equipment for the Arctic environment.

The department, together with industry, began an R&D project to develop such a system, the prototype of which was installed in the northern Quebec community of Koartak in 1976/77. Since there were no telephones in the community, the system used radio technology: VHF and HF portable radios were used for communications from the land (from the trail and from remote camps), and VHF radios were installed in a number of homes. In effect the automatic base station/interconnect terminal provided for radio cross-patch, that is, a person in the community using a VHF radio could speak with a person at a distant location using an HF portable radio, which greatly extended the communications range possible using VHF radio only.

However, the community of Koartak now has a telephone system, as do most northern communities, and satellite/or radio relay terminals link the communities to the outside world. This made necessary further refinements in the system so that radio installations in villagers' homes would no longer be needed. In-house research in collaboration with Baron Communications of Vancouver, British Columbia, produced suitable terminal equipment. The radio-to-telephone-interconnect (RTI) terminal is controlled by microprocessor and enables cross-patching of VHF or HF radio systems. In addition to the radio-to-telephone-interconnect, users can make selective calls. This system was tested in limited field trials during 1983/84. Because it requires more extensive evaluation, the department, in cooperation with the Labrador Inuit Association and the Newfoundland Telephone Company, will carry out a field trial in Labrador and the North Coast during 1985/86. The field trial of this HF-SSB radio-to-telephone interconnect system will compliment a VHF trail radio project, sponsored by the federal and Newfoundland governments to improve communications in Labrador.

Interference and compatibility

An urban area's radio signal environment can cause interference that affects the performance and reliability of radio communications. Strong signal levels can affect a variety of electronic equipment used by consumers. During 1983/84, the Radio Communications Laboratory analyzed and interpreted comprehensive measurements made in 1982/83 of the signal environment of 150,450 and 850 MHz frequencies used for land mobile radio communications and of strong AM, FM and TV broadcast signals.

Radio noise is another phenomenon that affects radio communications. The department has been collecting data on radio noise levels, particularly of the mobile radio bands, to use as a basis for setting standards, for predicting the design and performance of various communications systems, and to assess interference. These signal and noise environmental studies will evolve during 1984/85 into the development of a mobile radio channel simulator which will facilitate mobile radio technology research. Areas needing further work are: compatibility of digital and voice communication systems; compatibility of FM and ACSB systems; optimization of ACSB communications; and evaluation of performance of digital communications using ACSB; etc.

Re-radiation of MF broadcast signals from highrise buildings and power transmission lines constructed near broadcast stations results in distortion of the directional patterns of the broadcast station's antenna system. This could cause interference for listeners in adjacent areas who are in the protected directions of the local broadcast station. There is an urgent need to study this phenomena, both to establish the magnitude of the effect and to develop remedial measures that will minimize the interactions. In 1977, the department spearheaded an R&D project that evolved into a major program involving research carried out in-house, at the National Research Council, at the universities of Toronto and Concordia, and Ontario Hydro. Underway for approximately five years, this study, unique in that no other country has ever looked at the problem in such detail, should be completed by the end of the 1984/85 fiscal year. Part of the work was funded by the Canadian Electrical Association.

Spectrum planning, licensing and regulation

Major activities in this area included monitoring of land mobile radio use and licensing of ACSB mobile radio systems.

The radio spectrum is a limited resource, a problem particularly noticeable for land mobile use, since the bandwidths assigned to this service are barely adequate to meet public demand. To alleviate this situation, the department has developed a computer-assisted Spectrum Management System (SMS). A key element of SMS is the application of land mobile radio channel usage data to allow extensive channel sharing by different users, thereby maximizing use of the band. Obtaining the channel usage data is a difficult technical and logistic problem, however, the department has successfully developed monitoring techniques and data analysis methodologies that are based on the use of mobile equipment. Canada is believed to be the first country to have a fully operational SMS system, and second-generation monitoring equipment, which is expected to have off-shore sales potential, is now being developed by Miller Communications Systems Ltd. of Kanata, Ontario.

Spectrum research

The Radio Propagation Laboratory carried out spectrum research to explore the potential of those portions of the spectrum not currently in use, and to assist planners and designers of radio systems to make use of the radio frequency spectrum.

As part of its ongoing ionospheric studies related to medium and high frequency communications, the department has continued to record and analyze data from the ISIS 1 and 2 satellites (which ceased operations in 1983 after twelve successful years).

The laboratory also provided scientific leadership to the high frequency portion of the Canada/United States Waves in Space Plasmas experiment. On behalf of this experiment, the National Research Council awarded a contract to Canadian Astronautics Ltd. of Ottawa, Ontario, for the development of equipment that will be flown on the Spacelab-6 mission of the Space Shuttle Program.

The department's VHF/UHF prediction program, a sophisticated computer-based procedure for determining the radio coverage of transmitters operating in these bands, has been made available to industry through the Access to Information Act.

Work continued on a comprehensive program to develop new models, or verify existing models, for upper UHF land mobile propagation channels, on the basis of channel characterization and performance measurement. Simultaneously, in a contract awarded by the department, Laval University in Quebec conducted computer simulations to study coding and digital system error performance.

Studies of UHF and VHF propagation in the Canadian Arctic investigated the possibility of taking advantage of unique propagation conditions to improve the reliability and efficiency of Arctic communications.

In the microwave region of the spectrum, a 15 GHz digital radio system has been installed from Shirley Bay to downtown Ottawa (about 15 km) to determine propagation reliability in this band. As well, the department conducted special studies with Teleglobe Canada to further evaluate sites in Ontario that are under consideration for INTELSAT earth stations. Initial measurements were made to examine earth-space propagation limitations in the 30-40 GHz frequency range.

Radar and military communications

In addition to its own activities, the branch provides advisory services and carries out various research projects in support of military radar and communication systems. This work is carried out in the Radio Communications Laboratory, the Radio Propagation Laboratory, the Military Communications Directorate and the Radar Research Laboratory. The department is also a source of expertise for other government departments having interests in these areas, including Environment Canada, Transport Canada and Fisheries and Oceans.

Optical Communications Directorate

The optical communications group conducts research in selected areas of optics, opto-electronics and integrated optics (comprehensively termed photonics) to advance optical communications and information technologies, with potential secondary impact on computer technology. The research output consists of scientific papers, talks, demonstration of novel devices, inventions and patents; where it is useful to do so this technology is transferred to Canadian industry for further development and exploitation. The mechanism of transfer is by the licensing of technology through CPDL as well as through the use of development contracts. Through its expertise gained in research, studies and technology assessments the group

supports the departmental strategic needs in the photonic field with respect to regulation, policy, industrial development and the development of fibre-optic standards by participating in CCITT, International Electrotechnical Commission and chairmanship of the Government Electronics Standards Committee/Data Communications Working Group — Special Interest Group on Optical Communications (GESC/DCWG SIG). The technical capability of the group is also used to evaluate photonics and related proposals submitted to the National Research Council (NRC) Granting Agencies (Industrial Research Assistance Program, IRAP; Program for Industry/Laboratory Projects, PILP; the Natural Sciences and Engineering Research Council of Canada, NSEC; Project of Research Applicable in Industry, PRAI). A further function of the group is to provide the Department of National Defence with consultation and contract management on its activities in optical fibre technology and to participate in the NATO RSG-12 and TTCP Subgroup JTP-12 on military applications of optical fibre technology.

During the year significant progress was achieved as a result of in-house research. A fused biconical single-mode coupler that could be tuned mechanically was demonstrated. This device has applications as an optical bypass switch in high-speed fibre-optic local networks and in optical fibre sensors that are of all-fibre-interferometer construction. The fused biconical single-mode directional coupler was also shown to be sensitive to the refractive index of the material surrounding the coupler waist thus providing a means for fabricating an electronically controlled optical switch. Invention notices for both these devices were submitted to CPDL. The group has developed an analytic model to describe the operation of a semiconductor laser diode and demonstrated the modulation of laser diodes at frequencies up to 5 GHz. This latter capability offers the possibility of transmitting microwave carrier signals directly on an optical light beam through a fibre.

In its external activities the optical communications group sponsored a contract in industry to develop high-speed transmitter and receiver pairs that transmit digital signals at 1 Gbit/sec or analog signals with a 0-5 GHz bandwidth. These devices have important applications in high speed digital trunks, as attested by AT&T's plan to build in the United States a $2 billion 1.7 GHz national network. In order to diffuse fibre-optic technology within Canada the group transferred to Canadian universities technology relevant to optical fibre preform fabrication using a chemical vapour deposition plasma torch. It also transferred new fabrication techniques useful for making high-performance fused biconical single-mode directional couplers. The group funded two studies "Application Opportunities for Optical Communications in Canada" and

"Identification of Inside Plant Fibre Optic LAN Technology Needs". The first study provides the department with data on the technical resources available in Canada on a technology that will eventually dominate the communication and information industry worldwide whereas the second study investigated means that optical fibre will be used in the local area networks.

The principal military activity was the development in industry of low loss single-mode couplers using the optical polishing manufacturing technique. Canada now has the capability to manufacture fibre-optic directional couplers using the two best approaches and is the principal supplier of couplers in the world. The Naval Research Laboratory (NRL) asked the optical communications group to apply their expertise to the fabrication of directional couplers from polarization maintaining fibre. Special fibre etching techniques were developed to permit the fabrication of couplers from this fibre. Two couplers were sent to NRL under the TTCP JTP-12 component exchange program. Canada also contributed to activities of the NATO RSG-12 by supplying high-performance couplers for characterization to the participants of the subgroup on modal effects in short-haul military fibre-optic links and, by funding in industry, a study contract on modal effects in short-haul military links.

CANADIAN WORKPLACE AUTOMATION RESEARCH CENTRE

In April 1983, the Department of Communications created the Canadian Workplace Automation Research Centre at Laval. The centre received a start-up budget of $11 million ($5 million for construction and $6 million for equipment). Its operational and maintenance budget, which was approved by Treasury Board in February 1984, is $4,430,000 for the 1984/85 fiscal year and will be gradually increased to $11,578,000 by 1987/88.

Approximately half of the scientific staff will be recruited from the private sector and universities through the Industrial Exchange Program to be funded by the centre. Its 111 person-years will consist of 71 permanent employees and 40 additional staff members drawn from outside sources. The centre began operations in temporary quarters in April 1984 and will move to permanent facilities in November.

To ensure that the centre meets the expectations of users, the department has sought advice from a variety of federal departments and agencies, the private sector and universities. These consultations have resulted in a number of innovative measures that will facilitate and maximize technological transfers.

The centre will be able to rely on the support of two standing committees. The first, composed mainly of private sector and university representatives, will provide the department with advice on the centre's scientific activities; its chairperson will be elected by members. The second, a type of interdepartmental forum, will bring together various federal public servants under the chairmanship of the Deputy Secretary, Policy and Strategy Branch, Ministry of State for Science and Technology.

In addition to conducting research and development, as specified in its mandate, the centre will coordinate such efforts at the national level. Its research program will focus on the technical and organizational aspects of workplace automation systems, and will include psychological and social impact studies. Its principal objectives are as follows:

- assist users, including the federal government, in defining their workplace automation needs and thereby help Canadian office equipment manufacturers to compete at home and abroad;
- develop a pool of knowledge and highly skilled individuals, in cooperation with the public and private sectors, to enable Canada to penetrate domestic and international markets which, in 1983, were worth $3 billion and $100 billion respectively;
- establish an information network linking the federal government, industry and universities to facilitate the rapid transfer of new ideas and research results and thereby enable manufacturers to improve their production planning and respond to demand;
- become a national and international centre for the distribution of information and exchange of personnel to promote awareness among users and the general public about the economic benefits and social impact of workplace automation.

The centre's scientific activities will focus on four main areas:

- integrated systems;
- advanced research;
- organizational and social impact research; and
- information distribution and development of a strategic information network.

REGIONAL OPERATIONS

Central

University Research

Staff in the Central Region were involved in co-ordinating the development of a research proposal entitled Le défi de l'informatisation de la société canadienne pour la francophonie dans l'Ouest canadien : perspectives et prospective. Under the auspices of the Centres of Excellence Program, the study involves two French institutions, the Faculté St. Jean at the University of Alberta and the Centre d'études bilingues at the University of Regina.

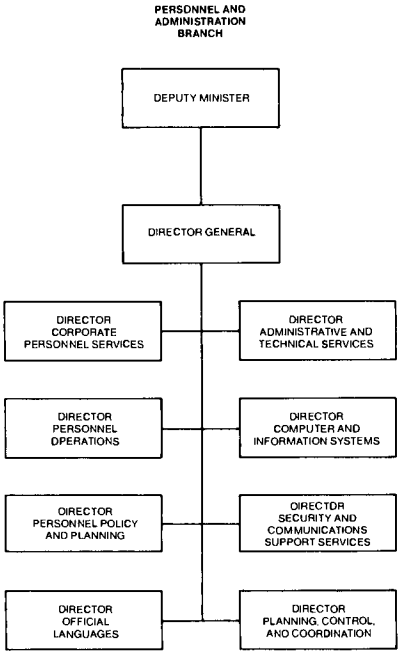
Space

In cooperation with the University of Saskatoon, the department took part in the development and implementation of a field trial using a satellite link and cable for veterinary education courses. A videotape outlining the program, and the department's involvement, is now available.

Ontario

Program Development and Policy Analysis

Regional staff took part in seven days of MSAT, and 31 SARSAT presentations in different locations throughout Ontario, and eight exhibitions covering approximately 50 days, primarily in Toronto.


PERSONNEL AND ADMINISTRATION BRANCH
DEPUTY MINISTER
DIRECTOR GENERAL
DIRECTOR CORPORATE PERSONNEL SERVICES
DIRECTOR ADMINISTRATIVE AND TECHNICAL SERVICES
DIRECTOR PERSONNEL OPERATIONS
DIRECTOR COMPUTER AND INFORMATION SYSTEMS
DIRECTOR PERSONNEL POLICY AND PLANNING
DIRECTOR SECURITY AND COMMUNICATIONS SUPPORT SERVICES
DIRECTOR OFFICIAL LANGUAGES
DIRECTOR PLANNING, CONTROL, AND COORDINATION

Personnel and Administration Branch

7

Under the departmental reorganization, eight of the directorates that provide the infrastructural services upon which each sector relies were incorporated into the Personnel and Administration Branch.

Planning, Control and Coordination Directorate

Access to information and privacy

The Access to Information Act and the Privacy Act came into effect in July 1983, and during the first year of implementation, the department received 31 access inquiries and three privacy inquiries. One of these resulted in a complaint to the information commissioner during this period.

To enable staff to assist the public with placing enquiries, during 1983/84 personnel completed the entering of all departmental records classification manuals, including those from regional offices, into the departmental records data base, thereby facilitating computer searches using key words.

For the second year of implementation, plans were underway to set up reading rooms in the regional offices, where the public could consult departmental manuals, including the automated records index.

Personnel Operations Directorate

As of March 1984, the department had 2,377 men and women on staff, distributed in the following categories: Administrative Support, 30 per cent; Technical, 27 per cent; Administrative and Foreign Service, 22 per cent; Scientific and Professional, 15 per cent; Management, 4 per cent; and Operational, 2 per cent.

Affirmative Action Program

In the area of human resources management planning, the procedures of the government's Affirmative Action Program, created to ensure that women, indigenous and handicapped people receive equitable representation through the Public Service of Canada, were a priority: the objectives established under this program and the specific action plans developed for the department were carefully taken into account.

At the end of March 1984, female employees in the department numbered 884 and were represented in all employment categories. A heavy concentration of female employees is evident at the lower levels in the Administrative Support category (614 women) and in the Administrative and Foreign Service category (128 women). These two junior level categories account for 83 per cent of the total number of female employees in the department.

Female Employees by Category and Hierarchical Level

Category	Senior	Intermediate	Junior	Total
Management	7			7
Scientific and Professional	7	7	4	18
Administrative and Foreign Service	22	69	128	219
Technical		3	22	25
Administrative Support			614	614
Operational	—	—	1	1
	36	79	769	884

English is the official language of 70 per cent of the department's total staff. Employees who report French as their first official language are represented in all employment categories.

The department also continued to promote the recruitment of native and handicapped people through special measures designed to increase their representation. Seven appointments had been made by the end of the fiscal 1983/84, and the department intends to maintain its special recruitment program for people in these two target groups during 1984/85.

First Official Language by Category and Hierarchical Level

Category	Senior E	Senior F	Intermediate E	Intermediate F	Junior E	Junior F	Total E	Total F
Management	72	22					72	22
Scientific and Professional	181	21	99	41	14	11	294	73
Administrative and Foreign Service								
Technical	3		236	59	256	71	495	130
Administrative Support					412	296	412	296
Operational					56	14	56	14
	333	75	488	173	836	472	1,657	720

Official Languages Directorate

The department attaches a high priority to providing bilingual services to the public. Consequently, the department was pleased when a customer survey it conducted during 1983/84 revealed that 98 per cent of its clients expressed complete satisfaction with the linguistic quality of its services.

The equality of status of the two official languages within the institutions of Parliament and the Government of Canada, as declared in Section 2 of the Official Languages Act, is ensured by a number of programs and activities within the department. For example, at the scientific symposium the department organized to mark World Communications Year in 1983, 35 per cent of the 50 papers given were presented in French to an audience of some 150 specialists. Another example is the department's French-language Centres of Excellence Program, under which 16 research contracts totalling $350,000 were awarded in fields of special interest to the department.

Administrative and Technical Services Directorate

Library

During 1983/84, the departmental library continued the transfer of its manual records to the DOBIS system, an on-line library management system that supports major library functions and searches for all types of library material. By the end of the fiscal year, approximately 75 per cent of the card catalogue had been transferred to DOBIS. The library's terminals also have access to the department's own automated records index, the Infoglobe system (which provides data on the Globe and Mail press files), and the Canada Systems Group data bases (which provide information on Canadian companies).

Records Management Division

Under the functional direction and control of the Records Manager, all records systems were decentralized to the users. The Records Management Division periodically audits the systems and prepares reports on the resulting observations and recommendations for the benefit of users. The decentralized system has resulted in savings of approximately 17 person-years.

Material services and contracting

This division has implemented several changes to improve service to the operational sectors and reduce the cost of operations.

The introduction of microcomputers played a major role in service improvement and costs reduction. For example, the transfer of the Contract Information System, formerly on the Comshare VIP system, to a departmental microcomputer, will save approximately $25,000 annually in service bureau fees. In addition, both the Headquarters Storeroom Inventory and the Photo-copier Utilization Program were transferred from manual systems to the computer.

In the area of telecommunications and accommodations, several projects were initiated for 1983/84. Planning began for converting the department's telephone system to the new Enhanced Exchange Wide Dial system. Two thousand telephones at headquarters will be affected and all telephones at the Communications Research Centre will receive new numbers.

A new data communications concentrator, the Develcon Dataswitch, was installed at the beginning of the year. By the fiscal year-end, the system had 180 users at headquarters and close to 600 users at the Communications Research Centre.

Th division replaced individual maintenance agreements for repairs to office machinery and word processing equipment with standing offer agreements issued through the Department of Supply and Services (DSS). Savings in lower rates and lower DSS contracting charges will be noticeable.

Computer and Information Systems Directorate

The Computer and Information Systems Directorate has provided large scale computing power, information systems planning, development and operations support to the department. To keep pace with the rapid evolution of advanced informatics technology, the directorate must play a leading role in training and support for technology users. In 1984, two such initiatives were the provision of key systems support for the OCS field trial, and the opening of the Micro-computer Display Centre.

The display centre is equipped with a variety of microcomputers and a library of systems, development and applications software. Complete with ergonomically designed furniture, the facility is available to departmental staff who wish to compare and evaluate hardware/software configurations to determine which best meet their requirements.

Informatics training is available through the centre, which was established to provide basic and enhanced levels of computer literacy. Users will have access to audiovisual and computer software training packages, as well as hands-on experience under the guidance of trained personnel.

Security and Communications Support Services Directorate

This directorate has a dual mandate which is carried out by the Security Programs and Operations Division and the Communications Support Services Division.

The Security Programs and Operations Division is responsible for developing, implementing and monitoring all security policies and programs related to the protection of information, personnel, property and facilities at headquarters and in the regional and district offices. This mandate includes the administration of an occupational health and safety program and a fire prevention program.

The interdepartmental mandate of the Communications Support Services Division requires it to provide communications-electronic security support for federal departments and agencies, including the development of plans and programs to ensure the continuity of telecommunications services to meet government, industry and public needs during civil and wartime emergencies.

Security Programs and Operations Division

The division's programs provide services in areas such as clearance and identification of personnel, reliability screening, access control, surveys of problem areas, training and education of employees, and advice on information and technical security and occupational health and safety matters.

Several initiatives were undertaken in 1983/84. The Security Inspection Program for regions and districts was expanded into a survey to assist in improving departmental security procedures. It began a program for providing disaster response facilities and procedures to ensure the protection of departmental assets and personnel in any emergency. It continued to improve the efficiency of the fire emergency organization (which has won national and regional awards for excellence). The division has also undertaken studies to consider how office automation could threaten the security of office communications systems.

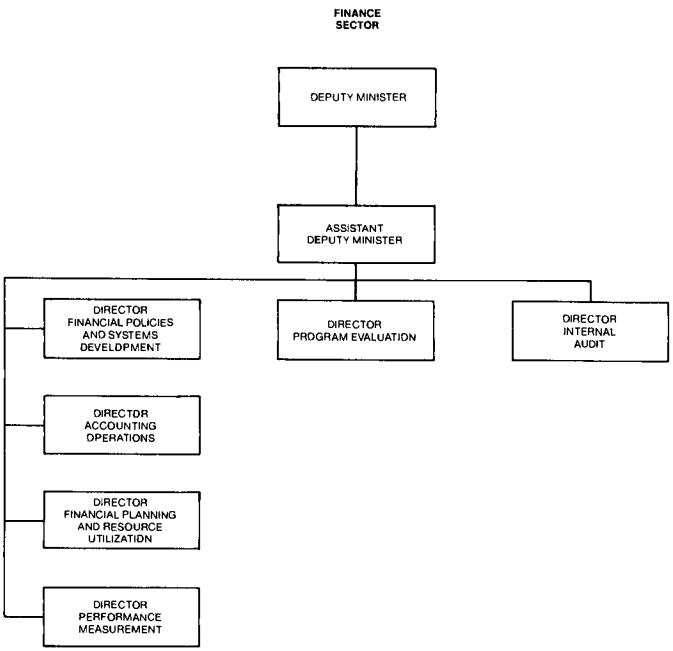
Communications-electronic Security (COMSEC)

This division comprises an external service to support and represent most federal departments and agencies to originate or enhance security of information as it is during processing or telecommunication.

The division assists through identifying and verifying requirements, preparing systems designs, and providing implementation and operational support. Since knowledge of COMSEC is not widely based, the division's training and briefing sessions and periodic COMSEC advisory notices are also important functions which supplement the information clients receive at Central Committee meetings where the formulation of COMSEC policy recommendations, standards and guidelines is carried out.

On-going activities and projects undertaken by the division during 1983/84 include:

- systems design or trials for such departments as Revenue Canada - Taxation, Employment and Immigration Canada, Justice, and Ports Canada;
- coordination of six COMSEC training courses and two intra-departmental briefing sessions;
- inspection, evaluation, and advice pertinent to EDP facilities as the COMSEC member of the RCMP Security Evaluation Inspection Team (SEIT);
- trials of Canadian federal government approved documents;
- attendance at four regular meetings of the Communications-electronic Security Committee;
- attendance at Government Telecommunications Planning Group (GTPG) meetings; and
- representation at selected seminars.


FINANCE
SECTOR
DEPUTY MINISTER
ASSISTANT
DEPUTY MINISTER
DIRECTOR
FINANCIAL POLICIES
AND SYSTEMS
DEVELOPMENT
DIRECTOR
PROGRAM EVALUATION
DIRECTOR
INTERNAL
AUDIT
DIRECTOR
ACCOUNTING
OPERATIONS
DIRECTOR
FINANCIAL PLANNING
AND RESOURCE
UTILIZATION
DIRECTOR
PERFORMANCE
MEASUREMENT

Appendix I

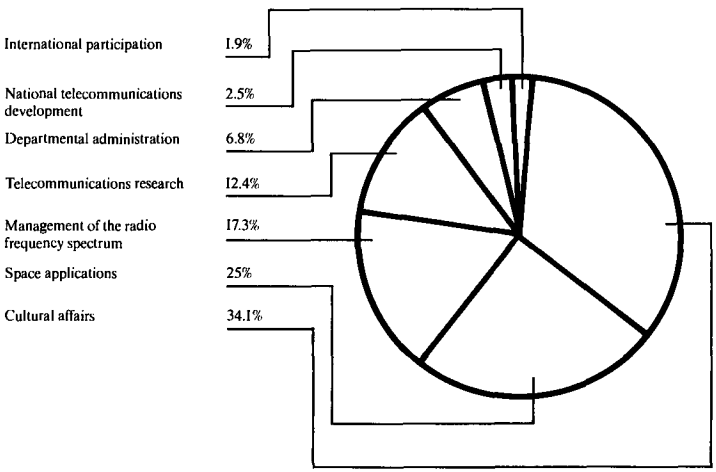
Expenditures by activity 1983/84
(in thousands of dollars)

	Operating	Capital	Grants and contributions	Total
COMMUNICATIONS PROGRAM				
Departmental administration	15,833	85		15,918
Telecommunications research	19,698	8,843	455	28,996
National telecommunications development	5,787		68	5,855
International participation	1,962		2,415	4,377
Management of the radio frequency spectrum	38,375	1,379	807	40,561
Space applications	29,670	13,641	15,222	58,533
Contributions to employee benefit plans	9,781			9,781
	121,106	23,948	18,967	164,021
Less: revenues credited to the vote	5,874			5,874
	115,232	23,948	18,967	158,147
Less: receipts credited to revenue	23,516			23,516
Add: accommodation provided without charge by this department	3,585			3,585
accommodation provided without charge by Public Works	7,014			7,014
other services provided without charge by other departments	1,596			1,596
Total cost of program	103,911	23,948	18,967	146,826
COMMUNICATIONS PROGRAM-GOVERNMENT TELECOMMUNICATIONS AGENCY REVOLVING FUND				
Administration	5,462	320		5,782
Telecommunications engineering support	4,043			4,043
Operations	121,373			121,373
	130,878	320		131,198
Less: receipts credited to the Fund	129,989			129,989
	889	320		1,209
Total cost of program	104,800	24,268	18,967	148,035
ARTS AND CULTURE PROGRAM				
Policy development and analysis	2,285			2,285
Special programs	56,104	46	21,544	77,694
Contributions to employee benefit plans	421			421
	58,810	46	21,544	80,400
Less: receipts credited to revenue	172			172
Add: accommodation provided without charge by Public Works	292			292
other services provided without charge by other departments	67			67
Total cost of program	58,997	46	21,544	80,587
Grand total	163,797	24,314	40,511	228,622

SOURCE: Public Accounts of Canada, 1983/84

Appendix II

Total expenditures by activity 1983/84
(excluding the Government Telecommunications Agency)



SOURCE: Department of Communications.

Appendix III

Government Telecommunications Agency Revolving Fund
Statement of operations for the year ended March 31, 1984

	1984	1983
	$	$
Revenue		
Telecommunications services	130,188,348	116,375,065
Expenses		
Operating		
Intercity network	53,324,942	48,410,589
Customized services	53,114,880	47,814,987
Operators' salaries	6,042,574	5,031,136
Government data network	4,943,590	4,341,794
Local shared services	1,754,098	1,351,455
Interest charges	922,703	643,243
Directory services	401,707	441,600
Leased space	118,280	118,964
Other	39,905	84,769
	120,662,679	108,238,537
Engineering support		
Salaries and employee benefits	3,527,209	4,226,322
Provision for employee termination benefits	45,283	114,167
Professional services	328,704	106,743
Travel and removal	91,144	105,799
Rental building and equipment	58,081	54,709
Office materials and supplies	3,765	607
Other	30,645	17,743
	4,084,831	4,626,090
Administration		
Salaries and employee benefits	3,504,158	2,138,244
Provision for employee termination benefits	44,988	55,404
Rental building and equipment	906,657	755,270
Professional services	512,624	367,681
Telephone and freight	185,867	185,967
Travel and removal	116,857	64,373
Office materials and supplies	89,545	77,056
Depreciation	76,596	70,274
Information	47,547	33,867
Repairs	24,335	44,518
Loss on disposal of fixed assets	256	1,355
Other	48	399
	5,509,478	3,794,408
	130,256,988	116,659,035
Net loss before extraordinary item	68,640	283,970
Extraordinary item — Receipt of appropriation for reimbursement of extraordinary item (Note 1)		(1,485,822)
Net loss (profit)	68,640	(1,201,852)

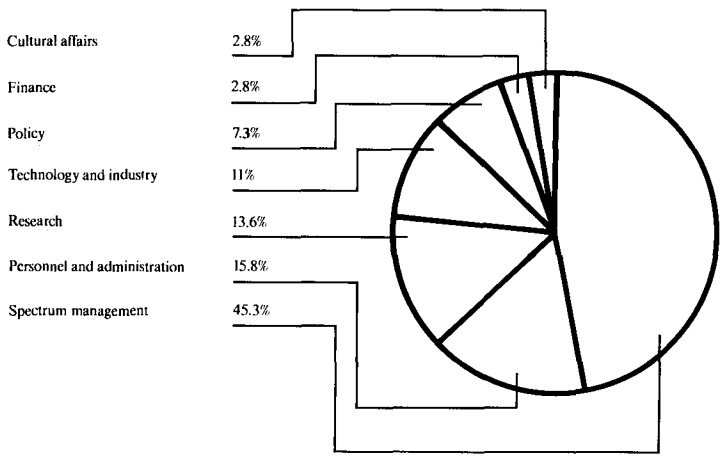
1. Purpose and authority

The Government Telecommunications Agency Revolving Fund was originally established in 1963 to plan and provide telecommunications facilities and services at the request of federal departments and agencies. Section 23 of the Adjustment of Accounts Act authorized the Minister to make payments out of the Consolidated Revenue Fund for working capital, capital equipment and temporary financing of operating requirements, the total of which was not to exceed $8,000,000 at any time. This authority was increased to $12,000,000 by Appropriation Act No. 4, 1981-82 and to $15,000,000 by Appropriation Act No. 4, 1983-84. In accordance with Vote 2c, Appropriation Act No. 4, 1982-83, an amount of $1,485,822 was credited to the Fund for a payment to Bell Canada for a terminated contract. An amount of $741,781 representing net assets assumed by the Fund and assets contributed to the Fund was charged against this authority when the Fund became budgetary in 1981.

SOURCE: Public Accounts of Canada, 1983/84

Appendix IV

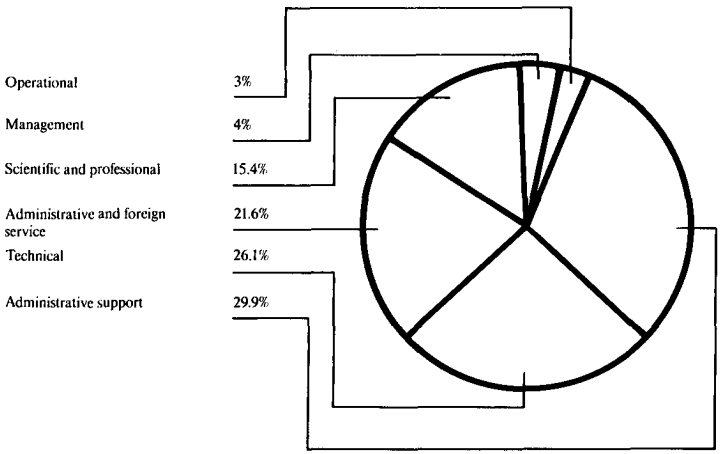
Departmental employees by activity 1983/84



SOURCE: Department of Communications.

Appendix V

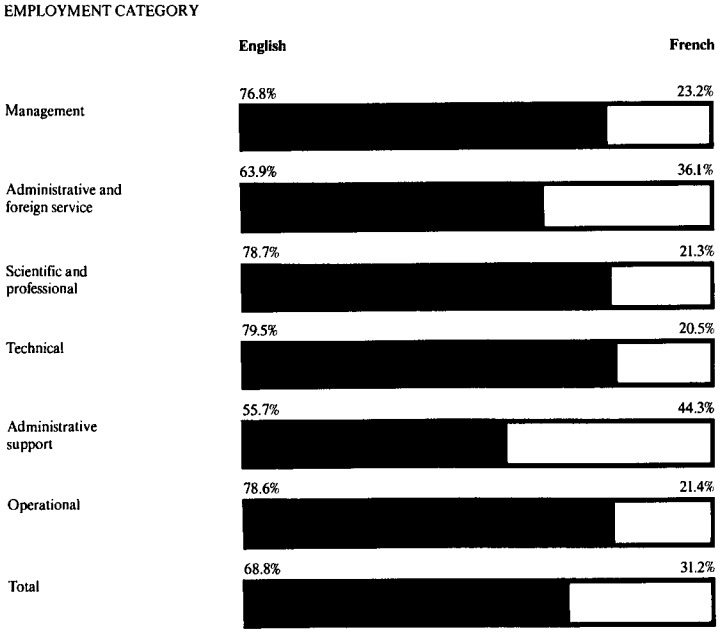
Distribution of employees by employment category (as of March 31, 1984)



SOURCE: Department of Communications.

Appendix VI

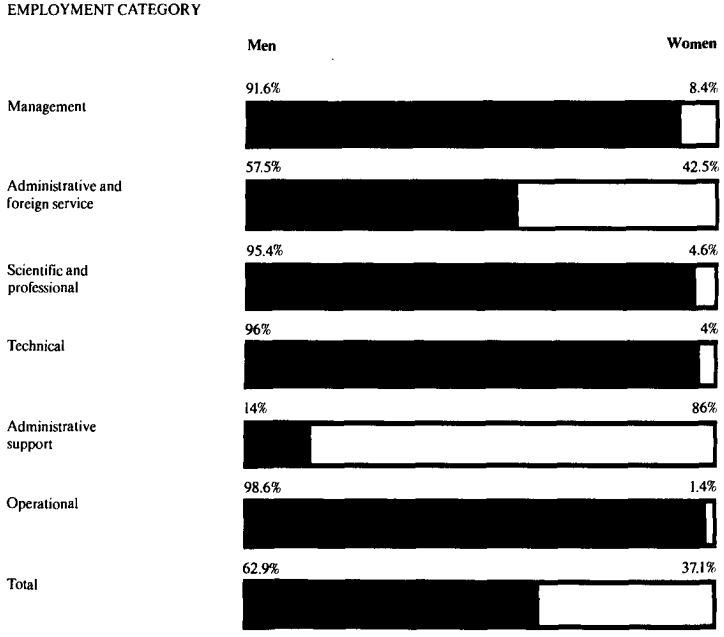
Distribution of employees by employment category and first official language (as of March 31, 1984)



SOURCE: Department of Communications.

Appendix VII

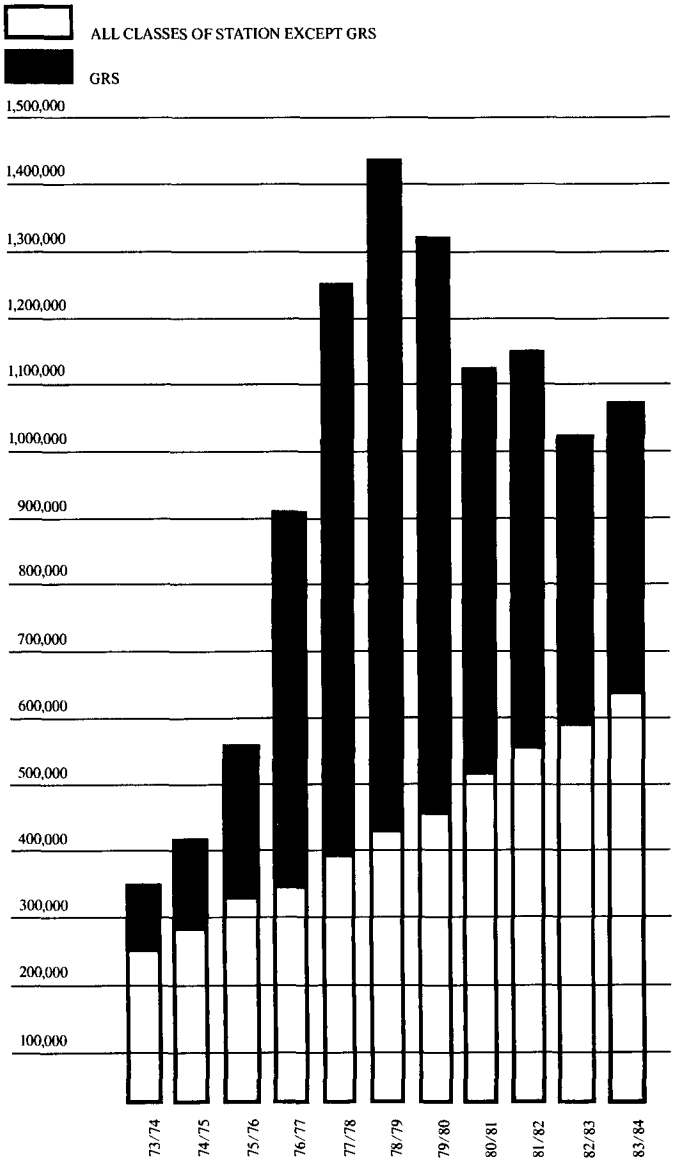
Distribution of employees by employment category and sex (as of March 31, 1984)



SOURCE: Department of Communications.

Appendix VIII

Radio station licences in force from 1973/74 to 1983/84



SOURCE: Department of Communications.

Appendix IX

Radio stations by service category for 1983/84

Service Category*	Number of Stations			
	Ship	Coast	Land	Mobile
Maritime mobile	34,078			
Limited maritime mobile		30		
Private maritime mobile		120		
Public commercial			2,923	18
Restricted public commercial			2,050	
Private commercial**			59,203	383,223
Provincial government			8,805	53,778
Municipal			5,847	45,901
Experimental			632	610
Amateur			22,885	
Public commercial receiving			199	
Private commercial receiving			884	505
Public commercial automatic repeater			1,142	
Private commercial automatic repeater			4,459	
Aircraft navigational				3
Aeronautical mobile			1,904	16,709

* Statistics shown for each service category indicate the number of stations performing that particular category of service. Note that a licence may show more than one service category.

**Included in the category are 11,869 land and 86,997 mobile stations licensed to federal government departments and to federal and provincial agencies.

NOTE: Excluded from the above are the following radio stations:

General radio service	428,585
Earth	759
Space	9

SOURCE: Department of Communications.

Appendix X

Acts under which the Minister of Communications has responsibility

The Department of Communications Act
The Telegraphs Act
The Canadian Radio-television and Telecommunications Commission Act
The National Transportation Act
The Telesat Canada Act
The Radio Act
The Railway Act
The Broadcasting Act
The Canada Council Act
The Canadian Film Development Corporation Act
The Cultural Property Export and Import Act
The National Arts Centre Act
The National Film Act
The National Library Act
The National Museums of Canada Act
The Public Archives of Canada Act

SOURCE: Department of Communications.

Appendix XI

Addresses of regional and district offices of the Department of Communications

ATLANTIC REGION

Regional Office
Department of Communications
7th Floor
Terminal Plaza Building
P.O. Box 5090
1222 Main Street
MONCTON, N.B.
E1C 8R2

District Offices

New Brunswick
Department of Communications
Custom House, Room 337
P.O. Box 7285, Stn. A
189 Prince William Street
SAINT JOHN, N.B.
E2L 4S6

Nova Scotia
Department of Communications
Gulf Building, 9th Floor
6009 Quinpool Road
HALIFAX, N.S.
B3K 5J7

Prince Edward Island
Department of Communications
Dominion Bldg., 3rd Floor
97 Queen Street
CHARLOTTETOWN, P.E.I.
C1A 4A9

Newfoundland
Department of Communications
Sir Humphrey Gilbert Building
Room 612
P.O. Box 5277
Duckworth Street
ST. JOHN'S, NFLD.
A1C 5W1

QUEBEC REGION

Regional Office
Department of Communications
Rasco Hotel
295 St. Paul Street East
MONTREAL, Que.
H2Y 1H1

District Offices

Department of Communications
Suite 436
2 Place Quebec
QUEBEC, Que.
G1R 2B5

Department of Communications
Suite 401
1650 King Street West
SHERBROOKE, Que.
J1J 2C3

Department of Communications
P.O. Box 37
2nd Floor
151 du Lac Avenue
ROUYN, Que.
J9X 4N6

Department of Communications
Guy Favreau Complex
200 Dorchester Blvd. West
Tower East, 12th Floor
MONTREAL, Que.
H2Z 1X4

Department of Communications
Public Building — Post Office
P.O. Box 67
Suite 339
1285 Notre-Dame Street
TROIS-RIVIÈRES, Que.
G9A 5E3

Department of Communications
2nd Floor
942 Chabanel Street
CHICOUTIMI, Que.
G7H 5W2

Department of Communications
701 Laure Blvd., 2nd Floor
SEPT-ÎLES, Que.
G4R 1X8

Department of Communications
Suite 206
140 West St. Germain Street
RIMOUSKI, Que.
G5L 4B5

ONTARIO REGION

Regional Office
Department of Communications
9th Floor
55 St. Clair Avenue East
TORONTO, Ont.
M4T 1M2

District Offices

Department of Communications
880 Ouellette Street
WINDSOR, Ont.
N9A 1C7

Department of Communications
30 Duke Street West, 5th Floor
KITCHENER, Ont.
N2H 3W5

Department of Communications
9th Floor
55 St. Clair Avenue East
TORONTO, Ont.
M4T 1M2

Department of Communications
Trebla Bldg., 473 Albert Street
OTTAWA, Ont.
K1R 5B4

Department of Communications
Room 210
135 James Street South
HAMILTON, Ont.
L8P 2Z6

Department of Communications
451 Talbot Street, Room 1112
LONDON, Ont.
N6A 5C9

Department of Communications
P.O. Box 380
3rd Floor, Suite 2
280 Pinnacle Street
BELLEVILLE, Ont.
K8N 5A5

Department of Communications
Station Tower, 2nd Floor
421 Bay Street
P.O. Box 727
SAULT STE. MARIE, Ont.
P6A 5N3

CENTRAL REGION

Regional Office
Department of Communications
Room 200
386 Broadway Avenue
WINNIPEG, Man.
R3C 3Y9

District Offices

Manitoba
Department of Communications
Room 200
386 Broadway Avenue
WINNIPEG, Man.
R3C 3Y9

Saskatchewan
Department of Communications
206 Circle Drive East
SASKATOON, Sask.
S7K 0T5

Department of Communications
Financial Bldg., Room 101
2101 Scarth Street
REGINA, Sask.
S4P 2H9

Alberta
Department of Communications
10th Floor, Liberty Bldg.
10506 Jasper Avenue
EDMONTON, Alta.
T5J 2W9

Department of Communications
Government of Canada Bldg.
820 - 220 4th Avenue S.E.
P.O. Box 2905, Station M
CALGARY, Alta.
T2P 2M7

Department of Communications
8th Floor
9909 - 102nd Street
GRANDE PRAIRIE, Alta.
T8V 2V4

Northwest Territories
Department of Communications
Precambrian Bldg., 10th Floor
P.O. Box 2700
YELLOWKNIFE, N.W.T.
X1A 2R1

PACIFIC REGION

Regional Office
Department of Communications
800 Burrard Street, Suite 1700
VANCOUVER, B.C.
V6Z 2J7

District Offices

British Columbia
Department of Communications
816 Government Street,
Room 224
VICTORIA, B.C.
V8W 1W9

Department of Communications
Federal Building, Room 304
471 Queensway
KELOWNA, B.C.
V1Y 6S5

Department of Communications
309 2nd Avenue West,
Room 583
PRINCE RUPERT, B.C.
V8J 3T1

Department of Communications
3884 192nd Street
P.O. Box 3396
LANGLEY, B.C.
V3A 4R7

Department of Communications
800 Burrard Street, Suite 1700
VANCOUVER, B.C.
V6Z 2J7

Department of Communications
707 - 299 Victoria Street
PRINCE GEORGE, B.C.
V2L 5B8

Department of Communications
101 - 125 10th Avenue South
CRANBROOK, B.C.
V1C 2N1

Yukon District
Department of Communications
Polaris Building
201 - 4133 4th Avenue
WHITEHORSE, Y.T.
Y1A 1H8