Communications Canada

ANNUAL REPORT 1989-1990

Canada

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To:

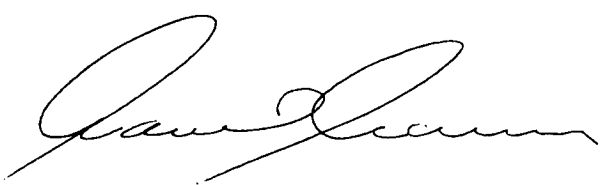
His Excellency the Right Honourable Ramon John Hnatyshyn,
P.C., C.C., C.M.M., C.D., Q.C., Governor General and
Commander-in-Chief of Canada

Your Excellency:

I have the honour to present the Annual Report of the
Department of Communications for the fiscal year ending
March 31, 1990.

I remain,

Your Excellency's obedient servant,



Marcel Masse

Minister of Communications

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Treasury Board designates the Government Telecommunications Agency (GTA) as a special operating agency.

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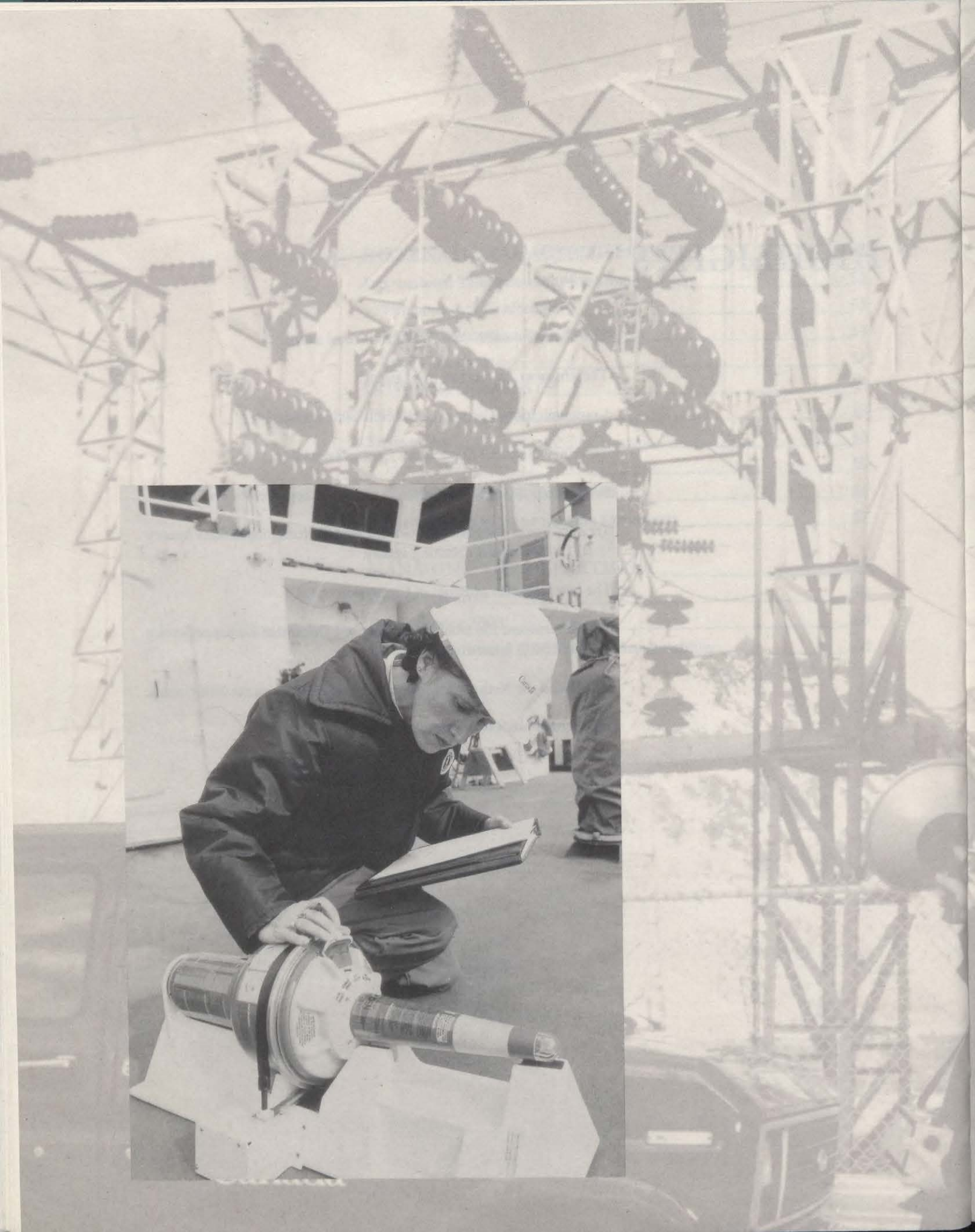


INTRODUCTION

Communications Canada's mission reflects its central role within the federal government in strengthening the nation through communications and culture by ensuring:

- that Canada's communications systems evolve in an orderly fashion at the forefront of global developments while meeting the needs of all Canadians at affordable costs; and
- that Canadians have the opportunity to choose from a wide selection of Canadian cultural products and information services among the many international choices carried on our communications systems.

through a variety of conventional and newer technologies such as television, telephone, satellite, electronic media, radio and fibre optics. The increasing power and flexibility of the communications infrastructure during the past 20 years, the result of the computerization of communications devices and networks, has made it the nervous system of the information society. Consequently, policies for its development and use have a crucial bearing on the achievement of national social and economic goals.

With the transfer of the arts and culture program from the Department of the Secretary of State to the Communications portfolio in 1980,

Since its inception in 1969, Communications Canada has promoted the development and use of the national communications system that links Canadians from all regions

the Department's mandate broadened to include greater emphasis on Canadian cultural products, the preservation of Canadian heritage, and support for Canadian creators.

◁ *A radio inspector in the Atlantic Region examines and tests an emergency position-indicating radio beacon (EPIRB).*

▷ *Communications Minister Marcel Masse views weapons being restored at Vimy House, the storage facility of the Canadian War Museum, with Victor Suthren, Director of the Museum.*

Roy Dupuis and Marina Orsini star in "Les Filles de Caleb," a popular French-language television drama filmed in the Mauricie region of Quebec. (Photo by Michel Gauthier.)

The integration of communications and culture in a single Department provides a base for utilizing the full potential of emerging communications and computer technologies. These are powerful new tools for the production and dissemination of content by Canadian creators, giving rise to a host of culturally and economically important information services and cultural products.

Our mission

Communications Canada's mission is expressed in the phrase NATION BUILDING: helping Canadians share their ideas, information and dreams. It reflects the dynamic link between the two central areas of the Department's work — the communications systems that link Canadians and the cultural experience Canadians share.

The operating principles that guide this mission have also been expressed in simple terms — service as our highest goal; caring about individuals; good management; effective communications; recognition of achievement; and teamwork and shared values.

Communications and culture portfolio responsibilities

The Minister of Communications is responsible to Parliament for enabling legislation for certain Crown and departmental corporations, regulatory agencies and branches of government.

A fine-arts conservator removes overpaint from a 16th-century polychrome wooden sculpture. Once the conservation treatment is complete the sculpture will be displayed at the Nova Scotia Museum in Halifax.

The Minister's portfolio includes:

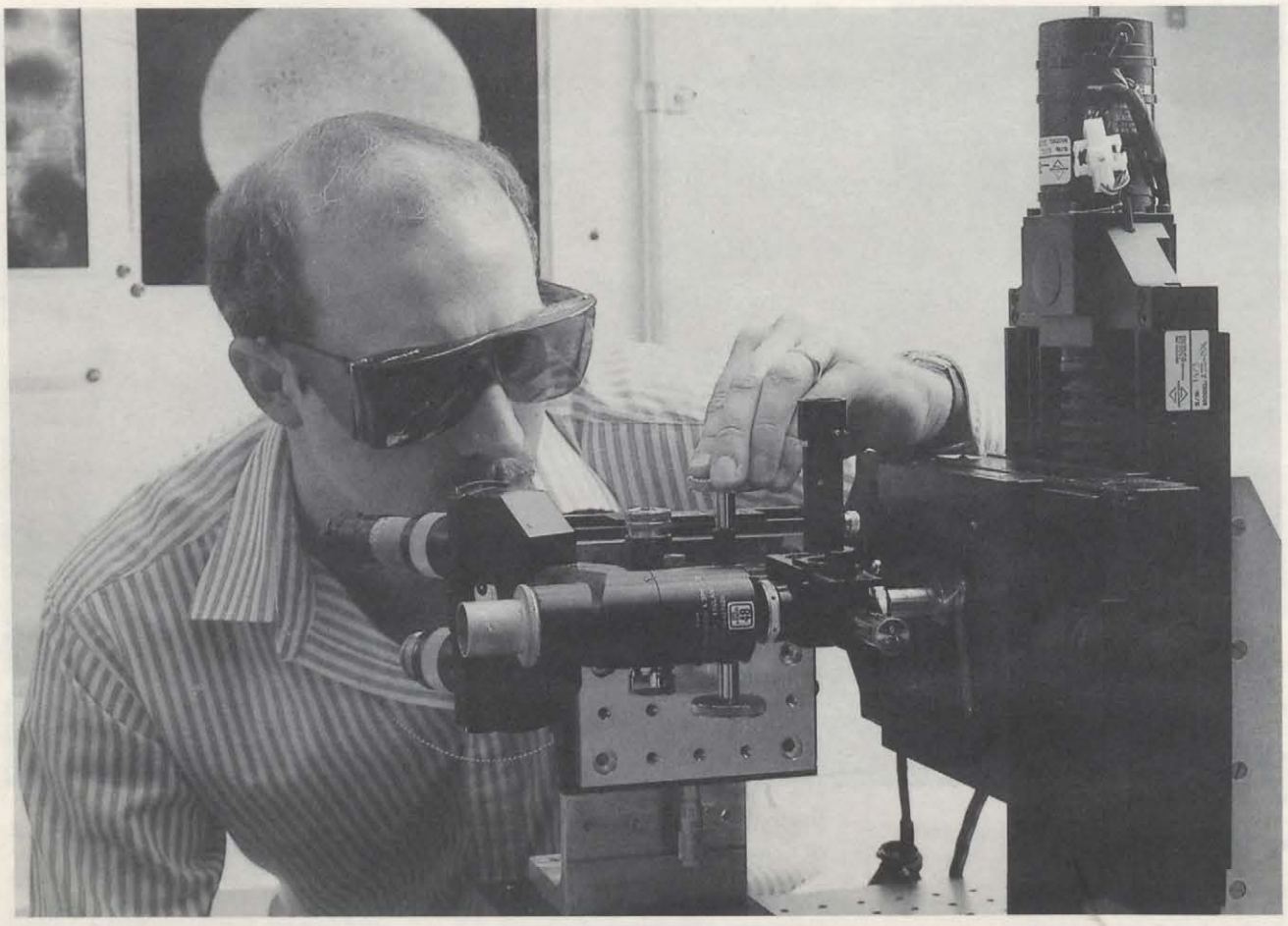
- The Canadian Radio-television and Telecommunications Commission
- The Canadian Broadcasting Corporation
- Telefilm Canada
- The National Arts Centre
- The National Film Board of Canada
- The National Museum of Science and Technology (including the National Aviation Museum)
- The Canadian Museum of Nature
- The Canadian Museum of Civilization (including the Canadian War Museum)
- The National Archives of Canada
- The National Library of Canada
- The National Gallery of Canada (including the Canadian Museum of Contemporary Photography)
- The Canadian Cultural Property Export Review Board
- The Canada Council

The portfolio receives advice from the National Library Advisory Board, the National Advisory Committee on Culture Statistics (which also reports to Statistics Canada), and Consultative Committees on Communications with the provinces.

Statutes

The Minister of Communications is responsible to Parliament for all or part of the following statutes:

- *The Department of Communications Act*
- *The Telegraphs Act*
- *The Canadian Radio-television and Telecommunications Commission Act*
- *The National Telecommunications Powers and Procedures Act*
- *The Telesat Canada Act*
- *The Radiocommunication 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 Act*
- *The National Archives of Canada Act*



A technologist adjusts the photo luminescence scanning system used to detect defects in gallium arsenide wafers.

The program approach

During the year in review, Communications Canada comprised six sectors, each responsible for a different segment of the Department's program.

Technology and Research

- formulates policies related to the development of the national communications network, including radio, wire, cable and satellite systems. The sector also conducts research and disseminates information on new technologies and services, and works to promote the use of new telecommunications and informatics technologies by government, industry and the public. The Government Telecommunications Agency operates within this sector.

Cultural Affairs and Broadcasting

- fosters an environment in which Canada's heritage is preserved and made accessible, artistic expression can flourish, cultural markets can develop, and Canadian audiences have increased access to cultural products and services.

Spectrum Management and Regional Operations

- manages the use and development of the radio frequency spectrum in Canada, and protects Canadian interests by representing Canada in the negotiation of international agreements on the use of the spectrum and the geostationary satellite orbit. It also manages the Department's operations throughout Canada.

Corporate Policy

- responsible for strategic planning, federal-provincial relations, international relations, legal services, information services, program evaluation, and internal audit.

Corporate Management

- supports and advises the Minister and employees, assisting them in exercising proper management and control as they carry out the Department's mission.

Quebec

- responsible for all Quebec Region operations in the fields of communications and culture, including project management, spectrum management, the Canadian Workplace Automation Research Centre (CWARC), and administration of national programs delegated to the region.

Oqutaq, Sheokjuk. (1920-1982) Walrus, *1981. Stone and ivory, 32.5 x 10.1 x 37.4 cm. Donated to the McMichael Canadian Art Collection by the West Baffin Eskimo Co-operative Limited, Cape Dorset, under the terms of the* Cultural Property Export and Import Act. *(Reproduced with the permission of the West Baffin Eskimo Co-operative Limited.)*

POLICY ISSUES

Communications Minister Marcel Masse examines Champlain's astrolabe with Dr. George MacDonald, Director of the Canadian Museum of Civilization. The astrolabe was repatriated from the United States and put on display at the new museum in time for its June 1989 opening. The distinctive architecture of the museum is featured in the background photo.

Telecommunications

Telecommunications policy and legislation

The new telecommunications policy for Canada announced in 1987 enunciated three central objectives: universal access to basic telephone services at affordable prices; an efficient telecommunications network infrastructure; and a thriving marketplace for telecommunications services and equipment in all regions. A new Telecommunications Bill to support these objectives is nearing completion and it is expected that it will be tabled in 1990-91. The new bill deals with a number of important issues, including the establishment of regulations governing Canadian ownership within the industry, and the empowering of the Canadian Radio-television and Telecommunications Commission (CRTC) to forbear from regulation where competition ensures fair treatment for consumers. The Bill also gives the Government the ability to issue policy directions to the CRTC, and provides for consultation with the provinces on policy matters and the regionalization of the CRTC.

Public consultation on local distribution telecommunications networks

In a notice published in the September 2, 1989 edition of the *Canada Gazette*, the Minister of Communications invited public comment on the development of local broadband communications systems that would facilitate the delivery of voice, video and data services to the home. This was the first step in a major policy review of the cable television and common carrier industries in Canada.

The review aims to foster development of advanced local distribution networks for Canadians. It will examine standards of service and rate-setting and develop proposals for a regulatory framework within which the industry will operate. This detailed review of public policies and the regulatory environment will benefit network operators and service providers, as well as service users.

Field trials of public cordless telephone service

The latest generation of cordless telephones may soon be ready for introduction to the Canadian market. The new, pocket-sized devices, which can be used both at home and away, were to undergo field trials in early 1990. An industry advisory committee and subcommittees have been established to recommend to the Department appropriate provisions and standards for the public cordless telephone service.

Several types of cordless telephones will be tested, the simplest of which can place but not receive calls. All versions are low-powered and designed for use within a 200-metre radius of a base station, which would connect their signals to the telephone system. These base stations would be

located in public places such as shopping centres and airports. Although the principle is similar to that of cellular phones, the pocket-sized cordless telephone service would allow for a greater density of users and is expected to be less expensive than cellular phone service.

Cordless telephone service promises to be a significant component of the public telecommunications system over the next decade. It will have a particular impact on local telephone service provisioning, within customers' premises for business and residential applications, and at public access points to public networks. Some projections are that 50 percent of all additional telephone access lines by the turn of the century will be provided by various wireless mobile service technologies including cordless telephone, cellular and personal communications.

Radio spectrum policy framework

Demand for radio spectrum is growing constantly. This is caused in part by the rapid emergence of new radio technologies such as cellular telephones, mobile satellite services and advanced broadcast systems such as high-definition television (HDTV). Because the radio frequency spectrum is a limited natural resource it must be managed to achieve maximum efficiency, technical quality and user access.

In November 1989, the Minister of Communications announced that the Department would undertake a reassessment of spectrum policy as an integral part of a reexamination of policies governing development of Canada's communications infrastructure.

A discussion paper will be issued and public consultation will begin in the fall of 1990. The discussion paper

◁ *John Lawrence, Chairman of the Private Sector Advisory Committee on Integrated Services Digital Network (ISDN), discusses* The Report on ISDN Implementation in Canada *during a news conference in May 1989.*

will provide an overview of spectrum resources and utilization, as well as an assessment of Canada's technological and industrial capacity. It will outline the basis for a strategic policy framework, raising a series of policy issues and principles for debate. Among the issues that will be considered are: spectrum allocation principles such as putting market value to competitive use of frequencies through an auction process; linking research and development commitments to the allocation of spectrum for public radio networks; attributing priorities to public radiocommunications undertakings; and linking spectrum resources to different legislative objectives.

A spectrum policy framework is expected to be enunciated in 1991.

Privatization

The Government's policy is to privatize those Crown corporations that no longer require government ownership to achieve public policy goals. In support of this objective, Teleglobe Canada and two telephone company subsidiaries of Canadian National, Terra Nova Tel and NorthwesTel, have been privatized. In addition, CN has sold its interest in CNCP Telecommunications (now known as Unitel).

During 1989-90, the Government determined that it will dispose of its interest in Telesat Canada, and is reviewing its options in this regard. These shares are expected to be sold in 1990-91.

Vision 2000

In the highly charged global market for communications and information technologies, Canada's competitiveness is threatened, for two main reasons. First, other countries are investing substantially in joint public- and private-sector research and development ventures; second, Canada has lacked strategic direction at the national level to promote the same type of collaborative research benefitting its competitors. A Communications Canada initiative to remedy this situation led to the launching of Vision 2000, a joint government and private-sector project. Vision 2000 is working to build a common vision of Canada's future information services and communications infrastructure, to rationalize Canadian investment, and to reach national consensus on a new research and development agenda.

Vision 2000 held two national conferences in 1989, and a third will be held in October 1990. The 35 member companies have contributed a total of $1 million for the development of a Vision 2000 business plan. The Department has established a program office to provide liaison, policy, administrative, technical, research and development support. In addition, the Department is supporting the project's working groups by undertaking policy studies, reviewing the regulatory framework, conducting research and development in radiocommunications, and identifying spectrum allocation requirements.

Regional advisory committees have been established to develop regional telecommunications strategies consistent with Vision 2000's focus and strategic programs, with co-ordination provided by the Department. These committees will seek to involve representatives from the private sector, universities, and the provincial governments.

The Radiocommunication Act

On October 4, 1989, the *Radiocommunication Act* received royal assent. The new Act, the first major revision of the 1939 *Radio Act*, reflects the enormous technological advances made in radiocommunications over the last 50 years. It also establishes a legislative framework to ensure that Canada continues to enjoy the highest standards in the use and development of radiocommunications.

The Act is characterized by stronger control in some areas, greater flexibility in others. Included are authorities for the regulation of radio-sensitive equipment and provisions for greater control of substandard equipment. The Act also empowers the Minister of Communications to seek court injunctions against harmful or dangerous interference to safety-related radio communications such as fire or police communications. In order to allow more rapid exploitation of advanced technologies, the Act contains broader powers to exempt radio apparatus from licensing requirements.

The Minister of Communications is also empowered by the new Act to take into consideration community and environmental concerns over the siting of antenna supporting structures before issuing a licence.

The crew in the wheelhouse of the ferry Wolfe Islander *as it navigates Lake Ontario near Kingston.*

Ship radio inspections, an essential element of marine safety, are performed regularly by Communications Canada personnel.

Broadcasting

Broadcasting Bill (C-40)

The Broadcasting Bill, which expired on the Senate order paper when the 33rd Parliament was dissolved in September 1988, was reintroduced with some modification in the 34th Parliament as Bill C-40. The Bill would replace the 1968 *Broadcasting Act*, updating its core policy statement to reflect changes in Canadian society and in the broadcasting system. In addition, the Bill includes changes to the Canadian Radio-television and Telecommunications Commission (CRTC), measures to encourage private investment in Canadian programming, and anti-piracy provisions. Changes affecting the Canadian Broadcasting Corporation (CBC) would reinforce its important role as a source of Canadian programming, improve its management structure and improve its financial accountability to Parliament while guaranteeing its journalistic, creative and programming independence.

Broadcasting Fund

Under the broadcasting policy enunciated in 1988, the Government committed $250 million in new funds, over a period of five years, to strengthen the production and distribution of Canadian programs. These funds are intended to increase the level of Canadian content on the CBC, improve English- and French-language programming of public and private broadcasters, improve distribution of programs to small and remote communities, develop a

Art Hindle, Mark Humphrey and Sara Botsford star in the television series "E.N.G." (Photo courtesy of Telefilm Canada.)

satellite distribution service for native broadcasters in the North, and establish a new national radio service for the visually impaired.

Fiscal restraint and deficit reduction have delayed the implementation of certain measures, but the programs of support for Television Northern Canada and the National Broadcast Reading Service are both now in operation. The Canadian Broadcast Program Development Fund, administered by Telefilm Canada, invested in more than 500 hours of first-run Canadian television programs shown on the public and private networks. The development fund's yearly budget has now been increased to $72 million.

Publishing

Postal subsidies

Funding for the Publications Distribution Assistance Program, more commonly known as the Postal Subsidy Program, finances concessionary postal rates for books, newspapers and magazines. During 1989, the Government announced that concessionary rates would be phased out and replaced by a $110 million program of direct financial assistance to the industry. The extent of the expenditure reductions to the Program will likely lead to significant changes in the mix of beneficiaries. The replacement program will also mark a new and direct approach to support for

Broadcast reading services are helping to expand the "communications reach" of many visually impaired Canadians.

the distribution of publications. A number of options are being explored to ensure maximum benefit to both readers and the Canadian publishing industry.

Foreign investment in cultural industries

The Government's policy on foreign investment in Canadian cultural industries is designed to ensure the normal development of the industries in a climate of increasing globalization. The policy is in the midst of a major review, as the Government explores several options to improve Canadian control in the domestic market and increase Canada's share of market sales.

Copyright

In 1988, Parliament passed several amendments to the *Copyright Act*, beginning a process of extensive revision of the legislation of 1924. Among the amendments were the abolition of compulsory licensing of sound recordings, explicit protection for computer programs and choreographic works, and new exhibition rights for visual artists.

Work on further revision of the copyright law, now in progress, is examining issues such as the extension of rights for producers and performers of sound recordings; exceptions for schools, libraries, the disabled and broadcasters; as well as technical updating and modernization of certain provisions.

During a visit to the National Ballet School in March 1990, Communications Minister Marcel Masse announced the creation of the Task Force on Professional Training for the Arts in Canada, which is to examine the professional training needs of the Canadian arts community. The Minister also announced a $2.3-million grant for the National Ballet School.

Status of the artist

Legislation

The Canadian Advisory Committee on the Status of the Artist entered the third year of its three-year mandate in January 1989. Charged with advising the Government on methods to improve the socio-economic status of Canadian artists, the Committee is now drafting policy. These proposals include amendments to the *Income Tax Act* that would recognize the special status and unique problems of artists, and ensure their fair and equitable treatment by the tax system.

Professional training

In March 1990, the Minister of Communications announced the creation of a Task Force on Professional Training for the Arts in Canada. The task force, which will work in close co-operation with the provinces, will study issues such as the state of professional training in Canada, problems and possible solutions, and the Canadian Government's role in providing assistance for training.

Museums and Heritage

The Museums Act *(Bill C-12)*

The *Museums Act*, Bill C-12, which received royal assent on January 30, 1990, will come into force on July 1, 1990. The Act dismantles the National Museums of Canada Corporation and establishes four new, independent Crown corporations. They are the National Gallery of Canada (including the Canadian Museum of Contemporary Photography); the Canadian Museum of

Communications Minister Marcel Masse inaugurates construction of the Canadian Museum of Contemporary Photography, as Jean Pigott, Chairman of the National Capital Commission, and Michael Binder, Assistant Deputy Minister Corporate Management, Communications Canada, look on.

Civilization (including the Canadian War Museum); the Canadian Museum of Nature; and the National Museum of Science and Technology (including the National Aviation Museum). Each will operate indepen-dently under the management of its own 14-member board of directors.

Initiatives are being undertaken to explore ways to decentralize some collections. For example, an advisory committee is working with the Canadian Museum of Civilization and Communications Canada to explore the concept of developing a Museum of the Performing Arts, in Montreal, as an affiliate of the Canadian Museum of Civilization.

Archaeology policy

To support the national review of the Government's archaeology policy, the Department has established an Archaeology Policy Unit. This office will develop proposals for policy and legislation, while continuing the public consultation process initiated by the 1988 discussion paper *Federal Archaeological Heritage Protection and Management.*

Profile of Canadian consumers of art

Canadian performing arts organizations and visual artists will soon benefit from the same type of marketing data and tools major corporations use to prepare their own marketing strategies. A national survey to be conducted between September 1990 and December 1991 will furnish information for the creation of a Canadian Arts Consumer Profile database. Telephone, mail and audience surveys will be used to collect demographic data such as the age, gender and income of those who attend performances or visit galleries, as well as psychographic information such as attitudes and values that influence participation in various types of cultural activities.

The project is sponsored by Communications Canada, the provincial ministries responsible for culture, and several major cities. The database will be accessible to artists and arts organizations across Canada.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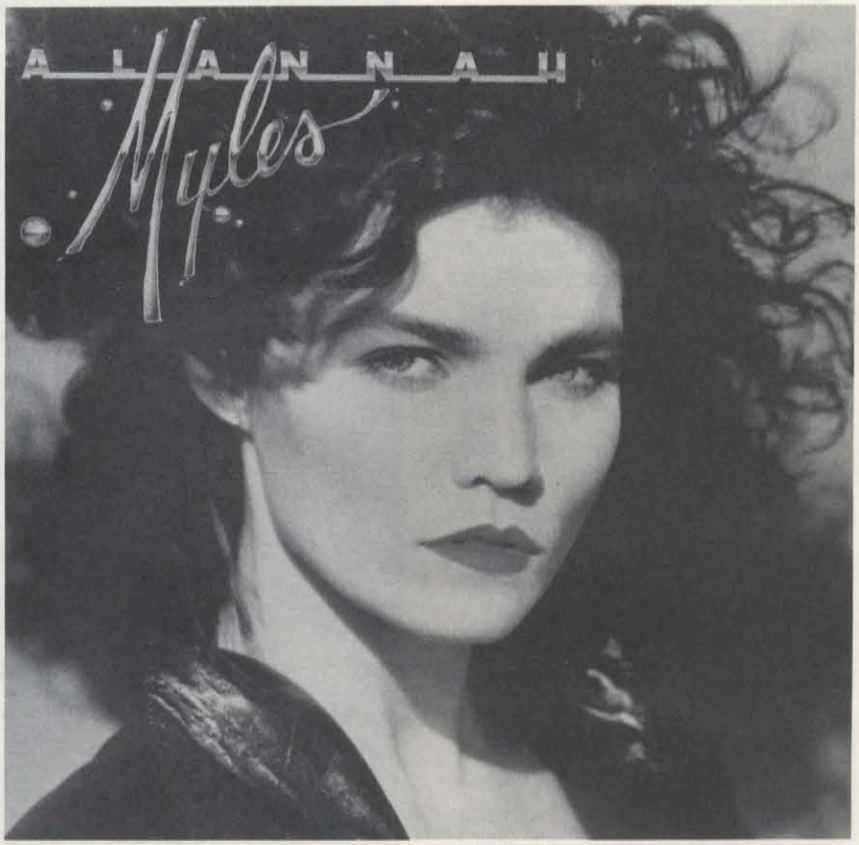
CROSS-CANADA SERVICES AND OPERATIONS



▷ *With assistance from the Sound Recording Development Program, the debut album of Alannah Myles reached six times platinum status (sales of 600,000) in 1989-90.*

◁ *A Communications Canada district office official checks the image quality of channels carried by a local cable company.*

Regional development and program delivery

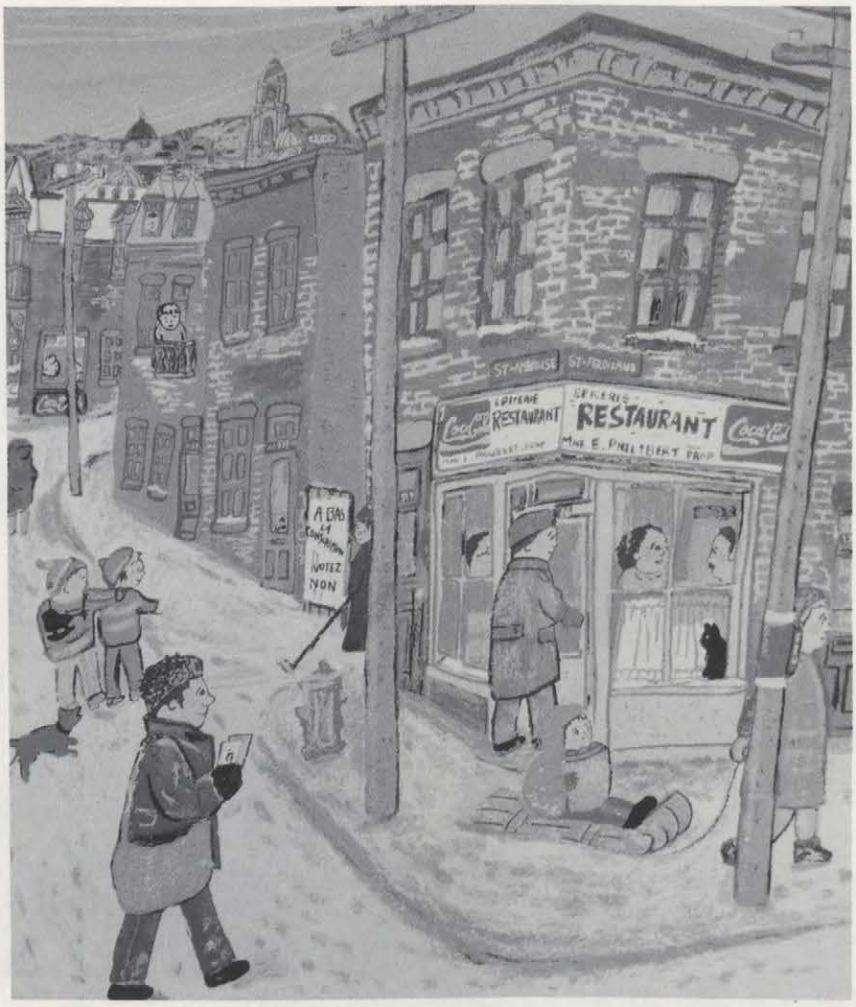
The role of the regional and district offices continued to grow in 1989-90. This is a direct result of the Department's objectives to improve service to its clients, to increase its visibility and presence throughout Canada, to foster partnerships with the private and academic sectors, and to ensure that regional perspectives are brought fully to bear on national policy formulation and program delivery.

District offices are enlarging their traditional role in spectrum management to become increasingly involved in arts and cultural initiatives. Like the regional offices, they also have greater responsibility for participating in the promotion of research and development, and in the development of telecommunications and spectrum management policies.

Spectrum management

Automation of operations

The rationalization of spectrum management systems and services to achieve the greatest efficiency and cost-effectiveness continues to be a



Tanobe, Miyuki.
Restaurant Philibert, *1983. Serigraph, 106/125, 35.5 x 45.8 cm. Donated to the Institut canadien de Québec by Mr Jean-Pierre Valentin under the terms of the* Cultural Property Export and Import Act. *(Photo courtesy of the Institut canadien de Québec.)*

priority in which the automation of operations has a fundamental role.

One automation project of 1989-90 was the increased use of computers by the Department's Canada/U.S. Co-ordination Group in handling frequency co-ordination requests. This has greatly improved the response time over the old system, which relied on word processors and telexes to communicate with the Group's American counterpart.

Licensing and spectrum control

Radiocommunications in Canada continues to expand rapidly, especially cellular telephones. System licensing for cellular telephone operators, implemented in 1987, has been key to the Department's ability to cope with the burgeoning demand. The concept is now being applied in another area: in December 1989, Cabinet approved system licensing of Radio Common Carriers, effective April 1, 1990.

Licensing procedures for cellular base stations and very small aperture terminals (VSATs) were simplified during the fiscal year, reducing the paperwork and the response time for issuing licences. A new strategy for licensing mobile terminals that communicate with satellites immediately reduced the administrative burden and paved the way for system licensing in the future.

A client applies for a mobile licence at a Communications Canada district office in Quebec. The Department's regional and district offices provide services across Canada.

In 1989-90, the Department issued approximately 99,400 new and amended radio licences, and renewed nearly 925,000 radio station licences, an increase of 13 percent over the previous year. Revenues from radio licence fees were approximately $86 million. Other fees, including those related to the Terminal Attachment Program and radio-type approval, generated an additional $2 million.

Electronic device immunity

The newly enacted *Radiocommunication Act* empowers Communications Canada to establish standards to control the immunity of radio-sensitive electronic equipment. Substandard equipment could, for example, simulate the response of a radio receiver by picking up signals emitted by radio transmitters, to the detriment of its intended function.

Measures under the Department's three-year strategic plan for the implementation of immunity controls avoid increased regulation. Instead, the plan emphasizes study of the electromagnetic environment, improvements to the immunity of consumer electronic devices, and public awareness of problems and remedies.

Electronic manufacturers are now being encouraged to help develop minimum immunity standards and voluntarily observe them. If, in addition, manufacturers and their agents are willing to adopt responsible after-sale policies of repair, replacement or refund for defective equipment, it should be possible to forestall the institution of mandatory immunity limits. The effectiveness of this approach will be reviewed as the program progresses.

Paging services

In the May 13, 1989 issue of the *Canada Gazette*, the Department called for applications to operate paging services on the newly designated 929-932 MHz channels. A highly competitive licensing process resulted in the awarding, in December 1989, of nine new Canada-wide paging frequencies, two to be shared with the United States and seven for exclusive Canadian use. Cantel Incorporated and MBM International

(a consortium of Motorola Canada Ltd., Maclean-Hunter Communications Inc. and The Beeper People, Inc.) were granted authority to use the two shared Canada/U.S. frequencies. Maclean-Hunter Communications Inc., Telelink Canada Ltd., Cantel Inc., CNCP Telecommunications, The Beeper People, Inc., Motorola Canada and La corporation Scotpage limitée were granted licences to use the exclusively Canadian frequencies.

Government Telecommunications Agency

The Government Telecommunications Agency (GTA) plans, develops and manages common network and enhanced telecommunications services for the Government of Canada. The 1989-90 fiscal year was significant in the evolution of the GTA. The process of replacing several common services with more efficient ones began, while development of state-of-the-art services such as the Government Packet Network continued. New common services such as the Government Voice Messaging Service and the Government Electronic Messaging and Document Exchange Service (GEMDES) were launched after several years of planning.

Status as special operating agency

In December 1989, the President of Treasury Board announced the establishment of five special operating agencies (SOAs) as a way to improve the delivery and cost-effectiveness of certain services. The SOAs are service units within departments that are given more direct responsibility for results and for operating in a business-like way. They have increased management flexibility, within the limits of existing legislation, in order to improve the delivery of their services. The SOAs operate on a cost-recovery basis: revolving funds finance day-to-day operations, while occasional appropriations from the Treasury Board Operating Reserve finance special projects and system improvements.

The GTA was chosen to be one of these agencies, effective April 1, 1990. The GTA is expected to generate over $200 million in revenues in 1990-91.

Government Packet Network (GPN)

The Government Packet Network continues to expand rapidly. GPN now links over 130 locations across Canada, providing data communications to about 20,000 users in more than 50 federal departments and agencies. Local dial access, which can be used to reduce the cost of accessing the Government Electronic Messaging and Document Exchange Service (GEMDES), is provided in 25 Canadian centres.

Organizations in the network subscribe to a shared, rather than customized service, resulting in substantial savings in the cost of their data transmissions.

Government Satellite Network (GSN)

In February 1989, the GTA signed a five-year contract with Telesat Canada for the procurement of a government thin-route satellite service for voice, data and image transmission. There are now 18 sites

A representative of Newfoundland Telephone and a Government Telecommunications Agency employee discuss telephone models in a Newfoundland Telephone showroom.

in service, with 40 additional sites to be installed during 1990. Plans are also underway to introduce a C-band (6/4 GHz) service in 1990, extending GSN into the Canadian Arctic.

Government Electronic Messaging and Document Exchange Service (GEMDES)

GEMDES, the GTA's shared electronic messaging service, is accessible to accredited subscribers from public and private telephones and dedicated Datapac (Telecom Canada) facilities anywhere in Canada. With the approval of the GEMDES tariff by the CRTC, the service started in December 1989, and became fully operational in February 1990. There are now more than 5,000 subscribers.

GEMDES has also been adopted as a principal element of the Senior Executive Network (SEN). SEN uses a variety of electronic communications services to distribute information formerly sent by mail or fax machine to deputy ministers, assistant deputy ministers and their staffs. The network is available in 34 federal departments and agencies.

Government Telecommunications Network (GTN-2000)

GTN-2000 is a program to convert existing Government telecommunications networks into a common digital-based, intelligent network infrastructure capable of transmitting voice, data and images. Phase I of the three-phase program will provide digital channel and intelligent network services, and will be implemented between 1990 and 1995. An initial Government Digital Channel Service has been implemented, and a national intelligent network pilot project will be deployed by late 1990.

Integrated Services Digital Network (ISDN) evaluation

The Integrated Services Digital Network (ISDN) is a new universal telecommunications architecture, based on international standards, that provides voice, data and image services, all on a single copper access line. GTA has initiated the ISDN Applications Development and Assessment Project to assess strategic and technical development in ISDN. Under the project, GTA is defining the network and service requirements for Government applications. Selected applications will be implemented as common services under GTN-2000.

The first ISDN Technology Trial, a two-year joint project of GTA and Bell Canada, was completed in November 1989. A joint GTA/Telecom Canada GTN-2000/ISDN Trial Planning Committee has been formed to develop plans for the National ISDN Trial/Government Intelligent Networking Pilot, a one-year trial to begin in the fall of 1990. This project will link government users in Ottawa with users in eastern and western Canada.

Economic and Regional Development Agreements

Economic and Regional Development Agreements (ERDAs) were established in 1984 for federal and provincial governments to fund cooperatively, among others, cultural and communications projects whose goals are to:

- stimulate economic development in the cultural and communications sectors,
- establish objectives and rationales to respond to provincial and national economic priorities, and
- identify the cultural and communications sectors as key areas that respond to these priorities.

The Department is responsible for the following ERDA subagreements:

- Canada-Ontario Subsidiary Agreement for Cultural Development,
- Canada-Manitoba Communications and Cultural Enterprises Subsidiary Agreement,
- Canada-Quebec ERDA Subagreement on Development of Communications Enterprises,
- Canada-Quebec ERDA Subagreement on Cultural Infrastructure.

A view of the renovated Elgin and Winter Garden Theatre Complex in Toronto. The project was completed under the Canada-Ontario Cultural Development Subsidiary Agreement.

Quebec

Twenty-two ERDA communications projects received a total of $5.4 million from Communications Canada in 1989-90. These projects included continued financial support for TV5, the international French-language television network; for a program to combat the pirating of computer software; and for CONSORTEL, a trial project providing fibre-optic cable television and telephone services to Quebec homes. Cosmo Vision, a pilot project on the use of multichannel distribution technology, also received ERDA funding.

The subagreements on cultural infrastructure and on communications development were extended for one year to March 31, 1991, and the funds increased. The subagreement on cultural infrastructure received an additional $33.5 million, for a total of $73.5 million. The subagreement on development of communications enterprises received another $3.6 million, for a total of $43.6 million.

Ontario

The Canada-Ontario Cultural Development Subsidiary Agreement supports projects under four program components: feasibility studies, infrastructure development, cultural enterprises development, and marketing assistance. Of the $41.8 million in federal/provincial contributions made thus far under the Program, $10.9 million occurred during the 1989-90 fiscal year. The total $50 million available has been fully committed to 27 projects.

The life of the Jamieson family is portrayed in the award-winning feature film The Last Winter. *Written and directed by Aaron Kim Johnston, the drama was filmed in Manitoba with the assistance of the Cultural Industries Development Office. (Photo courtesy of the National Film Board of Canada.)*

Several of the most significant infrastructure projects being supported under the agreement were completed during 1989-90, including the Elgin and Winter Garden Theatre Complex in Toronto, the Sault Ste. Marie Museum, the Huron County Museum in Goderich, and the renovations to the Canadian Centre for Advanced Film Studies in North York. Each has taken a prominent place in furthering local and national cultural and economic objectives.

After extensive refitting to expand its film scoring and sound recording capabilities, the Northumberland 29 Recording Studio in Campbellford has re-opened. This project, supported under the cultural enterprises development component, has enabled the studio nearly to double its production capacity and is drawing new business from as far away a Nashville.

The Great Lakes Science Centre feasibility study and the Sharon Temple master plan, both funded under the feasibility studies component, were completed in 1989-90. The proposed Great Lakes Science Centre would showcase the heritage of the Great Lakes, while the Sharon Temple master plan has provided the Temple with a conservation and development plan for the site.

Manitoba

The five-year $21-million Canada-Manitoba subagreement on communications and cultural enterprises ($13 million federal and $8 million provincial) expired on March 31, 1989.

Evelyn Hart dances in "The Big Top," a production of the Royal Winnipeg Ballet, which celebrated its 50th anniversary in 1989.

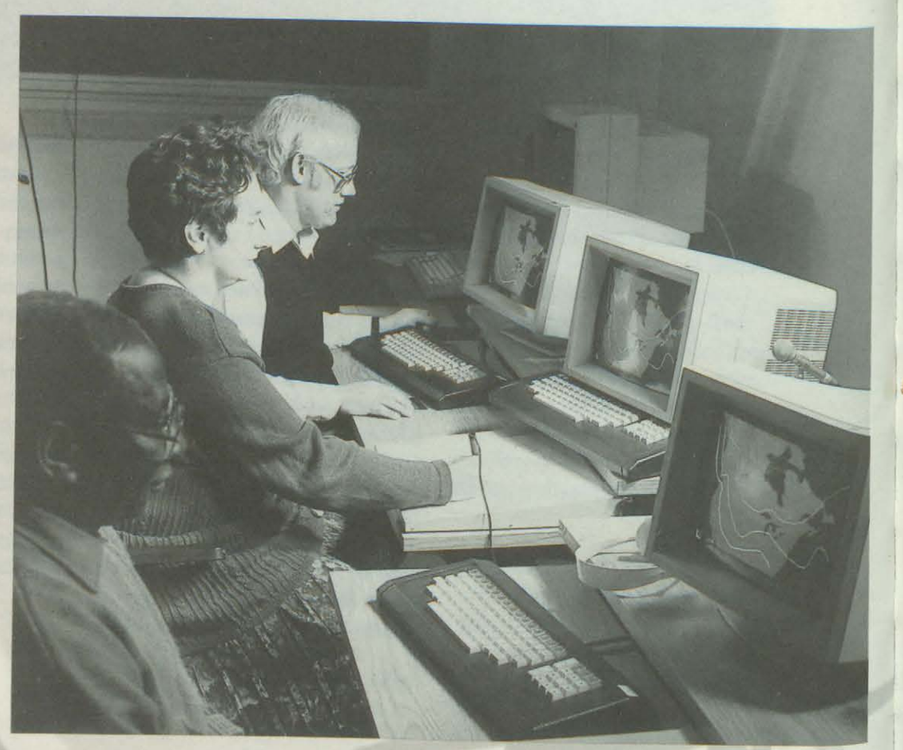
Funding to previously approved projects continued in 1989-90 and included GPT Canada's low-power microwave multi-channel distribution system, which achieved significant sales in its first year; an automatic meter-reading system called IRIS; and Ubitrex's hospital bedside data collection and information processing system called NURS.

Approval to fund new cultural projects under the contribution agreement with the Cultural Industries Development Office (CIDO), which was established under the ERDA, ended on March 31, 1990. Treasury Board approved an additional contribution of $874,000 for 1990-91 to extend CIDO's mandate for one year. Programming highlights in 1989-90 included two feature films, *The Last Winter* and *Mob Story*; an animated short, *The Cat Came Back,* which won a Genie Award; and two Juno award-winning records, *Lullaby Berceuse* and a children's album by Fred Penner.

Atlantic

Communications Canada, the Atlantic Canada Opportunities Agency and the Atlantic provincial governments have made substantial progress on joint development initiatives undertaken during 1989-90. Negotiations on Canada/Prince Edward Island and Canada/New Brunswick Co-operation Agreements on Cultural Development have been successfully concluded and have been submitted to the provincial governments for funding approval. The agreements are expected to be announced within the next year.

RESEARCH ACTIVITIES



A demonstration of the Common Visual Space Network (CVSNET). This multi-station, interactive technology is being transferred to industry.

Communications Canada is home to three major research facilities: the Communications Research Centre (CRC) at Shirleys Bay, near Ottawa; the Canadian Conservation Institute (CCI) in Ottawa; and the Canadian Workplace Automation Research Centre (CWARC) in Laval, Quebec.

CRC carries out research and development in communications technologies such as radio, satellites, microelectronic and optical devices and components, and broadcast and video technologies. CWARC specializes in workplace automation and informatics. CCI works to preserve art objects and artifacts, and provides information and advice on conservation to institutions in Canada and abroad. The work of all three centres is recognized worldwide.

During the year, the Department helped to establish three new Regional Applications Centres to promote research and development partnerships with industry. There are now seven of these centres in operation across the country.

Communications Research Centre (CRC)

The Communications Research Centre's mandate is to carry out research and development that supports the Department's roles in the development and implementation of telecommunications policies, regulations and standards. Working through partnerships and co-operative activities with the academic and industrial sectors, the CRC promotes the development, application and commercialization of innovative communications and information technologies. In this capacity, it plays a crucial intermediary role between university-based research and development on the one hand, and industry-based research and development on the other.

Research labs evaluation

The Department has recently completed the first extensive evaluation to focus on its entire research sector, examining the quality of research conducted and the relevance of the labs to the telecommunications industry. The evaluation revealed that 96 percent of external clients (representing private firms and universities) and 78 percent of their peers consider their work to be of the highest quality and on the leading edge of research by international standards.

The high quality of their work places the labs in a unique and valuable niche within the telecommunications industry, with benefits extending to all of Canadian society. Strong support was expressed for the continued operation of the labs; in fact, 97 percent of external clients indicated that without the labs, they would be unable to fill the research gap, forcing them to discontinue potentially beneficial research.

High-definition television

The North American standard for high-definition television (HDTV) will be set within the next two or three years. The CRC's Broadcast Technologies Research Branch is playing an important role in determining what that standard will be and in ensuring that the one chosen will be the most suitable for use in Canada.

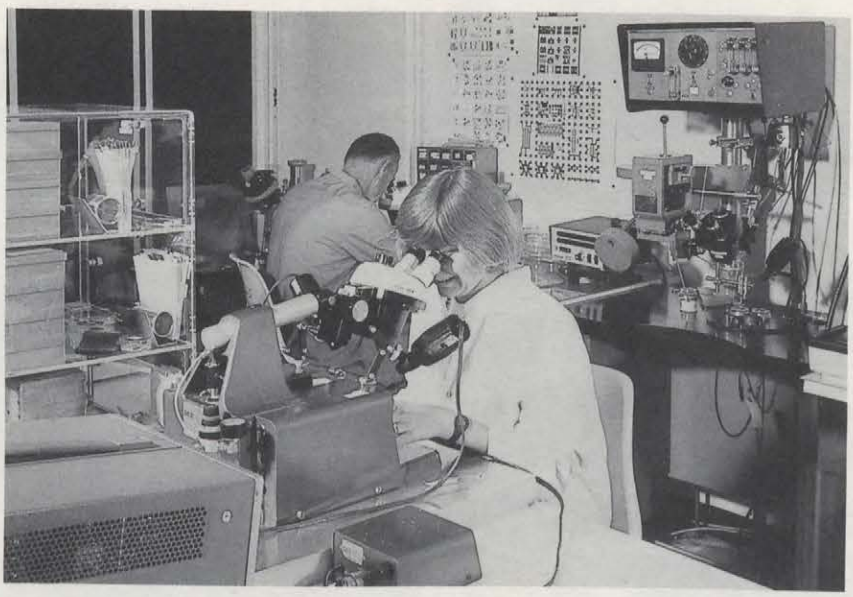
Several advanced television systems have been proposed for the standard and CRC scientists, working in collaboration with colleagues from organizations in the United States, have designed a testing program to assess the various designs. The assessment will include subjective testing, objective testing and field trials.

The subjective testing will be carried out entirely in Canada. The CRC is now working with Canadian industry to arrange facilities and staff to conduct this two- to three-year joint project.

Digital audio broadcasting

Advances in digital audio technology now offer the potential to transmit sound with the quality of compact discs (CDs) over the airwaves. The broadcasting industry is showing great interest, and the Department is now laying the foundations for the introduction of digital audio broadcasting in Canada.

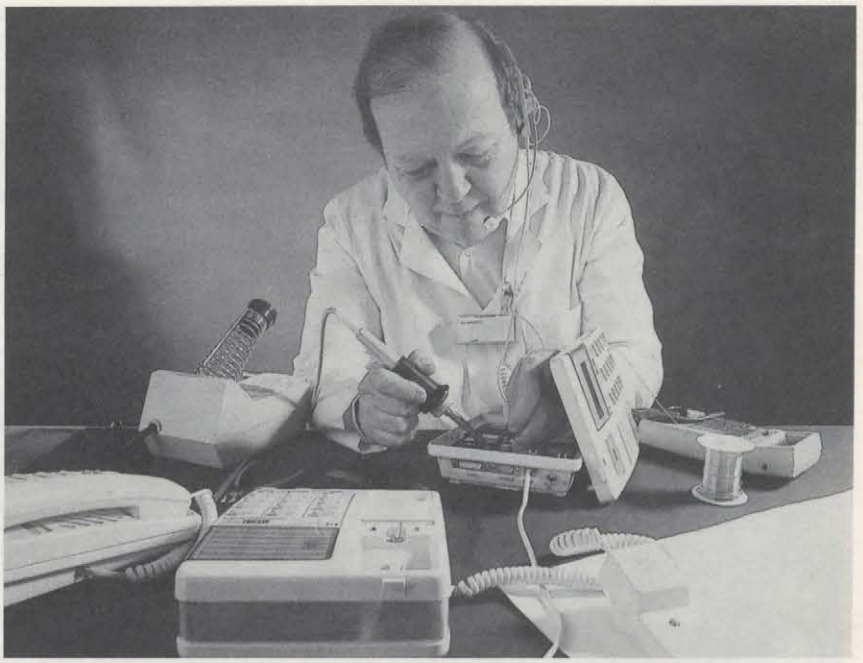
Studies are under way to determine spectrum requirements, and strategies for the implementation of digital audio systems are in development. Plans are already in place to demonstrate and evaluate a prototype system.



A technologist at work in the monolithic microwave integrated circuit laboratory at the Communications Research Centre (CRC).

Gallium arsenide microelectronics

Integrated circuits based on the compound semiconductor gallium arsenide will greatly improve the quality of communications systems. These circuits are high-frequency and high-speed, up to six times faster than those based on silicon; and because gallium arsenide devices can be made



This voice privacy device is under development for transfer to industry.

to emit light, they can be used as miniature lasers in optical communications systems.

The CRC has for several years been a front-runner in the development of processes and techniques to produce monolithic microwave integrated circuits (MMICs) based on gallium arsenide. One basic process developed at CRC now supports a variety of in-house projects, including the development of optoelectronic integrated circuits and EHF microwave components. Canadian industry is also benefitting from CRC initiatives: one fundamental MMIC fabrication process developed with the assistance of the CRC is already used in the Canadian electronics sector, and several more domestic OEMs (original equipment manufacturers) are considering it.

Miniature hybrid microwave integrated circuits (MHMIC) technology

The CRC is working with the Centre National d'Études des Telecommunications of France and several Canadian companies on the development of MHMIC, a miniaturization technique to make microwave components smaller, more reliable and capable of being manufactured in large quantities. Progress during 1989-90 has been excellent. MPR Teltech Ltd. successfully demonstrated several circuits developed at CRC. MPR Teltech now intends to set up a Canadian foundry service for components based on this technology. Efforts are also being made to create a Canadian consortium to continue the development of MHMIC technology.

Digital signal processing

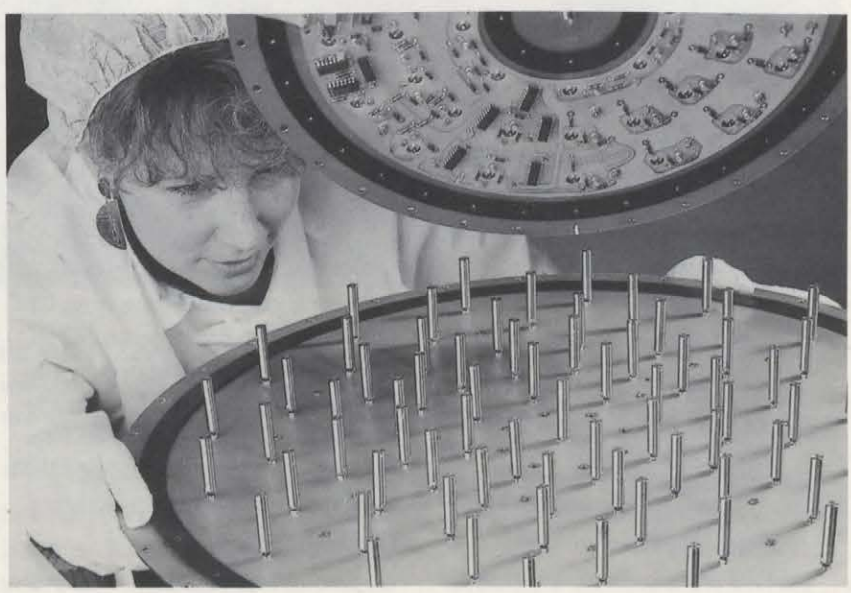
CRC completed two major projects in digital signal processing this year, one in digital voice modulation, the other in digital voice coding for both military and civilian uses. Both resulted in new technologies of international significance.

The first project produced a voice modulation technique known as constant average power single sideband (CAP-SSB), a powerful technique that will both improve the quality of voice transmissions and use the spectrum more efficiently. The technology has been transferred to Canadian industry for incorporation into a number of different radios to be used in trials leading up to the launch of MSAT (Mobile SATellite) in 1994. Two Canadian companies are already actively involved in licensing the technology for mobile satellite system use worldwide.

The second project studied the problem of frequency congestion in the VHF and UHF bands, and found a promising solution in the form of a new narrow-band digital voice coding radio system. The 4800-bit-per-second codebook excited LPC has been successfully implemented and turned over to the Department of National Defence for technology transfer. The new system is arousing much interest among Canada's partners in NATO (the North Atlantic Treaty Organization), as well as in Canadian industry.

Microwave propagation

The CRC has recently completed a joint project with Lapp-Hancock to model the effect of diurnal and seasonal variations of rain attenuation on intercontinental satellite links. This project was conducted on behalf of INTELSAT, the International Telecommunications Satellite Organization.



The L-band antenna designed for MSAT service by the Communications Technologies Research Branch at CRC.

The Skywave briefcase terminal in operation during MSAT communications trials at Weir, Quebec.

MSAT Program

MSAT (Mobile SATellite), the world's first dedicated domestic mobile communications satellite, is to be launched by Telesat Mobile Inc. (TMI) in 1994. Based on a concept developed by Communications Canada, MSAT will revolutionize communications in isolated and sparsely populated areas. The satellite will virtually eliminate the problems of limited range, noise, interference and distortion experienced by users of two-way radios and telephones in remote areas.

Discussions are continuing among Communications Canada and several other departments on the introduction of mobile satellite services. Contract negotiations between TMI, Spar Aerospace and Hughes Aircraft for the procurement of two satellites are also in the advanced stages. Plans for pre-launch voice and data trials are nearly complete. Sealink Ltd. of Newfoundland has concluded the first phase of messaging, dispatch and control service trials with east coast fishing fleets and a shore-based control station. Seimac Limited of Nova Scotia has been awarded a contract to perform data trials in collaboration with the Coast Guard, National Sea Products, the Bedford Institute of Oceanography and marine towing firms.

Canadian Workplace Automation Research Centre (CWARC)

Reflecting the Government's emphasis on the need for effective intersectoral partnerships in pursuing national research and development priorities, the Canadian Workplace Automation Research Centre (CWARC) works closely with the private sector, universities, and government through negotiated partnerships. Together, CWARC and its partners promote the development and growth of a Canadian industry, designing, testing and implementing new concepts and technologies associated with office automation and telematics.

A view of the main computer centre at the Canadian Workplace Automation Research Centre (CWARC) in Laval.

Integrated systems

CWARC is particularly active in the field of integrated systems, with work under way on a wide range of applications.

Multimedia systems, where voice, video and graphics capabilities are integrated in various systems, are a priority. CWARC is collaborating with the private sector to develop and test these systems for applications in such fields as voice messaging and voice response systems, systems for the hearing and visually impaired, and systems for access and dissemination of culture and of information to the general public.

Open systems interconnection

Another priority is open systems interconnection (OSI). CWARC is working on a joint project with the United Kingdom National Computing Centre, British Telecom, and Idacom of Alberta to develop TODAC, a conformance-testing tool for international ODA (office document architecture) and ODIF (office document interchange format) standards. TODAC is considered the most advanced in the world; and organizations in the United States, Japan and Europe are negotiating acquisitions. TODAC was chosen to test implementations of the ODA standard in preparation for interoperability demonstrations at the international 1989 and 1990 CEBIT conferences and shows in Hanover, West Germany.

CWARC is also collaborating with the Canadian Interest Group on Open Systems (CIGOS) to establish the infrastructure necessary for the orderly introduction, exploitation and harmonization of OSI in Canada. During 1988-89, CWARC prepared a workplan for a Open Systems Test Program, which this year evolved into a proposal from the private sector to establish a Test Centre Corporation with government support. Negotiations are in the final stages.

A CWARC employee uses the new CD-ROM technology to retrieve information on office automation. One CD-ROM disc can hold as much information as the Encyclopedia Britannica.

Organizational research

A current project in organizational research at CWARC focuses on the management of organizational change, exploring ways to successfully prepare for and implement change that can be adapted to different work environments and contexts. This approach is influencing many areas of organizational research and is arousing international interest.

Computer-assisted translation

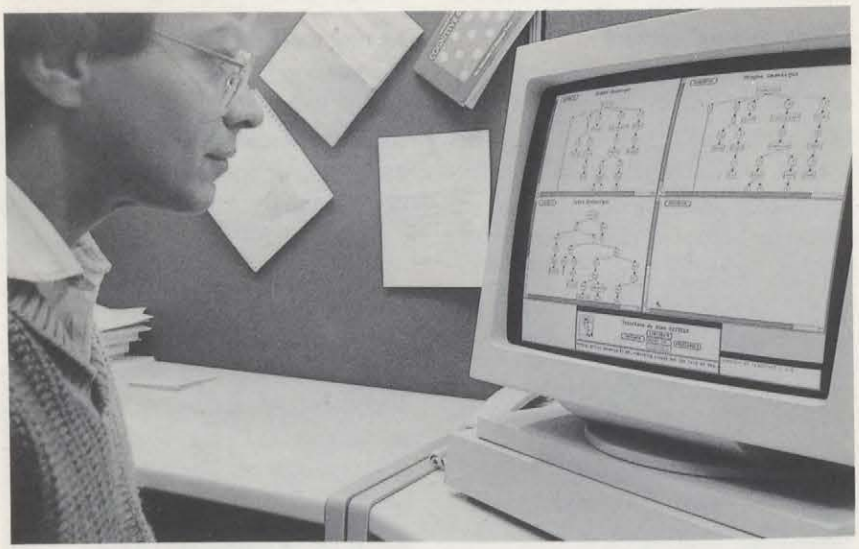
CWARC is exploring two avenues of computer translation, one whereby a computer system facilitates the work of a human translator, another whereby the computer system itself generates the translations.

CWARC's Translator's Workstation uses standard PC hardware and integrated software, including word processing, terminology management, file comparison and conversion, telecommunications and various writing tools. The first version of the workstation has undergone initial testing at the Translation Bureau of the Department of the Secretary of State. The second version is under development.

CWARC is also preparing a feasibility study on the use of bilingual test generation systems for certain statistical reports at Statistics Canada, as part of a major program of Industry, Science and Technology Canada (ISTC) on research and development of artificial intelligence. If the study shows positive results, the process will be used to support an important ISTC/Statistics Canada research and development project to be carried out over the next few years.

Expert systems

Another element of CWARC's work is the development of special purpose expert systems. One example is Amethyst, a system to facilitate the



Developed by CWARC, CRITTER is a fully automatic, bidirectional computer-assisted translation system specializing in agricultural product reports.

work of pay and benefits clerks in the federal government. Amethyst is being used on an experimental basis by Communications Canada.

Information resources service

Canada's central source of information on workplace informatization is CWARC's Information Resources Service databank, which now contains nearly 36,000 bibliographic references. It is accessible through computer terminals at researchers' workstations at CWARC and in the library at departmental headquarters.

Canadian Conservation Institute (CCI)

The Department's Canadian Conservation Institute (CCI) is a world leader in conservation. Its conservators work to restore and preserve an enormous range of art objects and other culturally important artifacts. CCI scientists study the behaviour of materials and artifacts in various museum environments, and develop improved methods of conservation. Totem poles and tiny carvings; objects recovered from shipwrecks and archaeological sites; manuscripts and documents; historical costumes and textiles; paintings and sculptures are a small sample of the objects treated.

◁ *Using video conferencing technology, public service managers discuss information technology with representatives of CWARC and the Canadian Centre for Management Development at an Expo-forum jointly sponsored by the two centres.*

CCI also provides consulting services to museums and art galleries throughout Canada. Its conservators regularly visit institutions to lead training seminars and workshops, and they provide intermediate and advanced training in-house to conservators from across Canada and around the world.

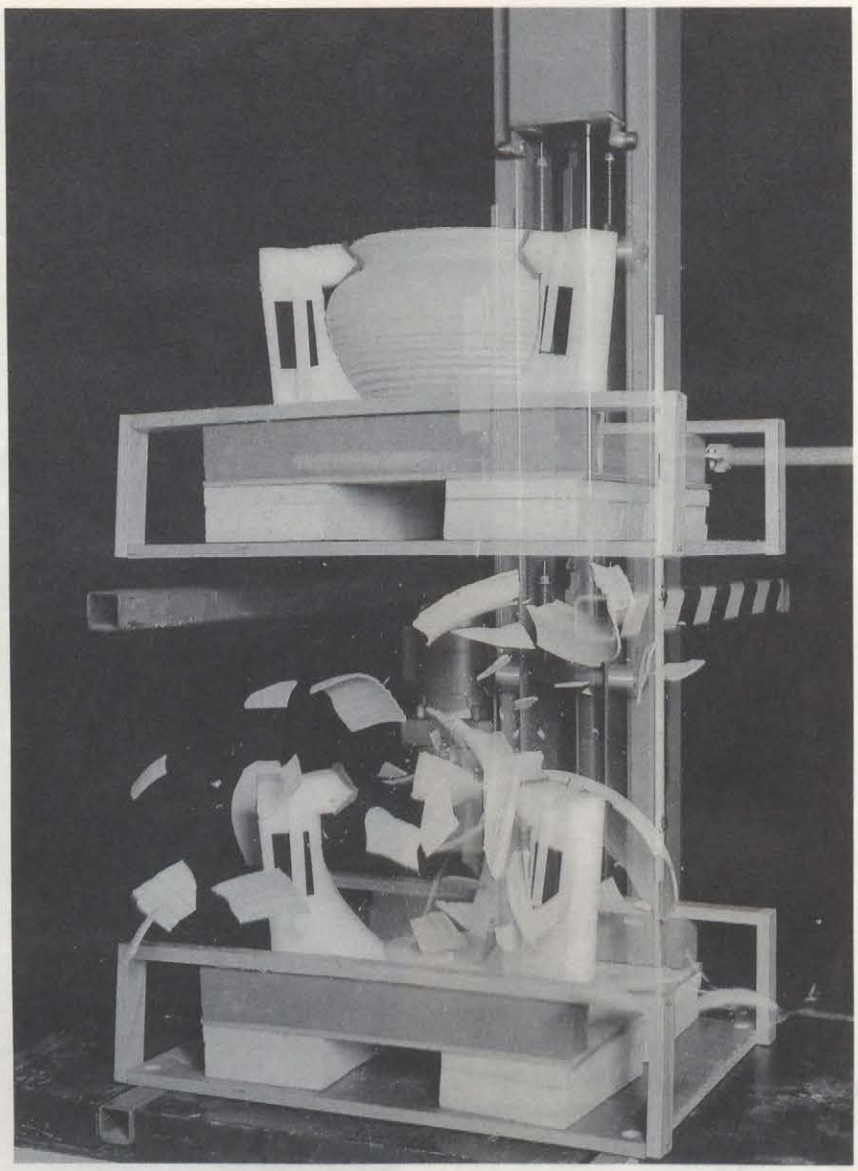
The Institute is a co-founder of CIN, the Conservation Information Network, which maintains and offers international access to the largest and most comprehensive conservation databases in existence. Through an extensive publication program, it also disseminates information nationally and internationally on subjects such as conservation research, techniques and materials.

Major CCI projects of 1989-90 ranged from treatment of a tapestry several centuries old to research on the use of Parylene, a polymer used to strengthen delicate materials.

The tapestry, "Tobias and Sarah Bidding Farewell to her Parents," was

▷ *A conservator with CCI's Fellowship Program performs the final steps in the restoration of an 18th-century French bracket clock. The clock will be returned to the Royal Ontario Museum once the treatment is complete.*

A demonstration of shock damage to an unfired clay pot. CCI uses the results of such tests to assist museums with new packing techniques that prevent damage when objects are transported.



one of five commissioned for Bisham Abbey during the reign of England's King Henry VIII. Its treatment, on behalf of the Winnipeg Art Gallery, required 4,000 work hours to complete.

The Parylene study focuses on the polymer's ability to consolidate fragile materials and to provide a stable coating. The use of Parylene has been applied in such diverse ways as the consolidation of logbooks recovered from the Dryden, Ontario air disaster; the preservation of 40-million-year-old leaf, cone and wood specimens from the Arctic fossil forest on Axel Heiberg Island in the Northwest Territories; and the consolidation of disintegrating book bindings from the Archives nationales du Québec.

A CCI conservator installs the second stage of a mount for 100 ceramic tiles that make up a mid-16th-century "Kachel Ofen." This Nuremberg stove is now on display at the University of British Columbia's Museum of Anthropology.

Research partners

The Department is actively involved in a vast range of communications research and development. Its own research facilities, the Communications Research Centre (CRC), the Canadian Workplace Automation Research Centre (CWARC) and the Canadian Conservation Institute (CCI) carry out research projects, independently and in collaboration with partners in the public and private sectors in Canada and around the world. These projects keep Canada at the forefront in domains such as telecommunications, microelectronics, broadcast technologies, office automation, and conservation.

Research conducted or supported by the Department extends beyond the development of new technologies to the development of the industry itself. By participating in and promoting research and development partnerships, the Department fosters productive interaction, contributing to the development of new technologies and their transfer for commercial application.

The Department's consultative role within the communications sector is also vital. This role ranges from expert advice in areas such as testing and commercialization of new applications to the compilation of comprehensive databases on various technologies.

The Department's financial and other assistance to Regional Application Centres supports research, development and technology transfer within specialized fields. The Regional Applications Centres provide a dynamic research environment that leads to rapid advances in the development of applications and the growth of competitive high-technology industries.

The first three Regional Applications Centres were established in 1988-89: Canadian Healthcare

Telematics Inc. in Winnipeg; the Telemedicine and Education Technology Resources Agency (TETRA)

A graphic designer and production manager use TETRA's desktop publishing equipment. (Photo courtesy of TETRA.)

in St. John's; and the Canadian Centre for Marine Communications (CCMC), also in St. John's. By the end of 1989-90, three new centres had begun or were about to begin operations: the Legal Information Systems and Technologies Foundation, the Centre for Image and Sound Research, and the National Wireless Communications Research Foundation, all in Vancouver. As well, the Centre for Computer-assisted Translation in Moncton was in the planning stages, and other centres were under consideration.

Canadian Centre for Marine Communications

The Canadian Centre for Marine Communications (CCMC) was opened in St. John's, Newfoundland, in April 1989 to help its members develop and market marine communications products and services nationally and internationally. Membership is open to any Canadian organization that is a user, developer or supplier of marine communications products and services.

CCMC focuses on applied research in communications technologies for the fishing, shipping and off-shore oil industries. Marine antennas and integrated electronic systems for ships are of particular interest, as are integrated electronic systems for ships, communications technologies for ships and shore stations, signal-processing technology, and information-processing technology. CCMC members benefit from well-equipped research facilities that include a licensed experimental marine radio station, underwater test and measurement equipment and facilities, and sophisticated computer systems.

In addition to conducting research and providing technical and marketing assistance to its members, CCMC promotes members' products and services at national and international trade shows and through an internationally distributed newsletter. It also maintains a database on Canadian industrial capabilities and collects information on marine communications technology and the industry.

The Department's Communications Research Centre (CRC) works closely with CCMC, which helps transfer technologies developed by CRC. CRC scientists and engineers conduct research at CCMC, and CCMC can arrange for its staff to receive training at CRC. Similarly, CCMC members can have their staff trained at CCMC.

A non-profit corporation, CCMC is funded by the Atlantic Canada Opportunities Agency ($7.5 million), Communications Canada ($1.5 million) and the Newfoundland and Labrador Institute of Fisheries and Marine Technologies ($1.1 million), with additional funding for ongoing projects expected from the private sector.

An editor at work in TETRA's computerized editing suite. (Photo courtesy of TETRA.)

During 1989-90, CCMC completed its implementation phase, hiring 13 professionals and initiating, in consultation with industry, several application projects.

Telemedicine and Educational Technology Resources Agency

The Telemedicine and Educational Technology Resources Agency (TETRA) has become widely known for its development of telemedicine, distance education and training programs.

The agency, which operates through the Telemedicine Centre and the Division of Education Technology at Memorial University, completed its first full year in 1989-90. It started operations in September 1988 with funding from the Atlantic Canada Opportunities Agency, Communications Canada and Memorial University.

During 1989-90, TETRA introduced its services and the concept of distance education to several organizations, including professional associations, businesses, educational institutions, and provincial and federal government departments and agencies. Programs are tailored to suit clients' needs.

The Department supports TETRA through the provision of satellite earth stations and segment space on satellites, and through opportunities for linkages with the Commonwealth of Learning and la Francophonie. As well, the Department is facilitating TETRA's involvement in the *Olympus* satellite trials, the pre-MSAT trials and the MSAT Program itself. TETRA already works closely with

Canadian Healthcare Telematics Inc., a Regional Application Centre in Winnipeg, and is examining the potential for joint projects with Communications Canada and the Canadian Centre for Marine Communications.

Canadian Healthcare Telematics Inc.

Through the creation of strategic research partnerships, Canadian Healthcare Telematics Inc. (CHTI) encourages the development and application of telecommunication and information technologies for use in healthcare. Opened in Winnipeg in November 1988, CHTI works at the forefront of telecommunications, providing a forum to co-ordinate technological advances and the development of products and services to meet market needs.

CHTI was established as a non-profit corporation in co-operation with the federal departments of Communications and National Health and Welfare. It works with government, industry, the healthcare system, and universities on projects that test and demonstrate telecommunication and information technologies in healthcare applications. Activities during 1989-90 included projects on: linking rural and remote healthcare facilities with education, research and medical consultation services; computer conferences, workshops, courses and journal supplements for healthcare personnel; and development and implementation of decision-support systems linking rural practitioners with major healthcare institutions.

CHTI assists the Department's Canadian Workplace Automation Research Centre (CWARC) and other government research establishments to transfer technology to the private sector. In addition, the Department relies on CHTI as the scientific authority for projects it funds in healthcare and telematics.

Communications Canada contributed $600,000 and the services of its professional staff to assist CHTI's start-up.

Legal Information Systems and Technologies Foundation

The Legal Information Systems and Technologies (LIST) Foundation was established by the University of British Columbia in 1989 to capitalize on the university's success with a project in the application of communication and information technology to the legal profession. This early project involved the design and implementation of a sentencing database that provided British Columbia lawyers and provincial court judges with rapid access to information on sentencing precedents. IBM Canada and Communications Canada supported the project; the Department contributed $125,000.

Now LIST is conducting research and development in emerging information technologies for application in the legal system.

Under a Memorandum of Understanding, CWARC assists LIST in expert systems, database management systems, operator-machine interfaces,

and networking. LIST and CWARC also collaborate in assessing the productivity and performance of information technologies used by the legal profession.

One project of the Centre for Image and Sound Research is COMPOSE, a computer-based tool that assists choreographers in the composition of dance.

Centre for Image and Sound Research

In January 1990, the Department contributed $150,000 to assist in the establishment of the Centre for Image and Sound Research at Simon Fraser University in British Columbia. The centre researches and develops technology for the cultural and entertainment industries.

Projects at the centre include work on image processing, computer graphics, computer vision and pattern recognition, 3-D animation, computer-based 3-D modelling techniques, digital sound synthesis, synchronization systems and interactive laser disc technology. Among its first projects, the centre developed COMPOSE, a computer-based instrument to assist choreographers in the composition of dance.

National Wireless Communications Research Foundation

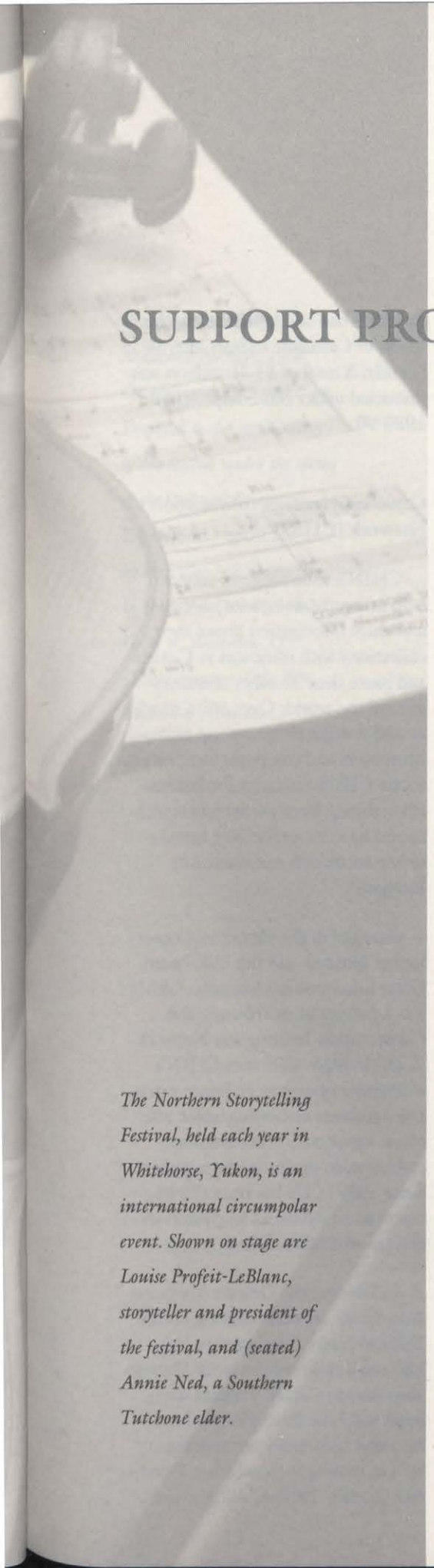
In May 1989, the Department contributed $85,000 to the National Wireless Communications Research Foundation in Vancouver for the preparation of the foundation's business and science plans. The foundation's mandate is to develop Canadian industrial expertise in wireless communications.

Wireless communications encompasses products and technologies employed in satellite communications, mobile telephones, two-way radio and dispatch systems, and paging/messaging systems. A field that typically returns investment tenfold in seven years, it is the subject of intense competition in markets worldwide.

The foundation will provide a national focus for applied research and development in the wireless transmission, reception and processing of voice, data, and image signals. This effort will include the transfer or networking of technologies from many Canadian sources, with emphasis on small businesses.

Government and industry investment in the foundation during its first five years is forecast at $27 million, with industry contributing 50 percent of this, including $3.3 million from the re-investment of royalties. The foundation's objective is to become self-sufficient.

SUPPORT PROGRAMS



The Northern Storytelling Festival, held each year in Whitehorse, Yukon, is an international circumpolar event. Shown on stage are Louise Profeit-LeBlanc, storyteller and president of the festival, and (seated) Annie Ned, a Southern Tutchone elder.

Canadian Audio-Visual Certification Office

The Government of Canada offers tax incentives in the form of Capital Cost Allowances to investors in qualified Canadian film and videotape productions, incentives that have played a pivotal role in financing and developing the industry. The Canadian Audio-Visual Certification Office is responsible for determining which productions are eligible, applying certification criteria that favour Canadian participation in and control of all aspects of production. During 1989-90, the Office certified 210 productions, with budgets totalling $437 million.

Sound Recording Development Program

The Sound Recording Development Program (SRDP) supports and strengthens the Canadian recording industry by making funds available to Canadian companies and organizations. These funds are intended to help cover the costs of producing audio and video musical products and radio programs, marketing and international touring, and business development. The Program disburses approximately $5 million a year. Forty percent is targeted to the French-language sector of the industry and 60 percent to the English-language sector.

During the year SRDP helped raise the international profile of Canada's recording industry by supporting Canadian participation at two major international events, the *Marché international du disque, de la vidéo et de l'édition (MIDEM)* in Cannes, France, and the Tenth Annual New Music Seminar in New York. As in previous years, SRDP also provided funds for innovative projects prepared especially for these two events, including promotional compact disc recordings (CDs) featuring Canadian artists. The CDs were distributed to international recording executives and distributors attending the fairs to draw attention to Canadian talent.

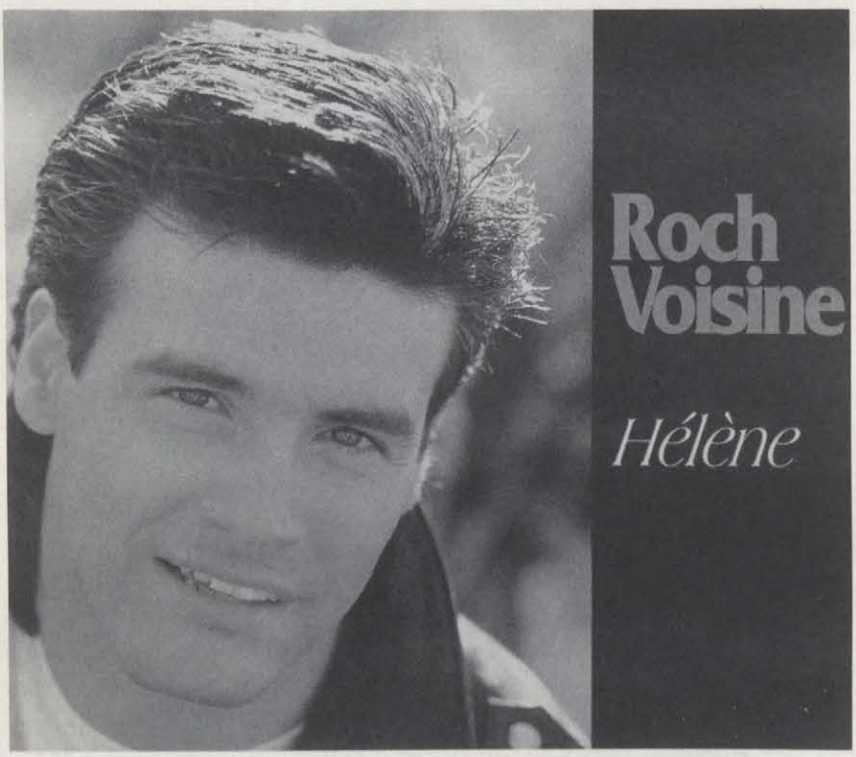
During 1989-90, nine recordings funded by the SRDP achieved gold-record status (sales of 50,000); nine, platinum status (sales of 100,000); one, double platinum status (sales of 200,000); and one, six times platinum status (sales of 600,000).

Book Publishing Industry Development Program

The Book Publishing Industry Development Program (BPIDP) is designed to support Canadian publishers in their efforts to increase profitability and improve efficiency.

During 1989-90, $2.1 million was directed towards projects in marketing, promotion and computerization. Over $3.6 million was disbursed under the Educational Publishing Fund, designed to help Canadian publishers increase their share of the domestic educational book market.

The BPIDP's Aid to Industry and Co-operative Projects component supports initiatives among book publishers to achieve economies of scale or synergies in production, marketing and distribution. This year several projects received financial assistance, including a joint sales-force project by a group of literary presses, a distribution and marketing project in the Atlantic Provinces, and a project to improve typesetting facilities for a consortium of small publishers.



Roch Voisine's album, Hélène, *reached double platinum status (sales of at least 200,000) during 1989-90.*

The Aid to Professional Associations component of BPIDP supports professional development seminars and research geared to the needs of the publishing industry. The Export Marketing Assistance component assists publishers in buying and selling rights abroad and in marketing the works of Canadian authors internationally. A total of $1.25 million was disbursed under this component in 1989-90.

Canadian Heritage Information Network (CHIN)

CHIN's wide range of services help museums document, manage and share information about their collections with museums in Canada and more than 20 other countries around the world. Over 360 Canadian and foreign museums use microcomputers and computer terminals to access CHIN databases for information ranging from conservation techniques to a comprehensive list of stolen art objects maintained by Interpol.

Along with the Canadian Conservation Institute and the U.S.-based Getty Conservation Institute, CHIN was a partner in establishing the Conservation Information Network (CIN) in 1985. CIN uses CHIN's mainframe computer to house extensive databases on bibliographic references, conservation materials and conservation products and suppliers. Since 1987, CIN has been offering access to its databases to conservation centres around the world.

CHIN and the Ontario Museums Association are collaborating on the Trillium project, designed to link 150 small and medium-sized Ontario museums to CHIN. Trillium databases will hold descriptions of artifacts and natural science specimens held in museums throughout Ontario and Canada. Trillium will provide

Franck, Albert Jacques.
Aberdeen Avenue, *1958.*
Oil on board, 50.5 x 61.0 cm.
Donated to the Art Gallery of Hamilton under the terms of the Cultural Property Export and Import Act *by Mrs. Cecil W. Robinson in memory of her husband, Cecil W. Robinson, Q.C.*
(Photo courtesy of the Art Gallery of Hamilton.)

information on suppliers of museum materials, lists of exhibits and available exhibit space, and biographies of artists.

Movable Cultural Property Program

The *Cultural Property Export and Import Act* of 1977 protects objects of cultural significance to Canada by regulating their export.

The Department's Movable Cultural Property Program administers the Act. The Program also helps Canadian institutions build their collections: it administers a certification process for tax incentives offered to individuals and corporations who donate or sell cultural objects to designated institutions, and it provides grants or loans for the repatriation of important pieces held outside Canada or for purchase in Canada when export permits have been denied.

The Canadian Cultural Property Export Review Board met five times during 1989-90 to consider 756 applications for certification of cultural property valued at approximately $60 million. The Board also heard four appeals in cases where export permits had been denied.

Thirty applications for cultural property grants were approved by the board, for a total of $1.6 million. Of particular significance was the repatriation from the United States of an astrolabe believed to have been used by Samuel de Champlain during his explorations of the Ottawa Valley in 1613. The astrolabe is now in the

collection of the Canadian Museum of Civilization. The Provincial Museum of Alberta received a grant that enabled it to purchase an impressive collection of Blackfoot and North-West Mounted Police material. As well, the Art Gallery of Ontario was able to acquire an important work by sculptor John Tiktak, marking the first occasion on which funds were granted to repatriate an Inuit sculpture.

Two Ways and Means Motions in the February 20, 1990 Budget amended the *Income Tax Act* and the *Cultural Property Export and Import Act,* transferring responsibility for determining the fair market value of certified cultural property from Revenue Canada Taxation to the Canadian Cultural Property Review Board.

Insurance Program for Travelling Exhibitions

The Department helps Canadian museums, galleries, archives and libraries host travelling Canadian and international exhibitions by providing funds to help cover the costs of insuring the exhibitions in transit and on location. The Program applies only to exhibitions containing works valued at $1 million or more. During 1989-90, 18 exhibitions were insured to a total value of $292 million.

Museums Assistance Program

The Museums Assistance Program (MAP) supports and strengthens the Canadian museum community by providing grants, advisory service and technical services to Canadian museums, galleries and related institutions. MAP funding and services assist museums in preserving and exhibiting objects of importance to Canada's cultural heritage.

During the 1989-90 fiscal year, the Program received 246 requests for a total of $17 million; some $8.5 million was distributed to museums and related organizations across Canada.

Larger grants included $478,700 for the upgrading of equipment to care for the collection of the Musée du Québec, and $366,100 for special lighting equipment for the new British Columbia Sports Hall of Fame. The Museum Association of Newfoundland and Labrador, in collaboration with community museums in Conception Bay, received $66,600 to produce the national travelling exhibition "The Price of Fish." The Canadian Museums Association and the Assembly of First Nations were granted $25,000 to establish a task force on Museums and the First Peoples.

MAP also provided technical support to more than 90 museums and related organizations to assist them in preparing plans related to fire safety, security, environmental control, conservation and facilities. International Exhibition Services co-operated with various foreign governments and cultural agencies to circulate 33 international exhibits in Canada. The Exhibit Transportation Service provided transportation assistance to some 90 museums to move collections and exhibitions valued at $327 million.

The Sarcee Indian Gallery of the Glenbow Museum in Calgary contains artifacts from the daily and ceremonial lives of the Sarcee people. (Photo courtesy of the Glenbow Museum.)

Cultural Initiatives Program

Since 1984, the Cultural Initiatives Program has been providing financial support to non-profit Canadian professional cultural groups. The money is intended to help the groups:

- develop management skills,
- develop innovative ways of applying communications technologies in their work,
- bring professional performing and visual artists to audiences throughout Canada,
- develop a Canadian network of museums and performing, visual arts, heritage and cultural facilities, and
- support festivals and special events of national character or significance.

In 1989-90, the Program supported 393 projects, with contributions totalling $18 million. Examples include: $20,000 for the Stephenville Festival in Newfoundland; $18,000 for the Centre Bras d'Or in Baddeck, Nova Scotia; $30,000 to the Conseil de promotion et de diffusion de la culture in Moncton, New Brunswick; and $17,542 to Le Village Pionnier Acadien in Mont-Carmel, Prince Edward Island, for improvement of management practices; $400,000 for the 1989 International Choral Festival in Toronto; $628,922 to the Musée régional Laure-Conan, Pointe-au-Pic, Quebec; $225,000 to the Prairie Theatre Exchange in Winnipeg; $778,038 to the Calgary Military Museum for construction projects; $1,633,433 to the Norman Mackenzie Art Gallery in Regina for renovations; $85,000 for the Vancouver Children's Festival; $10,000 for the Frostbite Music Festival in Whitehorse, Yukon; and $5,000 to L'Association culturelle Franco-Ténoise, in Yellowknife, Northwest Territories.

The Vancouver Symphony performs at Blackcomb Mountain, British Columbia. (Photo by Jack Wong.)

The Cultural Initiatives Program and its predecessor, the Special Cultural Initiatives Program, have been in operation for a total of ten years. During this time, $142 million has been disbursed in direct support of Canada's cultural sector.

Public Lending Right Program

Canadian authors, translators, editors and illustrators benefit not only from the sale of their books, but are also compensated for the free use of their work through public libraries by the Public Lending Right Program, now in its fourth year of operation. The Program's funds are disbursed by the Public Lending Right Commission, which represents Canadian libraries, writers' groups, and book publishers' associations. The Commission determines the amount of each payment by a formula based on Canadian books catalogued and held by Canadian libraries. In 1989-90, 6,405 individuals received payments averaging $729 each, for a total of $4.7 million.

Support to national service organizations for the arts

For several years, the Department has been making contributions to the Canadian Conference of the Arts and the Canadian Crafts Council to help cover their operating expenses and the costs of various projects. This year they were granted $555,000 and $140,000 respectively.

◁ *Oshaweetuk.* Eskimo Legend, Owl, Fox, and Hare, *1959. Skin stencil on paper, 16/30, 42.7 x 34.6 cm. Donated to the Art Gallery of Greater Victoria by Miss Olive Heritage under the terms of the* Cultural Property Export and Import Act. *(Photo courtesy of the Art Gallery of Greater Victoria.)*

Centres of Excellence Development and Promotion Program

The Centres of Excellence Development and Promotion Program has two goals: first, to increase the representation of francophones in the technical, scientific and professional categories; and second, to foster a working environment conducive to the equitable use of French and English. The Program awards research grants to French-language and bilingual universities to develop centres of excellence that work in areas of interest to the Department. Last year, a new component was added to the Program; now, contracts can be awarded to bring graduate-level researchers into the Department to work on in-house research projects.

During 1989-90, the Department awarded ten contracts under the Program, for a total of $327,942.

▷ *Jean Lapointe stars in the French feature film* Une histoire inventée. *(Photo courtesy of Telefilm Canada.)*

INTERNATIONAL ACTIVITIES

◁ *In October 1989, Canada concluded a film and video co-production agreement with the Netherlands. Shown during the signing ceremony are Jan Breman, Ambassador of the Netherlands, and Monique Vézina, Minister of State (Employment and Immigration).*

▷ *Donald Sutherland stars in the feature film* Bethune, *a co-production with France and the People's Republic of China, where much of the footage was shot. (Photo courtesy of Telefilm Canada.)*

International Telecommunication Union

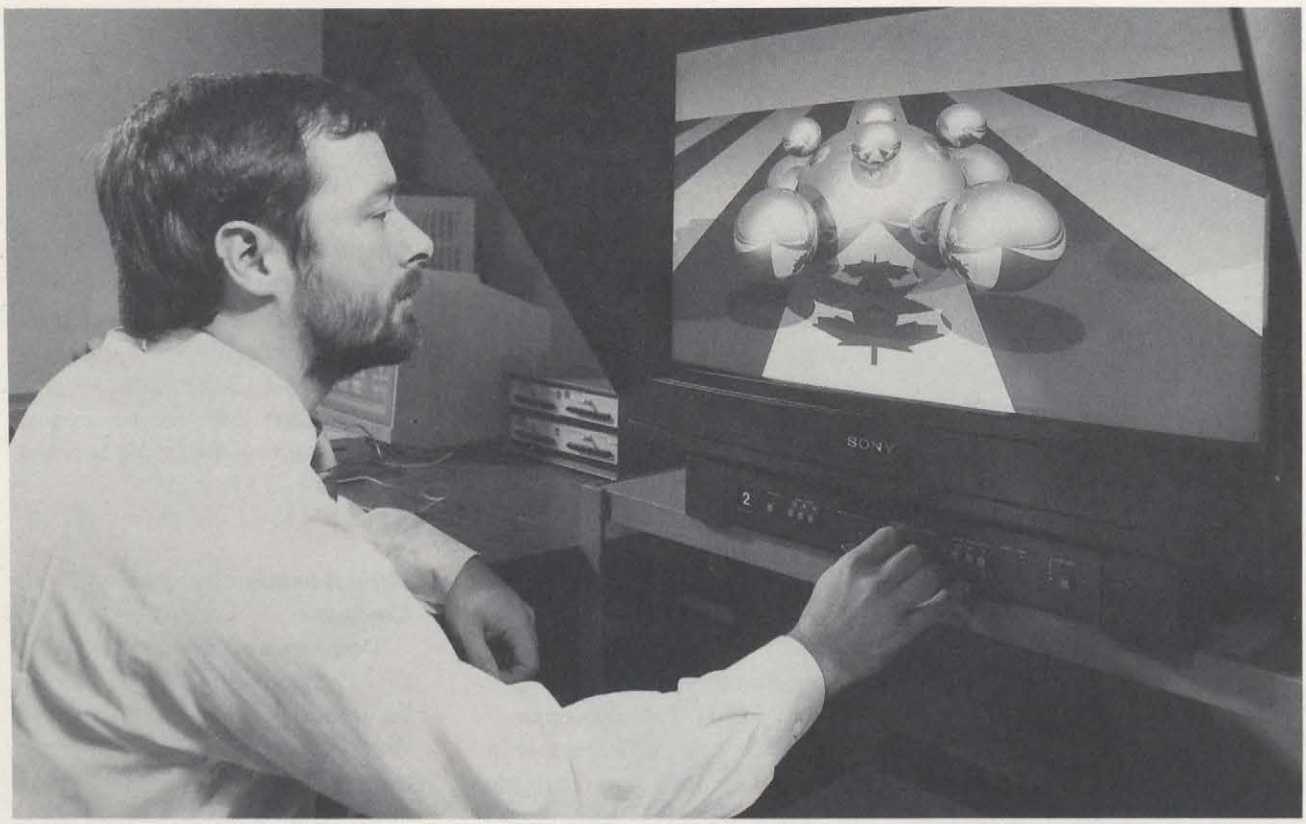
The International Telecommunication Union (ITU), a specialized agency of the United Nations, co-ordinates the international regulation of telecommunications in 166 member administrations around the world. Communications Canada represents Canada in the ITU, co-ordinating and leading Canadian public- and private-sector delegations to ITU conferences and meetings.

Plenipotentiary Conference

The 1989 ITU Plenipotentiary Conference, held in Nice, France in May and June 1989, saw the election of Canada to the ITU Administrative Council and to the 21-member ITU High-Level Committee (HLC), which will review the role of the ITU. Mr. Gaby Warren, Communications Canada's Director General of International Relations and Canada's representative on the HLC, was elected to chair the committee. Another Canadian, Mr. Gary Brooks, was re-elected as one of the five members of the International Frequency Registration Board (IFRB).

World Administrative Radio Conferences

Decisions were made at the 1989 ITU Plenipotentiary Conference on the agenda and dates for the next two World Administrative Radio Conferences (WARCs). A WARC on radio frequency spectrum allocation will be held in Spain in 1992. A 1993



Researcher viewing the results of video processing on an HDTV monitor.

WARC, at a location to be determined, will deal with high-frequency shortwave broadcasting matters. The Department is now preparing for these two conferences.

HDTV standards

The need to establish a single world standard for high-definition television (HDTV) is critical, and Canada is playing a leading role in promoting an international agreement on what that standard should be. The Department's work in assessing various proposed studio standards to find common structural elements on which worldwide standards could be based bore fruit at an Extraordinary Meeting of the ITU's International Radio Consultative Committee (CCIR) Study Group 11, when a Canadian compromise proposal based on a common image format was accepted.

INTELSAT/INMARSAT

The Department represents Canada on two international satellite-operating agencies: the International Telecommunications Satellite Organization (INTELSAT), and the International Maritime Satellite Organization (INMARSAT).

In 1989, negotiations between Canada and the United States led to an agreement at the October INTELSAT Assembly of Parties on the use of the next generation of Canadian (*Anik E*) and U.S. domestic satellites for Canada/U.S. transborder satellite services.

TEMIC

TEMIC, the Telecommunications Executive Management Institute of Canada, a joint government/private-sector initiative launched in 1986, offers comprehensive training to telecommunications executives and senior managers from developing countries. Approximately 100 participants from 40 countries came to Canada in 1989-90 to develop and share managerial expertise in telecommunications, making it a notably successful year for TEMIC.

Trade policy

Europe 1992

In December 1989, an interdepartmental working group chaired by the Department released a comprehensive report on the implications of a single European market (Europe 1992) for the Canadian telecommunications and informatics industries. A second interdepartmental working group, also chaired by the Department, is now exploring the effects of Europe 1992 on Canada's cultural industries.

Diplomatic discussions with France, concerning trade in film and video products, were successful. France is Canada's most important partner in terms of the volume of co-production activities. France's Minister for Communications confirmed in March 1990 that France will accord domestic and European Community status to Canada-France co-productions.

GATT/Multilateral Trade Negotiations

The Department participates actively in the development of Canadian proposals put forward during the Uruguay Round of multilateral trade negotiations under the General Agreement on Tariffs and Trade (GATT). Key areas of departmental interest include trade-related intellectual property and trade in telecommunications services.

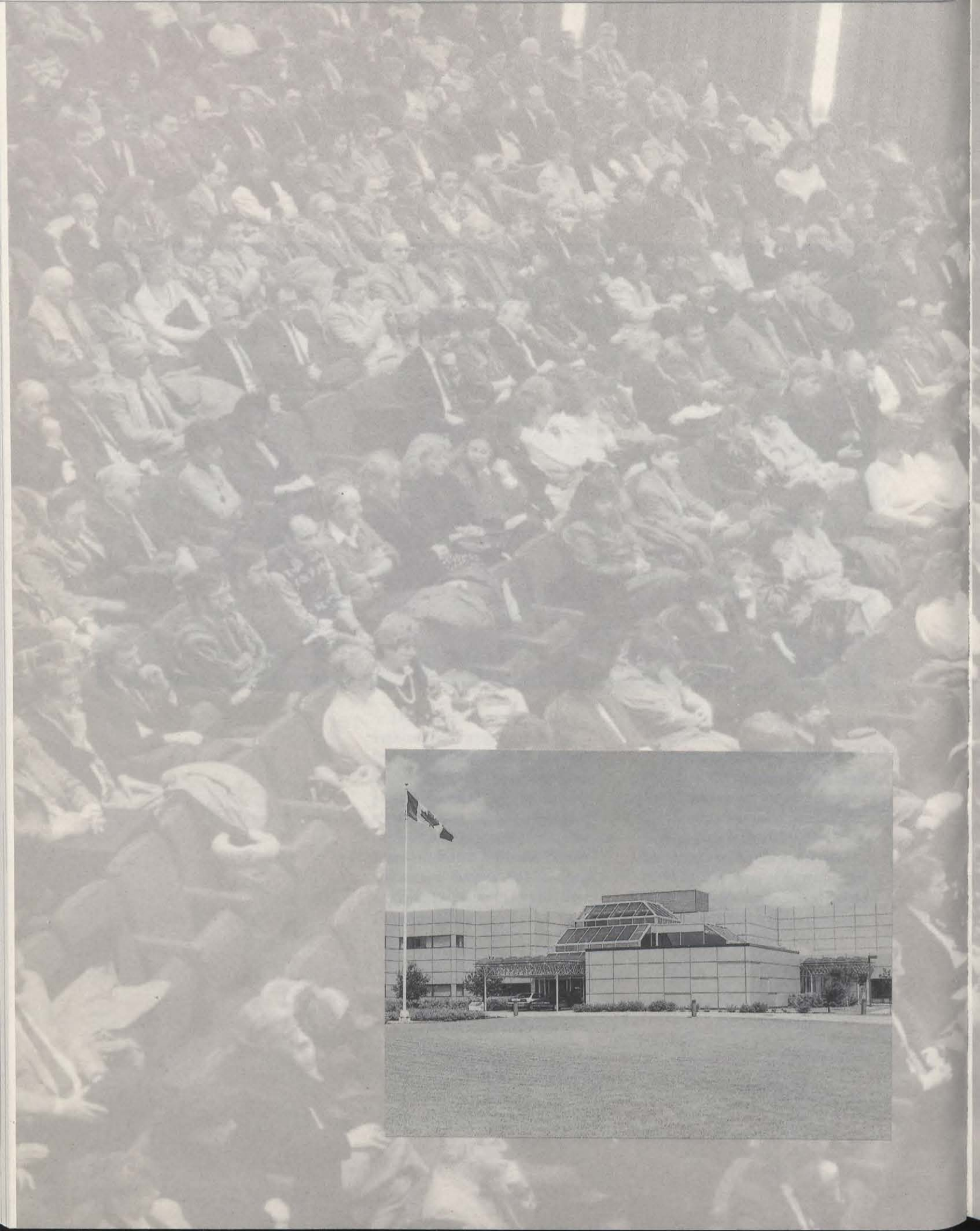
◁ *A Memorandum of Understanding for technical co-operation was signed between Communications Canada and Japan's Ministry of International Trade and Industry (MITI). Shown (left to right) are Yoshiki Mikami, Director, Information Standards Office (MITI); Masahide Yamashita, Director General, Standards Department, Agency of Industrial Science and Technology (MITI); René Guindon, Director General, CWARC; and Bill McCrum, Director, Systems Interconnection Research, Communications Canada.*

Film and television co-production agreements

Canada has long recognized the enormous benefits of working in partnership with other countries in film and television production: costs and risks are shared; new markets are opened for Canadian productions; international distribution increases; and Canadian film and production crews gain easier access to the partner countries.

During the past year, Ireland and the Netherlands signed co-production agreements with Canada. Also, Canada and the Soviet Union signed a special framework agreement during the Prime Minister's visit there in 1989. This agreement not only covers co-production, but also opens opportunities for co-operation in other areas. These three new agreements bring the number of Canada's international co-production partners to 19.

Furthermore, previously concluded agreements are generating increasing activity. During her visit this past year, France's Minister for Communications, and Canada's Minister of Communications signed a mini-treaty that creates a special fund to encourage French-language television co-productions. Television was also the focus of a successful seminar at the June 1989 Banff Television Festival, in which participants discussed ways to enhance co-production and co-operation among Canada, New Zealand, Australia and Great Britain.



MANAGING THE DEPARTMENT

▷ *Communications Canada employees attend a disability awareness session held at headquarters in May 1989. These sessions are designed to sensitize managers to the needs of the disabled.*

◁ *The Canadian Workplace Automation Research Centre in Laval, Quebec.*

Human resources

Communications Canada continued to implement *Challenge for Change*, an action plan formulated in 1988-89 to develop the full potential of the Department's staff. The culmination of a year of intensive examination of the operations and organization of the Department and how employees work with one another, *Challenge for Change* encourages more effective communication among the Department's staff and sectors. It puts a greater emphasis on the management of people, as opposed to operations, and encourages a more open management style. *Challenge for Change* also includes measures to carry out the Department's commitment to the welfare of its employees, and provides more opportunities for training and personal development.

Among the key initiatives carried out in 1989-90 under *Challenge for Change* were the establishment of a Career Management Information Centre and several awards programs; the publication of an Employee Guide; and the offering of an expanded range of in-house training courses, including courses on effective supervision, stress management, internal communications and computers.

A Memorandum of Understanding to simplify administrative management is signed by (left to right) Communications Deputy Minister Alain Gourd, Robert de Cotret, President, Treasury Board of Canada, Communications Minister Marcel Masse, and Gérard Veilleux, Secretary, Treasury Board.

Public Service 2000

Public Service 2000, a wide-ranging initiative to improve the operations, morale and flexibility of the public service, was announced by the Prime Minister in December 1989. Its recommendations will ultimately affect employees at every level and in every area of the Department, giving them greater responsibility for and control of their work.

The Department of Communications is very active in Public Service 2000, with senior management representatives, among them the Deputy Minister, on four of the ten task forces.

Increased Ministerial Authority and Accountability

As a result of a Memorandum of Understanding (MOU) signed in June 1989 by the President of

Treasury Board and the Minister of Communications, the Department has been able to streamline and make more flexible administrative procedures in administration, human resources and financial management. In accordance with the Treasury Board program of Increased Ministerial Authority and Accountability (IMAA), the MOU transfers decision-making authorities in many areas to the managers more directly involved. For example, informatics technology acquisitions and contracting can now be approved by an assistant deputy minister; previously, the authority rested with the deputy minister.

Some departmental managers also now have more discretionary authority in allocating human and financial resources to meet changing priorities.

Reporting and planning procedures have been simplified, and managerial accountability improved. A new annual management report will combine and replace a series of ad hoc reports on different areas of responsibility, and a more results-oriented Operational Planning Framework has been implemented.

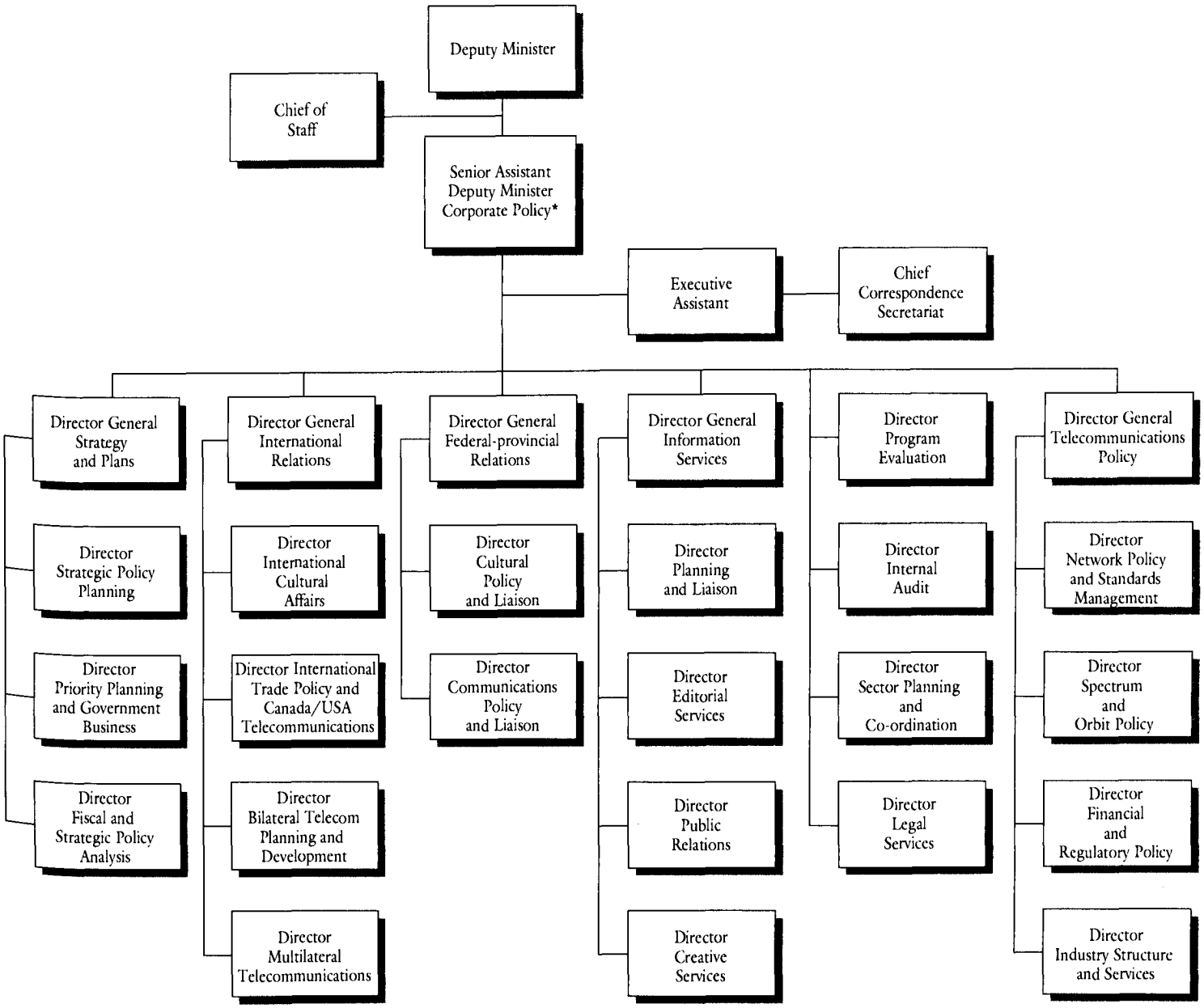
The IMAA agreement resulted from 18 months of detailed analysis and negotiations. The process continues, with discussions now focusing on personnel matters.

Ottawa school children had the opportunity to try out the equipment of amateur radio station VY9CC during an open house at Communications Canada's headquarters.

APPENDICES

APPENDIX 1
Organization

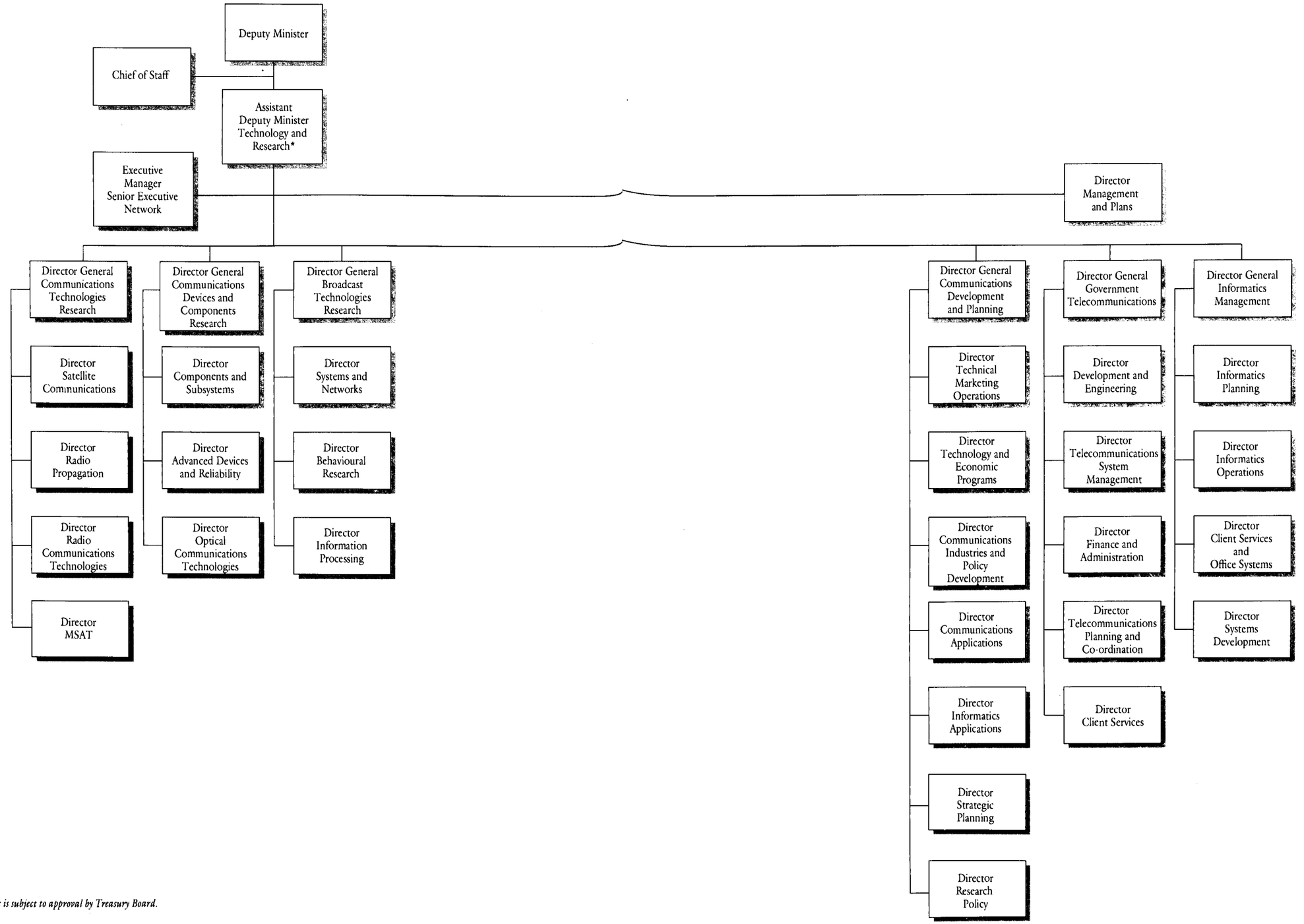
CORPORATE POLICY SECTOR



As of March 31, 1990

** The organizational structure is subject to approval by Treasury Board.*

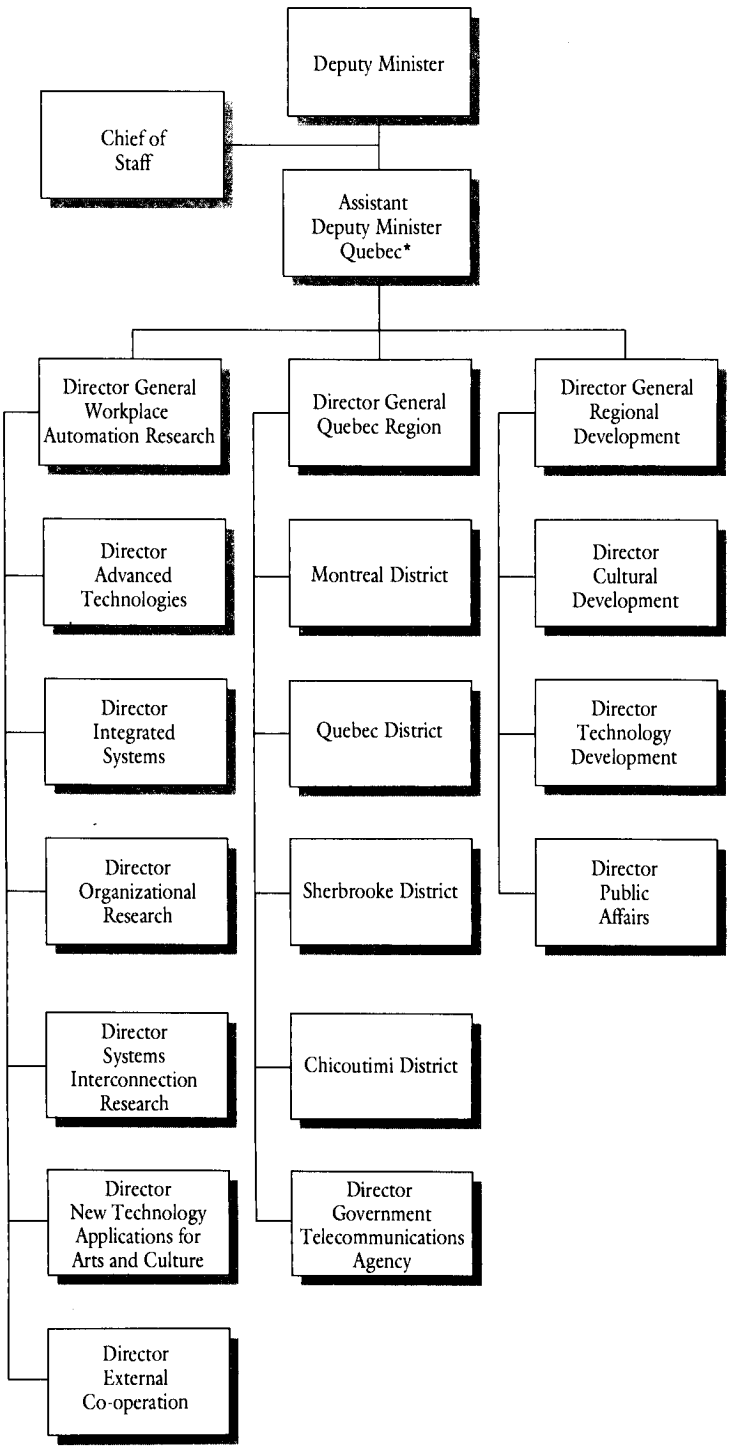
TECHNOLOGY AND RESEARCH SECTOR



As of March 31, 1990

** The organizational structure is subject to approval by Treasury Board.*

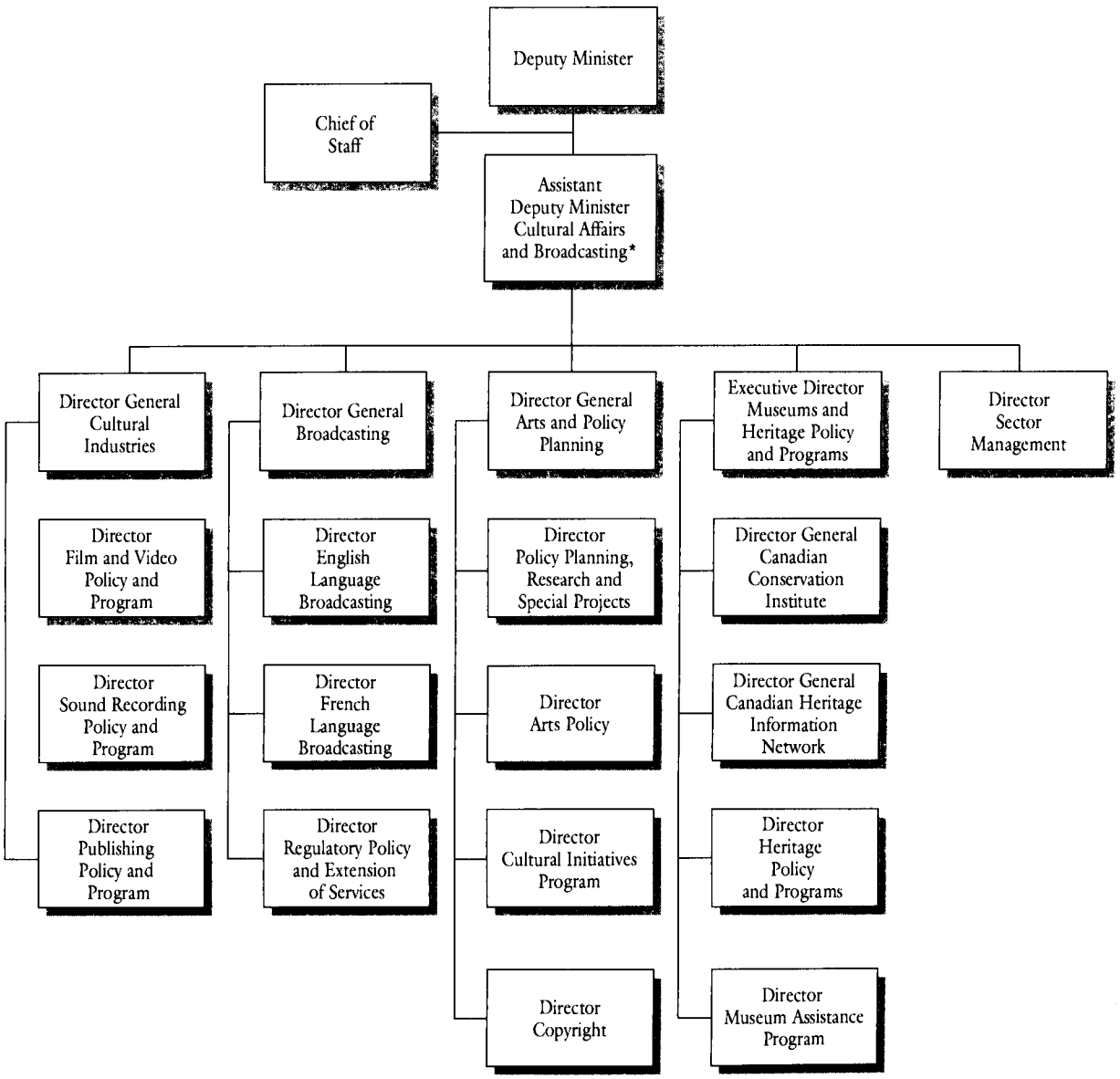
QUEBEC SECTOR



As of March 31, 1990

** The organizational structure is subject to approval by Treasury Board.*

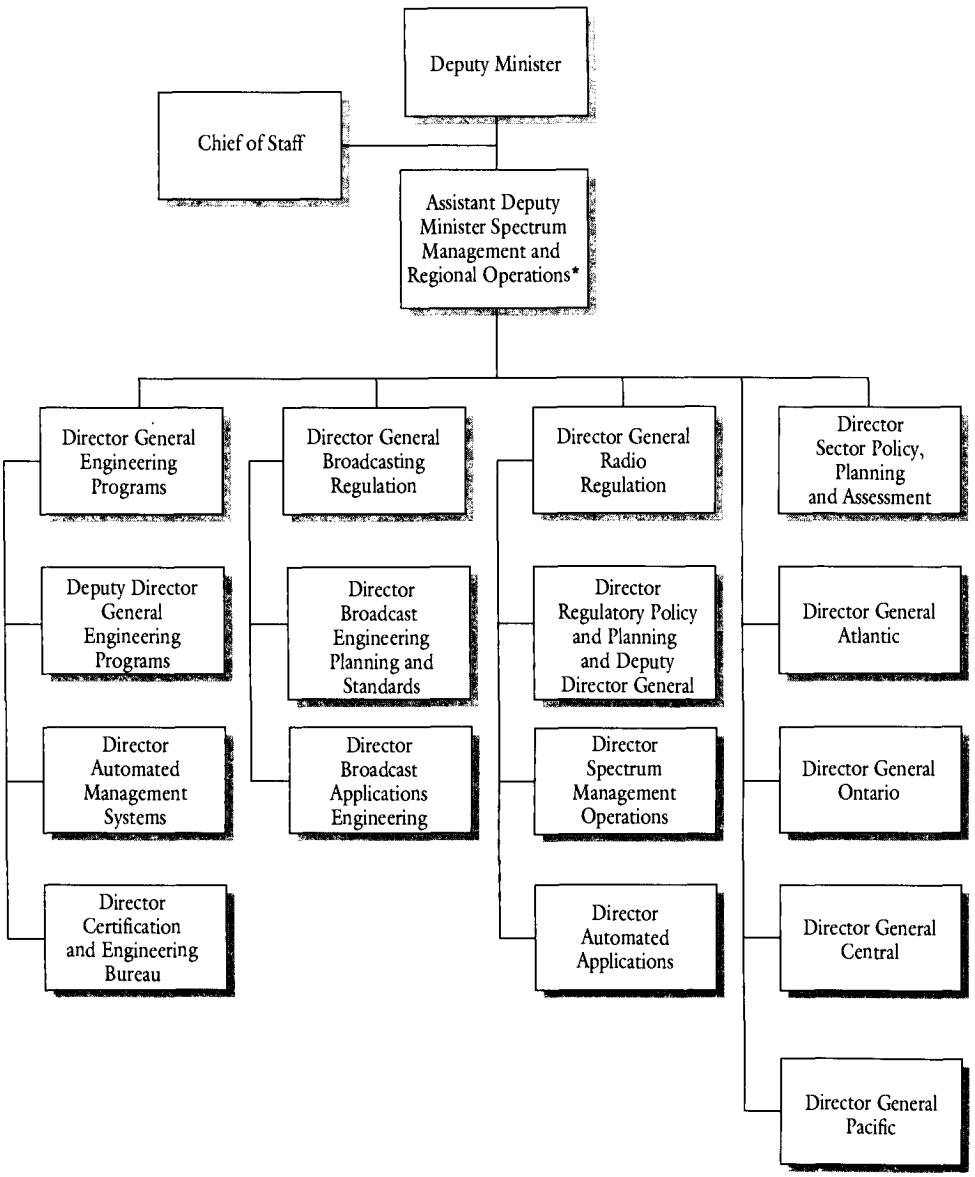
CULTURAL AFFAIRS AND BROADCASTING SECTOR



As of March 31, 1990

** The organizational structure is subject to approval by Treasury Board.*

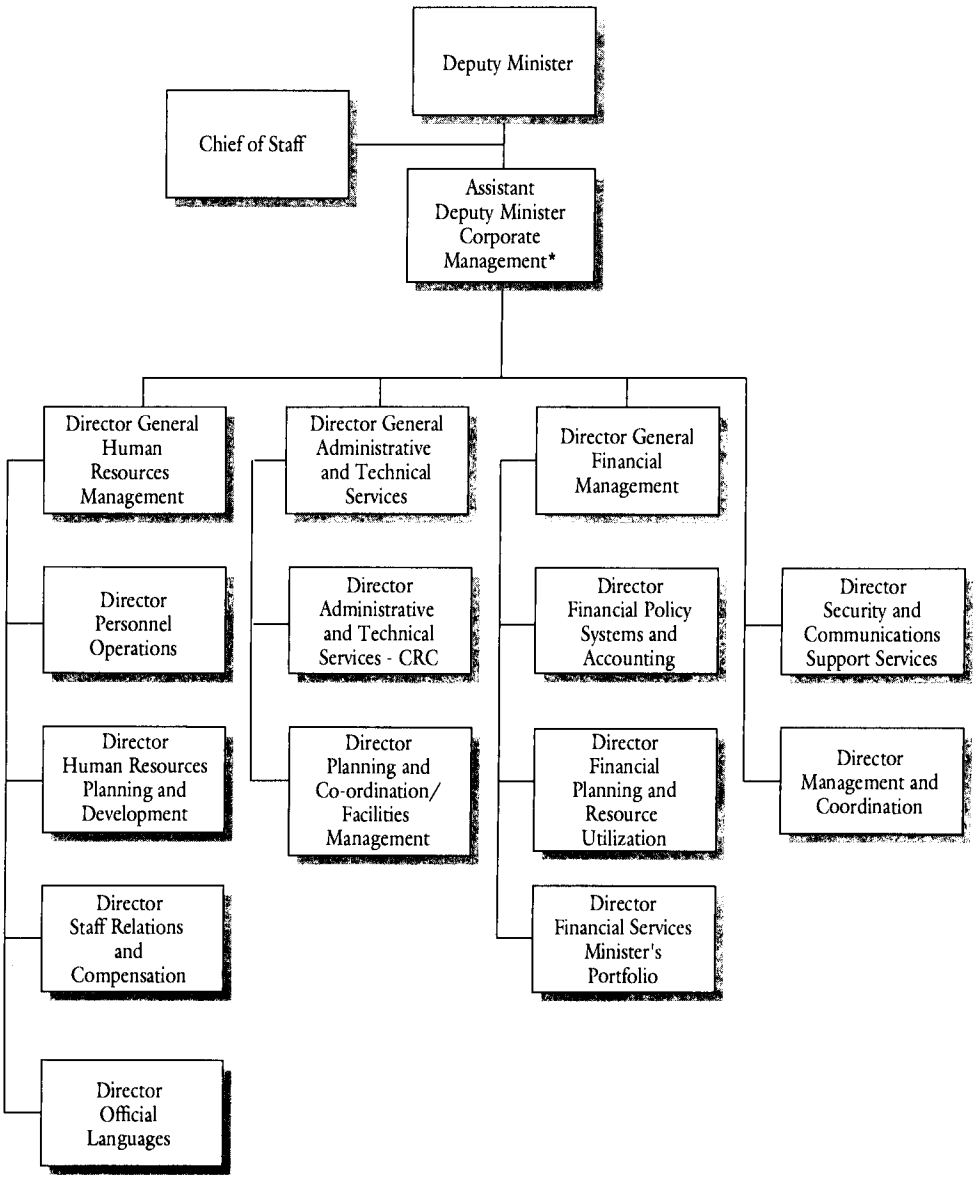
SPECTRUM MANAGEMENT AND REGIONAL OPERATIONS SECTOR



As of March 31, 1990

** The organizational structure is subject to approval by Treasury Board.*

CORPORATE MANAGEMENT SECTOR



As of March 31, 1990

** The organizational structure is subject to approval by Treasury Board.*

APPENDIX 2

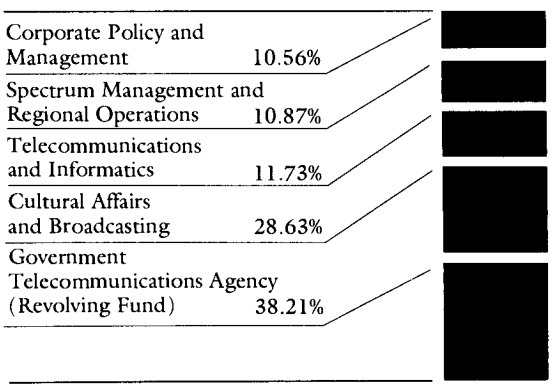
EXPENDITURES BY ACTIVITY 1989-1990
(in thousands of dollars)

Communications and Culture Program	Gross expenditures	Revenue credited to the vote	Net expenditures
Telecommunications and Informatics	61,510	6,348	55,162
Spectrum Management and Regional Operations	57,009	641	56,368
Government Telecommunications Agency (Revolving Fund)	200,394	202,179	(1,785)
Corporate Policy and Management	55,349		55,349
Cultural Affairs and Broadcasting	150,150	820	149,330
Total	**524,412**	**209,988**	**314,424**

Source: Communications Canada

APPENDIX 3

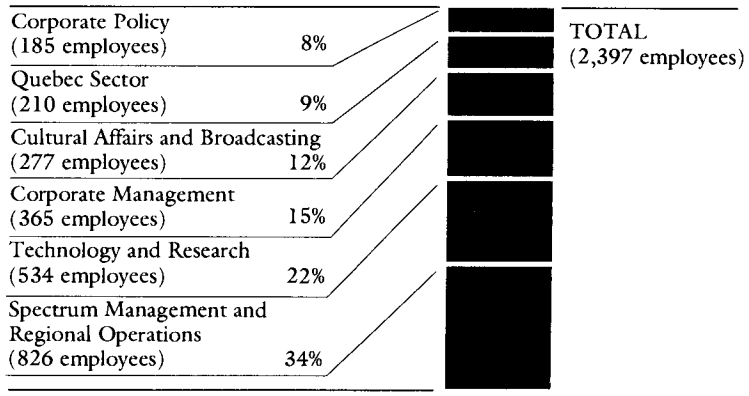
GROSS EXPENDITURES BY ACTIVITY 1989-1990



Source: Communications Canada

APPENDIX 4

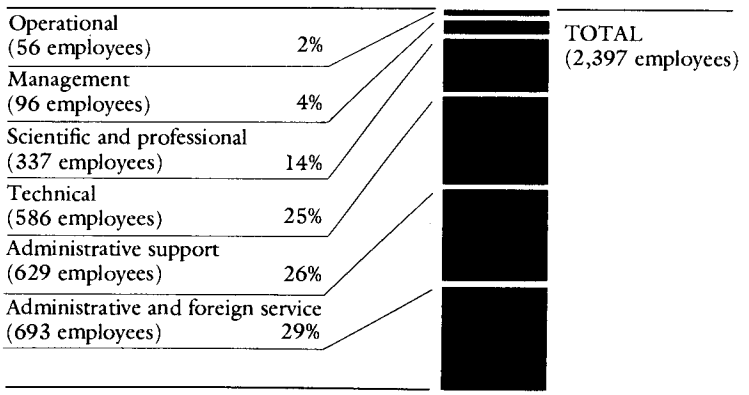
DISTRIBUTION OF EMPLOYEES BY ACTIVITY (as of March 31, 1990)



Source: Communications Canada

APPENDIX 5

DISTRIBUTION OF EMPLOYEES BY EMPLOYMENT CATEGORY (as of March 31, 1990)



Source: Communications Canada

APPENDIX 6

DISTRIBUTION OF EMPLOYEES BY EMPLOYMENT CATEGORY AND FIRST OFFICIAL LANGUAGE
(as of March 31, 1990)

	French	*English*
Administrative support (629 employees)	48 %	52 %
Administrative and foreign service (693 employees)	43 %	57 %
Management (96 employees)	34 %	66 %
Scientific and professional (337 employees)	25 %	75 %
Operational (56 employees)	24 %	76 %
Technical (586 employees)	24 %	76 %
Departmental distribution (2,397 employees)	37 %	63 %

Source: Communications Canada

APPENDIX 7

DISTRIBUTION OF EMPLOYEES BY EMPLOYMENT CATEGORY AND SEX
(as of March 31, 1990)

	Women	*Men*
Operational (56 employees)	0 %	100 %
Scientific and professional (337 employees)	10 %	90 %
Technical (586 employees)	13 %	87 %
Management (96 employees)	15 %	85 %
Administrative and foreign service (693 employees)	50 %	50 %
Administrative support (629 employees)	86 %	14 %
Departmental distribution (2,397 employees)	44 %	56 %

Source: Communications Canada

APPENDIX 8 — ADDRESSES

COMMUNICATIONS CANADA HEADQUARTERS
300 Slater Street
Ottawa, Ont.
K1A 0C8

RESEARCH FACILITIES

Communications Research Centre
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Canadian Workplace Automation Research Centre
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H7V 2X2

Canadian Conservation Institute
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Ottawa, Ont.
K1A 0C8

REGIONAL AND DISTRICT OFFICES

Atlantic Region

Regional Office

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E1C 8R2

District Offices

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E2L 4S6

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B3K 5J7

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C1A 4A9

Newfoundland
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A1A 2X9

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J1L 1C1

Communications Canada
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Communications Canada
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G7H 5W2

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Communications Canada
9th Floor
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Toronto, Ont.
M4T 1M2

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Communications Canada
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Kitchener, Ont.
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Communications Canada
9th Floor
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Communications Canada
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Communications Canada
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Communications Canada
Government of Canada Building
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Communications Canada
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R3C 3Y9

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Communications Canada
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T2P 2M7

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9909-102 Street
Grande Prairie, Alta.
T8V 2V4

Northwest Territories
Communications Canada
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Yellowknife, N.W.T.
X1A 2R1

Pacific Region

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Communications Canada
Federal Building
Room 304
471 Queensway Avenue
Kelowna, B.C.
V1Y 6S5

Communications Canada
Suite 1700
800 Burrard Street
Vancouver, B.C.
V6Z 2J7

Communications Canada
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Prince George, B.C.
V2L 4X3

Communications Canada
Federal Building
Room 203
101-10th Avenue South
Cranbrook, B.C.
V1C 2N1

Yukon
Communications Canada
Polaris Building
Room 201
4133 4th Avenue
Whitehorse, Y.T.
Y1A 1H8