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Government of Canada
Department of Communications

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Department of Communications

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To:

His Excellency the Right
Honourable Edward Schreyer,
P.C., C.C., C.M.M., C.D.,
Governor General and
Commander-in-Chief of Canada

Sir:

I have the honor to present the
Annual Report of the Department
of Communications for the fiscal
year ending March 1982.

I remain, Sir,
Your Excellency's obedient servant,

F. Fox

Francis Fox,
Minister of Communications

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Introduction

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The Department of Communications was established in 1969 as a result of the government's awareness that communications policies, already affecting the lives of many Canadians, would become ever more significant in their impact in the future. In 1980, the government expanded the mandate of the department to include responsibility for arts and culture. As a result, a new coherence and direction is emerging in both communications and cultural policies.

The Federal Cultural Policy Review Committee is examining the kind of support Canadians feel the government should be providing to the arts. The committee presented a Summary of Briefs and Hearings to the minister in January 1982 and expects to make public its final report in fall 1982.

Meanwhile, the arts in Canada are receiving immediate assistance through such programs as the Canadian Book Publishing Development Program and the Special Cultural Initiatives Program. Construction of new homes for the National Gallery of Canada and the National Museum of Man was approved in February 1982. The film industry continues to benefit from the 100 per cent capital cost allowance on Canadian productions. Stricter interpretations of the certification regulations were introduced during the year to ensure greater Canadian control of production.

The marriage of communications and culture is well illustrated by the Telidon program. Telidon brings together artists and technologists, software and hardware, with the home TV set serving as a way of accessing banks of information. Telidon became the de facto North American standard for videotex following endorsement by AT&T and CBS, a development that opened the American market to Canadian entrepreneurs. More than 20 Canadian companies are now able to provide Telidon equipment and services. Hundreds of thousands of Canadians have become aware of Telidon through the promotional activities of the department in co-operation with industry, and several programs are operating to encourage new entrants as users or information providers.

Telidon is one of many examples of technology developed in the department's research laboratories and successfully transferred to industry. Others are fibre optics and mobile radio communications. Through this transfer of technology, the department is ensuring the timely industrial availability of technologies needed in future systems and helping Canadian industry capture its share of emerging markets.

The co-operative approach that worked so well for Telidon is being applied in the Office Communications Systems Program. Canadian communications, software and computer firms are being offered financial assistance to develop new office equipment and to test it through field trials. The field trial approach is also being applied to integrated delivery of Telidon, telephone, data, television and FM radio in the Elie-St. Eustache fibre optics project in Manitoba. The federal government and industry jointly funded the project to a total of about $9.6 million, sharing the cost on a fifty-fifty basis.

The $18 million expansion of the David Florida Laboratory at the department's Communications Research Centre has been completed. Testing of two of Telesat's spacecraft, Anik C-2 and Anik D-1, was carried out in the upgraded facility and integration of Anik D-2 was started during the year. Throughout the year an increasing number of companies have paid to use the laboratory for testing of components ranging from aircraft systems and sections of the Canadarm to complete satellites.

The department completed a study of the use of satellites for improved Mobile Communications in Canada, defining concepts and plans for a demonstration system for mobile users (MSAT). The study indicated a sufficient market demand to ensure future commercial viability if the required technology and services were developed.

Canada is co-operating with other countries on new space programs. Plans for the demonstration MSAT, for example, are being developed in co-operation with the United States. Canada is also co-operating with the European Space Agency in its large communications satellite (L-SAT) project, and with the United States, France and the U.S.S.R. in a demonstration of satellite-assisted search and rescue.

Direct satellite-to-home broadcasting has been shown to be technically feasible in pilot projects using Anik B. The potential impact and desirability of introducing direct broadcast services are now under study by the department.

Meanwhile, broadcasting services are being extended via satellite to remote and rural areas of the country through the multi-channel package of TV and radio signals licensed by the CRTC in April 1981. The department provided technical advice and guidance to help communities prepare their applications to the CRTC for local distribution of these signals. Some 300 communities had been licensed by the end of the year under review.

The International Year of the Disabled is now past, but the department continues to pursue its efforts to improve communications for the handicapped as it has done since the mid-1970s. A major achievement of the year was the establishment of the Canadian Captioning Development Agency to provide captioning of Canadian TV programs for people who have trouble hearing.

Canada participated actively in conferences of the International Telecommunication Union, notably the conference in November 1981 to finalize a frequency assignment plan for the approximately 9,000 AM broadcasting stations in the Americas. The conference accepted the Canadian proposal to retain the current 10 kilohertz channel spacing between stations.

Domestically, the Government of Canada continued to consult with provincial governments on policy and program matters and to implement co-operative projects in areas such as high-technology development.

Canada has proved its mastery of the scientific and engineering challenges through its achievements with Telidon, fibre optics, satellites and other complex technologies. But there are equally difficult challenges in other parts of the communications universe, such as program production and computer services. Our response to these challenges may transform the way we work and live, communicate with each other and view ourselves as a people. They will profoundly affect every Canadian, as we move into the Information Society. Effective collaboration between government and industry and the fullest intergovernmental co-operation will be crucial to the success of Canada's communications and cultural policy.

Arts and Culture

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Recent statements by the government have underlined the importance of the arts for all Canadians and stressed that the government's interest in promoting Canadian culture and artistic creativity runs parallel to its interest in strengthening nationhood through the new constitution: both are designed to enhance the values that make a Canadian identity possible.

In July 1980, the Department of Communications became responsible for the federal government's arts and culture policies and programs. This change recognized the close link between culture and communications. It was intended to ensure that communications policy would be conducted with the highest concern for the cultural content and cultural implications of communications technology and also that the cultural milieu would benefit from technological advances in communications. The computerized Canadian Record Catalogue designed for use with Telidon and the tele-ordering system for the Canadian book industry now under development are two examples of the progress made in this direction during the year.

Through its arts and culture policies and programs, the department addresses the needs of perfonming and visual artists, libraries, museums, archives and galleries as well as the cultural industries -- book and periodical publishing, film and videotape production, and sound recording. To carry out these responsibilities, the arts and culture sector has some 80 employees and an operating budget of approximately $6 million. In addition, it administers various programs of grants and contributions with a total budget of about $25 million, including the Special Program of Cultural Initiatives funded from the federal government's share of lottery revenues.

The department receives a high volume of ministerial correspondence on arts and culture subjects. During the 1981/82 fiscal year, some 3,100 pieces of correspondence were processed, dealing with a wide variety of subjects including tax issues of concern to artists; cultural policy at the federal level; support for visual and performing artists, film makers, publishers, writers and heritage groups; preferential postal rates for books, periodicals and newspapers; funding for academic research in the social sciences and humanities; and copyright protection for Canadian creators.

Cultural agencies

The Minister of Communications is responsible for all nine cultural agencies -- the National Film Board of Canada, the Canadian Film Development Corporation, the National Library of Canada, the Public Archives of Canada, the National Museums of Canada, the National Arts Centre, the Canadian Broadcasting Corporation, the Canada Council and the Social Sciences and Humanities Research Council of Canada. The department promotes co-operation among these agencies so they may carry out common cultural objectives and provides advisory services as required on program and budgetary submissions. During 1981/82, approximately $45 million in new funds were allocated to the cultural portfolio; the money is to be available over the next five years. Among the agencies benefitting from increased budgets are:

- the Canadian Film Development Corporation, which has been furnished with a $4 million fund to provide interim financing for both production and distribution;
- the Canada Council, which received a $3 million increase in its 1981/82 budget, bringing its Parliamentary appropriation to more than $50 million;
- the National Arts Centre, which received $5 million in supplementary funds to help defray the cost of major repairs to facilities over a three-year period; and
- the Social Sciences and Humanities Research Council of Canada, whose budget over a three-year period was augmented by $11 million to support research in Canadian studies.

The Minister of Communications is also responsible for the Canadian Radio-television and Telecommunications Commission, a regulatory agency, and the Canadian Cultural Property Export Review Board.

Federal cultural policy review

The federal government's cultural policy has been undergoing careful re-examination since August 1980 when the Federal Cultural Policy Review Committee was created. This is the first comprehensive review of Canadian cultural institutions and cultural policy since the

Royal Commission on National Development in the Arts, Letters and Sciences of 1949-1951 (the Massey-Lévesque Commission). The 18-member committee is chaired by Louis Applebaum, Toronto composer and conductor, and co-chaired by Montreal writer Jacques Hébert.

Between April 13 and July 10, 1981, the committee held televised public hearings in 18 Canadian cities. Its preliminary report, a Summary of Briefs and Hearings, was presented to the minister in January 1982 and over 10,000 copies were distributed to the public. The report was based on the oral submissions made at the hearings by 521 individuals and associations, and the more than 1,300 briefs that were examined by the committee. The final report with recommendations is to be presented to the minister during the fall of 1982. It is expected to serve as a guide for federal cultural policy for the next 20 years.

Cultural initiatives program

A Special Program of Cultural Initiatives was announced by the federal government in December 1980 in response to the demonstrated needs of Canadian artistic and cultural organizations. The fiscal year 1981/82 was the second year of the three-year, $39.6 million program, which is financed through revenues accruing to the federal government under the federal-provincial agreement on lotteries. The program has four components.

The first is a program of grants to Canadian professional non-profit performing arts organizations and institutions to help them retire their accumulated operating deficits and thereby improve their financial stability. Under this component, 123 Canadian professional performing arts organizations received a total of $3,030,819 in 1981/82.

The objective of this part of the program is to alleviate the pressing financial difficulties faced by many performing institutions in face of the rapidly spiralling costs of recent years. Matching provincial participation is a pre-requisite for federal support under this component.

The second component is intended to encourage management development in performing arts organizations. One part provides contributions to projects designed to strengthen an organization's corporate management capability and so to enhance its viability. Some of the organizations for which this type of funding was approved in 1981/82 are: Toronto

Theatre Festival's Business Conference, "Stage Directions"; les États généraux du théâtre professionel au Québec and the Western Canada Theatre Company. A total of $438,000 was awarded to 14 organizations in 1981/82.

The second part of this component offers grants to professional non-profit performing arts organizations which did not show a deficit in their audited statements for the fiscal year ending on or before June 30, 1980. In 1981/82, 115 professional arts organizations were assisted through this component to a total of $1,209,000.

The third component of the Special Program of Cultural Initiatives involves capital assistance to non-profit organizations for the performing arts and to custodial cultural institutions. The objective is to develop a national network of suitable facilities to provide greater opportunities for public exposure by Canadian performers and performing companies and to improve the facilities in which this country's major collections are housed.

The deadline for receipt of submissions was May 31, 1981; 150 applications were received from cultural organizations across Canada. The government contributed $15.3 million to 43 capital projects under this component of the program. All successful applicants had received a commitment of financial assistance from their respective provincial governments and had obtained broad community support for their projects.

The fourth component has enabled the government to assist special events that draw Canadians from many regions of the country to celebrate and take part in artistic and cultural happenings. To be eligible, proposals must be submitted by Canadian non-profit organizations which are either principally involved in artistic activity and cultural interests or are ready to commit a significant portion of a national event they are organizing to artistic and cultural endeavours. Under this component, the department also entertains requests for assistance towards the cost of ensuring major domestic and international exhibitions hosted by a Canadian museum or gallery.

Support provided under this component went to the World Film Festival in Montreal, the Stratford Shakespearean Festival Foundation, the Canadian Theatre Today Conference in Saskatoon, the cultural component of the 1981 Canada Summer Special Olympics, and 46 other organizations to a total of $1,999,500 in 1981/82.

Cultural industries

Cultural industries by their very nature have a role to play in achieving both the economic and the social objectives of governments. As industrial undertakings motivated by profit, they employ capital and labor, transform raw materials and ultimately sell their products and services to individual consumers. However, they are also vehicles for Canada's cultural expression, embodying creative acts in their own right and making individual talent accessible to society at large. Cultural industries, as a result, occupy a special place in Canada; few businesses are so intimately interwoven with the national fabric as these industries which provide the essential links among cultural creators, producers, distributors and consumers.

Through a variety of programs and through ongoing policy development, the department is striving to ensure a strong sense of Canada's national identity by:

- making Canadian cultural products more accessible to Canadians through the development and promotion of Canadian-owned and Canadian-controlled cultural industries;
- enhancing the creativity of Canadians in these cultural industries;
- developing new Canadian talent; and
- increasing the Canadian share of the market at home and abroad.

Book publishing

Almost $7.4 million was made available to Canadian book publishers during the third year of the Canadian Book Publishing Development Program, administered by the department. The purpose of the program is to strengthen the Canadian-controlled sector of the industry and increase the distribution and sales of Canadian-authored books both in Canada and abroad.

Most of this funding ($5.6 million) was disbursed among 79 publishing companies owned and controlled by Canadians, of which $3.9 million went to assist marketing of trade books and $1.7 million to aid the publication of Canadian textbooks.

Under another component of the program, the Canadian Telebook Agency received assistance in the amount of $150,000 to develop a comprehensive industry-wide data base of titles available in Canada and to establish a teleordering system for the Canadian book industry. A similar data base of French titles will be available in the future. The Telebook Agency is a creation of the Association of Canadian Publishers, the Canadian Book Publishers' Council and the Canadian Booksellers' Association.

In March 1982, the government announced a three-year extension of the program, with funding at about $25 million over the three years. This compares with approximately $19 million in the first three years.

Books imported from the United States have been exempted from duty under a temporary arrangement lasting from January 1979 until June 1982. A special government/industry working group has been monitoring the effects of this measure on Canadian printers and publishers. A report prepared by the department concluded that the measure had had no negative impact on the Canadian industry. At the end of the year under review, the government was studying the report with a view to permanently removing the duty on books imported from the United States.

Periodicals publishing and postal rates

More than 3,500 newspapers and periodicals benefit from reduced postal rates as second class mail. Reduced rates are also available to libraries, publishing houses, book wholesalers, distributors and retailers who mail books in Canada. The department contributed $189.5 million to Canada Post to underwrite the cost of these preferential rates during the year.

Increases of 18 per cent for most Canadian subscriber publications were to take effect on April 1, 1982, while publishers' book rates would increase by approximately 20 per cent, according to a government announcement made in September 1981. The minister subsequently stated that the federal government would continue to give special treatment to books and to second class newspapers and periodicals although publishers and readers would be expected to pay a greater share of distribution costs in future.

In June 1981, Peat, Marwick and Partners presented their research design for the Canadian periodical industry. Commissioned by the department, the report identifies areas where research is needed to provide a better understanding of the industry and so enable the department to assess the impact of government policies such as the postal subsidy. After making copies of the report available to the periodical and newspaper publishers associations, the department undertook a series of consultations with representatives of the industry to obtain their views on the proposed research program.

Sound recording

In May 1981, the department received approval to have the management consulting firm of Woods Gordon conduct a major evaluation of the Canadian record industry, working closely with the industry itself. This extensive research effort will provide the data and analysis required by the department in developing policy options to help the industry meet the needs and opportunities of a rapidly changing economic and technological environment. The major portion of the research was completed this year.

One of the most significant developments to date in the recording industry is a computerized version of the Canadian Record Catalogue. Under the department's encouragement, the catalogue has progressed from a bi-monthly print publication to a bilingual, fully-searchable data base containing information on some 10,000 record releases that qualify as Canadian content. Designed for use with Telidon, the catalogue was prepared by the Canadian Independent Record Production Association and the Association du disque et de l'industrie du spectacle québécois. Funding was provided by the department, the CRTC and the Department of Supply and Services.

Officially launched in October 1981, the catalogue was demonstrated to nearly 5,000 representatives of the international music industry at the 16th International Recording and Music Publishing Market (MIDEM 82) in Cannes, France, in January 1982.

Film and videotape production

During the calendar year 1981, the department's Canadian Film and Videotape Certification Office certified 37 feature productions with a production value of $64.7 million, and 264 short productions with a production value of $39.8 million. Such certification qualifies

productions for the 100 per cent capital cost allowance under the Income Tax Regulations. A review panel is being set up to provide the minister with a second opinion in cases where the Certification Office recommends against certification of a production. Producers will be given the opportunity to make submissions to the panel on their cases, but the final decision will rest with the minister.

Revisions to the capital cost allowance regulations drawn up in consultation with the industry during 1981 came into effect on January 1982. These revisions, intended to promote greater Canadian participation in and control of all aspects of production, make it mandatory to employ a Canadian actor or actress in one of the two leading roles, and to use a Canadian director or screenwriter.

In addition to this fine tuning of the regulations, the department is assessing the overall effectiveness of the capital cost allowance provisions and examining possible alternatives. Furthermore, in March 1982 the minister announced the formation of a task force charged with developing proposals to address problems of production, marketing and exhibition that have plagued the industry over the years.

Film festivals

The department's Film Festivals Bureau co-ordinates participation of Canadian films in international film festivals. Through its efforts, more than 1,783 Canadian films were exhibited at 154 film festivals in 1981/82. While not all these festivals were competitive, Canadian films won 230 awards.

In addition, the bureau co-operated with other government agencies and departments to organize 16 prestige screenings in various countries at which 105 Canadian feature productions and 60 short films were shown. In Canada, 14 film festivals were assisted by grants from the department totalling $350,000. Funds were also granted to the Academy of Canadian Cinema ($20,000) to assist in setting up the Canadian Academy of Broadcast and Film Arts and Sciences, and to the Canadian Film Institute ($50,000) to ease cash flow problems.

Every year the bureau publishes a catalogue of bilingual information sheets on recent Canadian feature films. The 1981 edition, published under the title "Cinema Canada 1981", contains information on 59 Canadian productions.

The bureau initiated and co-ordinated a major retrospective of the work of the Canadian film maker Jean Pierre Lefebvre which was shown across Canada from March to May 1981 through the offices of the Canadian Film Institute with the assistance of a $25,000 grant from the department. Between January and May 1982, the bureau's Jean Pierre Lefebvre retrospective was shown throughout England by the British Film Institute. Both film institutes published a book on Lefebvre to mark the occasion.

For many years, the bureau has represented Canadian cinematographic interests at special events, promoting Canadian cinema and stimulating sales of Canadian films. Since 1979, when the mandate to do marketing for the Canadian film industry was given to the Canadian Film Development Corporation, the bureau has confined its marketing work to the Cannes Festival. Early in 1982, a special umbrella organization, Film Canada, was formed under the responsibility of the Canadian Film Development Corporation, to focus the efforts of government and industry in marketing Canadian films at major film markets, beginning with Los Angeles in March 1982. The bureau's work at these events was integrated with the activities of Film Canada.

Copyright

In July, the Minister of Communications and the Minister of Consumer and Corporate Affairs announced that officials of their departments would work together to prepare joint legislative proposals to revise current copyright legislation. The Minister of Communications also announced the formation of a departmental team to assist in preparing legislative proposals for revision, and to study the relationship between copyright law and cultural policy objectives.

The existing Copyright Act came into force in 1924. Although it has been amended several times, it has never been revised to reflect contemporary cultural conditions or the impact of technological developments such as videotape, cable and pay TV, satellite TV broadcasting, photocopying, and electronic information storage and retrieval systems. The revised legislation must provide adequate protection and fair economic returns to creators, while ensuring reasonable access to their works; it must also take into account Canada's obligations under international copyright conventions.

Creators, users of copyright materials and the general public have had opportunities to present their views through briefs and consultations with federal government officials since 1977, and their views have been carefully examined by the Interdepartmental Copyright Committee of which the department is a member. Interested parties will have further opportunity to present their views when a copyright bill is introduced in Parliament.

Performing and visual arts

During the year, the department reviewed various briefs presented to the minister by representatives of the arts community including the Canadian Conference of the Arts and the Professional Art Dealers Association on such issues as the impact of federal fiscal measures and the tax expenditure system on Canadian artists, the need for increased funding for the arts, the implications of copyright legislation for Canadian artists and the need for a federal policy in support of crafts.

Also reviewed were a proposal presented to the minister by the Canada Council suggesting a system of payments to Canadian authors on the public use of their works held in libraries, and a major study conducted by Davidson Dunton on the state of the National Theatre School.

Sustaining grants were awarded to the Canadian Conference of the Arts ($466,000) and the Canadian Crafts Council ($77,000). Both organizations also benefitted from project funding under the Special Program of Cultural Inititiatives.

The department provides an annual sustaining grant to the Fathers of Confederation Buildings Trust in Charlottetown to maintain the Confederation Centre of the Arts as a national memorial to the Fathers of Confederation. The federal grant is calculated on the basis of four cents per capita of the population of Canada. In 1981, the grant amounted to $963,548. The department also awarded a grant of $475,000 to the Confederation Centre of the Arts as part of the federal participation in the centre's capital repair program.

A final payment of $360,000 was made to the Kitchener-Waterloo performing arts centre, Centre in the Square, under the provisions of the capital assistance component of the Special Program of Cultural Initiatives.

The department provided $807,500 to underwrite a portion of the capital costs associated with the development of the Terry Fox Canadian Youth Centre. This assistance was also provided under the capital assistance component of the Special Program of Cultural Initiatives.

A major analysis of the nature and growth of professional dance in Canada was done for the department by Hickling-Johnston during 1981/82. Co-operating in the study were the Canada Council and the Canadian Association of Professional Dance Organizations. The study will provide a description of dance audiences and will include the general lines of a marketing plan.

Data analysis was completed of a survey of artisans in five provinces carried out in 1980/81 to establish how many individuals make crafts for sale, and to obtain some basic economic and demographic information. Over 3,700 individuals were interviewed in the survey and about 200 craft businesses were contacted. In addition, a pilot study was commissioned in New Brunswick to examine the process by which craft operations attain industrial levels of production and employment and to determine what support is available or required to encourage the developmental process.

In an effort to obtain better policy-oriented information on the visual arts in Canada, the department had a research plan prepared by the Bureau of Management Consulting, an agency of Supply and Services Canada. During preparation of the plan, intensive discussions were held with the arts community, specifically with individual artists, artists' organizations, art dealers' associations and governments. In 1981, the department published a brochure outlining the schedule and rationale for its plan of research into the visual arts in Canada. A study on how visual art is distributed in Canada, identified in the research plan as a priority, was contracted to the Bureau of Management Consulting and commenced in 1981.

Museums and heritage

Canada's heritage is a non-renewable resource. The existence of archives, museums and libraries testifies to the sincere and growing desire of Canadians to preserve their heritage, while the national collections such as those of the National Museums of Canada reach a significant number of Canadians and ensure that future generations will have access to heritage artifacts and images.

Major steps were taken during the year to overcome problems of inadequate accommodation. In February 1982, the federal government officially approved the construction of new homes for the National Gallery of Canada and the National Museum of Man and announced that a budget of $185 million had been earmarked for this purpose over the coming five years. The two projects will be the responsibility of a new public corporation under the presidency of the former director of the National Gallery, Jean Sutherland Boggs, who will make final recommendations on matters of site, architectural design and construction.

An indemnification program for Canadian custodial institutions has been under discussion with the provinces since last year. Further meetings were held with representatives of provincial governments to discuss possible implementation. Such a program would assist Canadian custodial institutions with the expensive costs of insuring both domestic and international exhibits of works of art travelling in Canada.

The department co-ordinated inventories of archives in eight communities across Canada conducted under the student summer employment program of the Canada Employment and Immigration Commission in co-operation with the Public Archives of Canada and provincial archives authorities.

Cultural property

Five years after its proclamation, the Cultural Property Export and Import Act appears to be achieving its primary purpose of preserving in Canada the best examples of Canadian heritage in movable cultural property.

The act is administered jointly by the Minister of Communiations and the Canadian Cultural Property Export Review Board. The Movable Cultural Property Secretariat of the Department of Communciations carries out the ministerial duties and provides administrative services to the review board.

One provision of the act is for a system of export controls. The Movable Cultural Property Secretariat oversees the processing of all cultural property export permits through a network of permit officers and expert examiners. In 1981/82, 166 applications for cultural property export permits were processed, and 58 were referred to expert examiners. Eight applicants who were refused export permits appealed to the Cultural Property Export Review Board and five subsequently were granted permits.

Early in 1981, the first charges under the act were laid by the RCMP for illegal export of cultural objects to the United States. The case came to trial in 1981/82 and the company involved was found guilty and fined. The RCMP investigated a number of other possible violations of the export provisions of the act during the year, but no charges were laid.

In March, 1981, the Canadian government received its first request from a foreign government for return of a cultural object under the provisions of the 1970 UNESCO Convention on the Means of Prohibiting and Preventing the Illicit Import, Export and Transfer of Ownership of Cultural Property. In response to a request by the Government of Mexico, two pre-Columbian statuettes that had been illegally exported from the country were subsequently handed over to the Mexican Embassy in Ottawa for return to their country of origin.

A second request for return of a cultural object pursuant to the convention came in December 1981. At the request of the Government of Nigeria, a Nok terra-cotta sculpture was seized by the RCMP when it was brought into Canada from the United States, and three people were charged with illegally importing a cultural object.

As well as hearing appeals, the review board certifies cultural property for income tax purposes providing it meets criteria of outstanding significance and national importance and advises the minister on grants and loans to designated institutions.

Tax incentives encourage private individuals to donate or sell cultural objects to designated public institutions. In 1981/82,the review board issued 271 income tax certificates for cultural property valued at approximately $8.9 million.

Designation is a means of ensuring that tax certificates and cultural property grants are issued only to institutions which are publicly owned and which have appropriate facilities and personnel. Category A designation is in effect for an indefinite period of time and covers any object which relates to the institution's collecting mandate.

During 1981/82, the minister granted category A designation to 16 institutions and one public authority, bringing the total number to 137. Five institutions and four public authorities were granted category B designation, enabling them to acquire specific cultural property.

Twenty-six grants totalling over $1 million were made by the minister to designated institutions. These enabled them to purchase objects of national cultural significance which would otherwise have left the country or which were located outside the country and were available for repatriation. Requests for funds increased to such a degree that the $800,000 budget was exhausted early in the year and the grants program became inoperative for several months. In November 1981, an additional $800,000 was allocated for the fiscal year then in progress, and the annual budget for 1982/83 and following years was established at $2,190,000.

Cultural research and statistics

A number of studies on various disciplines of the arts have already been referred to in this chapter. In addition, the department conducts various types of cultural research ranging from in-depth economic, financial, sociological and statistical studies of a specific cultural sector to multi-disciplinary reviews of artistic and cultural activities.

The department also finances an extensive program of cultural data collection in co-operation with Statistics Canada to provide information on which to base cultural policies and programs. During the year, a survey of musicians was initiated and an analysis was completed of the three surveys of creators carried out under the joint program: visual artists (1978); freelance writers (1979); and actors and directors (1980).

A large portion of the department's cultural research in 1981/82 concentrated on the cultural industries. A key study of the Canadian sound recording industry was launched; a program of research into the periodicals industry was developed; and a study of the cultural opportunities offered by videodisc technology was completed. In addition, several policy-related studies in the book publishing field were undertaken.

In line with its objective of making the results of cultural research widely available to the cultural community, the department issued four arts and culture research publications during 1981/82:

- The first of these, Cultural Facilities: Oversupply or Undersupply, examines the characteristics of cultural facilities in 31 communities, as well as the characteristics of the communities themselves, and explores the relationship between supply factors and attendance at cultural events.

- The second, entitled Culture in Canada Today: Issues and Attitudes, summarizes three studies of public opinion about government support for culture which were conducted between January 1979 and June 1980 under the Cultural Statistics Program.

- The third study, Consumer Expenditures and Cultural Participation in Canada, provides a way of judging areas of growth and decline in arts and culture.

- The fourth is a Guide to Arts and Culture Studies and Reports, which gives brief descriptions of each study done by the department, and advises how to obtain copies.

Much of the department's cultural research is done under contract, thereby providing a stimulus for the development of cultural research expertise in the private and academic sectors.

Telecommunications Research and Development

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New information technologies are receiving increasing emphasis in the department's research and development efforts. Research programs also contribute to the orderly and efficient development of telecommunications networks and services and support the department's mandate to improve and extend utilization of the radio frequency spectrum.

While much of the research is carried out in-house, the department contracts out a portion of its research needs. Contracts awarded to universities encourage the development of academic centres of excellence, while industrial contracts allow for the transfer of technology, strengthening the innovative capacity and the competitiveness of Canadian industry.

In addition to its own activities, the department carries out various research projects for the Department of National Defence and provides advisory services in support of military communications systems. The department is also a source of expertise for other departments such as the Department of the Environment and the Department of Fisheries and Oceans.

Telidon

The Canadian videotex system, Telidon, was developed at the department's Communications Research Centre and announced in 1978. Videotex systems allow the general public to access information banks and transactional services using modified television sets. Telidon is widely considered to be superior to other videotex systems because its sophisticated and highly flexible method of coding information is independent of display, transmission and storage techniques and allows for future growth.

Most of the department's work on Telidon during the year was devoted to continued development and commercialization of Canadian videotex in co-operation with industry. The immediate objectives of the Telidon program were:

- to encourage the transfer of this technology from government labs to the private sector through development contracts and licensing arrangements;
- to assist in the creation of a commercially viable Telidon industry producing hardware, software, systems and services through research, product development promotion and field trials; and
- to promote the acceptance of Telidon as a national and international standard.

The department has been very successful in achieving these objectives. Telidon has been adopted by most of Canada's major telecommunications carriers, and equipment is being manufactured by five companies for the domestic and international markets. Sixteen Telidon data bases were in operation as of March 31, 1982, offering a wide range of information. Eleven domestic and two foreign field or market trials began during the year, and the first commercial systems started up — Infomart's agricultural information service, Grassroots, in Manitoba; Faxtel's Marketfax in Toronto and the London Free Press Videopress system in London, Ontario.

A major milestone in North American electronic publishing standards was passed in May 1981 when compatible standards were achieved between Telidon, CBS and American Telephone and Telegraph (AT&T), giving Canadian industry a competitive edge in a new North American market that is expected to reach $12 billion a year within a decade. Agreement was reached between the department and AT&T on the presentation part of the compatible standard, which governs the format used to describe information for storage in computer files and subsequent display on video screens. Canada and CBS worked together on the transmission part of the compatible standard, which governs teletext, the television broadcast version of videotex.

The compatible standard is reflected in the provisional broadcasting specification issued by the department in June 1981. Broadcast Specification 14 sets forth the transmission standards to be used by broadcast undertakings when carrying digital information within the structure of a TV signal.

A detailed specification of the extensible Telidon coding scheme as well as the principles which make it independent of storage device, communications channel and display hardware are provided in a technical paper published by the department in February 1982 under the title, Telidon--Videotex Presentation Level Protocol: Augmented Picture Description Instructions.

In the past year, Telidon made important strides in the international marketplace despite very active competition from the videotex systems of other countries. Canadian companies negotiated Telidon sales worth tens of millions of dollars to clients in Australia, Britain, Germany, Switzerland, the United States and Venezuela. Among these were significant sales by companies such as Infomart, Norpak and Hemton to influential customers such as Time Inc. in the United States, Standard Telephon und Radio AG (STR) in Switzerland and the Graham Poulter Group in England.

The next challenge is the full commercialization of Telidon technology in national and international markets. To achieve this, the government announced an additional $27.5 million funding for Telidon in February 1981.

From this additional funding, $9.5 million was committed to an Industry Investment Stimulation Program, to be spent over two fiscal years 1981/82 and 1982/83. This program is expected to generate more than $100 million of investment by the private sector in the first year alone. Under this program, the department will contribute to the purchase of thousands of Telidon terminals to support operational systems. To qualify for assistance, applicants must agree to match the government contribution by an equal amount, primarily to purchase terminals. While directly promoting the manufacture of Telidon equipment, the program will also encourage the expansion of Telidon data bases, develop a large audience for Telidon services, and help Canadian companies develop the skills and resources needed to operate and market commercially viable videotex services.

In January 1982, approval was given to 52 applications received in response to a request for proposals sent out in August 1981. Proposals were evaluated by an inter-departmental committee according to predetermined criteria. The approved projects, ranging from business systems to computer-assisted learning and health programs, will form the base of an informal network of Telidon systems and data bases.

A second program was funded from the $27.5 million Telidon budget increase to support non-profit groups who want to make use of Telidon for special interest applications. Under the $1 million Public Initiatives Program, the department called for applications by December 1981 from groups representing women, native people, consumers and the disabled. The purpose of this program is to increase the number of Canadians who have expertise in developing Telidon data bases. It is expected that 10 or 12 projects will be approved.

The department conducts behavioral research to assist in the design of videotex systems that respect the abilities and limitations of the user. During the year, reports were published dealing with design of tree-structured indexes, how people understand and use visual images, some human factors that should be considered in the design of data entry systems, and requirements of an interactive language for querying data bases outside the videotex system.

Public awareness of Telidon increased during the year. An estimated 250,000 people were introduced to the new technology through demonstrations given in towns and cities across Canada by the department's regional staff. In

co-operation with industry and the Department of External Affairs, the department also promoted Telidon at major trade shows such as Videotex '81, held in Toronto in May 1981, and Viewdata '81, which took place in October in London, England.

In coming years, the federal government will continue to develop Telidon applications and to concentrate on research and the setting of policies to deal with the many issues raised by the new industry, be they social, cultural, economic or legal. The government will also continue to use Telidon in its own information programs.

Information technology

Sophisticated electronic telecommunication techniques are increasingly being applied to information handling, opening new areas of application and forging new services. There is a growing desire to develop totally Canadian communications products, especially digital electronics and computer systems. The department has had considerable success in initiating basic image communications research and development within the lab, then transferring the results to industry. Examples are provided by achievements in graphic languages, improved Blissymbol communication techniques, raster graphic display systems and Telidon. Through this program, the department is now working towards future enhancements of existing public access information systems such as Telidon and is investigating coding schemes that will lay the groundwork for the development of all-digital television.

During the year, the department continued to conduct and support longer-term R and D into advanced image-based interpersonal communications. Laboratory trials of an elementary image manipulation and control protocol were begun, the end goal being interactive image manipulation in a multi-node network.

In support of the Telidon field trials, the department issued contracts for the development of teletext encoding systems and low-cost teletext decoders for use with broadcast Telidon.

New equipment and software have expanded the capabilities of the system and allowed a wide range of new services to be introduced. Telidon can now interface with a good number of other computer systems, including large IBM machines, AES word processors and Apple home computers.

Meanwhile, the Communications Research Centre is continuing its research and development work. During the year, researchers began work on a Telidon multiple services terminal with automatic dial-up and capability for transmitting over a digital packet network. Telidon color selection was enhanced to 4,096 choices, any 16 of which can be used simultaneously. The terminal data transfer rate was increased, and terminal memory, image description and image handling capability were expanded to take advantage of the wider color choice and to deliver a photographic display of exceptional color quality. Investigations continued into a number of prospective transformation techniques for image compression, and into the development of voice and sound accompaniment techniques.

The major part of R and D funds for the Telidon program have been placed outside the government laboratories. In 1981/82, $1.9 million was spent on Telidon research, of which approximately three-quarters was contracted out.

Office communications systems

The coming decade will see an increased demand for computerized office systems and data networks as Canadian firms seek to improve productivity and efficiency through the use of completely integrated office communication systems.

Through its Office Communications Systems Program, conducted in co-operation with the Department of Industry, Trade and Commerce, the department is helping Canada's high technology industries solve the technical problems in introducing automated office systems to the market and studying the human factors that determine the effectiveness of office work and the quality of the working environment.

There are two phases to the current program. Phase one, a planning phase, began in November 1980 and was completed in the first quarter of 1982. During this phase somewhat less than the full budget of $2.5 million was spent to confirm the feasibility and desirability of proceeding with the next phase of the program. This was primarily a definition phase to test the use of field trials as a vehicle for industry development.

Plans for phase two call for major industry field trials in federal departments to assess the long-term needs of the office of the future, to test the effectiveness of new products and services introduced by Canadian industry, and to evaluate the human impact of the new technology. The

trials offer manufacturers the opportunity to test new equipment and services in a controlled office environment. Once these products have been tested and refined, Canadian companies will have field-proven equipment to sell in world markets. A projected budget of $10 million over a three-year period was approved in principle in 1980. Authority to proceed with phase two will be sought early in the 1982/83 fiscal year.

Under the first phase, a program office was established and staffed in the Department of Communications. Some 20 studies were carried out for the department by various universities and consulting firms at a cost of more than $400,000, including technical, behavioral, economic, marketing and feasibility studies. These studies provided information on the impact that office automation can be expected to have on people faced with an entirely new concept of office work, and gathered forecasts on international trade trends, Canadian industry performance, productivity, employment and other economic effects. Reports on most of these studies are expected to be released in 1982.

Two advisory committees were established. The Industry Consultative Committee, with representatives from companies in the office equipment and services business, provides private sector advice to the department, recommending actions that will encourage the use of electronic office technology and stimulate the development of a competitive Canadian office automation industry. The second committee, a users group, ensures that the technical, economic and behavioral needs of the public-service user community are taken into consideration and serves as an information exchange for all federal departments that choose to belong.

A field trial methodology and plan were developed and distributed to all federal departments as a guide to field trial planning and to advise them how to participate in the Office Communications Systems Program, and possible field trial sites in the offices of federal departments and Crown agencies were identified.

Proposals were obtained from industry for field trials of intelligent work stations and communications hardware, and for creation of simpler, more effective ways to store and retrieve large quantities of diverse information. Proposals were assessed for the extent to which they could meet a distinct office need of a host department and offer significant benefits in terms of productivity and quality of work, as well as benefitting Canadian industry. Several proposals are being discussed in detail with prospective host departments, with a view to commencing field trials in the fall of 1982.

A major aim of the program is to foster an awareness of the benefits of office automation in federal departments and to assist these departments in analysing their needs. Assistance and advice were provided to departments planning to implement integrated electronic office systems and about $293,000 was spent on departmental field trial feasibility studies.

Limited government field trials were conducted to test prototype systems and equipment, including an optical character reader made by Hi-Tech Ltd. to automatically read printed documents. The first human impact study was completed, a small-scale evaluation of the effects of the introduction of a new text-transmission facility in one of the government departments.

A public information program was started, which included a film and a booklet describing the areas of expertise of some 50 Canadian office-systems consulting organizations. A similar catalogue of Canadian office equipment manufacturers was in preparation at year-end.

The Office Communications Systems Program is already serving as a catalyst to encourage Canadian companies to combine their efforts to develop office systems that serve the needs of entire organizations. Of particular interest during the year was the creation in August 1981 of the Office Communications Research Associates consortium. Together, the consortium's members have the resources to provide computer-based work stations and international telecommunication links and to develop new ways of distributing data, voice and video services by coaxial cable and other networks.

Fibre optics trial

In October 1981, the world's first project to test fibre optics technology for delivering a full range of communications services in a rural setting got under way in the farming communities of Elie and St. Eustache, 50 km west of Winnipeg.

The $9.6 million trial is bringing single party digital telephone, cable TV, stereo FM radio and Telidon services to 150 households. It will determine not only the technical feasibility of using optical fibres to deliver multiple communications services in rural areas but also consumer acceptability of integrated services.

The department provided about half the funding, with the balance coming from the Canadian Telecommunications Carriers Association, Infomart, the Manitoba Telephone System and Northern Telecom Canada Ltd.

Spectrum research

The department carries out research related to the radio frequency spectrum in order that this natural resource can be used more effectively. The results of this work benefit all users of radio by contributing to the design and development of new communications systems, and to the planning and management of the spectrum.

Research continued during the year on the propagation of radio waves in the very high frequency (VHF) and ultra high frequency (UHF) bands used by Canadian broadcast and mobile services.

Computerized techniques developed by the department now enable engineers to determine radio coverage patterns over different types of terrain. The computer program is being used by the Ontario and Atlantic regional offices of the department, and it has been extensively revised to satisfy the requirements of various companies who wish to use it.

Initial measurements were carried out to develop models to characterize the effects of multipath transmission which degrade digital transmissions in the land mobile and broadcasting services. These studies are being done in co-operation with specialists at the Université Laval, who are developing computer techniques to simulate different systems.

Other VHF/UHF activities include the continuing study of radio propagation over the sea to assess interference problems that might result from increased requirements for communications in coastal waters in support of oil exploration activities. Part of this work is supported by the Maritime Telegraph and Telephone Company. As well, a feasibility study was started to investigate the possibility of providing improved communication for shipping in the Arctic sea lanes.

In the area of microwave propagation, studies were carried out for both terrestrial and earth-space applications. During the year, work started on a small demonstration project to illustrate the feasibility of short-haul data communications at frequencies near 15 gigahertz (GHz). In addition to other in-house research work, a number of studies were conducted in co-operation with other

agencies. These included the British Columbia Telephone Company, CNCP Telecommunications, Telesat Canada, Teleglobe Canada, the New Brunswick Telephone Company and the Maritime Telegraph and Telephone Company, as well as six Canadian universities. Much of this work ultimately contributes to international regulations through Canadian presentations at meetings of the International Telecommunication Union.

Radio systems

Mobile radio

The department's work on mobile radio systems during the year concentrated on systems analysis intended to improve understanding of the needs for and use of new communications technology and to identify areas where further R and D is required.

Extensive liaison with several Canadian telephone companies has led to setting up of an in-house computerized data base on public mobile radiotelephone traffic for Alberta Government Telephones (AGT). Traffic data is being analysed to evaluate the character and growth of AGT's radio traffic and to develop models which may be applicable to other regions of Canada. An industry contract with the B.C. Telephone Company provided extensive data for the study of mobile radiotelephone market segmentation. Results from these analyses have contributed to planning for mobile satellite (MSAT) program and are expected to be useful for the department in evaluating service growth and radio spectrum requirements.

The mobile radio data system now in operation at the Vancouver Police Department resulted from an earlier departmental project to foster a high technology capability in Canada for the manufacture of mobile radio data systems. During 1981/82, the department commenced post-installation evaluation of the system through a contract with Cantel Engineering Associates Ltd. The contractor is assessing what effects the introduction of such spectrum efficient technology may have on communications patterns and radio spectrum requirements. A complementary research project was launched to study the behavioral factors affecting the use of mobile data terminals in the Vancouver Police Department and the extent to which they influence spectrum requirements. This work is being carried out under a university research contract by Simon Fraser University and the results are expected to be published.

High frequency radio

Over the years, the Communications Research Centre has built up a wealth of expertise in ionospheric propagation of radio signals. This expertise is being exploited for high frequency (HF) radio in new high reliability and high quality radio systems and subsystems under development by the department based on modern signal processing and microcomputer technology.

The RACE system (Radiotelephone with Automatic Channel Evaluation) has achieved a performance long believed possible but only now available commercially. Syncompex, the voice processing subsystem used in RACE, produces speech circuits of greatly improved quality at a modest cost. The technology for RACE has been transferred to Canadian Marconi and Syncompex technology has been transferred to Miller Communication Systems. The production version of RACE is being field tested this year by several organizations, including Bell Canada and the Bedford Institute of Oceanography. Forty-eight Syncompex units have been delivered by Miller to customers in Europe, North America and Australia.

Jointly funded development programs are under way involving the Department of Communications, the Department of Fisheries and Oceans, Environment Canada and the National Research Council to produce a variety of high frequency data systems including a low-cost terminal and a high frequency facsimile system.

Arrangements have been made between the Canadian company MacDonald Dettwiler & Associates and a U.S. supplier of airline radio equipment to evaluate a novel airborne HF data link incorporating an audio bandwidth modem. This modem was developed under the sponsorship of the department and is built by MacDonald Dettwiler under licence. Air Canada is now installing this type of modem for flight trials between North America and Europe.

Optical communications

The Department of Communications, through its research in fibre optics and assistance to industry, is contributing to the development of fibre optics technology in this country. In fibre optics systems, communications signals are transmitted in the form of light along hair-thin strands of glass.

Technology for the fabrication of high performance single-mode fibre optics couplers was transferred to two Canadian companies, Canstar Communications and Opto-Electronics Ltd. Canadian Patents and Development Ltd. has agreed to administer and licence the technology on behalf of the department.

The technology for making single-mode couplers has been enhanced in the laboratories of the department for use in multi-port devices where uniformity of light distribution is not a crucial parameter.

Rapid advances have been achieved in the area of opto-electronic switching, building on the video bandwidth opto-electronic switch developed under contract by Canadian industry using technology provided by the department. The potential information-carrying capacity of the switch has been improved and promises much more compact and consequently more economic implementations of future devices.

To date, the department's optical communications research program has concentrated on transmission links. This technology is now fairly well established. The next step is to process the information in the form of light rather than converting it into electricity as is done on today's chips. For this reason, the department is considering stepping up its research activity in photonics, the microelectronics of the future which combines optics and electronics to achieve increased speed and overall performance improvements.

Radio communications

The department carries out research and development on radio communications technology as part of its mandate to improve spectrum utilization, enhance the reliability and efficiency of existing communications services, and upgrade communications in rural and remote regions of the country. This work is supported by studies of the radio environment in which communication systems must operate, and by studies of selected electromagnetic interference and electromagnetic compatibility (EMI/EMC) problems.

In the area of radio communications technology, a new radio telephone system is under development in industry that will provide for radio selective call and radio-to-telephone interconnect through manual dialing employing a keyboard with VHF-FM or high frequency-single sideband portables. The object is to develop a low-cost operator-free direct dial radio telephone system that could provide a required service for small aircraft, ships and remote communities.

Signal interference affects the performance and reliability of radio communications. If the signal levels are very strong, they can affect the performance of a wide variety of consumer electronic equipment. There is a need to measure the strong signal environment in urban and suburban areas, to set standards for controlling acceptable levels of strong signals and for the performance of electronic equipment subject to strong electromagnetic fields. During the year, comprehensive measurements of signal levels were made in Toronto, Montreal and Ottawa for AM and FM radio, TV, land mobile and the General Radio Service, commonly known as CB radio. These measurements, which were being interpreted as the year ended, conclude a program that was started in 1980/81.

Work has continued in the area of EMI/EMC measurement methodology. Work this year has concentrated on development of probes to measure strong electric and magnetic fields, and on evaluating enclosed field devices that could be used to measure the performance of electronic equipments in strong electromagnetic fields.

Investigations continued this year into the re-radiation of FM signals from hydro lines and high buildings located near broadcast radio stations, since these affect the pattern of the antenna arrays, and thus the reception of signals. This work has developed into a comprehensive research program, involving collaboration between government, university and industry, particularly hydro companies. The work in progress is partially funded by the Canadian Electrical Association.

Radio noise data are required to provide levels for standards, for the design and performance prediction of communications systems, and for the assessment of radio noise sites and interference sources. The work this year has emphasized measurement of radio noise levels in the mobile radio bands, particularly the new 800 MHz band, in urban and suburban areas. The performance of an antenna designed for the MSAT program to discriminate against signals arriving from the direction of the horizon, has been measured. Measurement of radio noise in this and higher bands has required the development of new techniques needed to improve the measurement sensitivity, because the level of radio noise decreases in the higher frequency ranges of the radio spectrum.

Contract work has continued at the Nova Scotia Technical College and Université Laval on the effect of radio noise and interference on TV picture quality.

Rural communications

In April 1981 the department published its concluding report on the Rural Communications Program, a major research undertaking launched in 1976 in recognition of the disparity between communication services provided to rural areas and those available in urban parts of Canada.

The studies found a widespread need for improved telephone service and better mobile radio communications and a general desire for greater choice in television and radio broadcast signals. A rural services demand survey was initiated to quantify the level of communications services desired by rural people and their willingness and ability to pay for the desired services. This study was still in progress at year-end.

The main objective of the five-year program was to identify technological areas which promised economical solutions to rural communications problems. Two potential technological solutions were identified for rural telephone service: use of the rural interface device and possibly use of rural mobile/fixed radio.

The rural interface device can be retrofitted to party-line telephone stations to ensure complete privacy, selective ringing and automatic number identification for toll calls. The device also features automatic call-back if a subscriber tries to make a call when the line is busy, and in case of emergency, a 10-second interruption preceded by a warning tone allows a subscriber to speak to those using the line. The department funded technology development by Mitel Corporation for this device and contributed to the cost of a field trial by Alberta Government Telephones. The trial showed a positive response by subscribers. This equipment could transform the 650,000 multi-party lines in Canada to provide a level of service approaching that of individual lines.

For a longer range solution for telephone service and new data services such as Telidon, alarms and meter reading, radio may be the answer. Technically, it would be feasible to develop a universal radio system to cater to the need for rural and mobile telecommunications, although radio systems on the market at the time of the study were not cost-effective, and the economic viability of such a system had yet to be proven. The concluding report stated, however, that there is a large market for the right type of rural radio service in Canada and abroad, and suggests that further research be done on a new mobile/fixed radio network architecture for rural communications.

In the case of rural television services, the use of direct broadcasting satellites appeared to be the most attractive solution. This would bring direct-to-home TV broadcasts to all of rural Canada, and to remote and urban areas as well, using small low-cost earth stations for reception. In most areas, the initial capacity would be four to eight choices of TV channels, a significant improvement over the two or less TV channels now available to 43 per cent of rural dwellers.

University research

Complementing in-house and government/industry efforts is the department's program of university research. Subjects studied during the year ranged from the effects of information technology in Canada to northern native TV programming. In 1981/82, 38 contracts worth approximately $800,000 were awarded to Canadian universities, dealing with the social, economic, regulatory or technical aspects of telecommunications. These university contracts serve two purposes: they help to meet the department's research requirements, and they build expertise in Canadian universities.

Established in 1971, the university research program encourages the development of specialized skills that may be valuable to industry, government and the universities themselves.

University research contracts awarded in 1981/82

Province	Number	Value
British Columbia	5	$ 95,000
Alberta	2	$ 59,000
Ontario	18	$437,000
Quebec	10	$232,000
Nova Scotia	2	$ 32,000
Newfoundland	1	$ 20,000

Centres of excellence

Through a separate university research program, with a budget of about $330,000 in 1981/82, the department awarded 10 contracts for technical and scientific research to French-language universities in Ontario and Quebec. No contracts were awarded in New Brunswick since no projects were submitted from this province. The objective of this program is to foster centres of excellence where French is the language of work, and so to help achieve an equitable balance of centres of excellence between French-language and English-language universities.

Centres of excellence contracts awarded in 1981/82

Province	Number	Value
Quebec	8	$273,524
Ontario	2	$ 55,683

Communications Research Advisory Board

The department is assisted in setting its overall research policy and in planning specific research activities by the recommendations of the Communications Research Advisory Board.

Created in 1974, the board advises the department on the quality and management of its research programs, and their relevance to the department's objectives in the areas of information, space technology and communications, management of the radio frequency spectrum, and arts and culture. The board's report for 1980 was published in April 1981.

Transfer of technology

By Cabinet decision, the co-operative program with industry formerly administered by the department was merged with the National Research Council's Program for Industry/Laboratory Projects (PILP) starting in the fiscal year 1981/82.

Through PILP, the department transfers technologies developed in its research laboratories to Canadian industry. Financial assistance in the form of contracts is provided to firms interested in developing a particular technology, testing its acceptance and finally marketing it.

During 1981/82, 17 technology transfer contracts were signed with Canadian companies to a value of approximately $1.8 million.

Technology transfer contracts awarded in 1981/82

Province	Number	Value
British Columbia	2	$259,000
Saskatchewan	1	$ 18,000
Manitoba	1	$ 86,050
Ontario	9	$910,662
Quebec	4	$535,000

Space Communications

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The work of the department's space sector is directed towards the development in Canada of space telecommunications facilities and services, the exploration and development of new applications of space technology, the provision of space technology support to other departments and agencies to meet Canadian requirements, and the maintenance of an effective industrial base to serve domestic and international markets.

In April and December 1981, the government announced major space initiatives for Canada, creating new challenges for the department. Additional budgets of about $95 million and 10 new person-years were allocated over the period 1981/82 to 1984/85 to support the mobile satellite (MSAT) program, spacecraft subsystem development programs and studies related to direct broadcast by satellite, as well as the European Space Agency's plans to develop a large communications satellite (L-SAT). This brought the department's 1981/82 space sector budget to $42 million and person-years to 215 with a forecast increase to $65 million and 225 person-years for 1982/83.

To cope efficiently with these extended responsibilities and to deal with the increasingly complex technical and policy environment foreseen for satellite communications in the 1980s, the department reorganized its space sector. The sector now has three major components -- communications planning, space programs and industry development, and space technology and applications.

Direct broadcasting by satellite

Direct broadcasting by satellite (DBS) is rapidly becoming one of the most important new applications of communications satellites throughout the world. In Canada, where DBS technology was successfully pioneered on Hermes and still continues to operate on Anik B, the need to improve television services to approximately six million Canadians in rural and remote areas of the country led the Department of Communications to undertake a comprehensive multi-disciplinary program of planning studies designed to guide decisions on the implementation of a broadcasting satellite service in Canada.

The studies fall into four general categories: technical, socio-demographic, economic, and regulatory and institutional. They include detailed statistics on requirements for improved quantity and quality of television broadcasting services, market surveys to determine how much people would be willing to pay for this service and studies of requirements for complementary

services such as radio and teletext broadcasting. They also include studies of the impact of the introduction of DBS service on the broadcasting, manufacturing and program production industries as well as the impact of American DBS services which will spill over into Canada. The viability of Canadian DBS service will be assessed in light of the results of these technical and cost studies along with the need for bilingual programming. Social factors associated with regional needs identified in the studies as well as technical and economic trade-offs will help to determine the number of satellite antenna beams that would be required to cover Canada.

The studies are being conducted in close consultation with all sectors of the communications industry (broadcasters, cable operators, carriers and manufacturers) as well as regulators and provincial governments and are expected to lead to a discussion paper on the introduction of a Canadian DBS system.

Spectrum and orbit planning activities

Analysis of alternative arrangements for the sharing of the geostationary orbital arc received considerable attention from the department during 1981/82 because of the large increase in domestic requirements in the United States and because of Mexico's plans to establish a satellite system needing locations in an already crowded orbital arc. After lengthy discussion, representatives of the three countries reached an agreement by which the satellites of each country can share the orbital arc.

The department is now examining possible spectrum and orbit assignments for Canadian direct broadcasting satellites as part of the Canadian preparations for the 1983 Regional Administrative Radio Conference on the broadcasting satellite service in the western hemisphere. Work to date indicates that the orbital plan likely to evolve from the 1983 conference will allow a cost-effective Canadian system to be developed, and that no serious constraints will be placed on the expansion of that system.

The third major spectrum and orbit planning task was to find an arrangement whereby mobile satellite systems in Canada can share the 806-890 MHz band with existing and planned terrestrial mobile systems. Work continues in this area, with the objective of finding spectrum not only for the MSAT system but also for its successors.

Public comments were invited on the integration of terrestrial and satellite mobile radio in the 806-890 MHz band through a discussion paper released by the department in September 1981. The deadline for submissions was February 15, 1982.

Anik B

In February 1981, the department took up its option to renew its lease of Anik B's 14/12 gigahertz (GHz) capacity until September 1982. The original two-year lease made possible a series of pilot projects to test the more promising communications services identified with the experimental Hermes satellite. As part of this program, the department is making available satellite time, equipment and technical advice to a range of pilot project sponsors, including public, private, community and special interest groups. Sixteen major pilot projects as well as 20 shorter demonstration projects are being carried out to investigate the use of communications satellites for TV broadcasting or distribution, community communications, tele-education, telehealth, and business and public service applications.

The second phase of the program involves exploration of new areas such as the gathering of news by satellite and evaluation of ground terminals for Anik C, as well as further development of some Phase I activities. Through these projects, the department is exploring possible applications of the 14/12 GHz band for new satellite communications services, to ensure that its capabilities are recognized and applied effectively. Phase two will be completed in fall 1982, when the major video services developed under this program will transfer to commercial operations with Telesat Canada/TransCanada Telephone System (TCTS). Subsequent efforts in the Anik B program will concentrate on trials and development of telephone and data services to improve the access of remote communities and resource sites to good telephone service and to explore office-to-office satellite data links.

During 1981/82, the direct broadcast trial continued using the signals of TVOntario, the CBC and BCTV. The major tele-education project carried out by the Knowledge Network of the West (KNOW) also continued, extending into a network involving 70 distant communities in B.C. and the Yukon. The channel used by KNOW was time-shared with ACCESS Alberta to evaluate the distribution of educational TV in Alberta. As a result of these trials, TVOntario, ACCESS Alberta, the CBC and Newfoundland TV are negotiating with

Telesat Canada/TCTS for capacity on Anik C on a commercial basis. In addition, five of the six pay TV services licensed recently by the CRTC have selected 14/12 GHz satellites as the medium for delivering their signals to local distributors.

During the past year, a highly transportable video uplink earth station with a 1.8 metre antenna was developed at the department's Communications Research Centre. The CBC is using this in a pilot project in satellite news gathering. The earth station, which is towed by a CBC van, can be set up in half an hour to originate on-the-spot news reports.

Pilot projects were carried out in northern Canada by the Inuit Tapirisat of Canada and the Taqramiut Nipingat Inc. to develop native broadcasting services and to provide for interaction among native communities. These were completed successfully and led to the formation of the Inuit Broadcasting Corporation in July 1981. The new corporation will share 6/4 GHz satellite capacity with CBC's Northern Services.

A co-operative pilot project on Anik B between the department and CNCP to develop and test communications using less than a full transponder channel entered the last phase of customer service trials in March 1982. This project relies on time division multiple access (TDMA) technology to serve many different users simultaneously. During the year, the Government Telecommunications Agency joined this project to evaluate the application for government communications.

David Florida Laboratory

The David Florida Laboratory (DFL) provides aerospace and spacecraft test and assembly facilities to agencies of government and Canadian industry on a cost-recovery basis. Originally built in the early 1970s for the integration and testing of the communication technology satellite Hermes, the facilities were recently expanded in an $18 million upgrading program. The lab now offers all the equipment and assembly areas needed for integration and environmental testing of complete large spacecraft such as those designed for launch by the U.S. Space Shuttle.

In 1981/82 the DFL's office wing was completed, and in November 1981 the DFL was certified by major industrial users as able to do the work for which it was designed. Certification followed performance of demonstration testing on a mock satellite which showed that the staff and facility could handle the task safely and accurately.

The DFL provided services during the year to a number of companies including Spar Aerospace Ltd., Canadian Astronautics Ltd., CAE Electronics Ltd., COM DEV Ltd., Canadian Westinghouse and Dome Petroleum. Spar has been the major client to date, using the David Florida facilities for work on the shuttle remote manipulator system (Canadarm) and follow-on production, as well as for spacecraft integration and testing. The first spacecraft to be tested in the expanded lab was Anik C-2; integration and partial testing were completed in October 1981. Complete integration and spacecraft level testing were performed on Anik D-1 and integration of Anik D-2 was started during the year.

Satellite technology development

In August 1981, the government announced an $8 million two-year extension of a department program aimed at developing advanced satellite technologies. Through this program, begun in 1976, the department is encouraging the Canadian space industry to develop the subsystems and components expected to be required in future domestic and export satellite systems. The program also enables the department's space research staff to keep at the leading edge of technology.

Contracts worth approximately $2.5 million were let to Canadian firms under this program in 1981/82. Current efforts include development of:

- new earth terminal technology, including small antenna dishes for television receive-only (TVRO) terminals; low-cost telephony terminals for 14/12 GHz operation; and compact transmission lines for satellite equipment;
- spacecraft power systems technology such as solid-state power amplifiers; high-reliability battery management systems; and a variable power divider unit;
- spacecraft dynamics and control systems technology, including high-power solar array drive and power transfer assemblies; gyros and accelerometer systems; and an attitude beam control system;
- advanced microprocessors and onboard self-contained microprocessors for fault-tolerant or autonomous operation of future satellites;

- heat pipe and other thermal control systems required for future satellites with high-power payloads or large, flexible arrays and reflectors;

- large, flexible structures and mechanisms, and space-unique materials for use in future satellites for advanced communication and remote sensing; and

- new modulator-demodulator technology, utilizing the differential minimum shift keyed technique.

Major earth terminal development

In October 1981, the federal government announced a joint project with Spar and Teleglobe Canada for the development of the next generation of earth station equipment for international satellite telecommunications. The new equipment will increase by as much as three times the capacity of satellite channels for carrying international telephone traffic. The federal government and Teleglobe are contributing a total of $5.1 million to the project, while Spar's contribution will be $1.9 million.

The equipment is based on time division multiple access (TDMA) and digital speech interpolation (DSI) techniques, which make more efficient use of satellite channels through time sharing. Spar is designing the equipment to standards set by INTELSAT, the international satellite organization responsible for the operation of a commercial global system of telecommunications satellites.

Transfer of technology to Canadian industry

During the past fiscal year, the department began transferring to Canadian industry several projects developed either in its space research laboratories or at Canadian universities under its university research program. Through this transfer of technology, the department is ensuring the timely industrial availability of the technologies needed in future systems and helping Canadian industry capture its share of emerging markets.

Surface acoustic wave (SAW) device technology developed by the department is being transferred to COM DEV Ltd. of Cambridge, Ontario. The main application is for processing signals in the 10 MHz to 2 GHz frequency range for satellite communications and radar systems.

Linear Technology of Burlington, Ontario, is receiving new semiconductor technology developed at the University of Toronto under a DOC university research contract. The technology involves metal oxide semiconductors which are expected to have a wide range of applications in UHF communications.

In two other transfers, new technology for emergency locator transmitters operating at 406 MHz is being transferred to Bristol Aerospace Ltd. of Winnipeg, Manitoba; and hybrid spiral antenna technology is being transferred to Canadian Marconi Corporation of Montreal.

These four transfers are being financially assisted under the National Research Council's Pilot Industry/Laboratory Projects program (PILP), with contributions totalling nearly $2 million. The Department of Communications, in addition to providing all the background technology, makes its scientific personnel available to assist these projects as required and conducts testing and evaluation of the resulting products in its laboratories.

A fifth project during the year involved the transfer of gallium arsenide device technology to Optotek Ltd. of Ottawa, Ontario, through a $2 million interdepartmental program announced in October 1981. The program involves the development by Canadian industry of miniature electronic devices and circuits made from the compound gallium arsenide, which will be used in satellites, low-cost earth terminals and advanced radars.

The department is providing about half of the funding and will manage the four-year development project. It will also contribute expertise and laboratory facilities during the design, testing, and evaluation of the new devices. The remainder of the funding will be from the departments of National Defence and Supply and Services.

Mobile satellite communications

Since 1972, civilian and military experts have been studying the idea of a mobile satellite (MSAT) communications system for Canada. A major step forward came in 1979 when the World Administrative Radio Conference allocated the use of the 806-890 MHz band for this type of service in North and South America to be shared with terrestrial mobile services. The department followed up with a program of feasibility studies carried out in the 1980/81 and 1981/82 fiscal years. The studies gave proof of technical feasibility and found that the demand for mobile satellite services would be sufficient to make MSAT commercially viable. Possible military missions were also studied.

Some 23 contracts were completed in 1981/82 by 15 Canadian companies for engineering, marketing and socio-economic studies which led to government approval in December 1981 of a budget of $17 million for project definition.

The Department of National Defence is co-operating with the Department of Communications in the project definition phase. The studies in this phase will lead to a proposal to be put forward in 1984 for the construction and launching of a demonstration MSAT. The government will then decide whether or not to proceed with the program. Meanwhile, the possibility of a co-operative venture with the U.S. National Aeronautics and Space Administration (NASA) is under investigation.

The MSAT system is intended to provide service to moving terminals in any part of Canada or North America without restriction on distance, supplementing today's mobile communications which are limited to a range of about 80 km from a base station. The MSAT system would meet the urgent needs of mobile communications users -- both public and private -- in rural and remote areas.

L-SAT

The European Space Agency (ESA) has undertaken to produce and demonstrate a large commercial satellite (L-SAT) capable of carrying a range of communications and other payloads. Launch is scheduled for 1986, followed by five years of on-orbit operation. Canada is taking part in this program under an agreement of co-operation signed in 1978.

Canada took part in the preliminary definition phases of the L-SAT project, which were completed in 1981. In December 1981, this country elected to participate in the development and manufacturing phases along with a number of ESA countries, notably Italy, the Netherlands and the United Kingdom. The prime contractor for L-SAT will be British Aerospace Ltd. which, together with major subcontractors in Italy, Canada and the Netherlands, will form a consortium to build and market L-SAT derivatives.

Canada's contribution is estimated at 9 per cent of the overall program cost, and the government has approved a budget of $68 million up to 1984/85. Spar Aerospace Ltd. is to be a major subcontractor, while COM DEV will provide specialized components. The Canadian government's contribution to this program will enable Spar to build the solar array for the spacecraft and to have a major

responsibility for the final test of the spacecraft at the David Florida Laboratory, which was chosen over European facilities. Both Spar and COM DEV are to produce payload components.

Canada's participation will give this country's industry a role in the commercial exploitation of the satellite and the right to use the L-SAT structure for later domestic purposes such as direct satellites, MSAT and RADARSAT.

Satellite-aided search and rescue

Planning has been going on since the 1970s to use satellites equipped with suitable receivers to detect and locate emergency transmissions from aircraft and ships in distress. Experiments by the department's Communications Research Centre in 1975 and 1976 demonstrated that such a system could locate distress sites within minutes with an accuracy of 10 to 20 km.

In 1979, Canada, the United States and France agreed to co-operate in a search and rescue satellite (SARSAT) program. Norway joined the program in December 1981, and discussions are now underway with the United Kingdom and Japan which have expressed interest in participating.

The SARSAT partners are co-operating with the U.S.S.R., which is sponsoring a compatible search and rescue spacecraft program known as COSPAS. The objective is to achieve extended international co-operation in satellite-aided search and rescue.

SARSAT features Canadian-built radio repeaters to be installed on three U.S. polar orbiting weather satellites. The department took delivery of the first flight repeater from the manufacturer, Spar Aerospace Ltd., in March 1981; this was integrated into the spacecraft and successfully tested during the last half of 1981. A 15-month orbital demonstration and evaluation is scheduled to begin in 1983.

In July 1981, Canadian Astronautics Ltd. delivered a ground station for use in the Canadian component of SARSAT; this was formally accepted by the department in September. The company is also providing four American ground stations for the system and a portion of the French one.

During 1981/82, SED Systems Ltd. completed manufacture and testing of the Canadian search and rescue mission control centre. This was to be delivered to Trenton, Ontario, early in the 1982/83 fiscal year.

Prime contractor capability

A long-standing objective of the department has been to develop a Canadian prime contractor for communications satellites as a prerequisite to capturing a greater share of the domestic and export markets for satellites. Spar Aerospace Ltd. is now building two Anik D satellites for Telesat Canada, the first time that Canadian commercial satellites have been supplied by a Canadian company.

To enhance Spar's ability to compete successfully in international as well as domestic markets, the department continued a high level of investment through expenditures of $1.9 million for key technology studies and $2 million for accelerated R and D in satellites.

Marketing support for the space industry

Since the domestic market for space communications is relatively small, Canadian industry must obtain a share of the international market to remain viable. For this reason, the department provides support to Canadian companies in their domestic and international marketing activities whether these involve consulting, management, training, or production of hardware and software for space or ground segments. The main activities in 1981/82 were as follows:

- support of Spar Aerospace Ltd. in their bid as a prime contractor to supply the space segment for the Brazilian domestic satellite communications system;
- support of Canadian Astronautics Ltd. in winning a training contract from the government of Papua New Guinea, with the further objective of enabling Canadian companies to win contracts for that country's domestic satellite communications system which is scheduled to commence operation in 1985;
- support of several Canadian companies in the provision of the earth segment for the Papua New Guinea domestic satellite communications system;
- support of Spar Aerospace Ltd. in supplying the earth segment (20 stations) for the Petroleum Company of the People's Republic of China;
- support of a number of Canadian companies seeking consulting, management and earth segment contracts in the Colombian SATCOL program;

- support of the Department of External Affairs (Trade Development) and Canadian companies in organizing a Canadian consortium to bid on the provision of the earth segment for ARABSAT;

- support of various companies in supplying equipment for the Australian domestic satellite communications system;

- seeking areas for potential bilateral co-operation in research and development with the U.S. Air Force Space Division; and

- supporting other government departments in connection with NATO SATCOM affairs.

As part of its marketing support efforts, the department also produced a brochure entitled Space Industry Products and Services which is distributed abroad through Canadian embassies and in Canada through the department's offices.

International Satellites for Ionospheric Studies (ISIS)

The ISIS 1 and ISIS 2 satellites continued in operation, collecting scientific data on phenomena related to the ionosphere. As of March 1982, the satellites had been in operation for 13 and 11 years respectively and were each still scheduled for approximately two hours of data collection a day. Data is transmitted to the satellite ground control centre at the department's Communications Research Centre and to stations in other parts of the world where it is used in a number of programs.

Other activities

In addition to the major programs described here, the space sector has for a number of years performed a program of military satellite communications research and development for the Department of National Defence. The sector also provides specialist expertise to support space applications programs sponsored by other departments and agencies. These programs include aeronautical and marine navigation, space science experiments, remote sensing surveillance and weather forecasting.

Telecommunications and Broadcasting Policy

5

Spectrum and radio systems policy

The Department of Communications has a continuing responsibility to improve and extend the utilization of the radio frequency spectrum to permit the orderly growth of radio communications in Canada.

To this end, the department develops new policies and revises existing policies governing the use of the radio frequency spectrum and the introduction of new radio services. A constant concern is to encourage advanced concepts of spectrum use and to satisfy as fully as possible current and anticipated user requirements. Public consultation is an essential feature of the policy development process. New or revised policies are set and later implemented after the public has been given an opportunity to comment on proposals while they are in draft form. In each case, the terms of the policy review and an invitation to comment within a specified period are published in the Canada Gazette. Usually, a departmental policy paper containing the actual proposals is released to the public at the same time.

In addition to the policy papers mentioned below, the department prepared two publications on Canadian spectrum allocations during the year -- a full-color chart in poster format, and a table of frequency allocations for Canada. These publications are available from the Department of Supply and Services.

In July 1981, the department released a policy paper on the proposed use of the radio spectrum in the 0.89-10.63 GHz range. This was issued in connection with a complete review by the department of currently used microwave frequency bands. The main users of the 1-10 GHz band are telecommunication carriers, broadcasters, electrical utilities, cable TV operators, and government agencies.

The proposals are the product of a review process launched in 1979. Since then the department has carried out a detailed analysis of current and projected use of this spectrum range, taking into account responses to a 1979 background pape announcing the review, as well as development of new technology and the results of the 1979 World Administrative Radio Conference.

Some 15 submissions concerning the July 1981 policy proposals were received by the November 1981 deadline for comment. A final policy will be issued after th department has fully analysed all submissions and made any necessary revisions.

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Following publication of the July 1981 paper, the department released draft application procedures for planned radio stations above 890 MHz in the terrestrial fixed service.

As part of the government's initiatives to extend a full range of broadcasting services to all of Canada, the department issued a discussion paper in September 1981 proposing a new, more efficient method of using the television broadcasting spectrum to provide television services to small rural and remote communities. This method allows several signals to be retransmitted over the air from one central site in a community for home reception. These installations of co-sited transmitters would use a block of UHF television channels or, in certain cases, selected VHF channels.

The paper invited public comment on a proposed set of authorization guidelines for such non-protected, low power multi-channel local transmission systems. The paper also announced the department's intention to apply the criteria outlined starting immediately.

Also in September 1981, the department issued a discussion paper on radio licensing policy for cellular mobile radio systems in the 806-890 MHz band, and invited public comment by mid-February 1982.

Cellular radiotelephone systems are designed to allow radio frequencies to be reused within a geographic service area, thereby promoting efficient, high capacity spectrum utilization. They are expected to find their major application in automatic mobile and portable radio systems, which will be able to accommodate a much larger number of radiotelephone users than traditional mobile systems, while at the same time offering superior transmission quality and fewer delayed calls.

Related to cellular mobile radio is the proposal to set up a mobile satellite system (MSAT) operating in the 806-890 MHz and other frequency bands. An important aim of the MSAT project would be to establish a mobile telephone service interconnected with the landline network. Planning for these space and terrestrial mobile radio services needs to be closely co-ordinated. Factors connected with the introduction of both MSAT and cellular mobile radio were therefore reviewed in the discussion paper.

The department began working towards the establishment of a cellular radio systems policy in 1979, when it announced its spectrum allocation policy for the 406-960 MHz band. Among other changes, this policy reallocated the UHF TV channels 70 to 83 to the mobile radio service, with a view to the eventual introduction and licensing of conventional and cellular mobile systems in this band, which had been identified as the location for long-term growth in mobile radio.

Industry structure

As part of its mandate to ensure the orderly growth of communications systems in Canada, the department develops policy relating to the institutional, corporate and intercorporate structures and relationships of the common carrriers.

A specific area of concern during the year was the impact of the use of satellites for transborder telecommunications carriage on existing terrestrial transborder facilities and intercarrier arrangements. The department devoted considerable effort to formulating policy in this area as a step towards a possible Canada-United States agreement which would enable Canadian and U.S. satellite systems to be used for this purpose on an equal basis.

A contracted study was carried out for the department proposing basic principles that could be applied to the analysis of new entries into telecommunications service markets previously regulated as monopolies or oligopolies. The study was completed in March 1982.

The department also monitors the introduction of new services and new technologies to identify potential policy issues such as the impact that increased competition might have on industry structure. Of particular interest from this perspective were the proposed mobile satellite system (MSAT), direct broadcasting by satellite, informatics, electronic mail and the development of public air-to-ground telephone systems.

Industry structure was a key issue addressed by CRTC Telecom Decision 81-13, published in July 1981. This decision required Telesat Canada to provide for direct sale of its services to end-users and to also provide for the lease of partial channels. Bell Canada and B.C. Tel were required by the same decision to seek to renegotiate the TransCanada Telephone System (TCTS) revenue settlement plan.

The Governor in Council received a number of submissions representing a wide range of interests, supporting or opposing the CRTC decision. At the end of July, and again in November, the effective date of the satellite portion of the decision was postponed to permit the government time to review the national policy implications. The department performed the analysis for the Governor in Council review.

In December, the decision was varied again to retain Telesat Canada in its traditional role as a complement to rather than a competitor of the domestic telecommunications carriers, consistent with the government's policy established in 1969.

Since 1976, the department has sponsored a voluntary, co-operative program aimed at developing standards so that customer-provided equipment, once certified, can be connected to the networks of federally regulated telecommunications carriers. The department continues to develop standards for new types of customer-provided terminals under the aegis of the Terminal Attachment Program Advisory Committee, which comprises representatives of the federally regulated carriers, manufacturers, users and participating provinces. The aim is to produce terminal attachment certification standards suitable for adoption on a national basis, where approved by the appropriate regulatory authorities.

The department made progress during the year in developing technical standards for terminal equipment that can dial into the public switched telephone network. A certification standard covering single-line telephones, push button telephones and private branch exchanges was released in October 1981 and was recognized as one of three options for technical standards by the CRTC in November 1981 in its interim decision on requirements for terminal attachment. Another standard, this one on radio common carrier paging control equipment, was also issued in October.

Six new categories of network non-addressing equipment were added to the program: hotel/motel message registers, single-line hold, audio input on single-line hold, audio input on multi-line hold, telephones without dials, and slow scan/frame freeze TV terminals.

During the year, the department commissioned two independent studies in this area, one on the impact of liberalization of terminal attachment on the Canadian telecommunications manufacturing sector and the other on potential harm to the telephone network from customer-provided equipment.

Networks and standards policy

Telecommunications standards, both national and international, are essential to the maintenance and growth of Canada's telecommunications networks. At present in Canada, a variety of organizations are involved in telecommunications standards writing activities. These include the Canadian Standards Association, the Terminal Attachment Program Advisory Committee, the Canadian Videotex Consultative Committee and the Government EDP Standards Committee as well as the communications carriers. In addition, the Standards Council of Canada co-ordinates voluntary standardization and operates the national standards system.

There has been growing recognition of the need for national telecommunications standards prompted by the demand for telecommunications interconnection and by the increasing complexity of information technology. Accordingly, in 1981 the department commissioned a consulting firm to review current standards setting mechanisms and to make recommendations for future development and implementation of national standards in telecommunications and information technology.

The department continued to promote study of open systems interconnection for national and international implementation, to allow the widest possible technical compatibility of information systems.

Canada is co-operating with France and the United Kingdom in setting up a model of open systems interconnection. During the year, the department commissioned a study for this project, Transport Protocol for Open Systems Interconnection and Protocol Assessment. In addition, a special computer was installed at the Communications Research Centre to be used in testing the protocols which are being developed co-operatively by the three countries.

The department also studied the implications of interworking between message handling facilities and new telematic services such as videotex, teletext, Envoy 100 and Infotex.

Meanwhile, the department continued its high level of participation in the related work of the Standards Council of Canada as well as the technical consultative committees of the International Telecommunication Union.

In late 1980, the department undertook a review of certain aspects of its microwave licensing policy relating to the intercity delivery of television programming signals to broadcast undertakings.

Comments and briefs received were summarized in an interim report published by the department in August 1981. The submissions fall into three categories. Telecommunications carriers favored continuation and strengthening of the current policy which supports the use of carrier facilities. The cable television industry and broadcasters on the other hand urged that more radio spectrum be allocated for intercity signal delivery and that policy be liberalized to permit licensing of private microwave systems. Telesat Canada requested that the satellite alternative be considered before licenses are issued for private or carrier-owned microwave systems.

In view of the general nature of the comments received, in August 1981 the department announced a supplementary comment period of two months and invited interested parties to submit detailed information on some 20 points including the impact of private microwave systems on the extension of broadcasting services, on the provision of general telecommunications services, and on the development of regional and national satellite networks for delivery of program signals.

At year-end, the department was defining a position in light of the more than 50 submissions received in response to the invitation to comment.

In December 1981, the department changed its regulations on earth stations to open up licensing to business uses. The change meant that persons wishing to receive signals of other than radio and TV programming from Canadian satellites (news wire services, stock market information and weather forecasts, for example) would be eligible to apply for licences from the department for this purpose.

A second change was to exempt resource camps from the need to obtain an earth station licence to receive radio and TV programs from Canadian satellites, providing they would not be required by the CRTC to hold a broadcasting licence.

A third change affected those previously eligible to hold licences to operate TV receive-only stations (carriers, cable companies, TV broadcasters and provincial educational communications authorities), allowing them to receive radio signals not carried on the same channel as a TV signal and extending this eligibility to radio broadcasters.

The changes were made to facilitate the reception of radio and television programming signals from Canadian satellites, particularly in remote and underserved areas of the country.

Since 1979, the federal government has been making financial contributions under the Northern Communications Assistance Program towards the capital cost of bringing basic local and long-distance telephone service to some of the smaller settlements in the Northwest Territories. During 1981/82, the department signed an agreement with NorthwesTel covering the communities of Rae and Lac La Marte.

Regulatory affairs

The regulatory system governing communications, including the legislation on which it is based, must take into consideration cultural, social, economic and technological changes, as well as the interests of consumers and the general public, and the need for the industry to be commercially viable.

The department provides policy advice on regulatory matters which fall directly within the minister's purview, or which may have an impact on communications policy. This advice is based on independent analysis of the issues arising in regulatory forums.

Regulatory reform received particular attention following the publication in June 1981 of the Economic Council of Canada's report, Reforming Regulation. Specific initiatives included an evaluation of the regulatory principles and guidelines relating to the CRTC's treatment of subsidiaries and affiliates in the regulatory rate base.

The U.S. and provincial regulatory situation was also monitored from the viewpoint of regulatory policy, with particular emphasis on automatic rate indexing, usage sensitive pricing, net asset rate base regulation, depreciation and capital recovery.

Technological change continues to reduce traditional distinctions between broadcasters, telecommunication carriers, cable companies, print publishers and data processing companies, necessitating a re-examination of the rationale for regulation of all these sectors, but particularly cable television, which has features of both broadcaster and carrier.

New opportunities for growth in the cable industry will come from expanded channel capacity and the offering of new services, raising a number of questions:

- Should the principle of pricing separate bundles of services (tiers) be extended beyond the present experimental non-programming services?
- What should constitute the basic service?
- What role should the regulator play in defining and pricing tiers?

The CRTC is to hold a public hearing on these questions, which have a continuing interest for the department.

In January 1982, the CRTC held a public hearing on religious broadcasting. In light of the implications for broadcasting policy and the high level of public interest shown, the department carried out detailed analyses of the issues and submissions made to the CRTC.

Three regulatory studies are planned as part of the direct broadcasting satellite studies program. These deal with the regulatory implications of a direct broadcasting satellite system, options for institutional arrangements and legal aspects of direct satellite broadcasting.

Phase three of the CRTC's telecommunications cost inquiry was announced in December 1981, raising many important financial and regulatory issues. Its significance is enhanced by its interaction with the TCTS rate applications and the terminal attachment proceedings. The department is following the inquiry closely.

Extension of service

In April 1981, the CRTC approved a network licence for Canadian Satellite Communications Inc. (Cancom) for distribution of a balanced mix of signals originating from all regions of Canada. The satellite network offers a choice of programming in English, French and native languages. It carries four television channels and eight radio stations via the Anik system.

In May, the department set up a program of information and technical advice to assist groups in isolated and rural communities wishing to apply for licences to distribute Cancom signals in their locality. By March 1982, the CRTC had licensed Cancom affiliates in more than 300 communities.

Communities licensed for Cancom by province or territory as of March 31, 1982

Northwest Territories	7
Yukon	6
British Columbia	70
Alberta	3
Saskatchewan	59
Manitoba	102
Ontario	12
Quebec	7
Prince Edward Island	15
Nova Scotia	22
Newfoundland	1
TOTAL	304

Work was begun on preparation of a handbook intended for wide dissemination in rural and remote communities as a basic how-to manual. Its purpose is to explain in simple language the various possibilities for community distribution of radio and TV signals carried by Canadian satellites as well as methods of financing such distribution. Licensing requirements are to be outlined and guidance provided on where to find further advice and assistance.

To mark 1981 as the International Year of Disabled Persons, the department published a document entitled Federal-Provincial Initiatives: Communications and Disabled Persons, on the occasion of the federal-provincial conference of ministers of communications in September. This background paper reviewed the action taken by the Minister of Communications in seeking support from the provinces so as to respond to recommendations of the House of Commons Special Committee on the Disabled and the Handicapped involving areas of shared federal-provincial jurisdiction such as radio reading services, reduced telephone rates and provision of special telephone equipment at no extra charge.

In January 1982, the minister announced a new $175,000 program to be launched by the National Library to provide information and advice to libraries across the country to benefit some 300,000 visually and print-handicapped Canadians. This service includes information on special materials for the print-handicapped and on new aids to help disabled readers.

The government approved funding of $350,000 spread over three years to cover initial administrative and development costs for a facility to provide closed captions for

Canadian television programs. Closed captioning enables hearing-impaired viewers to see the spoken portion of a TV program in written form as captions or subtitles on the screen of a suitably equipped television set.

At the initiative of the department, a Canadian Captioning Development Agency (CCDA) was established as a non-profit, non-government corporation to function on a self-supporting basis with captioning centres in Montreal and Toronto to serve more than one million Canadian hearing-impaired viewers in both official languages. The CCDA is expected to become fully operational in 1983, captioning television programs for the CBC and CTV networks as well as other Canadian broadcasters. The agency plans to develop a Canadian captioning system based on Telidon which will be superior to the existing U.S. Line 21 technology but compatible with it.

A study of the telecommunications needs of the blind and print-handicapped was completed and is scheduled for public release in the summer of 1982, with the text to be available in Braille and on audio cassette.

The successful Anik B pilot projects carried out by the Inuit Tapirisat of Canada and Taqramiut Nipingat Inc. to produce Inuktitut television programs and distribute them via satellite to Inuit communities came to an end in May 1981. At that time, the government approved interim funding of $3.9 million over two years to the new Inuit broadcasting system in order to sustain Inuit production and broadcasting activities until more permanent arrangements can be made.

During the year, the department undertook a review of northern native broadcasting with the aim of developing a comprehensive northern broadcasting policy to respond to the growing need for television and radio programming in all northern native languages as a cultural counterbalance to the rapidly increasing availability via satellite of southern-oriented programs. Basic information was summarized in a background paper circulated to native organizations throughout northern Canada as the starting point in a process of formal consultation.

Broadcasting policy

New technologies such as satellite broadcasting, interactive cable systems and videotex are forcing a reassessment of the Canadian broadcasting system and of the institutions which comprise it. Rapid evolution of the domestic and international broadcasting environments

makes long-range planning imperative if the Canadian broadcasting system is to achieve the objectives of the Broadcasting Act. It is for this reason that the minister announced as a departmental priority the development of a comprehensive broadcasting strategy.

The main activities in this area in 1981/82 were:

- the development of options to encourage the production and exhibition of internationally competitive, domestically produced programming;
- development of a policy framework for the application of satellites for broadcasting, identifying difficulties with the current statutory and regulatory framework, and analysing the impact of satellites on all sectors of the broadcasting industry;
- examination of the role and financing of the CBC; and
- examination of a number of international developments affecting radio and television broadcasting, especially major changes in the U.S. regulatory framework, the spillover of new U.S. satellite television services into Canada and the controversy surrounding the 1976 amendment of Section 19.1 of the Canadian Income Tax Act.

Two broadcasting studies carried out for the department were released to the public during 1981/82. These dealt with multilingual programming in Canadian broadcasting and the opportunity for expansion of children's television production in Canada.

The introduction of pay television in Canada has been under consideration by the government and the CRTC for 10 years. The principles of policy to which the government subscribes were set forth by the minister in October 1980:

- Canadian pay TV must contribute positively and significantly to broadcasting in Canada;
- it must include the use of Canadian resources; and
- it must stimulate the Canadian program production industry.

In September and October 1981, the CRTC held a public hearing on the introduction and licensing of pay television in Canada, and considered 28 applications. The result was

a decision by the CRTC in March 1982 to issue six licences for the provision of pay TV services in both official languages. The licences are for a five-year period.

A number of submissions were subsequently received by the Governor in Council from interested parties supporting the decision or asking that it be referred back to the commission. These were under review at year-end.

New services and social policy

The department is monitoring and evaluating the impact of new information technologies such as videotex, and new communications services such as cable-satellite networks, particularly as they relate to people's needs (for example, for community information) or to their rights (such as the right of access or the right of privacy).

Among the areas receiving special attention during 1981/82 were:

- social implications of videotex in Canada, particularly within the context of Telidon field trials;
- implications for cultural sovereignty and economic development of transborder data flows and public on-line information services;
- provision of cable-delivered entertainment and non-programming consumer services;
- institutional impact of emerging technology on the broadcasting industry; and
- human and social impacts of office automation, especially in terms of the Office Communications Systems Program.

Economic studies

Government communications policies are in need of continuous reassessment in light of the rapid changes, particularly in technology, which characterize the communications/information sector. Economic considerations play a major role in this process. In April 1981, the department published a report outlining policies to help Canada meet the challenges of what has come to be called the information revolution. The report

examines the emergence of an information economy, recent relevant technological advances and policy concerns, and the related Canadian and foreign experience. It concludes by laying the groundwork for policy development to turn the information revolution to Canada's advantage. Copies of The Information Revolution and its Implications for Canada may be purchased from the Department of Supply and Services.

A major study was completed during the year as part of the department's efforts to develop a policy framework for the economic development of the Canadian communications/ information sector. Prepared by Price Waterhouse, it assesses the key characteristics of the communications/ information sector and the major trends likely to affect its growth and its contribution to economic development in the 1980s.

Another study, commissioned by the department and the Ontario government, explored the concept of a communications centre in Toronto catering to all aspects of production, distribution and programming.

Canada is the sole industrialized country which has not adopted some form of measured service for local telephone networks. What we have at present is essentially a flat rate system; under measured service, rates would be based on a combination of factors. The department therefore conducted a study on universal measured telephone service to assess the desirability of a pilot trial.

The department also studied the broad area of telecommunications rates and rates of return. A synthesis of financial and economic analyses made it possible to look into the conflict between the constraint of a fair rate of return given existing risk considerations, and the requirement for rates which are just and reasonable.

Other economic studies focussed on:

- the supply of computer communications equipment in Canada, this report is a companion to the publication entitled Supply of Communications Equipment released in March 81;
- the marketing strategies of telecommunications equipment manufacturers on the world scene;
- the growth potential of the program production industry; and
- opportunities in the U.S. market for Canadian-produced programming.

The department provided leadership to the Interdepartmental Task Force on Transborder Data Flows. In addition to providing the task force chairman and secretariat, it provided the chairmen of the working groups on the economic and sovereignty aspects of transborder data flows, and carried out several of the projects undertaken by these two working groups. It also took the lead role in an OECD study of the applications of teleprocessing in countries in various stages of economic development.

A series of public seminars on communications/information issues and a monthly communications economics newsbrief were initiated in 1981/82. Finally, the two-volume proceedings of the March 1981 conference sponsored by the department on Telecommunications in Canada: An Economic Analysis of the Industry was published jointly by the University of Victoria and l'École des hautes études commerciales.

Telecommunications statistics

The department organizes and disseminates national statistics on telecommunications. Specific activities in 1981/82 included:

- collection, organization and production of statistics on radio, television and cable TV, and on the telecommunications carriers;
- production of a yearly report covering 13 major telephone companies, Telesat Canada, Teleglobe Canada and CNCP Telecommunications, entitled Financial Statistics on Canadian Telecommunications Common Carriers 1980;
- collection and organization of a limited amount of data covering the general areas of computer communications, office of the future, and other new informatics services; and
- survey work with regard to the supply and demand for telecommunications, broadcasting and information equipment in Canada, followed by organization and tabulation of the data and preliminary analysis of the findings and trends.

Managing the Radio Frequency Spectrum

6

Under the Radio Act, the Department of Communications is responsible for managing the radio frequency spectrum, the electronic highway which carries broadcast and point-to-point radio communications including satellite signals. The department licences and regulates the use of mobile systems, amateur stations, CB radio stations and microwave stations; develops standards for telecommunications equipment; tests and approves radio apparatus for use in Canada; certifies types of customer-owned equipment for attachment to the networks of the federally regulated telecommunications carriers; establishes operating procedures; conducts examinations for radio operators; and issues technical and operating certificates for broadcasting stations.

Licensing

The department licences radio stations to ensure a conflict-free use of the limited natural resource of the radio frequency spectrum by all Canadian users. This function is accomplished based on prescribed requirements, using the most cost beneficial approach, while maintaining a high quality and level of service. Due to technical differences, the use of the radio spectrum is segmented into two parts.

The first part corresponds to business, safety/emergency and experimental communications. By its nature, it generates economic/service activity. As an interference-free spectrum is a must for such activities, it requires an extensive level of co-ordination of frequencies. During the year, in spite of the restrained economy, the number of licences in this category increased by 8.1 per cent to achieve an all time high of 551,125. This trend is expected to continue.

The second group corresponds to personal communications by the public and is identified with the General Radio Service. The number of these licences fluctuates. Compared to last year this number has decreased by 15 per cent to 578,176 licences. As a result of the automation of the general radio service licensing system, this service requires a minimum of administration by the department.

In accordance with international radio regulations, the department notified the International Frequency Registration Board of 4,697 terrestrial frequency assignments and 76 assignments for earth or space stations.

The department also studied 8,748 frequency proposals from foreign countries, mainly the United States, to ensure that the proposed stations would not interfere with Canadian stations, existing or planned, and co-ordinated a total of 7,992 frequencies with foreign agencies.

In addition, the department investigated 133 inter-station interference complaints during the year involving Canadian and foreign radio stations.

Radio regulation

Regulations, rules, procedures and standards issued by the department provide a framework for ensuring the orderly use of the radio frequency spectrum. Through a process established some 14 years ago, the department drafts proposed regulations and other documents following consultation with the communications industry, then announces them in the Canada Gazette, and invites public comment within a specified period, usually 90 days. All comments received before the deadline are taken into consideration before regulations are finalized and implemented. In the development and revision of rules and procedures affecting broadcasting stations, the department is aided by a permanent technical advisory committee comprising representatives of the broadcasting and cable industries, manufacturers and the CBC and CRTC. In the case of cable TV systems, TV receivers and interface equipment for various cable services, the technical standards and regulations are reviewed with technical committees of the manufacturing and cable TV industries.

Various changes were made to the General Radio Regulations in 1981/82. Among these were amendments to:

- authorize the use of additional frequencies in the 49 MHz band;
- permit continuous tuning and relax local oscillator leakage restrictions on cable compatible TV receivers;
- exempt from licensing a broader range of radio apparatus; and
- prescribe revised fees to be paid by licensees.

In addition, comments were invited on proposed changes to the General Radio Regulations affecting the amateur service.

Enforcement

During the year, the main thrust of enforcement activities was the education of those radio users who were violating the regulations. Typical infringements are unlicensed operation, using the wrong power or frequency, unauthorized modification of equipment and improper procedures. Education took the form of issuing press releases, advertisements, seminars and meetings with various groups, personal visits, summer student projects and direct mailings. Of special note was the conclusion of a project aimed at the Maritime Mobile Service. This project employed all of the above education techniques and has resulted in increased compliance with licensing and operating procedures.

During 1981/82, 205 infringement reports were issued to foreign countries to protect Canadian radio frequency assignments. During the same period, 34,872 investigations were carried out indicating an increase of 17.5 per cent over to the previous year.

Broadcasting regulation

Certification of the technical and engineering aspects of all broadcast and cable TV systems in Canada is a departmental responsibility. Such certification is a prerequisite for licensing by the Canadian Radio-television and Telecommunications Commission (CRTC). The department also regulates the technical operation of broadcast and cable TV systems after they have been licensed by the CRTC.

The department processed a total of 2,062 broadcasting applications in 1981/82 — 51 for AM radio, 125 for FM, 277 for television and 1,052 for cable TV. The number of TV and cable TV applications was considerably higher than in 1980/81 because of proposals to distribute the Cancom package of satellite TV signals, which is expected to bring to hundreds of small communities a range of programming previously available only in larger urban centres.

Revised TV and FM allotment plans for Canada was published during the year. These were developed in co-ordination with the CBC, CRTC and the broadcasting industry.

Among the regulations, guidelines and procedures issued during the year were the following:

- Broadcast Procedure 23, Issue 2, which outlines technical standards, operational requirements and test procedures for cable television and updates the previous issue originally published in 1971;

- two other Broadcast Procedures, one on the establishment of low power FM stations and the second on the assignment of call signs;

- two Telecommunications Regulation Circulars outlining technical requirements for radio apparatus such as descramblers and captioning adaptors, and for interface devices for TV sets such as video games and videodisc players.

The department continues to work with the governments of other countries on revisions to many bilateral and multilateral agreements. Foremost among these are the new Canada/U.S. agreements on AM, FM and TV broadcasting.

Spectrum Management System

At a time when the volume of radio licence transactions is high and spectrum congestion is increasing, the department is upgrading and expanding its use of automated tools for radio frequency licensing in order to meet the growing public demand for radio frequencies. The computer-based Spectrum Management System provides on-line support to departmental field offices in determining the potential for interference to new frequency assignments in the land mobile bands. In addition, the system stores information on all the existing radio systems in Canada except for the General Radio Service, prints licences and carries out the accounting functions for revenue collection associated with radio licence fees.

The Spectrum Management System has received worldwide recognition and has been reviewed by delegations from Australia, Papua New Guinea, Brazil, Saudi Arabia, Denmark and the Federal Republic of Germany.

The department has also mounted a major new effort to use microcomputers to assist with the technical and administrative tasks of spectrum management and to develop computer literacy among its employees at all levels.

Engineering laboratory

The department maintains a technical laboratory in Ottawa in support of its spectrum management activities. The laboratory develops methods for testing equipment, calibrates and overhauls equipment used for testing, and carries out testing for equipment type approval and the Terminal Attachment Program.

A total of 642 models of radio equipment received type approvals during the year, signifying that they met standards established under the Radio Act. Audits were carried out on 60 current production units to ensure that approved equipment continued to meet standards.

Terminal Attachment Program

Under the Terminal Attachment Program, in co-operation with federally-regulated telecommunications carriers, provincial representatives, user groups and industry, the department continued to develop standards for the connection of customer-provided terminal equipment to the networks of federally-regulated carriers. During the year, the department tested 162 types of equipment for certification, and performed post audits on 8 units selected at random to ensure that current production continues to comply with certification standards. A revised certification procedure for terminal equipment, including network addressing equipment, was published in October 1981. The fees for technical assessment and certification of terminal equipment were also revised.

Consumer electronic equipment immunity

In response to complaints from the public, the department has been working with Canadian industry for several years to find ways of reducing the malfunctioning of TVs, stereos and other electronic equipment in the presence of strong radio signals. As part of this continuing effort, the department provides the chairman of the Canadian Standards Association steering committee on electromagnetic compatibility. During the year, this group issued several new standards specifying methods of measuring radio noise and setting limits of tolerable interference.

To support the development of immunity testing methodology, the department funded a contract for the statistical characterization of the Canadian urban electromagnetic environment and constructed a shielded, absorber-lined chamber for use in immunity testing.

The department also provided technical contributions to the meeting of the International Special Committee on Radio Interference regarding international solutions to the immunity problem, and hosted the committee's annual meetings, held in Toronto in September 1981.

General Radio Service

During 1981/82, the department continued its studies towards the development of a new personal radio service at 900 MHz. Efforts were devoted to reaching an agreement with the Federal Communications Commission of the United States and the European Conference of Postal and Telecommunications Administrations on the specific band to be used for the new service. While some progress has been made, further negotiations are required.

International spectrum management

In pursuit of the department's objective of promoting Canada's expertise in telecommunications at home and abroad, marketing opportunities in the area of spectrum management were followed up with Mexico, Brazil, Hong Kong, Australia, Saudi Arabia and France. Negotiations are now underway for the transfer of Canadian spectrum management technology to Saudi Arabia.

Government Telecommunications

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The federal government is the largest user of telecommunications in Canada. Telecommunications expenditures by federal departments and agencies exceed $400 million annually.

The Government Telecommunications Agency (GTA) is a common service organization which plans, establishes and manages cost-effective telecommunications services and facilities for government departments and agencies.

Services to departments

The agency operates on a cost-recovery basis, providing government-wide shared voice and data telecommunications services. Over 80 departments and agencies take advantage of the savings realized from bulk-leasing from telecommunications carriers and from the centralized management of GTA.

Six major services are available through GTA: local shared voice services, the shared intercity voice network, shared data communications, customized services, consulting services and directory services.

The agency manages 24 consolidations or local networks in Canada and provides circuits to locations in the United States. In 1981/82, new consolidations were established at Sudbury and Kingston, Ontario and at Abbotsford, British Columbia. Automatic call detail recording systems were implemented in Sherbrooke, Quebec City, Montreal, Hamilton, London and North York (Toronto), as well as in the three new consolidations.

Circuit mileage on the intercity network increased by 4.5 per cent to 1,812 million circuit km. Wide Area Telephone Service (WATS) lines increased by 55.5 per cent to 1,365 circuits. This growth was primarily the result of conversion to WATS from more costly methods of communication and meant substantial savings for the government. The intercity network handled an average of 122,150 calls per working day.

GTA manages one major shared data service, the Government Data Network, which is a low speed store and forward message service carrying mainly teletype traffic.

The agency also offers a shared teleconferencing service which is seeing increased use as departments substitute teleconferencing for face-to-face meetings requiring travel. With a view to enhancing this service, GTA studied technological developments in both audio and video conferencing as well as in equipment, and in January 1982 put forward a proposal for a teleconferencing service trial.

Both the voice and the data transmission facilities are being upgraded to accommodate the demand for increased speed, capacity and flexibility resulting from the growth of communications traffic and the development of new requirements related to office automation.

Long-range planning

While departments have primary responsibility for determining and meeting their telecommunications needs, GTA is responsible for developing the long-range plannning framework for government telecommunications as a whole, based on an analysis of existing systems and departmental plans.

During the year, GTA formulated long-range plans in the following areas:

- evolution of intercity and local services based on digital multiplexing;
- office communications, with current emphasis on electronic messaging;
- roof-top to roof-top satellite communications;
- teleconferencing;
- application of open systems interconnection to a universal government communications network; and
- development of an integrated services digital network.

In support of its planning and co-ordination responsibilities, GTA is investigating the feasibility of developing an automated inventory of telecommunications applications in the government. During the year, the agency contracted a consulting firm to advise on the type of information needed by GTA and by departments to properly plan and control telecommunications resources.

Both the long-range planning framework and the systems inventory are described in more detail in the Annual Review of Telecommunications in the Government of Canada 1980/81.

Administrative policy

GTA supports and promotes the use of the most cost-effective telecommunications services in the federal government by developing and recommending policies, directives and guidelines. Through Circular Letters it issues, GTA assists departments in the efficient and effective management of their telecommunications resources.

During the year, GTA developed administrative practices for Government of Canada listings in public directories, bilingual telephone services and methods of controlling spending on long distance telephone calls. These were published as a new chapter in the Treasury Board's Administrative Policy Manual.

Office communications

Organizations in the federal government are showing increasing interest in automating their business communications. Several major departments have established task forces to study requirements for and benefits of office automation in their organizations and a good number of feasibility studies and pilot tests of new electronic communication systems are in progress or planned. These include tests of communicating word processor links, other forms of electronic mail, and local area networks.

To assist departments with this new technology, GTA has developed principles for conducting pilot tests and identified many of the opportunities and problems related to office automation. These are described in the Annual Review of Telecommunications in the Government of Canada. GTA is now formulating long-range plans in the area of office communications applications and network services, with the emphasis on electronic messaging and digital transmission. During the year, GTA conducted a survey of departments to identify their needs for text communications. The agency has subsequently been evaluating office communications technology and new services planned by the carriers as a prelude to the development of shared services for integrated electronic office communications in the federal government. In this context, GTA is managing a pilot trial of communicating word processors linking the department's five regional offices and headquarters.

Evaluation of satellite communications

Another area of increasing interest is the use of satellites for government telecommunications. To evaluate the potential, GTA is participating in two Anik B field trials, in co-operation with telecommunications common carriers.

The first of these is a joint undertaking of the department and CNCP Telecommunications, announced in June 1981 and designed to test the feasibility of using 14/12 gigahertz (GHz) voice-grade services for roof-top to roof-top transmission between government office buildings.

The second satellite field trial, this one with the TransCanada Telephone System (TCTS), was announced in December 1981. Using 6/4 GHz capacity on Anik B, the trial will evaluate the potential for government communications of the Integrated Satellite Business Network to be established by TCTS in 1983. This network will provide broadband satellite transmission facilities.

GTA is also studying the feasibility of using the proposed mobile satellite (MSAT) system to handle high volume government business traffic, and of interconnecting the MSAT network with the government intercity network.

Service to the public

In co-operation with the Task Force on Service to the Public, GTA is working to improve federal listings in public telephone directories, and to improve telephone referral services. GTA also offers technical consulting services to federal departments and agencies to assist them in implementing service to the public initiatives. For example, GTA assisted Revenue Canada Taxation in assessing the feasibility of converting from ZENITH service to INWATS. The study found that significant savings could be realized with only minor changes to current operating procedures, while maintaining the same level of service to the public.

Access to government services is also being improved through use of Telidon. Scores of unmanned Telidon terminals went into service in October 1981 in walk-in centres across the country to provide free public access to information on federal programs and services. Cantel, the Government of Canada data base developed for this project, contains some 50,000 pages of information in both official languages and is the largest government videotex data base in the world.

Federal-Provincial Relations

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In order to advance the federal government's policies and programs with respect to communications and to ensure consideration of provincial interests, the department continued to consult with provincial governments on key policy and program issues and carried out a variety of co-operative projects.

Communications ministers' meeting

On September 9 and 10, 1981, a federal-provincial conference of communications ministers was held, with discussions focussing on the importance of the communications sector to Canada's industrial development. The ministers reviewed a variety of matters including:

- satellite technology;
- extension of radio and TV services;
- broadcasting strategy;
- earth station licensing;
- CRTC Decision 81-13 dealing with the revenue settlement procedures of the TransCanada Telephone System (TCTS) and their rates for satellite services; and
- microwave licensing policy.

Working group reports were tabled on delegation to the provinces of regulatory authority over cable television, industrial impacts of communications policies, and competition and industry structure; these reports were then made public. The ministers directed officials to prepare reports for their next meeting on mechanisms for considering regulatory issues affecting more than one province and on the harmonization of interests respecting pay television. They also agreed that a greater emphasis is required in responding to the challenges of providing communications services to the disabled in Canada.

Co-operative ventures

Among the diverse co-operative ventures undertaken with the provinces are bilateral Anik B satellite pilot projects; new Telidon applications; and government-industry initiatives such as the Elie-St. Eustache fibre optics trials in Manitoba.

Consultative committees

The Atlantic Consultative Committee on Communications provides an ongoing forum for federal-provincial consultation and co-operation on matters of mutual interest to these provinces and the federal government.

The committee met four times in 1981/82. The main topics discussed were rural communications, mobile communications, direct broadcasting satellite services, extension of service, pay TV, microwave licensing policy and cellular mobile radio policy.

During the year, federal-provincial consultative committees were established in the Prairies and British Columbia, modelled after the Atlantic committee. These committees bring provincial representatives together with regional and headquarters officials from the department and the CRTC to exchange information and discuss such issues as regulatory activities and high-technology development.

Culture and historical resources

The steering committee of deputy ministers responsible for culture and historical resources met twice during the past year, in June 1981 in Quebec City and in January 1982 in Ottawa.

The committee continued its research on issues identified by ministers in September 1980, and examined other topics of concern arising out of the present cultural context. These included the Book Publishing Program, the Capital Cost Allowance Program, the Special Program of Cultural Initiatives, revision to the Public Archives Act, bibliographic networking, international cultural relations, fiscal incentives and the indemnification of large exhibitions. Work will continue on the latter two items in the next year. The committee also began work on the Canadian participation at the UNESCO World Conference on Cultural Policies scheduled for July 1982.

International Relations

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The provision of effective worldwide communications systems and services requires a high degree of continuing co-operation among members of the world community.

Through the Department of Communications, Canada participates in the work of some 20 international organizations concerned with the orderly development and use of worldwide telecommunications, with the promotion of technological co-operation and with improving world-wide agreements on administrative and technical regulations related to telecommunications services including radio spectrum management. Canada participates in numerous multilateral and bilateral meetings and negotiations and takes such action as may be necessary to secure by international agreements and regulations the rights of Canada in communications matters. There are also visits by Canadians to other countries and by foreign officials to Canada to discuss telecommunications matters of mutual concern.

International Telecommunication Union

International telecommunications are co-ordinated and regulated by the International Telecommunication Union (ITU), a United Nations specialized agency. During 1981/82, Canada continued to hold a seat as one of the 36 members of the ITU Administrative Council, which directs the affairs of the union in the periods between plenipotentiary conferences. The council met in Geneva for three weeks in June 1981, in its 36th session. Principal issues considered were the enhanced computer capabilities of the International Frequency Registration Board (IFRB), the program of future ITU conferences and meetings, the future of technical co-operation activities, and budgetary and personnel matters.

In the autumn of 1982, the ITU will hold a plenipotentiary conference in Nairobi, Kenya, the first since 1973 (Malaga-Torremolinos). The objective of this conference is to revise the convention which governs the administrative operations of the ITU. In Canada, an interdepartmental committee was active during 1981/82, drafting the proposals which Canada will make to the conference. Canada hopes that developed and developing countries will be able to agree on changes which will allow the ITU to keep pace with technological advances and maintain its effectiveness.

In November 1981, the United Nations proclaimed 1983 as World Communications Year and named the ITU as the lead agency. The theme is to be the Development of Communication Infrastructures. In Canada, a national steering committee chaired by the Department of Communications has been established with representation from public and private sectors to develop the Canadian program.

World Administrative Radio Conferences

The ITU has scheduled four World Administrative Radio Conferences to take place during the 1980s. These deal with mobile telecommunications, particularly distress and safety; high frequency (shortwave) broadcasting; space services; and general mobile services. A number of Regional Administrative Radio Conferences are also planned. Of these, two are of concern to Canada: one on direct broadcast satellites for the western hemisphere and the other on AM broadcasting. These conferences establish regulations governing international telecommunications.

In preparation, the Canadian government has formed inter-departmental committees chaired by representatives of the Department of Communications to develop conference proposals and positions that will meet future Canadian telecommunications needs. Consultation with industry is an important feature of the process. A government/ industry working group takes part in the development of proposals and positions on foreign proposals, and meetings for the general public are held when interest warrants, to provide the opportunity for direct input by all Canadians.

Mobile services

During the year, Canada prepared proposals to be submitted to the ITU World Administrative Radio Conference for mobile services, to be held in February 1983. The major task of this conference is to establish the regulatory environment for a single worldwide co-ordinated maritime distress and safety system. This system is expected to benefit all users of the maritime mobile radio service by improving the effectiveness of distress alerting and providing channels for distress and safety communications.

The Canadian proposals are based on three draft editions made available to the public for comment in the course of the past three years through announcements in the Canada Gazette. The final proposals take account of the comments received.

The Canadian submission will propose a complement of medium and high frequency (MF and HF) channels to provide for most of the distress and safety communications requirements identified by the International Maritime Organization. These include a very high frequency (VHF) channel for ship-to-ship communications for safety of navigation, an MF channel for the broadcasting of navigational and meteorological warnings to ships, and a number of HF channels for distress alerting and distress communications.

Planning conference for shortwave broadcasting

The World Administrative Radio Conference for planning the high frequency bands allocated to the broadcasting service is of great importance to Canada, particularly to Radio Canada International (RCI) which broadcasts in 11 languages to Eastern and Western Europe, North and South America, and Africa. Currently, the shortwave bands are very congested and RCI faces increasing costs just to maintain the existing service. Canada therefore considers it very important to undertake detailed planning of these bands and to introduce new regulations which will allow more economical and efficient broadcasting.

Canada is now preparing for the first session of the conference, to be held in January 1984. At this session, the technical parameters for shortwave broadcasting systems will be established, along with the principles governing the use of the bands. The second session, to be held in November 1986, will develop the worldwide broadcasting plan. Canada is pressing for free and equitable use of the shortwave broadcasting bands and is recommending that planning be based on broadcasting requirements, rather than on the basis of frequency assignment suggestions. This would be accomplished through a detailed computer program initiated and proposed by Canada which will be further developed at the conference. The ITU would use the program in selecting the frequency band, assessing reliability, undertaking compatibility studies, and selecting the optimum power and antenna configuration to be used by a broadcaster to serve the desired reception area. In view of the sensitive political issues facing this conference, Canada will be trying to find a workable middle ground.

The first draft of the Canadian proposals for this conference will be completed by January 1983 and will be circulated for public comment. Final proposals will be prepared and sent to the ITU in Geneva to meet the deadline of May 1983.

Space conference

Preparations have begun in Canada for the World Administrative Radio Conference on space services which will be convened by the ITU in two sessions in June or September, 1985 and August 1988.

The decision to hold this conference was made at the general World Administrative Radio Conference in 1979 when the developing countries strongly supported a conference "to guarantee in practice for all countries equitable access to the geostationary-satellite orbit and the frequency bands allocated to space services." The developing countries have expressed concern that the current large number of geostationary satellites in use by the developed countries for communications could preclude the availability of orbit positions for developing countries. Under the existing regulatory regime of "first-come, first-served", they say, there would be no orbital locations left in the future to satisfy their needs when their national development progresses to the stage where they need and can afford to establish their own domestic communications satellites.

The department expects to circulate the first draft of the Canadian proposals for this conference for public comment in November 1983.

Regional AM broadcasting conference

A frequency assignment plan for the approximately 9,000 AM broadcasting stations in the Americas was prepared at the final session of the Region 2 (Americas) conference convened by the ITU in Rio de Janeiro in November 1981. The new plan contains all the Canadian AM broadcasting stations currently operating (approximately 400) and allows for establishment of almost 160 new AM broadcasting stations in various locations in Canada.

The key technical standards for the new frequency assignment plan are similar to those contained in the North American Regional Broadcasting Agreement which has served Canada for more than two decades. As a

consequence, Canadian AM broadcasting stations will not be required to make any technical or operational changes to their stations. The conference accepted the Canadian proposal not to switch from the current 10 kHz to 9 kHz channel spacing between AM stations.

The final acts of the conference included a ground conductivity map for the Americas prepared by Canada on the basis of our extensive experience in this type of computer programming and using data supplied by participating countries. The contours shown on the map are useful for determining coverage patterns of radio stations and for predicting interference.

By resolution, the final session initiated preparations for a new regional conference to be convened by the ITU in 1988 that will extend the frequency assignment plan into the new frequency band 1605-1705 kHz which will be available for use by broadcasters late in the 1980s.

A Telecommunication Regulatory Circular is being prepared by the Department of Communications to provide information relating to the assignment of frequencies in this band prior to convening of the conference. A notice was also prepared for inclusion with licence renewals.

Broadcasting satellite service

A Regional Administrative Radio Conference to plan the broadcasting satellite service in the western hemisphere in the 12 GHz band is to be held in Geneva starting in June 1983. At this conference, members of the ITU will develop a plan for direct broadcasting satellites which will give to each country certain satellite orbital locations and frequency assignments for each specified service area. This plan could govern Canada's use of direct broadcasting satellites for the next 20 years.

Canadian preparations for the conference advanced significantly in 1981/82, culminating in the preparation of draft Canadian proposals. The document was scheduled to be released for public comment in April 1982. Final proposals must be sent to the ITU by the end of 1982.

In preparation for this conference, the Canadian government, the ITU and the Inter-American Telecommunications Conference (CITEL) co-sponsored a seminar of experts which took place in Ottawa in May 1981. Subjects discussed included intersystem co-ordination, propagation effects, satellite technology, operational requirements, spectrum availability, and spacecraft and earth station economics.

International consultative committees

The International Telegraph and Telephone Consultative Committee (CCITT) and the International Radio Consultative Committee (CCIR) are permanent organizations of the ITU. The CCIR studies technical and operating questions relating to radio communications while the CCITT studies technical, operating and tariff questions relating to telecommunication services other than the technical or operating questions relating specifically to radio communications. Each committee issues recommendations on matters within its purview, and works through a plenary assembly, generally meeting every four years, which reviews the study group work carried out by experts representing its respective members. Each consultative committee pays due attention to studying questions and formulating recommendations directly connected with the establishment, development and improvement of telecommunications in developing countries.

During the year, the Department of Communications collaborated with other government departments and agencies as well as industrial and scientific organizations to formulate Canadian positions for the final meetings of the 1978-82 study cycle of the CCIR. Immediately following these meetings in the fall of 1981, the department's activities concentrated on the development of Canadian positions on matters to be discussed at the Plenary Assembly which was held in February 1982 in Geneva. This carefully organized preparatory work enabled Canada to take an active part in discussion of such issues as the restructuring of the CCIR study groups, the methodology required for technical preparation for conferences, and the development of recommendations on international standards. Two Canadians, one from the department and the other from the CBC, were elected by the Plenary Assembly as vice-chairmen of two of the study groups.

During the year the department also participated in two special meetings of the CCIR, one to prepare the technical bases for the 1983 mobile services World Administrative Radio Conference, and the other to prepare for the Regional Administrative Radio Conference on broadcast satellites. In both cases, the Canadian delegations were successful in having the respective reports reflect and lay the basis for the future Canadian proposals to the ITU conferences.

In the CCITT, a study period began in 1981 and is to last through 1984. Activity during 1981/82 focussed on the study areas of the integrated services digital network, data communications, switching systems and telematic services (videotex services). At the seventh plenary assembly in 1980 in Geneva, Canada was re-affirmed to chair a major international study group on public data networks. Several Canadians were also appointed special rapporteurs on a number of questions; such international co-ordinators are chosen for their special expertise on specific technical problems, a clear recognition of Canada's high standing in such technical areas. In October 1981, Canada hosted two meetings of special rapporteurs concerning the formal descriptive techniques and message handling system associated with public data networks.

UNESCO

The department was represented on the Canadian delegation to the first two meetings of the Intergovernmental Council of UNESCO's International Programme for the Development of Communication (IPDC). The programme was formally established at the 1980 General Conference of UNESCO in Belgrade, in response to the desire of developing countries for a New World Information and Communications Order. At the Belgrade meeting, Canada was elected to the 35-member Intergovernmental Council. The council's first two meetings (held in Paris in June 1981 and Acapulco in January 1982) determined priorities and criteria for support of projects, and established a system of financing. For 1982, the council approved approximately $900,000 for preparatory assistance, training needs and projects in Asia, Africa, Latin America and the Caribbean, and the Arab regions.

In recognition of the need for concrete action to close the communications gap between developing and industrialized countries, Canada agreed to contribute $250,000 to the programme's special account.

INMARSAT

In November 1981, the department represented Canada at the second Assembly of Parties of the International Maritime Satellite Organization (INMARSAT), the 37-member agency established in 1979 to provide satellite communications links between ships and land-based telecommunications networks. The assembly, which meets every two years, reviewed the organization's progress in preparing for the inauguration of services. INMARSAT became fully operational in February 1982.

Inter-American Telecommunication Conference

In December 1981, Canada's membership in the Inter-American Telecommunications Conference (CITEL), a specialized body of the Organization of American States (OAS), was approved by the General Assembly of the OAS. Canada had participated as an active observer in CITEL since 1971.

In recent years, CITEL has taken increasing responsibility for co-ordinating preparations for International Telecommunication Union (ITU) Administrative Radio Conferences at both the world and regional levels. As CITEL is rapidly becoming the focal point for discussion and co-ordination of telecommunications matters in the weste.n hemisphere, participation in CITEL has been extremely useful in obtaining support for Canadian positions, and some Latin American countries now look to Canada for guidance. Canada's effectiveness will be enhanced by its full member status; for example, Canadian delegates may now be elected chairmen of working groups.

Becoming a full member of CITEL also provides an effective demonstration of the increasing importance Canada places on relations with Latin America, and offers greater opportunities for both bilateral and multilateral co-operation.

Bilateral relations

A large portion of our communications systems operate across the border with the United States. The bilateral communications relationship with the United States is one of the most complex and sophisticated relationships of its type in the world today. To allow officials of both countries to sensitize each other to communications developments in their country and to discuss issues before they become major irritants, periodic informal consultations were initiated in 1980. Arrangements were made during 1981/82 for similar consultations to take place in May 1982 in Washington between senior Canadian and U.S. communications officials.

Considerable bilateral activity took place during the year with other countries that represent potentially important markets for the Canadian telecommunications industry. Three groups from the Federal Republic of Germany toured Canada -- the first to study possible co-operative ventures in the telecommunications sector, the second and third (delegations of federal and provincial parliamentarians) to study the use and implications of new

information and telecommunications technologies and regulatory policies. The France-Canada Joint Commission met in Ottawa, agreeing upon co-operative projects in the areas of radio propagation, office communications, behavioral research, spectrum management and computer communication networks. The Saudi Arabian Minister of Posts, Telegraphs and Telephones made an official visit to Canada, signing a Letter of Understanding for the establishment of a spectrum management system in Saudi Arabia. The Governor of State of Sao Paulo, Brazil, visited Canada during which time he expressed a special interest in Telidon; he was followed a short time later by the editor of one of Brazil's major telecommunications journals who wrote a number of articles on the space industry in Canada. The Israeli Minister of Communications came to Canada to study the status of cable TV in Canada, as did a delegation from the People's Republic of China. The Canada-Algerian Joint Commission met in Ottawa, a meeting which was followed in November by the visit to Algeria of a Canadian technical mission.

International aspects of informatics

Governments throughout the world are uncertain about the full implications of rapid developments in microelectronics technologies, and of the rapid spread of their use to new areas of application. They are aware of the broad range of benefits to be derived from the growing use of these new technologies, but many are concerned about the potential for negative economic, social, legal and political impacts.

Growing international recognition of the importance of these new technologies, and of the need for appropriate public policies to deal with the new challenges and opportunities, is demonstrated by the establishment of a new committee in the Organization for Economic Cooperation and Development (OECD) to deal with information, computer and communications policy. Canada continues to give strong support to OECD work in this area, and the Department of Communications provides the international chairman of the Expert Group on Transborder Data Flow. Other issues covered by the new committee include: impacts on productivity and employment; trade in telecommunications and computing services; changing market structures in the provision of telecommunications services; and vulnerability of the computerized society.

The department also provides a member of the Panel of Experts advising the United Nations Centre on Transnational Corporations in its work on transborder data flow. The three priority projects of the centre cover: remote sensing by satellite; case studies of various countries summarizing their responses to transborder data flow issues; and access by developing countries to the international data market, and the relevance of existing services to their needs.

In this period of rapid change, the department is monitoring developments in other countries, as well as promoting Canadian interests in international bodies active in the area of informatics. The inherent international nature of telecommunications underscores the need for close relations between the development of domestic informatics policies and the evolution of international agreements.

International cultural relations

Although its mandate for international cultural relations has been delegated to the Department of External Affairs, the department continued to participate in bilateral and multilateral international cultural activities.

In 1981/82 the department took part in official meetings of the Canada-France and Canada-Belgium Joint Commissions, as well as in cultural consultations between Canada and the United Kingdom. The purpose of these meetings was to approve a program of cultural exchanges between Canada and these countries for the coming years.

In May 1981, the ministers of culture of member countries of the Council of Europe held a major conference in Luxembourg to which Canada was invited as a distinguished guest. The department briefed the Canadian delegation and was represented on it during the conference. The department also played a lead role in organizing the Canadian delegation to the first conference of ministers of culture of member countries of the Agency for Cultural and Technical Cooperation held at Cotonou, in the People's Republic of Benin, in September 1981. The delegation was led by the Minister of Communications.

Regional Operations

10

Since the department was set up in 1969, a major part of the activities of its five regions (Atlantic, Quebec, Ontario, Central and Pacific) have been devoted to managing the radio frequency spectrum and providing government telecommunications services. Last year, added emphasis was given to representation of those parts of the department concerned with policy, information, research, space and arts and culture.

Staff at the department's 47 district offices and associated spectrum surveillance centres carry out such spectrum management functions as licensing, inspection, monitoring and the administration of exams for radio operator certificates. On behalf of the Ministry of Transport, they also inspect radio installations on board ships and issue certificates of approval.

The implementation of the department's computerized spectrum management system has been completed in all the regions during the year. This system is designed to provide a common nation-wide structure for spectrum licensing and control.

Advice was provided to rural and remote communities wishing to receive the Canadian Satellite Communications (Cancom) package of Canadian satellite radio and television services. Staff in the department's regional and district offices provided applicants with information on licensing, general advice on technical alternatives and guidance in completing the application forms. Regional engineering staff meanwhile were assessing the impact of proposed low-power rebroadcast stations on spectrum congestion. Applicants were counselled to consider cable systems if at all practical as a way of conserving broadcasting spectrum.

All of the five regions ensured a smooth transition for client groups following the 1980 transfer of responsibility for arts and culture to the Department of Communications. Liaison with provincial officials in the cultural field was established, and efforts were made to develop a wide range of contacts with both regional cultural organizations and individual artists.

Regional staff provided technical advice to Anik B users, attended the experimenters' meetings and participated in evaluation of the projects. The Pacific, Central and Ontario regions were actively involved in co-ordinating the Program Delivery Pilot Project and regional engineering staff maintained the television receive-only (TVRO) terminals and offered on-the-spot technical advice.

With the heightened public awareness of new technologies, interest in the field of space communications has increased. Seminars on direct broadcasting by satellite were organized in each of the Atlantic provinces, while in British Columbia the department and the CRTC sponsored a seminar on the installation and use of TVRO terminals.

The department's regional offices played a key role in the Telidon public awareness campaign. Regional staff demonstrated the system at 22 special events, gave some 450 demonstrations in centres across Canada, permitting an estimated 250,000 people to view the technology for the first time. They also met with such groups as private companies, educators and native representatives, to encourage them to become involved with Telidon.

The network of regional and district offices generally provides the focal point for most of the department's direct contact with radio users, suppliers, manufacturers, carriers, broadcasters, universities, the media and the general public.

Regional staff visited most Canadian universities to talk with groups interested in communications studies and to inform them of the department's programs for sponsoring university research. They also held discussions with industry, to brief companies on the department's policies and programs, and encourage them to take on contract research for the department.

In the Atlantic region, the Prairies and British Columbia, consultative committees provide a forum for discussion and the exchange of information between provincial and federal communications officials.

The department's regional offices follow closely the proceedings of hearings and enquiries held by public utility boards relating to broadcasting and telecommunications services, terminal attachment programs, interconnection and service rates. They also analyse the impact of CRTC activities on the socio-economic development of broadcasting and telecommunications in the regions.

During 1981/82, the department's regional emergency telecommunication plan was extensively revised and is now being implemented in detail with planning at the district office level a major feature.

The major formal structure for inter-agency planning and co-operation is the regional emergency telecommunications committee, chaired by the department's regional director. These regional committees are intended to bring together representatives of relevant federal and provincial government departments, law enforcement and emergency agencies and telecommunications carriers. Such a committee was established in New Brunswick and plans were made to establish similar committees in the other three Atlantic provinces, in Ontario, and in the Central region. The Pacific regional committee is already operational.

Appendix I

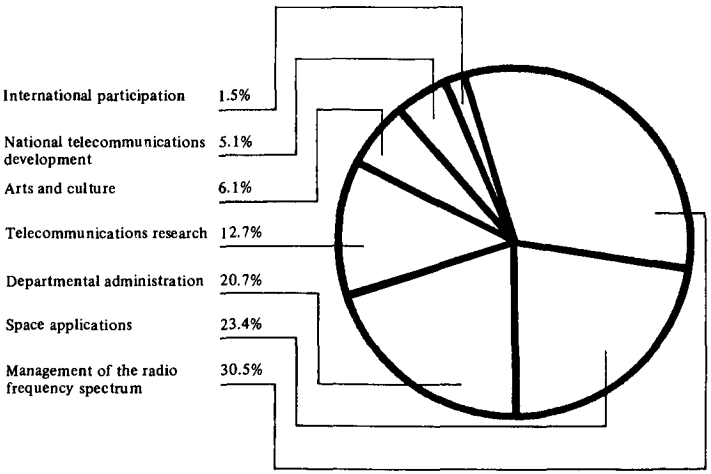
Expenditures by activity 1981/82
(in thousands of dollars)

	Operating	Capital	Grants and contributions	Total
COMMUNICATIONS PROGRAM (excluding the Government Telecommunications Agency)				
Departmental administration	21,364	225		21,589
Telecommunications research	13,137	13,473	6,203	32,813
National telecommunications development	5,223		619	5,842
International participation	1,546		2,157	3,703
Management of the radio frequency spectrum	31,408	1,126	152	32,686
Space applications	24,167	4,416	12,455	41,038
Contributions to employee benefit plans	8,120			8,120
	104,965	19,240	21,586	145,791
Less: receipts and revenues credited to the vote	5,088			5,088
	99,877	19,240	21,586	140,703
Less: receipts credited to revenue	22,779			22,779
Add: accommodation provided without charge by this department	2,792			2,792
accommodation provided without charge by Public Works	4,323			4,323
other services provided without charge by other departments	1,249			1,249
Total cost of program	85,462	19,240	21,586	126,288
ARTS AND CULTURE PROGRAM				
Policy development and analysis	3,851	8		3,859
Special programs	2,389	33	25,420	27,842
Contributions to employee benefit plan	431			431
	6,671	41	25,420	32,132
Less: receipts credited to revenue				
Add: accommodation provided without charge by Public Works	303			303
other services provided without charge by other departments	45			45
program costs associated with publication mailings	189,500			189,500
Total cost of program	196,519	41	25,420	221,980
Grand total	281,981	19,281	47,006	348,268

SOURCE: Public Accounts of Canada, 1981/82

Appendix II

Operating expenditures by activity 1981/82
(excluding the Government Telecommunications Agency)



SOURCE: Department of Communications

Appendix III

Government Telecommunications Agency revolving fund

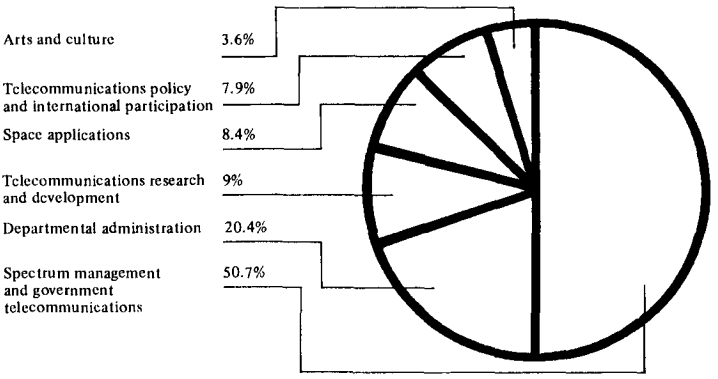
Statement of operations for the year ended March 31, 1982

	1982	1981
	$	$
Revenue		
Telecommunication services	71,177,231	56,583,303
Expenses		
Operating		
Intercity network	40,808,419	33,431,881
Customized services	12,549,167	8,446,914
Operators' salaries	4,337,834	3,175,884
Government data network	4,271,760	3,849,161
Local shared services	1,162,730	1,067,587
Interest charges	484,260	361,230
Directory services	405,329	330,969
Other network services	200,541	145,944
Leased space	114,946	122,252
Government facsimile network	74,400	66,289
Other	3,697	20,195
	64,413,083	51,018,306
Engineering support		
Salaries and employee benefits	3,515,658	2,531,310
Rental building and equipment	138,313	112,776
Travel and removal	99,485	88,611
Professional services	53,606	114,067
Telephone and freight	16,715	32,061
Office materials and supplies	15,379	9,562
Other	4,929	3,618
	3,844,085	2,892,005
Administration		
Salaries and employee benefits	1,924,268	2,100,403
Rental building and equipment	257,004	207,878
Professional services	250,756	126,259
Telephone and freight	154,416	117,850
Travel and removal	77,226	65,460
Depreciation	57,892	25,954
Office materials and supplies	48,479	35,087
Other	37,905	28,284
Loss on disposal of fixed assets	483	2,017
	2,808,429	2,709,192
	71,065,597	56,619,503
Net (profit) loss before extraordinary item	(111,634)	36,200
Extraordinary item–Approved settlement of terminated contract	1,485,822	
Net loss after extraordinary item	1,374,188	36,200

SOURCE: Public Accounts of Canada, 1981/82

Appendix IV

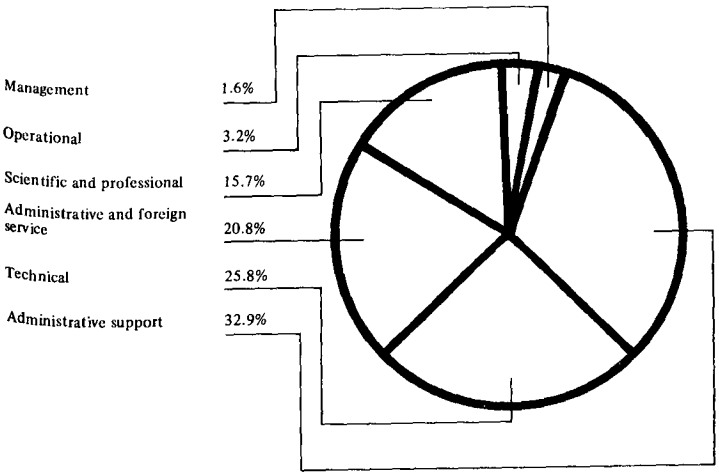
Departmental employees by activity 1981/82



SOURCE: Department of Communications

Appendix V

Departmental employees by employment category

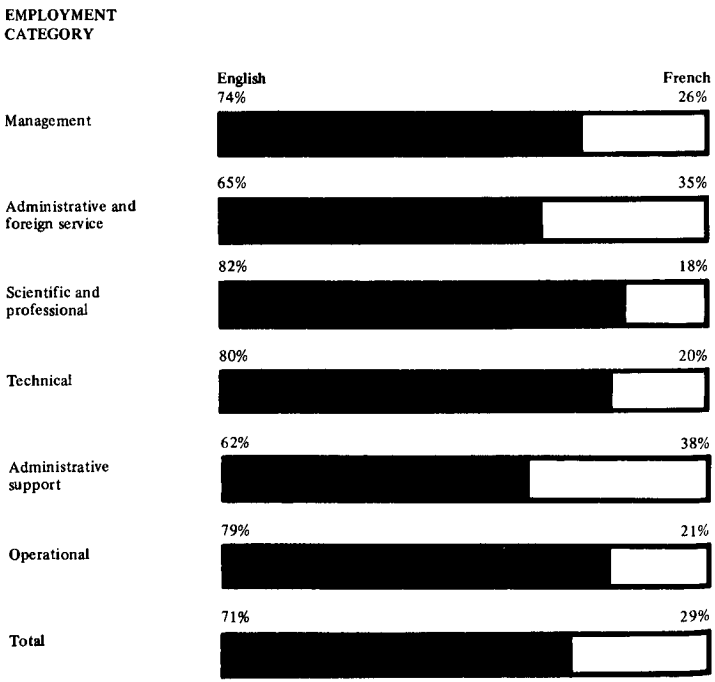


NOTE: Includes indeterminate as well as specified period employees as of March 31, 1982.

SOURCE: Department of Communications

Appendix VI

Department employees by employment category and first official language

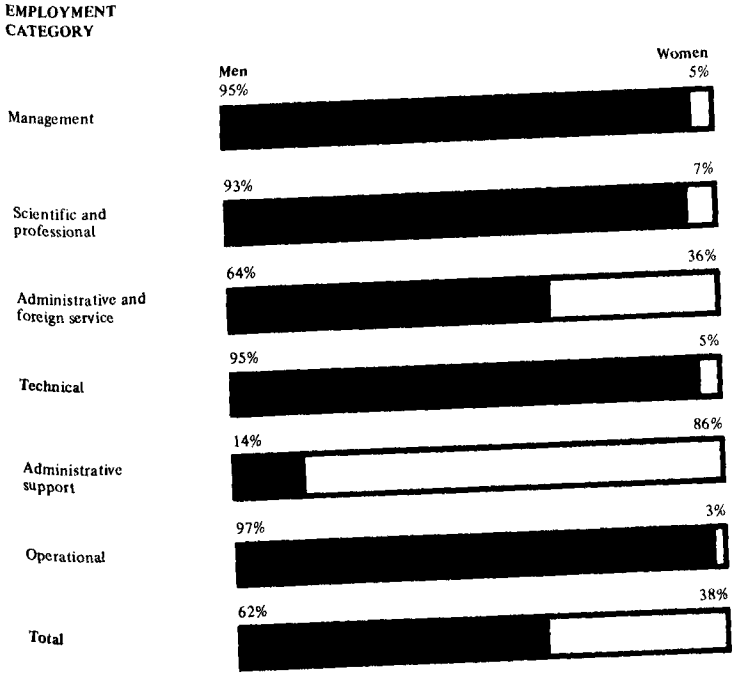


NOTE: Includes indeterminate and specified period employees as of March 31, 1982.

SOURCE: Department of Communications

Appendix VII

Departmental employees by employment category and sex



NOTE: Includes indeterminate and specified period employees as of March 31, 1982.

SOURCE: Department of Communications

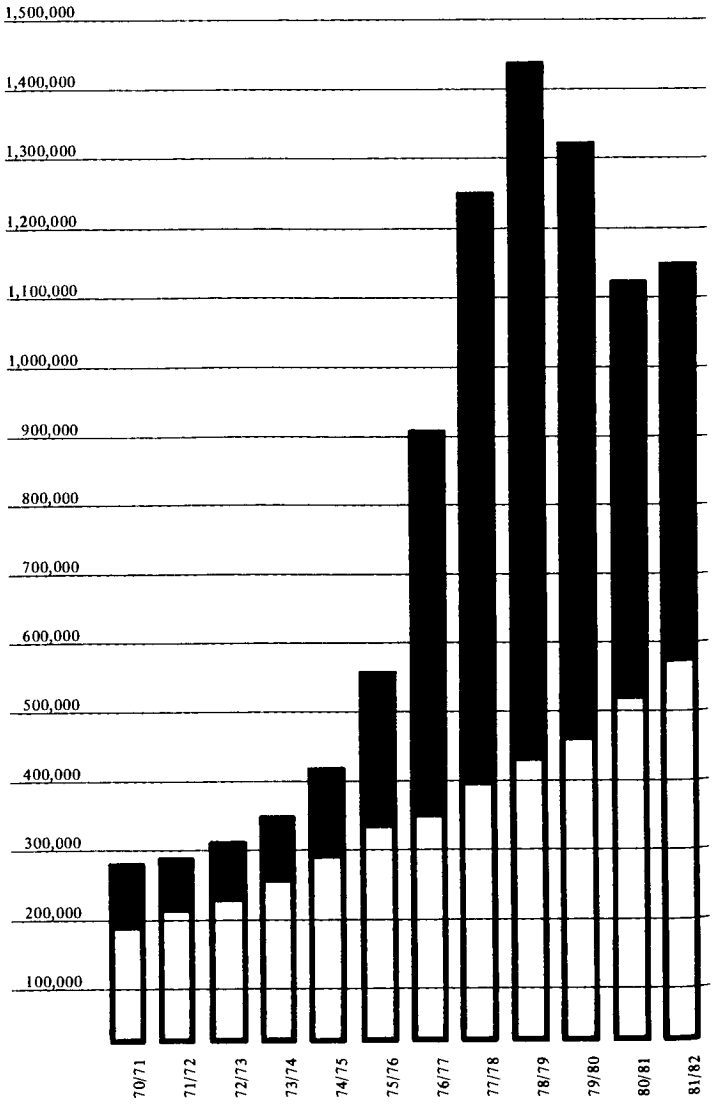
Appendix VIII

Radio station licences in force from 1970/71 to 1981/82

ALL CLASSES OF STATION EXCEPT GRS

GRS

SOURCE: Department of Communications.



Appendix IX

Radio stations by service category for 1981/82

Service Category*	Number of Stations			
	Ship	Coast	Land	Mobile
Limited maritime mobile		18		
Private maritime mobile		109		
Public commercial			2,656	16
Restricted public commercial			1,705	
Private commercial**			53,417	353,750
Provincial government			8,163	50,595
Municipal			4,956	45,381
Experimental			569	680
Amateur			21,648	
Public commercial receiving			201	
Private commercial receiving			896	492
Public commercial automatic repeater			1,269	
Private commercial automatic repeater			4,054	
Aircraft navigational				7
Aeronautical mobile			2,031	17,803
Maritime mobile	28,479			

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

** Included in this category are 8,107 land and 35,761 mobile stations licensed to federal government departments.

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

General radio service	578,176
Earth	637
Space	7

SOURCE: Department of Communications

Appendix X

Acts under which the Minister of Communications has responsibility

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

SOURCE: Department of Communications

Appendix XI

Addresses of regional and district offices of the Department of Communications

ATLANTIC REGION

New Brunswick

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

District Offices

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

Nova Scotia

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

Prince Edward Island

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

Newfoundland

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

QUEBEC REGION

Regional Office
Department of Communications
Rasco Hotel
295 St. Paul East
MONTREAL, Que.
H2Y 2H1

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

Department of Communications
4th Floor
1650 King Street West
SHERBROOKE, Que.
J1J 2C3

Department of Communications
32 Frédéric Hébert Avenue
NORANDA, Que.
J9X 1V2

Department of Communications
19th Floor
2085 Union Street
MONTREAL, Que.
H3A 2C3

Department of Communications
Public Building - Post Office
P.O. Box 67
TROIS-RIVIÈRES, Que.
G9A 5E3

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

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

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

ONTARIO REGION

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

District Offices
Department of Communications
880 Ouellette Street
WINDSOR, Ont.
N9Z 1C7

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

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

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

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

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

Department of Communications
Federal Building, Room 273
Clarence Street
P.O. Box 633
KINGSTON, Ont.
K7L 4X4

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

CENTRAL REGION

Manitoba

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

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

Saskatchewan

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

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

Alberta

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

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

Department of Communications
202 - 11117 100th Street
GRANDE PRAIRIE, Alta.
T8V 2N2

Northwest Territories

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

PACIFIC REGION

British Columbia

Regional Office
Department of Communications
325 Granville Street, Room 300
VANCOUVER, B.C.
V6C 1S5

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

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

Department of Communications
309 2nd Avenue West,
Room 584
PRINCE RUPERT, B.C.
V8J 3T1

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

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

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

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

Yukon District

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