Communications Canada

Annual Report 1971-1972

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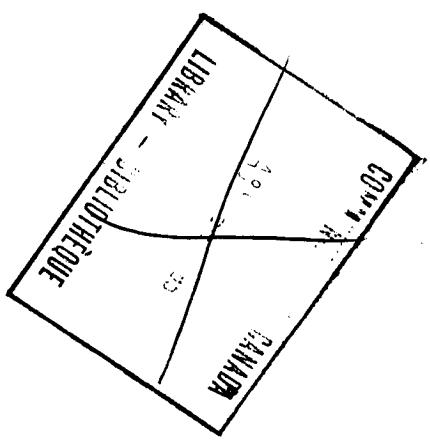


Submitted under the provisions of the Communications Department Act

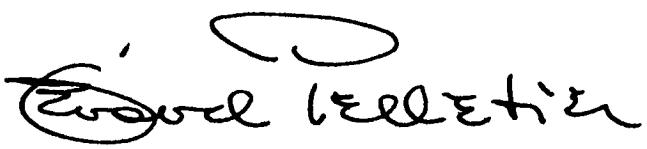
Cat. No.: Co1-1972

To His Excellency
The Right Honourable Roland Michener, P.C., Q.C.,
Governor General and Commander-in-Chief of Canada

Your Excellency,

I have the honour to present the Annual Report of the Department of Communications for the fiscal year ending 31 March 1972.

Yours faithfully,



Gérard Pelletier

Minister of Communications

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The ubiquitous telephone and telegraph lines, a part of the Canadian landscape for years, are now only one of many transmission methods.

Introduction

The role of the Department of Communications is one of helping to ensure that all Canadians obtain access to a rapidly expanding range of communications services. Fulfillment of this task involves not only technological research and planning but also exploration of the complex social, human and economic issues which result from changing patterns of communications. This report covers the third fiscal year of the Department's existence, a period in which important strides were made toward meeting communications commitments of the present and in planning for the future.

The Department has faced some challenging questions. How can the already crowded radio frequency spectrum best be managed in the face of growing national and international demands? What are the most effective methods of using new satellite communications technology to meet Canadian needs? What is the impact on Canadians arising from the marriage of computers and communications systems, or from invasions of privacy by computerized data banks? How can Canadian communications networks be made more effective, more reliable, less costly? How can new electronics and communications technology be applied to meet Canadian needs? What developments are likely in the near and more distant future?

Each of these questions is a complex matter in itself and becomes even more so when seen as part of the constantly changing and interrelated total communications picture. For these reasons a good deal of the Department's efforts have been directed toward studies and consultations which are needed for rational planning and policy making.

The first major input to this process was the over-all analysis provided by the report of the Telecommission, *Instant World,* published in April 1971. Specific issues raised in this report are already of use in developing policy guidelines. In addition, they provided the necessary groundwork for further studies which are under way.

The major undertaking of the fiscal year involved the signing of an agreement with the United States for the Communications Technology Satellite, scheduled for launch in 1975. The CTS is to be a strictly experimental satellite, providing no commercial services to the public. Instead, it will act as a testing

ground for high-powered orbiting transmitters that could provide sophisticated communications services to every corner of Canada in the 1980s.

Canada is responsible for the design, manufacture and assembly of this satellite while the United States will provide some advanced components and launch the satellife into geostationary orbit. The Department's Communications Research Centre (CRC) is managing construction of the satellite and the main subcontractors in the design phase are RCA Ltd. of Montreal for electronics and SPAR Aerospace Ltd. of Toronto for structure.

While the experimental CTS project was getting under way, there was continued progress toward the November 1972 launch of the commercial, operational satellite *Anik*.

The *Anik* system is the first domestic geostationary satellite communications network in the world. It was planned by Telesat Canada, an independent corporation created by Parliament in 1969, in which the federal government owns half the shares. The system will provide a large capacity for east-west television, telephone and data transmission and is to make possible the introduction of telephone and television communications to many remote areas of Canada. Satellites which result from the CTS experiment could provide the scientific basis for further improving services to small out-of-the-way communities by giving them access to the full range of communications services offered in developed areas.

Northern Electric Ltd. of Lucerne, Quebec, and Spar Aerospace Ltd. of Toronto were major Canadian subcontractors for *Anik's* construction. This has led one of the American companies that will build some of the satellites for the U.S. corporations which are considering establishment of a similar domestic system to make use of these Canadian companies' expertise in contributing to building the space segment.

Canada also uses satellites for international communications and is the fifth largest user of the system operated by the International Telecommunications Satellite Organization (INTELSAT). The Department and the Canadian Overseas Telecommunication Corporation, the telecommunications entity designated to represent Canada at the Meeting of Signatories, have worked actively in the drafting of new agreements to govern the organization's operations. They also have contributed to a variety of international forums held to discuss the policy and planning implications of communications satellites. The COTC is the Crown Corporation which provides and operates telecommunications links to overseas countries.

Other international activities included the opening of new telephone links with the People's Republic of China and with India.

On the home front, much attention has been focussed on the direct and indirect effects of computer technology on the nation and its citizens. The Canadian Computer /Communications Task Force has studied the implications of the integration of computers and communications services.

This task force, established in 1970 and attached to the Department of Communications, has undertaken a comprehensive survey of the rapidly expanding computer /communications industry in Canada and has studied developments in other countries. Professional staff recruited from industry, government and universities have collected the data needed to ascertain the present state of the industry, to determine present and future social and economic needs and problems, and to forecast technological trends and their adaptability to Canadian requirements. These data form the basis for policy recommendations to government.

The task force has received more than 200 position papers as a result of its approaches to users and suppliers of data-processing and computer/communications facilities. Specific problem areas were investigated through detailed questionnaires, on-site interviews, contracts with expert consultants and in-house special studies. The views of professional societies and associations were probed in a series of talks and seminars across the country.

The studies, to the point developed during the period under review, fully confirmed the existence of urgent problems in the field of computer/communications, and it was clear that the resolution of these problems will require the closest possible working relationships between federal and provincial governments and the private sector. The final report is scheduled to be published in August 1972.

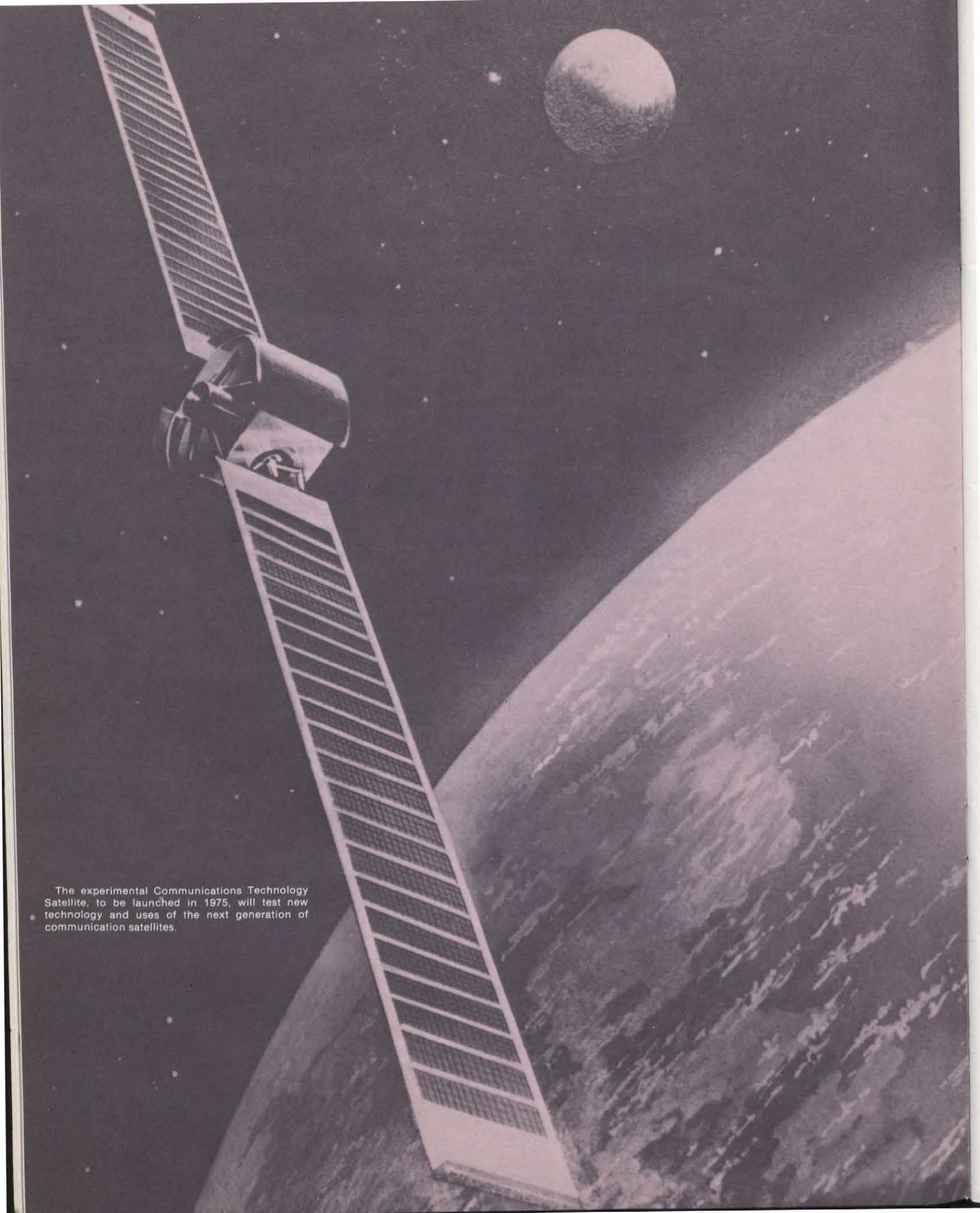
The Privacy and Computers Task Force, a joint project of the Departments of Communications and Justice, has studied the issues raised by the storage of increasing amounts of personal information in computer data banks. Publication of its report is planned for the end of 1972.

A Northern Pilot Project has been established to give special attention to the unique problems of communications in the North, particularly among Canadian native peoples. By the end of 1972, experimental radio-telephone networks, owned and operated by the communities involved will be installed in the Central Patricia District of Northern Ontario and the Keewatin District of the N.W.T. Community radio will also be provided to Baker Lake, N.W.T.

The activity of the Department which most directly affects the majority of Canadians is the management of the radio frequency spectrum, a limited natural resource which must be carefully protected against misuse and pollution. There are more than 250,000 licensed stations using the spectrum in Canada and all must be monitored and controlled.

Five regional directors were named in April 1971 to supervise expanded regional operations from headquarters in Moncton, Montreal, Toronto, Winnipeg and Vancouver. Among other duties, management of the radio frequency spectrum is in the hands of these strengthened regional operations.

The above highlights of the activities of the Department of Communications during the fiscal year which ended March 31, 1972, are dealt with in greater detail in the body of this annual report. The report has been divided into four sections which are: Research Program; Planning Activities; Operational and Regulatory Activities; Departmental Administration.



The experimental Communications Technology Satellite, to be launched in 1975, will test new technology and uses of the next generation of communication satellites.

Research Program

Research activities of the Department expanded considerably in the fiscal year with the official beginning of the Communications Technology Satellite (CTS) program. The satellite, to be launched in 1975, is being constructed at the Communications Research Centre (CRC) at Shirley Bay, just west of the Ottawa city limits. This represents a major new undertaking for the Centre's more than 500 scientists, technicians and support staff. However, they can draw on invaluable experience gained in the highly successful Alouette and ISIS satellite research programs conducted during the previous decade.

The Communications Technology Satellite program began officially on April 20, 1971, when the Department of Communications and the U.S. National Aeronautics and Space Administration (NASA) signed a Memorandum of Understanding. Under the agreement, Canada will design, build and operate the experimental satellite. NASA will provide some advanced components and launch the satellite into a geostationary orbit. The program will allow Canada to evaluate the technological, economic and social benefits which could be provided by such a powerful satellite broadcasting to small, low-cost ground terminals in remote areas. Another important objective is to test, under actual space conditions, various items of advanced design which might be suitable for telecommunications satellites. The ten-nation European Space Research Organization (ESRO) has asked to participate in the program by providing some components which it hopes to use on its communications satellites for the 1980s.

Under CRC direction, a team of experts from various industries established initial design concepts and a basic spacecraft configuration for the Project Definition Plan. Industrial proposals were then invited for spacecraft design, and design contracts were awarded to SPAR Aerospace Ltd. of Toronto for structure and RCA Ltd. of Montreal for the electronics. Some subsystems, such as the apogee motor, will have to be procured outside Canada.

A new facility has been constructed at CRC for the integration and testing of the satellite, and scientists there are also working to plan the CTS experimental program, to design and build the ground terminals, and to evaluate proposals put forward for experiments.

The seven stages of the CTS program are:

A. Concept development—Completed, August 1970
B. Project definition—Completed, summer 1971
C. Design—Completion scheduled late 1972
D. Manufacture and test—By industry
E. Integration and test—At CRC
F. Launch—By NASA, 1975
G. Operations—By CRC, projected for two years

As the first project with a major involvement of Canadian industry in the basic design and construction of a geostationary satellite, the CTS poses some novel challenges. It operates at much higher powers than existing satellites. The structure includes a thermal protection system to permit efficient operation in spite of the extreme temperature variations to which the spacecraft will be exposed during launch and in orbit. The attitude control system must stabilize the satellite and maintain its correct attitude despite disturbing factors such as solar radiation pressure on the solar array sails, operation of the experimental ion engine and solar and lunar gravitational forces. The arrays of solar cells will be stored in the spacecraft body during launch, unfolded like an accordion once in orbit and then oriented so that the solar sails continually face the sun.

As is normal with a project of this magnitude, the CTS research has affected several of the research categories into which the CRC is divided. In broad terms, CRC research is divided into the following four categories—information sciences, communications systems, the radio environment, and spacecraft technology. In addition, the department supports outside research by universities and industry.

Information Sciences

Research in information sciences seeks ways of improving machine-to-machine communications, man-to-machine interactions and man-to-machine telecommunications services. This basically involves finding better ways to use new technology for storing, processing and retrieving information.

One major project involves a joint study by CRC and universities into the feasibility of a Canadian computer communications network (CANUNET). Other research areas include: computer graphics systems; effectiveness and impact of two-way video; audio and graphics communications services for institutional user groups; computer image processing; optical data storage and processing; and optical propagation in glass fibres. Studies of computer signal processing have been undertaken for the Department of National Defence.

Communications Systems

Research in communications systems supports the Department's mission to develop and introduce new systems and facilities for Canada's domestic and international communications needs. One of the most important new developments in this field is the planned introduction of satellites for domestic communications, navigation and other applications.

Communications experiments are being developed to test and demonstrate the applications of the high- powered transponder to be carried in the Communications Technology Satellite. This transponder will enable it to beam back to earth a much more powerful signal than present satellites. Studies cover the problems of providing colour television, wide-band data transmission and audio broadcasts to low-cost terminals in remote regions. Provincial governments, industry, universities and other organizations are to propose experiments to be carried out in the satellite's expected two-year life-span. Experiments are being carried out to study propagation in the super-high frequencies which will be used by future satellites. Studies continue to develop advanced satellite terminals for use by the Department of National Defence in land, sea and air environments. Research also continues in the area of proposed communications and navigation satellites for aeronautical and maritime applications, with particular emphasis on problems of communication at extreme latitudes. The latter is a joint program with the Ministry of Transport and supports Canada's participation in international studies of these proposed navigational aids.

Work on communications systems engineering has increased, and the technique of systems modelling is being used as part of a

study of data communications requirements. Research and development in the radar field includes assistance in communications and remote sensing programs for the Departments of National Defence and of Energy, Mines and Resources.

Radio Environment

Studies of the radio environment focus on problems peculiar to Canadian latitudes. Much of the work involves systems such as high-frequency radio which depend on the ionosphere, and studies of the limitations imposed by ionization variations resulting from natural and man-made conditions. A varied observational program is pursued using ground-based equipment at a number of locations, rocket-borne experiments and satellite observations from the Alouette and ISIS satellites. Related studies deal with: direct effects of ionospheric conditions on spacecraft antennas, noise and interference levels in various locations in Canada, and the use of different portions of the radio spectrum for practical purposes such as remote sensing. CRC continues to provide a radio prediction, forecasting and consulting service to Canadian communications users.

Spacecraft Technology

Applied research in advanced electronics and space mechanics supports Canadian efforts in the field of communications satellites, particularly the Communications Technology Satellite program. The research concentrates on areas not yet adequately covered by Canadian industry. A new and difficult problem is the reliable stabilization in space of a satellite with large flexible appendages, such as the CTS with its extendable arrays solar cells. This differs considerably from the present generation of communication satellites, including *Anik*, which are stabilized by spinning the satellite body. New electronic devices, materials and technologies are required, as well as a superior standard of component reliability.

Although the program is specifically intended to support communications, research results often can be applied elsewhere, in fields such as medical electronics and pollution control. For example, research in reliability analysis resulted in the design of a specialized scanning electron microscope at CRC. Through Canadian Patents and Development Ltd., a new Canadian company was formed to manufacture this instrument, and multi-million dollar sales were forecast.

Outside Research

The Department's program of research contracts to universities has been set up in five major categories—Northern communications technology, man-machine interaction, computer technology, machine intelligence, and socio-economic aspects of communications. Some 44 contracts, a commitment of about $700,000, have been approved for universities across Canada. The object is to create a resource for contract research in Canadian universities to which the department and other agencies may go in future to meet specific requirements. In the 1972-73 fiscal year about 30 per cent of the contracts will be aimed at research on the social, economic and legal-regulatory aspects of communications in modern society.

Liaison has also been strengthened with other research laboratories in government and industry. This is facilitated by the increasing number of electronics and communications industries which have located in the Shirley Bay area in recent years, although the site of CRC was originally chosen as an electronically "quiet" rural area. Many of the Department's research projects involve contracts with industry, with CRC providing design authority and project management. Research projects are also carried out at CRC for other government departments and agencies on a cost-recovery basis. About one-fifth of CRC manpower is devoted to work on behalf of the Defence Research Board, providing research and development in the field of telecommunications for the Department of National Defence.

Inter-community radio systems installed on a pilot basis by the Department allow close contact among residents of Canada's widely separated northern communities.

Planning Activities

The Planning Branch is responsible for the provision of technological and socio-economic forecasts, definitions of needs and descriptions of problem areas within a logical framework that can be used by the entire Department. It develops, analyzes and recommends communications policies. Work is divided into two main areas, environmental planning and technological and systems planning. A program office in the branch develops planning and management techniques for use in the Department.

Environmental Planning

Regulatory environment: A Task Force on Privacy and Computers was established jointly, on April 1, 1971, with the Department of Justice, to examine the actual and potential impacts upon personal privacy of the rapid growth and increasing efficiency of computer data banks containing sensitive personal information about individuals. Many facets of this new problem were studied, and questionnaires were sent to 2,500 data-bank operators. Special attention was paid to the particular problems which might arise from the storage of information about Canadians in data banks outside Canadian borders.

The Northern Project Office was established in April 1971 on a temporary basis to conduct a series of field experiments in several northern communities. These experiments aim at establishing the social communications needs and priorities for isolated regions, and at testing the effectiveness of various communications media in meeting these needs.

Experimental communications systems—high-frequency telephone, community radio broadcasting, videotape recording—will be installed at the request of citizens' associations, and communications advisers or animators will assist in developing, operating and evaluating the projects. This should provide a firm basis for broader policy development and for defining criteria and operating methodologies for communications systems in which users are directly involved and for which they have a direct responsibility.

Social-environment: Multi-disciplinary research is needed to identify demands for alternative communications systems and to predict the likely social, cultural and political impacts of possible future systems. Projects

undertaken in the fiscal year included a survey of public attitudes toward the growing use of computers. The University of Montreal was contracted to make a conceptual analysis of the social and psychological effects of "information overload". A survey was also conducted to identify the quality and quantity of access to information by different groups within the population on the basis of geographical location, age, socio-economic status, and other factors.

Economic environment: The first comprehensive study of the rate structure of the Canadian telecommunications carriers has been initiated by the Canadian Transport Commission through its Cost Inquiry. For this inquiry, the Economic Planning unit has studied the principles of rate making, the economic basis for the separation of costs charged to specific services and the desirable relationship between costs attributed to specific services and the rates charged to customers for these services. The unit also engaged in a major study of policy management of the radio spectrum, with special attention to the rapidly rising demand for land mobile radios.

Technological and Systems Planning

Computer technology: New developments in computers, computer peripherals and data-communications technology are monitored continually to analyse technological trends, forecast future developments and assess the impact of computer/communications on society. Activities include comprehensive technological assessments of various systems and services, funding of selected research programs and participation in international forums such as the Computer Utilization Group of the Organization for Economic Cooperation and Development (OECD). The unit advises the Department on computer/communications matters.

Space Systems: All aspects of the Department's long range planning for the application of satellite communications technology are studied by this unit established in April 1971. User requirements and technology are analysed with a view to research and strategic planning for Canadian space systems concepts. Major studies have concentrated on the potential of future space systems to serve specific anticipated Canadian needs—for example, reliable communications in remote areas, satellite broadcasting, electronic transmission of mail. Activities in the fiscal year included the management of studies on contract by space-oriented Canadian companies, cooperative projects with other departments and agencies, and participation in technology and planning missions to the United States and Europe.

Communications technology and terrestrial systems: Continuous analysis and planning are required to keep abreast of developments in telecommunications technology and terrestrial systems. Activities in the fiscal year included: design and implementation of a pilot version of a comuter/communications management information system; topological analysis and design of possible alternatives for the proposed Canadian University Computer Network (CANUNET); setting up of a Canadian advisory committee to co-ordinate Canadian data network activities in the international Telecommunications Union, and participation in the interdepartmental committee that prepared a proposal for an Educational Systems Research Program. Over 20 study reports have been prepared on telecommunications and computer/communications, at least 10 of which were published in leading international journals.

The branch's other activities in the fiscal year included: participation in AEROSAT negotiations; discussion and preparation of policy on Northern communications and participation in the science and technology subcommittee of the United Nation's Committee on the Peaceful Uses of Outer Space.

Program Office

The Program Office has two main responsibilities—development and implementation of the Planning, Programming and Budgeting System (PPBS) within the Department, and development and application of long range planning and management techniques in various Departmental program areas. The PPBS program involves coordination of current and long-range programs, study of objectives and activities, preparation of annual operational plans, supervision of a project reporting system and the conducting of cost-effectiveness analyses. Several two-day courses on PPBS were conducted for

departmental managers and their staff, and a major review of departmental objectives and program structure was undertaken.

The long-range aspect involves evaluation of planning techniques to determine which can best be used in departmental activities. The office arranged seminars on a number of techniques and approaches designed to assist in effective planning and management—corporate planning, delphi studies, project management and control, and others. Work is under way to develop a planning framework for the use of senior management in assessing departmental activities. Inputs were provided for a number of department-wide studies on topics such as work improvement, efficiency and performance indicators, international communications and a survey of the Department's computer requirements.

Microwave towers are used to transmit telephone, television and data signals across the country.

Operational and Regulatory Activities

The Operations division exists to promote and ensure the orderly use and development of Canada's telecommunications resources. To achieve this aim it: sets technical standards for broadcasting, cable television and microwave equipment, and issues operating licenses; manages the radio spectrum; works with industry to develop national telecommunications networks; participates in the development of international telecommunications systems, standards and regulations, and co-ordinates Canadian government telecommunications. All these activities fall into one of two categories, national or international programs.

National Telecommunications

The National Telecommunications Branch is concerned with the development of Canada's communications systems, with the ability of the Canadian telecommunications industry to serve public and private needs and with the elaboration of policies to strengthen and extend communications systems. The branch's operational role begun in earnest following publication of the Telecommission report in January 1971, is directed at three problem areas: coordination between common carriers, connections of new terminals to existing systems, and relations between the hardware industry and the carriers. In addition, a continuing assessment is made of the economic and financial viability of firms operating in the sector to ensure the overall competitive strength of Canadian telecommunications.

The department's more direct operating responsibilities are related to government-owned enterprises and federally regulated carriers. With regard to the industry in general, its primary operative influence is centered through the economic evaluation of competitive radio communications systems plans with a view to the rational use of national resources.

In cooperation with the carriers and provincial governments, an assessment of Canada's inter-regional transmission facilities was completed during the fiscal year. Network development involves facilities provided by the telephone companies, railway telecommunications carriers and the Canadian Overseas Telecommunication Corporation

(COTC). This group will be joined in 1973 by Telesat Canada. This study indicates present and planned facilities are adequate to meet needs forecast for 1980. Despite the dynamic and uncertain nature of the demand for inter-regional facilities, the network appears to have an inherent flexibility which enables it to absorb considerable change in the demand forecasts. However, there are signs of over-capitalization in the inter-regional sector and declining capital productivity. Better mechanisms will have to be developed for planning and engineering the national network as the coming decade brings rapid expansion of cable, satellite and microwave facilities under the sponsorship of a multiplicity of competitive forces.

Interconnection, the attachment of equipment to telecommunications carriers' networks, is the subject of a study begun in the fall of 1971. A working paper is to be distributed to provincial governments and the carriers in November 1972. Under current practice, telecommunications carriers reserve to themselves the right to provide terminal facilities. The Department's inquiry examines the extent to which this practice is in the public interest. The first stage is the identification of practical alternatives to the restrictive rules now in force and the development of a framework for future discussions. The program then calls for consultation with the provinces and discussions with users and industries.

A comprehensive review of the Canadian telecommunications equipment manufacturing sector is also being completed. Consultations are under way with the national telecommunications carriers to develop estimates and forecasts of needs for switching, transmission and terminal equipment. Further studies are planned with the Department of Industry, Trade and Commerce and the manufacturing industry to identify procurement and manufacturing strategies which might contribute to a reduction of communication equipment costs and an increase in Canadian content and Canadian employment.

These three specific studies were supported by statistical information and economic studies of the corporate organization and financial performance of the industry.

Telecommunications Regulations

The Telecommunications Regulations Branch manages the radio frequency spectrum in Canada. Of all Department activities, this is the one which most directly affects the general public. It involves the development of technical standards, radio frequency plans and assignment criteria. The branch also participates in international conferences on telecommunications, and it is responsible for the technical evaluation of applications to use radio, technical certification of broadcasting undertakings, and the licensing of other radio stations. It inspects and monitors radio stations to ensure adherence to regulations and standards, and it provides information for spectrum planning purposes.

Licensing, Inspection and Monitoring: The number of radio station licenses in force in Canada, excluding commercial broadcasting stations, increased by 4.8 per cent in the fiscal year to a total of 268,810. This resulted in a 6.8 per cent increase in revenue from license and amendment fees. A total of 23,019 radios were inspected, an increase of 8 per cent over the previous year. A new monitoring station at St. Rémi, Que., commenced operation on March 1, 1972. This station is used primarily for monitoring the VHF spectrum in the Montreal area.

Satellite-Related Operations: Licenses have been issued to Telesat Canada granting it authority to install 29 earth stations for the *Anik* satellite system scheduled to commence operation in 1973. Co-ordination of further stations to be incorporated in the network is proceeding. Evaluation of the frequency assignment aspects of the licensing of the planned Communications Technology Satellite (CTS) has also been progressing and is expected to be completed successfully by the end of 1972.

Broadcast Engineering: In broadcasting, 617 applications for Technical Construction and Operating Certificates were processed and coordinated with the Canadian Radio-Television Commission. A total of 70 private commercial broadcasting stations either commenced operation or modified their facilities subject to the Minister's certification authority. To ensure protection of Canadian channels, the branch scrutinized

854 notifications of allotment changes from countries which have signed broadcasting agreements.

The branch began the certifying of new CATV systems which have been designed under the new technical standards contained in Broadcast Procedure 23. On August 6, 1971, the branch released the third of its series of documents dealing with new cable television requirements, entitled "Proof of Performance Procedure for Cable Television Systems". Public comments were invited in line with the policy of public consultation.

Plans and Standards: The first station in the Department's High-Frequency direction-finding system is under construction, and four more installations are in the planning stage. The five stations will form a surveillance network across Canada to assist in the resolution of interference problems. Work is also continuing on an automated spectrum-occupancy surveillance system.

The branch has continued development of a strategic plan for the forecasting of future radio spectrum requirements. The section of the project dealing witht the land mobile spectrum is nearing completion. The branch has been participating with industry in a Measurement Task Force of the Canadian Radio Technical Planning Board, with a view to establishing technical criteria for frequency sharing between land mobile radio and UHF television service.

Studies are under way to prepare plans and technical guidelines for the implementation of digital radio systems in Canada. CATV systems are expected to require wide-band TV distribution systems in the near future, and studies are being made for the provision of frequency spectrum and technical guidelines for this service.

Four Radio Standards Specifications were promulgated in final form during the fiscal year, and another two were issued in draft form and referred to the Canadian Radio Technical Planning Board for consideration and comments. A number of other Radio Standards Specifications are being prepared to cover garage-door controls, paging receivers, wireless microphones, RF loop paging systems and microwave ovens.

Radio Regulations Licensing Policy: Amendments have been made to the Radio Noise Limits Order to revise the limits applying to industrial, scientific and medical equipment and to prescribe limits based on standards developed by the Canadian Standards Association for suppressing interference from domestic and commercial electrical appliances and equipment.

Radio regulations have been amended to provide for: changes in the age requirements for licensees; transfer of ship station licensing from regulations under the Canada Shipping Act to the General Radio Regulations under the Radio Act; changes in regulations respecting Amateur Experimental and General Radio Services; exemptions from licensing of wireless microphones in the 88 to 108 MHz band, and revocation of the Tourist Radio Service.

New policies have also been developed for low-power communications services and municipal government services.

Regional Offices

The need for a strong regional organization has been recognized since the formation of the Department, and the fiscal year 1971-72 saw an important expansion of regional operations. At the beginning of the fiscal year, five regional directors were named and assigned to regional headquarters in Moncton, Montreal, Toronto, Winnipeg and Vancouver.

Management of the radio frequency spectrum and assurance of the highest possible technical standards are the major functions of the five regional offices, 36 district offices and 11 monitoring stations across the country. This involves the monitoring and control of radio and systems frequencies for public and private use—such as radio and television stations, emergency services, communications for ships and aircraft, mobile facilities, and so on. There are more than 250,000 licensed stations using the frequency spectrum in Canada, and management of this limited natural resource is going to become more and more important as increasing demands are made on it. A study indicates that demand for land mobile radio licenses in the Toronto area alone will increase from 17,000 at present to 41,000 in 1980.

Consideration of several major microwave systems proposals highlighted regional telecommunications activity. Major policy and competition issues, both at the regional and inter-regional levels, were raised by several applications which required extensive consultation between the Department and the telecommunications carriers.

Government Telecommunications

The Government Telecommunications Agency plans and manages federal government telecommunications facilities and services. The agency develops standards of service, establishes guidelines and provides consultative advice and direction to meet the needs of federal departments and agencies. It administers the federal intercity and local telecommunications networks which carry government voice, message and data traffic to points throughout Canada and in the United States, with costs allocated to departments on the basis of usage. The economies of scale from this centralization result in an annual saving of about $13.6 million. Traffic patterns are constantly monitored to assure optimum service to users at minimum cost.

Consultation and Planning: An extensive study of the telecommunications needs of federal government departments was concluded in the summer of 1971. This provided an up-to-date inventory of services, identified problems in various departments and forecast future needs. Objectives established as a result of the study included: a data communications network for common usage, training programs for communications staff in user departments, and development of equipment standards and guidelines for particular services with high growth potential. The agency's consulting services initiated a program to continuously review the data communications needs of departments and to update the developing plan for a data communications network.

Specific activities included an in-depth study of the Unemployment Insurance Commission's telecommunications needs and the provision of extensive assistance to the Canadian Penitentiary Service to improve its telecommunications facilities.

Regional staff, with assistance from headquarters, are planning telephone consolidations in the regions. Negotiations were completed in Edmonton for replacement of the existing consolidation, and a new consolidation was established in Sherbrooke, Que. Proposed consolidations for Regina and Calgary have been deferred until about 1975.

Telephone Systems: The systems in Montreal, Toronto and Ottawa have been expanded, and the number of main stations in the 15 consolidated locations has increased by 5,420 to a total of 40,800. The intercity network expanded with the addition of direct lines to Brantford, St. Thomas, Lachute, Oka, Buckingham, Thetford Mines, St. George de Beauce, Donnacona, Montmagny, Chicoutimi, Roberval and Rimouski.

Regional Activities, 1971-72 fiscal year

	Atlantic	Quebec	Ontario	Central	Pacific	Total
A. Enforcement						
1. Inspections	1340	4563	8348	5167	4050	23468
2. Interference visits	2660	2714	11256	6923	2230	25783
B. Authorization						
1. Examinations	944	513	1960	460	848	4725
2. Applications processed	6000	11250	15690	12716	7119	52775
3. Cancellations	300	5200	5334	4092	3224	18150
4. Amendments	3000	4925	1346	4620	—	13891
5. Certifications	944	494	1976	423	928	4765
C. Monitoring						
1. Assignments	696	594	1125	1306	387	4108
2. Infringement Reports	1196	717	942	4068	848	7771
3. Measurements	22600	8585	26698	38593	23450	119926

Network circuit mileage increased by 70,800 miles to a total of 368,000 miles of private lines. The network carried 9.25 million calls in the fiscal year, an increase of about 32 per cent over the previous year.

Data Communications: Expanding data communications needs were met by use of the Telex network, the voice communications network or dedicated line services such as those of the Department of National Revenue and the Unemployment Insurance Commission. Facsimile transmission increased particularly rapidly during the year as more and more departments adopted this means of communication.

International Programs

Canada has continued to participate actively in various international telecommunications organizations. A number of special agreements have enabled Canada to communicate more effectively with all the peoples of the world and to participate in advanced scientific projects.

A direct telephone link between Canada and the People's Republic of China was inaugurated on December 7, 1971, following special arrangements made in collaboration with the Department of External Affairs and the Canadian Overseas Telecommunication Corporation (COTC). A similar arrangement was made for a permanent telephone circuit linking Canada and India, and this service was inaugurated on February 10, 1972.

A memorandum of understanding was negotiated with l'Office de Radiodiffusion-Télévision Française (ORTF) and signed in Paris to provide for allotment and utilization of television channels in the area of Newfoundland and the French islands of St-Pierre and Miquelon.

Canada and the European Space Research Organization (ESRO) negotiated an agreement whereby ESRO will provide advanced components for test in the Communications Technology Satellite.

A Canadian delegation attended the first Inter-American Telecommunications Conference in September 1971. The Department also participated actively in the Canadian scientific mission to France in February and March of 1972. Government and electronics industry representatives examined the French electronics industry and government telecommunications and space agencies.

International Telecommunications Union (ITU): Canada has continued its active role in the International Telecommunications Union. Canada is a member of the 29-member Administrative Council and participates in the ITU's permanent organs, the International Telegraph and Telephone Consultative Committee (CCITT) and the International Radio Consultative Committee (CCIR). The Canadian membership contribution to the ITU for the fiscal year amounted to $272,585, or 18 units out of total contributions of 479.5 units. Canada took part in the 26th session of the Administrative Council.

Participation in the CCITT study group meetings has been broadened to include more of the research, development and planning aspects of telephone, telegraph and data systems. Government-industry cooperation has been broadened through the establishment of national study committees on particular topics. Preparations are being made for the Administrative Telegraph and Telephone Conference to be held in April 1973 to examine revisions of the 1958 regulations. A program of on-going studies into new data networks has been proposed. A small departmental-industry delegation, led by the President of COTC, attended the World Plan Meeting in Venice in October 1971, at which steps were taken to improve planning of the world telephone network.

Canada participated actively at the CCIR's World Administrative Radio Conference for Space Telecommunications in June and July of 1971. The purpose of the meeting was to revise the ITU Radio Regulations in order to provide additional radio frequency spectrum for the growing needs of space telecommunications and radio astronomy. New technical and administrative regulations, to become effective January 1, 1973, were formulated. The new agreements provide for the orderly implementation of space and terrestrial systems, the equitable sharing of frequency bands among various services, and make allowances for future systems such as satellite broadcasting service and inter-satellite service. The expected future growth of space radiocommunications was recognized by extending the ITU Table of Frequency Allocations from 40 GHz to 275 GHz. The conference results were deemed adequate to

safeguard present systems and facilitate the development of future systems in Canada.

International Telecommunications Satellite Consortium (INTELSAT): The Plenipotentiary Conference for the new Definitive Arrangements for INTELSAT adopted the final texts on May 21, 1971 after two years of negotiations. The Definitive Agreements consist of an intergovernmental Agreement for signature by the member governments and an Operating Agreement for signature by the telecommunications entities designated by each country. The Canadian Overseas Telecommunication Corporation (COTC) is the operating company designated for that purpose by the federal government. Canada, which was one of the founding members of INTELSAT in 1964, was one of the first to sign these Definitive Agreements on August 20, 1971, when they became opened for signature. INTELSAT has 83 partner-member countries.

Canada, with a 3.48 per cent investment share in INTELSAT, participates in the Interim Communications Satellite Committee (ICSC) which directs the affairs of the consortium and is represented there by the COTC.

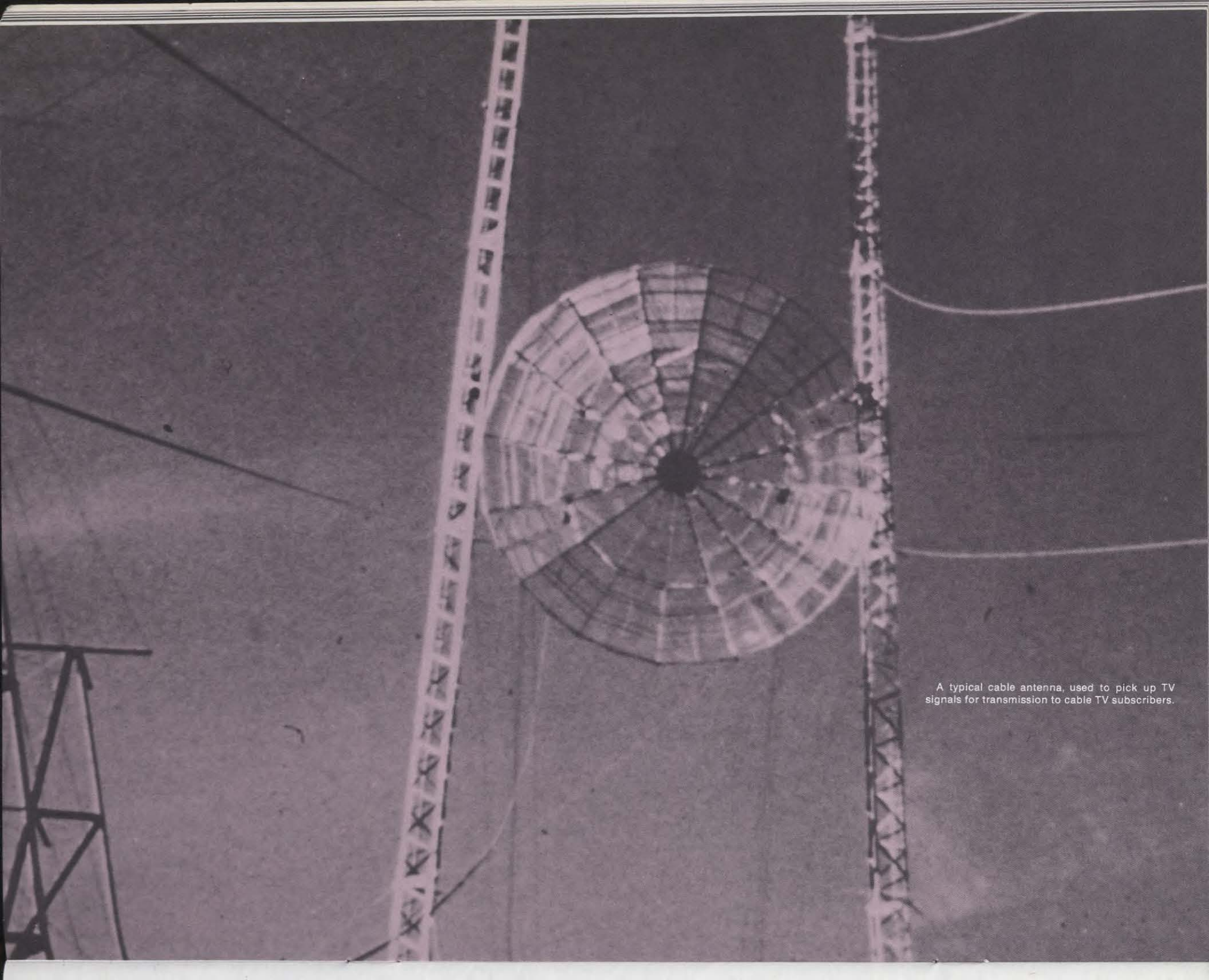
Commonwealth Telecommunications Organization (CTO): The Commonwealth Telecommunications Council met in Nairobi in October 1971. Recommendations were made that the Commonwealth Telecommunications Conference be hosted by Canada in Ottawa in November 1972 to review progress made since 1966 and study future telecommunications needs. The conference was also asked to deal with revisions of the financial arrangements among Commonwealth partners.

Canadian Overseas Telecommunication Corporation (COTC): Construction of the West Coast satellite earth-station at Lake Cowichan, B.C. proceeded in preparation for opening in the autumn of 1972. Departmental officers worked with COTC in negotiating maximum use of Canadian materials in the second Canada-United Kingdom submarine cable (CANTAT 2).

Inter-Governmental Maritime Consultative Organisation (IMCO): The Department co-operated with the Ministry of Transport in preparing for deliberations of the 9th session of the IMCO subcommittee on Radio-communications in London in January 1972. The two departments also represented Canada at the 25th session of the IMCO Maritime Safety Committee, which formed a panel of experts to study and to plan for a maritime mobile satellite communications system.

Allied Radio Frequency Agency (ARFA): As a member of the North Atlantic Treaty Organization, Canada participates in the development, establishment and operation of terrestrial and space radiocommunications facilities to meet the needs of this organization. Prior to the World Administrative Radio Conference in 1971, Canada took part in joint civil-military meetings to ensure that proposals of NATO nations to the conference were compatible with NATO requirements. Meetings after the conference reviewed the results and formulated agreements on the utilization of specific frequency bands for NATO purposes. Canada agreed to accommodate the NATO frequency requirements within Canadian jurisdiction.

Small dish antennas enable remote communities in Canada to receive communication service through Anik, Canada's domestic communications satellite.



A typical cable antenna, used to pick up TV signals for transmission to cable TV subscribers.

Departmental Administration

Personnel Management

The Personnel Branch carries out a variety of programs designed to meet the current and long-term manpower needs of the Department.

Important supporting work in personnel management includes: beginning statistical data collection to develop a Manpower Planning Model of future manpower needs; conducting industrial exchanges, performance review appraisal and career planning programs for employees; assimilating changes in acts and regulations affecting employees; pay and benefits and designing work safety programs with special emphasis on high-risk areas.

The Department has accepted further delegated authority to classify positions in a number of occupational groups and categories, extending its classification authority to cover all positions except the Senior Executive Category. This requires extensive training of managers in classification techniques, as well as the development of internal policies and procedures for grievances, audits and classification committees.

More than 1,100 staffing requests were received in the fiscal year; 30 employees were promoted, 31 hired from other departments, and 265 recruited from outside the Public Service. More than 200 persons were hired as temporary employees, 128 were employed for short periods on contract from personnel agencies, and 123 students were hired for summer months. Various counselling and training programs encouraged the further participation of managers in the staffing process.

The Personnel Advisor at the Communications Research Centre has become increasingly involved in recruiting and selecting contract employees to be assigned to the Communications Technology Satellite Program. Two major projects were undertaken in association with the francophone recruiting program and the language training relief program. All employees in the Professional and Technical Categories were appraised as part of an ongoing appraisal process introduced at CRC in 1970.

Equal Opportunities for Women: An Equal Opportunities for Women Program

has been established following recommendations to the Minister by a steering committee. The Personnel Branch has been given responsibility for planning, co-ordinating and implementing this program. The main objective is to encourage the employment, promotion and career development of women in the Department. A position of coordinator has been identified to make the program operational.

Bilingualism: The Department has continued to expand and develop bilingualism with a wider variety of programs. There were 292 employees attending Public Service Commission language courses during the fiscal year. Eight employees, four English-speaking and four French-speaking, are participating in the departmentally-sponsored two-year bicultural exchange program.

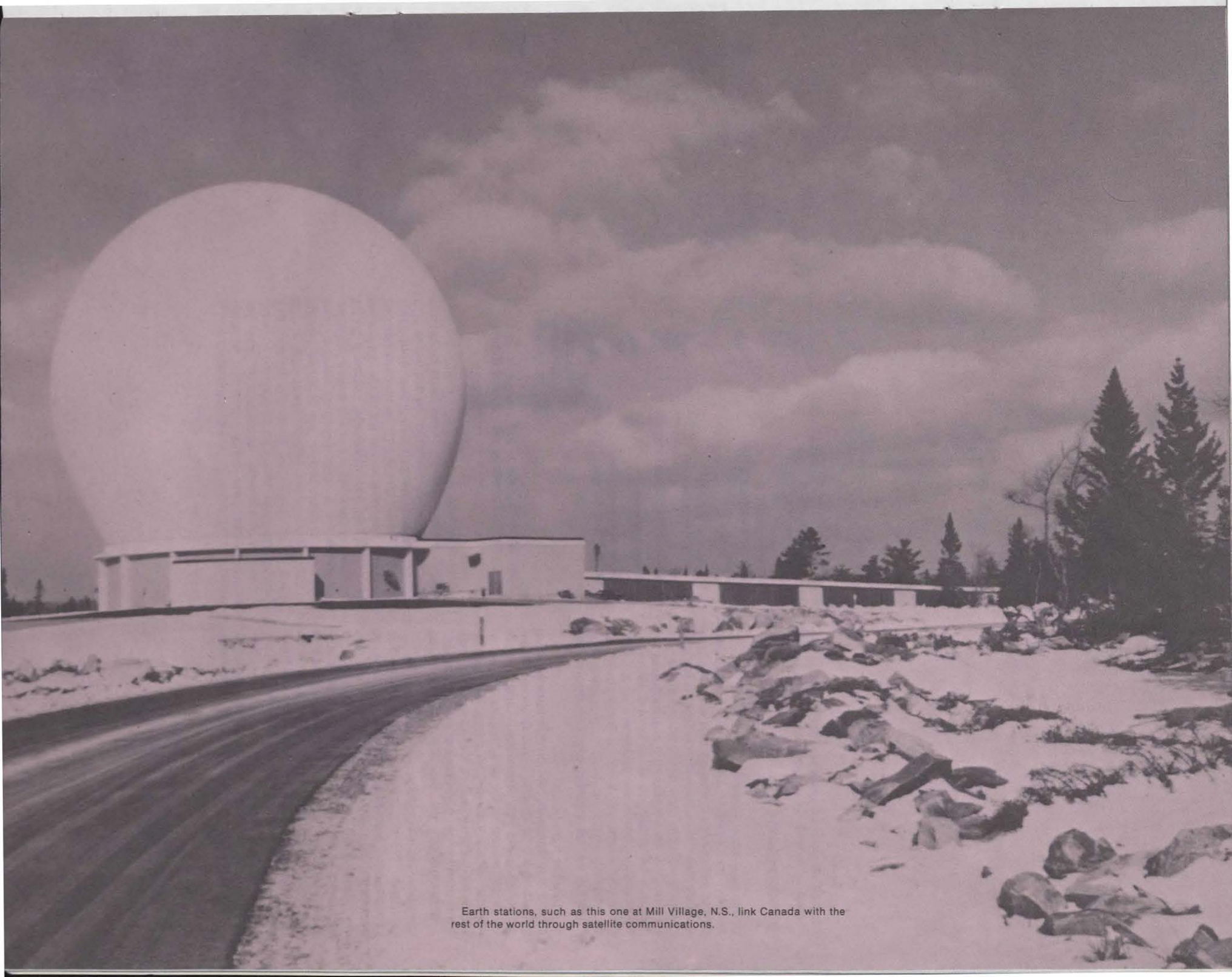
Labour Relations: To strenghten labour relations and develop dialogue, the Branch has set up a union-management consultation program and initiated a training program in staff relations for managers and supervisors. The Branch handles more than 34 collective bargaining agreements, ranging from trade groups and support staff to highly specialized research professionals.

Financial Summary

Financial Management: Total expenditures for the Department of Communications for the fiscal year ending March 31, 1972 amounted to $30.3 million. Administrative and operating expenditures constituted 70.3 per cent of total expenditures compared to 27.7 per cent for capital expenditures and 2.0 per cent for grants and contributions. Personnel costs represented 68.5 per cent of operating expenditures while personnel equivalent to 1,506 man-years was utilized. Receipts and revenues reached $8.6 million bringing the net amount of expenditures to $21.7 million. The transactions in the Government Telecommunications Agency Revolving Fund amounted to $10.2 million, compared to recoveries of $10.1 million, leaving a balance of $0.1 million to be recovered during the next fiscal year.

Summary of the Income and Expenditures for the fiscal year ending March 31, 1972.

	Millions of Dollars 1971-72
Administration, operation and maintenance expenditures	21.3
Capital expenditures	8.4
Grants and contributions	0.6
Total Expenditures of the Department	30.3
Less: Receipts and Revenues on account of credit	8.6
Net Expenditures of the Department	21.7



Earth stations, such as this one at Mill Village, N.S., link Canada with the rest of the world through satellite communications.