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Telecommunications Policy Branch

Radio Systems Policy

1. TOWARDS A SPECTRUM POLICY FRAMEWORK
FOR THE TWENTY-FIRST CENTURY

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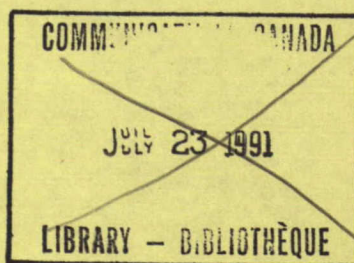
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Spectrum and Orbit Policy Directorate

DISCUSSION PAPER
SEPTEMBER 1990



Canada

PREAMBLE

This Discussion Paper is intended to provide the initial public consultation on the development of a Spectrum Policy Framework to ensure that Canada will be ready to meet future challenges as developments within the next ten years will probably establish the foundation of spectrum policy for the next century.

A reassessment of spectrum policy as an integral part of the Canadian infrastructure was announced by the Minister of Communications at the Spectrum 20/20 Symposium held in Montreal in November, 1989.

First, an overview of how spectrum resource policy development is accomplished at the present time is presented in the context of the role of the Department and domestic and international needs.

Then, trends and pressures that exist or are foreseen in radio spectrum resources are indicated. These include emerging technologies and networks, growth in use of spectrum resources, emerging new services, globalization, legislative and regulatory developments and the changing role of government in the economy.

The following issues and principles are raised to solicit comments from interested parties:

- the allocation and utilization of spectrum resources;
- spectrum policies and principles;
- general licensing policies;
- technical standards and spectrum planning;
- commitments to research and development;
- the role of government;
- international aspects of spectrum policy;
- spectrum resource revenues; and
- market-based considerations for spectrum allocation and assignment.

The challenge of this review is to ensure that a Spectrum Policy Framework will support other strategic developments being undertaken by the Department in radiocommunications, telecommunications and broadcasting, research and development and industry structure in Canada. In addition, the Framework has to be flexible and adaptive to demands of existing and emerging new radio services on the strategic resource, the spectrum.

The discussion of major issues will provide an important foundation to establish policy principles to guide the development of a judicious oversight of the spectrum resources.

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SECTION I

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INTRODUCTION AND INTENT

Introduction

The radio frequency spectrum influences the daily lives of every Canadian and accommodates a wide variety of services benefitting our social, cultural, economic and industrial endeavours. With the rapid evolution and application of new radio technologies, it is becoming an increasingly congested and limited resource, particularly in light of the ever increasing and competing demands for new services.

Canada is vitally dependent upon the judicious use of radio spectrum resources for advancing national policies, achieving telecommunications, broadcasting and cultural goals, ensuring the security and welfare of the nation and conducting its domestic and foreign affairs. The radio spectrum resource is also a basic underlying element of the Canadian telecommunications and broadcasting infrastructure. The availability of and access to suitable radio spectrum will have a major impact on future advances in communications services.

It has been more than 20 years since a comprehensive review of radio spectrum resources was conducted as part of the Telecommission studies after the Department of Communications was formed in 1969. In its continuing public consultation process, the Department conducts policy reviews on a wide range of issues related to the use of spectrum resources. (These reviews have included preparations for International Telecommunication Union (ITU) World Administrative Radio Conferences, the 1 to 10 GHz, 10 to 30 GHz and the 30 to 960 MHz reviews). However, these have been limited in scope and encompassed, in many cases, issues or concerns to meet near-term demands.

It is now opportune to reassess, through wide public consultation, Canada's general spectrum policy directions to assure an effective framework is in place to meet its existing and future public objectives.

This Discussion Paper provides an overview of spectrum resources in terms of their impact and benefits to Canada. It then presents some of the significant trends, pressures and challenges occurring in spectrum management and concludes with a set of issues and principles for discussion.

Intent of Spectrum Policy Review

The overall objective of this initiative is to develop a spectrum policy framework for Canada which will establish principles for the oversight of spectrum resources that are responsive to the public interest as well as fostering the utilization of these resources for the benefit of all Canadians.

Subsequent phases of this public consultation are intended to culminate in a comprehensive review of spectrum resource policies, utilization and principles, public interest elements and options and alternatives for dealing with spectrum resource demands and issues.

This initiative was announced by the Minister of Communications at the Spectrum 20/20 Symposium in Montreal in November 1989. The Minister stated, "The reassessment of our spectrum policy is considered an integral part of the modernization of our infrastructure and is necessary to ensure that our telecommunications infrastructure is sufficiently flexible and advanced to meet the economic, social and cultural needs of all Canadians at the dawn of the Twenty-First Century." He went on to say, "It is also important that the regulatory and legislative framework promotes the rapid and orderly deployment of products and services to all Canadians wherever they may live in Canada".

The Minister indicated that the public review would discuss among other areas the principles of auctioning of spectrum, considerations of economic factors in spectrum allocation, financial contributions to radiocommunications research and development, alternatives to radiocommunications and the appropriateness of our current spectrum management mechanisms and procedures to rapidly developing technologies.

This Discussion Paper should not be considered as including the current preparations for the 1992 World Administrative Radio Conference (WARC) or as interfering with any of the current public consultations on specific spectrum policy initiatives, licensing policy reviews, review of conditions of licence or processes or other radiocommunications matters. (These public consultations will proceed as scheduled).

This general spectrum policy review is intended to deal with a broad range of issues that will lead to establishing principles for a policy framework, rather than dealing with specific spectrum issues on an immediate and case-by-case basis without

strategic coordinated direction. The review is primarily addressed to the users of the spectrum, service providers, manufacturers and associations and those concerned about the future course of spectrum policy in Canada.

The responses to this Discussion Paper will assist in the development of the subsequent phase, which will involve proposals on principles for a spectrum policy framework, and is expected to be initiated by early 1991. Following public consultation on these proposals, it is foreseen that a Spectrum Policy Framework for Canada would be enunciated in 1991 making provisions for a number of policy initiatives in high priority areas.

SECTION II BACKGROUND

This section provides an overview of the importance of spectrum resources to Canada and puts into context the role of the Department and the impact on domestic decision-making of recent developments in the regulatory environment.

Importance of Spectrum Resources

Canadians use radio spectrum resources every day - at home watching television, making a long distance telephone call provided by radio circuits, using a cordless telephone, microwave oven or garage door opener, and mobile cellular communications. As well, this invisible resource is being used in radar services to guard the nation, radionavigation services to assist in orderly and safe travel and in industrial, scientific and medical uses to assist in the development of services required by the users.

Canada's demographic diversity has historically promoted the development of advanced radiocommunications systems to link the country. The need to build an efficient telecommunications infrastructure from coast to coast and to bring the communities of Northern Canada into the Canadian and international infrastructures has significantly advanced the use of radiocommunications. The benefits have been enormous. Spectrum resources have provided a central role in forging Canadian social, economic and cultural strength, and they have formed the basis of a significant, independent manufacturing and service industry.

Spectrum resources support a multi-billion dollar industry. Satellite and microwave radio relay systems have provided to-date the bulk of the intermediate to long-haul transmission capacity of the Canadian telecommunications system and are a dominant part of the radio industry. Capital investments in radar, radionavigation and other radio systems are equally large. Public and private mobile radio, cellular radio and other radiocommunications systems are an increasingly growing industry.

Due to Canada's size, diversity and population concentration and dispersion, spectrum resources have, by necessity, played a major part as an instrument of cultural dissemination and recreational endeavours of Canadians. Without radio and television local and network broadcasting, social and political unity would have suffered and the expression of cultural heritage and values would have been hampered. In Canada, because of the immense distances and sparse population, radio services are an essential catalyst to national development and well-being.

Role of Department

Canada has always been a nation keenly aware of the international dimension of its economic and social activities. As the radio frequency spectrum is a common global resource, spectrum management can only meaningfully take place through bilateral agreements with neighbouring countries and multilateral arenas such as the International Telecommunication Union (ITU).

The Minister of Communications and the Department are responsible for developing national policies and goals for spectrum resource use and fostering the orderly development and operation of communications in the domestic and international spheres.

Decisions must be viewed in light of the Department of Communications mandate which reflects its central role within the federal government in strengthening the nation through communications and culture by ensuring that:

- (a) Canada's communications systems evolve in an orderly fashion at the forefront of global developments while continuing to meet the basic communications needs of all Canadians at affordable costs; and
 - (b) Canadians have the freedom to choose a wide selection of Canadian cultural products and information services among the broad international choices being carried on our communications systems.
- (Source: Annual Report 1987/1988)

The Department has historically provided general guidance to users of spectrum resources and ensured that developments in Canada are in accord with overall social, economic and cultural policies. Canada has become a world leader in spectrum management systems and the application of radio technology in the public interest.

Current Spectrum Policies and Principles

Under the Convention of the ITU, member organizations are obliged to use the radio frequency spectrum in a rational manner and to prevent interference to each other. Through the process of ITU World Administrative Radio Conferences, frequency bands are allocated to different radio services. Along with the specific allocation, accompanying regulations, frequency plans, frequency assignment and coordination procedures are established to ensure efficient and compatible use of the spectrum resource. At a national level, a country has certain flexibility to decide on a particular service allocation to meet its domestic needs, provided that it does not interfere with adjacent countries.

The radio frequency spectrum is allocated to services whose needs are best tailored to specific parts of the spectrum. Generally, the Canadian Table of Frequency Allocations describes the full range of spectrum allocations for specific radio services. While its primary purpose is to accommodate domestic needs, it is consistent with the International Frequency Table of the ITU.

While Canadian spectrum policy must respond quickly to frequency allocation changes made by the ITU, it is clearly in Canada's interest to influence the international process so it will accommodate Canadian interests. This is done at the early stage of international negotiation through to the ITU Administrative Radio Conference where the decisions are made.

From time to time, the Department allocates specific frequency bands to services in order to satisfy domestic communications requirements.

Within the Canadian environment, use of the radio frequency spectrum is contingent on an efficient and effective set of spectrum and licensing policies, radio regulations, radio system standards, rules, procedures and practices designed to accommodate as many users as possible, and to promote equitable sharing among the users in an environment free from harmful interference.

Policies are developed to achieve optimum utilization of the radio frequency spectrum to meet the immediate and long-term needs of users. Through regulations, a sufficient level of security and control is maintained over the spectrum. As well, administrative tools to monitor and manage the spectrum resource are developed. Negotiations with other countries and agreements must be concluded and detailed technical requirements need to be established.

Licensing policies are also consistent with an overall policy objective aimed at fostering the efficient development of telecommunications, broadcasting and other services in Canada.

The Department of Communications has established well-balanced allocation principles to meet the public needs, to encourage efficient development of radiocommunications and to ensure effective management of the radio frequency spectrum.

Some of these principles guide spectrum management practices and include the following:

Allocation of Bands to Radio Services - Bands of spectrum are allocated to particular radio services. Each frequency band (i.e. HF, VHF, UHF, etc.) possesses propagation and other characteristics peculiar to it which more or less determine its optimal usage. These characteristics are factored into the process when sub-allocations or utilization policies are made to support particular radiocommunication services.

Allocation to Usage - Spectrum allocation is on the basis of usage rather than type of user. (Usage refers to the types of radio systems applications such as paging use, dispatch mobile radio use, broadcasting use, etc. User types are exemplified by the common carriers, electric power utilities, railway companies, etc.). Under this arrangement, spectrum is shared among various user groups and is more fully utilized.

Interference Free Operation - The effects of harmful interference are minimized through the development of technically feasible options taking into account system characteristics and limitations and coexistence with other services.

Conformance to Standards and Plans - Common standards are required to allow orderly development of radio systems and to avoid interference, allow common usage and as a basis for regulation.

Public Interest Factors - An assessment of the public interest to be met by any particular service is of great importance, particularly where there is intensive spectrum usage. (For example, for microwave systems, the applicant must demonstrate that there is a public interest and need to be served by the creation of the new facility, and that existing facilities cannot properly satisfy this interest and need).

Orderly Growth of Communications - The proposed usage of the spectrum must be in harmony with the overall objectives of spectrum usage in Canada.

Use Must be Justified - The need must be demonstrated in each radio application as well as the appropriateness of the use of the spectrum rather than non-spectrum alternatives.

Socio-Economic Factors - In the allocation of spectrum to services, the social and economic aspects of the service is taken into account. (For example, in the 1970 microwave system licensing policy, socio-economic criteria were introduced for authorizing microwave systems, to assure maximum social benefits and a minimum of wasteful duplication of investment where resources are both scarce and essential).

Reservation of Spectrum - The Department does not normally reserve spectrum for any user(s) in order not to compromise efficient spectrum utilization and management. However, in specific instances, for growth protection (i.e. broadcast plans and microwave growth plans) frequencies may be set aside within a specific plan.

Fostering of New Technologies - The use of newly available technologies which would result in increased traffic-carrying capabilities or the development of new services is encouraged.

Encouragement of Non-Radio Alternatives - The Department encourages potential spectrum users to pursue to the extent possible the use of non-radio alternatives where reasonable economic and transmission requirements can be achieved from non-radio alternatives.

Public Consultation - The Department is continually advancing its spectrum allocation and utilization policies, licensing policies, standards and regulations through full public review. This consultation is conducted usually with a formal Notice in the Canada Gazette and at times with the publication of an associated discussion paper.

The Department, in order to improve its spectrum policy decision-making, has initiated an extensive public consultation process and a disciplined approach to address specific spectrum allocations and international negotiations. However, events and the technological explosion in radiocommunications may in the future outpace the Department's ability to respond in a timely manner to meet spectrum needs. The challenge to Canadians is how to improve an existing spectrum policy framework, one that has worked well in the past, to meet new and complex demands and pressures. The next section addresses in more detail these trends, pressures and challenges arising in the spectrum resource environment.

SECTION III - THE ENVIRONMENT

Trends, Pressures and Challenges

Several major developments - the pace of emerging technologies and networks, the growth in the use of spectrum resources and services, international globalization, legislative and regulatory developments and the restructuring of the role of the public sector in the Canadian economy - all highlight that a reassessment of the benefits of current Canadian spectrum policy needs to be pursued.

--- PACE OF EMERGING TECHNOLOGIES AND NETWORKS --- The pace of technology development has accelerated. The time from equipment design to market is becoming very short for new products and services. Once a spectrum allocation is agreed to at the ITU, related domestic policies must be harmonized with the international changes to permit manufacturers to access the spectrum resource and enter the marketplace.

Yet the traditional view of good management of the spectrum requires the Government to undertake or establish certain spectrum utilization criteria, to establish administrative procedures and possibly to establish or revise technical standards before new radio services and applications may be authorized. This process is time-consuming, expensive, and can constitute an obstacle to the rapid market entry of innovative services. Often more rapid market entry is facilitated by authorizing new and innovative services on an experimental basis.

New networks based on digital technologies are emerging rapidly. New technologies in broadcasting intended to increase the realism of the viewing and listening experience through improvements in the quality of sound and picture are rapidly being developed. Integrated digital services and networks will become commonplace in future telecommunications systems. Digital technologies will markedly increase the transmission capacity and efficiency of distribution systems. This will result in the blurring of the medium, the message and the spectrum utilization.

Technological advances in mobile communications have increased the users awareness of these services, the benefits that could be derived as well as meeting the need for personal "mobility" in communications.

International developments in mobile communications and advanced broadcasting systems are placing higher priorities on the future planning and utilization of the spectrum resource.

--- GROWTH IN USE OF SPECTRUM RESOURCES --- As an example, radio station licences (excluding General Radio Service) were doubling every ten years. The overall demand for mobile radio communication services, including paging, mobile radio, cellular telephony, mobile data communication, cordless telephone and personal communication networks will likely continue to increase by 10% to 20% per year.

An explosive growth is anticipated in mobile and personal communications. (Several telecommunications companies estimate 50% of their connections will be mobile at one end by the Twenty-First Century). How will these demands be met and what will be the priorities?

--- EXISTING AND EMERGING NEW SERVICES --- Pressures are being placed at the lower end of the microwave spectrum (in the VHF and UHF bands) for additional frequencies for existing and emerging new services such as public cordless telephone, paging services and new personal communications, digital sound broadcasting (terrestrial and/or satellite) and mobile satellite. Also considerable interest is being generated for wide-band High Definition Television (HDTV) broadcasting by satellite in the SHF band. The 1992 World Administrative Radio Conference (WARC) will address these frequency allocation requirements and all indications are that significant pressures will be exerted to find new allocations in the crowded VHF and UHF bands and in the SHF band.

In the longer term, as congestion increases, it is likely that new policies will have to be developed to provide spectrum for new services, likely through a gradual displacement of fixed services to higher bands.

There is a need for government to guide the allocation of spectrum in the 1990's and beyond and to support the objectives of other priority projects (such as Vision 2000---a major Canadian research and development project to support personal productivity networking and to use the power of communications to enable Canadians to work and create more effectively, as well as R&D in the millimetre bands).

--- INTERNATIONAL TRENDS AND GLOBALIZATION --- For Canadian spectrum policy, globalization means the planning and management of Canadian requirements in the context of comprehensive policy changes taking place at the international level.

Users, services and companies are all becoming more international in perspective. Worldwide competition has been fierce for new products and services. Many large companies operate on a global scale, operating comfortably in any country.

Increasingly, with the high degree of worldwide market potential for services, the spectrum is being viewed as a strategic resource for the future trade of radio services and products to the consumer. For example, satellite broadcasting services are seeking international service distribution and mobile satellite networks are seeking to provide aeronautical, maritime and land mobile services. Canadian firms are facing a challenging international environment.

In addition, factors associated with the General Agreement on Tariffs and Trade, Canada-U.S. Free Trade Agreement and global competition all must be taken into account, when establishing frequency allocations.

Major new services, such as personal communications networks and advanced broadcasting services, are being developed in Europe and Japan with global markets in mind. Even domestic broadcasting networks now rely on being part of a worldwide communications resource.

The rapidity and complexity of technological change has also compelled the ITU to study its mode of operation. At the last Plenipotentiary Conference (Nice, 1989), it was decided to establish a Voluntary Group of Experts to examine in greater

detail allocation matters including the study of the definition of radio services, the structure and method of establishing international frequency allocations. This group will also tackle the simplification of the ITU Radio Regulations.

As well, a High Level Committee was established, to reassess the ITU's structure and functioning including an assessment of its regulatory function including spectrum management systems, the work of the International Frequency Registration Board (IFRB) and the role of other ITU organs involved in radiocommunications, such as the International Radio Consultative Committee (CCIR).

A large part of Canada's spectrum planning and management takes place with the United States. This is an inevitable function of geographical and economic commonalities. Our policies often share a common ground, but just as often independent stands must be taken and defended.

--- **LEGISLATIVE AND REGULATORY DEVELOPMENTS** --- The Department of Communications develops national policies and goals for spectrum use in accordance with legislation that governs its operations.

The Department through the **Department of Communications Act** and the **Radiocommunication Act**, is responsible for establishing well-balanced spectrum allocation and utilization policies to meet public needs, efficient development of radiocommunications in the public interest and ensuring effective management of the radio frequency spectrum.

The Department also initiates the review and the amendment of that legislation to reflect the evolution of the spectrum environment. New initiatives have hence been undertaken to deal with the convergence of technologies and research and development.

The new **Radiocommunication Act**, given Royal Assent on October 4, 1989, provides considerable flexibility to deal with technological change, to implement policies governing the structure of the radiocommunications service industry, and to be responsive in dealing with innovations and new uses of radio. It also increases Ministerial flexibility respecting licensing. Associated with implementation of the new Act will be a major rewriting of the General Radio Regulations.

On July 22, 1987 the Minister of Communications announced a **Telecommunications Policy Framework** respecting the establishment and operation of telecommunications common carriers in Canada. The policy is expected to foster Canadian ownership of common carriers and a more uniform and competitive national market while ensuring the efficient use of facilities. The Minister is

planning to introduce a comprehensive telecommunications bill to include a number of elements: modernizing legislation, establishing Canadian ownership regulations, granting the CRTC power to forebear from regulation, considerations of new carrier entry and establishing national standards.

On June 23, 1988 the Minister of Communications announced a new broadcasting policy and tabled a Broadcasting Bill which addresses distribution systems. Some of the objectives mentioned in the Bill are the use of the most cost-effective technologies and the according recognition of a priority to Canadian programming services. The Bill fosters a "technology neutral" approach to the delivery of broadcasting programming and does not favour one technology or set of technologies. In addition, the new Bill recognizes that broadcasting goes beyond the traditional, over-the-air technologies of "radiocommunications," and will overlap and converge more and more with telecommunications.

Linkages to Canadian policies must be established to ensure that the radio spectrum will enhance the ability to meet the objectives enunciated in existing and new legislation.

--- ROLE OF PUBLIC SECTOR IN THE CANADIAN ECONOMY --- During the 1980's, Canada has witnessed a reduction in the role and contribution of the public sector in the financing, research and development of spectrum based technologies. This has been necessitated by national and international economic conditions. There has been an increased reliance on partnerships and sharing arrangements with the private sector to continue Canada's "edge" in many areas of technology development. This has occurred at a time of unprecedented technological development and of unprecedented demands upon spectrum resources.

--- SUMMARY --- The volume and acceleration of technological and regulatory change have created enormous pressures for a new look at Canada's approaches to spectrum policy. Canada has reached a point where a complete reassessment of the spectrum resource philosophy and its utilization is necessary to retain an ability to effectively manage its own technological future.

As the radio frequency spectrum is a limited and strategic resource supporting the social, economic and cultural infrastructure, new approaches and innovative deployment may be desirable with the rapid advances in technology and increase in service demands. National priorities and the public interest will need to be balanced against international directions.

As the Minister of Communications stated in late 1989 at Spectrum 20/20, "We must now take stock of the current spectrum allocation policy and assess the new needs in this field so that Canada may continue its economic, social and cultural development in the Twenty-First Century".

SECTION IV - ISSUES AND PRINCIPLES FOR PUBLIC DISCUSSION

This reassessment of Canada's spectrum policies is an integral part of the modernization of its communications infrastructure. Overall policy directions must be developed for radiocommunications as it is being done for telecommunications, broadcasting, cultural development, the convergence of technologies, and research and development.

As part of the public discussion on the development of a Spectrum Policy Framework, interested parties are invited to provide their views and comments on a number of issues and principles. Input on other issues deemed relevant to the scope of this review would also be welcome.

1.0 ALLOCATION OF SPECTRUM RESOURCES

The allocation and utilization of spectrum resources will be viewed from the standpoint of linkages to legislation objectives, public interest principles and socio-economic factors.

1.1 Linkages of Spectrum Resources to Legislation Objectives

Radiocommunications has become an integral part of the distribution media for a wide variety of services to the general public and industry, and an integral component of the Canadian telecommunications and broadcasting systems. It is also indispensable for the security, safety and sovereignty of this country.

The Department of Communications through the Radiocommunication Act, is responsible for the management of the spectrum resource in the public interest.

As spectrum policies are important to support the objectives of the proposed broadcasting and telecommunications legislation, as well as the advancement of economic and cultural goals, Canadian policy objectives should therefore be viewed in terms of priorities in the utilization of spectrum resources.

Taking into account Canadian objectives for spectrum resources, interested parties are requested to respond to the following questions:

- (a) Spectrum resources can be linked to and be supportive of a variety of national and international goals and/or objectives, be they economic, social, cultural, safety, security, sovereignty, etc. In general and specific terms, what should be the long-term (10 years and beyond) goals and objectives to be served by public spectrum resources?
- (b) What order of priority, if any, should be ascribed to these goals and objectives and why?
- (c) Are there areas where regulation of the spectrum resource is not required? If so, what alternatives are there?
- (d) Is spectrum policy development acting as a barrier to productivity development and access to the spectrum? If it is, how could the situation be improved?

The comments received will assist in advancing clear objectives and goals for Canada's spectrum resources.

1.2 Public Interest Principles

Exploitation of the spectrum resource is contingent on an efficient and effective body of policies, rules, procedures and practices designed to accommodate as many users and service applications as possible, and to promote equitable sharing among the services and users in an environment free from harmful interference.

As a general guiding principle, an assessment of the public interest to be met by the use of spectrum resources is of great importance, particularly in areas where there is intensive spectrum usage. For example, radio systems providing a "safety service" (e.g police, ambulance or fire) or national security services can assume primary importance in comparison to some other uses of radio in some situations.

Services involving the security and sovereignty of the country and safety of life and property can be given higher priority than others to be established for industrial or business communications purposes. However, telecommunications common

carriers, broadcasting undertakings, public utilities, highways and transportation systems, etc. which serve the general public are given a higher priority than the establishment of private radiocommunications links for individuals.

In terms of the public interest aspects of spectrum resources, interested parties are requested to respond to the following:

- (a) Should principles of "public interest" as they pertain to the use of spectrum resources be more explicitly defined? If so, what criteria should be established and why?
- (b) Should priorities be established for certain radio services? Are there specific priorities that should be attributed to public radiocommunications undertakings?
- (c) Should some or all public radiocommunications service providers have public interest obligations to provide a certain basic level or standard (technical, interference-free) of service? If so, how should these be dealt with by the Department?

Comments received will assist in determining the public interest aspects of spectrum resources and priorities of services.

1.3 Socio-Economic Factors

In the allocation of spectrum to services, the social and economic aspects of the service is taken into account. For example, in 1970, the Minister of Communications announced that broader criteria would be applied to the licensing of microwave relay systems due to the growing social and economic importance of this form of telecommunications. These criteria were introduced to assure maximum social benefits and a minimum of wasteful duplication of investment where resources are both scarce and essential.

However, major shifts of national interest may be required to attempt to accommodate anticipated requirements, the magnitudes of which are not clear. As an example, the debate over standards for advanced television systems (e.g. HDTV) includes a range of options for delivery which could have tremendous impacts on the existing spectrum allocations, and investments in production, distribution and consumer equipment. In order to adequately assess various allocation tradeoffs, socio-economic considerations and the overall public interest needs to be taken into account.

As well, all indications are that fibre will relieve significantly the transmission requirements for fixed service spectrum on a number of microwave radio relay applications thus making new spectrum available for other expanding services.

The provision of advanced television systems by off-air broadcasting may be accommodated within the existing NTSC television channel or may require an additional 3 or 6 MHz television channel. These standards are yet to be determined. On the other hand, the cable distribution network is well advanced in Canada, reaching most homes in urban areas. The quality of these systems is being gradually improved by the application of fibre optic cable. During the 1990's, will the cable infrastructure including fibre optic upgrades play a significant role in alleviating the demand for additional spectrum in urban areas to introduce HDTV?

In considering the frequency allocation and utilization of spectrum resources to various services, interested parties are requested to respond to the following:

- (a) What socio-economic factors should be taken into account in the allocation and utilization of spectrum resources, and what should be their relative priorities?
- (b) How should these factors be applied in the spectrum resource decision process?
- (c) To what extent can socio-economic priorities and objectives be met by using non-spectrum alternatives?

The responses to this section will assist in the determination of socio-economic factors to be taken into account in spectrum policy development.

2.0 SPECTRUM POLICIES

The Department seeks to fulfill its mandate to foster the orderly development and operation of communications for Canada in the domestic and international spheres, in part through the planning and management of the radio frequency spectrum resource. Policies are developed to achieve optimum utilization of the radio frequency spectrum to meet the immediate and long-term needs of users.

There is now a pressing requirement to accelerate development and increase the flexibility of the telecommunications infrastructure in radiocommunications to improve industrial competitiveness and to better meet in future the cultural, social and economic needs of Canadians. Without a reassessment of its spectrum policies, Canada's flexibility, adaptability and responsiveness to these increasing demands and technological developments may not be suitable to the emerging radio service needs and challenges of the 1990's. In addition, without the reassessment, it is likely that policies will continue to be developed without due consideration to the longer term and other important factors.

Spectrum policies can be viewed from the standpoint of spectrum conservation and efficiency, radiocommunications alternatives and spectrum sharing and displacement of existing services.

2.1 Spectrum Conservation and Efficiency

Generally, spectrum conservation represents those operations which provide and extend similar services to the greatest number of users and provides the greatest transmission of information per unit of spectrum. Radiocommunications applications based on spectrum efficient techniques are generally given preference particularly in the areas of moderate to intensive use.

The Department encourages the use of newly available technologies which would result in greater spectrum efficiencies through increased traffic-carrying capabilities without requiring additional spectrum. Systems proposals are evaluated in terms of optimum and economically feasible usage of innovative and state-of-the-art practices. The Department may authorize radio systems using station parameters which promote spectrum conservation while satisfying the coverage and reliability demanded by the service application.

As a further measure, the Department may adopt spectrum policies or system applications measures to conserve the spectrum. For example, the use of trunked systems for mobile radio service and the development of a digital mobile infrastructure in spectrum congested areas such as Toronto, Montreal and Vancouver.

In terms of future spectrum conservation and efficiency considerations, interested parties are requested to comment on the following:

- (a) What further spectrum conservation measures would be appropriate for the Department to adopt to encourage a more efficient and greater conservation of spectrum?

- (b) What priority and implementation considerations should be attributed to each of these measures and why?
- (c) Should the Department reserve spectrum, to a greater or lesser degree than the present time, for specific services?

Comments received will assist in the determination of spectrum conservation principles which could be applied in developing spectrum allocation and utilization directions.

2.2 Radiocommunications Alternatives

Increasingly, opportunities are arising to use non-radio transmission facilities such as fiber optical and coaxial cable resources for the delivery of services. Consequently, applicants for radio licences may expect the Department to continue to strongly encourage the use of non-radio alternatives and to request comparisons in the application of fiber optics and coaxial cable, especially in areas where spectrum is congested or heavily utilized and where these alternatives can be reasonably deployed.

By using non-radio alternatives, spectrum may become available for other services and may reduce the growth in demand for spectrum in the short or long term. There may be a number of appropriate incentives which could be introduced.

In terms of spectrum alternatives, the following questions are appropriate:

- (a) What should be the guiding limits of the Department in encouraging applicants to consider alternative transmission to radiocommunications?
- (b) What type of incentives could be used to encourage non-spectrum alternatives?

Responses in this area will assist in determining the overall emphasis and commitment to the use of alternatives to spectrum.

2.3 Spectrum Sharing and Displacement of Services

In a future environment of increasingly scarce spectrum resources, there may be a need to share to a greater extent the spectrum resource among services in particular allocations and in locations where there is congestion. For example, the possibilities of land mobile sharing with television broadcasting might be explored.

As well, there are indications that further pressures in the future will require the gradual movement of fixed services into higher frequency bands to make way for new services such as mobile and mobile satellite services and sound broadcasting satellite.

The sharing of spectrum is different in an urban and rural environment. This raises the question of timing, technology impacts and amortization of equipment.

Also, there is spectrum allocated to future new services where several years may be needed for a technological or economical situation to be available to support such radiocommunications. As an example, spectrum requirements have been provided for Direct Broadcasting Satellite service since 1983. As yet, in North America, the service has not been implemented although recently there has been considerable interest in the United States.

Designating spectrum by type of use has also proved effective in satisfying the public demand for radio services in various areas of Canada.

In terms of spectrum sharing and displacement of services, interested parties are requested to comment on the following aspects:

- (a) Should spectrum users and licensees be required to share spectrum to a greater extent, and if so, what conditions should apply?
- (b) Should consideration be given to allotting spectrum, or certain bands of spectrum, to users or user groups? If so, what measures or responsibilities need to be enforced to ensure effective utilization?
- (c) Should a radiocommunications service be allowed to develop as a Secondary Service in certain frequency bands which would not be used imminently by a Primary Service? What should be the compelling provisions to ensure that Secondary Services or other services vacate the spectrum?

Comments will assist in the development of appropriate spectrum utilization principles for spectrum resource sharing or displacement appropriate for Canada.

3.0 LICENSING POLICIES

The traditional means of radiocommunication development in Canada has been to allocate bands of spectrum to particular radio services and then to subsequently license applicants within each service. This processing and assigning of frequencies for radio applications is accomplished according to existing spectrum utilization policies, licensing policies, general radio regulations and radio system standards and is normally on a "first-come, first-served" basis, providing that the licensing will not totally pre-empt the licensing of other similar applications at a later date. However, preference is generally given to those applications providing greater public benefits, better spectrum utilization and overall efficiency.

Until recently, there has not been a need to diverge significantly from this method of licensing. However, in several situations, there has been an increase in user demand and no corresponding increase in spectrum supply or rapid adoption of improvements in usage technology.

Licensing policies are generally reviewed to take into account new developments in services, the market demand and the need for competition. These are reflected in the present microwave licensing initiatives, the licensing policies for cellular systems, trunked mobile radio and nation-wide paging and the review of licensing in limited spectrum environments.

Licensing of radiocommunications facilities must also be consistent with fostering the efficient development of telecommunications and broadcasting services in Canada.

In terms of general licensing policies, interested parties are requested to respond to the following:

- (a) To what extent are the licensing policies, procedures and authorization decision processes appropriate to rapid access and deployment of radiocommunication technologies and services? What changes, if any, should be made?
- (b) Should licensing policies be used to encourage marketing trials, industry development, experimental systems for new equipment and services, to advance competition and to enhance spectrum access?

Comments received will assist in the development of licensing policies.

4.0 STANDARDS AND PLANNING

The development of policies and regulations associated with the allocation of spectrum resources is subject to economic, political and technical analyses. Options pertaining to any use of the spectrum are also contingent on technically feasible options in terms of radio system characteristics and limitations and coexistence with other services to ensure, to the greatest degree possible, the absence of harmful interference. These require considerations associated with standards and planning.

4.1 Standards

Over the years the Department has adopted the principle of conformance to Departmental standards, which are national in scope, for radio services (for example, Radio Standards Procedures, Standard Radio System Plans, Broadcast Rules and Procedures). These technical standards are established in conformity with national frequency plans and have evolved into an essential element to assure that the spectrum is used without harmful interference and to facilitate sharing among different services and to assist in the identification of interferers.

In recognition of the fact that the requirements for spectrum vary widely across Canada and that it may not be appropriate to impose the same requirements for applications in the remote areas as it is for the most congested areas of the country, the Department has adopted the principle that it will permit a certain degree of flexibility in the application of these standards or in fact enunciate different requirements more attuned to local requirements. These variations will still be subjected to the general requirement of good spectrum management including the required signal quality, interference criteria, economic and social policy aspects and appropriateness for the purpose.

Some further considerations are the economies of scale and the multinational nature of many manufacturers. It is unclear with large scale volume manufacturers that any economic savings would really be appreciable if the current small national Canadian market was further segmented into two or three classes of equipment of different standards. Every effort has been made to make compatible our standards related activities with those of other countries particularly in North America. The advances in the General Agreement on Tariffs and Trade and more recently the Free-Trade Agreement have given added emphasis to the preceding considerations. In particular, with reference to the U.S.A., in those instances where the service on both sides of the border is

identical (e.g. cellular systems), one might consider the appropriateness of reciprocally accepting the Department or U.S. Federal Communications Commission (FCC) equipment approval for the purposes of licensing and operation. Hence it would appear appropriate to recognize the need for compatibility within a policy framework.

In terms of the area of standards, interested parties are requested to comment on the following:

- (a) To what extent is the development of technical standards appropriate to the rapid deployment of radiocommunication technologies?
- (b) When should there be consideration for demographic differences in standards which may advance radiocommunications and provide significant benefits?
- (c) To what extent, within domestic objectives, should standards related measures and procedures be made compatible with those of other countries? In the case of the U.S., where the service is identical on both sides of the border (e.g. cellular systems), would there be any benefit to accepting reciprocally in certain cases the U.S. equipment type of approval for the purposes of licensing and operation? How would this best be done?

Responses to this section will assist in the determination of the relative needs for future North American standards requirements.

4.2 Planning

Under the Radiocommunication Act, Section 5.(1)(e), the Minister of Communications is responsible for planning the allocation and use of the spectrum. The need for more and better information, including statistical, on spectrum use and efficiency and its availability in various locations will be required to allow the Department to adapt to and be more responsive to new demands being placed on the spectrum resource.

Historically, the Department has done its planning for the spectrum through a consideration of a number of factors, notably among them:

- review of international developments
- review of technology developments
- review of emerging public need
- a public consultation process in the allocation of spectrum.

The result of this process has been spectrum utilization plans which some might suggest have been unduly rigid. However, as we move forward, increasingly there will have to be new measures related to the various aspects (demographics, changes in consumer demand, technology diffusion, etc.) of the spectrum resource.

With regard to spectrum planning, the Department solicits comments both on the process and the perception of the results and seeks advice accordingly. Respondents are requested to reply to the following questions:

- (a) What improvements or changes should be made to our spectrum planning processes? (As an example, the role of the general public in this process could be reviewed. Up to now their part has been mainly in responding to Canada Gazette Notices).
- (b) What types of information and statistics would be most appropriate?
- (c) What type of Departmental planning information or statistics should be placed in the public domain?

Comments to this section will assist in determining planning needs and tools.

5.0 SPECTRUM RESOURCE REVENUES

Licensees are responsible for paying a licence fee for the recovery of costs associated with the overall planning and management of the spectrum by the Government. In an environment of increasingly limited spectrum, it may be timely to consider a new approach to fees appropriate to the use of the spectrum. These fees could be related to the following:

- **Leasing Fees** - This would involve leasing the use of the spectrum for a limited period of time for experimental or marketing developmental purposes or on a Secondary Service basis until the spectrum is acquired by a Primary Service. (A Secondary Service has no licensing protection from the use of spectrum by a Primary Service). Leasing could also be appropriate under a system where the spectrum is leased under a number of specific conditions such as increasing spectrum efficiency, providing specific public interest services or research incentives.

- **User Fees** - Some form of user fee might be considered in relation to consumption of the spectrum resource (i.e. related to time, bandwidth and geographical location of use with the high usage areas having a premium fee). If fees are levied to a greater degree than at present on the amount of spectrum used, there would be a greater incentive to use less spectrum to avoid the higher costs. Fees could also be related to spectrum congestion i.e. lower fees could be an incentive to use frequencies in certain frequency ranges or areas where the spectrum is not as congested. This sort of variation in fees has already been introduced in some cases for the geographic dimension of spectrum congestion.

Spectrum fees could also be related to frequency band, power levels and accrued benefits (social, economic, commercial, etc.)

- **Value-Added or Enhanced Services Fees** - This type of fee may be appropriate where the value is added to the service or the service is enhanced to reap greater benefits or profits from the resource than that which would normally be required in the public interest for basic or universal services. This is not unlike the tiering of broadcasting channels for discretionary services, where additional charges may be applied. An example in the current context is advanced television services enhancing the traditional television channel and perhaps only available to the consumer at a premium. (In other words, the additional television channel frequency bandwidth could be available to licensees at a premium price to provide an enhanced service).

Interested parties are requested to respond to the following:

- (a) Are fees and/or taxes an appropriate mechanism to use as an incentive or disincentive in the more efficient and effective use of spectrum?
- (b) Should these be used for future development of spectrum resource management to a greater extent than today where licence fees cover the costs of policy development, planning, spectrum research and international negotiations?

Responses to this section will assist in the future consideration of an appropriate approach to charging for the use of the spectrum.

6.0 MARKET-BASED CONSIDERATIONS

The establishment of market-based principles for the allocation or assignment of a particular portion of the radio spectrum (for example, public radiocommunications services, where the spectrum resource will have a commercial value), is a spectrum resource policy matter where conflicting demands have to be balanced against public interest principles such as competition, socio-economic benefits, service provisioning and industry structure under a number of different scenarios. (Auctioning or putting value on spectrum resources has been the subject of continuous public debate in many countries as a fundamental policy direction).

The current practice of competitive licensing and the potential use of auctioning is directly linked to the provisioning of public commercial services and an integral part of telecommunications policy and service development. For example, this has been the case for guiding the industry structure and services development for the competitive licensing of cellular mobile and nation-wide paging systems. This will likely be the case for the orderly introduction of competition in the provisioning of future public radiocommunications services such as air-ground mobile service, public cordless telephone and future public mobile services.

The Minister of Communications stated, in a speech to the Spectrum 20/20 Symposium in Montreal in November 1989, that discussion should be started on a number of principles pertinent to a new strategy. The auctioning of spectrum or employment of some form of market-based mechanism in the management of the spectrum resource is a possible option to be considered.

In order to objectively review market-based concepts, it is considered essential that all concepts be brought forward at this time. Market-based concepts could be applied to a block of frequencies, a specific band of frequencies or to a minimum number of frequencies. In situations where the demand for radio frequencies will or does exceed the available supply, where a new band is to become available for new services or a new radio service is to be provided and there are many potential providers, then a market-based approach may be appropriate. There are also related issues as to rights acquired i.e. whether they can be transferred or resold.

Various options would have to take into consideration factors such as the nature of the system, type of service (public or private), spectrum availability, extent of the system (national, regional, local, etc.), and regulatory and licensing requirements.

Factors not directly related to the technical and commercial aspects of the spectrum may have to be taken into account such as social, cultural, national defence and security needs.

Some of the options which could be considered in an allocation or licensing context include the following:

Administrative (Comparative) Processing

This option is often viewed as appropriate in the Canadian context and has been the Department's approach in managing the spectrum and the decision-making process for granting licences in situations where there have been more applicants than spectrum available. It has been a closed process, not subject to public consultation.

This process is normally initiated by a "call for applications" to develop a radio service for a frequency band, or with limited frequencies. It requires extensive preparation to ensure that all potential applicants are made aware of the opportunity to submit applications and that the method of application, evaluation criteria and their weighting are relevant, and consistently applied and the final decision is defensible. It demands relatively high process costs for both the Department and the applicants and may result in delays in service implementation.

Due to the relative time to carry out the comparative process, it may not be responsive to the quick response time expected to bring certain services to the marketplace. Proposals, once submitted, may require further amplification before all can be consistently evaluated. Public hearings could also be considered as they provide an even more open forum for this exigency but at a price of increased cost, complexity and time.

Lotteries

A lottery process would consist of selecting a winner at random from those applicants eligible to enter the lottery.

With the use of a lottery procedure, a certain pre-qualification process must be engaged in although it need not be as detailed nor as time consuming as in the administrative option since, once qualified, each applicant has an equal chance to be selected through a random draw. Since there is little cost to applicants, a disproportionately large number of applications may be received, often by the same applicant through a number of incorporated companies. Pre-qualification and post-selection rules could help to discourage casual application as could a significant application fee.

Lotteries have been criticized as a method whereby windfall gains accrue to winners since their costs to enter are minimal and the value of the licence received is great. Lotteries could help to reduce the government administration expenses associated with the review of applications. This process is most appropriate where a large number of applicants are to provide essentially the same service with similar technologies and it would be difficult to differentiate among the applications.

The lottery process may, however, be considered as open to manipulation and not in line with the orderly development of the telecommunication infrastructure and the determination of access to the spectrum in line with policy objectives.

Auctions

An auction is concerned with the granting of a licence or the granting of spectrum to the highest bidder.

An auction procedure could secure revenues for the government on an ongoing basis or one time large revenues up-front, and supposedly it would more closely approximate the true market value of the spectrum. (This value approximation could then be used in assessing future spectrum allocation and assignment decisions).

Auctions would normally require less pre-qualification work than administrative processing, although both the applicant and the Department would have to estimate the value of the spectrum if some reasonably accurate value is to be received from the winner. This is particularly true if a minimum bid or reserve bid figure is to be established. (Depending on whether an auction is "open" or by sealed bids).

The use of auctioning could speed the introduction of new services, reduce the number of applicants and encourage rational and efficient use of the resource. An auction could be used to obtain revenues for spectrum which is particularly valuable in

some geographic locations and in some frequency ranges. It could promote value-consciousness in spectrum users and could promote spectrum conservation. It would be relatively simple to administer.

However, auctions could also deter competitive services, increase the consumer costs of the service (due to the auction price being recovered from the users) and could lessen the development of new and innovative services.

Auctioning might be also considered as open to manipulation and not in line with the orderly development of telecommunications infrastructure and the determination of spectrum access in line with policy objectives. It could be considered as equating the public interest with ability to pay.

Discussion

In an environment of limited spectrum, a market-based approach might be suitable under a number of potential scenarios.

In the future with the increasing demands for spectrum, there will be a requirement to decide among competing services and applicants for services. However, once these mechanisms are used, a series of further questions arise in their implementation concerning the process under existing legislation, comparability to other government processes, fees vs. taxes, public interests, rights, tenure, international obligations, delegated or implied powers, reclaiming frequencies, rights of existing licensees, discrimination, market restriction, spectrum efficiency, spectrum hoarding, etc.

As well, adoption of these market-based approaches would likely have to be tailored to the particular requirement at the time of determination of the type of service, the types of applicants, the type of competition and industry structure, etc. Market-based approaches would likely be more appropriate under circumstances where the service to be provided is considered as not basic and non-essential in the public interest, or where there is a fair and effective competitive situation in the provisioning of a public service. These would include for example, services for which a profit is to be derived, competition is to be enhanced or where the services are purely for convenience, entertainment and luxury purposes (i.e. improvements in quality of services).

From a Canadian perspective, it may be better to be flexible in adopting any specific technique according to the circumstances that arise and the objectives to be obtained; whether the objective is to enhance government revenues, to support social, economic or political goals or reduce the complexity of decision-making required. Another objective may be to optimize the economic efficiency of the spectrum. All of these market-based concepts will require more in-depth study.

At the present time, however, interested parties are requested to respond to the following:

- (a) Under what circumstances, if any, should the Department consider market-based techniques to determine access to the spectrum?
- (b) Should the concepts be applicable at the allocation level, to a specific band or block of frequencies, or to the frequency assignment level?
- (c) Are there any specific spectrum services applications which are best served by this approach and why?
- (d) What conditions, if any, should apply in the use of market-based techniques and why?
- (e) By what means could the public interest be protected in the introduction of market-based techniques to spectrum management?

7.0 RESEARCH AND DEVELOPMENT

As we approach the Twenty-First Century, two major challenges will have to be faced; improvement of our performance in international markets and maintenance of our cultural integrity and Canadian identity in a world of high technology. In order to ensure positioning of the Canadian industry in the global marketplace, it is imperative that we keep pace with our international competitors, which will not occur without a greater emphasis on research and development.

Funding of research and development is considered critical if Canada is to keep pace with industrialized countries in the development of products and services to meet both the domestic and international marketplace. As numerous studies have indicated, the Canadian economy requires the availability of advanced communications and information technologies and services so that Canadian industry can continue to compete in the global marketplace. Where and by whom this research is to be conducted

is of significance in these days of constrained budgets. (Public spending on R&D is about equal in relative terms to that of most other industrialized nations. However, Canadian industry spends, relatively speaking, one-half of the U.S. and one-third of Japan's spending on R&D).

In order to encourage advanced radiocommunications technologies to foster a more efficient utilization of the spectrum resource, to better serve Canadians and for a stronger developed economy, commitments to increase research and development will be required.

One means for achieving this would be to require licensees providing certain radiocommunications services to direct resources to research and development activities. One approach is to levy a specific fee from these licensees for the establishment of a technology fund which could be assigned to priority projects. Alternatively, the commitment by the licensee of a specified percentage of operating revenues to R&D projects which the licensee identifies and carries out might be part of the conditions of licence. Details on the administration of these and other options would have to be studied in greater detail.

These commitments would be expected to lead to greater spectrum efficiency in the future as well as better designed and engineered products to meet Canadian public telecommunications users needs and to improve international competitiveness. (The Department is presently negotiating commitments to research and development with some service providers).

Interested parties are requested to comment on the following:

- (a) Should certain users of spectrum contribute financially to research and development in the areas of radiocommunications systems?
- (b) Should a separate fund be established to ensure the continuation of research and development related to Canadian spectrum requirements?
- (c) Who should contribute to this proposed funding and how should it be administered?
- (d) What would be an appropriate level of financial commitment and on what should it be based (operating revenues, etc.)?

Comments received will assist in determining support for research and development

8.0 GOVERNMENT ROLE

The regulation of radiocommunications by the Government of Canada ensures a balance between economic efficiency and social equity. Government regulations can have a significant impact on business decisions and future planning for systems and services.

The government's role, in essence, has been one of providing general guidance to the users and the industry in order to obtain effective utilization of the spectrum with respect to all requirements.

8.1 Leadership

The use and dependence of our country on the spectrum resource in meeting the everyday needs of Canadians must be recognized. This recognition as well as leadership by the Government is particularly relevant now with the ever-changing environment within and external to Canada, the globalization of communications and the adverse impact of shortages of spectrum.

The following questions should be considered:

- (a) What should be the involvement of government in encouraging the manufacturing industry in Canada, the development of new radio technology applications and providing leadership in radiocommunications service developments?
- (b) What should be the role of government to enhance national and international opportunities and why?
- (c) Does the Department have an advocacy role internal and external to government with regard to spectrum matters?

Responses will assist in the determination of government involvement in future radiocommunications developments and applications.

8.2 Public Consultation

The Department of Communications has an ongoing need to consult the public, interested individuals and organizations, and affected parties on various policy issues, development and formulation of policies, standards and procedures to realize the greatest public benefit.

The Gazette Notice, published in the Canada Gazette Part I, is the formal instrument used by the Department to initiate public consultation and to apprise or inform the public, and obtain suitable public representation on significant issues. Policy changes arise from the need to respond to new demands on the radio spectrum. These can originate in several ways, such as the introduction of new service applications and technologies, changes in the international frequency allocation or use of the spectrum, or simply frequency congestion in an existing band when demand exceeds supply.

As well, the Department has established ongoing relationships with major industry associations and user groups as well as government-industry technical advisory committees. The Radio Advisory Board of Canada (RABC) is a primary association with which the Department consults. The Board's purpose is to consult and advise the Department of Communications on behalf of industry on technical and policy matters with regard to radio services in Canada.

In terms of the public and industry consultation conducted by the Department, interested parties are requested to comment on the following:

- (a) Has the existing public consultation process of the Department been able to provide for the orderly and efficient radiocommunications development in a timely, relevant and consistent manner? If not, what specific changes to the process would you recommend and why?
- (b) The Department, as part of its ongoing consultation process, publishes documentation on spectrum utilization policies, radio systems policies, regulations, licensing policies, rules, procedures and standards. Are these generally appropriate to the continuing radiocommunications needs? If not, what changes would you recommend and why?

Comments received will assist in determination of the effectiveness and reasonableness of the public consultation process to advance well-balanced policy and technical directions.

9.0 INTERNATIONAL CONSIDERATIONS

We are now and increasingly will be in the future operating in a global economy. International markets and competition will have to be taken into account in the development and introduction of new services. Allocation issues will have to take into account international impacts and issues.

More could also be done to harness Canada's strength in radio technology and spectrum management to expand market horizons and make Canadian companies more aware of global markets.

From an international perspective, the following questions are considered relevant:

- (a) Canada must consider its own spectrum needs and public interest as being paramount as well as being sensitive to changes in the international environment. How are these needs best accomplished? (i.e. What specific international considerations should be taken into account in developing spectrum allocations, policies and regulations?)
- (b) Under what conditions is it appropriate for Canada's frequency allocations to differ from the ITU, if any?
- (c) What are known restrictions or constraints hindering the success of Canadian radiocommunications products in international markets?
- (d) Are there other international obligations that should be encompassed within a Canadian spectrum policy framework?

The comments provided will assist in focussing our international development activities and role.

SECTION V - CONCLUDING REMARKS

This Discussion Paper is the first phase of public consultation to request comments and input from interested parties. The initiative is expected to culminate in the publication of a proposed Spectrum Policy Framework early in 1991 outlining policy principles and with the full benefit of a second round of public consultation.

In addition, the Department is expecting to initiate a number of internal and external studies to substantiate and review some of the above issues and assess the public inputs.

Following full public consultation on a range of proposed policy principles, the Minister will be in a position to state a Spectrum Policy Framework for Canada in 1991 and to indicate critical policy initiatives that would be first advanced. (Other priority areas or issues which need further public debate or broader consideration will be dealt with subsequently).

The discussion of major issues will provide an important foundation to establish the policy principles to guide the judicious oversight of the spectrum resources.

DEPARTMENT OF COMMUNICATIONS

RADIOCOMMUNICATION ACT

NOTICE NO. DGTP-03-90

TOWARDS A SPECTRUM POLICY FRAMEWORK
FOR THE TWENTY-FIRST CENTURY

The radio frequency spectrum is a limited public resource of which the use influences the daily lives of all Canadians and provides a wide variety of services serving their social, cultural, economic and industrial endeavors.

With the rapid evolution of new technologies, and the ever increasing and competing demands being placed on the spectrum resource, it is considered essential at this time to reassess our spectrum policies and to develop a Spectrum Policy Framework which will provide guiding directions and establish principles for the judicious utilization of spectrum resources.

To assist the Department in the development of the policy framework, a background Discussion Paper has been prepared which provides an overview of spectrum resources in Canada, outlines some of the trends and challenges and provides details and options on some of the current issues.

Therefore, as part of the public discussion on the development of a Spectrum Policy Framework, the Department of Communications invites interested and affected parties to provide their views and comments on a number of issues and principles as a first step in public consultation. Input on other issues deemed relevant to the scope of this policy initiative would also be welcome.

Copies of the Discussion Paper entitled Towards a Spectrum Policy Framework for the Twenty-First Century are available from Information Services, Department of Communications, 300 Slater Street, Ottawa, Ontario K1A 0C8, (Telephone (613) 990-4900) or from the Department's Regional Offices in Moncton, Montreal, Toronto, Winnipeg and Vancouver.

The Department invites written comments from all interested parties to assist in the development of a spectrum policy framework. This current phase of public consultation will be followed by a set of proposals at the beginning of 1991 followed by the enunciation of a Spectrum Policy Framework in 1991 with courses of action on priority initiatives.

Submissions should be addressed to the Director General, Telecommunications Policy Branch, Department of Communications, 300 Slater Street, Ottawa, Ontario, K1A 0C8 to be received on or before January 6, 1991. All representations should cite the Canada Gazette Part I Notice publication date, title, and the Notice reference number.

Written comments received in response to this Notice will be made available for viewing by the public two weeks after the closing date of this Notice, during normal business hours, at the Department of Communications Library, 300 Slater Street, Ottawa and at the Regional Offices of the Department at Moncton, Montreal, Toronto, Winnipeg and Vancouver for a period of one year from the close of comments.

Also, approximately two weeks after the close of the comment period, copies may be obtained, by mail order or over-the-counter, from Kwik-Kopy Printing, 300 Slater Street, Ottawa, K1P 6A6 (Telephone (613) 234-8826). Reasonable costs of duplication will be charged.

Dated at Ottawa this 29 day of Oct, 1990.



Paul Racine
Assistant Deputy Minister
Communications Policy