

Policy for the utilization of the
0.890 — 10.68 GHz radio spectrum
by the fixed service

COMMUNICATIONS

TK
6553
P65
1982

Canada

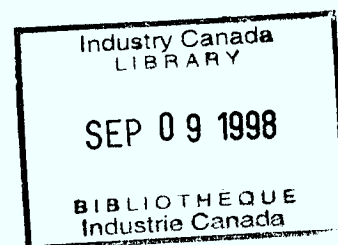


Government of Canada
Department of Communications

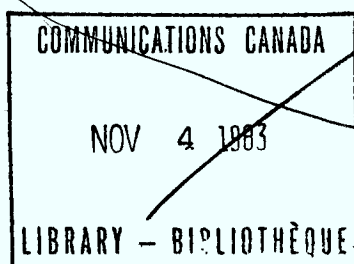
Gouvernement du Canada
Ministère des Communications

TK
6553
P65
1982

16/ POLICY FOR THE
UTILIZATION OF THE 0.890-10.68 GHz RADIO SPECTRUM
BY THE FIXED SERVICE —



December 1982



DD 4025475
DL 4052945

TK
6553
P65
1982

CONTENTS

<u>Section</u>	<u>Page</u>
Glossary	5
1. Executive Summary	7
2. Discussion	
2.1 Exclusive Use of Spectrum	9
2.2 General Arrangement for Non-standard Systems	10
2.3 The 7125-7725 MHz and 7725-8275 MHz Bands	13
2.4 Frequency Diversity	15
2.5 Two-frequency and Four-frequency Plans	16
2.6 Video Services	17
2.7 Impact of Very Low Capacity and Low Capacity Systems	20
2.8 The 5850-6425 MHz Band	20
2.9 Multipoint Communication Systems	21
2.10 The 890-960 MHz Band	23
2.11 Overflow Bands	26
2.12 New Technology	26
2.13 AM/FM Studio Transmitter Links	27
2.14 Sharing Considerations	28
3. Implementation	28
4. Conclusion	29
5. Spectrum Charts	30

Appendices

- A. Spectrum Availability by Type of Fixed Service
- B. List of Public Submissions for the July 1981 Paper
- C. Radio Licensing Policy for Fixed Services in the Bands 7125-7725 and 7725-8275 Megahertz (16 July 1977)
- D. Statement of Interpretation (SRSP 305 and SRSP 306) Issue 2, 7 November 1978
- E. Implementation
- F. Gazette Notice

GLOSSARY

- In-plant Video - A fixed service for the transmission of industrial or security video signals within the boundary of the premises of the user.
- ITV - Instructional Television - a fixed service for instructional (usually educational) TV applications.
- MCS - Multipoint Communications Systems (MCS) - a fixed service consisting of a central terminal communicating on a one or two way basis with two or more associated radio terminals.
- Non-standard System - A system which is either non-conforming to an SRSP or which is authorized before an SRSP has been issued for the band.
- Standard System - A system which conforms to an SRSP.
- SRS - Subscriber Radio System - an MCS service normally employed for rural telephone applications.
- SRSP - Standard Radio System Plan - departmental document which details the minimum technical requirements of radio systems using specific radio frequency bands.
- STL - Studio Transmitter Link - a fixed service for one way transmission between a broadcast studio and a (AM, FM or TV) broadcast transmitter.
- Temporary TV Link - A fixed service for transmission of a television signal on a temporary basis.
- TV Pick-up - A fixed service between a temporary remote television camera location and the studio. A TV pick-up may consist of a camera to mobile studio link and a mobile studio to TV broadcast studio link.
- VHCM - Very High Capacity Microwave - a fixed service currently defined for the transmission of four or more television signals for the purpose of CATV distribution over distances of 65 km or less.

RF Channel Capacity

	<u>Analogue</u> (voice channels)	<u>Digital</u> (minimum final capacity)
VERY LOW (VLC)	1-24	56 Kb/s
LOW (LC)	25-120	1.544 Mb/s
MEDIUM (MC)	121-600	44.736 Mb/s
HIGH (HC)	601-1200	90 Mb/s
VERY HIGH (VHC)	1201 & UP	274 Mb/s

1. EXECUTIVE SUMMARY

In August 1979, the Department announced its intention to undertake a review of the 1-10 GHz radio spectrum by a notice in the Canada Gazette and the public release of a discussion paper entitled "The Utilization of the Radio Spectrum in the Range 0.890-10.68 GHz". The first objective of the review was to examine current spectrum utilization and projected service demands in the frequency range, particularly for the rapidly expanding fixed services. A second and more important objective was to provide for these service demands, to the extent possible, using technological advances and licensing policy as a means of achieving a more efficient utilization within the frequency range and thus relieving spectrum congestion. Following analysis of the public submissions made in response to the above discussion paper, certain proposals were presented in a second paper entitled "Proposed Utilization of the Radio Spectrum in the Range 0.890-10.68 GHz by the Fixed Service", which was issued for public comment in July 1981. The present policy paper, therefore, marks the culmination of a two-stage process of public consultation. It is hoped that this paper fulfills the original objectives in a manner consistent with radio user needs.

A total of 16 parties covering a broad range of microwave radio interests responded to the July 1981 paper. Broadcasters, cable operators, landline and radio common carriers, electric power utilities, equipment manufacturers, provincial governments and an amateur radio association were all represented. In some cases, technical matters were raised which properly belong to the development of Standard Radio System Plans (SRSPs) which will be discussed with industry as these plans are introduced or revised. More often, however, the public comment was directed to general matters falling within the scope of the 1-10 GHz review which is addressed in Section 2 of this paper.

In response to the public submissions and the need to relieve spectrum congestion, the Department has adopted new licensing policies for microwave radio in the 1-10 GHz frequency range. Additional spectrum is made available to meet the demand for lower capacity analog and digital systems, higher capacity digital systems and for service applications such as multipoint communication* systems, in-plant video, TV pick-ups and temporary TV links, and studio transmitter links for radio broadcasting. A general arrangement for non-standard systems is introduced in all frequency bands. In order to conserve spectrum, frequency diversity (see Section 2.4) becomes non-standard in the 890-960 MHz, 1427-1525 MHz and 1710-1900 MHz bands. Short-haul systems of up to 65 km in length, used for the carriage of video signals, are no longer standard in the 8275-8500 MHz band; adequate spectrum for these systems is available above 10 GHz. The fixed service in certain yet to be determined segments of the 890-902 MHz/ 928-942 MHz allocations will become non-standard in certain metropolitan areas and other parts of Canada so as to provide for the future entry of mobile services. This will be clarified in forthcoming policy proceedings but until that time any new fixed assignments in the 890-902/928-942 MHz bands will be made on a non-standard basis whether frequency diversity is used or not. In the longer term, it is possible that this restriction on the fixed service may have to be extended to other portions the 890-960 MHz band.

The additional spectrum utilization noted above will have a material impact on certain SRSPs, introducing possible delays in the authorization of new systems. In order to minimize any inconvenience to the public in this respect, the Department will authorize systems which will conform to the new or revised SRSP when issued. Systems that are potentially non-conforming to the new or revised SRSPs will be considered for authorization as non-standard on a case-by-case

* The term "multipoint distribution" was used in the proposed policy document, which implies unidirectional outbound communications. Two-way or in-bound communication was not intended to be precluded, hence the term "multipoint communication" is used.

basis. In certain frequency bands, it may be necessary to withhold authorization until an SRSP is available. Section 3 and Appendix E provide further details of these arrangements, which will be discussed with industry.

Attention is directed to certain still unresolved matters which could affect the future development of the 1-10 GHz fixed service. Negotiations are underway with the US authorities to give effect to a long-term policy for the introduction of a high capacity digital trans-Canada system in the 4400-5000 MHz band along a specific route. If the Canada/US frequency arrangement can be successfully negotiated, these systems would be introduced but possibly with geographic or frequency restrictions. As a further consideration, it is possible that additional frequencies will be required in the 3500-4200/4500-4800/5850-7075 MHz bands for the expansion of Telesat's domestic satellite service. This would increase the co-ordination required for new fixed services in these bands.

2. DISCUSSION

2.1 Exclusive Use of Spectrum

In Canada, the radio spectrum has always been allocated by type of use rather than type of user*, a policy which has proved to be effective in satisfying the varying public demand for radio services across Canada. Under this arrangement, the spectrum which is not required by one user at any location is available for others, who have a use for it. In addition, radio systems designed for a common type of use under the policy are more easily co-ordinated, permitting a greater number to be licensed at a given location. Because of these advantages, the present policy of allocating spectrum by type of use will be continued, and spectrum will not be reserved exclusively for one type of user.

* Type of use refers to the types of radio systems and parameters such as channel loading, channelling plan and other technical criteria laid down in the SRSP. User types are exemplified by the common carriers, electric power utilities, railway companies, etc.

2.2 General Arrangement for Non-standard Systems, Including the Modification or Replacement of Existing Non-standard Systems

Considerable public comment resulted from a recommendation in the July 1981 paper that existing radio systems in certain frequency bands would be subject to modification after a five-year period if their use of frequency diversity blocked the entry or expansion of a system without frequency diversity. Many respondents were concerned over the economic impact of this proposal and suggested that a minimum advance notification of two years should be given if system modification or replacement were necessary, that exceptions should be made for remote areas where frequencies were not congested, and that systems installed to an earlier departmental standard should be protected against change for the duration of their service life. These are matters which go beyond frequency diversity to include any non-standard feature of the system.

The SRSP documents do not attempt to establish comprehensive technical standards for a radio system but only those standards which are necessary for efficient spectrum usage. Technical standards specified in the SRSPs are therefore considered beneficial to all users of the radio spectrum, and it must be expected that revisions will occur when made necessary by changing circumstances. In introducing new or revised standards, the Department has always taken every step possible to protect radio systems already licensed, and this practice will continue. As spectrum usage increases, however, it would be unreasonable to assume that every single licensed system could be guaranteed a full service life, which may be 20 years or longer. Inevitably, there will be occasions when an existing system at a particular location might have to be modified or replaced to make way for new systems that are more efficient in their use of spectrum. To take care of this eventuality, it is planned to make a common provision for non-standard systems in all SRSPs as they are reissued.

A microwave radio system is classed as non-standard if it does not conform to the most recent issue of the SRSP for the frequency band in question, or if no SRSP has been issued for the frequency band. (See Section 3 for an interim arrangement which will be followed with respect to this policy as it affects existing SRSPs.) Such radio systems are subject to modification or replacement if their non-standard aspects block the entry of a proposed new or extended system which is standard, i.e., a system conforming to the most recent issue of the SRSP.* In this eventuality, the parties involved will be encouraged to reach agreement among themselves. Failing such agreement, the Department will consult with the parties involved and determine what modification or replacement of non-standard systems is warranted in the particular circumstances, taking full account of the equipment investments in place, the service requirements of the user, reasonable time frames and any other factors bearing on the matter.

This recourse, to be used sparingly and as a last resort, is considered necessary if spectrum management is to avoid the straightjacket of obsolete planning and technology. A minimum advance notification of two years will be given for any system change required, and no system change will be required before five years have elapsed from the date on which the system became non-conforming. Alternative spectrum will be identified if a change in frequency is involved.

Based on the Department's experience with the entry of new standard systems after the modification of an SRSP, very few non-standard systems have been affected. It is therefore anticipated that very few non-standard systems will be affected by these provisions and the majority of non-standard systems will be able to continue operation without modification or replacement, for the duration of their service life.

* It may be noted that "standard" is not the exact opposite of "non-standard", i.e., a standard system conforms to the SRSP but a non-standard system is either non-conforming to the SRSP or authorized before the SRSP is first issued.

As a general rule, any installation of microwave radio must conform to the most recent issue of the SRSP, including the extension or replacement of existing systems. In the public submissions for the July 1981 paper, it was argued, with some force, that an exception to this rule should be made for frequency diversity in remote areas since the additional spectrum required is freely available and operating advantages would result for the user. By extension, the argument can be made to apply to any non-standard system requiring additional spectrum, such as tropospheric scatter systems (also mentioned in the public submissions). On the question of spectrum availability, however, it may be noted that while the remote areas of Canada are extensive, the installation of microwave radio is confined to the few routes accessible by road or water, and these routes tend to become frequency congested because of multiple systems. Even the microwave sites serviced by air, principally on mountains, are often found on established routes which are subject to frequency congestion. In this situation it is difficult to predict spectrum availability with confidence, making a blanket exception to system standards impractical in remote areas. The Department remains committed, therefore, to the present policy of examining each application for non-standard systems on its merits and authorizing these systems as non-standard on a case-by-case basis, subject to the provisions noted earlier for the modification or replacement of non-standard systems. The licensing of new systems that do not conform to the applicable SRSP should be regarded as an infrequent occurrence justified by special circumstances.

It was stated earlier that existing non-standard systems would be subject to modification or replacement after five years had elapsed from the date of the first issue of an SRSP in which the equipment became non-conforming. As indicated in section 2.4, however, frequency diversity becomes non-standard in certain frequency bands, effective with the public release of this paper. The same consideration applies also to the non-standard status of short-haul video systems in the

8275-8500 MHz band (section 2.6). In these two cases, the modification/replacement provision for existing non-standard systems will take effect 1 January 1988. A minimum advance notification of two years will be provided for any system change required and this could be given from 1 January 1986 onward.

Section 2.10 refers to the future status of certain fixed systems in the 890-902/928-942 MHz allocations. In this case, the modification/replacement provision for existing systems will depend on the domestic and foreign developments in mobile radio at these frequencies, which are necessarily uncertain in scope and timing. The identification of those fixed systems which will become non-standard will have to await policy proceedings related to the development of various mobile services currently in the planning stages. A minimum two-year advance notification will be provided for any fixed system requiring change as a result of the impending implementation of an internationally compatible mobile service, e.g. air to ground public correspondence, personal radio service, etc. The five and two year rule for protection and potential reassignment of existing fixed systems which are declared non-standard in this policy (due to use of frequency diversity, for example) or which become non-standard in future will normally be applied in considering the entry of conventional domestic mobile systems.

In the 7125-7725 MHz and 7725-8275 MHz bands, the modification/replacement provision will take effect on the dates shown in Section 2.3

2.3 The 7125-7725 MHz and 7725-8275 MHz Bands

In 1977, radio licensing policies were issued (Appendix C) in which the 7125-7725 MHz and 7725-8275 MHz bands were re-channelled primarily but not exclusively to satisfy the respective service applications of the power utilities and the telecommunication common

carriers. In so doing, it was recognized that existing systems which became non-standard because of these policies should be protected to the extent possible. Protection from modification or replacement for existing non-standard systems was therefore granted until at least 1 January 1984 with provision to continue operation after that date unless the entry or expansion of a standard system was blocked. In addition, new non-standard systems would be considered for licensing under exceptional circumstances and given the same protection as existing non-standard systems. These arrangements are reflected in SRSPs 305/306, issue 2, sections 2.4 and 2.6 with the further remark that the date for ending protection against the eventuality of modification or replacement would be determined for each Region of the Department. These regional dates (not to precede 1 January 1984) have now been established as follows:

Atlantic Region	1 January 1985
Quebec Region	1 January 1985
Ontario Region	1 January 1985
Central Region	1 January 1985
Pacific Region	1 January 1984

Radio systems in the 7125-7725 MHz and 7725-8275 MHz bands that are non-conforming to issue 2 of SRSPs 305 and 306 respectively will be subject to modification or replacement on the dates shown above for each Region if they come into conflict with standard systems, rather than five years after the 1977 date of issue 2. Except in this respect, the general arrangement for non-standard systems (section 2.2) applies equally to the 7125-7725/7725-8275 MHz bands).

After the 7125-7725 MHz band was re-channelled in 1977, it came into wide use for microwave systems associated with the telemetry, control and protection of electric power grids. Grids exist on a regional basis, requiring for their support a microwave network of comparable extent and high reliability. Although traffic volumes for

this usage are moderate, the microwave network must be capable of expansion in rough geographic conformance to the power grid, which may in time become national in scope. In continuing and strengthening this past practice, assignments in the 7125-7725 MHz band will therefore be made primarily but not exclusively to systems serving the telemetry, control and protection purpose. Applicants with such primary uses are encouraged to file their system plans with the Department and to update these plans on a regular basis, so that applications for other uses can be co-ordinated with these primary systems in accordance with Radio Standards Procedure 113, Section 2.2.1.

2.4 Frequency Diversity

The term "frequency diversity" in this paper refers to the simultaneous transmission of the same traffic information over two RF microwave channels operating at different frequencies to provide equipment redundancy and improved propagation reliability. In systems having more than one RF working channel a similar form of protection is provided whereby one protection RF channel acts as backup for several working channels. This is commonly referred to as 1 for N operation, i.e., one protection channel for N working channels.

In the past, when spectrum utilization was much lower than at present, the 1 for 1 type of operation was permitted in several bands for end to end system operation. The current high level of spectrum demand makes this practice no longer acceptable. In the 890-960 MHz, 1427-1525 MHz and 1710-1900 MHz bands frequency diversity becomes non-standard with the public release of this paper.

2.5 Two-frequency and Four-frequency Plans

A two-way radio channel in a microwave system requires two frequencies, one for each direction of transmission, and if high performance antennas are used the two frequencies can be repeated from hop to hop throughout the microwave system, resulting in a spectrum efficient "two-frequency plan". Two-frequency plans are best suited to the higher frequencies where superior antenna performance is readily achieved. They are also suited to lower frequencies if digital radio is used, owing to its greater immunity to noise. For these reasons, the two-frequency plan has been standard for analog and digital systems in all frequency bands above 3500 MHz, and preferred for digital systems in the frequency bands below 3500 MHz. No change is contemplated in this policy except in the 1900-2290 MHz band, where a two-frequency plan will become standard for digital systems* when digital systems are provided for in the next issue of SRSP 304.

In the frequency bands below 3500 MHz, technical considerations often require an analog system to use four frequencies for each two-way radio channel in order to avoid interference at the repeater stations. This results in a "four-frequency plan" which occupies twice the spectrum of a two-frequency plan and is undesirable from a spectrum point of view. It is apparent by the public submissions that the intent of the recommendations in the July 1981 paper on the subject of four-frequency plans was misconstrued. As the charts in the Section 5 show, no change to existing licensing arrangements for two-frequency and four-frequency plans is contemplated in the 1-10 GHz review.

* The 1900-2290 MHz band is channelled for medium capacity digital systems, making the two-frequency plan practical as a standard for digital radio.

2.6 Video Services

The transmission of video signals for the cable and broadcasting industries occupies a prominent place in microwave radio because of its demand on spectrum. A video signal usually requires an entire RF channel to itself, with the result that whole frequency bands* have been devoted primarily to the carriage of television traffic. Despite the importance of satellites and cable for video transmission, there are many service applications in which terrestrial radio will continue to be used because of cost and other advantages. Shown below are the 1-10 GHz frequency allocations for video services provided by terrestrial microwave radio. The arrangements above 10 GHz for video services, including Very High Capacity Microwave (VHCM) will form part of a separate review of spectrum utilization.

(a) Multi-hop Video

8275-8500 MHz Band:

6 RF ch (18.75 MHz)	1 way (go)
3 RF ch (18.75 MHz)	1 way (return)

(b) Single Hop Video (single channel)

6590-6770 MHz Band: 9 RF ch (20 MHz) 1 way

This band, normally restricted to single hop systems, is intended for TV Studio Transmitter Links (STL) and any other non-temporary video service requiring a one-way, single channel facility.

Frequencies above 10 GHz or non-radio alternatives will be used wherever possible for STLs of less than 16 km.

* The 8275-8500 MHz and 12.7-12.95 GHz bands are examples.

(c) TV Pick-ups and Temporary TV Links

2450-2500 MHz: no channelling plan

6930-7125 MHz: 10 RF ch (20 MHz) 1 way

- In response to the public submissions received for the July 1981 paper, the existing licensing arrangements will be retained for the 6930-7125 MHz band, as shown in SRSP 308, issue 1.
- For TV pick-ups, frequencies above 10 GHz will be used wherever possible for the link between camera and mobile van, and either the 2450-2500 MHz band or the 6930-7125 MHz band is recommended for the link between the mobile van and main studio.

(d) Instructional Television (ITV) and Multipoint Communication Systems (MCS) - Video

2548-2686 MHz: 23 RF ch (6 MHz) 1 way

- ITV has been used primarily by educational institutions. MCS-video (section 2.9) is not intended as a substitute for CATV distribution in urban areas for which allocations above 10 GHz are available.

The 8275-8500 MHz band is the only spectrum between 1 and 10 GHz that is reserved primarily for Multi-hop Video (MHV)*, one of

* Wideband radar carriage on a case-by-case basis is also permitted in the 8275-8500 MHz band.

the two largest video services* in terms of spectrum demand. As a result, the band has been heavily utilized, especially for one-way systems in which a less expensive, low performance antenna is permitted; and a need for spectrum relief has developed at certain locations. In a public submission, the 7125-7725 MHz band was recommended for this purpose in order to reuse the existing 8275-8500 MHz antennas and waveguide which can operate at both frequencies. Although the Department is sympathetic to cost saving proposals such as this one, a warning must be issued that video services are not standard in the 7125-7725 MHz band. The 7125-7725 MHz band is therefore not available for MHV as a general rule, and any video services permitted on a non-standard basis would be subordinate to the requirement for standard services in the band. Moreover, the procedures noted earlier for the modification or replacement of non-standard equipment would apply.

In order to relieve frequency congestion and provide adequately for MHV services, short-haul systems of up to 65 km in length are now designated non-standard in the 8275-8500 MHz band. Short-haul video systems (up to 65 km in length) will be accommodated above 10 GHz.

Additional spectrum for long-haul video systems may be provided in the 10-30 GHz policy review which is underway; subject to the outcome of the Intercity microwave licensing review.** In addition, satellite facilities are always available as an alternative to terrestrial microwave radio, especially for long-haul systems.

* The other service is VHCM

** Canada Gazette Part I, Notice No. DGTN 004-80 (29 November 1980) and DGTN 004-81 (15 August 1981). Intercity microwave refers to the intercity delivery of signals for use by a broadcasting undertaking, a form of multi-hop video.

2.7 Impact of Very Low Capacity and Low Capacity Systems (VLC/LC)

The July 1981 paper introduced the concept of VLC systems having a minimum capacity of one analog voice channel or 64 kbits/sec, and provision was made for these systems in various frequency bands together with LC systems, defined by a minimum capacity of 24 voice channels or 1.5 Mbits/sec. Certain public respondents have been concerned that a VLC/LC system operating at minimum capacity could block the growth of larger capacity systems, with a consequent loss in spectrum efficiency. This is a concern of the Department, as well, and every step will be taken to avoid it. The problem is most severe in the 890-960 MHz, 1427-1525 MHz and 1710-1900 MHz bands, already subject to frequency congestion, but a measure of relief will be provided by the elimination of frequency diversity for new and extended systems in these bands. In addition, an interleaved channelling plan is available in the 890-960 MHz and 1710-1900 MHz bands, permitting the coexistence of large and small systems in the same area. More generally, the Department will attempt to maintain frequency or geographic separation between large and small systems by taking into account the anticipated service demands of existing and new users in its assignment practices.

2.8 The 5850-6425 MHz Band

A CCIR* channelling plan for the 5925-6425 MHz portion of this band has been in use for high capacity systems in North America and elsewhere for many years, with the result that equipment designed to the CCIR standard is readily available and there are large plant investments in place. In consideration of these factors, the band will not be re-channelled to incorporate its downward extension to 5850 MHz, approved by the 1979 World Administrative Radio Conference. Instead, the 5850-5925 MHz portion of the band will be allocated to VLC/LC analog and digital systems, leaving the present allocation for high capacity systems unchanged.

* International Radio Consultative Committee

Apart from channelling, most of the public comment for this band was devoted to the proposed introduction of digital systems and their service application. Digital transmission was supported but opinion was divided on whether analog or digital short-haul systems should be permitted and whether the minimum RF channel capacity for digital systems should be 45 or 90 Mbits/sec. Until the present, the 5925-6425 MHz portion of the band has been reserved for "high performance, large cross-section, trunk route radio-relay systems"*, having a minimum capacity of 600 analog voice channels per RF channel. This priority will continue for analog and digital high performance long-haul systems, but short-haul analog/digital systems will also be permitted to the extent that the development of existing and planned long-haul systems is not compromised. Users of high performance long haul systems are encouraged to submit their detailed extension plans so that short-haul analog/digital systems can be accommodated where possible.

Although long-haul systems are usually of a large cross section because of cost, the short-haul application is variable. A 45 Mbit/sec system might better satisfy the service requirement in certain locations and be more easily co-ordinated with nearby systems of higher capacity. There is insufficient information before the Department to determine whether the minimum RF channel capacity should be 45 or 90 Mbits/sec, and this matter will therefore be decided during the consultative process for the revision of SRSP 301.

2.9 Multipoint Communication Systems (MCS)

A proposal to introduce MCS-VLC data/voice in the bands 1427-1525 MHz, 2290-2548 MHz and 10.5-10.68 GHz was supported in the public submissions for the July 1981 paper, although concern was expressed over the co-ordination difficulties with other services and the small size of certain proposed allocations. Some respondents have indicated a need for further consultation on this subject between

* SRSP 301, issue 2, section 1.1. The minimum RF channel capacity is given in section 4.2.

government, industry and users. This will be provided for during the preparation of revised SRSPs for the frequency bands in question. In response to the public comment already received, certain changes have been made in the MCS allocations as detailed below. Little can be done concerning the need for co-ordination with other services, since shared allocations are the rule below 10 GHz and few allocations are suitable for MCS. MCS is inherently difficult to co-ordinate because of its wide area configuration, but until installations are proposed and examined, it would be premature to judge the issue. The following remarks are therefore intended as guidelines for the initial planning of MCS systems.

In the 1427-1525 MHz band, MCS-VLC data/voice is allocated without restriction as to limited use on the basis that it is primarily an urban service which should not conflict with the subscriber radio system, a telephone service used in rural or remote areas. A potential source of interference to MCS and other fixed systems in this band are the US assignments for aeronautical telemetry, a mobile service which is shared on a primary co-equal basis with the fixed service under ITU* regulations. These assignments have been internationally co-ordinated and protected by notification to the International Frequency Registration Board of the ITU. While there is no existing bilateral agreement for the 1427-1525 MHz band, the United States will comment on how a proposed Canadian system might be affected by operations currently authorized in the United States. The possibility of a future bilateral agreement for the co-ordination of this band is being discussed with the US authorities, and until the matter is resolved, the Canadian fixed services will be co-ordinated through the International Frequency Registration Board.

* International Telecommunications Union

In the 2290-2548 MHz and 10.5-10.68 GHz bands, the individual allocations originally proposed for MCS-VLC data/voice and VLC/LC systems are now shared* by these two services in order to provide maximum flexibility for growth and an improved separation between send and receive frequencies. Fixed services operating in the 2310-2548 MHz range must be co-ordinated with high power radar, a major source of potential interference. There are no plans for a broadcasting satellite in the 2500-2690 MHz band, but co-ordination might be required with the fixed-satellite service in this frequency band. In the 10.5-10.68 GHz band, the possibility exists of interference between fixed and radiolocation services at 10.5-10.55 GHz; apart from this, no co-ordination problems are anticipated. Prospective users should note, however, that a power limitation exists by international agreement for fixed services in the upper 80 MHz of the band**.

The 2548-2686 MHz band has been opened for possible uses such as the distribution of video messages, expansion of ITV and video conferencing. The Department will discuss the technical characteristics of such systems with potential users during the revision of the SRSP in order to determine technical sharing criteria which would permit these uses to develop to their potential. While these uses would be generally proposed in urban areas, the Department might also consider use of the band in rural areas where cable or alternative means of distribution are not practical or economically viable, for the delivery of broadcast programming direct to the home. However, the Department at this time is not prepared to accept any applications for MCS-Video until SRSP-300 has been revised and promulgated (see Appendix E).

2.10 The 890-960 MHz Band

When SRSP 310 was issued in 1976, licence applicants for fixed services were warned that mobile services might attain primary or secondary status in the 890-960 MHz band, for certain geographic areas. In fact, this has happened with the 1 January 1982 issue of the

* Except the lower 20 MHz of the 2290-2548 MHz band, reserved for MCS.

** Table of Frequency Allocations, 1 January 1982, footnote 831.

Canadian Table of Frequency Allocations, which shows mobile services (except aeronautical mobile) as primary at 890-902/928-942 MHz and secondary at 942-960 MHz. Fixed services retain their primary status throughout the band but must now share on a co-equal basis with mobile services in the allocations mentioned. The decision to introduce mobile allocations at 890-960 MHz and lower frequencies was taken at the 1979 World Administrative Radio Conference because of the superior propagation characteristics for mobile radio below 1 GHz and the burgeoning demand for mobile services.

In the 890-902/928-942 MHz allocations, the development of fixed and mobile services can only proceed on the basis of geographic separation, and it is the Department's policy to give the mobile service precedence since it is not suited to alternative spectrum above 1 GHz, unlike the fixed service. Consideration must be given to the possible introduction in the longer term future of conventional mobile services domestically in the 900 MHz band, and in the shorter term to the introduction of certain internationally compatible mobile services such as air/ground public correspondence, personal radio service, etc. Steps should therefore be taken now with respect to fixed systems, which would otherwise grow and obstruct the future entry of such mobile services. With this in mind, the July 1981 paper recommended that the licensing of fixed systems be reduced. Effective with the release of this paper, new systems or extensions of existing systems in the 890-902 MHz/ 928-942 MHz bands* will be licensed only on a non-standard basis. In addition, systems which are non-standard as a result of frequency diversity (see section 2.4) will remain non-standard even if they modify their operation to operate on a non-diversity basis in these bands.

* Exclusion of the 890-902/928-942 MHz spectrum reduces by 50 percent the number of RF channels available in SRSP 310, issue 1. To compensate for this loss, VLC/LC allocations have been made as low as possible in the spectrum above one GHz so as to retain the desirable propagation, antenna and other characteristics of fixed systems below one GHz, to the extent possible.

The July 1981 paper also warned that existing fixed systems could be required to transfer to other bands. This transfer may be caused by the introduction in the long term, of conventional domestic mobile systems, but in the short term it is more likely to be caused by the introduction of mobile systems which must by the nature of their operation be internationally compatible. Proposals to implement any of these mobile systems would be given in future policy proceedings, discussion papers, etc. for public comment and subsequently followed by notification to affected licencees as necessary. The Department will provide as much lead time as possible so that licensees of existing fixed systems may assess the level of potential interference and restructure their systems accordingly. With regard to existing standard fixed systems which are declared non-standard in this or any future policy proceedings dealing with the introduction of conventional domestic mobile normally the five and two year rule relating to the protection and potential reassignment of these systems will be applied. However, the internationally compatible* mobile services require consideration of factors (frequency bands, technical characteristics and implementation schedules) which are beyond those of a domestic nature only. This results in a degree of uncertainty which may prevent the application of the five-year protection period, but in all cases the minimum two-year notice of change will be given. The future mobile policy proceedings may also determine that certain segments of the 890-902/928-942 MHz band will not be used by mobile services, in which case existing and new fixed systems may be accommodated.

* An experimental air/ground radiotelephone service for US airlines has been authorized in the 890-960 MHz band by the US Federal Communications Commission. Should a commercial service develop in Canada or the United States, Canadian fixed systems in certain areas may be affected.

2.11 Overflow Bands

The July 1981 paper indicated that the 6425-6590/6770-6930 MHz band could be used to solve co-ordination problems at crossovers or spurs as an "overflow" band. There was considerable public comment on the respective merits of the 6425-6590/6770-6930 MHz and 1900-2290 MHz bands for this purpose. On reviewing this matter, the Department has concluded that the choice of any overflow band depends on the particular case and should not be predetermined. No recommendation is therefore made for a specific overflow band.

2.12 New Technology

As stated earlier, an objective of the 1-10 GHz review was to improve spectrum utilization by means of new technology. To this end, consideration will be given to the use of antennas with improved characteristics, criteria for baseband throughput in digital systems, cross-polarization, digital speech interpolation, encoding schemes for digitized voice and video which reduce bandwidth, and in general any method of improving spectrum efficiency. Various public respondents have expressed concern over the potential cost and operating impacts that new technology might have for the user, and have recommended that further consultations take place before new technology is standardized. Further consultation with the public will take place as part of the normal revision process for SRSPs.

As a related matter, mention may be made of a public recommendation that digitally encoded non-message service be permitted in MC/HC/VHC digital bands when the bits are interleaved or intermixed with digitally encoded message traffic. Upon inquiry, the Department was informed that "digitally encoded non-message service" referred to the carriage of broadcast TV signals. Although spectrum is economized by the interleaving of message and non-message traffic into a common bit stream, it may still be desirable to establish a limit for the individual TV signal in Mbits/sec because of the large RF requirement. Subject to this condition, TV transmission would be permitted in MC/HC/VHC digital bands as it is now in analog bands of corresponding capacity. Narrowband conference video, of course, is not a subject of concern in this context.

2.13 AM/FM Studio Transmitter Links

In spectrum congested areas, the Department has experienced increasing difficulty in providing frequency assignments for studio transmitter links in support of FM broadcasting. To meet this service demand, and to provide for the possible introduction of AM stereo broadcasting, the present FM STL allocation at 956-960 MHz will be augmented with a new 1700-1710 MHz allocation for AM stereo/FM STLs. In further relief of spectrum congestion, the practice of carrying AM/FM STLs as a sub-carrier of video STLs will continue to be encouraged.

2.14 Sharing Considerations

Most of the fixed service spectrum under review is now utilized by analog systems so that as a general rule, the new digital allocations detailed in Section 4 can only be provided on the basis of digital/analog sharing. To avoid disruption of the analog systems, the existing channelling plans will remain in force, imposing a constraint on digital design. Fixed services, whether analog or digital, must share the spectrum with other services in accordance with the Canadian Table of Frequency Allocations, as amended from time to time. The charts in Section 5 of this paper conform to the 1 January 1982 issue of the Canadian Table.

3. IMPLEMENTATION

The SRSP documents detail technical requirements and preferred channelling arrangements for microwave systems for the purpose of efficient spectrum utilization. For the sake of convenience and guidance, the contents of an SRSP often also reflect spectrum utilization policy statements on the standard uses of the bands such as those specified in this policy paper. Insofar as this paper makes changes to the standard uses of the radio spectrum in certain microwave bands, the SRSPs for those bands will have to be modified in various degrees so as to agree with this paper. As a result of this, in the period until the applicable SRSP can be reviewed and updated, special procedures will be followed.

Systems licensed now or in the future in bands in which the SRSP will be subject to only minor changes or none at all for the particular usage as a result of this policy will be considered for licensing as standard systems if they are clearly in conformance with the SRSP as modified by this policy.

Certain SRSPs are materially affected for a particular usage by the policies within this paper. The Department will consider the licensing of new systems so affected as non-standard where in the judgement of the Department it is considered likely that the re-issue of the SRSP will result in making these systems standard. In some extreme cases where major revisions in the SRSP may be required and the outcome of these revisions is uncertain, the Department may recommend that no systems be licensed at least until a draft revised SRSP is available. Such uncertainty may occur in bands where there is a broad range of technical options to consider in the re-formulation of the SRSP.

In cases where there is no SRSP at present, any systems licensed would be designated non-standard; however, the Department may refuse to licence systems in some bands for the reasons mentioned above.

The SRSPs affected by this paper, and the degree of impact are contained in Appendix E. The matter of priorities and target dates for this future work will be discussed with industry.

4. CONCLUSION

An attempt has been made in this paper, the result of a public consultation process that began in 1979, to provide for increased utilization of the 1-10 GHz radio spectrum by new and existing fixed services. This spectrum is already heavily occupied by fixed and other services, and its further development will therefore depend on increased sharing between services and the introduction of more spectrum efficient technology, as circumstances permit. The Standard Radio System Plans, governing the technical requirements for microwave radio in the frequency bands below 10 GHz, will be issued

or revised in conformance to this paper as soon as possible. Every effort will be made to maintain a stable licensing environment for microwave radio in order to protect equipment investments in place and facilitate long-term planning, but users should recognize that change cannot be avoided when services and technology are evolving rapidly. The Department must therefore consider and adopt new measures as the need arises. Applicants for microwave systems are reminded that the requirements of other public documents, such as Radio Standards Procedure 113 must be adhered to in the licensing process.

5. SPECTRUM CHARTS

The following charts display the radio spectrum utilization policy in Canada for the fixed service from 0.890 to 10.68 GHz.

Note: Where a number of radio services share a frequency band it is often necessary to define the relationship of one service with respect to the others. For this reason the following categories (as in the International Telecommunications Union Radio Regulations) have been established.

Primary Service: Services - the names of which are printed in capitals.

Example: FIXED

Secondary Services: Services - the names of which are printed in upper and lower case.

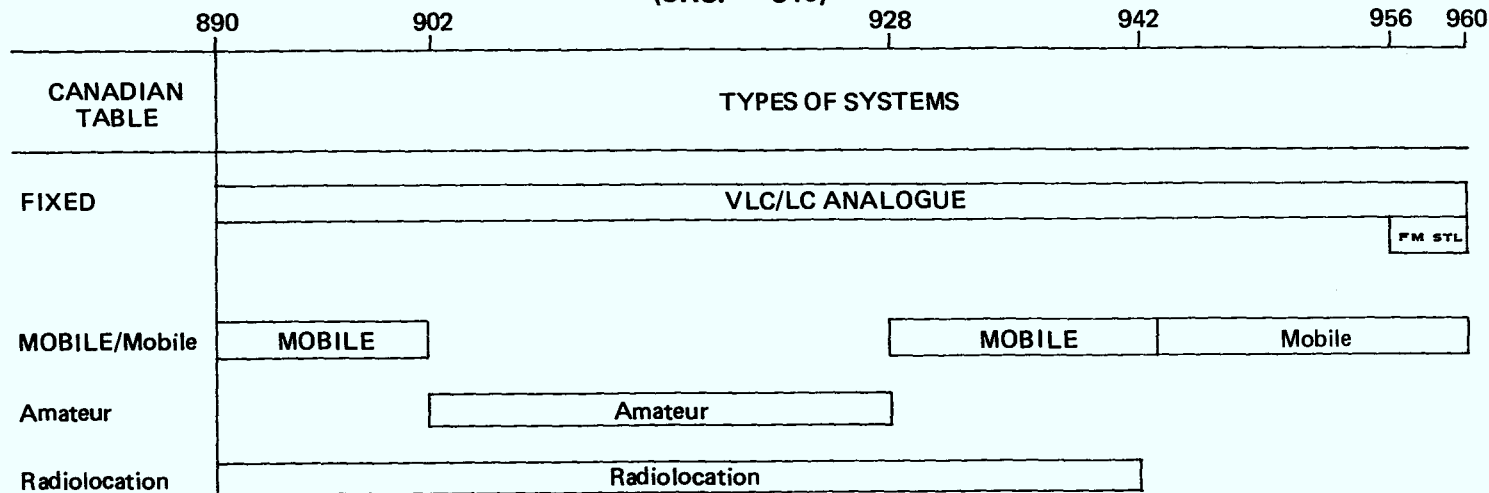
Example: Radiolocation

The relationship of these categories is as follows:

Stations of a secondary service

- a) shall not cause harmful interference to stations of primary service to which frequencies are already assigned or to which frequencies may be assigned at a later date;
- b) cannot claim protection from harmful interference from stations of a primary service to which frequencies are already assigned or may be assigned at a later date;
- c) can claim protection, however, from harmful interference from stations of the same or other secondary service(s) to which frequencies may be assigned at a later date.

**890 – 960 MHz BAND
(SRSP – 310)**



LEGEND

MOBILE... Primary
 Mobile..... Secondary
 VLC..... Very Low Capacity
 LC..... Low Capacity
 STL..... Studio Transmitter Link

REMARKS

1. The status of fixed systems in the band 890-956 MHz is described in 2.10. Future changes in status may occur and would be dealt with in future policy proceedings on mobile services. Potential fixed system applicants for this band are cautioned to consider frequencies above 1 GHz, in order to reduce the risk of changes at some later date.
2. The existing 956-960 MHz allocation for FM STLs will be retained. Additional spectrum for FM STLs and AM stereo STLs is available in the 1700-1710 MHz band.
3. (a) Frequency diversity is non-standard and existing or new diversity systems which are modified or proposed to operate on a single channel, but remain in the mobile sub-bands, are non-standard until further notice.
 (b) Four-frequency plans continue to be standard in accordance with SRSP 310, issue 1.

REMARKS (continued)

4. VLC systems of 1-6 voice channels (or equivalent) might utilize sub-channels from the existing interleaved plan for VLC systems of 6-24 voice channels (or equivalent) and geographic separation will be maintained with respect to systems of higher capacity.
5. In Region 2, the 902-928 MHz allocation is designated for industrial, scientific and medical (ISM) applications. Radio services operating within this band must accept harmful interference which may be caused by these applications.
6. Subject to further examination, MCS-VLC data may be considered in the band 890-960 MHz and may also operate in conjunction with mobile assignments, provided no restrictions are placed on the mobile usage of the band.

960 - 1427 MHz

In the bands between 960-1427 MHz there are no allocations to the FIXED Service on either a primary or secondary basis.

**BAND 1427 – 1525 MHz
(SRSP – 311)**

	1429 1427	1525
CANADIAN TABLE	TYPES OF SYSTEMS	
FIXED	VLC/LC/MC ANALOGUE AND VLC/LC DIGITAL	
	SUBSCRIBER RADIO SYSTEMS (SRS)	
	RADIO ENTRANCE LINKS (SRS FREQUENCIES)	
	MCS (VLC DATA/VOICE)	
	SPACE OPERATION	
SPACE OPERATION (E-S)	←	

LEGEND

E-S..... Earth-to-Space
VLC..... Very Low Capacity
LC..... Low Capacity
MC..... Medium Capacity
MCS..... Multipoint
 Communication
 Systems
SRS..... Subscriber Radio
 Systems

REMARKS

1. VLC/LC/MC analog and VLC digital systems will make use of the RF channels now allocated to LC digital systems so as not to interfere with the existing SRS channelling plan.
2. MCS-VLC data/voice is to be primarily urban in character and therefore will not conflict with the Subscriber Radio System (SRS) used for rural telephone service.
3. a) Frequency diversity is non-standard.
 b) Two-frequency and four-frequency plans continue to be standard, subject to the conditions specified in SRSP 311, issue 1.
4. Radio entrance links for SRS systems may employ SRS frequencies.
5. Co-ordination is required with US aeronautical telemetry.

1525 - 1535 MHz

The band from 1525-1535 MHz is treated as part of a group of miscellaneous bands at the end of this section.

1535 - 1660.5 MHz

In the bands between 1535-1660.5 MHz there are no allocations to the FIXED service on either a primary or secondary basis.

1660.5 - 1668.4 MHz and 1668.4 - 1670 MHz

These bands are treated as part of a group of miscellaneous bands at the end of this section.

1670 - 1700 MHz

In the bands between 1670-1700 MHz there are no allocations to the FIXED service on either a primary or secondary basis.

1700 - 1710 MHz

The band from 1700-1710 MHz is treated as part of a group of miscellaneous bands at the end of this section.

**BAND 1710-1900 MHz
(SRSP - 303)**

	1710		1900
CANADIAN TABLE		TYPES OF SYSTEMS	
FIXED		VLC/LC/MC ANALOGUE AND VLC/LC DIGITAL	

LEGEND

VLC..... Very Low Capacity

LC..... Low Capacity

MC..... Medium Capacity

REMARKS

1. (a) Frequency diversity is non-standard.
 (b) Two-frequency and four-frequency plans continue to be standard subject to the conditions specified in SRSP 303, issue 2.
2. VLC systems of 1-6 voice channels (or equivalent) might utilize sub-channels from the existing interleaved plan for VLC/LC systems of 6-60 voice channels (or equivalent) and geographic separation will be maintained with respect to systems of higher capacity.

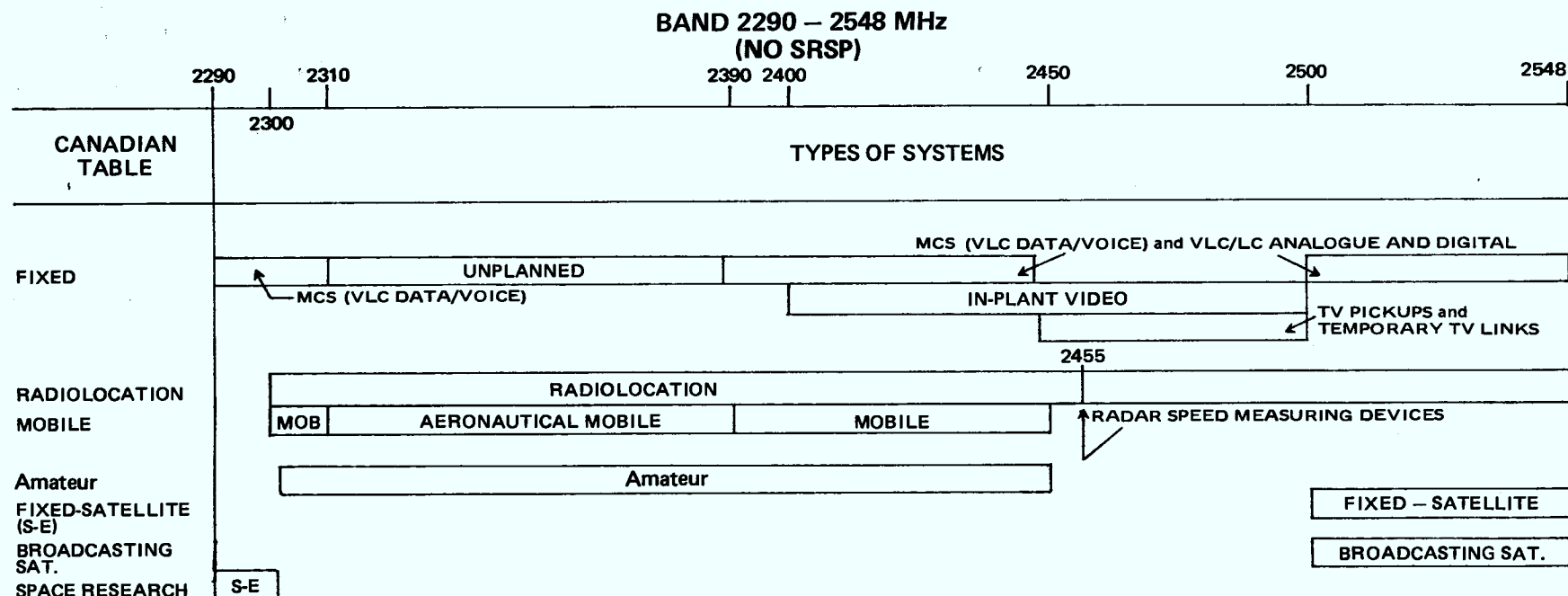
**BAND 1900-2290 MHz
(SRSP - 304)**

	1900	2290
CANADIAN TABLE	TYPES OF SYSTEMS	
FIXED		
	HC ANALOGUE AND MC DIGITAL	
	WIDE-BAND RADAR CONVEYANCE	

LEGEND

MC..... Medium Capacity
HC..... High Capacity

REMARKS	
1.	Two-frequency plans are standard for digital systems. Two-frequency and four-frequency plans continue to be standard for analog systems in accordance with SRSP 304, issue 1.
2.	Analog and digital systems will share the existing channelling plan of SRSP 304, issue 1.
3.	The carriage of wideband radar (29 MHz maximum bandwidth) will be considered on a case-by-case basis, on the understanding that suitable bandwidth reduction techniques will be employed as they become feasible.



LEGEND

MCS Multipoint Communication Systems

VLC Very Low Capacity

LC Low Capacity

MOB MOBILE

S-E Space to Earth

REMARKS

- (a) Either two-frequency or four-frequency plans are standard for analog systems.

(b) Two-frequency plans are standard for digital systems but four-frequency plans may be licensed as standard if technical and/or economic justification is provided.
- Separate groups of RF channels in the 2390-2450/2500-2548 MHz allocations will be assigned for MDS-VLC data/voice and VLC/LC analog/digital systems according to the local demand for these systems.
- The use of the 2310-2390 MHz allocation by the aeronautical mobile service is difficult to co-ordinate with the fixed service, therefore the use of the fixed service in unplanned in this sub-band.

REMARKS (continued)

4. Low power systems are to be used for in-plant video in the 2400-2500 MHz allocation.
5. For TV pick-ups, frequencies above 10 GHz will be used wherever possible for the camera to mobile studio link and either this or the 6 GHz band for the link from mobile studio to main studio.
6. In Region 2, the 2400-2500 MHz allocation is designated for industrial, scientific and medical (ISM) applications. Radio services operating within this band must accept harmful interference which may be caused by these applications.
7. Co-ordination with existing high power radiolocation services is required in the range 2310-2548 MHz.
8. At present, there are no plans in Canada for a broadcasting-satellite service in the 2500-2690 MHz allocation. The fixed-satellite service is under study and would involve co-ordination with the fixed service.

**BAND 2548-2686 MHz
(SRSP - 300)**

2548		2550		2655		2686	
CANADIAN TABLE		TYPES OF SYSTEMS					
FIXED		MCS VIDEO/ITV					
FIXED SATELLITE (S-E)		FIXED-SAT					
FIXED SATELLITE (E-S) (S-E)		FIXED-SAT					
BROADCASTING SAT.		BROADCASTING-SAT					
Earth Exploration Sat. Passive		Earth Exploration Sat. P.					
Space Research Passive		Space Research P.					
Radio Astronomy		Radio Astronomy					
RADIOLOCATION		RL					
		REMARKS					
LEGEND		1. MCS-video has access to this underutilized band, which had been reserved entirely for Instructional Television. MCS-video is not a substitute for or an adjunct to Very High Capacity Microwave (VHCM) used for urban TV distribution by broadcast receiving undertakings, for which allocations above 10 GHz are available.					
S-E..... Space-to-Earth		2. Separate groups of RF channels (6 MHz) will be assigned to ITV and MCS-video according to the local demand for these systems.					
E-S..... Earth-to-Space		3. At present, there are no plans in Canada for a broadcasting-satellite service in the 2500-2690 MHz allocation. The fixed-satellite service is under study and would involve co-ordination with the fixed service.					
MCS..... Multipoint Communication Systems							
ITV Instructional Television							
LC..... Low Capacity							
RADIO- LOCATION							

2686 - 2690 MHz

The band from 2686-2690 MHz is treated as part of a group of miscellaneous bands at the end of this section.

2690 - 3500 MHz

In the bands between 2690-3500 MHz there are no allocations to the FIXED service on either a primary or secondary basis.

**BAND 3500-4200 MHz
(SRSP – 302)**

	3500	4200
CANADIAN TABLE	TYPES OF SYSTEMS	
FIXED	HC DIGITAL AND VHC ANALOGUE	
FIXED-SATELLITE	FIXED-SATELLITE (S-E)	

LEGEND

S-E Space to Earth
 HC High Capacity
 VHC Very High Capacity

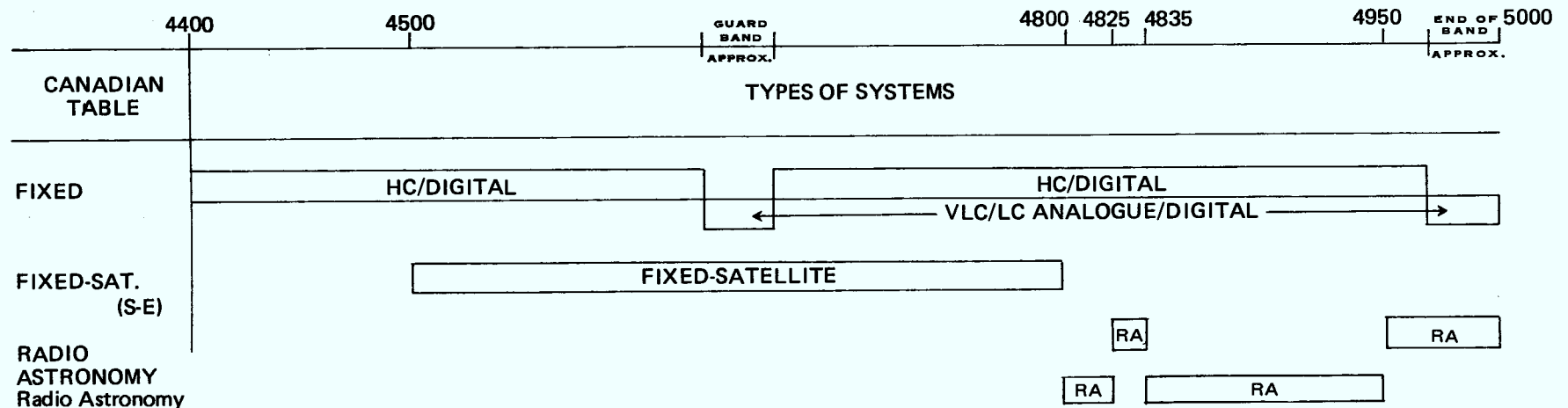
REMARKS

1. With the eventual phasing out of existing analog systems, the frequency band will be re-structured to accommodate digital systems.
2. (a) Two-frequency plans are standard for digital systems.
 (b) Two-frequency plans continue to be standard for analog systems as specified in SRSP 302, issue 2.
3. Co-ordination is required with the fixed-satellite service.

4200 - 4400 MHz

In the band from 4200-4400 MHz there are no allocations to the FIXED service on either a primary or secondary basis.

BAND 4400-5000 MHz (NO SRSP)



LEGEND

S-E..... Space-to-Earth
VLC..... Very Low Capacity
LC..... Low Capacity
HC..... High Capacity
VHC..... Very High Capacity

REMARKS

1. Systems employing frequencies in the band 4400-5000 MHz will have to be planned with US systems (possibly troposcatter) in mind. The exact types, locations and terms of operation of these systems for this band are still being resolved.
2. VLC/LC analog and digital systems may be inserted in the guard band for HC digital systems and equal space at the end of the band. The size and location of these bands will be decided when the 4400-5000 MHz band is channelized.
3. Two-frequency plans will be standard in this band.
4. Co-ordination will be required between the fixed, fixed-satellite and radio astronomy services.

5000 - 5850 MHz

In the bands between 5000-5850 MHz there are no allocations to the FIXED service on either a primary or secondary basis.

**BAND 5850-6425 MHz
(SRSP - 301)**

	5850	5925	6425
CANADIAN TABLE	TYPES OF SYSTEMS		
FIXED	<div style="border: 1px solid black; padding: 5px; text-align: center;"> HC/VHC ANALOGUE AND MC/HC DIGITAL </div>		
	<div style="border: 1px solid black; padding: 5px; text-align: center;"> ← VLC/LC ANALOGUE & DIGITAL </div>		
FIXED-SATELLITE	<div style="border: 1px solid black; padding: 5px; text-align: center;"> FIXED-SATELLITE (E-S) </div>		
Amateur	<div style="border: 1px solid black; padding: 5px; text-align: center;"> Amateur </div>		
Radiolocation	<div style="border: 1px solid black; padding: 5px; text-align: center;"> Radiolocation </div>		

LEGEND

E-S..... Earth-to-Space
 MC..... Medium Capacity
 HC..... High Capacity
 VHC..... Very High Capacity
 VLC..... Very Low Capacity
 LC..... Low Capacity

REMARKS

1. As a result of WARC'79, the fixed service obtained a 75 MHz downward extension to 5850 MHz, which has been included in the Canadian allocation. The 75 MHz extension will be used for VLC/LC analog and digital systems, leaving the present channelling plan unchanged for high capacity systems in the 5925-6425 MHz allocation.
2. Short-haul systems, analog or digital, will be permitted in the 5925-6425 MHz allocation to the extent that existing and planned long-haul systems are not compromised.
3. Analog and digital systems in the 5925-6425 MHz allocation will share the existing channelling plan of SRSP 301, issue 2.
4. In the 5850-5925 MHz allocation, two-frequency plans are standard for analog and digital systems.

REMARKS (continued)

5. Co-ordination will be required with the fixed satellite service.
6. In the 5925-6425 MHz allocation:
 - (a) two-frequency plans are standard for digital systems
 - (b) two-frequency plans continue to be standard for analog systems in accordance with SRSP 301, issue 2.
7. In Region 2, the 5725-5875 MHz allocation is designated for industrial, scientific and medical (ISM) applications. Radio services operating within this band must accept harmful interference which may be caused by these applications.
8. Frequencies for auxiliary radio-relay will be deleted.

**BANDS 6425-6590 MHz
6770-6930 MHz
(SRSP — 307)**

6425	6590	6770	6930
CANADIAN TABLE	TYPES OF SYSTEMS		
FIXED	HC/VHC ANALOGUE	SEE NEXT PAGE FOR INFORMATION FOR THIS RANGE OF FREQUENCIES	HC/VHC ANALOGUE
	MC/HC DIGITAL		MC/HC DIGITAL
	FIXED-SATELLITE		FIXED-SATELLITE
FIXED-SAT (E-S)			

LEGEND

E-S..... Earth-to-Space
MC..... Medium Capacity
HC..... High Capacity
VHC..... Very High Capacity

REMARKS

1. Analog and digital systems will share the existing channelling plan of SRSP 307, issue 1.
2. (a) Two-frequency plans are standard for digital systems.
(b) Two-frequency plans continue to be standard for analog systems in accordance with SRSP 307, issue 1.
3. Co-ordination will be required with existing fixed systems used for the backhaul to earth stations if the fixed-satellite service is introduced in this band. In new applications for terrestrial backhaul, the possibility of interference with the fixed-satellite service should be considered.

**BANDS 6590-6770 MHz
6930-7125 MHz
(SRSP - 308)**

	6590	6770	6930	7075	7125
CANADIAN TABLE	TYPES OF SYSTEMS				
FIXED	TV STL		SEE PREVIOUS PAGE FOR INFORMATION FOR THIS RANGE OF FREQUENCIES		
FIXED-SATELLITE	FIXED-SATELLITE (E-S)		TV PICKUPS & TEMP. TV LINKS		
			FIXED-SATELLITE (E-S)		

LEGEND

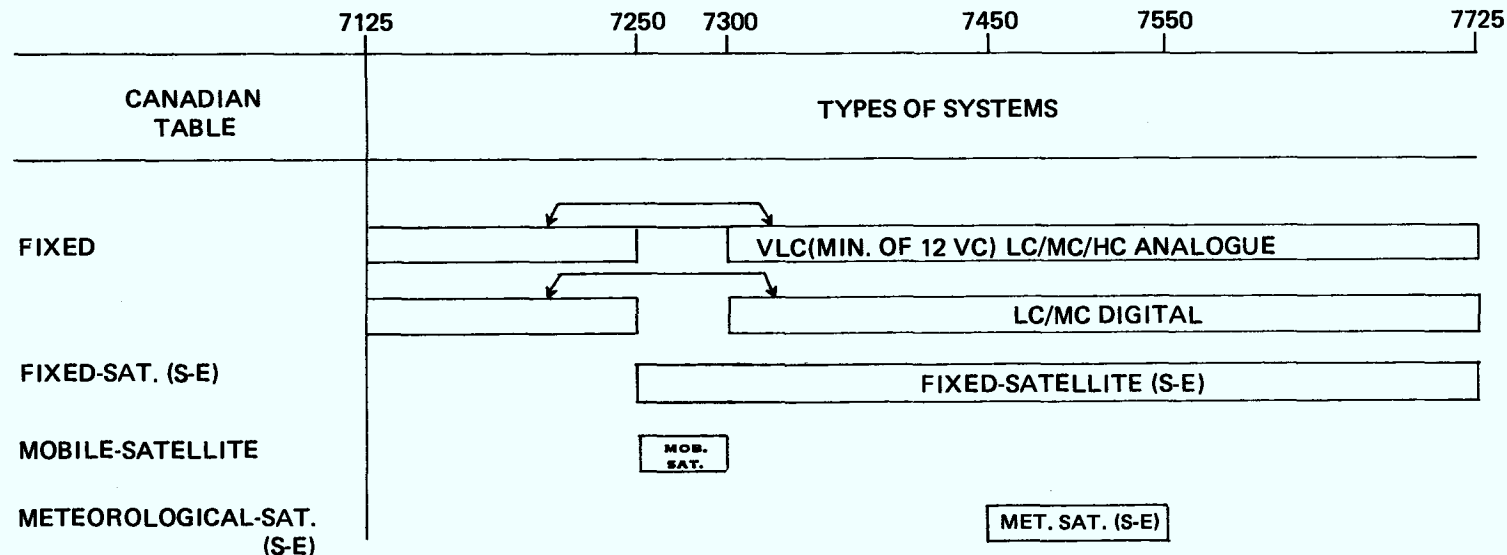
E-S..... Earth-to-Space

STL Studio to Transmitter
Link

REMARKS

1. The existing licensing arrangements of SRSP 308, issue 1, section 5.3 will be retained for TV pick-ups and Temporary TV links in the 6930-7125 MHz allocation.
2. For TV pick-ups, frequencies above 10 GHz will be used wherever possible for the camera to mobile studio link and either the 2.5 GHz or this band for the link from mobile studio to main studio.
3. Frequencies above 10 GHz or non-radio alternatives will be used wherever possible for short STLs (less than 16 km).
4. In order to avoid interference with satellite systems, the EIRP of TV pick ups and temporary TV links will be limited to 47 dBW.
5. The carriage of AM/FM STLs as a sub-carrier of TV STLs will be encouraged in order to conserve spectrum.
6. Co-ordination will be required with the fixed satellite service.

**BAND 7125-7725 MHz
(SRSP - 305)**



LEGEND

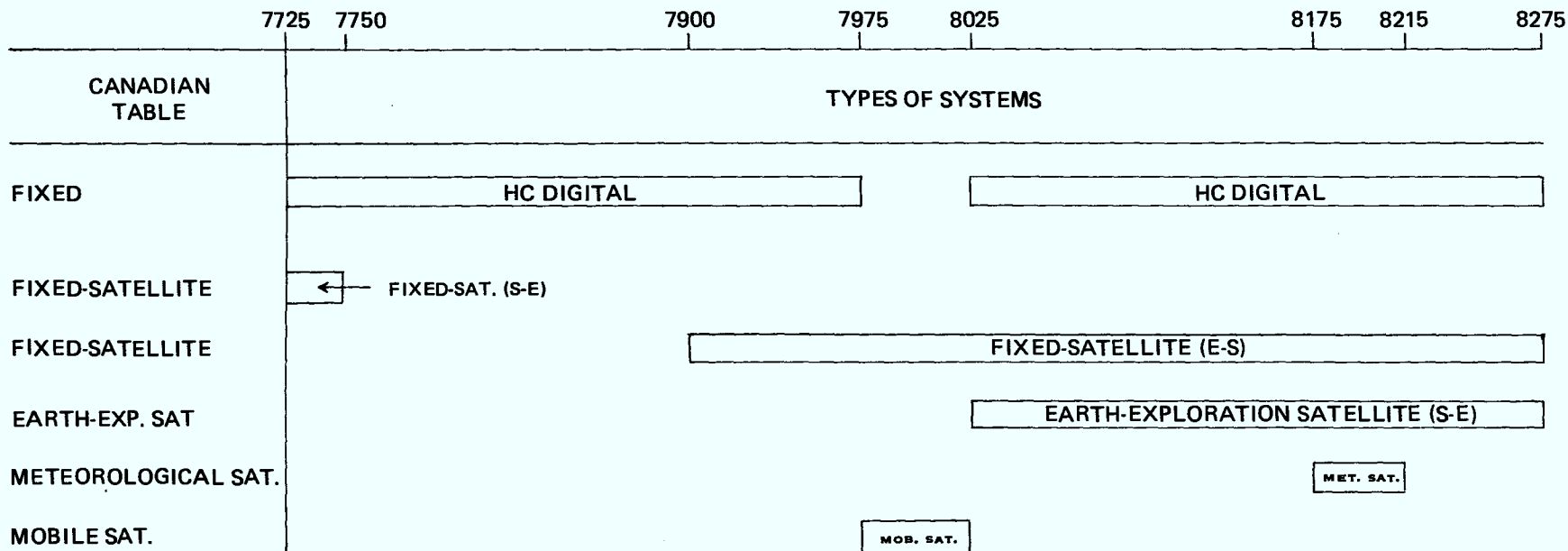
S-E..... Space-to-Earth
VLC..... Very Low Capacity
LC..... Low Capacity
MC..... Medium Capacity
HC..... High Capacity
VC..... Voice Channels

REMARKS

- (a) Frequency diversity continues to be standard subject to the conditions specified in SRSP 305, issue 2 and the associated Statement of Interpretation dated 7 November 1978 (Appendix D).

(b) Two-frequency plans continue to be standard with exceptions as specified in SRSP 305, issue 2 and the associated Statement of Interpretation dated 7 November 1978 (Appendix D).
- The carriage of TV signals is non-standard in this band.
- Use of the fixed-satellite and mobile-satellite services in this band is reserved for the Government of Canada. Co-ordination is required.
- Assignments in this band will be made primarily, but not exclusively to systems serving the telemetry, control and protection purpose.

**BAND 7725-8275 MHz
(SRSP - 306)**



LEGEND

S-E..... Space-to-Earth
 E-S..... Earth-to-Space
 HC..... High Capacity

REMARKS

1. Two-frequency plans continue to be standard in accordance with SRSP 306, issue 2.
2. A new frequency plan which incorporates cross-polarization, with minimal frequency separation, is required in order to double the capacity of digital systems.
3. Use of the fixed-satellite and mobile-satellite services in this band is reserved for the Government of Canada. Co-ordination is required.

BAND 8275-8500 MHz
(SRSP - 309)

	8275	8400	8500
CANADIAN TABLE	TYPES OF SYSTEMS		
FIXED	MULTI-HOP VIDEO		
FIXED-SATELLITE (E-S)	FIXED-SATELLITE		
EARTH-EXPL. SAT. (S-E)	EARTH-EXPLORATION-SATELLITE		
SPACE RESEARCH (S-E)	SPACE RESEARCH		

LEGEND

E-S..... Earth-to-Space

S-E..... Space-to-Earth

REMARKS

1. Short-haul video systems (up to 65 km) are no longer standard in this band.
2. (a) The 8275-8500 MHz band is reserved for long-haul video systems (over 65 km in length). Additional spectrum above 10 GHz may be provided for these systems depending on the outcome of the "Intercity microwave licensing policy review" and the forthcoming 10-30 GHz policy review.
3. The carriage of wideband radar (37.5 MHz maximum bandwidth) will be considered on a case-by-case basis on the understanding that suitable bandwidth reduction techniques will be employed as they become feasible.
4. Digitized video systems will be assigned in this frequency band if the RF bandwidth does not exceed 18.75 MHz.
5. Use of the fixed-satellite service in this band is reserved for the Government of Canada. Co-ordination is required.

8500 - 9800 MHz

In the bands between 8500-9800 MHz there are no allocations to the FIXED service on either a primary or secondary basis.

9800 - 10000 MHz

Although the FIXED service is secondary to the RADIOLOCATION service there are no frequency assignments to the RADIOLOCATION service in this band, therefore, certain FIXED service applications could be considered in this 200 MHz of spectrum on a case-by-case no protection basis from future RADIOLOCATION assignments.

10.0 - 10.5 GHz

In the bands between 10.0-10.5 GHz there are no allocations to the FIXED service on either a primary or secondary basis.

**BAND 10.50-10.68 GHz
(NO SRSP)**

	10.50	10.55	10.60	10.68
CANADIAN TABLE	TYPES OF SYSTEMS			
FIXED	VLC/LC ANALOGUE & DIGITAL AND MCS (VLC DATA/VOICE)			
RADIOLOCATION	RADIOLOCATION			
RADIO ASTRONOMY	10.525 Radar Speed Measuring Devices	RADIO ASTRONOMY		
SPACE RESEARCH (PASS.)	SPACE RESEARCH (PASSIVE)			
EARTH-EXPLOR. SAT.	EARTH EXPLORATION SAT. (PASSIVE)			

LEGEND

MCS..... Multipoint Communi-
cation Systems

VLC..... Very Low Capacity

LC..... Low Capacity

REMARKS

1. Separate groups of RF channels will be assigned for MCS-VLC data/voice and VLC/LC analog/digital systems according to the local demand for these systems.
2. Two-frequency plans are standard for analog and digital systems.
3. Applicants for fixed systems in the 10.5-10.55 GHz spectrum should be aware of possible interference to and from radiolocation services, e.g. low powered speed measuring devices at 10.525 GHz.

**MISC. BANDS
(NO SRSP's)**

CANADIAN TABLE	TYPES OF SYSTEMS
BAND 1525-1535 MHz	
SPACE OPERATION (S-E)	SPACE OPERATION (S-E) 1525 – 1530 MHz ONLY
Earth Expl. – Satellite	Earth Exploration – Satellite
Fixed	Fixed
Mobile	Mobile
MARITIME MOB-SAT (S-E) 1530-1535 MHz ONLY	MARITIME MOBILE – SATELLITE (S-E) 1530-1535 MHz ONLY
BAND 1660.5 -1668.4 MHz	
RADIO ASTRONOMY	RADIO ASTRONOMY
SPACE RESEARCH (P)	SPACE RESEARCH (PASSIVE)
Fixed	Fixed
BAND 1668.4-1670 MHz	
FIXED	FIXED
RADIO ASTRONOMY	RADIO ASTRONOMY
METEO AIDS	METEOROLOGICAL AIDS

REMARKS		
1.	1525 – 1535	Because the fixed service is secondary in this band to other services, no policy is made relating to this service.
2.	1660.5-1668.4	Because the fixed service is secondary in this band to other services, no policy is made relating to this service.
3.	1668.4-1670	As there is only 1.6 MHz available to the fixed service in this band, no policy is made.

**MISC. BANDS (con't)
(NO SRSP's)**

CANADIAN TABLE	TYPES OF SYSTEMS
-------------------	------------------

BAND 1700-1710 MHz

FIXED	FM AND POSSIBLY AM STEREO STL's
MET. SAT. (S-E)	METEOROLOGICAL SATELLITE (S-E)

BAND 2686-2690 MHz

FIXED	VLC ANALOGUE & DIGITAL
FIXED SAT.	FIXED SATELLITE (E-S) (S-E)
BROADCASTING SAT.	BROADCASTING SATELLITE
Earth Expl. – Sat. (Passive)	Earth Exploration Satellite (Passive)
Radio Astronomy	Radio Astronomy
Space Research (Passive)	Space Research (Passive)

LEGEND

S-E Space-to-Earth
E-S Earth-to-Space
VLC Very Low Capacity
STL Studio to Transmitter
 Link

REMARKS		
1.	1700 – 1710	Overflow for FM STLs from 956-960 MHz and possible for AM STEREO STLs.
2.	2686 – 2690	VLC analogue and digital one-way radio paging fixed links.

SPECTRUM AVAILABILITY BY TYPE OF FIXED SERVICE1.0 Summary

- Note: 1) Most of the spectrum indicated is shared with other services. See following pages for details.
- 2) Only sharing with other fixed terrestrial telecommunications services indicated - e.g. services such as satellite, radiolocation, ISM, etc. is not indicated.

1.1 Analogue Systems

<u>System Capacity</u>	<u>Total Available Spectrum (MHz)</u>	<u>Total Previous Spectrum (MHz)</u>
VLC	1289	620
LC	1285	810
MC	838	740
HC	1765	1765
VHC	1525	1525

1.2 Digital Systems

<u>System Capacity</u>	<u>Total Available Spectrum (MHz)</u>	<u>Total Previous Spectrum (MHz)</u>
VLC	695	0
LC	1241	550
MC	1765	0
HC	2625	500

1.3 Other Services

<u>Type of System Capacity</u>	<u>Total Available Spectrum (MHz)</u>	<u>Total Previous Spectrum (MHz)</u>
Multipoint Communication Systems (MCS) - VLC Data/Voice	406	0
Multipoint Communication Systems (MCS) - Video	138	0
Subscriber Radio Systems - Telephone (SRS)	98	98
TV STLs	180	180
FM STLs	14	4
Instruction Television (ITV)	138	138
TV Pick-ups and Portable TV Links	245	195
Multi-hop Video	225	225

2.0 Band by Band Comparison of Proposed & Existing Spectrum Available2.1 Analogue Systems2.1.1 Very Low Capacity (VLC)

<u>Bands MHz</u>	<u>Available Spectrum MHz</u>	<u>Previous Spectrum MHz</u>	<u>Comments</u>
902-928/942-960	44	70	In the 890-902/928-942 MHz allocations of certain fixed systems are non-standard as described in section 2.10.
1427-1525	98	0	Shared with MC/LC analogue, VLC/LC digital, SRS and MCS - VLC data/voice.
1710-1900	190	0	Previously 6-24 VC shared with LC/MC analogue and VLC/LC digital. (VLC/LC analogue and digital interleaved with MC analogue.)
2390-2450/2500-2548	108	0	Shared with LC analogue, VLC/LC digital, MCS - VLC data/voice and In-plant video
2686-2690	4	0	Shared with VLC digital.
4400-5000	40 (approx.)	0	In the guard band for HC digital shared with LC analogue and VLC/LC digital.
5850-5925	75	0	Shared with LC analogue and VLC/LC digital.
7125-7250/ 7300-7725	550 (12-24 VC)	550 (12-24 VC)	Interleaved with MC/HC analogue and MC digital and shared with LC analogue and LC digital.
10500-10680	180	0	Shared with LC analogue, VLC/LC digital and MCS - VLC data/voice.
Total 1,289		620	

2.1.2 Low Capacity (LC) Analogue

<u>Bands MHz</u>	<u>Available Spectrum MHz</u>	<u>Previous Spectrum MHz</u>	<u>Comments</u>
902-928/942-960	44	70	In the 890-902/928-942 MHz allocations of certain fixed systems are non-standard as described in section 2.10.
1427-1525	98	0	Shared with MC/VLC analogue, VLC/LC digital, SRS and MCS - VLC data/voice.
1710-1900	190	190	Shared with VLC/LC digital and VLC analogue (VLC/LC analogue and digital interleaved with MC analogue).
2390-2450/2500-2548	108	0	Shared with VLC analogue, VLC/LC digital and MCS - VLC data/voice.
4400-5000	40 (approx)	0	In the guard band for HC digital shared with VLC analogue and VLC/LC digital.
5850-5925	75	0	Shared with VLC analogue and VLC/LC digital.
7125-7250/ 7300-7725	550	550	Interleaved with MC/HC analogue and MC digital and shared with VLC analogue and LC digital.
10500-10680	180	0	Shared with VLC analogue, VLC/LC digital and MCS - VLC data/voice.
<hr/>			
Total	1285	810	

2.1.3 Medium Capacity (MC) Analogue

<u>Bands MHz</u>	<u>Available Spectrum MHz</u>	<u>Previous Spectrum MHz</u>	<u>Comments</u>
1427-1525	98	0	Shared with VLC/LC analogue, VLC/LC digital, SRS and MCS - VLC data/voice.
1710-1900	190	190	Shared with VLC/LC analogue and LC digital.
7125-7250/ 7300-7725	550	550	Shared with HC analogue and MC digital. Interleaved with VLC/LC analogue and digital.
<hr/>			
Total	838	740	

2.1.4 High Capacity (HC) Analogue

<u>Bands MHz</u>	<u>Available Spectrum MHz</u>	<u>Previous Spectrum MHz</u>	<u>Comments</u>
1900-2290	390	390	Shared with MC digital.
5925-6425	500	500	Shared with VHC analogue and MC/HC digital.
6425-6590/ 6770-6930	325	325	Shared with VHC analogue and MC/HC digital.
7125-7250/ 7300-7725	550	550	Shared with MC analogue and MC digital. Interleaved with VLC/LC analogue and digital
<hr/>			
Total	1765	1765	

2.1.5 Very High Capacity (VHC Analogue)

<u>Bands</u> <u>MHz</u>	<u>Available</u> <u>Spectrum</u> <u>MHz</u>	<u>Previous</u> <u>Spectrum</u> <u>MHz</u>	<u>Comments</u>
3500-4200	700	700	Shared with HC digital.
5925-6425	500	500	Shared with HC analogue and MC/HC digital.
6425-6590/ 6770-6930	325	325	Shared with HC analogue, MC/HC digital and multi-hop video.
<hr/>			
Total	1525	1525	

2.2 Digital Systems2.2.1 Very Low Capacity (VLC) Digital

<u>Bands MHz</u>	<u>Available Spectrum MHz</u>	<u>Previous Spectrum MHz</u>	<u>Comments</u>
1427-1525	98	0	Shared with LC digital VLC/LC/MC analogue, SRS and MCS - VLC data/voice.
1710-1900	190	0	Shared with VLC/LC analogue and LC digital (VLC/LC analogue and digital interleaved with MC analogue).
2390-2450/ 2500-2548	108	0	Shared with VLC/LC analogue, LC digital and MCS - VLC data/voice.
2686-2690	4	0	Shared with VLC analogue.
4400-5000	40 (approx.)	0	Shared with VLC/LC analogue, and LC digital in guard band of HC digital.
5850-5925	75	0	Shared with LC digital and VLC/LC analogue.
10500-10680	180	0	Shared with LC digital and VLC/LC analogue, and MCS - VLC data/voice.
<hr/>			
Total	695	0	

2.2.2 Low Capacity (LC) Digital

<u>Bands</u> <u>MHz</u>	<u>Available</u> <u>Spectrum</u> <u>MHz</u>	<u>Previous</u> <u>Spectrum</u> <u>MHz</u>	<u>Comments</u>
1427-1525	98	0	Shared with VLC digital, VLC/LC/MC analogue, SRS and MCS - VLC data/voice.
1710-1900	190	0	Shared with VLC/LC analogue and LC digital (VLC/LC analogue and digital interleaved with MC analogue).
2390-2450/ 2500-2548	108	0	Shared with VLC/LC analogue, VLC digital and MCS - VLC data/voice.
4400-5000	40 (approx.)	0	Shared with VLC/LC analogue and VLC digital in the guard band of HC digital.
5850-5925	75	0	Shared with VLC digital and VLC/LC analogue.
7125-7250/ 7300-7725	550	550	Interleaved with MC/HC analogue and MC digital and shared with VLC/LC analogue.
10500-10680	180	0	Shared with VLC digital and VLC/LC analogue and MCS - VLC data/voice.
<hr/>			
Total	1241	550	

2.2.3 Medium Capacity (MC) Digital

<u>Bands MHz</u>	<u>Proposed Spectrum MHz</u>	<u>Existing Spectrum MHz</u>	<u>Comments</u>
1900-2290	390	0	Shared with HC analogue.
5925-6425	500	0	Shared with HC/VHC analogue and HC digital.
6425-6590/ 6770-6930	325	0	Shared with HC/VHC analogue, HC digital.
7125-7250/ 7300-7725	550	0	Shared with MC/HC analogue. Interleaved with VLC/LC analogue and LC digital.
<hr/>			
Total	1765	0	

2.2.4 High Capacity (HC) Digital

<u>Bands MHz</u>	<u>Available Spectrum MHz</u>	<u>Previous Spectrum MHz</u>	<u>Comments</u>
3500-4200	700	0	Shared with VHC analogue
4400-5000	600 (approx)	0	Shared with VLC/LC digital and VLC/LC analogue in the digital guard band.
5925-6425	500	0	Shared with HC/VHC analogue and MC digital.
6425-6590/ 6770-6930	325	0	Shared with HC/VHC analogue, MC digital.
7725-7975/ 8025-8275	250 250	250 250	
<hr/>			
Total	2625	500	

2.3 Other Services2.3.1 Multipoint Communication Systems (MCS) - VLC Data/Voice

<u>Bands MHz</u>	<u>Available Spectrum MHz</u>	<u>Previous Spectrum MHz</u>	<u>Comments</u>
1427-1525	98	0	Shared with VLC/LC digital, VLC/LC/MC analogue and SRS.
2290-2310	20	0	
2390-2450/ 2500-2548	108	0	Shared with VLC/LC analogue and digital systems.
10500-10680	180	0	Shared with VLC/LC analogue and digital systems.
<hr/>			
Total	406	0	

2.3.2 Multipoint Communication Systems (MCS) - Video

<u>Bands MHz</u>	<u>Available Spectrum MHz</u>	<u>Previous Spectrum MHz</u>	<u>Comments</u>
2548-2686	138	0	Shared with ITV.
<hr/>			
Total	138	0	

2.3.3 Subscriber Radio Systems (SRS) - Telephone

<u>Bands MHz</u>	<u>Available Spectrum MHz</u>	<u>Previous Spectrum MHz</u>	<u>Comments</u>
1427-1525	98	98	
<hr/>			
Total	98	98	

- 10 -

2.3.4 TV STL's

<u>Bands MHz</u>	<u>Available Spectrum MHz</u>	<u>Previous Spectrum MHz</u>	<u>Comments</u>
6590-6770	180	180	
<hr/>			
Total	180	180	

2.3.5 FM STL's

<u>Bands MHz</u>	<u>Available Spectrum MHz</u>	<u>Previous Spectrum MHz</u>	<u>Comments</u>
956-960	4	4	Shared with VLC/LC analogue.
1700-1710	10	10	Also possibly AM STLs.
<hr/>			
Total	14	14	

2.3.6 Instructional Television (ITV)

<u>Bands MHz</u>	<u>Available Spectrum MHz</u>	<u>Previous Spectrum MHz</u>	<u>Comments</u>
2548-2686	138	138	Shared with MCS video.
<hr/>			
Total	138	138	

2.3.7 TV Pickups and Temporary TV Links

<u>Bands MHz</u>	<u>Available Spectrum MHz</u>	<u>Previous Spectrum MHz</u>	<u>Comments</u>
2450-2500	50	0	Shared with radar speedmeters at 2455 MHz.
6930-7125	195	195	
<hr/>			
Total	245	195	

2.3.8 Multi-Hop Video (two-way high growth potential)

<u>Bands</u> <u>MHz</u>	<u>Available</u> <u>Spectrum</u> <u>MHz</u>	<u>Previous</u> <u>Spectrum</u> <u>MHz</u>	<u>Comments</u>
8275-8500	225	225	
<hr/>			
Total	225	225	

LIST OF PUBLIC SUBMISSIONS FOR THE JULY 1981 PAPER

1. Canadian Amateur Radio Federation Inc.
2. Canadian Association of Broadcasters
3. Canadian Broadcasting Corporation
4. Canadian Electrical Association
5. Canadian National Communications
6. Canadian Radio Technical Planning Board
7. CNCP Telecommunications
8. CUC Limited
9. Department of Transportation, Nova Scotia
10. Electrical and Electronic Manufacturers Association of Canada
11. Farinon Canada
12. Harry Dulmage Associations Limited (for Canadian Radio Common Carriers Association)
13. Intergovernmental Affairs Secretariat, Newfoundland and Labrador
14. Nova Scotia Power Corporation
15. Telecommunications Forum
16. Transport Canada

DEPARTMENT OF COMMUNICATIONS

RADIO LICENSING POLICY FOR FIXED SERVICES IN THE BANDS

7125 - 7725 AND 7725 - 8275 MEGAHERTZ

(16 JULY 1977)

INTRODUCTION

The Department gave notice in the Canada Gazette, Part I, of June 26, 1976, inviting comments on a proposed licensing policy covering the two bands 7125-7725 MHz and 7725-8275 MHz.

The Department has taken into consideration these comments, and other information made available since that date, and has given notice of a policy for the two bands in the Canada Gazette, Part I, dated July 16, 1977.

Notification has also been made for new Standard Radio System Plans (SRSP's) No. 305 (Issue 2) and No. 306 (Issue 2) covering the two bands and these should be read in conjunction with the following policies.

OBJECTIVE

The objective of the policies for the FIXED services in the bands 7125-7725 and 7725-8275 Megahertz is to provide guidance to permit the orderly growth and development of the FIXED services in these bands. (1)

POLICY FOR THE BAND 7125-7725 MHz (7 GHz BAND)

The Department recognizes the importance of adequate and suitable microwave spectrum for the control of electrical energy distribution facilities. In view of the growing importance of power in the economy of Canada, a channelling plan, SRSP 305, was developed in the 7 GHz band to suit the requirements of the Power Utilities. Similar requirements for low capacity analogue and digital systems are, however, foreseen for other users and the 7 GHz band will continue to be available to a number of users in any given area, particularly where such systems meet the requirements of SRSP 305.

On the basis of information currently available to the Department, and in view of the protection afforded to Power Utility systems in the 8 GHz band, the Department is confident that the microwave requirements of the Power Utilities can be met without conflicting with existing users of the 7 GHz band up to approximately January 1, 1984. Existing systems not conforming to SRSP 305 (Issue 2) will, therefore, be protected at least up to that date. It is proposed to permit "non-conforming" systems to continue to operate in the band after January 1st, 1984, provided they do not restrict the entry, extension or expansion of a system conforming to SRSP 305. Where such a restriction appears likely, the licensee of the existing system may be subject to notice of not less than one year to vacate the 7 GHz band. Such notice would not, however, be given until other suitable spectrum has been found to ensure continuation of service and until consideration has been given to all the economic implications. It is the view of the Department that serious conflicts after January 1984 can largely be avoided by careful planning-stage coordination between the various users of the band.

- 3 -

New systems, or the extension or expansion of existing systems, which do not conform to SRSP 305 (Issue 2) will continue to be considered for licensing in the 7 GHz band when a conforming system cannot be installed. It is, however, expected that such systems will only be required under exceptional circumstances. Where such systems conflict with existing or planned low capacity analogue or digital systems conforming to the SRSP, the Department will attempt, with the cooperation of the parties concerned, to resolve the conflict in an equitable manner, taking into consideration the technical, economic and operational requirements of all concerned. Such systems will be protected in the same manner as existing "non-conforming" system as described above.

POLICY FOR THE BAND 7725-8275 MHz (8 GHz BAND)

The Department recognizes the importance of providing adequate and suitable microwave spectrum on major trunk routes for medium capacity digital systems to permit Canada to realize the significant cost savings resulting directly from the integrated use of digital switching and transmission systems for voice and data communications. A new channelling plan, SRSP 306, has been developed for the 8 GHz band to suit these requirements which are expected to be met by the Telecommunications Common Carriers. There are other users, primarily the Power Utilities, who already occupy parts of the 8 GHz band with analogue systems and who wish to be able to have access to this band for new analogue or digital systems or to expand existing systems.

On the basis of planning information provided by TCTS, the Department is confident that the plans for the medium capacity digital networks can proceed without conflicting with existing users of the 8 GHz band up to approximately January 1, 1984. Existing systems not conforming to SRSP 306 (Issue 2) will, therefore, be protected at least up to that date. It is proposed to permit existing "non-conforming"

- 4 -

systems to continue to operate in the band after January 1st, 1984, provided they do not restrict the entry, extension or expansion of a system conforming to SRSP 306. Where such a restriction appears likely, the licensee of the existing system may be subject to notice of no less than one year to vacate the 8 GHz band. Such notice would not, however, be given until other suitable spectrum, preferably 7 GHz, has been found to ensure continuation of services and until consideration has been given to all the economic implications. It is the view of the Department that serious conflicts, after January 1984, can largely be avoided by careful planning-stage coordination between the users of the band (i.e., the Power Utilities and the Telecommunications Common Carriers).

New systems, or the extension or expansion of existing systems which do not conform to SRSP 306 (Issue 2) will continue to be considered for licensing in the 8 GHz band when a conforming system cannot be installed. It is, however, expected that such systems will only be required under exceptional circumstances. Where such systems conflict with an existing or planned medium capacity digital system conforming to the SRSP, the Department will attempt, with the co-operation of the parties concerned, to resolve the conflict in an equitable manner, taking into consideration the technical, economic and operational requirements of all concerned. Such systems will be protected in the same manner as existing "non-conforming" systems as described above.

POLICY IMPLEMENTATION

The Department is satisfied that the course of action outlined above represents the best means for ensuring the effective use of scarce spectrum and for satisfying a wide range of needs for spectrum for point-to-point relay systems in the 7 and 8 GHz bands. It recognizes that the implementation of new policies for the utilization

- 5 -

of important bands of the spectrum already in use in certain locations will involve a transition period. The Department will closely monitor the implementation of the policies to ensure consistency of application and to avoid potential conflicts and will look to those involved to participate in coordination procedures aimed at achieving the most equitable resolution of conflicts that might arise.

Where potential conflicts can be foreseen, they should be brought to the attention of the Department as early as possible. The Licensing Policy and the SRSP's (Issue 2) become effective on July 16, 1977.

Ottawa, July 16, 1977

-
- (1) There is a band 50 MHz wide within each of the 7 and 8 GHz bands, allocated exclusively to the FIXED-SATELLITE service. It is used by the military for NATO communications. The Department has excluded these bands from plans for the assignment of frequencies for the operation of terrestrial system.

STATEMENT OF INTERPRETATION*
SRSP-305 & SRSP-306
ISSUE 2 (7 NOVEMBER 1978)

SRSP-305

ITEMS	INTERPRETATION	CONFORMANCE/ PROTECTION
Use of both ring, and frequency diversity in a system	<p>The use of both ring and frequency diversity should be discouraged in a system. However, in recognition of the serious consequences of electrical power facility control failures, frequency diversity on power control microwave ring systems will be permitted with the following restraints:</p> <p>1) Propagation calculations will be required in accordance with the methods of RSP 113 to demonstrate the need for frequency diversity with ring systems in areas of frequency congestion.</p> <p>2) Where repetition of frequencies throughout a ring is not feasible, interference calculations will be required to justify the use of additional frequencies.</p>	Conforming system
Odd number of hops in a ring system	<p>In every SRSP there is a paragraph which states: "Closed Loops - Systems must be designed so that any closed loop will comprise an even number of hops".</p>	

* This statement of interpretation was developed to assist certain user groups in the application of SRSP 305 and SRSP 306 to their particular needs.

ITEMS	INTERPRETATION	CONFORMANCE/ PROTECTION
	<p>a) Because odd number of hops in a ring (loop system means deviating from the standard frequency plan, newly designed ring systems would require an even number of hops.</p> <p>b) However, extensions to existing systems proposing an odd number of hops could be considered for licensing under exceptional circumstances.</p>	<p>a) Conforming systems</p> <p>b) Protection provided from interference from present and future conforming systems.</p>
Two-frequency plan	<p>a) SRSP 305 states that, "Systems conforming to this standard are to employ two-frequency plans. In cases where ring diversity is used, it may be necessary to deviate from the preferred two-frequency plan, and such systems will receive the same degree of protection as the preferred system".</p> <p>Therefore, in ring systems where the angle between links is not sufficient for a two-frequency plan, additional frequencies may be allowed <u>on a case by case basis</u>.</p>	<p>a) Protection provided from interference from present and future conforming systems.</p>
	<p>b) As in other high performance microwave bands, departure from a two-frequency plan for a radio-relay system may be considered <u>on a case by case basis</u> for the first hop of a branching or spur route which does not have sufficient antenna discrimination to re-use the same frequencies as the main route.</p>	<p>b) Protection provided from interference from present and future conforming systems.</p>

ITEMS	INTERPRETATION	CONFORMANCE/ PROTECTION
One bit/hertz of bandwidth	Means bits/second per hertz bandwidth.	
Channel loading (deviation)	We have no objection to increasing the frequency deviation per audio channel in a microwave system providing the RF channel bandwidth for a particular frequency plan is not exceeded at any time. This applies when the number of audio channels needed are less than the maximum permitted in the appropriate SRSP.	Conforming system
High-performance antennas (F/B ratio 65 dB)	High-performance antennas are preferred so that the two- frequency plan called for in SRSP 305 can be followed and because of the sharing requirements between the fixed and satellite services in this band. However, in non-congested, remote areas, antennas not meeting the standard could be considered for licensing on a non-standard basis.	Non-conforming system

ITEMS	INTERPRETATION	CONFORMANCE/ PROTECTION
SRSP 306		
Policy vs SRSP	Policy document does generally agree with SRSPs 305 and 306. However, in discussions of any paragraphs the principle of the policy document will take precedence over the SRSP's.	
Frequency plans (not in SRSP)	Frequency plans other than stated in SRSP 306 could only be considered for licensing if the proposed non-standard system does not block existing or planned conforming systems. The co-ordination procedure (RSP 113) will indicate whether or not frequency compatibility is possible.	Non-conforming system
Loading capacity	Likewise, a proposed system not meeting the loading capacity requirements (2 bits per Hertz, etc.) will not be considered for licensing unless the prior coordination between companies (RSP-113) indicates no harmful interference is anticipated to existing or planned conforming systems.	Non-conforming system

ITEMS	INTERPRETATION	CONFORMANCE/ PROTECTION
Relaxation of minimum antenna requirements	A relaxation of the minimum antenna requirements could only be considered in non-congested, remote areas.	Non-conforming system
Policy Document (non-conforming systems)	The analogue and digital systems referred to in the first paragraph of the policy document for the 8 GHz band are the systems referred to as "Non-conforming systems", or "Systems which do not conform to SRSP 306, issue 2", in paragraphs 2 and 3 (pages 3 and 4) of the Policy Document.	

IMPLEMENTATION

This appendix indicates the conditions (category) in which the various services in each microwave band covered by the policy are licensed or not licensed until the SRSPs are issued.

The categories for licensing the various services in each frequency band until the SRSPs are issued, are as follows:

- A. Systems are licenseable as standard providing they conform to the existing SRSP as modified by the policy paper.
- B. Systems are licenseable as non-standard pending final revision of the SRSP.
- C. Systems are not licenseable, as the outcome of the SRSP is not foreseeable for a particular service.

CATEGORY

890-960 MHz (SRSP-310)

VLC (6-24 V.C.)/LC ANALOGUE

890-902 and 928-942 MHz	B
902-928 and 942-960 MHz	A
956-960 MHz (FM STL'S)	A
VLC (1-6 V.C.)	C

1427-1525 MHz (SRSP-311)

VLC DIGITAL	C
LC DIGITAL	A
SUBSCRIBER RADIO SYSTEMS (SRS)	A
VLC/LC/MC ANALOGUE	C
MCS (VLC DATA/VOICE)	C
RADIO ENTRANCE LINKS (SRS FREQUENCIES)	C

- 2 -

CATEGORY

1710-1900 MHz (SRSP-303)

VLC ANALOGUE (1-6 V.C.)/VLC DIGITAL
VLC (6-24 V.C.)/LC/MC ANALOGUE AND
VLC/LC DIGITAL

C
A

1900-2290 MHz (SRSP-304)

HC ANALOGUE
MC DIGITAL
WIDE-BAND RADAR CONVEYANCE

A
B
C

2290-2548 MHz (NO SRSP'S)

MCS (VLC DATA/VOICE) AND/OR VLC/LC DIGITAL
TV PICKUPS AND TEMPORARY LINKS
IN-PLANT VIDEO

C
C
C

2548-2686 MHz (SRSP-300)

ITV
MCS (VIDEO)

A
C

3500-4200 MHz (SRSP-302)

VHC ANALOGUE
HC DIGITAL

A
C

4400-5000 MHz (NO SRSP)

HC DIGITAL
VLC/LC ANALOGUE AND DIGITAL

C
C

5850-5925 MHz (NO SRSP)

VLC/LC ANALOGUE AND DIGITAL

C

CATEGORY

5925-6425 MHz (SRSP-301)

HC/VHC ANALOGUE

A

MC/HC DIGITAL

B

6425-6590 MHz

6770-6930 MHz (SRSP-307)

HC/VHC ANALOGUE

A

MC/HC DIGITAL

B

6590-6770 MHz

6930-7125 MHz (SRSP-308)

TV STL'S

A

TV PICKUPS AND TEMPORARY TV LINKS

A

7125-7725 MHz (SRSP-305)VLC (MIN. OF 12 V.C.) LC/MC/HC ANALOGUE
AND LC DIGITAL

A

MC DIGITAL

B

7725-8275 MHz (SRSP-306)

HC DIGITAL

B

8275-8500 MHz (SRSP-309)

MULTI-HOP VIDEO

A

10.50-10.68 GHz (NO SRSP)

VLC/LC ANALOGUE AND DIGITAL

C

MCS (VLC DATA/VOICE)

C

CATEGORY

MISC. BANDS

1700-1710 MHz

FM AND POSSIBLE AM STEREO STL'S

C

2686-2690 MHz

VLC ANALOGUE AND DIGITAL

C

NOTICE PUBLISHED IN THE CANADA GAZETTE

PART 1

DEPARTMENT OF COMMUNICATIONS

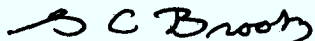
Notice No. DGTN 007-82 DGTR 019-82

Policy for the Utilization of the Radio Spectrum in
the Range 0.890-10.68 GHz by the Fixed Service

In August 1979, the Department announced its intention to undertake a review of the 1-10 GHz radio spectrum by a notice in the Canada Gazette and the public release of a discussion paper entitled "The Utilization of the Radio Spectrum in the Range 0.890-10.68 GHz". The first objective of the review was to examine current spectrum utilization and projected service demands in the frequency range, particularly for the rapidly expanding fixed services. A second and more important objective was to provide for these service demands to the extent possible, using technological advance and licensing policy as a means of achieving a more efficient utilization within the frequency range, thus relieving spectrum congestion. Following analysis of the public submissions made in response to the above discussion paper, certain proposals were presented in a second paper entitled "Proposed Utilization of the Radio Spectrum in the Range 0.890-10.68 GHz by the Fixed Service", which was issued for public comment in July 1981. The present policy, therefore, marks the culmination of a two-stage process of public consultation, in which the original objectives are fulfilled in a manner consistent with radio user needs.

This policy is outlined in a paper entitled Policy for the Utilization of the Radio Spectrum in the Range 0.890-10.68 GHz by the Fixed Service. Copies of this paper may be obtained from Information Services, Department of Communications, 300 Slater Street, Ottawa, Ontario K1A 0C8 (phone 613-995-8185) or from Departmental Offices in Moncton, Montreal, Toronto, Winnipeg, and Vancouver.

Dated at Ottawa, this 26th day of November, 1982.



G.C. Brooks
Acting Director General
Telecommunication Regulatory
Service
Department of Communications



V. Hill
Director General
National Telecommunications
Branch
Department of Communications

