Industry Canada

SP 30-896 MHz, Part II
April 5, 1995

Spectrum Management

Spectrum Utilization Policy

Spectrum Utilization Policy for the Mobile, Broadcasting and Amateur Services in the Frequency Range 30-896 MHz (Part II)

Canada

Aussi disponible en français – PS 30-896 MHz, partie II

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Department of Industry

Radiocommunication Act

Notice No. DGTP-004-95

Spectrum Utilization Policy for the Mobile, Broadcasting and Amateur Services in the Frequency Range 30-896 MHz, Part II (SP 30-896, Part II)

This notice announces the release of a spectrum utilization policy entitled *Spectrum Utilization Policy for Certain Frequency Bands in the Mobile, Broadcasting and Amateur Services in the Range 30-896 MHz, Part II (SP 30-896 MHz, Part II).* This spectrum utilization policy follows the July 1993 release of a policy proposals paper entitled *Proposed Spectrum Allocations and Utilization in the Range 30-960 MHz* (DGTP-002-93/SMEP-011-93) and completes the public consultation process which began in 1987. This new policy, *SP 30-896 MHz, Part II* , deals with those bands not covered in the previously-released companion policy document *SP 30-896 MHz, Part I.*

Based on the assessment of public comments made during the review and internal study, the Department of Industry herewith sets the utilization policies for a number of bands in the mobile, broadcasting and amateur radio services. Some general policy guidelines are provided for the development of a re-deployment plan for mobile services in certain frequency bands in the 150 MHz and 450 MHz ranges. The Department of Industry recognizes the critical need to proceed with a plan to ensure the availability of sufficient mobile spectrum below 1 GHz through the turn of the century. Also the document entitled *Revision to the Canadian Table of Frequency Allocations (1994)* announced in Gazette Notice DGTP-005-94, adopted certain allocation changes in the 30-896 MHz range.

This policy spectrum document is available electronically via the Internet at the following addresses:

Anonymous file transfer (FTP)
debra.dgbt.doc.ca/pub/isc/gazette
Gopher
debra.dgbt.doc.ca port 70/Industry Canada Documents
World Wide Web (WWW)
http://debra.dgbt.doc.ca/isc/gazette

Copies of the subject document are available from the Communications Branch, Department of Industry, 235 Queen Street, Ottawa, Ontario K1A 0H5, (613) 947-7466, or from its offices in Moncton, Montreal, Winnipeg and Vancouver.

Dated at Ottawa, this 5th day of April, 1995.

Michael Helm
Director General,
Telecommunications Policy Branch

1. Intent

This policy document, released with the issuance of Gazette Notice DGTP-004-95, sets forth the utilization policy for a number of bands in the mobile, broadcasting and amateur radio services in the range 30-896 MHz. In addition, some general policy principles are provided for dealing with the re-deployment of certain mobile bands, between 100-500 MHz, with more spectrum-efficient systems. The spectrum utilization policies contained herein along with those previously-iterated in spectrum utilization policy SP 30.01-896 MHz, Part I (dated May 1990)[1], SP 450 MHz (dated May 1986) [2] and SP 896 MHz (dated September 1991)[3] provide a complete series of spectrum policies for the 30-960 MHz range. The frequency bands which have been included in this document are detailed in Annex 1.

2. Background

The Department of Industry began a radio frequency band review of the 30-896 MHz range with the release, for public comment, of a discussion paper entitled, *Utilization of the Radio Frequency Spectrum in the Range 30.01-890 MHz*. The primary objective was to undertake a systematic review of the allocation and utilization of spectrum resources and the related policy directives which foster their efficient use. A secondary objective was to reassess current spectrum utilization policies to ensure the continued orderly use of the radio frequency spectrum. The first part of the review for certain bands was concluded in May of 1990 with the release of the *Spectrum Allocation and Utilization Policy 30-896 MHz, Part I.*

On July 17, 1993 the Department of Industry released the policy proposals paper for the remaining bands entitled *Proposed Spectrum Allocations and Utilization in the Range 30-960 MHz* for Part II of the review (herein referred to as the *30-960 MHz Review*). The comment period for this spectrum review was completed on December 20, 1993. This policy document, highlights some of the results of public consultation (Section 3), outlines general policy guidelines to be applied to the development of a re-deployment plan for the mobile service in frequency ranges 150 MHz and 450 MHz (Section 3.2.3), makes reference to the *Revisions to the*

1 Spectrum Allocation and Utilization in Certain Bands in the Range 30.01-896 MHz, Part I.

2 Spectrum Utilization Policy for the Frequency Bands 450-451 MHz and 455-456 MHz and also parts of the 150 MHz Band Used in Support of Broadcasting Operations and the Frequency Band 409-410 MHz and 420-421 MHz Used by the Mobile Radio Service.

3 Spectrum Utilization Policy for the Fixed, Mobile, Radiolocation and Amateur Services in the Band 896-960 MHz.

Canadian Table of Frequency Allocations (1994) (Section 4), and enunciates the utilization policy for specific bands (Section 5).

3. Overview of the Results of Public Consultation

3.1 Theme Questions

Chapter I of the **30-960 MHz Review** offered conclusions on six theme questions for public consultation. The themes were Low Power Devices, Introduction of New Technologies, Personal/Business Radio Service, UHF Television Broadcasting and Land Mobile and UHF Television Spectrum Sharing, Strategy for Implementing More Spectrum-Efficient Systems and Radiocommunications Development. The information provided in response to the theme question regarding a Strategy for Implementing More Spectrum-Efficient Systems, elicited significant response which will be used in the forthcoming development of a re-deployment implementation plan for the mobile service in frequency ranges 150 MHz and 450 MHz (138-144 MHz, 148-149.9 MHz, 150.05-174 MHz, 406.1-410 MHz, 410-414 MHz, 415-419 MHz, 420-430 MHz and 450-470 MHz). The remaining theme questions also generated a number of comments. The conclusions on these policy issues can be stated as follows:

Low Power Devices

Permitting the extended deployment of licence-exempt low power devices across the band 30.01-50 MHz would more fully exploit this portion of spectrum. Extended deployment can be achieved through appropriate radio standards specifications that protect the primary and licensed use of the band for mobile service. Utilization of the band for licensed or licence-exempt low power devices will foster, to the extent practicable, a homogeneous use of frequency bands across the 30-50 MHz range.

Introduction of New Technologies

Introduction of new and advanced radio technologies and applications (e.g. digital, trunking, narrow band and cellular-like frequency re-use)will greatly improve spectrum efficiency while supporting new and innovative service offerings . Proven spectrum-efficient technologies and systems applications that cause minimal disruption to existing services should be encouraged as part of the licensing process.

Personal/Business Radio Service

Based on a continuous lack of public interest to establish a Personal/Business Radio Service and the recognition that evolving mobile radio technologies are meeting

most of these needs, there is no sufficient interest for the development of a personal/business radio service in the 216-220 MHz band.

Television Broadcasting in the Digital Era[4]

The Department of Industry's preliminary conclusion, after reviewing the public submissions received on this issue, was that to provide for the implementation of a high quality advanced television (ATV) broadcasting system of significantly better quality than NTSC (National Television Standards Committee), it would not be prudent at this time to permit mobile services in portions of the television spectrum. However, with the advent of advanced digital broadcasting technology closely aligned to ATM digital transmission techniques, digital video compression and multi-program channels, there is an increasing interest by the broadcasting community in offerings of non-programming services[5] over advanced digital broadcasting systems using spectrum which has traditionally been allocated exclusively for broadcasting services.

Although digital broadcasting technology represents a unique opportunity to have a very high quality ATV broadcasting system over a 6 MHz channel, it is also seen by some as a potential to enable two or more digital TV broadcasting channels of moderate quality, or one digital TV channel with a significant level of remainder digital transmission capacity that would enable the distribution of a range of non-programming services such as data services to the home, Internet computer files, electronic mail, magazines and newspapers, computer software, etc.

The Department of Industry has noted this mounting interest of the broadcasting industry in the potential carriage capability of the new digital broadcasting technology as a source of new revenues which could be an important part of their future business plans. The recommendations of the Advanced Broadcasting Systems of Canada Inc. (ATV Implementation Task Group) in its report of June 15, 1994, makes reference to the multi-TV channel capability and other business opportunities as an attractive option for the implementation of digital television in Canada.

In light of the above and the convergence aspects of local broadcasting and telecommunications distribution networks, a new set of spectrum related issues is

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4 This revised theme question title covers the theme questions from the review formerly entitled, " UHF Broadcasting" and "Spectrum Sharing: Land Mobile and UHF Television".

5 i.e. non-programming services that represent radiocommunication applications such as radio paging and data transmission, as opposed to programming services and broadcasting-related services such as closed captioning and broadcasting control signals.

emerging. The Department of Industry intends to address these spectrum issues shortly in a public consultation proceeding on broadcasting spectrum and the potential for the accommodation of the land mobile service in Television Broadcasting spectrum that would be initiated through a gazette notice. The consultation could address a range of spectrum issues related to non-programing services including access to radio station facilities and the resale of transmission capacity and their licensing.

Strategy for Implementing More Spectrum-Efficient Systems

Accelerating the use of trunking techniques alone, in large metropolitan centres, will not be sufficient to resolve mobile spectrum congestion in the long term. It will be necessary to adopt new channelling plans and system applications and implement more spectrum-efficient technologies (e.g. digital modulation techniques, narrow band, signal compression, cellular-like frequency re-use) recognizing that the usefulness of many digital applications have yet to be demonstrated.

It should be noted that many mobile users also make use of the fixed service frequencies for auxiliary communications requirements. A moratorium on fixed service utilization below 1 GHz is not viewed, at this time, as a necessary measure to increase spectrum efficiency.

Radiocommunications Development[6]

The Department of Industry will continue on its course of setting well-balanced spectrum utilization policies in consultation with industry, relevant for the orderly development and efficient operation of radiocommunication in Canada. Furthermore, the efficient use of spectrum resources will provide a greater diversity of wireless radio services for all Canadians.

3.2 New Radio Technology in the Mobile Service Bands 150 MHz and 450 MHz.

3.2.1 Public Comments

In general, the public comments from the **30-960 MHz Review** supported a comprehensive study of the land mobile bands 138-144 MHz, 148-149.9 MHz, 150.05-174 MHz, 406.1-410 MHz, 410-414 MHz, 415-419 MHz, 420-430 MHz and 450-470 MHz with the objective of re-deploying new technology in order to accommodate an ever-increasing demand for mobile radio services. There was agreement that planning should begin as soon as possible towards the development

6 This theme question represents the review theme question, formerly entitled *Industry Development.*

of a "re-deployment" plan. To this end, the Radio Advisory Board of Canada (RABC) has created a "Refarming Committee" to work with The Department of Industry on such a plan. It was stressed that this should be done in harmony with similar US initiatives.

The majority of comments indicate that there is concern about committing to the deployment of very narrow band equipment (i.e. 5 kHz, or 6.25 kHz) before such equipment has proven its capability to perform as required in congested spectrum. Commenters indicated that the VHF (150 MHz bands) and UHF (450 MHz bands) mobile service bands to be re-deployed should have a common migration path to 12.5 kHz equipment which allows the use of either analogue or digital modulation equipment.

Several comments received suggest that the transition plan should be on a channel-by-channel basis which would maintain interoperability among users while allowing sufficient time to amortize existing equipment. The comments indicate that a realistic equipment amortization period could vary from a minimum of 10 years to a maximum of 20 years. The redeployment plan should provide for backward compatibility to support a smooth transition to the new spectrum efficient technologies. The plan should also allow for a seamless and economical transition path to new technologies with existing systems on the same channel in the same environment. Local requirements should be taken into account in the redeployment plan, specifically to not require an early transition in locations where channel occupancy is low. As a result of this approach, licensees should be permitted to retain current frequency assignment plans in order to facilitate continued interoperability in rural areas where the transition could be delayed.

The re-deployment plan should support a channel plan which arranges contiguous channels by user group to enable the use of narrow band or wide band channels to accommodate a variety of new technologies which will offer the best combination of voice and/or data services as determined by the user. Recommended incentives that may be introduced to encourage a re-deployment plan include allowing existing users to "re-deploy" within their assigned allotments. If re-assignment becomes necessary, considerations should be given to providing for the grouping of frequencies for similar users. Trunking should be allowed and encouraged, but not mandated. Users should be allowed to determine whether trunking is the most suitable solution for their communication needs.

It was indicated by some commenters that although spectrum efficiency is a worthwhile and critical goal, its value must be weighed against the costs (financial and operational) imposed on the radiocommunications sector and that the Department of Industry should not impose actions which would reduce the flexibility of manufacturers, service providers, or users. The transition plan should allow the marketplace to choose the most effective technologies for spectrum

efficiency gains. The transition to narrower bandwidth solutions should be technology neutral.

Commenters indicated that digital mobile radio technologies (e.g. 5 kHz or 6.25 kHz narrow band equipment) are in their infancy and that further experimentation is required to verify their viability. Therefore, while work may begin towards developing a re-deployment plan, it is premature to commit to a specific program until more knowledge is gained on these technologies.

3.2.2 Observations

The Department of Industry has noted the above concerns and the favourable response to the need for a re-deployment approach and the detailed comments are under consideration. In particular, The Department of Industry will continue dialogue with industry, primarily through the forum established by the RABC for this purpose. In addition, the Department of Industry will continue discussions with both the Federal Communications Commission (FCC) and National Telecommunication and Information Agency (NTIA) to ensure the greatest possible harmonization with the parallel refarming activities in the United States.

The mobile service frequency bands which are to be considered for re-deployment planning are:

MHz	Canadian Frequency Allocations
138-144	FIXED, LAND MOBILE Space Research (space-to-earth)
148-149.9 FIXED, LAND MOBILE	MOBILE-SATELLITE (Earth-to-space)
150.05-156.7625	MOBILE, Fixed
156.8375-174 MOBILE, Fixed	
406.1-410 RADIO ASTRONOMY, MOBILE except aeronautical mobile, Fixed	
410-414	MOBILE except aeronautical mobile, Fixed[7]

7 This band is paired with the band 415-419 MHz..

	Space Research (space-to-space)
415-419	MOBILE except aeronautical mobile, Fixed
	Space Research (space-to-space)
420-430	
MOBILE except aeronautical mobile[8]	
	Fixed
450-470	MOBILE, Fixed

The specific comments on a common migration approach for both the VHF and UHF mobile bands will be considered in the re-deployment planning, as will the need to take into account local requirements, while developing a national approach. The need to provide for the maximum flexibility in technology and to allow the marketplace to choose the most effective new technologies is noted.

The Department of Industry will review and reissue where required, spectrum utilization policies (SP), radio standards specifications (RSS) and standard radio systems plans (SRSP) dealing with the mobile service bands based on further public consultation. The input from all interested parties including the RABC and the results of discussions with the FCC and NTIA will be factored into the re-deployment plan.

3.3 Spectrum Utilization Re-Deployment Principles

In the 150 MHz and 450 MHz mobile service bands, as previously defined in Section 3.2.2 , mobile spectrum usage in the major urban centres is reaching or has already reached critical levels of congestion. This situation, combined with the reality that there is no new spectrum available for existing and emerging mobile radio services below 1 GHz, requires the development of a re-deployment plan to redress this situation. For many new mobile radio services, the utilization of spectrum above 1 GHz is alternatively too expensive. Consequently, the most economically-sound way to meet the growing traffic capacity demands of emerging and existing users of spectrum below 1 GHz , may be to free-up core spectrum through the introduction of significant spectrum efficient radio technologies.

The Department of Industry is committed to the re-deployment of radio frequencies in the 150 MHz and 450 MHz ranges, as a long term solution to meeting spectrum

8 In the band portion 420-421 MHz, base transmit frequencies are used in conjunction with mobile transmit frequencies in the band 409-410 MHz.

user needs. The Department of Industry also recognizes that the implementation of a coherent re-deployment plan will require continuous consultation with industry over a number of years. In this regard, a re-deployment plan will be developed with industry based on comments already received and ongoing consultation over the next year or so. Such an approach will enable the creation of a comprehensive plan that is sensitive to user needs while at the same time recognizing that such a plan must carefully balance the introduction of any new spectrum utilizations with similar ones that are emerging in a North American context. The following principles result from public consultation on the **30-960 MHz** Review and should guide the development of a re-deployment plan for mobile service bands in the 150 MHz and 450 MHz ranges.

Some Guiding Principles for the Development of a Re-deployment Plan

i) Plan a gradual transition to new technologies with a minimum of disruption to existing users.

ii) Adopt transition periods that reflect the future spectrum needs of a majority of users and include appropriate periods for equipment amortization.

iii) Adopt transition periods that will free-up sufficient frequencies for the ever-increasing demand for new mobile systems in various service areas (e.g. urban, rural and remote areas).

iv) Provide an access priority in the usage of newly freed-up spectrum to users who aggressively deploy technologies that significantly increase traffic capacity.

v) Encourage technologies offering improved spectrum efficiency with minimal disruption to existing services and give such applications preference in access to frequencies over conventional systems.

vi) Remove technical, policy or regulatory constraints that inhibit the utilization of new spectrum efficient technologies.

vii) Provide appropriate policy measures for safety, security, rail and maritime mobile services.

viii) Provide equitable treatment of all spectrum users in pursuing more spectrum efficient technologies.

ix) Recognize regional differences in spectrum density or congestion in policy directions.

x) Recognize backward compatibility with existing mobile systems to support a smooth and graceful transition to new technologies.

xi) Recognize areas of high spectrum congestion and give priority to dealing with these areas.

xii) Consolidate users with common needs and systems with similar operating requirements to realize common solutions to advance spectrum utilization efficiency.

xiii) Provide for a seamless and economical transition, where practicable, to new technologies with existing systems on the same channel(s) with the same requirements.

xiv) Provide consideration of rural and remote users (areas of low spectrum use) who may not need to convert to narrow band operation as spectrum is plentiful.

4. Revisions to the Canadian Table of Frequency Allocations

Most of the proposed new allocations in the **30-960 MHz Review** were based on decisions taken at WARC-92. They included those allocations supporting non-geostationary mobile satellite systems below 1 GHz, (137-138, 148-149.9, 149.9-150.05 and 400.15-401 MHz), space research allocations (400.15-401 and 410-420 MHz) and allocations modifications to accommodate the mobile service (849-851, 894-896 and 942-960 MHz). Gazette Notice DGTP-005-94 released the document entitled, *Revisions to the Canadian Table of Frequency Allocations (1994)* which adopted new allocations to the Canadian Table. In the utilization policies section (Section 5) which follows, a summary of the Canadian allocations will be presented for each frequency band. The reader should refer to the Canadian Table of Frequency Allocations for a full description of the relationship between bands and services.

5. Utilization Policies

Based upon the results of public consultation, the following is a series of spectrum utilization policy statements for certain services and frequency bands dealt with in Part II of the 30-960 MHz Review. A summary of the specific frequency allocations

currently in force in the Canadian Table of Frequency Allocations will be stated as additional information to that provided in the utilization policies.

5.1 Mobile Service Bands

A full description of the relationship between bands and services as contained in related international and domestic footnotes can be found in the Canadian Table of Frequency Allocations.

5.1.1 Overview: 30-50 MHz

The 30-50 MHz band is used by licensed radio users for a number of mobile service applications. These licensed systems tend to be concentrated in the upper portion of the band where radio propagation characteristics are more favourable. This upper band portion includes experimental radio systems operating in spectrum vacated by GLMRS (General Land Mobile Radio Service), radio paging, private radio systems and radio common carrier systems. Furthermore, there is extensive mobile usage (both private and government including the National Defence Department) across the entire 30-50 MHz range of frequencies. It is recognized that government and non-government entities use frequencies across the entire 30-50 MHz range for licensed mobile service and such primary operation will continue on a homogeneous and coordinated basis.

The overall utilization policy direction is to continue to support new radio technology applications that can be easily deployed within the full range of frequencies with minimum impact on existing users. Hence, it is understood that the term "new technologies" is to be construed in its broadest sense. Currently, The Department of Industry is permitting large capacity land mobile systems in vacated GLMRS frequencies as well as spread spectrum technology and other experimental spectrum efficient systems in the band. These ongoing uses are in accordance with *Radio Systems Policy RP-013* released in October, 1988, which permits large capacity land mobile systems and experimental testing of spectrum efficient systems in the vacated spectrum formerly utilized by GLMRS.

The deployment of licence-exempt low power applications in this range will be permitted as a secondary service that is, on a non-interference basis without protection from interference from licensed users. The terms for *licence-exempt applications* for low power and very low power systems are set out in *Radio Standards Specification - RSS 210.* Very low power devices, with a spurious emission field strength of no greater than 100 uV/m at 3 metres, are permitted in the 30-50 MHz range of frequencies. Therefore, such devices should not interfere with licensed stations and will operate on a non-protection and non-interference basis. Such devices are deemed to be technically suitable for licence-exemption in accordance with radio standards emission requirements.

The following subsections set-out the utilization policy provisions for the band 30-50 MHz.

5.1.2 30.005-37.5 MHz

Domestic Allocations

MOBILE
SPACE RESEARCH
Fixed

Utilization Policy

The band 30.005-30.01 MHz is amalgamated with the band 30.01-37.5 MHZ for licensed mobile systems. This amalgamated band, 30.005-37.5 MHz, will continue to accommodate existing uses such as mobile radio systems at 20 kHz channel spacing, radio paging, automatic repeaters and remaining GLMRS users, experimental uses and large capacity land mobile systems (in the ten vacated frequency pairs at 35.260-35.660 MHz and 43.260-43.660 MHz). These uses will continue to be permitted in accordance with *Radio Systems Policy RP-013* released in October, 1988. The 36.0-37.5 MHz portion of the newly amalgamated band is also designated to the development and testing of new long range transmission techniques over and above current licensed use.

5.1.3 37.5-38.25 MHz

Domestic Allocations

MOBILE
Fixed
Radio Astronomy

Utilization Policy

The band 37.5-38.25 MHz will be used by various licensed mobile systems on a primary basis. On a secondary basis, fixed systems will be accommodated where practical. New mobile and fixed applications may be assigned to this portion of spectrum.

5.1.4 38.25-39.986 MHz

Domestic Allocations

MOBILE
Fixed

Utilization Policy

The band 38.25-39.986 MHz, will continue to accommodate the licensing of various mobile systems on a primary basis. On a secondary basis, Emergency Traffic Control and Remote Fire Alarm systems and other licence-exempt systems are currently permitted. Furthermore, the use of long-range transmission applications, with a view to meeting requirements for point-to-point, point-to-multipoint and radio paging communications is permitted. Frequency designations are intended to reflect the utilization policy set out in Radio Systems Policy RP-004 of October 1, 1983, entitled, *Policy for the Licensing of Very Low Capacity Point-to-Point Links in the Band 30-890 MHz.*

5.1.5 39.986-41.015 MHz

Domestic Allocations

MOBILE
Fixed
Space Research

Utilization Policy

The band 39.986-40.02 MHz is amalgamated with the bands 40.02-40.98 MHz and 40.98-41.015 MHz. In the amalgamated band 39.986-41.015 MHz, Emergency Traffic Control and Remote Fire Alarm systems and ISM operations is permitted. The band portion 40.02-40.98 is also designated to analogue and digital low-power systems on a licence-exempt basis.

5.1.6 41.015-47 MHz

Domestic Allocations

MOBILE
Fixed

Utilization Policy

In the band 41.015-47.0 MHz, mobile usage is accommodated on a primary basis and low-power systems on a secondary basis. For certain types of low-power systems, particularly those intended for industrial applications where safety is concerned there must be an adequate level of protection against interference. In

the band portion 43.260-43.660 MHz such uses are permitted in accordance with *Radio Systems Policy RP-013* released in October, 1988. This radio system policy is maintained in order to satisfy the requirements of users of the land mobile service in non-urban regions.

Analogue cordless telephones currently are permitted to utilize 10 frequency pairs in the 46 MHz band (base transmit only: 46.610-46.970 MHz - see following Section, 5.1.7) in accordance with *Radio Systems Standard - Low Power Cordless Telephones Operating in the 46 MHz and 49 MHz bands (RSS-209).*

5.1.7 47-50 MHz

Domestic Allocations

MOBILE
Fixed

Utilization Policy

The band 47.0-50.0 MHz is heavily used by the land mobile service particularly along the corridor extending 120 km north along the Canada/U.S. border. Current mobile designation therefore is to be maintained.

Analogue cordless telephones, assigned on a secondary allocation basis without protection from interference, currently are permitted to utilize 10 frequency pairs in the 49 MHz band (handset transmit only: 49.670 - 49.970 - see previous section, 5.1.6) in accordance with *Radio Systems Standard - Low Power Cordless Telephones Operating in the 46 MHz and 49 MHz bands (RSS-209).* At the moment no other cordless telephone frequencies are permitted for use in this frequency range. However, there is interest in a North American context to increase the number of channels available for new cordless telephone technology in this frequency range. It is the intention of the Department of Industry, following the finalization of these developments, to implement to the maximum extent possible a similar channelling plan in Canada (i.e. to the extent that they can be accommodated across Canada in the various regions, with minimal disruption of usage to existing users).

Additional frequency pairs in adjacent subbands, that could raise the total number of frequency pairs from 10 to 25, are being considered. This should accommodate the needs of second generation cordless telephone users.

5.1.8 72-73 MHz

Domestic Allocations

FIXED
MOBILE

Utilization Policy

In the band 72-73 MHz, mobile systems are permitted on a shared primary basis with fixed systems. This band also accommodates low power industrial safety applications which are permitted with due regard for making assignments that do not cause interference to T.V. channels 4 and 5 or to neighbouring aeronautical radionavigation facilities in the band 74.5-75.2 MHz.

5.1.9 138-174 MHz

Domestic Allocations

138 -144 MHz	FIXED LAND MOBILE Space Research (space-to-Earth)
148 -149.9 MHz	FIXED LAND MOBILE MOBILE-SATELLITE (Earth-to-space)
150.05 - 156.7625 MHz	MOBILE Fixed
156.7625 - 156.8375 MHz	MARITIME MOBILE (distress and calling)
156.8375 - 174 MHz	MOBILE Fixed

Utilization Policy

These bands represent the VHF spectrum usage for a wide range of licensed mobile systems and mobile applications.

These mobile service bands will continue to provide the core spectrum for the wide range of mobile services below 1 GHz. Development of a re-deployment plan will require further public consultation. This spectrum will need to accomodate an ever-increasing growth of mobile service. Spectrum congestion is already being experienced in large metropolitan centres.

A re-deployment plan for the mobile service bands will be developed through further dialogue with industry. The principles set out in section 3.3 will guide the development of a re-deployment plan for further public consultation.

5.1.10 216-220 MHz

Domestic Allocations

FIXED
MARITIME MOBILE
LAND MOBILE (reserved)

Utilization Policy

The recent policy document entitled *Revisions to the Canadian Table of Frequency Allocations (1994)* allocated the band 216-220 MHz for land mobile service which is being held in reserve for future mobile applications. Current maritime mobile use of this band is light and will continue to be permitted. Fixed radio applications are permitted in the band with appropriate separation between maritime mobile assignments 170 km away from navigable waterways and TV channel 13 to prevent interference to television reception.

In addition to the uses previously-stated, there are radio technology and service applications developments being implemented in the United States for Interactive Video Data Services (IVDS) at 218-219 MHz. Although no interest exists to provide such a service in Canada, accommodating this type of service in the band 216-220 MHz may be given further consideration subject to public interest.

5.1.11 402-403 MHz

Domestic Allocations

METEOROLOGICAL AIDS
Earth Exploration Satellite (Earth-to-space)
Fixed
Mobile except aeronautical mobile

Utilization Policy

Utilization of the band 402-403 MHz includes a few meteorological aids assignments for use by weather balloons and a number of fixed assignments concentrated mostly in the central region of Canada. Such assignments are permitted with meteorological applications taking precedence in the band.

Mobile assignments will be permitted in the band on a non-protection, non-interference basis similar to fixed assignments and to the extent that they can be accommodated without causing interference to meteorological aids which have a primary status in the band.

5.1.12 403-406 MHz

Domestic Allocations

METEOROLOGICAL AIDS
Fixed
Mobile except aeronautical mobile

Utilization Policy

Utilization of the frequency band 403-406 MHz is available for meteorological aids. Mobile assignments will be permitted in the band on a non-protection, non-interference basis similar to fixed assignments and to the extent that they can be accommodated without causing interference to meteorological aids which have a primary status in the band. Use of the band for fixed systems in the gathering of non-telemetry data and in-hospital telemetry is permitted in this band on a non-protection, non-interference basis.

5.1.13 406.1-410 MHz

Domestic Allocations

RADIO ASTRONOMY
MOBILE except aeronautical mobile
Fixed

Utilization Policy

In the band 406.1-410 MHz land mobile systems, including GLMRS like the AURORA public mobile system in Alberta that uses mobile station channels in the band portion 409-410 MHz paired (1+1 MHz) with base station frequencies at 420-421 MHz, are permitted. In addition, a significant portion of the band 406.1-410 MHz is used by municipal safety services in simplex and duplex modes. Utilization of the band for the mobile service is permitted subject to the radio astronomy protection zones established in *Spectrum Utilization Policy - SP 450 MHz* (Figure b-1), for the Algonquin Radioastronomy Observatory. Radio Systems Policy RP-004 of October 1, 1983, entitled, *Policy for the Licensing of Very Low Capacity Point-to-Point Links in the Band 30-890 MHz,*

applies to radio systems in this band. For the band portion 409-410 MHz, Spectrum Utilization Policy SP 450 MHz of May 1986 applies.

A re-deployment plan for the mobile service bands will be developed through wide consultation with industry. The principles set-out in section 3.3 will guide the development of a re-deployment plan for further public consultation.

5.1.14 410-414 MHZ and 415-419 MHz

Domestic Allocations

410-414 MHz
MOBILE except aeronautical mobile
Fixed
Space Research (space-to-space)

415-419 MHz
MOBILE except aeronautical mobile
Fixed
Space Research (space-to-space)

Utilization Policy

The bands 410-414 MHz and 415-419 MHz are paired based on a 5 MHz duplex spacing and are available for mobile services. These bands are assigned on a 25 kHz channel spacing and include users of provincial and municipal mobile and fixed radio systems.

A re-deployment plan for the mobile service bands will be developed through wide consultation with industry. The principles set-out in Section 3.3 will guide the development of a re-deployment plan for further public consultation.

5.1.15 414-415 MHz and 419-420 MHz

Domestic Allocations

414-415 MHz
FIXED
Mobile except aeronautical mobile
Space Research (space-to-space)

419-420 MHz
FIXED

Mobile except aeronautical mobile
Space Research (space-to-space)

Utilization Policy

The bands 414-415 MHz and 419-420 MHz are paired based on a 5 MHz duplex spacing and available for fixed services. These bands are assigned on 25 kHz channel spacing. The need to protect the primary use of these bands for fixed service precludes extensive mobile use. However, assignments may be made in accordance with Radio Systems Policy RP-004 of October 1, 1983, entitled, *Policy for the Licensing of Very Low Capacity Point-to-Point Links in the Band 30-890 MHz*.

5.1.16 420-430 MHz and 450-470 MHz

Domestic Allocations

420-430 MHz
MOBILE except aeronautical mobile
Fixed

450-470 MHz
MOBILE
Fixed

Utilization Policy

In the bands 420-430 MHz and 450-470 MHz mobile systems, including GLMRS like the AURORA public mobile system in Alberta that uses base station frequencies in the band portion 420-421 MHz paired (1+1 MHz) with mobile station channels at 409-410 MHz, are permitted.

A re-deployment plan for the mobile service bands will be developed through wide consultation with industry. The principles set-out in Section 3.3 will guide the development of a re-deployment plan for further public consultation.

5.2 Broadcasting Service Bands

FM broadcasting band 88-108 MHz was reviewed in the *Spectrum Utilization Policy 30-896 MHz, Part I*. The introduction of digital radio broadcasting in the band 1452-1492 MHz is expected to replace AM and FM broadcasting stations in the long term. This could reduce the need for the 88-108 MHz band for broadcasting.

A full description of the relationship between bands and services, as contained in related international and domestic footnotes, can be found in the Canadian Table of Frequency Allocations.

5.2.1 Television Broadcasting in the VHF and UHF Bands

Domestic Allocations

VHF Bands - 54-72 MHz
76-88 MHz
174-216 MHz

UHF Bands - 470-608 MHz
614-806 MHz

Utilization Policy

In the short to medium term, the UHF broadcasting bands will be utilized for NTSC television broadcasting and future Advanced Television broadcasting (ATV). Initially, NTSC and ATV services will be simulcast. However, as discussed in Section 3.1, under the theme question on "Television Broadcasting in the Digital Era", there is indication that deployment of an ATV channel may take less than a 6 MHz channel and there is mounting interest to use broadcasting spectrum for non-programming radio services. The Department of Industry is of the view that, given these opportunities in these broadcasting bands and others, there is a need to initiate public consultation soon on the use of exclusive broadcasting frequency allocation for non-broadcasting types of services.

5.3 Amateur Service Bands

A full description of the relationship between bands and services as contained in related international and domestic footnotes can be found in the Canadian Table of Frequency Allocations.

5.3.1 50-54 MHz

Domestic Allocations

AMATEUR

Utilization Policy

Utilization of the band 50-54 MHz is available for the amateur service.

5.3.2 144-148 MHz

Domestic Allocations

AMATEUR
AMATEUR-SATELLITE (144-146 MHz)

Utilization Policy

The band 144-148 MHz is available for the amateur service. The 144-146 MHz portion is also available for the amateur-satellite service.

5.3.3 220-225 MHz

Domestic Allocations

AMATEUR

Utilization Policy

The level of interest demonstrated by the mobile community was not sufficient at the time of consultation to initiate further consultation on the allocation of 220-222 MHz to the land mobile service. Consequently, the current utilization of the band 220-225 MHz by the amateur service will continue. The Department of Industry encourages the usage for the amateur service to be concentrated in the upper portion of the band until a formal agreement is reached with the U.S. on the designation of frequencies along the Canada/U.S. border. The amateur community has expressed some concerns over the potential for future change to the current amateur service allocation in this band. The Department of Industry will continue to monitor the evolution of uses in this band in other countries and may review the current allocation at an appropriate time in the future.

5.3.4 430-450 MHz

Domestic Allocations

RADIOLOCATION
Amateur

Utilization Policy

The band 430-450 MHz is available for the radiolocation service on a primary basis. Should the need arise in Canada, the Department of Industry may

accommodate wind-shear radar/wind-profiler operation in the upper portion of the band 430-450 MHz as a radiolocation type of service.

The amateur-satellite service is permitted in the band portion 435-438 MHz on a secondary, non-protection, non-interference basis. In addition, and on the same secondary basis, the amateur and space operation services and the space research service are permitted in the band portions 440-450 MHz and 449.75-450.25 MHz, respectively.

6. Supplementary Information

- Revisions to the Canadian Table of Frequency Allocations (1994)
- Canadian Table of Frequency Allocations, March 1991.
- Radio Systems Policy for the Licensing of Very Low Capacity Point-to-Point Links in the Band 30-890 MHz (RP-004) October 1, 1983.
- General Information Related to Spectrum Utilization and Radio Systems Policies (SP- GEN) January, 1991. (Revisions to the current version of SP-GEN was issued in the January 1995 policy document entitled *Revisions to Microwave Spectrum Utilization Policies (Gazette Notice DGTP-002-95)).*
- Spectrum Utilization Policy on the Use of Certain Public Correspondence Bands in Canada (SP 013) October, 1988.
- Spectrum Utilization Policy for Frequency Bands 450-451 MHz and 455-456 MHz and Also Parts of the 150 MHz band Used in Support of Broadcasting Operations and the Frequency Band 409-410 MHz and 420-421 MHz Used by the Mobile Radio Service (SP 450 MHz) May, 1986.
- Spectrum Allocation and Utilization for Certain Bands in the Range 30.01-896 MHz (SP 30-896 MHz, Part I) May, 1990.
- Spectrum Utilization Policy for the Fixed, Mobile, Radiolocation and Amateur Services in the Band 896-960 MHz (SP 896 MHz) September, 1991.
- Proposal for Implementation of narrow band personal communications services in the 900 MHz Range (November, 1994).
- Proposal concerning the Radio Systems Policy (RP-005) for dispatch type mobile radio interconnection with the Public switched telephone network and also

clarifying the provision of service applications by cellular providers (November, 1994).

- Radio Standard Specification - Cordless Telephones in the Bands 46 MHz and 49 MHz (RSS-209) May, 1991.

- Radio Standard Specification - Low Power Radiocommunication Devices (RSS-210) November,1993.

7. Implementation

It is suggested that applicants contact the nearest office of the Department of Industry regarding radio licensing in the bands covered in this policy document. General inquiries about the policy provisions contained in this document may be addressed to the Spectrum and Radio Service Directorate, Telecommunications Policy Branch, 300 Slater St., Ottawa, Ontario, K1A 0C8 (Phone: 613-998-4470/4010) (Fax: 613-952-0567).

Issued under the authority
of the Radiocommunication Act

Michael Helm
Director General
Telecommunications Policy Branch

ANNEX 1

Frequency Bands Included in this Document

MHz	Domestic frequency Allocations
30.0005-37.5	MOBILE, SPACE RESEARCH, Fixed
37.5-38.25	MOBILE, Fixed, Radio Astronomy
38.25-39.986	MOBILE, Fixed
39.986-41.015	MOBILE, Fixed, Space Research
41.015-47	MOBILE, Fixed
47-50	MOBILE, Fixed
50-54	AMATEUR
54-72	BROADCASTING (VHF)
72-73	FIXED, MOBILE
76-88	BROADCASTING (VHF)
138-144	FIXED, LAND MOBILE Space Research (space-to-Earth)
144-148	AMATEUR, AMATEUR-SATELLITE (144-146 MHz)
148-149.9	FIXED, LAND MOBILE MOBILE-SATELLITE (Earth-to-space)
150.05-156.7625	MOBILE, Fixed
156.7625-156.8375	MARITIME MOBILE (distress and calling)
156.8375-174	MOBILE, Fixed
174-216	BROADCASTING (VHF)
216-220	FIXED, MARITIME MOBILE, LAND MOBILE

220-225 AMATEUR

ANNEX 1 (cont'd)

Frequency Bands Included in this Document

MHz	Domestic Frequency Allocations
402-403	METEOROLOGICAL AIDS, Earth Exploration Satellite (Earth-to space), Fixed, Mobile except aeronautical mobile
403-406	METEOROLOGICAL AIDS, Fixed, Mobile except aeronautical mobile
406.1-140	RADIO ASTRONOMY, MOBILE except aeronautical mobile,Fixed
410-414	MOBILE except aeronautical mobile, Fixed, Space Research (space-to-space)
414-415	FIXED, Mobile except aeronautical mobile, Space Research (space-to-space)
415-419	MOBILE except aeronautical mobile, Fixed, Space Research (space-to-space)
419-420	FIXED, Mobile except aeronautical mobile, Space Research (space-to-space)
420-430	MOBILE except aeronautical mobile, Fixed
430-450	RADIOLOCATION, Amateur
450-470	MOBILE, Fixed
470-608	BROADCASTING (UHF)
614-806	BROADCASTING (UHF)