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Spectrum Management and Telecommunications

# **Consultation on the Spectrum Allocations and Spectrum Utilization Policies for the Frequency Range 1435-1525 MHz (L-Band)**

Aussi disponible en français

**Canada**

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## **1. Intent**

This consultation paper, announced in *Canada Gazette* notice DGTP-010-09, initiates a public review of the spectrum allocations and utilization policies for the band 1435-1525 MHz. This review considers increased flexibility for the provision of broadband access, with special attention to rural areas, the possible designation of spectrum for aeronautical mobile telemetry (AMT) applications, as well as general questions on how to maximize the economic and social benefits for Canadians from the use of this spectrum.

The paper includes proposals for changes in allocations and footnotes in the *Canadian Table of Frequency Allocations*, and proposes new spectrum utilization policies and related transition policies.

To reduce potential transition issues while reviewing the allocations and spectrum utilization policies affecting the spectrum in the band 1435-1525 MHz, Industry Canada is imposing a moratorium on any new licensing in this band and will not issue new broadcasting certificates. Existing licences can be renewed, but the Department will discourage extensions of systems in these bands until a final policy document is issued. This moratorium will be in effect until the new policies are established following public consultation.

However, in response to an urgent requirement for AMT spectrum put forward by the aeronautical industry, the Department may authorize the use of AMT systems on an interim basis in unused portions of the 1.4 GHz band. Such licensing would be without prejudice to any future policy.

## **2. Background**

### **2.1 Current Allocations and Spectrum Designations**

The band 1435-1525 MHz is currently divided into three sub-bands, with an additional section of unused mobile-satellite service (MSS) spectrum at the top. The spectrum designations are as follows:

Sub-band 1435-1452 MHz is currently designated for subscriber radio systems (SRS), which is currently limited to a fixed service application under the Multipoint Communication System definition. SRS provides basic telephony services, generally in rural areas.

Sub-band 1452-1492 MHz is designated for digital audio broadcasting (DAB), with an allotment plan related to the AM and FM bands.

Sub-band 1492-1517 MHz is designated for SRS. There is a channelling plan for SRS and this sub-band is paired with the SRS spectrum in sub-band 1435-1452 MHz. There is also a designation for narrowband multipoint communication system(s) (N-MCS) in urban areas in the band from 1493.5 MHz to 1496.5 MHz. Within 70 km of the boundaries of major urban areas, N-MCS and SRS must be coordinated.

There are no designations for 1517-1518 MHz; there is an MSS allocation for 1518-1525 MHz, with a footnote indicating that the use of MSS in this band is withheld.

Basically, Industry Canada proposes to:

- designate new spectrum for AMT at the top of the band;
- rescind the DAB designation in the middle of the band, to be replaced by a designation for flexible use licences; and
- provide more flexibility and develop a new band plan in the bottom of the band.

### Current and Proposed Spectrum Utilization

	1435 MHz	1452 MHz	1492 MHz	1518 MHz	1525 MHz
Current	SRS in rural areas	DAB	SRS rural areas	MSS	
Proposed	Flexible use (fixed and mobile)*	Flexible use (fixed, mobile and broadcasting)	Aeronautical Mobile Telemetry		

\* seeks comments on maintaining a designation for SRS in rural areas and whether or not to open this band in urban areas

The proposed changes to the spectrum utilization policies and band plan are based on the current division of spectrum around the DAB designation, i.e. three segments, from 1435-1452 MHz, 1452-1492 MHz and 1492-1525 MHz. However, the Department will consider other proposals that accommodate AMT spectrum requirements and other wireless systems taking into account equipment characteristics. For example, there may be benefits to include frequency division duplex systems, either fixed or mobile, in this spectrum.

Given that proposed changes at the top of the band (1492-1525 MHz) lead to consequential changes in lower frequencies, this document will address spectrum changes from 1525 MHz down to 1435 MHz in order to avoid repetition in the discussion.

## 2.2 Digital Audio Broadcasting (DAB)

In 1992, the World Administrative Radio Conference (WARC) added broadcasting and broadcasting-satellite services in the band 1452-1492 MHz to the International Telecommunication Union (ITU) *Table of Frequency Allocations* as co-primary with existing fixed and mobile services. This provided administrations with the discretion to implement DAB. The United States elected to exclude these broadcasting allocations from the continental United States (in-country footnote), as the L-band is extensively used for government services, including mobile aeronautical telemetry service (“MATS” as referred to in that country). As alternatives, the United States chose to allocate broadcasting-satellite service in the S-band (2320-2345 MHz) for DAB and to implement terrestrial digital audio by overlaying HD radio technology (previously known as In-Band-On-Channel (IBOC)) on analogue FM and AM spectrum.

In 1994, the *Canadian Table of Frequency Allocations* was modified to incorporate the allocation decisions of WARC-92, including broadcasting and broadcasting-satellite services with fixed and mobile services in the band 1452-1492 MHz. A spectrum policy was established to gradually release this

spectrum from the fixed microwave users and SRS for rural areas to terrestrial DAB, as broadcasting would be gradually implemented.

In 1996, the Department published an allotment plan to accommodate all existing and some new FM and AM radio stations by providing each with a DAB assignment. The dedication of the sub-band 1452-1492 MHz for DAB was justified on the expectation that DAB would replace analogue FM and AM stations, and that the associated spectrum would be released for new wireless services. Canada adopted the Eureka 147 standard for DAB, which was widely accepted by European countries and others. In response to the interest of broadcasters to offer some non-broadcasting services using DAB broadcasting facilities, the Canadian Radio-television and Telecommunications Commission (CRTC, 1996) and the Department (1997) made provisions to permit a limited amount of non-programming services.

Starting in the late 1990s, the CRTC licensed 76 DAB stations in Toronto, Windsor, Montréal, Vancouver, Victoria and Ottawa. In addition, the CRTC approved a stand-alone ethnic commercial radio station. After a promising start, the roll-out of DAB has virtually come to a stop and some stations have ceased operation. The marginal development of DAB services in Canada can be attributed to several factors. First, consumers have only had limited access to high-priced DAB receivers. Secondly, the United States, with its influential market, is implementing HD digital technologies on the shoulders of the analogue FM and AM channels. Most European countries have implemented DAB services in the VHF band III (174-230 MHz) instead of the anticipated L-band. Only a few countries have pursued DAB in the L-band. The success in such countries has been quite limited. Furthermore, Canada used a different channelling system that required the few receivers imported to Canada to be customized for this small market.

An ongoing concern of Canadian broadcasters has been the inability to broadcast a significant level of new programming on DAB stations in order to attract subscribers during the transition phase. Moreover, as digital radio was implemented in only a few cities, without contiguous coverage over major transport corridors, car manufacturers are not installing DAB receivers in new vehicles for sale in Canada. Since then, with the availability of two subscription digital radio satellite services, the Canadian automobile manufacturers have proceeded to install satellite digital radio receivers in new vehicles.

In 2006, the CRTC launched a public review<sup>1</sup> of its commercial radio policy, which included a review of the L-band DAB transition policy. It culminated in a new licensing model being adopted for digital radio broadcasting (Broadcasting Public Notice CRTC 2006-160). Some of the findings related to digital broadcasting and to the decision aspects with respect to this spectrum review are as follows:

- the offering of new and innovative program content may raise consumer interest for DAB services, but technical quality alone will not drive demand;
- the FM and AM frequency bands will be needed in the future for radio broadcasting, and HD radio digital broadcasting could further enhance the importance of this spectrum for over-the-air radio broadcasting;
- the transition model of replacing analogue FM and AM stations with L-band DAB is no longer a tenable objective.

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<sup>1</sup> Review of Commercial Radio Policy (<http://www.crtc.gc.ca/eng/archive/2006/n2006-1.htm>)

In summary, several impediments will continue to affect the implementation of DAB services under the new licensing model, such as:

- the lack of affordable L-band DAB receivers;
- the lack of factory-installed DAB receivers in new vehicles;
- the U.S. market influence of digital radio services using HD radio technology on existing analogue FM and AM channels; and
- the European market influence of having adopted DAB service in the VHF Band III (174-230 MHz) and their review of the L-band spectrum for a variety of technologies and service applications.

Other related matters discussed in the CRTC proceedings were the use of HD radio digital technology to convert analogue AM and FM stations, as well as some of the operational issues that need to be overcome. The CRTC indicated a willingness to consider licensing HD radio digital provided that the Department approves a technology standard and issues broadcasting certificates. The CRTC indicated that it would adopt an expeditious HD radio licensing process for the simulcasting of existing FM and AM program content.

As noted in the May 2007 letter to the CRTC, Industry Canada is developing technical standards and operational parameters for hybrid digital HD radio services in the FM bands. Recently, the Department published technical guidelines to allow experimental authorizations of hybrid digital HD radio in the FM band. It is to be noted that the CRTC has expressed its willingness to licence HD radio when the Department eventually issues technical certificates.

There was general consensus in the CRTC proceedings that technical innovation should be encouraged, including permitting field trials using DVB-H (digital video broadcasting-handheld) or DMB (digital multimedia broadcasting) technologies to deliver a mix of audio, video and ancillary broadcasting data in the DAB L-band. However, concern was expressed as to whether there would be sufficient spectrum for these new service applications. In the proceedings, the CRTC acknowledged the important role of new technologies to deliver innovative programming provided that any spectrum issues and technical standards be addressed by Industry Canada.

### **2.3 Subscriber Radio Systems (SRS) and Automatic Meter Reading (AMR)**

In the mid 1970s, most of the L-band was assigned to the fixed microwave service in order to improve telephone access facilities in high-cost rural and remote regions of Canada. The spectrum has mainly been used for telephone SRS and specialized transmission facilities to monitor and control pipelines (Supervisory Control and Data Acquisition (SCADA)), power lines and other utility applications. As a result of the 1994 allocation of digital broadcasting in the band 1452-1492 MHz, the spectrum utilization policy for the band was modified, favouring DAB over services to rural areas. A modified frequency plan<sup>2</sup> was adopted for SRS in the paired bands 1427-1452 MHz and 1492-1518 MHz. Due to the limited DAB implementation, there are still many fixed service licences in the band 1452-1492 MHz.

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<sup>2</sup> SRSP-301.4 - *Technical Requirements for Fixed Line-of-Sight Radio Systems Operating in the Bands 1427-1452 MHz and 1492-1517 MHz*, <http://strategis.ic.gc.ca/epic/site/smt-gst.nsf/en/sf00028e.html>

In 1999, spectrum policy amendments (DGTP-06-99<sup>3</sup>) made provisions for N-MCS in the sub-bands 1427-1430 MHz and 1493.5-1496.5 MHz for applications for AMR in urban areas. In 2005, the department held a public consultation on *Proposals and Changes to the Spectrum in Certain Bands Below 1.7 GHz*<sup>4</sup> (DGTP-004-05), which included a proposal to re-farm the spectrum in the band 1492-1504 MHz. The proposal included expanding the designation to N-MCS for AMR applications to 1492-1504 MHz, except for the Windsor-Montréal corridor, and expanding the application to accommodate all kinds of flexible fixed and mobile service use to support utility telemetry applications. A second proposal was to expand the SRS designation to allow implementation of wireless access applications and to support time division duplex (TDD) mode systems.

Of the few comments received pertaining to this band, Look and UBS were in favour of opportunities for telemetry using TDD. Bell and TELUS have commented on the fact that they are providing essential telephone service in rural and remote areas, and that the Department is increasingly reducing the amount of usable spectrum for the SRS service. Since this consultation, there has been no deployment of digital radio along the Windsor-Montréal corridor. There were no comments from telemetry users, such as utility operators, regarding the need for the band 1492-1504 MHz for telemetry.

### **3. Proposals for the Band 1492-1525 MHz**

#### **3.1 Considerations**

##### **3.1.1 Aeronautical Mobile Telemetry (AMT)**

In the past few years, Industry Canada has had difficulty in meeting the spectrum requirements for the AMT service. AMT and associated telecommands are applications under the mobile allocation. AMT is used in flight tests to certify aircrafts and helicopters to domestic and international (ICAO) standards and to ensure the safety and integrity of the aircrafts. Spectrum requirements have increased dramatically over the past few years and, at the last World Radiocommunication Conference in 2007, spectrum was designated for AMT applications to meet long-term requirements.

In Canada, prior to 2001, AMT and associated telecommand were authorized over the entire 2300-2400 MHz frequency range. However, in 2001, SP 2285 was modified to make room for Wireless Communication Services, and for DAB services via satellite, known as S-DARS. AMT still has access to the band 2300-2360 MHz, but on a secondary basis. Because of primary incumbents in the band 2300-2360 MHz, this provides limited opportunities for new AMT systems to be deployed.

The only spectrum to support these mandatory flight tests for the aerospace industry is currently limited to the band 2360-2400 MHz, and only after successful coordination with the Department of National Defence (DND). In addition, aeronautical video surveillance for law enforcement has been permitted to use up to 10 MHz of spectrum in this band, further limiting access to spectrum for civilian AMT applications. Consequently, although the spectrum requirements for AMT have increased, spectrum availability in Canada has decreased. In a several other countries, AMT is currently provided in both the 1.4 GHz band and the 2.3 GHz band. The 1.4 GHz band is used extensively in the United States for

<sup>3</sup> *Amendments to the Microwave Spectrum Utilization Policies in the 1-3 GHz Frequency Range*  
<http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf01918.html>

<sup>4</sup> <http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf08494.html>

AMT. AMT equipment currently used by Canadian companies has the ability to use both the 1.4 GHz and the 2.3 GHz bands.

Industry Canada will review the policy regarding the band 2360-2400 MHz in a forthcoming consultation that will also consider the new bands identified for AMT at the 2007 World Radiocommunication Conference (WRC-07) in Geneva. The new bands identified for AMT at WRC-07 may address long-term spectrum requirements, for which equipment could become available in several years. In the meantime, the Department has received some requests to accommodate the immediate and mid-term requirements of the aeronautical industry in the 1.4 GHz band, considering the capabilities of the industry's test equipment.

The Canadian aerospace industry provides for more than 83,000 jobs and \$23.6 billion/year in revenues,<sup>5</sup> mostly for export purposes. The aeronautical industry is an important part of the aerospace industry and meeting spectrum requirements in support of the aeronautical industry is an important public benefit.

### **3.1.2 SRS**

AMT applications will generally involve emissions from aircraft and helicopters. Aircraft transmitting from an altitude of several thousand metres will be in the line of sight of many SRS, which are likely to suffer interference. The operations are not expected to be compatible. Interference to SRS would reduce the capability and reliability of essential telephone services. Although most AMT applications envisaged in this band involve transmissions from an aircraft to a terrestrial test facility, there may be some transmissions from the terrestrial facility to the airborne station. In both cases, the line of sight scenario may lead to interference. AMT deployment in this band may require the displacement of SRS within the line of sight of AMT testing areas, for both the SRS and AMT systems to operate interference free.

Also, some of the new equipment being manufactured for use in this band is based on TDD technology. The Department has received requests for new SRS using this equipment, but such licences would be non-standard in view of the paired band plan.

### **3.1.3 N-MCS for AMR**

In 1999, the Department designated sub-band 1493.5-1496.5 MHz for N-MCS for services, such as AMR, in urban areas. In 2005, Industry Canada proposed to expand this designation in DGTP-004-05. There were no comments submitted by the utility users indicating a requirement for public utility telemetry in that sub-band. Since then, there has been no interest for the deployment of N-MCS in that sub-band.

### **3.1.4 MSS**

The band 1518-1525 MHz is currently allocated to MSS in addition to fixed and mobile services. MSS was added to the *Canadian Table of Frequency Allocations* in the 1990s, with the view that a North American assignment would eventually be made for commercial mobile satellites with the pairing of the band 1668-1675 MHz. Mobile-satellite networks require large investments and rely on large

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<sup>5</sup> See <http://www.aiac.ca/resources-and-publications/industry-statistics/>

telecommunications markets that are much larger than the Canadian market alone. In other bands, the current and planned Canadian mobile-satellite networks are providing or are planning to provide North American coverage and beyond.

The band 1518-1525 MHz is important government spectrum in the United States for AMT (or MATS as it is referred to in that country) and is not available for commercial mobile satellites. Furthermore, the spectrum with which this band would be paired, 1670-1675 MHz, has been designated in the United States and in Canada for terrestrial services. Hence, there is no plan in North America to use the bands 1518-1525 MHz and 1668-1675 MHz for MSS.

Finally, AMT and MSS are not compatible; therefore, the possible use of the band 1518-1525 MHz for AMT in Canada would preclude MSS deployment.

### **3.2 Proposed Spectrum Utilization and Transition Policy Provisions**

#### **3.2.1 AMT**

The L-band is used for AMT in the United States, and Canadian telemetry equipment can tune over this frequency range, making this band a natural extension to the core aeronautical telemetry band in Canada. This would help to relieve some of the urgent spectrum requirements of the Canadian aeronautical industry. The Department seeks comments on the following proposal:

##### **Item 1:**

The Department proposes to designate the band 1492-1525 MHz for aeronautical mobile telemetry.

The Department seeks comments on this proposal, and on the potential locations of AMT test areas, and particularly whether they would be across Canada or only in certain areas.

The Department also seeks comments on whether other portions of the range 1452-1525 MHz could be used for AMT.

#### **3.2.2 N-MCS for AMR**

In 1999, the Department designated the band 1493.5-1496.5 MHz among others, for narrowband multipoint communications systems (N-MCS) for AMC used for public utility telemetry in urban areas. In 2005, a consultation sought comments on the expansion of this utilization. There were no comments submitted by the utility industry in the 2005 consultation regarding the expansion of the band 1493.5-1496 MHz. The use is concentrated in the band below 1432 MHz. To maintain a clear environment for AMT, the designation for N-MCS should be removed from the band 1493.5-1496.5 MHz.

**Item 2:**

The Department proposes to rescind the designation for narrowband multipoint communications systems (N-MCS) in the band 1493.5-1496.5 MHz.

The Department seeks comments on the above proposal.

**3.2.3 Treatment of Incumbent SRS**

Over the past 15 years, the amount of spectrum designated for fixed line-of-sight SRS in the L-band has been rearranged to accommodate several new services. With the assignment of the band 1452-1492 MHz for broadcasting in 1996, the modified paired bands 1427-1452 MHz and 1492-1517 MHz were designated for SRS. However, with the expectation of new equipment in the near future that could be suitable for SRS, the construction of new fixed SRS in the L-band has significantly decreased. Furthermore, new TDD technologies have been developed, which can operate in an unpaired band. Finally, SRS, which provide essential telephone services, may suffer loss of capacity and reliability due to AMT transmissions from flight tests. Should the aeronautical mobile telemetry applications also include transmissions from the terrestrial facility into the airborne receiver, SRS stations within line-of-site may cause harmful interference to the AMT system.

To enable the deployment of AMT systems, SRS that could cause harmful interference to AMT systems should be transitioned out of the band. Also, it may be in the public interest to transition susceptible systems to another band where reliability and capacity would not be jeopardized. A transition period of five years after notification is proposed, considering that SRS provides basic telephony services. It is also proposed that for those SRS systems that do not interfere with AMT services but may receive interference, the SRS licensee may choose to continue to operate after the five-year notification, but on a non-interference, no-protection basis. SRS licensees are protected if they do not receive any notification, or until the five-year notification period is over. The Department seeks comments on the following proposal:

**Item 3**

The Department proposes the following transition policy for SRS in the band 1492-1525 MHz:

- SRS which may cause or be subject to harmful interference from existing or planned AMT systems will be subject to a transition policy.
- The transition policy would provide a five-year notification period during which SRS are protected and may operate as licensed. Five years after receiving such notification, these systems may continue to operate on a no interference, no protection basis. Notification would be issued on an “as required basis.”

The Department seeks comments on the above proposal.

## **4. Proposals for the Band 1452-1492 MHz**

### **4.1 Considerations**

#### **4.1.1 Flexible-use Licences**

With the convergence of fixed, broadcasting and mobile services over digital wireless platforms, a regulatory approach promoting flexible use of spectrum is increasingly important. Over the years, there has been gradual accommodation by the Department and the CRTC to expand the range of services permitted on wireless and broadcasting facilities. For example, broadcasting spectrum in the MDS band has been allowed to provide fixed broadband Internet access, spectrum in the FM band has been permitted to support subsidiary delivery of paging and data, spectrum in the DAB band has been allowed to provide data service applications, and spectrum in the mobile Cellular/PCS bands has been permitted to provide IP-based services. As stated in the *Spectrum Policy Framework for Canada* (2007), the Department believes that spectrum resources should be allocated and assigned in such a way as to maximize the economic and social benefits for Canadians from the use of the spectrum.

Several countries that initially considered the band 1452-1492 MHz for DAB services have recently begun to re-farm the spectrum for a range of broadcasting and multimedia applications within the international regulations and allocations. In particular, Ofcom, the U.K. regulator, has auctioned the band 1452-1492 MHz for a variety of services and technologies<sup>6</sup> within the allocations for broadcasting, fixed and mobile services. A set of technical parameters and spectrum user rights have been established. To expedite the process, the existing European Maastricht Plan for DAB (consisting of 1.7 MHz channels) is being used to aggregate the spectrum for the auction. Germany and France are proposing to allow digital multimedia technologies in addition to DAB technology. Digital multimedia broadcasting technology could accommodate a mix of one-way digital radio, video and multimedia broadband access. The prospect of a wide range of services in the band 1452-1492 MHz being allowed by industrialized countries in Europe and elsewhere further underlines the risk for Canada of pursuing only the conventional DAB service in this band.

Consequently, the current allotment plan developed for the DAB implementation may not be appropriate given the new technologies that could be deployed in this band. Broadband wireless technologies, which support multimedia applications, are developed based on a 5 MHz channel width.

To implement flexible use of the band, the mobile allocation will need to be upgraded to primary status from the current secondary status in the *Canadian Table of Frequency Allocations* and Industry Canada should adopt international footnote 5.343. Once all the services have a primary status allocation, the Department can plan the usage of the band.

#### **4.1.2 Broadcasting-Satellite Service (BSS)**

The 1992 ITU Conference (WARC-92) made global frequency allocations for broadcasting and BSS co-primary with fixed and mobile services to support DAB in the band 1452-1492 MHz. This provided Administrations with the option of developing terrestrial DAB in this band. The Department entered

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<sup>6</sup> Possible use of 1452-1492 MHz: mobile multimedia (DVB-H, T-DMB, S-DMB, DAP-IP, ISDB-T and MediaFLO); mobile audio (S-DAB and T-DAB); Wireless broadband (Wi-MAX and UMTS TDD); 802.20 and PSLSE; and other standards.

broadcasting and BSS in the *Canadian Table of Frequency Allocations* in 1994, with provisions to first support the terrestrial DAB service in accordance with an allotment plan and technology standards. Some believed that BSS could materialize in the future to complement terrestrial DAB services. At WARC-92, the United States opted out of the broadcasting allocations in the L-band over the continental United States and instead adopted an allocation for satellite digital audio radio services (S-DARS) in the S-band. Then, in the mid 1990s, the United States proceeded to develop HD radio technology that overlays on existing FM and AM radio channels and implemented two S-DARS broadcasting satellite networks. The situation encouraged Canada and the U.S. to develop a coordination agreement to respectively protect the terrestrial DAB service in the L-band and S-DARS service in the S-band. Although Canada included the allocation of BSS in its Table, it was known that the coordination of an L-band BSS for Canada would be exceedingly difficult with the U.S. MATS operation along the border. Also, it was recognized that the cost of a stand-alone broadcasting radio satellite network for the small Canadian market would be expensive. The 2005 licensing of two satellite radio services in Canada in the S-band (using available U.S. facilities) has further made the building of a Canadian broadcasting satellite network in the L-band unlikely. Moreover, new vehicles are being equipped with S-DARS receivers.

#### **4.2 Proposals for a Spectrum Utilization Policy for the Band 1452-1492 MHz**

As mentioned, DAB service in the L-band is no longer a replacement for analogue AM and FM services, nor is there any prospect for releasing the FM and AM broadcasting spectrum for other services. The CRTC indicated its willingness to consider extending the broadcasting licence terms of existing transitional simulcasting DAB stations in good standing to a full seven years. However, the prospect of success in attracting the consumers' interest for L-band conventional (free-over-the-air) DAB service is still affected by a number of factors that have prevailed since the introduction of DAB. Some of these factors are the lack of DAB receivers, including new vehicle factory installation of L-band receivers, the influence of the U.S. trend towards HD radio and the European choice of the VHF band for DAB technology.

The Department proposes to introduce more flexibility in the band and let market forces play a greater role in determining the services to be offered in this spectrum. To this end, technical specifications would be developed to offer maximum flexibility. Releasing the spectrum under flexible-use licences could facilitate the delivery of subscription broadcasting, multimedia, mobile or fixed broadband wireless access, or other telecommunications applications.

There remain a few operational DAB stations that rebroadcast the contents of their FM and AM stations in digital format. A future consultation on the policy and licensing framework for the band 1452-1492 MHz could consider the transition policy for these few remaining DAB stations and the different licensing mechanisms at the Department's disposal, including the use of auctions.

#### **Item 4:**

The Department proposes to rescind the DAB Allotment Plan for the band 1452-1492 MHz, including all associated channels to FM and AM stations across the full band 1452-1492 MHz.

The Department seeks comments on this proposal.

**Item 5:**

The Department proposes to adopt a spectrum utilization policy allowing for flexible use of the spectrum to support a variety of services and technologies for subscription broadcasting, multimedia, fixed and mobile broadband applications.

The Department seeks comments on this proposal.

**5. Proposals for the Band 1435-1452 MHz**

**5.1 Considerations**

**5.1.1 Unpaired SRS Spectrum**

This spectrum is currently used in rural and remote areas for SRS and is paired with the band 1492 MHz to 1517 MHz. The Department notes that, although there are currently more than 700 frequency records of SRS and public utilities, there have not been many new SRS systems implemented in the past few years, due in part to the expectation of new equipment. Indeed, some manufacturers of equipment for this band are turning to TDD technology for the provision of broadband services, which would enable SRS operators to offer flexible services. As the proposed implementation of aeronautical mobile telemetry service in the band 1492-1525 MHz would deprive SRS of its paired spectrum, SRS could still be implemented in the band 1435-1452 MHz using TDD technology. The new TDD technologies would allow SRS licensees to upgrade and offer more services to the subscribers. Current and future SRS licences in this band would provide for flexible-use (mobile and fixed) spectrum under this proposal.

The band plan outlined in SRSP 301.4 is based on SRS channels of 3.5 MHz wide. New technologies may operate over a wider bandwidth. Broadband wireless technologies are often designed based on 5 MHz channels.

**Item 6:**

The Department seeks comments on a suitable band plan and technical criteria (including the need for guard bands) that can facilitate planning the use of this band.

**5.1.2 Definition of Rural/Remote Areas**

Some of the comments received in the 2005 consultation for the review of spectrum below 1.7 GHz pertained to the need for a clear definition that can be applied to determine whether a region is rural or urban.

Definitions of urban and rural boundaries depend on a number of issues, including:

1. the service designations;
2. the geographic markets for these services; and
3. technical considerations (propagation and technical compatibility).

The Department notes that SRS licences have, to date, been awarded using the first-come, first-served licensing mechanism, as this application was limited to the provision of basic telephony services where wireless is preferred over wireline, e.g. generally in rural and remote locations. Use of the first-come, first-served licensing mechanism can only be applied when demand for spectrum does not exceed supply.

## **5.2 Proposal for a Spectrum Utilization Policy for the Band 1435-1452 MHz**

### **Item 7:**

The Department seeks comments on the following:

1. Should the designation to SRS be maintained;
2. Should the spectrum utilization allow for flexible use of the spectrum, for both fixed and mobile, and for both narrowband and broadband services;
3. Should the spectrum be available only in rural areas, using the first-come, first-served licensing mechanism, and reviewed for use in urban areas in a few years, or should the spectrum be made available in urban areas immediately;
4. If the spectrum is to be made available in urban areas immediately, what service and applications should be considered for a spectrum utilization policy?

### **Item 8:**

Should the spectrum be reserved only for rural areas, the Department seeks comments on a suitable definition of rural and urban areas for the application of the spectrum utilization policy for the band 1435-1452 MHz.

### **Item 9:**

Considering the characteristics of the new equipment for SRS, the Department seeks comments on a suitable band plan for implementation of TDD technologies.

## **6. General Questions Related to the Band 1435-1525 MHz**

As mentioned, the proposed divisions between service designations in this band are based on the current boundaries established by the DAB designation. However, the new divisions should reflect spectrum requirements for the different applications and technological characteristics.

**Item 10:**

The Department is seeking comments on the spectrum requirements of each application (AMT, SRS, and flexible use), the band plan and band division, and any issue that may impact the economic and social benefits that Canadians could derive from the use of this band. In particular, the Department seeks comments on how the different policy proposals could affect the cost of operation, the cost to subscribers, or competition.

In addition, the Department is planning or has already initiated various other consultation initiatives. As a result, the Department seeks guidance as to the timing to implement the outcomes of this consultation, including additional consultation exercises that may be required concerning licensing approaches, etc.

**7. Proposed Changes to the Canadian Table of Frequency Allocations**

A summary of the proposed changes to the spectrum utilization policies is illustrated below. These are based on the current proposals, but can be modified based on comments received:

**Current and Proposed Spectrum Utilization**

	1435 MHz	1452 MHz	1492 MHz	1518 MHz	1525 MHz
Current	SRS in rural areas	DAB	SRS rural areas	MSS	
Proposed	Flexible use (fixed and mobile)*	Flexible use (fixed, mobile and broadcasting)	Aeronautical Mobile Telemetry		

\* seeks comments on maintaining a designation for SRS in rural areas and whether or not to open this band in urban areas

In support of the implementation of the services and applications discussed previously, a number of changes to the *Canadian Table of Frequency Allocations* would be required. The Department seeks comments on the following proposed changes.

**7.1 Proposed Changes to the Canadian Table of Frequency Allocations for the Band 1492-1525 MHz**

**7.1.1 MSS**

The Department no longer considers the band 1518-1525 MHz as a possible implementation band for MSS. MSS systems usually provide regional coverage and satellite services are more viable if harmonized on a regional basis. The Department proposes to remove the MSS allocation and its associated footnotes from the band 1518-1525 MHz.

**Item 11:**

The Department proposes to remove allocation entry for the mobile-satellite service from the *Canadian Table of Frequency Allocations* in the bands 1518-1525 MHz and associated footnotes 5.348, 5.348B, 5.351A and C31, as outlined in Annex 1. Also, the Department proposes to adopt international footnote 5.343 next to the mobile allocation.

The Department seeks comments on these proposals.

**7.1.2 AMT**

There is a demand for more AMT spectrum to accommodate the aerospace industry. The release of the band 1492-1525 MHz is likely to meet the short-term requirement for AMT, which supports the aeronautical industry. AMT is an application under the mobile allocation which is already included as primary in the *Canadian Table Frequency Allocations*; however, the Department proposes to add international footnote 5.343 next to the mobile allocation in the sub-bands 1492-1518 MHz and 1518-1525 MHz, and to merge these two blocks into one contiguous block from 1492 MHz to 1525 MHz.

**Item 12:**

The Department proposes to merge the two sub-bands 1492-1518 MHz and 1518-1525 MHz, and to adopt international footnote 5.343 next to the mobile allocation.

The Department seeks comments on these proposals.

**7.2 Proposed Changes to the Canadian Table of Frequency Allocations for the Band 1452-1492 MHz**

**7.2.1 Broadcasting-Satellite Service (BSS)**

It is beneficial to streamline the Canadian frequency allocations in the band 1452-1492 MHz and to give full flexibility and priority to terrestrial services. As no satellite services are envisaged for North America in this band, the satellite allocation and related footnotes should be removed.

**Item 13:**

The Department proposes to remove the allocation entry of broadcasting-satellite service (BSS) from the *Canadian Table of Frequency Allocations* in the band 1452-1492 MHz and suppress associated footnotes 5.208B, C28 and C40, as outlined in Annex 1.

Comments are sought on this proposal.

### 7.2.2 Mobile Service

This band could support a range of innovative broadcasting applications, such as subscription digital, audio and video broadcasting using hand-held devices, and non-broadcasting services, such as fixed and mobile broadband wireless access to provide multimedia services. In order to provide flexibility for a diversity of terrestrial services, mobile service should be elevated to primary status in the *Canadian Table of Frequency Allocations* for the band 1452-1492 MHz. Mobile service has a co-primary allocation with other services in the *International Table of Frequency Allocations* for the band 1435-1525 MHz, and in the *Canadian Table of Frequency Allocations* for the bands 1435-1452 MHz and 1492-1525 MHz.

#### Item 14:

The Department proposes to elevate the status of mobile service to co-primary with broadcasting and fixed services in the band 1452-1492 MHz, as outlined in Annex 1.

The Department seeks comments on this proposal.

### 7.2.3 DAB

The mission for DAB in the band 1452-1492 MHz, as the digital replacement for the analogue FM and AM broadcasting services, has been abandoned. It could be argued that the future stand-alone DAB stations may be limited and that the Department should now provide additional flexibility for the use of this spectrum (band 1452-1492 MHz). Hence, to introduce more flexibility in the use of this spectrum, the Department proposes to streamline some of the Canadian footnotes.

#### Item 15:

The Department proposes to suppress Canadian footnotes C29 and C30 to reflect the co-primary nature of all allocations in the band 1452-1492, as outlined in Annex 1.

Comments are sought on this proposal.

### 7.3 Proposed Changes to the Canadian Table of Frequency Allocations for the Band 1435-1452 MHz

As the *Canadian Table of Frequency Allocations* already lists the fixed and mobile services as co-primary, the only relevant change would be to add international footnote 5.343 in view of the possible use of mobile in Canada.

**Item 16:**

The Department proposes to add international footnote 5.343 for the frequency range 1429-1452 MHz.

Comments are sought on this proposal.

**8. Conclusion and Next Steps**

Based on the results of the public consultation initiated in this document and further internal evaluation, Industry Canada will make appropriate revisions, which are in the public interest, to the related spectrum allocations and utilization policies for the frequency bands under discussion. The Department intends to publish the decisions related to the allocations and utilization policies for the bands 1435-1452 MHz and 1492-1525 MHz by mid 2010.

A future public consultation will address the policy and licensing framework for the band 1452-1492 MHz.

Issued under the authority  
of the Radiocommunication Act

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Telecommunications Policy Branch

## Annex 1: Proposed Changes to the Canadian Table of Frequency Allocations

The proposed changes to the *Canadian Table of Frequency Allocations* are depicted using the following legend:

Strikeout means removing or rescinding an allocation entry in the Canadian Table and removing or rescinding Canadian footnotes.

Suppress (SUP) means removing a Canadian footnote from the Table.

Underlines mean addition of an allocation or footnote.

Modification (MOD) indicates that a footnote has been modified – shown by strikeout – and/or additional text underlined.

### 1. Bands 1 492-1 518 and 1 518-1 525 MHz

Proposal as per items 11 and 12:

MHz
<del>1 492-1 518</del>  <del>FIXED</del> <del>MOBILE</del>  <del>5.341</del>
<u>1 492-1 518-1 525</u>  FIXED MOBILE <u>5.343</u> MOBILE-SATELLITE (space-to-Earth) <del>5.348 5.348B 5.351A-C31</del>  5.341

**5.341** In the bands 1 400-1 727 MHz, 101-120 GHz and 197-220 GHz, passive research is being conducted by some countries through a program that conducts searches for intentional emissions of extraterrestrial origin.

**ADD 5.343** In Region 2, the use of the band 1 435-1 535 MHz by the aeronautical mobile service for telemetry has priority over other uses by the mobile service.

**SUP 5.348** The use of the band 1 518-1 525 MHz by the mobile-satellite service is subject to coordination under **No. 9.11A**. In the band 1 518-1 525 MHz stations, in the mobile-satellite service shall not claim protection from the stations in the fixed service. **No. 5.43A** does not apply. (WRC-03)

**SUP 5.348B** In the band 1 518-1 525 MHz, stations in the mobile-satellite service shall not claim protection from aeronautical mobile telemetry stations in the mobile service in the territory of the United States (see Nos. **5.343** and **5.344**) and in the countries listed in No. **5.342**. No. **5.43A** does not apply. (WRC-03)

**SUP 5.351A** For the use of the bands 1 518-1 544 MHz, 1 545-1 559 MHz, 1 610-1 645.5 MHz, 1 646.5-1 660.5 MHz, 1 668-1 675 MHz, 1 980-2 010 MHz, 2 170-2 200 MHz, 2 483.5-2 520 MHz and 2 670-2 690 MHz by the mobile-satellite service, see Resolutions **212 (Rev. WRC-07)** and **225 (Rev. WRC-07)**. (WRC-07)

**SUP C31 (CAN-04)** In the bands 1 518-1 525 MHz and 1 668-1 675 MHz, the mobile-satellite service is withheld.

## 2. Band 1452-1492 MHz

As per the proposals in items 13, 14, and 15:

### MHz

1 452-1 492
BROADCASTING
<del>BROADCASTING-SATELLITE 5.208B</del>
FIXED
<u>MOBILE</u> <del>Mobile</del> 5.343
5.341 5.345 <del>C28 C29 C30 C40</del>

**SUP 5.208B** In the bands:  
137-138 MHz,  
387-390 MHz,  
400.15-401 MHz,  
1 452-1 492 MHz,  
1 525-1 610 MHz,  
1 613.8-1 626.5 MHz,  
2 655-2 690 MHz,  
21.4-22 GHz,  
Resolution **739 (Rev. WRC-07)** applies. (WRC-07)

**5.341** See text above.

**5.343** See text above.

**5.345** Use of the band 1 452-1 492 MHz by the broadcasting-satellite service and the broadcasting service is limited to digital audio broadcasting and is subject to the provisions of Resolution **528 (WARC-92)**.

**SUP C28** In the band 1 452-1 492 MHz, until at least 1 January 2000, the broadcasting-satellite service shall not cause harmful interference to the fixed service. After this date, the fixed service may continue to operate provided that it neither causes harmful interference to, nor is affected by the broadcasting-satellite service beam assignments when the broadcasting-satellite service is implemented in Canada. This footnote will be reviewed prior to 1 January 2000.

**SUP C29** In the band 1 452-1 492 MHz, existing fixed stations may continue to operate provided these installations do not cause interference nor claim protection from stations of the broadcasting service operating in accordance with the domestic allotment plan implemented under **C30**.

**SUP C30** In the band 1 452-1 492 MHz, stations in the broadcasting service shall be implemented in accordance with a domestic allotment plan, which takes into account stations in the fixed service, to the extent possible.

**SUP C40** Feeder links to broadcasting-satellite (sound) space stations operating in the band 1 452-1 492 MHz shall be implemented in the band 7 025-7 075 MHz to the extent possible before a different fixed-satellite (Earth-to-space) band is so used. Use of the fixed-satellite (Earth-to-space) allocation in the 7 025-7 075 MHz band is limited to this application, except for general fixed-satellite use by inter-Regional fixed-satellite networks.

### 3. Band 1429-1452 MHz

As per the proposal in item 16:

<b>MHz</b>
1 429-1 452
FIXED MOBILE <u>5.343</u>
5.338A 5.341

**5.338A** In the bands 1 350-1 400 MHz, 1 427-1 452 MHz, 22.55-23.55 GHz, 30-32.3 GHz, 49.7-50.2 GHz, 50.4-50.9 GHz and 51.4-52.6 GHz, Resolution **750 (WRC-07)** applies. (WRC-07)

**5.341** See text above.

**ADD 5.343** See text above.