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Spectrum Management and Telecommunications

Proposed Revisions to the Canadian Table of Frequency Allocations

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Canada 

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1. Intent

This consultation paper, announced in *Canada Gazette* notice SMSE-004-13, proposes revisions to the *Canadian Table of Frequency Allocations* (the Canadian Table), taking into account the results of the 2012 World Radiocommunication Conference (WRC-12) and domestic requirements. The Canadian Table was last modified in 2009, to incorporate the results of WRC-07 and implement certain domestic spectrum policies. Subsequent changes have also been made since then to reflect changes in domestic spectrum utilization policies.

2. Background

The International Telecommunication Union (ITU) adopts an international *Table of Frequency Allocations* (the International Table) as part of its *Radio Regulations* (RR). This International Table allocates spectrum to various combinations of radio services and may include conditions for the use of the spectrum. The International Table is revised, along with other parts of the international *Radio Regulations*, at meetings of the ITU World Radiocommunication Conferences (WRC), which are held on a periodic basis, typically every three to four years.

The Canadian Table is derived from the International Table and contains those radio services required to meet Canadian needs, among those allocated by the ITU, including the applicable international footnotes. This domestic table also specifies, by allocation and Canadian footnote, any additional provisions for use of those radio services in Canada.

Industry Canada revises the Canadian Table on a periodic basis, normally following a WRC. WRC-12, which met from January 23 to February 17, 2012, in Geneva, Switzerland, adopted several changes to the frequency allocations in the International Table. The Conference dealt with issues concerning amateur, fixed, mobile, broadcasting, radiolocation, navigation, space science, broadcasting-satellite, mobile-satellite and the fixed-satellite services. The resulting changes to the International Table necessitate consideration of several domestic issues. Also, domestic requirements for other changes to the Canadian Table have emerged, and will be addressed as well. The remainder of this document discusses these issues and makes proposals for revisions to the Canadian Table.

3. Process

Canada Gazette notice SMSE-004-13 invites public comments on the proposed revisions contained in this consultation paper. Following the review of comments received, the allocation decisions will be promulgated by the issuance of a revised edition of the Canadian Table.

4. Structure of the Document

Section 7 of this consultation paper is divided into seven Parts that address the proposed changes to the Canadian Table consequential to the decisions made at WRC-12 and other domestic spectrum policy modifications or decisions. Parts A through F identify the related WRC-12 agenda items, whereas Part G proposes modifications to the Canadian Table not related to the outcome of WRC-12.

5. Conventions Used in the Document

The proposals contained in this document are identified as modifications to the Canadian Table, last revised and published in December 2009 (The current version of the Canadian Table may be obtained from Industry Canada's website at http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/h_sf01678.html). For a better understanding of these proposals, refer to the most recent International Table, as found in the ITU's *Radio Regulations*, Volume 1 (2008 Edition), Article 5, and the Final Acts of the World Radiocommunication Conference (Geneva, 2012).

<u>Underlining</u>	When used in the Canadian Table, underlining proposes the addition of a radio service or footnote. It is also used in the text of Canadian footnotes to identify proposed additional text.
Strikeout	When used in the Canadian Table, strikeout proposes the deletion of a radio service or footnote. It is also used in the text of Canadian footnotes to identify proposed deleted text.
5.XXX	This is the designation format of an international footnote.
CXX	This identifies a Canadian footnote.
MOD	This indicates an international footnote modified at WRC-12 or a Canadian footnote proposed for modification. These appear in both the Canadian Table and in the lists of footnotes.
ADD	This is used in a list of footnotes to indicate an international footnote created at WRC-12 or a proposed new Canadian footnote.
ADD MOD	This indicates the proposed addition of an international footnote to the Canadian Table as modified at WRC-12.
SUP	This is used in a list of footnotes to indicate an international footnote suppressed at WRC-12 or a Canadian footnote proposed for suppression.

6. Definitions

The following is a list of terms and definitions that are relevant to the Canadian Table. These terms and definitions have been extracted from the ITU's *Radio Regulations*, which should be consulted for a more comprehensive listing.

6.1 General Terms

Administration: Any governmental department or service responsible for discharging the obligations undertaken in the Constitution of the International Telecommunication Union, in the Convention of the International Telecommunication Union and in the Administrative Regulations.

Allocation (of a frequency band): Entry in the Table of Frequency Allocations of a given frequency band for the purpose of its use by one or more terrestrial or space radiocommunication services or the radio astronomy service under specified conditions. This term also applies to the frequency band concerned.

Allotment (of a radio frequency or radio frequency channel): Entry of a designated frequency channel in an agreed plan, adopted by a competent conference, for use by one or more administrations for a terrestrial or space radiocommunication service in one or more identified countries or geographical areas and under specified conditions.

Assignment (of a radio frequency or radio frequency channel): Authorization given by an administration for a radio station to use a radio frequency or radio frequency channel under specified conditions.

Radio: A general term applied to the use of radio waves.

Radio Waves or Hertzian Waves: Electromagnetic waves of frequencies arbitrarily lower than 3 000 GHz, propagated in space without artificial guide.

Radiocommunication: Telecommunication by means of radio waves.

Terrestrial Radiocommunication: Any radiocommunication other than space radiocommunication or radio astronomy.

Space Radiocommunication: Any radiocommunication involving the use of one or more space stations or the use of one or more reflecting satellites or other objects in space.

Radiodetermination: The determination of the position, velocity and/or other characteristics of an object, or the obtaining of information relating to these parameters, by means of the propagation properties of radio waves.

Radionavigation: Radiodetermination used for the purposes of navigation, including obstruction warning.

Radiolocation: Radiodetermination used for purposes other than those of radionavigation.

Radio Direction-Finding: Radiodetermination using the reception of radio waves for the purpose of determining the direction of a station or object.

Radio Astronomy: Astronomy based on the reception of radio waves of cosmic origin.

Coordinated Universal Time (UTC): Time scale, based on the second (SI), as defined in Recommendation ITU-R TF.460-6.

For most practical purposes associated with the *Radio Regulations*, UTC is equivalent to mean solar time at the prime meridian (0° longitude), formerly expressed in GMT.

Industrial, Scientific and Medical (ISM) Applications (of radio frequency energy): Operation of equipment or appliances designed to generate and use locally radio frequency energy for industrial, scientific, medical, domestic or similar purposes, excluding applications in the field of telecommunications.

6.2 Radio Services

Aeronautical Mobile Service: A mobile service between aeronautical stations, and aircraft stations, or between aircraft stations, in which survival craft stations may participate; emergency position-indicating radiobeacon stations may also participate in this service on designated distress and emergency frequencies.

Aeronautical Mobile (OR)¹ Service: An aeronautical mobile service intended for communications, including those relating to flight coordination, primarily outside national or international civil air routes.

Aeronautical Mobile (R)² Service: An aeronautical mobile service reserved for communications relating to safety and regularity of flight, primarily along national or international civil air routes.

Aeronautical Mobile-Satellite Service: A mobile-satellite service in which mobile earth stations are located on board aircraft; survival craft stations and emergency position-indicating radiobeacon stations may also participate in this service.

Aeronautical Mobile-Satellite (OR)¹ Service: An aeronautical mobile-satellite service intended for communications, including those relating to flight coordination, primarily outside national and international civil air routes.

Aeronautical Mobile-Satellite (R)² Service: An aeronautical mobile-satellite service reserved for communications relating to safety and regularity of flights, primarily along national or international civil air routes.

Aeronautical Radionavigation Service: A radionavigation service intended for the benefit and for the safe operation of aircraft.

¹ (OR): off-route

² (R): route

Aeronautical Radionavigation-Satellite Service: A radionavigation-satellite service in which earth stations are located on board aircraft.

Amateur Service: A radiocommunication service for the purpose of self-training, intercommunication and technical investigations carried out by amateurs, that is, by duly authorized persons interested in radio technique solely with a personal aim and without pecuniary interest.

Amateur-Satellite Service: A radiocommunication service using space stations on earth satellites for the same purpose as those of the amateur service.

Broadcasting Service: A radiocommunication service in which the transmissions are intended for direct reception by the general public. This service may include sound transmissions, television transmissions or other types of transmission.

Broadcasting-Satellite Service: A radiocommunication service in which signals transmitted or retransmitted by space stations are intended for direct reception by the general public.

In the broadcasting-satellite service, the term *direct reception* shall encompass both individual reception and community reception.

Earth Exploration-Satellite Service: A radiocommunication service between earth stations and one or more space stations, which may include links between space stations, in which:

- information relating to the characteristics of the Earth and its natural phenomena, including data relating to the state of the environment, is obtained from active sensors or passive sensors on Earth satellites;
- similar information is collected from airborne or Earth-based platforms;
- such information may be distributed to earth stations within the system concerned;
- platform interrogation may be included.

This service may also include feeder links necessary for its operation.

Fixed Service: A radiocommunication service between specified fixed points.

Fixed-Satellite Service: A radiocommunication service between earth stations at given positions, when one or more satellites are used; the given position may be a specified point or any fixed point within specified areas; in some cases, this service includes satellite-to-satellite links, which may also be operated in the inter-satellite service; the fixed-satellite service may also include feeder links for other space radiocommunication services.

Inter-Satellite Service: A radiocommunication service providing links between artificial satellites.

Land Mobile Service: A mobile service between base stations and land mobile stations or between land mobile stations.

Land Mobile-Satellite Service: A mobile-satellite service in which mobile earth stations are located on land.

Maritime Mobile Service: A mobile service between coast stations and ship stations, or between ship stations, or between associated on-board communication stations; survival craft stations and emergency position-indicating radiobeacon stations may also participate in this service.

Maritime Mobile-Satellite Service: A mobile-satellite service in which mobile earth stations are located on board ships; survival craft stations and emergency position-indicating radiobeacon stations may also participate in this service.

Maritime Radionavigation Service: A radionavigation service intended for the benefit and for the safe operation of ships.

Maritime Radionavigation-Satellite Service: A radionavigation-satellite service in which earth stations are located on board ships.

Meteorological Aids Service: A radiocommunication service used for meteorological, including hydrological, observations and exploration.

Meteorological-Satellite Service: An earth exploration-satellite service for meteorological purposes.

Mobile Service: A radiocommunication service between mobile and land stations, or between mobile stations.

Mobile-Satellite Service: A radiocommunication service:

- between mobile earth stations and one or more space stations, or between space stations used by this service; or
- between mobile earth stations by means of one or more space stations.

This service may also include feeder links necessary for its operation.

Radio Astronomy Service: A service involving the use of radio astronomy.

Radiocommunication Service: A service involving the transmission, emission and/or reception of radio waves for specific telecommunication purposes. Unless otherwise stated, any radiocommunication service relates to terrestrial radiocommunication.

Radiodetermination Service: A radiocommunication service for the purpose of radiodetermination.

Radiodetermination-Satellite Service: A radiocommunication service for the purpose of radiodetermination involving the use of one or more space stations.

This service may also include feeder links necessary for its own operation.

Radiolocation Service: A radiodetermination service for the purpose of radiolocation.

Radiolocation-Satellite Service: A radiodetermination-satellite service used for the purpose of radiolocation.

This service may also include feeder links necessary for its operation.

Radionavigation Service: A radiodetermination service for the purpose of radionavigation.

Radionavigation-Satellite Service: A radiodetermination-satellite service used for the purpose of radionavigation.

This service may also include feeder links necessary for its operation.

Safety Service: Any radiocommunication service used permanently or temporarily for the safeguarding of human life and property.

Space Operation Service: A radiocommunication service concerned exclusively with the operation of spacecraft, in particular space tracking, space telemetry and space telecommand.

These functions will normally be provided within the service in which the space station is operating.

Space Research Service: A radiocommunication service in which spacecraft or other objects in space are used for scientific or technological research purposes.

Standard Frequency and Time Signal Service: A radiocommunication service for scientific, technical and other purposes, providing the transmission of specified frequencies, time signals, or both, of stated high precision, intended for general reception.

Standard Frequency and Time Signal-Satellite Service: A radiocommunication service using space stations on earth satellites for the same purposes as those of the standard frequency and time signal service.

This service may also include feeder links necessary for its operation.

6.3 Categories of Services

Primary and Secondary Services:

In the Canadian Table, where a band is indicated as allocated to more than one service, services are listed in the following order:

- (a) primary services are printed in “all capital letters” (example: FIXED); and
- (b) secondary services are printed in “upper and lower case letters” (example: Amateur).

Additional remarks are printed in “normal characters” (example: MOBILE except aeronautical mobile).

For each category, services are listed in alphabetical order, but that order does not indicate relative priority.

Stations of a Secondary Service:

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

The frequency band referred to in each allocation is indicated in the top left-hand corner of the box of the Table concerned.

The footnote references that appear in the Table below the allocated service or services apply to more than one of the allocated services, or the whole of the allocation concerned.

The footnote references to the right of the name of a service are applicable only to that particular service.

7. Proposed Revisions to the Canadian Table of Frequency Allocations

Part A: Maritime and Aeronautical Services

A1 (AI 1.3) — Spectrum Requirements for Unmanned Aircraft Systems (UAS)

Background

Unmanned aircraft systems (UAS) consist of an unmanned aircraft and associated unmanned aircraft control station. Unmanned aircraft are aircraft that do not carry a human pilot, and may fly autonomously or be piloted remotely. UAS operations have been limited to segregated airspace where separation from other air traffic can be assured. However, there are plans to expand UAS deployment outside of segregated airspace.

The development of UAS is based on recent technological advances in aviation, electronics and structural materials, making the economics of UAS operations more favourable, particularly for more repetitive, routine and long-haul duration applications. The current state of UAS design and operation is leading to the rapid development of UAS applications to fill many diverse requirements. More specifically, there is a wide variety of existing and envisioned applications of UAS, such as cargo transportation, firefighting, flood monitoring, search and rescue, disaster operations management, oceanographic and atmospheric observations, weather forecasting, geological survey, monitoring of gas pipelines and electricity distribution systems, city and highway traffic, border patrol, law enforcement, counter drug operations, crop and harvest monitoring, broadcast and airborne relay-type services, etc. The operation of unmanned aircraft outside segregated airspace involves the same issues as manned aircraft, namely safe and efficient integration into the air traffic control system.

Discussion

WRC-12 successfully allocated 61 MHz in the frequency band 5030-5091 MHz to the aeronautical mobile (R) service (AM(R)S) in order to support and ensure the safe operation of both the satellite and terrestrial components of UAS. WRC-12 did not permit the use of some fixed-satellite service (FSS) allocated frequency bands for UAS operation, based on the lack of sharing studies vis-à-vis existing services and the need to ensure that the International Civil Aviation Organization's (ICAO) safety of flight requirements were met. However, a new agenda item for WRC-15 was approved to address these two issues on the use of FSS allocated frequency bands.

The WRC-12 decision to allocate the frequency band 5030-5091 MHz for UAS operation aligns with the position that Canada took on this issue. Part of the Canadian position was to seek a decision by WRC-12 to permit the use of some identified FSS frequency bands for the satellite component of UAS. However, WRC-12 decided to adopt a new agenda item for WRC-15 to study the safety aspects of UAS operation in non-segregated air space using the fixed-satellite service. Although it would have been beneficial to facilitate some implementation of satellite-based UAS in the FSS bands in the near term, this WRC-12 decision remains satisfactory to Canada.

The Department is proposing to reflect the decisions of WRC-12 for UAS operation in the Canadian Table. A new allocation for the frequency band 5030-5091 MHz is being added with the consequential changes to some existing footnotes. The Department believes that the proposed changes will satisfy the needs of the UAS community in Canada to begin the development of standards and enable access and deployment of UAS capability in non-segregated airspace in the future. The Department also believes that the proposed changes to the Canadian Table will provide protection to the existing services and systems from the introduction of UAS systems. Accordingly, there may be a need to revise Regulation by Reference RBR-1, *Technical Requirements for the Operation of Mobile Stations in the Aeronautical Service*, to take into account these proposed changes to the Canadian Table.

Summary of Proposed Changes to the Canadian Table

1 610-1 626.5 MHz

1 610-1 610.6	AERONAUTICAL RADIONAVIGATION MOBILE-SATELLITE (Earth-to-space) 5.351A 5.341 5.364 5.366 MOD 5.367 5.368 5.372
1 610.6-1 613.8	AERONAUTICAL RADIONAVIGATION MOBILE-SATELLITE (Earth-to-space) 5.351A RADIO ASTRONOMY 5.149 5.341 5.364 5.366 MOD 5.367 5.368 5.372

1 613.8-1 626.5

AERONAUTICAL RADIONAVIGATION
 MOBILE-SATELLITE (Earth-to-space) 5.351A
 Mobile-Satellite (space-to-Earth) 5.208B

5.341 5.364 5.365 5.366 **MOD** 5.367 5.368 5.372

MOD 5.367 *Additional allocation:* The frequency bands 1 610-1 626.5 MHz ~~and 5 000-5 150 MHz~~ are ~~is~~ also allocated to the aeronautical mobile-satellite (R) service on a primary basis, subject to agreement obtained under No. **9.21**. (WRC-12)

5 000-5 150 MHz

5 000-5 010

AERONAUTICAL MOBILE-SATELLITE (R) ADD 5.443AA
 AERONAUTICAL RADIONAVIGATION
 RADIONAVIGATION-SATELLITE (Earth-to-space)

~~5.367~~

5 010-5 030

AERONAUTICAL MOBILE-SATELLITE (R) ADD 5.443AA
 AERONAUTICAL RADIONAVIGATION
 RADIONAVIGATION-SATELLITE (Earth-to-space)(space-to-space)
 5.328B 5.443B

~~5.367~~

5 030-5 091

AERONAUTICAL MOBILE (R) ADD 5.443C
AERONAUTICAL MOBILE-SATELLITE (R) ADD 5.443D
 AERONAUTICAL RADIONAVIGATION

~~5.367~~ **MOD** 5.444

5 091-5 150

AERONAUTICAL MOBILE 5.444B
AERONAUTICAL MOBILE-SATELLITE (R) ADD 5.443AA
 AERONAUTICAL RADIONAVIGATION

~~5.367~~ **MOD** 5.444 5.444A

ADD 5.443AA In the frequency bands 5 000-5 030 MHz and 5 091-5 150 MHz, the aeronautical mobile-satellite (R) service is subject to agreement obtained under No. **9.21**. The use of these bands by the aeronautical mobile-satellite (R) service is limited to internationally standardized aeronautical systems. (WRC-12)

- ADD 5.443C** The use of the frequency band 5 030-5 091 MHz by the aeronautical mobile (R) service is limited to internationally standardized aeronautical systems. Unwanted emissions from the aeronautical mobile (R) service in the frequency band 5 030-5 091 MHz shall be limited to protect RNSS system downlinks in the adjacent 5 010-5 030 MHz band. Until such time that an appropriate value is established in a relevant ITU-R Recommendation, the e.i.r.p. density limit of -75 dBW/MHz in the frequency band 5 010-5 030 MHz for any AM(R)S station unwanted emission should be used. (WRC-12)
- ADD 5.443D** In the frequency band 5 030-5 091 MHz, the aeronautical mobile-satellite (R) service is subject to coordination under No. **9.11A**. The use of this frequency band by the aeronautical mobile-satellite (R) service is limited to internationally standardized aeronautical systems. (WRC-12)
- MOD 5.444** The frequency band 5 030-5 150 MHz is to be used for the operation of the international standard system (microwave landing system) for precision approach and landing. In the frequency band 5 030-5 091 MHz, the requirements of this system shall ~~take precedence~~ have priority over other uses of this band. For the use of the band 5 091-5 150 MHz, No. **5.444A** and Resolution **114 (Rev.WRC-0312)** apply. (WRC-0712)

A2 (AI 1.4) — Introduction of New Aeronautical Mobile (R) Service Systems

Background

At WRC-03, an allocation in the band 108-117.975 MHz was made to the aeronautical mobile (R) service (AM(R)S), limited to systems that transmit navigation and surveillance information in accordance with international aviation standards. At WRC-07, AM(R)S in the band 108-112 MHz was further limited only to ground-based systems that transmit navigational information in support of air navigation functions, whereas the band 112-117.975 MHz was opened to all AM(R)S systems subject to Resolution **413 (Rev.WRC-07)**. In conjunction with this change, WRC-12 agenda item 1.4 was adopted to determine if further regulatory measures were necessary to facilitate introduction of new AM(R)S in the band 112-117.975 MHz. Studies were performed to address this question.

At WRC-07, an AM(R)S allocation was made in the band 960-1 164 MHz, limited to systems operating in accordance with international aviation standards. In addition, agenda item 1.4 and Resolution **417 (WRC-07)** were adopted to study operational and technical means to facilitate sharing between AM(R)S systems operating in the band 960-1 164 MHz and the aeronautical radionavigation service (ARNS) systems identified in *considering f) and g)* of Resolution **417**. Resolution **417 invites ITU-R** in accordance with *resolves 5* to study operational and technical means to facilitate sharing between AM(R)S systems operating in the band 960-1 164 MHz and the radionavigation-satellite service (RNSS) operating in the band 1164-1215 MHz. Studies were performed to address this question.

Report ITU-R M.2120, produced in response to WRC-07 agenda item 1.6 and Resolution **414 (WRC-03)**, estimated the AM(R)S spectrum requirement for surface applications at airports at between 60 and 100 MHz, and noted that this value would be refined through further study. At WRC-07, the frequency band 5091-5150 MHz was allocated to AM(R)S for surface applications. Due to uncertainty in the spectrum requirement and the perceived lack of maturity with respect to compatibility studies between AM(R)S and RNSS, as well as with AM(R)S and radio astronomy service (RAS) in the adjacent band 4990-5000 MHz, the proposal to further allocate the bands 5000-5010 MHz and 5010-5030 MHz to AM(R)S for surface applications was not made. However, in order to continue the studies concerning these bands, WRC-12 agenda item 1.4 and Resolution **420 (WRC-07)** were adopted.

Resolution **420** invites the ITU to determine if AM(R)S spectrum requirements for surface applications at airports could be satisfied in the already allocated band 5091-5150 MHz. If not, Resolution **420** further invites the ITU to: investigate the feasibility of an allocation for AM(R)S for surface applications at airports between 5000 and 5030 MHz; study the technical and operational issues related to the protection of RNSS in the bands; study as well the issues related to the protection of the RAS in the band 4990-5000 MHz from AM(R)S; and to develop appropriate ITU-R Recommendations.

Discussion

Agenda item 1.4 addressed three distinct issues identified in their respective Resolutions.

Resolution **413** addressed the use of the band 108-117.975 MHz by the aeronautical mobile (R) service while considering the protection of the FM broadcasting below 108 MHz. WRC-12 concluded that no harmful interference would be caused to the analog broadcasting systems. However, studies may still be required to address the introduction of new digital sound broadcasting systems and Resolution **413** was amended accordingly. The decision by WRC-12 is in line with the Canadian position. No. **5.197A** will require a consequential change to reflect an update to Resolution **413**.

Resolution **417** addressed the use of the band 960-1164 MHz by the aeronautical mobile (R) service, particularly the compatibility with existing systems operating in the same band in the ARNS allocation that are not standardized by the International Civil Aviation Organization (IACO). Resolution **417** also addressed the compatibility with the adjacent systems operating in the RNSS in the upper adjacent band. WRC-12 allocated the band 960-1164 MHz to the aeronautical mobile (R) service with the modified provisions of Resolution **417**, which describe sharing requirements with existing ARNS systems. The WRC-12 decision is in line with the Canadian position. Industry Canada proposes to reflect the WRC-12 decision in the Canadian Table by updating the reference to Resolution **417** in No. **5.327A**.

Resolution **420** addressed the consideration of the frequency bands between 5000 and 5030 MHz for aeronautical mobile (R) service surface applications at airports as an expansion band for the already allocated band 5091-5150 MHz for the same application. After many contentious discussions around the compatibility with the RNSS allocation and the requirements for additional spectrum for the surface applications, the proponents of such an allocation withdrew their proposal. Consequently, WRC-12 concluded that no change was required to the International Table. Canada originally supported the additional 10 MHz frequency allocation in the band 5000-5010 MHz for airport surface applications. However, in view of the overwhelming opposition to such a frequency allocation and in the spirit of international cooperation, Canada moved to support no change to the International Table.

Some editorial changes were proposed to No. **5.444** to align the text across the various languages used by the ITU. No. **5.444B** was amended to remove the application for aeronautical security applications in the frequency band 5091-5150 MHz.

The Department believes that the proposed changes to the Canadian Table will satisfy the needs for AM(R)S requirements, and provide protection to the existing services and systems from the introduction of new AM(R)S systems.

Summary of Proposed Changes to the Canadian Table

960-1 164 MHz

960-1 164	AERONAUTICAL MOBILE (R) MOD 5.327A AERONAUTICAL RADIONAVIGATION 5.328
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5 091-5 150 MHz

5 091-5 150	AERONAUTICAL MOBILE MOD 5.444B <u>AERONAUTICAL MOBILE-SATELLITE (R) ADD 5.443AA</u> AERONAUTICAL RADIONAVIGATION 5.367 MOD 5.444 5.444A
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MOD 5.327A The use of the frequency band 960-1 164 MHz by the aeronautical mobile (R) service is limited to systems that operate in accordance with recognized international aeronautical standards. Such use shall be in accordance with Resolution **417 (Rev.WRC-0712)**. (WRC-0712)

ADD 5.443AA In the frequency bands 5 000-5 030 MHz and 5 091-5 150 MHz, the aeronautical mobile-satellite (R) service is subject to agreement obtained under No. **9.21**. The use of these bands by the aeronautical mobile-satellite (R) service is limited to internationally standardized aeronautical systems. (WRC-12)

MOD 5.444 The frequency band 5 030-5 150 MHz is to be used for the operation of the international standard system (microwave landing system) for precision approach and landing. In the frequency band 5 030-5 091 MHz, the requirements of this system shall ~~take precedence~~ have priority over other uses of this band. For the use of the band 5 091-5 150 MHz, No. **5.444A** and Resolution **114 (Rev.WRC-0312)** apply. (WRC-0712)

MOD 5.444B The use of the frequency band 5 091-5 150 MHz by the aeronautical mobile service is limited to:

- systems operating in the aeronautical mobile (R) service and in accordance with international aeronautical standards, limited to surface applications at airports. Such use shall be in accordance with Resolution **748 (Rev.WRC-0712)**;

- aeronautical telemetry transmissions from aircraft stations (see No. **1.83**) in accordance with Resolution **418 (Rev.WRC-0712)**.
- ~~— aeronautical security transmissions. Such use shall be in accordance with Resolution **419 (WRC-07)**. (WRC-0712)~~

A3 (AI 1.10) — Frequency Allocation Requirements for Ship Safety and Port Security Operations

Background

The global maritime community had agreed on special measures to enhance maritime safety systems for ships and ports. International Maritime Organization (IMO) Resolution MSC 74(69) stated that: “The AIS should improve the safety of navigation by assisting in the efficient navigation of ships, protection of the environment, and operation of Vessel Traffic Services (VTS), by satisfying the following functional requirements: (1) in a ship-to-ship mode for collision avoidance; (2) as a means for littoral States to obtain information about a ship and its cargo; and (3) as a VTS tool, i.e. ship-to-shore (traffic management).”

The ITU’s *Radio Regulations* only recognize the automatic identification system-search and rescue transponder (AIS-SART) operation as having a safety function on the two AIS frequencies as noted in Appendix **15 (Rev.WRC-07)**. Furthermore, additional AIS channels were studied as required to enhance global ship-tracking capabilities.

Appendix **18** is used globally, for both data and voice services. There is also increasing demand for data services at the regional, and ultimately, the global level, as described by Resolution **342 (Rev.WRC-2000)**. For example, voice transmissions play a continuing role in port operations, ship movement and distress at sea, as presented by Resolution **357 (WRC-07)**.

Under broadcast of safety and security information for ships and ports which is vital for maritime safety, Article **33** describes the operational procedures for maritime urgency and safety communications, including the transmission of maritime safety information (MSI). However, IMO and the International Hydrographic Organization (IHO) recognize that the existing MSI systems have limited capacity and will include only the promulgation of changes to the security levels in major ports and coastal waters. If additional security-related information needs to be promulgated, this will have to be transmitted via other systems. Therefore, there may be a requirement for additional spectrum to be allocated for this purpose.

Communication systems in the band 415-526.5 kHz includes transmissions in accordance with Recommendations ITU-R M.540-2 and ITU-R M.1677-1, and may include digital technology similar to that used in Recommendation ITU-R M.1798-1. Additional studies for enhanced broadcast in a portion of the band 415-526.5 kHz are contained in Report ITU-R M.2201. The data access network is a simplex data exchange based on an automated carrier-sense (listen-before-talk) protocol.

Discussion

Although several issues were to be addressed by agenda item 1.10, only four were ultimately considered by WRC-12. Of these four issues, only three pertain to the Canadian Table, as discussed below.

Issue A: Regulatory status of AIS 1 and AIS 2

Allocations were made on a regional basis with the automatic identification system (AIS) channels AIS 1 (161.9625-161.9875 MHz) and AIS 2 (162.0125-162.0375 MHz) being individually segregated in the International Table. Having the allocation in the International Table instead of in a footnote provides greater prominence which satisfies the Canadian interest.

Canada supports the resultant changes to the International Table allocation in Region 2; providing a primary allocation to the maritime mobile service, mobile-satellite service and the aeronautical mobile (OR) service (limited to search and rescue operations).

As a consequence of new footnote No. **5.228D** and the removal of the fixed and mobile allocations after 1 January 2025, the Department proposes to impose a moratorium, effective immediately, on the authorization of new stations in the land mobile and fixed services in the bands 161.9625-161.9875 MHz and 162.0125-162.0374 MHz. Transition of existing stations not used for AIS purposes within these bands will be subject to a future public consultation. A new Canadian footnote is also proposed.

Issue B: Satellite detection of AIS (status of channels 75 and 76 in Appendix 18)

While the allocation changes to the International Table were not uniform across all Regions, Canada fully concurred with the changes for Region 2 with the adoption of a primary allocation to the maritime mobile and mobile-satellite services for these two frequency channels. A footnote was also adopted to restrict the use by the mobile-satellite service for long-range tracking of AIS and to restrict maritime mobile operations to a power of no more than 1 watt in order to protect the satellite reception of AIS.

Additional footnotes provide for the restrictive use of the specific frequency bands directly related to AIS and also provide for a transitional period for the removal of other services, such as the land mobile and fixed services, operating within the frequency bands of AIS 1 and AIS 2.

Issue C: Broadcasts of safety and security information for ships and ports

Canada fully supported an exclusive worldwide primary allocation in the band 495-505 kHz to the maritime mobile service, together with the suppression of the footnotes previously limiting the use of the band to radiotelegraphy.

The Department proposes to reflect the above WRC-12 decisions in the Canadian Table.

There will also be a need to revise accordingly Regulation by Reference RBR-2, *Technical Requirements for the Operation of Mobile Stations in the Maritime Service*, to take into account these proposed changes to the Canadian Table.

Summary of Proposed Changes to the Canadian Table

495-525 kHz

495-505	<u>MARITIME MOBILE</u> (distress and calling) 5.82A 5.82B
...	
510-525	AERONAUTICAL RADIONAVIGATION <u>MARITIME MOBILE</u> 5.79A 5.84

SUP 5.82A ~~The use of the band 495-505 kHz is limited to radiotelegraphy.~~

SUP 5.82B ~~Administrations authorizing the use of frequencies in the band 495-505 kHz by services other than the maritime mobile service shall ensure that no harmful interference is caused to the maritime mobile service in this band or to the services having allocations in the adjacent bands, noting in particular the conditions of use of the frequencies 490 kHz and 518 kHz, as prescribed in Articles 31 and 52.~~

156.7625-174 MHz

156.7625-156.8375 7875	<u>MARITIME MOBILE</u> (distress and calling) <u>MOBILE-SATELLITE</u> (Earth-to-space) 5.111 5.226 ADD 5.228
<u>156.7875-156.8125</u>	MARITIME MOBILE (distress and calling) 5.111 5.226
156.7625 8125 -156.8375	<u>MARITIME MOBILE</u> (distress and calling) <u>MOBILE-SATELLITE</u> (Earth-to-space) 5.111 5.226 ADD 5.228
156.8375-174 161.9625	MOBILE Fixed 5.226 5.227A

<u>161.9625-161.9875</u>	<u>AERONAUTICAL MOBILE (OR)</u> <u>MARITIME MOBILE</u> <u>MOBILE-SATELLITE (Earth-to-space)</u>
	ADD 5.228C ADD 5.228D ADD C53
<u>161.9875-162.0125</u>	MOBILE Fixed
	5.226 5.227A
<u>162.0125-162.0375</u>	<u>AERONAUTICAL MOBILE (OR)</u> <u>MARITIME MOBILE</u> <u>MOBILE-SATELLITE (Earth-to-space)</u>
	ADD 5.228C ADD 5.228D ADD C53
156.8375 <u>162.0375-174</u>	MOBILE Fixed
	5.226 5.227A

ADD 5.228 The use of the frequency bands 156.7625-156.7875 MHz and 156.8125-156.8375 MHz by the mobile-satellite service (Earth-to-space) is limited to the reception of automatic identification system (AIS) emissions of long-range AIS broadcast messages (Message 27, see the most recent version of Recommendation ITU-R M.1371). With the exception of AIS emissions, emissions in these bands by the maritime mobile service for communications shall not exceed 1 W. (WRC-12)

ADD 5.228C The use of the frequency bands 161.9625-161.9875 MHz and 162.0125-162.0375 MHz by the maritime mobile service and the mobile-satellite (Earth-to-space) service is limited to the automatic identification system (AIS). The use of these frequency bands by the aeronautical mobile (OR) service is limited to AIS emissions from search and rescue aircraft operations. The AIS operations in these frequency bands shall not constrain the development and use of the fixed and mobile services operating in the adjacent frequency bands. (WRC-12)

ADD 5.228D The frequency bands 161.9625-161.9875 MHz (AIS 1) and 162.0125-162.0375 MHz (AIS 2) may continue to be used by the fixed and mobile services on a primary basis until 1 January 2025, at which time this allocation shall no longer be valid. Administrations are encouraged to make all practicable efforts to discontinue the use of these bands by the fixed and mobile services prior to the transition date. During this

transition period, the maritime mobile service in these frequency bands has priority over the fixed, land mobile and aeronautical mobile services. (WRC-12)

ADD C53 (CAN-13) In the bands 161.9625-161.9875 MHz and 162.0125-162.0375 MHz, a moratorium is placed on the authorization of new stations in the land mobile and fixed services. Existing stations, not used for automatic identification systems (AIS) purposes, will be displaced according to a future transition policy to enable full implementation of AIS.

SUP 5.227A ~~Additional allocation: the bands 161.9625-161.9875 MHz and 162.0125-162.0375 MHz are also allocated to the mobile-satellite service (Earth-to-space) on a secondary basis for the reception of automatic identification system (AIS) emissions from stations operating in the maritime mobile service (see Appendix 18). (WRC-07)~~

Part B: Radiolocation and Amateur Services

B1 (AI 1.15) — Radiolocation Service Allocations for Oceanographic Radar Applications in the 3 to 50 MHz Range

Background

Allocations to the radiolocation service will be used for oceanographic radar applications that monitor the sea surface for wave heights, currents and tracking of large objects. Oceanographic radars have been operating in the 3 to 50 MHz range for more than 30 years on an experimental, non-interference basis. Increased reliance on the data from these systems for maritime safety, oceanographic, climatological, meteorological and disaster response operations has driven the need to provide regulatory status for these applications in the radiolocation service in the 3 to 50 MHz range.

ITU-R studies indicated that sharing between oceanographic radars applications in the radiolocation service and fixed and mobile services was possible with separation distances to protect the incumbent services. The e.i.r.p. of oceanographic radar systems used in these compatibility studies was comparable to the e.i.r.p. of existing licensed fixed and mobile systems in Canada. Due to the nature of HF (3 to 30 MHz) propagation, global and/or regional allocations were deemed most practical.

Discussion

It appeared very difficult to get a consensus on the identification of global frequency bands due to various regional and geographical variations, propagation considerations and divergent administrations' views resulting from their domestic usage. The result was the identification of various sub-bands in the 3 to 50 MHz range with primary or secondary allocations on a regional basis. In some cases, country footnotes were also included. A common footnote to each allocation ensures that oceanographic radars shall not cause harmful interference to, or claim protection from, stations operating in the fixed or mobile services and requires oceanographic radar to operate in accordance with Resolution **612 (Rev. WRC-12)**. Resolution **612** identifies operating restrictions and geographical separation distances for oceanographic radar operating between 3 and 50 MHz. The proposed changes to the Canadian Table are in line with the new allocations to Article **5** of the ITU's *Radio Regulations* in Region 2 with the exception of the frequency band 13450-13550 kHz. In the frequency band 13450-13550 kHz, Canada is

proposing a primary allocation to the radiolocation service because both the fixed and mobile services have primary allocations in Canada. In Regions 1 and 3, several other allocations were made around 9 MHz, 39 MHz and 42 MHz.

Radiolocation allocations around 5 MHz, 13 MHz, 16 MHz, 24 MHz and 26 MHz provide flexibility to oceanographic radar applications to operate within variable propagation conditions. With the following proposed radiolocation allocations, the spectrum use for oceanographic radar applications will be organized into several frequency bands, which will result in coordinated assignments, as well as some global harmonization and predictability for incumbent services. Overall, this approach will reduce frequency band congestion and the impact to other users.

Summary of Proposed Changes to the Canadian Table

4 438-4 650 kHz

4 438-4 650 <u>488</u>	FIXED MOBILE except aeronautical mobile (R) <u>RADIOLOCATION ADD 5.132A</u>
4 <u>488</u> -4 650	FIXED MOBILE except aeronautical mobile (R)

5 250-5 450 kHz

5 250-5 450 <u>275</u>	FIXED MOBILE except aeronautical mobile <u>RADIOLOCATION ADD 5.132A</u>
5 <u>275</u> -5 450	FIXED MOBILE except aeronautical mobile

13 410-13 570 kHz

13 410-13 570 <u>450</u>	FIXED MOBILE except aeronautical mobile (R) 5.150
13 <u>450</u> -13 550	FIXED MOBILE except aeronautical mobile (R) <u>RADIOLOCATION ADD 5.132A</u>

13 550-13 570

FIXED
MOBILE except aeronautical mobile (R)

5.150

15 800-16 360 kHz15 800-16 360100

FIXED

16 100-16 200

FIXED
RADIOLOCATION ADD 5.145A

16 200-16 360

FIXED

24 000-24 890 kHz24 000-24 890450

FIXED
LAND MOBILE

24 450-24 650

FIXED
LAND MOBILE
RADIOLOCATION ADD 5.132A

24 650-24 890

FIXED
LAND MOBILE

26 175-27 500 kHz

26 175-27 500 26 200	FIXED MOBILE except aeronautical mobile 5.150
<u>26 200-26 420</u>	FIXED MOBILE except aeronautical mobile <u>RADIOLOCATION ADD 5.132A</u>
26 475 420 -27 500	FIXED MOBILE except aeronautical mobile 5.150

ADD 5.132A Stations in the radiolocation service shall not cause harmful interference to, or claim protection from, stations operating in the fixed or mobile services. Applications of the radiolocation service are limited to oceanographic radars operating in accordance with Resolution **612 (Rev.WRC-12)**. (WRC-12)

ADD 5.145A Stations in the radiolocation service shall not cause harmful interference to, or claim protection from, stations operating in the fixed service. Applications of the radiolocation service are limited to oceanographic radars operating in accordance with Resolution **612 (Rev.WRC-12)**. (WRC-12)

B2 (AI 1.21) — Primary Allocation to the Radiolocation Service in the Band 15.4-15.7 GHz**Background**

This extension to the existing primary radiolocation service allocations in the frequency band 15.7-17.3 GHz provides an additional 300 MHz of spectrum for increased image resolution and range accuracy of both airborne and ship radar applications.

Technical studies within the ITU-R study period addressed compatibility between the radiolocation service and aircraft landing systems operating under the aeronautical radionavigation service, the radio astronomy service and the fixed-satellite service. To ensure compatibility between these services, operational restrictions were proposed for the radiolocation service.

Discussion

WRC-12 successfully allocated 300 MHz to the radiolocation service in the frequency band 15.4-15.7 GHz and added two new footnotes to ensure the protection of the aeronautical radionavigation service and radio astronomy service.

Summary of Proposed Changes to the Canadian Table

15.4-15.7 GHz

15.4-15.43	AERONAUTICAL RADIONAVIGATION RADIOLOCATION ADD 5.511E ADD 5.511F
15.43-15.63	AERONAUTICAL RADIONAVIGATION FIXED-SATELLITE (Earth-to-space) 5.511A RADIOLOCATION ADD 5.511E ADD 5.511F 5.511C
15.63-15.7	AERONAUTICAL RADIONAVIGATION RADIOLOCATION ADD 5.511E ADD 5.511F

ADD 5.511E In the frequency band 15.4-15.7 GHz, stations operating in the radiolocation service shall not cause harmful interference to, or claim protection from, stations operating in the aeronautical radionavigation service. (WRC-12)

ADD 5.511F In order to protect the radio astronomy service in the frequency band 15.35-15.4 GHz, radiolocation stations operating in the frequency band 15.4-15.7 GHz shall not exceed the power flux-density level of $-156 \text{ dB(W/m}^2\text{)}$ in a 50 MHz bandwidth in the frequency band 15.35-15.4 GHz, at any radio astronomy observatory site for more than 2 per cent of the time. (WRC-12)

B3 (AI 1.23) — Secondary Amateur Allocation in the 415 to 526.5 kHz Range

Background

The main interest of the amateur service in the 500 kHz (600-metre) band lies in its unique propagation properties, which are different from those in the 135 kHz and 1800 kHz bands. For example, the band allows for ground wave propagation, which is unaffected by ionospheric disturbances and sunspot-cycle variations. This characteristic would prove invaluable in the continuing development by radio amateurs of communications in disaster and emergency situations. Moreover, new means of reliable radiocommunications using digital signal processing represent opportunities to make use of these frequencies.

Studies were undertaken and submitted to the ITU-R. The goal of such studies was to ensure that a secondary allocation in the frequency range under study would not adversely impact the maritime mobile, aeronautical radionavigation or aeronautical mobile services. The studies showed that mitigation measures such as frequency and geographic separation would ensure that amateur service operations would not interfere with incumbent services in the band under study.

Discussion

Most regional administrations were in favour of a secondary allocation to the amateur service and supported an allocation of approximately 15 kHz in the band 472-487 kHz or in the bands 461-469/471-478 kHz. Canada supported an allocation in the bands 461-469/471-478 kHz.

That said, some countries were opposed to the secondary allocation. They argued that the aeronautical radionavigation service (ARNS), which is a safety of life service, requires protection from amateur service operations. Concerns were voiced that this protection could not be guaranteed, as two secondary services are not required to protect each other. (The ARNS has a secondary allocation throughout most of the bands under study.)

Ultimately, a worldwide secondary allocation of 7 kHz in the band 472-479 kHz was made to the amateur service. Four footnotes were amended or added to Article 5 of the International Table to ensure the protection of the aeronautical radionavigation and maritime mobile services from amateur service operations. These footnotes include power limits and geographic exclusion zones for the amateur service. As well, amateur service operations are not permitted in certain countries.

Summary of Proposed Changes to the Canadian Table

415-495 kHz

415-495 <u>472</u>	MARITIME MOBILE 5.79 5.79A MOD 5.82
<u>472-479</u>	MARITIME MOBILE 5.79 5.79A <u>Amateur ADD 5.80A</u> MOD 5.82
415 <u>479</u> -495	MARITIME MOBILE 5.79 5.79A MOD 5.82

ADD 5.80A The maximum equivalent isotropically radiated power (e.i.r.p.) of stations in the amateur service using frequencies in the band 472-479 kHz shall not exceed 1 W. Administrations may increase this limit of e.i.r.p. to 5 W in portions of their territory which are at a distance of over 800 km from the borders of Algeria, Saudi Arabia, Azerbaijan, Bahrain, Belarus, China, Comoros, Djibouti, Egypt, United Arab Emirates,

the Russian Federation, Iran (Islamic Republic of), Iraq, Jordan, Kazakhstan, Kuwait, Lebanon, Libya, Morocco, Mauritania, Oman, Uzbekistan, Qatar, Syrian Arab Republic, Kyrgyzstan, Somalia, Sudan, Tunisia, Ukraine and Yemen. In this frequency band, stations in the amateur service shall not cause harmful interference to, or claim protection from, stations of the aeronautical radionavigation service. (WRC-12)

MOD 5.82 In the maritime mobile service, the frequency 490 kHz is to be used exclusively for the transmission by coast stations of navigational and meteorological warnings and urgent information to ships, by means of narrow-band direct-printing telegraphy. The conditions for use of the frequency 490 kHz are prescribed in Articles **31** and **52**. In using the frequency band 415-495 kHz for the aeronautical radionavigation service, administrations are requested to ensure that no harmful interference is caused to the frequency 490 kHz. In using the frequency band 472-479 kHz for the amateur service, administrations shall ensure that no harmful interference is caused to the frequency 490 kHz. (WRC-0712)

Part C: Fixed and Mobile Services

C1 (AI 1.8) — Fixed Service in the Bands 71 GHz to 238 GHz

Background

Several countries have operational fixed service links in the frequency bands 71-76 GHz and 81-86 GHz and some also have links in the bands 92-94 GHz and 94.1-95 GHz. In addition to these active service applications, several countries operate remote sensing and meteorological satellites that utilize the Earth exploration-satellite service (EESS) (passive) allocation from 86 to 92 GHz and all countries, including Canada, use the data from the satellites for meteorological predictions.

In the period leading up to WRC-12, the ITU-R undertook studies on the potential out-of-band impact from fixed point-to-point systems in the band 81-86 GHz to EESS (passive) satellite sensors used for meteorology in the band 86-92 GHz. These studies also analyzed possible unwanted emission limits intended to preclude such interference. These limits were consistent with regulatory limits already in place in Europe, but were more stringent than regulatory limits in the United States. As fixed systems operating above 94 GHz are still in an early stage of development, it was not possible to analyze this case in detail; however, it was felt to be reasonable to assume that similar conditions would apply above 94 GHz as below 86 GHz.

Discussion

At WRC-12, it became apparent that it was necessary to balance the need to protect meteorological sensors without unduly constraining the ability to provide new fixed service applications in adjacent bands. As a result, rather than impose mandatory unwanted emission limits, WRC-12 decided to urge administrations to take all reasonable steps to ensure that unwanted emissions from fixed service stations in these bands do not exceed recommended maximum levels, as contained in Resolution **750 (Rev.WRC-12)**, and noted that EESS (passive) sensors provide worldwide measurements that benefit all countries, even if these sensors are not operated by their country. Therefore, although Industry Canada proposes to incorporate the following changes in the Canadian Table, the adoption of domestic unwanted emissions limits for the bands 81-86 and 92-94 GHz will be decided at a later date.

Summary of Proposed Changes to the Canadian Table**81-86 GHz**

81-84	<p>FIXED ADD MOD 5.338A FIXED-SATELLITE (Earth-to-space) MOBILE MOBILE-SATELLITE (Earth-to-space) RADIO ASTRONOMY Space Research (space-to-Earth)</p> <p>5.149 5.561A</p>
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84-86	<p>FIXED ADD MOD 5.338A FIXED-SATELLITE (Earth-to-space) MOBILE RADIO ASTRONOMY</p> <p>5.149</p>
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92-94 GHz

92-94	<p>FIXED ADD MOD 5.338A MOBILE RADIO ASTRONOMY RADIOLOCATION</p> <p>5.149</p>
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ADD MOD 5.338A In the bands 1 350-1 400 MHz, 1 427-1 452 MHz, 22.55-23.55 GHz, 30-31.3 GHz, 49.7-50.2 GHz, 50.4-50.9 GHz, ~~and 51.4-52.6 GHz~~, 81-86 GHz and 92-94 GHz, Resolution **750 (Rev.WRC-0712)** applies. (WRC-0712)

C2 (AI 1.17) — Sharing Between the Mobile Service and Other Services in the Band 790-862 MHz**Background**

This agenda item concerned sharing and coordination measures related to the introduction of mobile radio systems in former TV broadcasting spectrum in ITU-R Regions 1 and 3 (e.g. Europe, Africa, Asia and Oceania).

Discussion

WRC-12 decisions made in relation to agenda item 1.17 to establish sharing criteria between the mobile service and other services in Regions 1 and 3 do not affect Canada. However, updates were made to footnote No. **5.317A**, which also applies to Region 2 countries, including Canada. The changes to this footnote were made to incorporate revised versions of Resolution **224** and Resolution **749**, which, in turn, incorporate sharing criteria for the mobile service in Regions 1 and 3.

Although none of the above changes affect the provisions that apply to Canada, these changes mean that the Canadian Table is currently out of step with the International Table. Therefore, Industry Canada proposes to adopt these minor changes.

Summary of Proposed Changes to the Canadian Table

746-902 MHz

746-806	BROADCASTING MOBILE MOD 5.317A C7 5.293 C22 C24
806-890	MOBILE MOD 5.317A C7 Fixed 5.317 5.318
890-902	FIXED MOBILE except aeronautical mobile MOD 5.317A C7 Radiolocation C5A 5.318

928-960 MHz

928-929	FIXED MOBILE except aeronautical mobile MOD 5.317A C7 Radiolocation C5A
929-932	MOBILE except aeronautical mobile MOD 5.317A C7 Fixed Radiolocation C5A

932-932.5	FIXED MOBILE except aeronautical mobile MOD 5.317A C7 Radiolocation C5A
932.5-935	FIXED Mobile except aeronautical mobile MOD 5.317A C7 Radiolocation C5A
935-941	MOBILE except aeronautical mobile MOD 5.317A C7 Fixed Radiolocation C5A
941-941.5	FIXED MOBILE except aeronautical mobile MOD 5.317A C7 Radiolocation C5A
941.5-942	FIXED Mobile except aeronautical mobile MOD 5.317A C7 Radiolocation C5A
942-944	FIXED Mobile MOD 5.317A C7
944-952	FIXED MOBILE MOD 5.317A C7
952-956	FIXED MOBILE MOD 5.317A C7
956-960	FIXED Mobile MOD 5.317A C7

MOD 5.317A Those parts of the band 698-960 MHz in Region 2 and the band 790-960 MHz in Regions 1 and 3 which are allocated to the mobile service on a primary basis are identified for use by administrations wishing to implement International Mobile Telecommunications (IMT). See Resolutions **224 (Rev. WRC-0712)** and **749 (Rev. WRC-0712)**, as appropriate. This identification does not preclude the use of these bands by any application of the services to which they are allocated and does not establish priority in the Radio Regulations. (WRC-0712)

Part D: Science Services

D1 (AI 1.6) — Passive Services Between 275 GHz and 3000 GHz

Background

The purpose of this agenda item was to review the ITU's footnote No. **5.565**, excluding frequency allocations, in order to update the spectrum use between 275 and 3000 GHz by the passive services. Currently, No. **5.565** provides a list of frequency bands throughout the 275-1000 GHz range that have been identified for observations of spectral line emissions and spectral windows under the Earth exploration-satellite service (passive), the space research service (passive) and the radio astronomy service.

Discussion

The international community, including Canada, is of the view that the limited use to date of the band 275-3000 GHz by the various active services indicates that consideration of frequency allocations above 275 GHz is premature. However, there is a need to update the list of bands included in No. **5.565** given that it was last updated in 2000.

WRC-12 revisions to No. **5.565** included an updated list of frequency bands used for passive service applications in the range 275-1000 GHz. In addition, the International Table was extended from 1000 GHz to 3000 GHz and, based on the results of studies, a statement within the footnote was added indicating that all frequencies in the range 1000-3000 GHz may be used by both active and passive services. Industry Canada proposes to incorporate these changes in the Canadian Table.

Summary of Proposed Changes to the Canadian Table

275-3 000 GHz

Beyond <u>275-3 000</u> (not allocated) MOD 5.565
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MOD 5.565 The following frequency bands in the range 275-1 000 GHz may be used are identified for use by administrations for experimentation with, and development of, various active and passive services applications. In this band a need has been identified for the following spectral line measurements for passive services:

- radio astronomy service: 275-323 GHz, 327-371 GHz, 388-424 GHz, 426-442 GHz, 453-510 GHz, 623-711 GHz, 795-909 GHz and 926-945 GHz;
- Earth exploration-satellite service (passive) and space research service (passive): 275-277~~286~~ GHz, 294~~296~~-306 GHz, 316~~313~~-334~~356~~ GHz, 342~~349~~ GHz, 363~~361~~-365 GHz, 371~~369~~-389~~392~~ GHz, 397-399 GHz, 409-411 GHz, 416-434 GHz, 442~~439~~-444~~467~~ GHz, 496~~477~~-506~~502~~ GHz, 523-527 GHz, 546~~538~~-568~~581~~ GHz, 624~~611~~-629~~630~~ GHz, 634-654 GHz, 659~~657~~-661 GHz, 684-692 GHz, 713-718 GHz, 730~~729~~-732~~733~~ GHz, 750-754 GHz, 771-776 GHz, 823-846 GHz, 851~~850~~-853~~854~~ GHz, 857-862 GHz, 866-882 GHz, 905-928 GHz, and 951-956 GHz, 968-973 GHz and 985-990 GHz.

The use of the range 275-1 000 GHz by the passive services does not preclude use of this range by active services. Future research in this largely unexplored spectral region may yield additional spectral lines and continuum bands of interest to the passive services. Administrations wishing to make frequencies in the 275-1 000 GHz range available for active service applications are urged to take all practicable steps to protect these passive services from harmful interference until the date when the Table of Frequency Allocations Table is established in the above-mentioned 275-1 000 GHz frequency bandrange. All frequencies in the range 1 000-3 000 GHz may be used by both active and passive services. (WRC-200012)

D2 (AI 1.11) — Primary Allocation to the Space Research Service Within the Band 22.55-23.15 GHz

Background

This agenda item considered a primary allocation to the space research service (SRS) (Earth-to-space) within the band 22.55-23.15 GHz.

At WRC-03, a primary SRS (s-E) allocation in the band 25.5-27.0 GHz was added to the International Table to support a wide range of space research missions. However, there was a need for a companion uplink (E-s) allocation to provide the mission data, command and control links for these missions. Due to the potential for many concurrent exploration-related systems and the large bandwidth requirements of these systems, especially those supporting manned missions, it was envisioned that a total uplink bandwidth of at least several hundred megahertz would be needed.

Discussion

The Department believes that the proposed changes to the Canadian Table will satisfy the following needs:

- future long-term plans of the Canadian Space Agency and possible partnerships with other space agencies for joint missions requiring the use of this band;
- protection of the fixed service, given the low number of large SRS Earth stations around the world and the additional regulatory measures that are to be implemented in the *Radio Regulations*.

Summary of Proposed Changes to the Canadian Table

22.55-23.55 GHz

<u>22.55-23.5515</u>	FIXED INTER-SATELLITE 5.338A <u>SPACE RESEARCH (Earth-to-space) ADD 5.532A</u> Mobile
	5.149

22.5523.15-23.55

FIXED
 INTER-SATELLITE 5.338A
 Mobile

5.149

ADD 5.532A The location of earth stations in the space research service shall maintain a separation distance of at least 54 km from the respective border(s) of neighbouring administrations to protect the existing and future deployment of fixed and mobile services unless a shorter distance is otherwise agreed between the corresponding administrations. Nos. **9.17** and **9.18** do not apply. (WRC-12)

D3 (AI 1.12) — Protection of Primary Services in the Band 37-38 GHz

Background

This agenda item was proposed at WRC-07 with the intent to exclude the aeronautical mobile service from the band 37-38 GHz in order to protect the other services using this band, particularly the space research service (SRS). SRS systems are to be used for high-rate digital data transfer of telemetry, voice, and video between the Earth and other planetary bodies, such as the Moon and Mars, to support manned exploration.

Since the adoption of this agenda item at WRC-07, the aviation industry has been considering several candidate bands, including the band 37-38 GHz, for a newly identified airborne application. An example of such an application is called the Wireless Avionics Intra-Communications (WAIC) system, which provides communications between two or more points (on a single aircraft) that may include integrated wireless components (such as cockpit headsets or crew microphones) and/or installed components of the system. In all cases, those communications are assumed to be part of a closed, exclusive network required for the operation of the aircraft. WAIC systems do not provide air-to-ground or air-to-air communications, nor do they include communications with consumer devices, such as Radio Local Area Network (RLAN).

Discussion

The Department is of the view that excluding the aeronautical component of the mobile service allocation in the band 37-38 GHz will ensure appropriate protection of existing and planned fixed, space research, fixed-satellite and mobile services.

The aviation community's need to find frequency bands in which to operate applications, such as wireless avionic intra-aircraft communications to support data, voice and video communications, is addressed under a new agenda item for WRC-15.

Summary of Proposed Changes to the Canadian Table

37-38 GHz

37-37.5	FIXED MOBILE <u>except aeronautical mobile</u> SPACE RESEARCH (space-to-Earth)	5.547
37.5-38	FIXED FIXED-SATELLITE (space-to-Earth) MOBILE <u>except aeronautical mobile</u> SPACE RESEARCH (space-to-Earth) Earth Exploration-Satellite (space-to-Earth)	5.547

D4 (AI 1.16) — Allocation to Meteorological Aids Service Below 20 kHz for Lightning Detection Systems

Background

The purpose of this agenda item was to choose an appropriate method to provide recognition to long-established lightning detection systems of the meteorological aids service in the frequency range below 20 kHz. Lightning detection systems rely on naturally occurring emissions from lightning strokes. There were occasions in the past when the data collected had been compromised due to interference from various sources, including man-made emissions.

Discussion

WRC-12 agreed that appropriate sharing criteria and a formal regulatory status would ensure the stability and viability of long-term lightning detection operations below 20 kHz. As such, WRC-12 adopted a new primary allocation to the meteorological aids service in the band 8.3-11.3 kHz, a new footnote (No. **5.54A**) to limit the use of meteorological aids in the band 8.3-11.3 kHz to passive sensors and to protect existing radionavigation stations in the band 9-11.3 kHz, consequential changes to footnotes Nos. **5.53** and **5.54** and two new country footnotes with additional allocations. The two new country footnotes only apply to countries of Regions 1 and 3.

Therefore, Industry Canada proposes to incorporate both the new primary allocation to the meteorological aids service in the band 8.3-11.3 kHz and new footnote No. **5.54A** within the Canadian Table. The Department further proposes to modify the existing Canadian footnotes C1 and C2 to align them with the revised Nos. **5.53** and **5.54**.

Summary of Proposed Changes to the Canadian Table**0-14 kHz**

<u>0-98.3</u>	(not allocated) MOD C1 MOD C2
<u>98.3-9</u>	<u>METEOROLOGICAL AIDS ADD 5.54A</u>
<u>9-1411.3</u>	<u>METEOROLOGICAL AIDS ADD 5.54A</u> RADIONAVIGATION
<u>911.3-14</u>	RADIONAVIGATION

MOD C1 (CAN-13) Users of frequencies below 98.3 kHz shall ensure that no harmful interference is caused to the services to which the bands above 98.3 kHz are allocated.

MOD C2 (CAN-13) Scientific researchers using frequencies below 98.3 kHz are urged to advise the Department in order that such research may be afforded all practicable protection from harmful interference.

ADD 5.54A Use of the 8.3-11.3 kHz frequency band by stations in the meteorological aids service is limited to passive use only. In the band 9-11.3 kHz, meteorological aids stations shall not claim protection from stations of the radionavigation service submitted for notification to the Bureau prior to 1 January 2013. For sharing between stations of the meteorological aids service and stations in the radionavigation service submitted for notification after this date, the most recent version of Recommendation ITU-R RS.1881 should be applied. (WRC-12)

D5 (AI 1.24) — Extension of the Meteorological-Satellite Service Allocation Around 7.9 GHz**Background**

This agenda item addressed the possible extension of the existing primary allocation to the meteorological-satellite (MetSat) service in the band 7750-7850 MHz, to include the range 7850-7900 MHz, for non-geostationary-satellite orbit (non-GSO) MetSat service in the space-to-Earth direction.

Compatibility between the MetSat and the fixed service (FS) and mobile service (MS) (except aeronautical mobile) had already been demonstrated during the preparation for WRC-97 where a new MetSat allocation in the band 7750-7850 MHz was added to the International Table. The extension of the MetSat service allocation into the band 7850-7900 MHz concerns the same radiocommunication services, namely the FS and MS (except aeronautical mobile), as in the current band 7750-7850 MHz. It was demonstrated during the previous ITU-R study period that these same services can share the extended band under similar conditions.

Discussion

The Department believes that the proposed changes to the Canadian Table will satisfy the following needs:

- future operational requirements of the meteorological community;
- protection of the fixed service, given that the regulatory measures that currently apply in the existing MetSat service allocation in the band 7750-7850 MHz will also apply in the extended band 7850-7900 MHz.

Summary of Proposed Changes to the Canadian Table

7 750-7 900 MHz

7 750-7 850 <u>900</u>	FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) MOD 5.461B
7 850-7 900	FIXED

MOD 5.461B The use of the band 7 750-7 ~~850~~900 MHz by the meteorological-satellite service (space-to-Earth) is limited to non-geostationary satellite systems. (WRC-~~97~~12)

Part E: Satellite Services

E1 (AI 1.7) — Long-term Spectrum Availability and Access for the Aeronautical Mobile Satellite (R) Service at 1.5/1.6 GHz

Background

Agenda item 1.7 was adopted at WRC-07 to consider the results of ITU-R studies related to the long-term spectrum availability and access to spectrum necessary to meet requirements for the aeronautical mobile-satellite (R) service (AMS(R)S), in accordance with Resolution **222 (Rev.WRC-07)**, as concerns use of the bands 1525-1559 MHz and 1626.5-1660.5 MHz by the mobile-satellite service (MSS).

The spectrum requirements of MSS, including the safety services, have so far been accommodated through the coordination process by the various MSS operators who hold regular multilateral meetings. The requirements of the AMS(R)S have so far been relatively low. There were concerns expressed by one aeronautical safety services provider that the priority afforded by No. **5.357A** and Resolution **222 (Rev.WRC-07)** may not be sufficient to meet the long-term spectrum requirements of safety services.

ITU-R studies concluded that the total worldwide one-way AMS(R)S requirements for 2025 would range anywhere from 0.5 MHz to 4.4 MHz and that they could be accommodated in the existing 10 MHz, where AMS(R)S has priority access to the band.

Discussion

At WRC-12, a compromise solution was achieved that permits continued use of the mobile-satellite service bands 1525-1559 MHz and 1626.5-1660.5 MHz by the MSS operators, including provisioning of aeronautical safety-of-life applications over these MSS networks, while maintaining and better clarifying the existing regime and associated time frame for coordination of the satellite frequencies. This solution has been captured in the revised Resolution **222**.

The role of the ICAO as a possible advisor on traffic requirements was recognized and administrations wishing to avail themselves of the ICAO's advice can do so, on a voluntary non-binding basis. A new resolution (Resolution **422**) tasks the ITU-R to develop a methodology to calculate aeronautical mobile-satellite (R) service spectrum requirements within these frequency bands.

Although the change to footnote No. **5.357A** is merely an update of the reference to Resolution **222** and does not directly affect the Canadian Table, the application of the change in conjunction with Resolution **222** and Resolution **422** would have an impact on how future systems of AMS(R)S would share the band with MSS systems.

The Department is of the view that the compromise solution achieved at WRC-12 would ensure access to adequate spectrum for systems deploying AMS(R)S safety services while maintaining the efficient use of the generic MSS allocations.

Summary of Proposed Changes to the Canadian Table

1 535-1 660 MHz

1 535-1 559	MOBILE-SATELLITE (space-to-Earth) 5.208B 5.351A 5.341 5.351 5.353A 5.354 5.356 5.357 MOD 5.357A
...	
1 626.5-1 660	MOBILE-SATELLITE (Earth-to-space) 5.351A 5.341 5.351 5.353A 5.354 MOD 5.357A 5.374 5.375 5.376

MOD 5.357A In applying the procedures of Section II of Article **9** to the mobile-satellite service in the frequency bands 1 545-1 555 MHz and 1 646.5-1 656.5 MHz, priority shall be given to accommodating the spectrum requirements of the aeronautical mobile-satellite (R) service providing transmission of messages with priority 1 to 6 in Article **44**. Aeronautical mobile-satellite (R) service communications with priority 1 to 6 in Article **44** shall have priority access and immediate availability, by pre-emption if necessary, over all other mobile-satellite communications operating within a network.

Mobile-satellite systems shall not cause unacceptable interference to, or claim protection from, aeronautical mobile-satellite (R) service communications with priority 1 to 6 in Article 44. Account shall be taken of the priority of safety-related communications in the other mobile-satellite services. (The provisions of Resolution 222 (Rev. WRC-200012) shall apply.) (WRC-200012)

E2 (AI 1.13) — Broadcasting-Satellite Service in the Band 21.4-22 GHz in Regions 1 and 3

Background

This agenda item concerned the use of the band 21.4-22 GHz by the broadcasting-satellite service in ITU-R Regions 1 and 3 (e.g. Europe, Africa, Asia and Oceania).

Discussion

With two exceptions, the provisions agreed at WRC-12 under agenda item 1.13 do not concern or affect Canada, as we do not use this band for the broadcasting-satellite service. Firstly, measures were adopted to protect fixed service systems in this band in Region 2 (including Canada) from any risk of interference from broadcasting satellite signals in other parts of the world. Secondly, in order to provide protection to broadcast receivers in Regions 1 and 3, WRC-12 also adopted limits for the emissions from fixed service transmitters in Region 2. Considering the large separations between Canada and any locations in Regions 1 and 3, this is not expected to pose any constraint on the use of the fixed service in this band in Canada. Therefore, Industry Canada proposes to adopt these changes in the Canadian Table.

Summary of Proposed Changes to the Canadian Table

21.4-22 GHz

21.4-22	FIXED Mobile
	5.208B ADD 5.530A ADD 5.530C

ADD 5.530A Unless otherwise agreed between the administrations concerned, any station in the fixed or mobile services of an administration shall not produce a power flux-density in excess of -120.4 dB(W/(m² · MHz)) at 3 m above the ground of any point of the territory of any other administration in Regions 1 and 3 for more than 20% of the time. In conducting the calculations, administrations should use the most recent version of Recommendation ITU-R P.452 (see Recommendation ITU-R BO.1898). (WRC-12)

ADD 5.530C The use of the band 21.4-22 GHz is subject to the provisions of Resolution **755 (WRC-12)**. (WRC-12)

SUP 5.208B

Note that the suppression of **5.208B** from the Canadian Table is only with respect to the band 21.4-22 GHz. See Section F3.

Part F: Footnote Modifications to the Canadian Table**F1 (AI 1.1) — Requests From Administrations to Delete Their Country Name From Footnotes**

Resolution **26 (Rev. WRC-97)** urges administrations to review footnotes periodically and to propose the deletion of their country footnotes or of their country names from footnotes, as appropriate. In exceptional cases, Resolution **26** provides that proposals for new footnotes or modifications of existing footnotes can be considered if they concern corrections of obvious omissions, inconsistencies, ambiguities or editorial error. *Resolves 2* to Resolution **26** states that the International Table should include those footnotes that have international implications for the use of radio frequency spectrum.

The following footnotes, which were modified at WRC-12 based upon proposals from administrations, are currently included in the Canadian Table. The Department proposes to adopt these modified footnotes in the Canadian Table.

- MOD 5.56** The stations of services to which the bands 14-19.95 kHz and 20.05-70 kHz and in Region 1 also the bands 72-84 kHz and 86-90 kHz are allocated may transmit standard frequency and time signals. Such stations shall be afforded protection from harmful interference. In Armenia, Azerbaijan, Belarus, ~~Bulgaria~~, the Russian Federation, Georgia, Kazakhstan, ~~Mongolia~~, Kyrgyzstan, ~~Slovakia~~, Tajikistan and Turkmenistan, the frequencies 25 kHz and 50 kHz will be used for this purpose under the same conditions. (WRC-0712)
- MOD 5.128** Frequencies in the bands 4 063-4 123 kHz and 4 130-4 438 kHz may be used exceptionally by stations in the fixed service, communicating only within the boundary of the country in which they are located, with a mean power not exceeding 50 W, on condition that harmful interference is not caused to the maritime mobile service. In addition, in Afghanistan, Argentina, Armenia, Azerbaijan, Belarus, Botswana, Burkina Faso, the Central African Rep., China, the Russian Federation, Georgia, India, Kazakhstan, Mali, Niger, Pakistan, Kyrgyzstan, Tajikistan, Chad, Turkmenistan and Ukraine, in the bands 4 063-4 123 kHz, 4 130-4 133 kHz and 4 408-4 438 kHz, stations in the fixed service, with a mean power not exceeding 1 kW, can be operated on condition that they are situated at least 600 km from the coast and that harmful interference is not caused to the maritime mobile service. (WRC-0712)
- MOD 5.293** *Different category of service:* in Canada, Chile, ~~Colombia~~, Cuba, the United States, Guyana, Honduras, Jamaica, Mexico, Panama and Peru, the allocation of the bands 470-512 MHz and 614-806 MHz to the fixed service is on a primary basis (see No. **5.33**), subject to agreement obtained under No. **9.21**. In Canada, Chile, ~~Colombia~~, Cuba, the United States, Guyana, Honduras, Jamaica, Mexico, Panama and Peru, the allocation of the bands 470-512 MHz and 614-698 MHz to the mobile service is on a

primary basis (see No. **5.33**), subject to agreement obtained under No. **9.21**. In Argentina and Ecuador, the allocation of the band 470-512 MHz to the fixed and mobile services is on a primary basis (see No. **5.33**), subject to agreement obtained under No. **9.21**. (WRC-0712)

MOD 5.331 *Additional allocation:* in Algeria, Germany, Saudi Arabia, Australia, Austria, Bahrain, Belarus, Belgium, Benin, Bosnia and Herzegovina, Brazil, Burkina Faso, Burundi, Cameroon, China, Korea (Rep. of), Croatia, Denmark, Egypt, the United Arab Emirates, Estonia, the Russian Federation, Finland, France, Ghana, Greece, Guinea, Equatorial Guinea, Hungary, India, Indonesia, Iran (Islamic Republic of), Iraq, Ireland, Israel, Jordan, Kenya, Kuwait, The Former Yugoslav Republic of Macedonia, Lesotho, Latvia, Lebanon, Liechtenstein, Lithuania, Luxembourg, Madagascar, Mali, Mauritania, Montenegro, Nigeria, Norway, Oman, Pakistan, the Netherlands, Poland, Portugal, Qatar, the Syrian Arab Republic, Dem. People's Rep. of Korea, Slovakia, the United Kingdom, Serbia, Slovenia, Somalia, Sudan, South Sudan, Sri Lanka, South Africa, Sweden, Switzerland, Thailand, Togo, Turkey, Venezuela and Viet Nam, the band 1 215-1 300 MHz is also allocated to the radionavigation service on a primary basis. In Canada and the United States, the band 1 240-1 300 MHz is also allocated to the radionavigation service, and use of the radionavigation service shall be limited to the aeronautical radionavigation service. (WRC-0712)

F2 — Other Footnotes Modified at WRC-12 and Relevant to the Canadian Table

WRC-12 also modified numerous footnotes, as well as certain entries in the International Table, in order to correct editorial errors, inconsistencies and outdated provisions. WRC-12 decided not to include most editorial corrections, addressed under agenda item 8.1.2,³ as part of the Final Acts of WRC-12; however, these corrections will be included in the subsequent edition of the ITU's *Radio Regulations*. WRC-12 also made some editorial amendments to update footnotes consequential to actions that it took under agenda items 2 and 4.

While Industry Canada proposes to adopt all applicable editorial modifications in the next edition of the Canadian Table, only those corrections considered more substantive in nature are presented below for reference. Likewise, the associated modifications to the Canadian Table are also not presented, as they are considered to be consequential and non-substantive in nature.

SUP 5.138A ~~Until 29 March 2009, the band 6.765-7.000 kHz is allocated to the fixed service on a primary basis and to the land mobile service on a secondary basis. After this date, this band is allocated to the fixed and the mobile except aeronautical mobile (R) services on a primary basis. (WRC-03)~~

³ WRC-12 agenda item 8.1.2 concerned, among other issues, difficulties or inconsistencies encountered in the application of the *Radio Regulations*, as reported by the Director of the Radiocommunication Bureau to WRC-12.

- MOD 5.142** ~~Until 29 March 2009, the use of the band 7 100-7 300 kHz in Region 2 by the amateur service shall not impose constraints on the broadcasting service intended for use within Region 1 and Region 3. After 29 March 2009~~ The use of the band 7 200-7 300 kHz in Region 2 by the amateur service shall not impose constraints on the broadcasting service intended for use within Region 1 and Region 3. (WRC-0312)
- MOD 5.143D** ~~In Region 2, the band 7 350-7 400 kHz is allocated, until 29 March 2009, to the fixed service on a primary basis and to the land mobile service on a secondary basis. After 29 March 2009, frequencies in this band 7 350 - 7 400 kHz may be used by stations in the above mentioned services, fixed service and in the land mobile service, communicating only within the boundary of the country in which they are located, on condition that harmful interference is not caused to the broadcasting service. When using frequencies for these services, administrations are urged to use the minimum power required and to take account of the seasonal use of frequencies by the broadcasting service published in accordance with the Radio Regulations. (WRC-0312)~~
- SUP 5.143E** ~~Until 29 March 2009, the band 7 450-8 100 kHz is allocated to the fixed service on a primary basis and to the land mobile service on a secondary basis. (WRC-03)~~
- MOD 5.388** The bands 1 885-2 025 MHz and 2 110-2 200 MHz are intended for use, on a worldwide basis, by administrations wishing to implement International Mobile Telecommunications-2000 (IMT-2000). Such use does not preclude the use of these bands by other services to which they are allocated. The bands should be made available for IMT-2000 in accordance with Resolution **212 (Rev.WRC-9707)**. (See also Resolution **223 (Rev.WRC-200007)**.) (WRC-200012)
- MOD 5.388A** In Regions 1 and 3, the bands 1 885-1 980 MHz, 2 010-2 025 MHz and 2 110-2 170 MHz and, in Region 2, the bands 1 885-1 980 MHz and 2 110-2 160 MHz may be used by high altitude platform stations as base stations to provide International Mobile Telecommunications-2000 (IMT-2000), in accordance with Resolution **221 (Rev.WRC-0307)**. Their use by IMT-2000 applications using high altitude platform stations as base stations does not preclude the use of these bands by any station in the services to which they are allocated and does not establish priority in the Radio Regulations. (WRC-0312)
- MOD 5.389B** ~~Dans les pays suivants : Argentine, Brésil, Canada, Chili, Equateur, Etats-Unis, Honduras, Jamaïque, Mexique, Pérou, Suriname, Trinité-et-Tobago, Uruguay et Venezuela, l'utilisation de la bande 1 980-1 990 MHz par le service mobile par satellite ne doit pas causer de brouillage préjudiciable aux services fixe et mobile ou gêner le développement de ces services: dans les pays suivants: Argentine, Brésil, Canada, Chili, Equateur, États-Unis, Honduras, Jamaïque, Mexique, Pérou, Suriname, Trinité-et-Tobago, Uruguay et Venezuela.~~

(concerns the French language only)

- MOD 5.443B** In order not to cause harmful interference to the microwave landing system operating above 5 030 MHz, the aggregate power flux-density produced at the Earth's surface in the band 5 030-5 150 MHz by all the space stations within any radionavigation-satellite service system (space-to-Earth) operating in the band 5 010-5 030 MHz shall not exceed -124.5 dB(W/m²) in a 150 kHz band. In order not to cause harmful interference to the radio astronomy service in the band 4 990-5 000 MHz, radionavigation-satellite service systems operating in the band 5 010-5 030 MHz shall comply with the limits in the band 4 990-5 000 MHz defined in Resolution **741 (Rev.WRC-0312)**. (WRC-0312)
- MOD 5.446** *Additional allocation:* in the countries listed in Nos. **5.369** and **5.400**, the band 5 150-5 216 MHz is also allocated to the radiodetermination-satellite service (space-to-Earth) on a primary basis, subject to agreement obtained under No. **9.21**. In Region 2, the band is also allocated to the radiodetermination-satellite service (space-to-Earth) on a primary basis. In Regions 1 and 3, except those countries listed in Nos. **5.369** and **5.400** Bangladesh, the band is also allocated to the radiodetermination-satellite service (space-to-Earth) on a secondary basis. The use by the radiodetermination-satellite service is limited to feeder links in conjunction with the radiodetermination-satellite service operating in the bands 1 610-1 626.5 MHz and/or 2 483.5-2 500 MHz. The total power flux-density at the Earth's surface shall in no case exceed -159 dB(W/m²) in any 4 kHz band for all angles of arrival. (WRC-12)
- MOD 5.446A** The use of the bands 5 150-5 350 MHz and 5 470-5 725 MHz by the stations in the mobile, except aeronautical mobile, service shall be in accordance with Resolution **229 (Rev.WRC-0312)**. (WRC-0712)
- MOD 5.447A** The allocation to the fixed-satellite service (Earth-to-space) in the band 5 150-5 250 MHz is limited to feeder links of non-geostationary-satellite systems in the mobile-satellite service and is subject to coordination under No. **9.11A**. (WRC-12)
- MOD 5.458** In the band 6 425-7 075 MHz, passive microwave sensor measurements are carried out over the oceans. In the band 7 075-7 250 MHz, passive microwave sensor measurements are carried out. Administrations should bear in mind the needs of the Earth exploration-satellite (passive) and space research (passive) services in their future planning of the bands 6 425-7 02575 MHz and 7 075-7 250 MHz. (WRC-12)
- MOD 5.536A** Administrations operating earth stations in the Earth exploration-satellite service or the space research service shall not claim protection from stations in the fixed and mobile services operated by other administrations. In addition, earth stations in the Earth exploration-satellite service or in the space research service should be operated taking into account the most recent version of Recommendations ITU-R SA.1278 and ITU-R SA.1625, respectively 1862. (WRC-0312)

F3 — Domestic Proposals to Remove International Footnotes From the Canadian Table

The Canadian Table contains international footnotes from the International Table that are deemed pertinent and thus adopted in Canada. The following footnotes are currently included in the Canadian Table, but are not relevant to the use of the allocation or band in Canada.

The Department proposes to remove these footnotes from the Canadian Table as indicated below:

(a)

5.208B

21.4-22 GHz

21.4-22	FIXED Mobile	5.208B
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Suppression of **5.208B** from the Canadian Table is only with respect to the band 21.4-22 GHz.

Rationale: There are no space-active services allocated in the frequency band 21.4-22 GHz in Canada.

(b)

5.523B

19.3-19.7 GHz

19.3-19.7	FIXED FIXED-SATELLITE (space-to-Earth)	5.523B 5.523C 5.523D 5.523E C16D C46A
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SUP 5.523B ~~The use of the band 19.3-19.6 GHz (Earth-to-space) by the fixed-satellite service is limited to feeder links for non-geostationary-satellite systems in the mobile-satellite service. Such use is subject to the application of the provisions of No. 9.11A, and No. 22.2 does not apply.~~

Rationale: In accordance with Spectrum Utilization Policy SP 3-30 GHz, there is no designation of the Earth-to-space direction for the fixed-satellite service in this band. Therefore, **5.523B** is not relevant in Canada.

Part G: Other Modifications to the Canadian Table**G1 — Additional Proposals for Incorporation Into the Canadian Table**

(a)

10.7-11.7 GHz

10.7-11.7	FIXED FIXED-SATELLITE (space-to-Earth) 5.441 5.484A C16 C16B C16C ADD C16H
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ADD C16H (CAN-13) The bands 11.075-11.2 GHz and 11.575-11.7 GHz are available to provide Direct-to-Home satellite broadcasting services in Canada until January 1, 2028. Industry Canada will not license new fixed service systems in these bands until January 1, 2026. See *Canada Gazette* notice DGTP-013-09 for complete details of the spectrum policy decision.

Rationale: See spectrum utilization policy decision in *Canada Gazette* notice DGTP-013-09. It is deemed appropriate that a domestic footnote be incorporated into the Canadian Table to reflect this decision.

(b)

MOD C46 (CAN-13) In the band 17.7-17.8 GHz, Canadian broadcasting-satellite space stations shall not radiate into the territory of the United States ~~administration~~ a power flux-density greater than that specified in the ITU Radio Regulations, Article 21, Table 21-4, for geostationary satellite space stations in the fixed-satellite service operating within this same band. Similarly, to protect Canadian fixed systems, transmissions from broadcasting-satellite space stations of United States operators can be expected to be limited in the same way in Canadian territory.

Rationale: Amendment of footnote C46 is deemed necessary to clarify its application and remove any ambiguity.

(c)

10.7-12.7 GHz

10.7-11.7	<p>FIXED FIXED-SATELLITE (space-to-Earth) 5.441 5.484A ADD C16I</p> <p>C16 C16B C16C ADD C16J</p>
11.7-12.2	<p>FIXED-SATELLITE (space-to-Earth) 5.484A ADD C16I ADD C16J</p> <p>5.485 5.488 C16B</p>
12.2-12.7	<p>BROADCASTING BROADCASTING-SATELLITE 5.492 C43 FIXED</p> <p>5.487A 5.488 5.490 C16B</p>

13.75-14.5 GHz

13.75-14	<p>FIXED-SATELLITE (Earth-to-space) 5.484A ADD C16I RADIOLOCATION Earth exploration-satellite Standard Frequency and Time Signal-Satellite (Earth-to-space)</p> <p>5.502 5.503 C16B ADD C16J</p>
14-14.47	<p>FIXED-SATELLITE (Earth-to-space) 5.457A 5.484A 5.506 ADD C16I Mobile-Satellite (Earth-to-space) 5.506A C41A</p> <p>5.504A C16B ADD C16J C39D</p>
14.47-14.5	<p>FIXED-SATELLITE (Earth-to-space) 5.457A 5.484A 5.506 ADD C16I Mobile-Satellite (Earth-to-space) 5.506A C41A Radio Astronomy</p> <p>5.149 5.504A C16B ADD C16J C39D</p>

19.7-20.2 GHz

19.7-20.2	<p>FIXED-SATELLITE (space-to-Earth) 5.484A 5.516B ADD C16I MOBILE-SATELLITE (space-to-Earth)</p> <p>5.525 5.526 5.527 5.528 5.529 C16B ADD C16J</p>
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29.5-30 GHz

29.5-29.9	<p>FIXED-SATELLITE (Earth-to-space) 5.484A 5.516B 5.539 ADD C16I MOBILE-SATELLITE(Earth-to-space)</p> <p>5.525 5.526 5.527 5.529 5.540 C16B ADD C16J</p>
29.9-30	<p>FIXED-SATELLITE (Earth-to-space) 5.484A 5.516B 5.539 ADD C16I MOBILE-SATELLITE (Earth-to-space)</p> <p>5.525 5.526 5.527 5.538 5.540 C16B ADD C16J</p>

SUP C16B ~~Geostationary orbit networks principally providing domestic fixed-satellite services utilize the conventional bands 11.45-12.2 GHz and 19.7-20.2 GHz in the space-to-Earth direction and paired, respectively, with the bands 13.75-14.50 GHz and 29.5-30.0 GHz in the Earth-to-space direction. Broadcasting satellite networks providing domestic services utilize the band 12.2-12.7 GHz in the space-to-Earth direction. Domestic implementation of non-geostationary fixed-satellite services in these bands will conform to future ITU Radio Regulations and operating criteria for sharing between services and systems. In addition, non-geostationary fixed-satellite service (FSS) use of the band 11.45-11.7 GHz which is shared with the fixed service on a coordinated basis will be governed by spectrum utilization policies which will be formulated in future.~~

ADD C16I (CAN-13) Geostationary orbit networks principally providing domestic fixed-satellite services utilizing the conventional bands 11.45-12.2 GHz and 19.7-20.2 GHz in the space-to-Earth direction are paired respectively with the bands 13.75-14.50 GHz and 29.5-30.0 GHz in the Earth-to-space direction.

ADD C16J (CAN-13) Domestic implementation of non-geostationary fixed-satellite services in the bands 11.45-12.2 GHz, 13.75-14.5 GHz, 19.7-20.2 GHz and 29.5-30.0 GHz will be required to conform to the applicable ITU Radio Regulations and operating criteria for sharing between services and systems in these bands.

Rationale: Suppression of C16B and addition of new C16I and C16J are deemed required to clarify the utilization of these bands for the services concerned and also to ensure consistency with Spectrum Utilization Policy SP 3-30 GHz.

(d)

2 750-2 850 MHz

2 700-2 900	AERONAUTICAL RADIONAVIGATION 5.337 Radiolocation 5.423 5.424 C14 ADD C54
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ADD C54 (CAN-13) The band 2750-2850 MHz is used for the operation of the 10.7 cm solar radio flux monitoring programme at the Dominion Radio Astrophysical Observatory (DRAO) located near Penticton, British Columbia. Other users of the band are urged to give all practicable protection to this passive operation.

Rationale: This band has been used by DRAO for more than 60 years to collect solar radio flux data. Recognition of these operations is deemed appropriate via a new domestic footnote.

(e)

SUP C8 (~~CAN-04~~) ~~The band 7 400-7 450 kHz is allocated to the fixed service on a primary basis and to the land mobile service on a secondary basis until 29 March 2009.~~

Rationale: Outdated footnote.

G2 — Incorporation of Spectrum Allocation Policy Decisions Into the Canadian Table Since the Last Publication of the *Canadian Table of Frequency Allocations*

The following spectrum policy decisions have been completed since the last publication of the *Canadian Table of Frequency Allocations* in 2009 and will be incorporated in the next edition of the Canadian Table. Furthermore, should any additional spectrum policy decisions involve domestic allocation or footnotes changes, these will be consequently incorporated in the next edition of the Canadian Table without further consultation.

(a)

3 650-3 700 MHz

3 650-3 700	FIXED FIXED-SATELLITE (space-to-Earth) MOBILE ADD C33
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ADD C33 (CAN-13) As of June 11, 2009, in the band 3650-3700 MHz, new fixed-satellite service earth stations are only authorized to operate on a secondary basis so as not to constrain the implementation of wireless broadband services.

Rationale: See Spectrum Utilization Policy SP 3650 MHz. Amendment of footnote CXX as found in SP 3650 MHz is required to clarify its application and remove any ambiguity.

(b)

MOD C47A (CAN-13) ~~In the band 27.35-28.35 GHz, is being licensed for Local Multipoint Communication Systems (LMCS) use of spectrum in for the fixed service systems, which~~ will be given priority over fixed-satellite service systems sharing this spectrum on a co-primary basis. Fixed-satellite service implementation in this band will be limited to applications which will pose minimal constraints upon the deployment of fixed service systems, such as a small number of large antennas for feeder links.

Rationale: Incorporates decision found in Spectrum Utilization Policy SP 25.25 GHz.

(c)

MOD C47B (CAN-13) ~~The band 25.35-27.5 GHz has been designated for Local Multipoint Communications Systems (LMCS) in the fixed service. Recommendations are under development within the ITU-R on sharing between fixed service systems and with the inter-satellite service in the band 25.35-27.5 GHz.~~

Rationale: Incorporates decision found in Spectrum Utilization Policy SP 25.25 GHz.

(d)

470-806 MHz

470-608	BROADCASTING 5.293 5.297 C24
...	
614-698	BROADCASTING 5.293 C24
698-806	BROADCASTING FIXED MOBILE 5.317A C7 5.293 C22

C24 (CAN-12) In the bands 470-608 MHz and 614-806 MHz, international footnotes **5.293** and **5.297** have raised the fixed and mobile services to a co-primary status with the broadcasting service. In Canada, the fixed and mobile services have primary allocations only in the 698-806 MHz range. Industry Canada will carry out public consultation in the future in order to consider adopting the other service allocation provisions of international footnotes **5.293** and **5.297** in the frequency bands 470-608 MHz and 614-698 MHz.

C7 (CAN-12) International Footnote **5.317A** provides administrations with the flexibility to implement International Mobile Telecommunications (IMT) in the parts of the band 698-960 MHz that are allocated to the mobile service on a primary basis. The application of **5.317A** is limited to the bands designated for cellular mobile radio systems, cellular mobile telephony and trunked mobile systems. The bands 698-758 MHz and 776-788 MHz, 824-849 MHz and 869-894 MHz are designated for cellular mobile radio systems, cellular telephony services and the bands 806-821 MHz, 851-866 MHz, 896-902 MHz and 935-941 MHz are designated for trunked mobile services and, as such, can evolve to accommodate IMT service capabilities.

SUP C22 ~~(CAN-04) In the band 746-806 MHz, the gradual use of spectrum for the mobile service will be subject to the development of a series of spectrum utilization policies as the transition of digital television progresses.~~

Rationale: Incorporates the spectrum utilization policy decisions found in SMSE-002-12, *Policy and Technical Framework: Mobile Broadband Services (MBS) — 700 MHz Band, Broadband Radio Service (BRS) — 2500 MHz Band*, regarding the modifications of C24 and C7 and deletion of C22.

(e)

216-220 MHz

216-220	FIXED <u>LAND MOBILE 5.242</u> MARITIME MOBILE Amateur C11 5.242
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Rationale: Incorporates spectrum utilization policy decisions announced in *Canada Gazette* notice DGTP-006-09 as it relates to Spectrum Utilization Policy SP 1.7 GHz.

(f)

SUP C38A ~~(CAN-04) The use of the band 2 500-2 690 MHz by the mobile service is subject to future spectrum policy and licensing considerations.~~

Rationale: See SMSE-002-12, *Policy and Technical Framework: Mobile Broadband Services (MBS) — 700 MHz Band, Broadband Radio Service (BRS) — 2500 MHz Band*.

Annex A: Acronyms

AIS	Automatic Identification System
AM(R)S	Aeronautical Mobile (Route) Service
ARNS	Aeronautical Radionavigation Service
EESS	Earth Exploration-Satellite Service
e.i.r.p.	Equivalent isotropically radiated power
FS	Fixed Service
FSS	Fixed-Satellite Service
GSO	Geostationary-satellite orbit
HF	High Frequency
ICAO	International Civil Aviation Organization
IMO	International Maritime Organization
IMT	International Mobile Telecommunications
ITU	International Telecommunication Union
ITU-R	International Telecommunication Union – Radiocommunication Sector
MetSat	Meteorological satellite
MS	Mobile Service
MSS	Mobile-Satellite Service
RR	Radio Regulations
RAS	Radio Astronomy Service
RNSS	Radionavigation-Satellite Service
SRS	Space Research Service
UAS	Unmanned aircraft systems
WRC-XX	World Radiocommunication Conference (XX = year of conference)