Proposed Revisions to the Canadian Table of Frequency Allocations, 2022 Edition

Note (effective January 19, 2022): The reply comments deadline provided in section 9 has been extended as follows:

- closing date for comments: March 21, 2022

SMSE-006-22
January 13, 2022

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▼ 1. Intent

1. Through this consultation paper, Innovation, Science and Economic Development Canada (ISED) is proposing revisions to the *Canadian Table of Frequency Allocations* (the Canadian Table) to take into account the results of the 2019 World Radiocommunication Conference (WRC-19) and domestic requirements. The Canadian Table was last modified in 2018, to incorporate the results of WRC-15 and to reflect changes to domestic spectrum policies.

2. ISED invites public comments on these proposals, as well as any input to ensure the completeness of the Canadian Table.

▼ 2. Background

3. The International Telecommunication Union (ITU) adopts an International Table of Frequency Allocations (the International Table) as part of the ITU ***Radio Regulations***. 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 ITU ***Radio Regulations***, at meetings of the ITU World Radiocommunication Conferences (WRC), which are typically held every four years.

4. 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 services in Canada.

5. ISED revises the Canadian Table periodically, normally following a WRC. WRC-19, which met from October 28, 2019 to November 22, 2019, in Sharm el-Sheikh, Egypt, adopted a number of changes to the frequency allocations in the International Table. WRC-19 dealt with issues, referred to hereafter as agenda items, concerning amateur, fixed, mobile, radiolocation, navigation, science, mobile-satellite, and fixed-satellite services. This document discusses these agenda items and makes proposals for revisions to the Canadian Table. In addition, domestic requirements for other changes to the Canadian Table have emerged and will also be addressed.

▼ 3. Process

6. ISED invites public comment on the proposals contained in this consultation paper. Following the review of comments received, allocation decisions will be promulgated by the issuance of a revised Canadian Table. Furthermore, any additional spectrum policy decisions that involve domestic allocation or footnote changes, and are subject to their own consultation process, will be consequently incorporated in the next revision of the Canadian Table without further consultation.

▼ 4. Conventions used

7. The proposals contained in this consultation paper are identified as modifications to the current Canadian Table, which includes any allocation changes resulting from domestic decisions since April 2018. The tables in this consultation have been taken from the Canadian Table and numbered to facilitate referencing. For a better understanding of these proposals, refer to the most recent International Table, as found in the ITU *Radio Regulations*, Volume 1 (2020 Edition), Article **5** and the Final Acts of the World Radiocommunication Conference (Geneva, 2019). In section 6, the following conventions are used:

Underlining and highlighting	When used in the Canadian Table, underlining and highlighting proposes the addition of a radio service or footnote. It is also used in the text of Canadian footnotes to identify proposed additional text. The text is highlighted as well as underlined to avoid confusion with hyperlinks in the document.
~~**Strikeout**~~	When used in the Canadian Table, strikeouts propose the deletion of a radio service or footnote. They are 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-19 or a Canadian footnote proposed for modification. Modifications 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-19 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-19.
SUP	This is used in a list of footnotes to indicate an international footnote suppressed at WRC-19 or a Canadian footnote proposed for suppression.

▼ 5. Definitions

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

5.1 General terms

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

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 described in Resolution **655 (WRC-15)**.

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.

5.2 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 *(R)* [1] 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 *(R)* [1] 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.

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 purposes 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 fixed 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.

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 of 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.

5.3 Categories of services

Primary and secondary services:

In the Canadian Table, where a frequency 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)

b. secondary services are printed in “normal characters” (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 left-hand top corner of the table concerned.

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

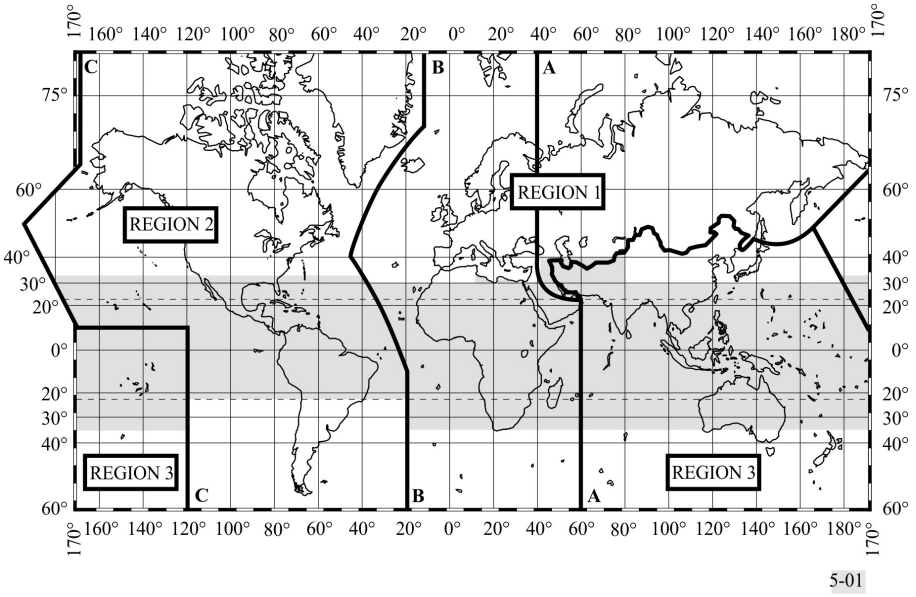
The footnote references, which appear to the right of the name of a service, are applicable only to that particular service.

5.4 Regions

These definitions and provisions are extracted from **5.2** to **5.9** of the ITU *Radio Regulations*.

> **5.2** For the allocation of frequencies, the world has been divided into three Regions as shown on the following map and described in Nos. **5.3** to **5.9**:

Figure 1 — Regions



5.3 Region 1: Region 1 includes the area limited on the east by line A (lines A, B and C are defined below) and on the west by line B, excluding any of the territory of the Islamic Republic of Iran, which lies between these limits. It also includes the whole of the territory of Armenia, Azerbaijan, the Russian Federation, Georgia, Kazakhstan, Mongolia, Uzbekistan, Kyrgyzstan, Tajikistan, Turkmenistan, Turkey and Ukraine and the area to the north of Russian Federation, which lies between lines A and C.

5.4 Region 2: Region 2 includes the area limited on the east by line B and on the west by line C.

5.5 Region 3: Region 3 includes the area limited on the east by line C and on the west by line A, except any of the territory of Armenia, Azerbaijan, the Russian Federation, Georgia, Kazakhstan, Mongolia, Uzbekistan, Kyrgyzstan, Tajikistan, Turkmenistan, Turkey and Ukraine and the area to the north of Russian Federation. It also includes that part of the territory of the Islamic Republic of Iran lying outside of those limits.

5.6 The lines A, B and C are defined as follows:

5.7 Line A: Line A extends from the North Pole along meridian 40° East of Greenwich to parallel 40° North; thence by great circle arc to the intersection of meridian 60° East and the Tropic of Cancer; thence along the meridian 60° East to the South Pole.

5.8 Line B: Line B extends from the North Pole along meridian 10° West of Greenwich to its intersection with parallel 72° North; thence by great circle arc to the intersection of mer°idian 50° West and parallel 40° North; thence by great circle arc to the intersection of meridian 20° West and parallel 10° South; thence along meridian 20° West to the South Pole.

5.9 Line C: Line C extends from the North Pole by great circle arc to the intersection of parallel 65° 30′ North with the international boundary in Bering Strait; thence by great circle arc to the intersection of meridian 165° East of Greenwich and parallel 50° North; thence by great circle arc to the intersection of meridian 170° West and parallel 10° North; thence along parallel 10° North to its intersection with meridian 120° West; thence along meridian 120° West to the South Pole.

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1 (R): route

▼ 6. Proposed changes to the Canadian Table of Frequency Allocations

9. The proposed changes to the Canadian Table of Frequency Allocations are organized in each sub-section by the type of service, and then numerically by the particular 2019 World Radiocommunication Conference (WRC-19) agenda item number.

6.1 Maritime and aeronautical services

(WRC-19, Agenda item 1.8): regulatory actions to support Global Maritime Distress Safety Systems (GMDSS) modernization and to support the introduction of additional satellite systems into the GMDSS

Background

10. The GMDSS was adopted as part of the 1988 amendments to the International Convention for the Safety of Life at Sea, 1974 (SOLAS). It has served the maritime community well since its inception, but some of the GMDSS technologies used have not reached their full potential, and some GMDSS functions could be performed by more modern technologies.

11. As part of a modernization plan for the GMDSS, two aspects were studied during the WRC-19 cycle. The first aspect (issue A) was the enhancement through the use of broadband technologies of navigational data (NAVDAT) for broadcasting maritime safety and security information. The second aspect (issue B) was the introduction of an additional satellite service provider into the GMDSS as recognized by the International Maritime Organization in 2018.

Discussion issue A

12. WRC-19 decided that some existing maritime mobile service frequency bands could be utilized for NAVDAT from shore-to-ship. This was accomplished by changes to Article **5** in the frequency range 415-526.5 kHz (415-510 kHz in Region 2) and by identifying channels in Appendix **18** of the ITU *Radio Regulations*.

13. This is in line with Canadian interests and ISED proposes to adopt the changes to the Canadian Table.

Table 1: Summary of proposed changes to the Canadian Table issue A 415-510 MHz

kHz	Frequency allocations
415-472	MARITIME MOBILE MOD 5.79 5.82

472-479	MARITIME MOBILE MOD 5.79 Amateur 5.80A 5.82
479-495	MARITIME MOBILE MOD 5.79 5.79A 5.82
495-505	MARITIME MOBILE ADD 5.82C
505-510	MARITIME MOBILE MOD 5.79

MOD **5.79** In the maritime mobile service, ~~T~~the ~~use of the~~ frequency bands 415-495 kHz and 505-526.5 kHz are limited to radiotelegraphy and may also be used for the NAVDAT system in accordance with the most recent version of Recommendation ITU-R M.2010, subject to agreement between interested and affected administrations. NAVDAT transmitting stations are limited to coast stations ~~(505-510 kHz in Region 2) by the maritime mobile service is limited to radiotelegraphy~~. (WRC-19)

ADD **5.82C** The frequency band 495-505 kHz is used for the international NAVDAT system as described in the most recent version of Recommendation ITU-R M.2010. NAVDAT transmitting stations are limited to coast stations. (WRC-19)

Discussion issue B

14. Although the WRC-19 decision to adopt an allocation to the maritime mobile-satellite service (MMSS) did not include the entire frequency range under consideration, the 5.15 MHz allocation (1 621.35-1 626.5 MHz) is a positive outcome for Canada and the maritime community to accommodate a second satellite GMDSS service provider for global coverage including Arctic and Antarctic areas. ISED proposes to reflect this WRC-19 decision in the Canadian Table as shown in table 2. This change is also reflected in Appendix **15** of the *Radio Regulations*, which contains all frequencies and frequency bands used by the GMDSS.

Table 2: Summary of proposed changes to the Canadian Table issue B
1 613.8-1 660 MHz

MHz	Frequency allocations
1 613.8- 1 62 1.35 ~~6.5~~	MOBILE-SATELLITE (Earth-to-space) 5.351A AERONAUTICAL RADIONAVIGATION Mobile-satellite (space-to-Earth) 5.208B 5.341 5.364 5.365 5.366 5.367 MOD 5.368 MOD 5.372

1 621.35- 1 626.5	MARITIME MOBILE-SATELLITE (space-to-Earth) ADD 5.373 ADD 5.373A MOBILE-SATELLITE (Earth-to-space) 5.351A AERONAUTICAL RADIONAVIGATION Mobile-satellite (space-to-Earth) except maritime mobile satellite (space-to-Earth) 5.208B 5.341 5.364 5.365 5.366 5.367 MOD 5.368 MOD 5.372
1 626.5- 1 660	MOBILE-SATELLITE (Earth-to-space) 5.351A 5.341 5.351 5.353A 5.354 5.357A 5.374 5.375 5.376

MOD **5.368** The provisions of No. **4.10** do not apply with respect to the radiodetermination-satellite and mobile-satellite services in the frequency band 1 610-1 626.5 MHz. However, No. **4.10** applies in the frequency band 1 610-1 626.5 MHz with respect to the ~~radiodetermination-satellite and mobile-satellite services the provisions of No. **4.10** do not apply in the band 1 610-1 626.5 MHz, with the exception of the~~ aeronautical radionavigation-satellite service when operating in accordance with No. **5.366**, the aeronautical mobile satellite (R) service when operating in accordance with No. **5.367**, and in the frequency band 1 621.35-1 626.5 MHz with respect to the maritime mobile-satellite service when used for GMDSS. (WRC-19)

MOD **5.372** Harmful interference shall not be caused to stations of the radio astronomy service using the frequency band 1 610.6-1 613.8 MHz by stations of the radiodetermination-satellite and mobile-satellite services (No. **29.13** applies). The equivalent power flux-density (epfd) produced in the frequency band 1 610.6-1 613.8 MHz by all space stations of a non-geostationary-satellite system in the mobile-satellite service (space-to-Earth) operating in frequency band 1 613.8-1 626.5 MHz shall be in compliance with the protection criteria provided in Recommendations ITU-R RA.769-2 and ITU-R RA.1513-2, using the methodology given in Recommendation ITU-R M.1583-1, and the radio astronomy antenna pattern described in Recommendation ITU-R RA.1631-0. (WRC-19)

ADD **5.373** Maritime mobile earth stations receiving in the frequency band 1 621.35-1 626.5 MHz shall not impose additional constraints on earth stations operating in the maritime mobile-satellite service or maritime earth stations of the radiodetermination-satellite service operating in accordance with the Radio Regulations in the frequency band 1 610-1 621.35 MHz or on earth stations operating in the

maritime mobile-satellite service operating in accordance with the Radio Regulations in the frequency band 1 626.5-1 660.5 MHz, unless otherwise agreed between the notifying administrations. (WRC-19)

ADD **5.373A** Maritime mobile earth stations receiving in the frequency band 1 621.35-1 626.5 MHz shall not impose constraints on the assignments of earth stations of the mobile-satellite service (Earth-to-space) and the radiodetermination- satellite service (Earth-to-space) in the frequency band 1 621.35-1 626.5 MHz in networks for which complete coordination information has been received by the Radiocommunication Bureau before 28 October 2019. (WRC-19)

(WRC-19, Agenda item 1.9.2): to consider modifications of the *Radio Regulations*, including new spectrum allocations to the maritime mobile-satellite service (Earth to space and space-to-Earth), preferably within the frequency bands 156.0125-157.4375 MHz and 160.6125-162.0375 MHz of Appendix 18, to enable a new very high frequency (VHF) data exchange system (VDES) satellite component, while ensuring that this component will not degrade the current terrestrial VDES components, applications specific messages (ASM) and automatic identifications system (AIS) operations

Background

15. Traditional maritime communication methods (i.e. voice) have been shown to be inadequate for the transfer of information required to improve the safety of navigation, particularly in adverse conditions. More information (such as weather, ice charts, status of aids to navigation, water levels and rapid changes of port status) is required in real-time to improve operational decisions on land and on ship that will lead to safer and more efficient voyages. As a result of these additional requirements on maritime communications, WRC-19 considered regulatory changes to facilitate the use of the satellite and terrestrial components of VDES.

Discussion

16. WRC-19 adopted two regulatory changes with respect to VDES. A secondary allocation was made to the maritime mobile satellite service in the frequency bands 157.1875-157.3375 MHz and 161.7875-161.9375 MHz, including addition of channels for the satellite component of VDES to Appendix **18** of the *Radio Regulations*. As well, VDES terrestrial component channels in Appendix **18** were updated to increase flexibility of their usage between ship stations and shore

stations. This is a successful outcome for Canadian maritime authorities to respond to increased data transfer and improve maritime safety and efficiency in the growing maritime environment. Worldwide, vessels will benefit from VDES terrestrial shore stations and satellite networks to support and enhance safety and navigation.

Table 3: Summary of proposed changes to the Canadian Table 156.8375-161.9375 MHz

MHz	Frequency allocations
156.8375-157.1875 ~~161.9375~~	MOBILE Fixed 5.226
157.1875-157.3375	MOBILE Fixed Maritime mobile-satellite ADD MOD 5.208A ADD MOD 5.208B ADD 5.228AB ADD 5.228AC 5.226
157.3375-161.7875	MOBILE Fixed 5.226
161.7875-161.9375	MOBILE Fixed Maritime mobile-satellite ADD MOD 5.208A ADD MOD 5.208B ADD 5.228AB ADD 5.228AC 5.226

MOD **5.208A** In making assignments to space stations in the mobile-satellite service in the frequency bands 137-138 MHz, 387-390 MHz and 400.15-401 MHz, and in the maritime mobile-satellite service (space-to-Earth) in the frequency bands 157.1875-157.3375 and 161.7875-161.9375 MHz, administrations shall take all practicable steps to protect the radio astronomy service in the frequency bands 150.05-153 MHz, 322-328.6 MHz, 406.1-410 MHz and 608-614 MHz from harmful interference from unwanted emissions as shown in the most recent version of Recommendation ITU-R RA.769 ~~. The threshold levels of interference detrimental to the radio astronomy service are shown in the relevant ITU-R Recommendation.~~ (WRC-19 ~~07~~)

MOD **5.208B** In the frequency bands:

137-138 MHz,
157.1875-157.3375 MHz,
161.7875-161.9375 MHz,
387-390 MHz,
400.15-401 MHz,
1 452-1 492 MHz,

1 525-1 610 MHz,
1 613.8-1 626.5 MHz,
1 655-2 690 MHz,
21.4-22 GHz,

Resolution **739 (Rev.WRC-1 9 ~~5~~)** applies**.** (WRC-1 9 ~~5~~)

ADD **5.228AB** The use of the frequency bands 157.1875-157.3375 MHz and 161.7875-161.9375 MHz by the maritime mobile-satellite service (Earth-to-space) is limited to non-geostationary-satellite systems operating in accordance with Appendix **18**. (WRC-19)

ADD **5.228AC** The use of the frequency bands 157.1875-157.3375 MHz and 161.7875-161.9375 MHz by the maritime mobile-satellite service (space-to-Earth) is limited to non-geostationary-satellite systems operating in accordance with Appendix **18**. Such use is subject to agreement obtained under No. **9.21** with respect to the terrestrial services in Azerbaijan, Belarus, China, Korea (Rep. of), Cuba, the Russian Federation, the Syrian Arab Republic, the Dem. People's Rep. of Korea, South Africa and Viet Nam. (WRC-19)

6.2 Mobile, fixed, and amateur services

(WRC-19, Agenda item 1.13): to consider identification of frequency bands for the future development of International Mobile Telecommunications (IMT), including possible additional allocations to the mobile service on a primary basis

Background

17. IMT systems have evolved to provide diverse usage scenarios and applications such as enhanced mobile broadband (eMBB), massive machine-type communications (mMTC) and ultra-reliable and low-latency communications (URLLC) requiring larger contiguous blocks of spectrum. These future IMT systems will incorporate the use of new technologies that benefit from the physical characteristics of the frequencies in the frequency ranges above 24.25 GHz and larger bandwidths, which will provide higher data rates and lower latencies.

18. The properties of higher frequency bands, such as shorter wavelengths, better enable the use of advanced antenna systems, including multiple-input and multiple-output (MIMO) and beam-forming techniques, in supporting eMBB.

Discussion

19. WRC-19 adopted regulatory text to identify over 15 GHz of spectrum for IMT. Of the frequency bands identified, the following bands are of key interest to Canada: 26 GHz (24.25-27.5 GHz), 37-43.5 GHz, 47.2-48.2 GHz and 66-71 GHz.

20. Agreement was also reached at WRC-19 not to identify the following frequency bands for IMT: 31.8-33.4 GHz, 47-47.2 GHz, 48.2-50.2 GHz, 50.4-52.6 GHz, 71-76 GHz and 81-86 GHz.

21. 26 GHz (24.25-27.5 GHz): This band was identified for IMT on a worldwide basis. This includes a new primary allocation to the mobile (except aeronautical) service in Regions 1 and 2 in the frequency band 24.25-25.25 GHz. Mandatory unwanted emission limits were added to Resolution **750** to ensure coexistence with adjacent Earth exploration-satellite service (EESS) (passive) receivers in the band 23.6-24 GHz. Measures were also put into place to ensure coexistence with fixed-satellite service (FSS) and inter-satellite service (ISS) receivers in the band 24.45-27.5 GHz. In Canada, part of the frequency band 24.25-27.5 GHz is subject to the *Decision on Releasing Millimetre Wave Spectrum to Support 5G*. Changes to the Canadian Table as a result of the decision are incorporated in the table 4 below and are not open for consultation.

22. 37-43.5 GHz: This entire range was identified for IMT on a worldwide basis. This included an upgrade of the land mobile service from secondary to primary in the frequency band 40.5-42.5 GHz. The aeronautical mobile and maritime mobile services remain secondary. Unwanted emission limits were put in place to ensure coexistence with adjacent EESS (passive) receivers in the band 36-37 GHz, including both mandatory limits and more stringent recommended limits. Measures were put into place to ensure coexistence with FSS satellite receivers in the frequency band 42.5-43.5 GHz (same measures as 26 GHz band). In addition, a number of provisions were included to ensure coexistence of IMT and High Density FSS Earth stations in the bands identified in footnote **5.516B** (39.5-40 GHz in Region 1, 40-40.5 GHz in all Regions, 40.5-42 GHz in Region 2 and 47.5-47.9 GHz in Region 1). In Canada, part of the frequency band 37-43.5 GHz is subject to the *Decision on Releasing Millimetre Wave Spectrum to Support 5G*. Changes to the Canadian Table as a result of the decision are incorporated in the table 5 below and are not open for consultation.

23. 47.2-48.2 GHz: This band was identified for IMT in Region 2 and some countries in Regions 1 and 3. Measures were put into place to coexist with FSS satellite receivers in the band (same conditions as the 26 GHz band).

24. 66-71 GHz: This band was identified for IMT on a worldwide basis, subject to a new Resolution **241** on the coexistence between IMT and other applications of the mobile service. In Canada, through the *Decision on Releasing Millimetre Wave Spectrum to Support 5G*, ISED designated the band 64-71 GHz for licence-exempt operations on a no-interference, no-protection basis, which could include IMT among other applications.

25. Further consideration of these frequency bands or parts thereof, for possible 5G deployment in Canada, if appropriate, will be carried out through separate consultations.

Table 4: Summary of proposed changes to the Canadian Table 24.25-27.5 MHz

GHz	Frequency allocations
24.25-24.45	FIXED MOBILE except aeronautical mobile ADD MOD 5.338A ADD 5.532AB RADIONAVIGATION
24.45-24.65	INTER-SATELLITE MOBILE except aeronautical mobile ADD MOD 5.338A ADD 5.532AB RADIONAVIGATION
24.65-24.75	INTER-SATELLITE MOBILE except aeronautical mobile ADD MOD 5.338A ADD 5.532AB RADIOLOCATION-SATELLITE (Earth-to-space)
24.75-25.05	FIXED-SATELLITE (Earth-to-space) 5.535 MOBILE except aeronautical mobile ADD MOD 5.338A ADD 5.532AB
25.05-25.25	FIXED FIXED-SATELLITE (Earth-to-space) 5.535 MOBILE except aeronautical mobile ADD MOD 5.338A ADD 5.532AB C44
25.25-25.5	FIXED INTER-SATELLITE 5.536 MOBILE ADD MOD 5.338A ADD 5.532AB Standard Frequency and Time Signal-Satellite (Earth-to-space)
25.5-27	EARTH EXPLORATION-SATELLITE (space-to-Earth) FIXED INTER-SATELLITE 5.536 MOBILE ADD MOD 5.338A ADD 5.532AB SPACE RESEARCH (space-to-Earth) Standard Frequency and Time Signal-Satellite (Earth-to-space) MOD 5.536A C47C

27-27.5	FIXED FIXED-SATELLITE (Earth-to-space) INTER-SATELLITE 5.536 MOBILE ADD MOD 5.338A ADD 5.532AB C47A

ADD MOD **5.338A** In the frequency bands 1 350-1 400 MHz, 1 427-1 452 MHz, 22.55-23.55 GHz, 24.25-27.5 GHz, 30-31.3 GHz, 49.7-50.2 GHz, 50.4-50.9 GHz, 51.4-52. 4 ~~6~~ GHz, 52.4-52.6 GHz, 81-86 GHz and 92-94 GHz, Resolution **750 (Rev.WRC-1 9 ~~2~~)** applies. (WRC-1 9 ~~2~~)

ADD **5.532AB** The frequency band 24.25-27.5 GHz is identified for use by administrations wishing to implement the terrestrial component of International Mobile Telecommunications (IMT). This identification does not preclude the use of this frequency band by any application of the services to which it is allocated and does not establish priority in the Radio Regulations. Resolution **242 (WRC-19)** applies. (WRC-19)

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 Recommendation ITU-R SA.1862. Resolution **242 (WRC-19)** applies. (WRC-1 9 ~~2~~)

Table 5: Summary of proposed changes to the Canadian Table 37-43.5 GHz

GHz	Frequency allocations
37-37.5	FIXED MOBILE except aeronautical mobile ADD 5.550B SPACE RESEARCH (space-to-Earth) 5.547
37.5-38	FIXED FIXED-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile ADD 5.550B SPACE RESEARCH (space-to-Earth) Earth exploration-satellite (space-to-Earth) 5.547 C51

38-39.5	FIXED FIXED-SATELLITE (space-to-Earth) MOBILE ADD 5.550B Earth exploration-satellite (space-to-Earth) 5.547 C51
39.5-40	FIXED FIXED-SATELLITE (space-to-Earth) 5.516B MOBILE ADD 5.550B MOBILE-SATELLITE (space-to-Earth) C50 Earth exploration-satellite (space-to-Earth) 5.547 C51
40-40.5	EARTH EXPLORATION-SATELLITE (Earth-to-space) FIXED FIXED-SATELLITE (space-to-Earth) 5.516B MOBILE ADD 5.550B MOBILE-SATELLITE (space-to-Earth) C50 SPACE RESEARCH (Earth-to-space) Earth exploration-satellite (space-to-Earth)
40.5-41	FIXED FIXED-SATELLITE (space-to-Earth) 5.516B BROADCASTING BROADCASTING-SATELLITE Mobile ADD 5.550B Mobile-satellite (space-to-Earth) 5.547
41-42.5	FIXED FIXED-SATELLITE (space-to-Earth) 5.516B BROADCASTING BROADCASTING-SATELLITE Mobile ADD 5.550B 5.547 5.551H 5.551I
42.5-43.5	FIXED FIXED-SATELLITE (Earth-to-space) 5.552 MOBILE except aeronautical mobile ADD 5.550B RADIO ASTRONOMY 5.149 5.547

ADD **5.550B** The frequency band 37-43.5 GHz, or portions thereof, is identified for use by administrations wishing to implement the terrestrial component of International Mobile Telecommunications (IMT). This identification does not preclude the use of this frequency band by any application of the services to which it is allocated and does not establish priority in the Radio Regulations. Because of the potential deployment of FSS earth stations within the frequency range 37.5-42.5 GHz and high-density applications in the fixed-satellite service in the frequency bands 39.5-40 GHz in Region 1, 40-40.5 GHz in all Regions and 40.5-42 GHz in Region 2 (see No.

5.516B), administrations should further take into account potential constraints to IMT in these frequency bands, as appropriate. Resolution **243 (WRC-19)** applies. (WRC-19)

Table 6: Summary of proposed changes to the Canadian Table 47.2-48.2 GHz

GHz	Frequency allocations
47.2-47.5	FIXED FIXED-SATELLITE (Earth-to-space) 5.552 MOBILE ADD 5.553B 5.552A C52
47.5-47.9	FIXED FIXED-SATELLITE (Earth-to-space) 5.552 MOBILE ADD 5.553B C52
47.9-48.2	FIXED FIXED-SATELLITE (Earth-to-space) 5.552 MOBILE ADD 5.553B 5.552A C52

ADD **5.553B** In Region 2 and Algeria, Angola, Saudi Arabia, Australia, Bahrain, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Central African Rep., Comoros, Congo (Rep. of the), Korea (Rep. of), Côte d'Ivoire, Djibouti, Egypt, United Arab Emirates, Eswatini, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Equatorial Guinea, India, Iran (Islamic Republic of), Iraq, Japan, Jordan, Kenya, Kuwait, Lesotho, Liberia, Libya, Lithuania, Madagascar, Malaysia, Malawi, Mali, Morocco, Mauritius, Mauritania, Mozambique, Namibia, Niger, Nigeria, Oman, Uganda, Qatar, the Syrian Arab Republic, the Dem. Rep. of the Congo, Rwanda, Sao Tome and Principe, Senegal, Seychelles, Sierra Leone, Singapore, Slovenia, Somalia, Sudan, South Sudan, South Africa, Sweden, Tanzania, Chad, Togo, Tunisia, Zambia and Zimbabwe, the frequency band 47.2-48.2 GHz is identified for use by administrations wishing to implement International Mobile Telecommunications (IMT). This identification does not preclude the use of this frequency band by any application of the services to which it is allocated, and does not establish any priority in the Radio Regulations. Resolution **243 (WRC-19)** applies. (WRC-19)

Table 7: Summary of proposed changes to the Canadian Table

66-71 GHz

GHz	Frequency allocations
66-71	INTER-SATELLITE MOBILE 5.553 5.558 ADD 5.559AA MOBILE-SATELLITE RADIONAVIGATION RADIONAVIGATION-SATELLITE 5.554

ADD **5.559AA** The frequency band 66-71 GHz is identified for use by administrations wishing to implement the terrestrial component of International Mobile Telecommunications (IMT). This identification does not preclude the use of this frequency band by any application of the services to which this frequency band is allocated and does not establish priority in the Radio Regulations. Resolution **241 (WRC-19)** applies. (WRC-19)

(WRC-19, Agenda item 1.14): appropriate regulatory actions for high-altitude platform stations (HAPS) within existing fixed service allocations

Background

26. HAPS systems consist of airborne platforms operating at a high altitude and a nominally fixed location, which then relays communications between multiple stations located on the ground. Because of its high altitude, a HAPS system can potentially provide connectivity and coverage over a very large footprint with minimal ground-level infrastructure. As a result, HAPS can be of interest for applications that provide broadband connectivity to sparsely located rural and remote communities, as well as for disaster response scenarios where a communication network can be rapidly set up by deploying a high altitude platform.

27. Over recent years, technological innovations in unmanned aircraft technology are leading towards the development of aircraft systems, which could potentially be powered to stay airborne for long periods of time (e.g. weeks or months) and also carry radio antennas, which can simultaneously connect to a high number of stations on the ground. These technological advances, coupled with the growing efforts to expand the availability of broadband in underserved areas, have led to a renewed interest in the use of HAPS systems.

28. WRC-19 considered changes to the international regulations for HAPS for existing spectrum identifications, as well as by making additional frequency bands available to be used by HAPS.

Discussion

29. WRC-19 took decisions to develop or amend resolutions and footnotes to enable the operation of HAPS in a number of frequency bands while protecting existing and planned services.

21 GHz Range in Region 2 (21.4-22 GHz):

- Resolution **165 (WRC-19)** and footnote **5.530E** were adopted to allow HAPS-to-ground operations and with set power limits.

26 GHz Range in Region 2 (24.25-27.5 GHz):

- Resolution **166 (WRC-19)** and footnotes **5.532AA** and **5.534A** were adopted to allow HAPS operations in different directions and with set power limits.

31 GHz Range (31.0-31.3 GHz):

- Resolution **167 (WRC-19)** and footnote **5.543B** were adopted to allow HAPS operations in different directions and with set power limits.

38 GHz Range (38.0-39.5 GHz):

- Resolution **168 (WRC-19)** and footnote **5.550D** were adopted to allow HAPS-to-ground operations and set power limits.

47 GHz Range (47.2-47.5 GHz and 47.9-48.2 GHz):

- Resolution **122 (WRC-19)** was modified to bring the technical power limits and compliance requirements in line with other frequency bands.

30. These solutions represent a global compromise that will effectively support the development of HAPS worldwide while protecting other services operating in the same frequency ranges.

31. ISED proposes to implement the allocations and footnotes adopted at WRC-19. However, spectrum utilization policies regarding the use of HAPS in Canada will be the subject of a future separate public consultation.

Table 8: Summary of proposed changes to the Canadian Table 21.4-22 MHz

GHz	Frequency allocations
21.4-22	FIXED ADD 5.530E Mobile 5.530A ADD MOD C52

~~**5.530C (**SUP – WRC-15)~~

ADD **5.530E** The allocation to the fixed service in the frequency band 21.4-22 GHz is identified for use in

Region 2 by high-altitude platform stations (HAPS). This identification does not preclude the use of this frequency band by other fixed-service applications or by other services to which it is allocated on a co-primary basis, and does not establish priority in the Radio Regulations. Such use of the fixed-service allocation by HAPS is limited to the HAPS-to-ground direction, and shall be in accordance with the provisions of Resolution **165 (WRC-19)**. (WRC-19)

ADD MOD **C52** (CAN-~~00~~ 19) Use of the frequency band s 21.4-22 GHz, 24.25-27.5 GHz, 31-31.3 GHz, 38-39.5 GHz, and 47.2-48.2 GHz by ~~H~~ h igh ~~A~~ a ltitude ~~P~~ p latform ~~S~~ s ystems (HAPS) will be governed by spectrum utilization policies which will be formulated in the future.

Table 9: Summary of proposed changes to the Canadian Table 24.25-27.5 GHz

GHz	Frequency allocations
24.25-24.45	FIXED ADD 5.532AA RADIONAVIGATION ADD MOD C52
24.45-24.65	FIXED ADD 5.532AA INTER-SATELLITE RADIONAVIGATION ADD MOD C52
24.65-24.75	FIXED ADD 5.532AA INTER-SATELLITE RADIOLOCATION-SATELLITE (Earth-to-space) ADD MOD C52
24.75-25.05	FIXED ADD 5.532AA FIXED-SATELLITE (Earth-to-space) 5.535 ADD MOD C52
25.05-25.25	FIXED ADD 5.532AA FIXED-SATELLITE (Earth-to-space) 5.535 C44 ADD MOD C52
25.25-25.5	FIXED ADD 5.534A INTER-SATELLITE 5.536 MOBILE Standard Frequency and Time Signal-Satellite (Earth-to-space) ADD MOD C52
25.5-27	EARTH EXPLORATION-SATELLITE (space-to-Earth) FIXED ADD 5.534A INTER-SATELLITE 5.536 MOBILE SPACE RESEARCH (space-to-Earth) Standard Frequency and Time Signal-Satellite (Earth-to-space) MOD 5.536A C47C ADD MOD C52

27-27.5	FIXED ADD 5.534A FIXED-SATELLITE (Earth-to-space) INTER-SATELLITE 5.536 MOBILE C47A ADD MOD C52

ADD **5.532AA** The allocation to the fixed service in the frequency band 24.25-25.25 GHz is identified for use in Region 2 by high-altitude platform stations (HAPS). This identification does not preclude the use of this frequency band by other fixed-service applications or by other services to which this frequency band is allocated on a co-primary basis, and does not establish priority in the Radio Regulations. Such use of the fixed-service allocation by HAPS is limited to the HAPS-to-ground direction and shall be in accordance with the provisions of Resolution **166 (WRC-19)**. (WRC-19)

ADD **5.534A** The allocation to the fixed service in the frequency band 25.25-27.5 GHz is identified in Region 2 for use by high-altitude platform stations (HAPS) in accordance with the provisions of Resolution **166 (WRC-19)**. Such use of the fixed-service allocation by HAPS shall be limited to the ground-to-HAPS direction in the frequency band 25.25-27.0 GHz and to the HAPS-to-ground direction in the frequency band 27.0-27.5 GHz. Furthermore, the use of the frequency band 25.5-27.0 GHz by HAPS shall be limited to gateway links. This identification does not preclude the use of this frequency band by other fixed-service applications or by other services to which this band is allocated on a coprimary basis, and does not establish priority in the Radio Regulations. (WRC-19)

ADD MOD **C52** (CAN-~~00~~ 19) Use of the frequency band s 21.4-22 GHz, 24.25-27.5 GHz, 31-31.3 GHz, 38-39.5 GHz, and 47.2-48.2 GHz by ~~H~~ high ~~A~~ altitude ~~P~~ platform ~~S~~ systems (HAPS) will be governed by spectrum utilization policies which will be formulated in the future.

Table 10: Summary of proposed changes to the Canadian Table 31-31.3 GHz

GHz	Frequency allocations
31-31.3	FIXED 5.338A ADD 5.543B MOBILE Space research 5.544 Standard Frequency and Time Signal-Satellite (space-to-Earth) 5.149 ADD MOD C52

ADD **5.543B** The allocation to the fixed service in the frequency band 31-31.3 GHz is identified for worldwide use by high-altitude platform stations (HAPS). This identification does not preclude the use of this frequency band by other fixed-service applications or by other services to which this frequency band is allocated on a co-primary basis, and does not establish priority in the Radio Regulations. Such use of the fixed-service allocation by HAPS shall be in accordance with the provisions of Resolution **167 (WRC-19)**. (WRC-19)

ADD MOD **C52** (CAN-~~00~~ 19) Use of the frequency bands 21.4-22 GHz, 24.25-27.5 GHz, 31-31.3 GHz, 38-39.5 GHz, and 47.2-48.2 GHz by ~~H~~high ~~A~~altitude ~~P~~platform ~~S~~systems (HAPS) will be governed by spectrum utilization policies which will be formulated in the future.

Table 11: Summary of proposed changes to the Canadian Table 38-39.5 GHz

GHz	Frequency allocations
38-39.5	FIXED ADD 5.550D FIXED-SATELLITE (space-to-Earth) MOBILE Earth exploration-satellite (space-to-Earth) 5.547 C51 ADD MOD C52

ADD **5.550D** The allocation to the fixed service in the frequency band 38-39.5 GHz is identified for worldwide use by administrations wishing to implement high-altitude platform stations (HAPS). In the HAPS-to-ground direction, the HAPS ground station shall not claim protection from stations in the fixed, mobile and fixed-satellite services; and No. **5.43A** does not apply. This identification does not preclude the use of this frequency band by other fixed-service applications or by other services to which this frequency band is allocated on a co-primary basis and does not establish priority in the Radio Regulations. Furthermore, the development of the fixed-satellite, fixed and mobile services shall not be unduly constrained by HAPS. Such use of the fixed-service allocation by HAPS shall be in accordance with the provisions of Resolution **168 (WRC-19)**. (WRC-19)

ADD MOD **C52** (CAN-~~00~~ 19) Use of the frequency bands 21.4-22 GHz, 24.25-27.5 GHz, 31-31.3 GHz, 38-39.5 GHz, and 47.2-48.2 GHz by ~~H~~high ~~A~~altitude ~~P~~platform ~~S~~systems (HAPS) will be governed by spectrum

utilization policies which will be formulated in the future.

Table 12: Summary of proposed changes to the Canadian Table 47.2-47.5 GHz

GHz	Frequency allocations
47.2-47.5	FIXED FIXED-SATELLITE (Earth-to-space) 5.552 MOBILE MOD 5.552A MOD C52

MOD **5.552A** The allocation to the fixed service in the frequency bands 47.2-47.5 GHz and 47.9-48.2 GHz is ~~designated~~ identified for use by high-altitude platform stations (HAPS). This identification does not preclude the use of this frequency band by any application of the services to which it is allocated on a co-primary basis, and does not establish priority in the Radio Regulations. Such ~~The~~ use of the fixed-service allocation in the frequency bands 47.2-47.5 GHz and 47.9-48.2 GHz ~~is subject to~~ by HAPS shall be in accordance with the provisions of Resolution **122 (Rev.WRC-19 ~~07~~)**. (WRC-19 ~~07~~)

MOD **C52** (CAN-~~00~~ 19) Use of the frequency bands 21.4-22 GHz, 24.25-27.5 GHz, 31-31.3 GHz, 38-39.5 GHz, and 47.2-48.2 GHz by ~~H~~ high ~~A~~ altitude ~~P~~ platform ~~S~~ systems (HAPS) will be governed by spectrum utilization policies which will be formulated in the future.

Table 13: Summary of proposed changes to the Canadian Table 47.9-48.2 GHz

GHz	Frequency allocations
47.9-48.2	FIXED FIXED-SATELLITE (Earth-to-space) 5.552 MOBILE MOD 5.552A MOD C52

MOD **5.552A** The allocation to the fixed service in the frequency bands 47.2-47.5 GHz and 47.9-48.2 GHz is ~~designated~~ identified for use by high-altitude platform stations (HAPS). This identification does not preclude the use of this frequency band by any application of the services to which it is allocated on a co-primary basis, and does not establish priority in the Radio Regulations. Such ~~The~~ use of the fixed-service allocation in the frequency bands 47.2-

47.5 GHz and 47.9-48.2 GHz ~~is subject to~~ by HAPS shall be in accordance with the provisions of Resolution **122 (Rev.WRC-19 ~~07~~)**. (WRC-19 ~~07~~)

MOD **C52** (CAN-~~00~~ 19) Use of the frequency band s 21.4-22 GHz, 24.25-27.5 GHz, 31-31.3 GHz, 38-39.5 GHz, and 47.2-48.2 GHz by ~~H~~ h igh ~~A~~ a ltitude ~~P~~ p latform ~~S~~ s ystems (HAPS) will be governed by spectrum utilization policies which will be formulated in the future.

(WRC-19, Agenda item 1.15): identification of frequency bands for use by administrations for the land mobile and fixed service application operating in the frequency range 275-450 GHz

Background

32. In response to the continued growth in demand for increasing broadband connectivity speeds, industry is constantly conducting research and development on broadband radio technology in higher ranges of radiofrequency spectrum. The throughput of a radio system is fundamentally limited by the amount of spectrum bandwidth it can use, and frequency ranges above 100 GHz are actively being studied as they could support contiguous spectrum bandwidths of many gigahertz. Radio equipment and antenna technologies have been continuously advancing in recent years in their ability to use higher frequency bands to the point that proponents are envisaging multiple applications under the fixed and land mobile services in bands above 275 GHz, which could support speeds in excess of 100 Gbit/s.

33. Prior to WRC-19,the international regulatory framework did not include any allocations for radio services in frequency bands above 275 GHz, however various portions of the spectrum between 275 GHz and 1000 GHz had been identified for applications of several passive services: radio astronomy service (RAS), EESS and space research service (SRS).

34. WRC-19 considered which portions of the 275-450 GHz frequency range could be identified for fixed and land mobile service applications, while also ensuring the protection of the passive services already identified for use in the range.

Discussion

35. WRC-19 decided to add a new footnote to the table of frequency allocations in Article **5** of the *Radio Regulations* for the frequency range 275-450 GHz, enabling the use of land mobile and fixed service applications. Some of these frequency bands can only be used once the ITU has developed conditions to ensure the protection of passive service applications in accordance with Resolution **731 (Rev. WRC-19)**.

Table 14: Summary of proposed changes to the Canadian Table 275-3 000 GHz

GHz	Frequency allocations
275-3 000	(Not allocated) ADD 5.564A 5.565

ADD **5.564A** For the operation of fixed and land mobile service applications in frequency bands in the range 275-450 GHz:

The frequency bands 275-296 GHz, 306-313 GHz, 318-333 GHz and 356-450 GHz are identified for use by administrations for the implementation of land mobile and fixed service applications, where no specific conditions are necessary to protect Earth exploration-satellite service (passive) applications.

The frequency bands 296-306 GHz, 313-318 GHz and 333-356 GHz may only be used by fixed and land mobile service applications when specific conditions to ensure the protection of Earth exploration-satellite service (passive) applications are determined in accordance with Resolution **731 (Rev.WRC-19)**.

In those portions of the frequency range 275-450 GHz where radio astronomy applications are used, specific conditions (e.g. minimum separation distances and/or avoidance angles) may be necessary to ensure protection of radio astronomy sites from land mobile and/or fixed service applications, on a case-by-case basis in accordance with Resolution **731 (Rev.WRC-19)**.

The use of the above-mentioned frequency bands by land mobile and fixed service applications does not preclude use by, and does not establish priority over, any other applications of radio services in the range of 275-450 GHz. (WRC-19)

(WRC-19, Agenda item 1.16): consider issues related to wireless access systems, including radio local area networks (WAS/RLAN), in the frequency bands between 5 150 MHz and 5 925 MHz, and take the appropriate regulatory actions, including additional spectrum allocations to the mobile service

Background

36. The frequency bands 5 150-5 350 MHz and 5 470-5 725 MHz were allocated to the mobile service for the implementation of wireless access systems (WAS), including radio local area networks (RLANs), by WRC-03. Technical and operational limits on RLANs were also adopted

to ensure compatibility with other services in the same frequency range. In the frequency band 5 350 to 5 470 MHz there is no primary mobile allocation.

37. Since WRC-03, technology has evolved significantly and there has been considerable growth in the demand for WAS/RLAN applications with multimedia capabilities. WAS/RLAN also complement licensed commercial mobile networks (i.e. offloading) and fixed wireline networks.

38. WRC-19 considered potential WAS/RLAN mitigation techniques to facilitate sharing with incumbent systems in the frequency bands 5 150-5 350 MHz, 5 350-5 470 MHz, 5 725-5 850 MHz and 5 850-5 925 MHz, while ensuring the protection of incumbent services, including the Earth exploration-satellite service (EESS) (active) allocations in the frequency bands 5 350-5 460 MHz and 5 460-5 470 MHz and the primary allocation to the aeronautical radionavigation service (ARNS) and the radiolocation service in the frequency band 5 350-5 460 MHz.

Discussion

39. WRC-19 updated the regulatory provisions in the frequency band 5 150-5 250 MHz as it applies to WAS/RLAN stations and the protection of the EESS in the adjacent frequency band above 5 250 MHz. Controlled and limited outdoor operation of WAS/RLAN is permitted with the modifications to Resolution **229**. The other frequency bands were not changed. ISED proposes to adopt these modifications in the Canadian Table, noting that in the Final Acts of WRC-19, Canada reserved its right to operate stations in the mobile service in the frequency band 5 150-5 250 MHz at higher power levels and subject to other conditions than those contained in Resolution **229 (WRC-19)**.

Table 15: Summary of proposed changes to the Canadian Table 5 091-5 350 MHz

MHz	Frequency allocations
5 091-5 150	FIXED-SATELLITE (Earth-to-space) 5.444A AERONAUTICAL MOBILE MOD 5.444B AERONAUTICAL MOBILE-SATELLITE (R) 5.443AA AERONAUTICAL RADIONAVIGATION 5.444
5 150-5 250	FIXED-SATELLITE (Earth-to-space) 5.447A MOBILE except aeronautical mobile MOD 5.446A 5.446B C39B AERONAUTICAL RADIONAVIGATION 5.446 5.447B 5.447C

5 250-5 255	EARTH EXPLORATION-SATELLITE (active) MOBILE except aeronautical mobile MOD 5.446A 5.447F C39B RADIOLOCATION SPACE RESEARCH 5.447D 5.448A
5 255-5 350	EARTH EXPLORATION-SATELLITE (active) MOBILE except aeronautical mobile MOD 5.446A 5.447F C39B RADIOLOCATION SPACE RESEARCH (active) 5.448A

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-19~~15~~)**;
- aeronautical telemetry transmissions from aircraft stations (see No. **1.83**) in accordance with Resolution **418 (Rev.WRC-19~~15~~)**. (WRC-15~~9~~)

Table 16: Summary of proposed changes to the Canadian Table 5 470-5 725 MHz

MHz	Frequency allocations
5 470-5 570	EARTH EXPLORATION-SATELLITE (active) MOBILE except aeronautical mobile MOD 5.446A 5.450A C39B RADIOLOCATION 5.450B MARITIME RADIONAVIGATION SPACE RESEARCH (active) 5.448B
5 570-5 650	MOBILE except aeronautical mobile MOD 5.446A 5.450A C39B RADIOLOCATION 5.450B MARITIME RADIONAVIGATION 5.452
5 650-5 725	MOBILE except aeronautical mobile MOD 5.446A 5.450A C39B RADIOLOCATION Amateur Space research (deep space) 5.282

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-19~~22~~)**. (WRC-19~~22~~)

(WRC-19, Issue 9.1.5): consideration of the technical and regulatory impacts of referencing Recommendations ITU-R M.1638-1 and ITU-R M.1849-1 in Nos. 5.447F and 5.450A of the *Radio Regulations*

Background

40. In the previous ITU-R study cycle of 2012-2015, Recommendations ITU-R M.1638 and ITU-R M.1849 were updated. This action necessitated a review of how these Recommendations were referenced in the *Radio Regulations* and if there were any technical or regulatory impacts of these updates on these references.

Discussion

41. Two footnotes (No. **5.447F** and **5.450A)** in Article **5** of the *Radio Regulations* that reference Recommendations ITU-R M.1638 and ITU-R M.1849 were updated at WRC-19. ISED proposes to align the Canadian Table to reflect this decision.

Table 17: Summary of proposed changes to the Canadian Table 5 250-5 350 MHz

MHz	Frequency allocations
5 250-5 255	EARTH EXPLORATION-SATELLITE (active) MOBILE except aeronautical mobile 5.446A MOD 5.447F C39B RADIOLOCATION SPACE RESEARCH 5.447D 5.448A
5 255-5 350	EARTH EXPLORATION-SATELLITE (active) MOBILE except aeronautical mobile 5.446A MOD 5.447F C39B RADIOLOCATION SPACE RESEARCH (active) 5.448A

MOD

5.447F In the frequency band 5 250-5 350 MHz, stations in the mobile service shall not claim protection from the radiolocation service, the Earth exploration-satellite service (active) and the space research service (active). The radiolocation service, the Earth exploration-satellite service (active) and the space research service (active) ~~These services~~ shall not impose more stringent conditions upon the mobile service ~~more stringent protection criteria, based on system characteristics and interference criteria, than those stated in Recommendations ITU-R M.1638-0 and ITU-R SA.1632-0~~ than those stipulated in Resolution **229 (Rev. WRC-19).** (WRC-1~~5~~9)

Table 18: Summary of proposed changes to the Canadian Table 5 470-5 725 MHz

MHz	Frequency allocations
5 470-5 570	EARTH EXPLORATION-SATELLITE (active) MOBILE except aeronautical mobile 5.446A MOD 5.450A C39B RADIOLOCATION 5.450B MARITIME RADIONAVIGATION SPACE RESEARCH (active) 5.448B
5 570-5 650	MOBILE except aeronautical mobile 5.446A MOD 5.450A C39B RADIOLOCATION 5.450B MARITIME RADIONAVIGATION 5.452
5 650-5 725	MOBILE except aeronautical mobile 5.446A MOD 5.450A C39B RADIOLOCATION Amateur Space research (deep space) 5.282

MOD **5.450A** In the frequency band 5 470-5 725 MHz, stations in the mobile service shall not claim protection from radiodetermination services. The r ~~R~~adiodetermination services shall not impose ~~on the mobile service~~ more stringent conditions ~~protection criteria~~ upon the mobile service, than those stipulated in Resolution **229 (Rev.WRC-19).** ~~based on system characteristics and interference criteria, than those stated in Recommendation ITU-R M.1638-0.~~ (WRC-1 9 ~~5~~)

6.3 Science services

(WRC-19, Agenda item 1.2): consider in-band power limits for earth stations operating in the mobile-satellite service, meteorological-satellite service and Earth exploration-satellite service in the frequency bands 401-403 MHz and 399.9-400.05 MHz

Background

42. The frequency bands 399.9-400.05 MHz and 401-403 MHz have traditionally been used by data collection systems in the mobile-satellite, meteorological-satellite and Earth exploration-satellite services in the Earth-to-space direction, typically operating using low power levels. A growing number of non-geostationary-satellite (non-GSO) systems are planned to use these bands for telecommand applications, which operate at higher power levels. Studies carried out by the ITU-R concluded that sharing was not feasible between these two type of applications without appropriate mitigation measures. WRC-19 considered regulatory changes to enable the use of these bands or part of these bands for telecommand applications, while protecting data collection system applications.

Discussion

43. WRC-19 added an e.i.r.p. density limit of 5 dBW in any 4 kHz in the frequency band 399.9-400.02 MHz. The limit does not apply until November 22, 2022 for systems notified and brought into use by November 22, 2019, allowing existing telecommand systems to continue their operations in the entire band, and new telecommand systems requiring a second 30 kHz channel, to operate for the next 3 years.

44. No limit is applied in the frequency range 400.02-400.05 MHz, providing one channel of 30 kHz that can be used indefinitely for telecommand operations.

45. In the frequency band 401-403 MHz, WRC-19 also added e.i.r.p. density limits of 7 dBW in any 4 kHz for non-GSO systems and of 22 dBW in any 4 kHz for geostationary and high elliptical orbit satellites. These limits do not apply until November 22, 2029 for systems notified and brought into use by November 22, 2019.

46. The provisions adopted by WRC-19 are proposed below for the Canadian Table of Frequency Allocations.

Table 19: Summary of proposed changes to the Canadian Table 399.9-400.05 MHz

MHz	Frequency allocations
399.9-400.05	MOBILE-SATELLITE (Earth-to-space) 5.209 ADD 5.260A ADD 5.260B 5.220 C19

ADD

5.260A In the frequency band 399.9-400.05 MHz, the maximum e.i.r.p. of any emission of earth stations in the mobile-satellite service shall not exceed 5 dBW in any 4 kHz band and the maximum e.i.r.p. of each earth station in the mobile-satellite service shall not exceed 5 dBW in the whole 399.9-400.05 MHz frequency band. Until 22 November 2022, this limit shall not apply to satellite systems for which complete notification information has been received by the Radiocommunication Bureau by 22 November 2019 and that have been brought into use by that date. After 22 November 2022, these limits shall apply to all systems within the mobile-satellite service operating in this frequency band.

In the frequency band 399.99-400.02 MHz, the e.i.r.p. limits as specified above shall apply after 22 November 2022 to all systems within the mobile-satellite service. Administrations are requested that their mobile- satellite service satellite links in the

399.99-400.02 MHz frequency band comply with the e.i.r.p. limits as specified above, after 22 November 2019. (WRC-19)

ADD **5.260B** In the frequency band 400.02-400.05 MHz, the provisions of No. **5.260A** are not applicable for telecommand uplinks within the mobile-satellite service. (WRC-19)

Table 20: Summary of proposed changes to the Canadian Table 401-402 MHz

MHz	Frequency allocations
401-402	METEOROLOGICAL AIDS SPACE OPERATION (space-to-Earth) EARTH EXPLORATION-SATELLITE (Earth-to-space) METEOROLOGICAL-SATELLITE (Earth-to-space) Fixed Mobile except aeronautical mobile ADD 5.264A ADD 5.264B

ADD **5.264A** In the frequency band 401-403 MHz, the maximum e.i.r.p. of any emission of each earth station in the meteorological-satellite service and the Earth exploration-satellite service shall not exceed 22 dBW in any 4 kHz band for geostationary-satellite systems and non-geostationary-satellite systems with an orbit of apogee equal or greater than 35 786 km.

The maximum e.i.r.p. of any emission of each earth station in the meteorological-satellite service and the Earth exploration-satellite service shall not exceed 7 dBW in any 4 kHz band for non-geostationary-satellite systems with an orbit of apogee lower than 35 786 km.

The maximum e.i.r.p. of each earth station in the meteorological-satellite service and the Earth exploration- satellite service shall not exceed 22 dBW for geostationary-satellite systems and non-geostationary-satellite systems with an orbit of apogee equal or greater than 35 786 km in the whole 401-403 MHz frequency band. The maximum e.i.r.p. of each earth station in the meteorological-satellite service and the Earth exploration-satellite service shall not exceed 7 dBW for non-geostationary-satellite systems with an orbit of apogee lower than 35 786 km in the whole 401-403 MHz frequency band.

Until 22 November 2029, these limits shall not apply to satellite systems for which complete notification information has been received by the

Radiocommunication Bureau by 22 November 2019 and that have been brought into use by that date. After 22 November 2029, these limits shall apply to all systems within the meteorological-satellite service and the Earth exploration-satellite service operating in this frequency band. (WRC-19)

ADD **5.264B** Non-geostationary-satellite systems in the meteorological-satellite service and the Earth exploration- satellite service for which complete notification information has been received by the Radiocommunication Bureau before 28 April 2007 are exempt from provisions of No. **5.264A** and may continue to operate in the frequency band 401.898-402.522 MHz on a primary basis without exceeding a maximum e.i.r.p. level of 12 dBW. (WRC-19)

(WRC-19, Agenda item 1.7): spectrum needs for telemetry, tracking and command in the space operation service for non-geostationary-satellites with short duration missions, to assess the suitability of existing allocations to the space operation service and, if necessary, to consider new allocations

Background

47. A growing number of non- geostationary-satellite orbit (GSO) systems are being built and launched in short timelines, and have short mission durations of less then three years. These short timelines resulted in difficulties with the process of resolution of difficulties under No. **9.3**, and coordination procedures under **9.11A**. To circumvent these difficulties, many satellite systems were filed under No. **4.4**, notably in the frequency bands allocated to the amateur and amateur-satellite services. Under WRC-19 agenda item 7, issue I, WRC-19 considered creating a new regulatory regime for satellite systems with short duration missions. Under WRC-19 agenda item 1.7, WRC-19 considered the identification of frequency bands under 1 GHz for use by short duration missions under this new regime.

Discussion

48. The space operation service (space-to-Earth) allocation in the 137-138 MHz frequency band and space operation service (Earth-to-space) allocation in the 148-149.9 MHz frequency band were identified for use by short duration missions on a secondary basis.

49. Under the new provisions, short duration missions can use these frequency allocations without the requirement to coordinate under No. **9.11A**. In the frequency band 148-149.9 MHz, the requirement to seek agreement under No. **9.21** does not apply for short duration missions that do not exceed a power flux-density of -149 dB(W/(m^2·4 kHz)) at the

border of a list of countries, mostly Regional Commonwealth in the Field of Communications (RCC) countries and some within Asia. ISED proposes to adopt the decision of the WRC-19 in the Canadian Table.

Table 21: Summary of proposed changes to the Canadian Table 137-138 MHz

MHz	Frequency allocations
137-13 7.175 ~~8~~	METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 5.208A 5.208B 5.209 SPACE OPERATION (space-to-Earth) ADD 5.203C SPACE RESEARCH (space-to-Earth) 5.208
137.175-137.825	METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 5.208A 5.208B 5.209 SPACE OPERATION (space-to-Earth) ADD 5.203C ADD 5.209A SPACE RESEARCH (space-to-Earth) 5.208
137.825-138	METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 5.208A 5.208B 5.209 SPACE OPERATION (space-to-Earth) ADD 5.203C SPACE RESEARCH (space-to-Earth) 5.208

ADD **5.203C** The use of the space operation service (space-to-Earth) with non-geostationary-satellite short-duration mission systems in the frequency band 137-138 MHz is subject to Resolution **660 (WRC-19)**. Resolution **32 (WRC-19)** applies. These systems shall not cause harmful interference to, or claim protection from, the existing services to which the frequency band is allocated on a primary basis. (WRC-19)

ADD **5.209A** The use of the frequency band 137.175-137.825 MHz by non-geostationary-satellite systems in the space operation service identified as short-duration mission in accordance with Appendix **4** is not subject to No. **9.11A.** (WRC-19)

Table 22: Summary of proposed changes to the Canadian Table 148-149.9 MHz

MHz	Frequency allocations
148-149.9	FIXED LAND MOBILE MOBILE-SATELLITE (Earth-to-space) 5.209 C26 5.218 ADD 5.218A MOD 5.219

ADD **5.218A** The frequency band 148-149.9 MHz in the space operation service (Earth-to-space) may be used

by non-geostationary-satellite systems with short-duration missions. Non-geostationary-satellite systems in the space operation service used for a short-duration mission in accordance with Resolution **32 (WRC-19)** of the Radio Regulations are not subject to agreement under No. **9.21**. At the stage of coordination, the provisions of Nos. **9.17** and **9.18** also apply. In the frequency band 148-149.9 MHz, non-geostationary-satellite systems with short-duration missions shall not cause unacceptable interference to, or claim protection from, existing primary services within this frequency band, or impose additional constraints on the space operation and mobile satellite services. In addition, earth stations in non-geostationary-satellite systems in the space operation service with short-duration missions in the frequency band 148-149.9 MHz shall ensure that the power flux-density does not exceed −149 dB(W/(m^2 · 4 kHz)) for more than 1% of time at the border of the territory of the following countries: Armenia, Azerbaijan, Belarus, China, Korea (Rep. of), Cuba, Russian Federation, India, Iran (Islamic Republic of), Japan, Kazakhstan, Malaysia, Uzbekistan, Kyrgyzstan, Thailand and Viet Nam. In case this power flux-density limit is exceeded, agreement under No. **9.21** is required to be obtained from countries mentioned in this footnote. (WRC-19)

MOD **5.219** The use of the frequency band 148-149.9 MHz by the mobile-satellite service is subject to coordination under No. **9.11A**. The mobile-satellite service shall not constrain the development and use of the fixed, mobile and space operation services in the frequency band 148-149.9 MHz. The use of the frequency band 148-149.9 MHz by non-geostationary-satellite systems in the space operation service identified as short-duration mission is not subject to No. **9.11A**. (WRC-19)

6.4 Satellite services

(WRC-19, Agenda item 1.5): consider the use of the frequency bands 17.7-19.7 GHz (space-to-Earth) and 27.5-29.5 GHz (Earth-to-space) by earth stations in motion (ESIM) communicating with geostationary space stations in the fixed-satellite service

Background

50. There has been a growing demand for broadband communications, and this includes requirements for users on vessels, aircraft and vehicles at fixed locations and while in motion. Earth Stations in Motion

(ESIMs) currently serve a wide range of applications on-board aircraft and ships, as well as on land, and the number of users and data requirements are growing.

51. In considering the use of specific spectrum to provide the envisioned services to various types of ESIMs, the sharing and compatibility between ESIMs operating with geostationary-satellite orbit (GSO) FSS networks and current and planned stations of existing services allocated in the spectrum was studied to ensure protection of these services.

Discussion

52. WRC-19 adopted a new footnote subjecting ESIMs in the frequency bands 17.7-19.7 GHz and 27.5-29.5 GHz to new Resolution **169 (WRC-19)**. The new Resolution allows the operation of ESIMs while protecting services to which the bands are allocated, including satellite and terrestrial services.

53. For maritime ESIMs, Resolution **169 (WRC-19)** specifies a minimum distance of 70 km from the low-water mark beyond which they can operate in order to protect terrestrial services. For land ESIMs, the Resolution includes a clause stating that they shall not cause unacceptable interference to terrestrial services in neighbouring countries.

54. For the protection of non-GSO FSS systems in the band 27.5-28.6 GHz, WRC-19 agreed on an e.i.r.p. density limit of 24.44 dB(W/14 MHz). With regard to protecting non-GSO mobile-satellite service (MSS) feeder links, a set of provisions was included in the Resolution to facilitate coordination discussions.

55. Finally, changes were made to Appendix **4** to include the new requirement to notify ESIMs, including commitments to adhere to the regulations, to not cause unacceptable interference, and, specifically, to meet pfd limits.

56. By adopting these regulatory additions in the Canadian Table, both satellite and terrestrial stakeholders in Canada will have a framework for the operation of ESIMs and the protection of services in these bands.

57. ISED proposes to adopt the above modifications in the Canadian Table.

Table 23: Summary of proposed changes to the Canadian Table 17.7-19.7 GHz

GHz	Frequency allocations

17.7-17.8	FIXED C45 FIXED-SATELLITE (space-to-Earth) (Earth-to-space) 5.516 5.517 ADD 5.517A C43 BROADCASTING-SATELLITE C46 5.515
17.8-18.1	FIXED FIXED-SATELLITE (space-to-Earth) (Earth-to-space) 5.484A 5.516 ADD 5.517A C43 5.519 C16D
18.1-18.4	FIXED FIXED-SATELLITE (space-to-Earth) (Earth-to-space) 5.484A MOD 5.516B ADD 5.517A 5.520 C43 5.519 C16D C16E
18.4-18.58	FIXED FIXED-SATELLITE (space-to-Earth) 5.484A MOD 5.516B ADD 5.517A C16E
18.58-18.6	FIXED-SATELLITE (space-to-Earth) 5.484A MOD 5.516B ADD 5.517A Fixed
18.6-18.8	EARTH EXPLORATION-SATELLITE (passive) FIXED-SATELLITE (space-to-Earth) MOD 5.516B ADD 5.517A 5.522B SPACE RESEARCH (passive) Fixed 5.522A
18.8-19.3	FIXED-SATELLITE (space-to-Earth) MOD 5.516B ADD 5.517A 5.523A C16K Fixed
19.3-19.7	FIXED FIXED-SATELLITE (space-to-Earth) ADD 5.517A 5.523C 5.523D 5.523E C46A C16D

MOD

5.516B The following bands are identified for use by high-density applications in the fixed-satellite service ~~(HDFSS)~~:

17.3-17.7 GHz
(space-to-Earth) in Region 1,
18.3-19.3 GHz
(space-to-Earth) in Region 2,
19.7-20.2 GHz
(space-to-Earth) in all Regions,
39.5-40 GHz
(space-to-Earth) in Region 1,
40-40.5 GHz
(space-to-Earth) in all Regions,
40.5-42 GHz
(space-to-Earth) in Region 2,
47.5-47.9 GHz
(space-to-Earth) in Region 1,
48.2-48.54 GHz

(space-to-Earth) in Region 1,
49.44-50.2 GHz
(space-to-Earth) in Region 1
and
27.5-27.82 GHz
(Earth-to-space) in Region 1,
28.35-28.45 GHz
(Earth-to-space) in Region 2,
28.45-28.94 GHz
(Earth-to-space) in all Regions,
28.94-29.1 GHz
(Earth-to-space) in Region 2 and 3,
29.25-29.46 GHz
(Earth-to-space) in Region 2,
29.46-30 GHz
(Earth-to-space) in all Regions,
48.2-50.2 GHz
(Earth-to-space) in Region 2.

This identification does not preclude the use of these frequency bands by other fixed satellite service applications or by other services to which these frequency bands are allocated on a co-primary basis and does not establish priority in these Radio Regulations among users of the frequency bands. Administrations should take this into account when considering regulatory provisions in relation to these frequency bands. See Resolution **143 (WRC-19 ~~03~~)**. (WRC-19 ~~03~~)

ADD **5.517A** The operation of earth stations in motion communicating with geostationary fixed-satellite service space stations within the frequency bands 17.7-19.7 GHz (space-to-Earth) and 27.5-29.5 GHz (Earth-to-space) shall be subject to the application of Resolution **169 (WRC-19)**. (WRC-19).

(WRC-19, Agenda item 1.6): consider the development of a regulatory framework for non-geostationary (GSO) fixed satellite service (FSS) satellite systems that may operate in the frequency bands 37.5-39.5 GHz (space-to-Earth), 39.5-42.5 GHz (space-to-Earth), 47.2-50.2 GHz (Earth-to-space) and 50.4-51.4 GHz (Earth-to-space)

Background

58. Historically, there were no regulatory provisions for sharing between non-GSO FSS systems and GSO networks or mechanisms requiring coordination between non-GSO systems operating in the Q/V (between 33-75 GHz) bands. As such, the ITU-R studied technical limits

and regulatory provisions to enable the deployment of new non-GSO FSS constellations in these bands. As well, since regulatory limits in Resolution **750 (Rev. WRC-15**) to protect the Earth exploration-satellite service (EESS) (passive) only applied to non-GSO FSS systems, the ITU-R developed new limits to protect the EESS (passive) from both GSO and non-GSO FSS networks and systems.

Discussion

59. WRC-19 developed technical limits that balance the twin goals of protecting GSO networks from the single entry (No. **22.5L**) and aggregate emissions (No. **22.5M**) of non-GSO systems, and allowing non-GSO FSS systems to share the bands under study (Q/V bands). Non-GSO FSS systems are now subject to coordination under No. **9.12**, thereby providing a framework for the deployment of multiple non-GSO FSS systems in these bands.

60. As well, non-GSO mobile-satellite service (MSS) systems are included in the non-GSO framework given their technical similarity to non-GSO FSS systems. As such, non-GSO MSS systems operating in the frequency band 39.5-40.5 GHz must protect GSO networks as per No. **22.5L** (single-entry protection requirements) and must coordinate with both non-GSO FSS and MSS systems under Article **9.12**. For non-GSO FSS systems notified before the end of WRC-19, new Resolution **771 (WRC-19)** on transitional measures applies. The frequency assignments for these systems must be brought into use prior to 23 November 2022 or the end of the regulatory period specified in No. **11.44** (whichever comes first); failure to do so will result in their suppression.

61. WRC-19 also updated the unwanted emission limits for both GSO and non-GSO FSS networks and systems in the frequency bands adjacent to the EESS (passive) band at 50.2-50.4 GHz. The new limits will only apply to GSO and non-GSO earth stations brought into use after 1 January 2024 and the date of entry into force of the Final Acts of WRC-19, respectively. ISED proposes to adopt the decisions made by WRC-19 in the Canadian Table.

Table 24: Summary of proposed changes to the Canadian Table 37.5-42.5 GHz

GHz	Frequency allocations
37.5-38	FIXED FIXED-SATELLITE (space-to-Earth) ADD 5.550C MOBILE except aeronautical mobile SPACE RESEARCH (space-to-Earth) Earth exploration-satellite (space-to-Earth) 5.547 C51

38-39.5	FIXED FIXED-SATELLITE (space-to-Earth) ADD 5.550C MOBILE Earth exploration-satellite (space-to-Earth) 5.547 C51
39.5-40	FIXED FIXED-SATELLITE (space-to-Earth) 5.516B ADD 5.550C MOBILE MOBILE-SATELLITE (space-to-Earth) C50 Earth exploration-satellite (space-to-Earth) 5.547 ADD 5.550E C51
40-40.5	EARTH EXPLORATION-SATELLITE (Earth-to-space) FIXED FIXED-SATELLITE (space-to-Earth) 5.516B ADD 5.550C MOBILE MOBILE-SATELLITE (space-to-Earth) C50 SPACE RESEARCH (Earth-to-space) Earth exploration-satellite (space-to-Earth) ADD 5.550E
40.5-41	FIXED FIXED-SATELLITE (space-to-Earth) 5.516B ADD 5.550C BROADCASTING BROADCASTING-SATELLITE Mobile Mobile-satellite (space-to-Earth) 5.547
41-42.5	FIXED FIXED-SATELLITE (space-to-Earth) 5.516B ADD 5.550C BROADCASTING BROADCASTING-SATELLITE Mobile 5.547 5.551H 5.551I

ADD **5.550C** The use of the frequency bands 37.5-39.5 GHz (space-to-Earth), 39.5-42.5 GHz (space-to-Earth), 47.2-50.2 GHz (Earth-to-space) and 50.4-51.4 GHz (Earth-to-space) by a non-geostationary-satellite system in the fixed- satellite service is subject to the application of the provisions of No. **9.12** for coordination with other non-geostationary-satellite systems in the fixed-satellite service but not with non-geostationary-satellite systems in other services. Resolution **770 (WRC-19)** shall also apply, and No. **22.2** shall continue to apply. (WRC-19)

ADD **5.550E** The use of the frequency bands 39.5-40 GHz and 40-40.5 GHz by non-geostationary-satellite systems in the mobile-satellite service (space-to-Earth) and by non-geostationary-satellite systems in the fixed-satellite service (space-to-Earth) is subject to the application of the provisions of No. **9.12** for coordination with other non-geostationary-satellite systems in the fixed-satellite and mobile-satellite

services but not with non-geostationary-satellite systems in other services. No. **22.2** shall continue to apply for non-geostationary-satellite systems. (WRC-19)

Table 25: Summary of proposed changes to the Canadian Table 47.2-51.4 GHz

GHz	Frequency allocations
47.2-47.5	FIXED FIXED-SATELLITE (Earth-to-space) ADD 5.550C 5.552 MOBILE 5.552A C52
47.5-47.9	FIXED FIXED-SATELLITE (Earth-to-space) ADD 5.550C 5.552 MOBILE C52
47.9-48.2	FIXED FIXED-SATELLITE (Earth-to-space) ADD 5.550C 5.552 MOBILE 5.552A C52
48.2-50.2	FIXED FIXED-SATELLITE (Earth-to-space) 5.338A 5.516B ADD 5.550C 5.552 MOBILE 5.149 5.340 5.555
50.2-50.4	EARTH EXPLORATION-SATELLITE (passive) SPACE RESEARCH (passive) 5.340
50.4-51.4	FIXED FIXED-SATELLITE (Earth-to-space) MOD 5.338A ADD 5.550C MOBILE Mobile-satellite (Earth-to-space)

(WRC-19, Issue 9.1.9): Studies relating to spectrum needs and possible allocation of the frequency band 51.4-52.4 GHz to the fixed-satellite service (Earth-to-space)

Background

62. Satellite systems are increasingly being used to provide broadband communication services and connectivity to users worldwide. As a result, there is a need for access to an adequate amount of spectrum to facilitate the opportunity for next generation fixed satellite service (FSS)networks to deliver these broadband services. This agenda item was established to study the spectrum needs and potentially provide an allocation in the 51.4-52.4 GHz band for GSO FSS (Earth-to-space) in accordance with Resolution **162** (**WRC-15)**. Studies were conducted for both in-band and adjacent band services, which identified a need for

protection criteria for Earth exploration-satellite service (EESS) (passive) in the frequency band 52.6-54.25 GHz, as well as ensuring protection of the in-band services of fixed, mobile and radio astronomy.

Discussion

63. WRC-19 added an uplink allocation for FSS (Earth-to-space) in the frequency band 51-4-52.4 GHz, limited to geostationary-satellite orbit (GSO) gateways with an antenna size of 2.4 meters. In order to protect GSO EESS (passive) space stations, limits to unwanted emission levels from earth stations were added to Resolution **750.** ISED proposes to adopt these modifications in the Canadian Table.

Table 26: Summary of proposed changes to the Canadian Table 51.4-52.6 GHz

GHz	Frequency allocations
51.4-52.4 ~~6~~	FIXED FIXED-SATELLITE (Earth-to-space) ADD 5.555C MOBILE MOD 5.338A 5.547 5.556
52.4-52.6	FIXED MOD 5.338A MOBILE 5.547 5.556

ADD **5.555C** The use of the frequency band 51.4-52.4 GHz by the fixed-satellite service (Earth-to-space) is limited to geostationary-satellite networks. The earth stations shall be limited to gateway earth stations with a minimum antenna diameter of 2.4 metres. (WRC-19)

MOD **5.338A** In the frequency bands 1 350-1 400 MHz, 1 427-1 452 MHz, 22.55-23.55 GHz, 24.25-27.5 GHz, 30-31.3 GHz, 49.7-50.2 GHz, 50.4-50.9 GHz, 51.4-52.4 ~~6~~ GHz, 52.4-52.6 GHz, 81-86 GHz and 92-94 GHz, Resolution **750 (Rev.WRC-19 ~~12~~)** applies. (WRC-19 ~~12~~)

6.5 Modifications to international footnotes in the Canadian Table (WRC-19 Agenda item 8): Requests from administrations to delete their country name from footnotes

64. 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.

65. Based on the above, a number of international footnotes, also included in the Canadian Table, were modified at WRC-19 based upon proposals from administrations. ISED proposes to adopt the modifications to these footnotes as follows:

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-19~~2~~)

MOD **5.295** In the Bahamas, Barbados, Canada, the United States and Mexico, the frequency band 470-608 MHz, or portions thereof, is identified for International Mobile Telecommunications (IMT) – see Resolution **224 (Rev.WRC-19~~5~~)**. This identification does not preclude the use of these frequency bands by any application of the services to which they are allocated and does not establish priority in the ~~ITU~~ Radio Regulations. Mobile service stations of the IMT system within the frequency band are subject to agreement obtained under No. **9.21** and shall not cause harmful interference to, or claim protection from, the broadcasting service of neighbouring countries. Nos. **5.43** and **5.43A** apply. ~~In Mexico, the use of IMT in this frequency band will not start before 31 December 2018 and may be extended if agreed by the neighbouring countries.~~ (WRC-19~~5~~)

MOD **5.297** *Additional allocation*: in Canada, Costa Rica, Cuba, El Salvador, the United States, Guatemala, Guyana and Jamaica, the frequency band 512-608 MHz is also allocated to the fixed and mobile services on a primary basis, subject to agreement

obtained under No. **9.21**. In the Bahamas, Barbados and Mexico, the frequency band 512-608 MHz is also allocated to the mobile service on a primary basis, subject to agreement obtained under No. **9.21**. In Mexico, the frequency band 512-608 MHz is also allocated on a secondary basis to the fixed service (see No. **5.32**). (WRC-19)

MOD

5.308A In the Bahamas, Barbados, Belize, Canada, Colombia, the United States Guatemala and Mexico, the frequency band 614-698 MHz, or portions thereof, is identified for International Mobile Telecommunications (IMT) – see Resolution **224 (Rev.WRC-19)**. This identification does not preclude the use of these frequency bands by any application of the services to which they are allocated and does not establish priority in the Radio Regulations. Mobile service stations of the IMT system within the frequency band are subject to agreement obtained under No. **9.21** and shall not cause harmful interference to or claim protection from the broadcasting service of neighbouring countries. Nos. **5.43** and **5.43A** apply. ~~In Belize and Mexico, the use of IMT in this frequency band will not start before 31 December 2018 and may be extended if agreed by the neighbouring countries.~~ (WRC-19)

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, North Macedonia, 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-12 9)

MOD **5.389B** The use of the band 1 980-1 990 MHz by the mobile-satellite service shall not cause harmful interference to or constrain the development of the fixed and mobile services in Argentina, Brazil, Canada, Chile, Ecuador, the United States, Honduras, Jamaica, Mexico, Paraguay, Peru, Suriname, Trinidad and Tobago, Uruguay and Venezuela. (WRC-19)

Other footnotes modified at WRC-19 and relevant to the Canadian Table

66. WRC-19 also modified numerous footnotes, as well as certain entries in the International Table of Article **5** to correct editorial errors, inconsistencies or outdated provisions. It also updated references to ITU-R Recommendations incorporated by reference under Agenda item 2, and updated references to resolutions and recommendations reviewed under Agenda item 4. WRC-19 Agenda item 9.2 addressed, among other things, difficulties or inconsistencies encountered in the application of the ITU *Radio Regulations*, as reported by the Director of the Radiocommunication Bureau to the Conference.

67. ISED proposes to adopt all these modifications that are applicable to Canada in this edition of the Canadian Table. The following international footnotes are proposed, either for modification or suppression:

MOD **5.134** The use of the bands 5 900-5 950 kHz, 7 300-7 350 kHz, 9 400-9 500 kHz, 11 600-11 650 kHz, 12 050-12 100 kHz, 13 570-13 600 kHz, 13 800-13 870 kHz, 15 600-15 800 kHz, 17 480-17 550 kHz and 18 900-19 020 kHz by the broadcasting service is subject to the application of the procedure of Article **12**. Administrations are encouraged to use these frequency bands to facilitate the introduction of digitally modulated emissions in accordance with the provisions of Resolution **517 (Rev.WRC-19 07)**. (WRC-19 07)

MOD **5.242** Additional allocation: in Canada and Mexico, the band 216-220 MHz is also allocated to the land mobile service on a primary basis. (WRC-19)

MOD **5.265** In the frequency band 403-410 MHz, Resolution **205 (Rev.WRC-19 5)** applies. (WRC-19 5)

MOD **5.279A** The use of the is frequency band 432-438 MHz by sensors in the Earth exploration-satellite service (active) shall be in accordance with Recommendation ITU-R SA.1260-2 1. Additionally, the Earth exploration-satellite service (active) in the frequency band 432-438 MHz shall not cause

harmful interference to the aeronautical radionavigation service in China. The provisions of this footnote in no way diminish the obligation of the Earth exploration-satellite service (active) to operate as a secondary service in accordance with Nos. **5.29** and **5.30**. (WRC-19~~03~~)

MOD **5.286AA** The frequency band 450-470 MHz is identified for use by administrations wishing to implement International Mobile Telecommunications (IMT) - ~~.S~~ see Resolution **224 (Rev.WRC-19~~07~~)**. This identification does not preclude the use of this band by any application of the services to which it is allocated and does not establish priority in the Radio Regulations. (WRC-19~~07~~)

MOD **5.287** Use of the frequency bands 457.5125-457.5875 MHz and 467.5125-467.5875 MHz by the maritime mobile service is limited to on-board communication stations. The characteristics of the equipment and the channeling arrangement shall be in accordance with Recommendation ITU-R M.1174-4~~3~~. The use of these frequency bands in territorial waters is subject to the national regulations of the administration concerned. (WRC-19~~5~~)

MOD **5.317A** The se parts of the frequency band 698-960 MHz in Region 2 and the frequency band s 694-790 MHz in Region 1 and 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-12~~19~~)**, **760 (Rev.WRC-19)** and **749 (Rev.WRC-12~~19~~)**, as appropriate ~~where applicable~~. This identification does not preclude the use of these frequency bands by any application of the services to which they are allocated and does not establish priority in the Radio Regulations. (WRC-12~~19~~)

MOD **5.393** *Additional allocation:* in Canada, the United States and India, the frequency band 2 310-2 360 MHz is also allocated to the broadcasting-satellite service (sound) and complementary terrestrial sound broadcasting service on a primary basis. Such use is limited to digital audio broadcasting and is subject to the provisions of Resolution **528 (Rev.WRC-15~~9~~)**, with the exception of *resolves* 3 in regard to the limitation on broadcasting-satellite systems in the upper 25 MHz. Complementary terrestrial sound broadcasting stations shall be subject to bilateral coordination with neighbouring countries prior to their bringing into use. (WRC-15~~9~~)

SUP	5.396
SUP	5.562F
SUP	5.562G

6.6 Other modifications to the Canadian Table

68. This section proposes revisions to the Canadian Table to include the results of any applicable domestic spectrum policy decisions where no proposal was provided with respect to the modification of the Canadian Table to implement the decision, as well as revisions needed as a result of any inconsistencies found during the review of the previous CTFA. In particular, any footnote that is indicated as suppressed in the Canadian Table (Edition 2018) will be permanently removed from the new 2021 Edition. As such, the following Canadian footnotes will be permanently removed:

C39D and C47B.

a. **(WRC-15, Agenda Item 1.1): to consider additional spectrum allocations to the mobile service on a primary basis and identification of additional frequency bands for International Mobile Telecommunications (IMT) and related regulatory provisions, to facilitate the development of terrestrial mobile broadband applications, in accordance with Resolution 233 (WRC-12).**

69. ISED proposes to align the Canadian Table to reflect the results of Agenda item 1.1 from WRC-15. These modifications include the addition of 'except aeronautical mobile' to the mobile allocations in 3 450-3 700 MHz, and the addition of footnotes **5.431A**, **5.431B**, and **5.434** to the Canadian Table. Footnote **5.434** was updated at WRC-19 and this most recent version is included here.

70. In addition, ISED has recently released decisions on the technical and policy framework in the 3.5 GHz range through SLPB-001-19, *Decision on Revisions to the 3500 MHz Band to Accommodate Flexible Use and Preliminary Decisions on Changes to the 3800 MHz Band*; and SLPB-002-21, *Decision on the Technical and Policy Framework for the 3650-4200 MHz Band and Changes to the Frequency Allocation of the 3500-3650 MHz Band*. Changes to the Canadian table as a result of the decision are incorporated in the table below as adopted changes and are not open for consultation.

Table 27: Summary of proposed changes to the Canadian Table 3 450-3 700 MHz

GHz	Frequency allocations
3 450-3 475	FIXED MOBILE except aeronautical mobile ADD 5.431A ADD 5.431B Amateur
3 475-3 500	FIXED MOBILE except aeronautical mobile ADD 5.431A ADD 5.431B Amateur
3 500-3 650	FIXED MOBILE except aeronautical mobile ADD 5.431B ADD MOD 5.434
3 650-3 700	FIXED MOBILE except aeronautical mobile ADD MOD 5.434

ADD **5.431A** In Region 2, the allocation of the frequency band 3 400-3 500 MHz to the mobile, except aeronautical mobile, service on a primary basis is subject to agreement obtained under No.**9.21**. (WRC-15)

ADD **5.431B** In Region 2, the frequency band 3400-3600 MHz is identified for use by administrations wishing to implement International Mobile Telecommunications (IMT). This identification does not preclude the use of this frequency band by any application of the services to which it is allocated and does not establish priority in the Radio Regulations. At the stage of coordination the provisions of Nos. **9.17** and **9.18** also apply. Before an administration brings into use a base or mobile station of an IMT system, it shall seek agreement under No. **9.21** with other administrations and ensure that the power flux-density (pfd) produced at 3m above ground does not exceed −154.5 dB(W/(m^2·4kHz)) for more than 20% of time at the border of the territory of any other administration. This limit may be exceeded on the territory of any country whose administration has so agreed. In order to ensure that the pfd limit at the border of the territory of any other administration is met, the calculations and verification shall be made, taking into account all relevant information, with the mutual agreement of both administrations (the administration responsible for the terrestrial station and the administration responsible for the earth station), with the assistance of the Bureau if so requested. In case of disagreement, the calculation and verification of the pfd shall be made by the Bureau, taking into account the information referred to above. Stations of the mobile service, including IMT systems, in the frequency band 3 400-3600MHz shall not claim more protection from space stations

than that provided in Table **21-4** of the Radio Regulations (Edition of 2004). (WRC-15)

ADD MOD **5.434** In Canada, Chile, Colombia, Costa Rica, El Salvador, and the United States and Paraguay, the frequency band 3 600-3 700 MHz, or portions thereof, is identified for use by these administrations wishing to implement International Mobile Telecommunications (IMT). This identification does not preclude the use of this frequency band by any application of the services to which it is allocated and does not establish priority in the Radio Regulations. At the stage of coordination the provisions of Nos. **9.17** and **9.18** also apply. Before an administration brings into use a base or mobile station of an IMT system, it shall seek agreement under No. **9.21** with other administrations and ensure that the power flux-density (pfd) produced at 3 m above ground does not exceed −154.5 dB(W/(m^2 · 4 kHz)) for more than 20% of time at the border of the territory of any other administration. This limit may be exceeded on the territory of any country whose administration has so agreed. In order to ensure that the pfd limit at the border of the territory of any other administration is met, the calculations and verification shall be made, taking into account all relevant information, with the mutual agreement of both administrations (the administration responsible for the terrestrial station and the administration responsible for the earth station), with the assistance of the Bureau if so requested. In case of disagreement, the calculation and verification of the pfd shall be made by the Bureau, taking into account the information referred to above. Stations of the mobile service, including IMT systems, in the frequency band 3 600-3 700 MHz shall not claim more protection from space stations than that provided in Table **21-4** of the Radio Regulations (Edition of 2004). (WRC-15~~9~~)

b. **Removal of historical allocation to the mobile satellite service in the frequency band 806-890 MHz**

71. In 1987, the World Administrative Radiocommunication Conference for the Mobile services introduced an additional allocation to the mobile satellite service (MSS) in the frequency band 806-890 MHz in Region 2. The use of this MSS allocation was intended for operations within national boundaries and subject to agreement obtained under No. **9.21**.

72. The conditions associated with the use of this allocation and in particular the limitation of operations within national boundaries as well as the requirements to seek agreement of affected administrations

makes it difficult to implement MSS in this band in Canada. Since 1987, several spectrum policies have been adopted leading to extensive use by other allocated services, especially stations of the mobile service, that may not be compatible with the deployment and use of the MSS in the band 806-890 MHz. In this context, ISED proposes to remove the reference to No. **5.317** from the CTFA to clearly indicate that the band 806-890 MHz is not available for MSS operations in Canada.

Table 28: Summary of proposed changes to the Canadian Table 806-890 MHz

MHz	Frequency allocations
806-890	MOBILE 5.317A C7 Fixed ~~5.317~~ 5.318

SUP 5.317

▼ 7. Other WRC-19 agenda items and issues

73. There were several WRC-19 agenda items and issues that did not impact the Canadian Table.

74. Six WRC-19 agenda items resulted in no change to Article **5** of the *Radio Regulations* and therefore have no impact on the Canadian Table:

WRC-19, Agenda item 1.1: consider an allocation of the frequency band 50-54 MHz to the amateur service in Region 1

75. WRC-19 adopted an allocation for Region 1 to the Amateur Radio Service in the frequency band 50-52 MHz on a secondary basis. Fourteen European administrations opted by footnote to make the first 500 kHz segment, 50-50.5 MHz, primary. In Africa and the Middle-East, several administrations added their names to an existing footnote whereby nine African administrations already had a primary allocation to the Amateur Radio Service in the frequency band 50-54 MHz. Together with other administrations who have authorized one or two MHz on a primary basis, a total of 29 African and Middle Eastern administrations now have a primary allocation in all or part of the frequency band 50-54 MHz. As this was a Region 1 issue, no modifications to the Canadian Table are proposed.

WRC-19, Agenda item 1.3: possible upgrading of the secondary allocation to the meteorological-satellite service (space-to-Earth) to primary status and a possible primary allocation to the Earth exploration-satellite service (space-to-Earth) in the frequency band 460-470 MHz

76. WRC-19 decided on no change in the frequency band 460-470 MHz. As a result, no modifications are proposed in the Canadian Table.

WRC-19, Agenda item 1.4: to consider the results of studies in accordance with Resolution 557 (WRC-15), and review, and revise if necessary, the limitations mentioned in Annex 7 to Appendix 30 (Rev. WRC-15), while ensuring the protection of, and without imposing additional constraints on, assignments in the Plan and the List and the future development of the broadcasting-satellite service within the Plan, and existing and planned fixed-satellite service networks

77. At WRC-19, it was agreed to remove some of the limitations in Annex 7 to Appendix **30** and adopt temporary regulatory measures to assist developing countries with access to the new spectrum resources via a new Resolution **559 (WRC-19)**. No modifications are necessary to the Canadian Table.

WRC-19, Agenda Item 1.10: spectrum needs and regulatory provisions for the introduction and use of the Global Aeronautical Distress and Safety System (GADSS)

78. WRC-19 concluded that existing radiocommunication service allocations and provisions were sufficient to satisfy the current requirements of GADSS. In line with that decision, ISED does not propose any modifications to the Canadian Table.

WRC-19, Agenda item 1.11: facilitate global or regional harmonized frequency bands to support railway radiocommunication systems between train and trackside within existing mobile service allocations

79. A new resolution, Resolution **240 (WRC-19),** that encourages administrations to consider the study results, as well as other relevant ITU-R Recommendations/Reports, with the view to facilitate spectrum harmonization for railway radiocommunication systems between train and trackside (RSTT) was adopted. This new resolution also invites the ITU-R to continue the work related to RSTT. Since this does not impact the Canadian Table, so no modifications are proposed.

WRC-19, Agenda item 1.12: consider possible global or regional harmonized frequency bands for the implementation of evolving Intelligent Transport Systems (ITS) under existing mobile service allocations

80. A new recommendation, Recommendation **208,** was approved at WRC-19 that encourages administrations to use globally or regionally harmonized frequency bands, or parts thereof, when planning and deploying evolving ITS applications and to take into account

coexistence issues between ITS stations and stations of existing services. This does not impact the Canadian Table of Frequency Allocations, so no modifications are proposed.

81. Several WRC-19 agenda items and issues concluded with modifications to Articles or Appendices of the *Radio Regulations* that do not impact the Canadian Table of Frequency Allocations:

WRC-19, Agenda item 1.9.1: regulatory actions within the frequency band 156-162.05 MHz for autonomous maritime radio devices to protect the global maritime distress and safety system and automatic identifications system

82. Recognizing the benefit of these devices to scientific, fishing, and recreational activities, WRC-19 took a decision to identify one frequency within the maritime mobile service for these type of applications in Appendix **18** of the ITU *Radio Regulations*. No modifications to the Canadian Table are required because the table already contains the appropriate references to Appendix **18**.

WRC-19, Agenda Item 7: to consider possible changes, and other options, in response to Resolution 86 (Rev. Marrakesh, 2002) of the Plenipotentiary Conference, an advance publication, coordination, notification and recording procedures for frequency assignments pertaining to satellite networks, in accordance with Resolution 86 (Rev.WRC-07), in order to facilitate rational, efficient and economical use of radio frequencies and any associated orbits, including the geostationary satellite orbit

83. WRC-19 addressed 17 issues in relation to this agenda item. Several modifications were made to the procedures in Articles **9**, **11,** Appendices **30, 30A** and **30B** of the *Radio Regulations* to clarify and simplify them while preserving their integrity. Some of these new and revised provisions also represent an important step towards addressing the deficiencies identified by WRC-15. No modifications to the Canadian Table are required.

▼ 8. Next steps

84. ISED intends to review the comments received and publish its decision on the proposals made in this consultation. Following the publication of a decision, ISED will finalize and publish the updated Canadian Table of Frequency Allocations.

▼ 9. Submitting comments

85. Respondents are requested to provide their comments in electronic format (Microsoft Word or Adobe PDF) by email.

86. In addition, respondents are asked to specify table numbers or WRC-19 agenda item numbers for ease of referencing. Respondents are requested to provide supporting arguments and rationale for each response. Additionally, respondents are requested to take the Canadian context into consideration in their response.

87. Paper submissions should be mailed to the following address:

Innovation, Science and Economic Development Canada
Senior Director, Spectrum Planning and Engineering
Engineering, Planning and Standards Branch
235 Queen Street, (6th Floor, East Tower)
Ottawa ON K1A 0H5

88. All submissions should cite the Canada Gazette, Part I, the publication date, the title and the notice reference number (SMSE-006-22). Parties should submit their comments no later than March 21, 2022, to ensure consideration. Soon after the close of the comment period, all comments received will be posted on ISED's Spectrum management and telecommunications website.

▼ 10. Obtaining copies

89. All spectrum related documents referred to in this paper are available on ISED's Spectrum management and telecommunications website.

Date modified:
2022-01-13