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| **World Radiocommunication Conference (WRC-15) Geneva, 2–27 November 2015** |  |
| **INTERNATIONAL TELECOMMUNICATION UNION** |  |
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| PLENARY MEETING | **Document 347-E** |
| **B9** | **19 November 2015** |
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| Ninth SERIES OF TEXTS SUBMITTED BY  EDITORIAL COMMITTEE TO THE PLENARY MEETING | |
| The following texts are submitted to the Plenary Meeting for **first reading:** | |

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| --- | --- | --- | --- |
| **Source** | **Document** | **Title** | **Agenda item** |
| COM6 | [320](http://www.itu.int/net4/proposals/WRC15//Detail/Index?idProposal=32550) | **ARTICLE 5** 148-223 MHz | 9.2 |
| COM4 | [315](http://www.itu.int/net4/proposals/WRC15//Detail/Index?idProposal=32572) | 148-223 MHz | 1.16 |
|  |  | 5.A116 |  |
| COM6 | [320](http://www.itu.int/net4/proposals/WRC15//Detail/Index?idProposal=32551) | 5.220 | 9.2 |
|  |  | 5.222 |  |
|  |  | 5.223 |  |
|  |  | 5.224A |  |
|  |  | 5.224B |  |
|  |  | 335.4-410 MHz |  |
|  |  | 5.260 |  |
|  |  | 5.279A |  |
| COM4 | [326](http://www.itu.int/net4/proposals/WRC15//Detail/Index?idProposal=32580) | 5.296 | 1.2 |
| COM6 | [320](http://www.itu.int/net4/proposals/WRC15//Detail/Index?idProposal=32559) | 5.316A | 9.2 |
| COM4 | [326](http://www.itu.int/net4/proposals/WRC15//Detail/Index?idProposal=32579) | 5.325A | 1.1 |
| COM6 | [320](http://www.itu.int/net4/proposals/WRC15//Detail/Index?idProposal=32560) | 5.362C | 9.2 |
|  |  | 5 570-7 250 MHz |  |
|  |  | 5.458C |  |
|  |  | 5.562D |  |
| COM4 | [314](http://www.itu.int/net4/proposals/WRC15//Detail/Index?idProposal=32545) | **ARTICLE 52** 52.221 |  |
|  |  | 52.221A |  |
|  | [326](http://www.itu.int/net4/proposals/WRC15//Detail/Index?idProposal=32581) | **APPENDIX 4** TABLE 1 |  |
|  | [315](http://www.itu.int/net4/proposals/WRC15//Detail/Index?idProposal=32574) | APPENDIX 18 | 1.16 |
| COM6 | [320](http://www.itu.int/net4/proposals/WRC15//Detail/Index?idProposal=32565) | APPENDIX 26 | 9.2 |
|  |  | APPENDIX 42 |  |
|  | [329](http://www.itu.int/net4/proposals/WRC15//Detail/Index?idProposal=32592) | RESOLUTION 76 | 4 |
|  |  | RESOLUTION 140 |  |
| COM5 | [336](http://www.itu.int/net4/proposals/WRC15//Detail/Index?idProposal=32608) | RESOLUTION 154 | 9.1(9.1.5) |
| COM6 | [329](http://www.itu.int/net4/proposals/WRC15//Detail/Index?idProposal=32594) | RESOLUTION 418 | 4 |
|  |  | RESOLUTION 553 |  |
|  |  | RESOLUTION 555 |  |

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**Annex:** 42 pages

ANNEX

ARTICLE 5

Frequency allocations

Section IV – Table of Frequency Allocations  
(See No. 2.1)

MOD B9/347/1#32550

148-223 MHz

|  |  |  |
| --- | --- | --- |
| Allocation to services | | |
| Region 1 | Region 2 | Region 3 |
| 149.9-150.05 MOBILE-SATELLITE (Earth-to-space) 5.209  MOD 5.220 | | |

MOD B9/347/2#32572

148-223 MHz

|  |  |  |
| --- | --- | --- |
| Allocation to services | | |
| Region 1 | Region 2 | Region 3 |
| … | | |
| 156.8375-161.9375  FIXED  MOBILE except aeronautical mobile | 156.8375-161.9375  FIXED  MOBILE | |
| 5.226 | 5.226 | |
| 161.9375-**161.9625**  FIXED  MOBILE except aeronautical mobile  Maritime mobile-satellite (Earth-to-space) ADD 5.A116 | 161.9375-**161.9625**  FIXED  MOBILE  Maritime mobile-satellite (Earth-to-space) ADD 5.A116 | |
| 5.226 | 5.226 | |
| … | | |
| **161.9875-162.0125**  FIXED  MOBILE except aeronautical mobile  Maritime mobile-satellite (Earth-to-space) ADD 5.A116 | **161.9875-162.0125**  FIXED  MOBILE  Maritime mobile-satellite (Earth-to-space) ADD 5.A116 | |
| 5.226 5.229 | 5.226 | |
| ... | | |

ADD B9/347/3#32573

5.A116 The use of the frequency bands 161.9375-161.9625 MHz and 161.9875-162.0125 MHz by the maritime mobile-satellite (Earth-to-space) service is limited to the systems which operate in accordance with Appendix **18**.     (WRC‑15)

MOD B9/347/4#32551

5.220 The use of the frequency bands 149.9-150.05 MHz and 399.9-400.05 MHz by the mobile-satellite service is subject to coordination under No. **9.11A**.     (WRC-15)

SUP B9/347/5#32552

5.222

SUP B9/347/6#32553

5.223

SUP B9/347/7#32554

5.224A

SUP B9/347/8#32555

5.224B

MOD B9/347/9#32556

335.4-410 MHz

|  |  |  |
| --- | --- | --- |
| Allocation to services | | |
| Region 1 | Region 2 | Region 3 |
| 399.9-400.05 MOBILE-SATELLITE (Earth-to-space) 5.209    MOD 5.220 | | |

SUP B9/347/10#32557

5.260

MOD B9/347/11#32558

5.279A The use of the frequency band 432-438 MHz by sensors in the Earth exploration-satellite service (active) shall be in accordance with Recommendation ITU‑R RS.1260‑1. 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‑15)

MOD B9/347/12#32580

5.296 *Additional allocation:* in Albania, Germany, Saudi Arabia, Austria, Bahrain, Belgium, Benin, Bosnia and Herzegovina, Bulgaria, Burkina Faso, Burundi, Cameroon, Vatican, Congo (Rep. of the), Côte d'Ivoire, Croatia, Denmark, Djibouti, Egypt, United Arab Emirates, Spain, Estonia, Finland, France, Gabon, Georgia, Ghana, Iraq, Ireland, Iceland, Israel, Italy, Jordan, Kenya, Kuwait, Latvia, The Former Yugoslav Republic of Macedonia, Lebanon, Libya, Liechtenstein, Lithuania, Luxembourg, Mali, Malta, Mauritania, Morocco, Moldova, Monaco, Niger, Norway, Oman, Uganda, the Netherlands, Poland, Portugal, Qatar, the Syrian Arab Republic, Slovakia, the Czech Republic, the United Kingdom, Rwanda, Serbia, Sudan, Sweden, Switzerland, Swaziland, Chad, Togo, Tunisia, Turkey, Angola, Botswana, Lesotho, Malawi, Mauritius, Mozambique, Namibia, Nigeria, South Africa, Tanzania, Zambia and Zimbabwe, the frequency band 470-694 MHz is also allocated on a secondary basis to the land mobile service, intended for applications ancillary to broadcasting and programme**‑**making. Stations of the land mobile service in the countries listed in this footnote shall not cause harmful interference to existing or planned stations operating in accordance with the Table in countries other than those listed in this footnote.    (WRC‑15)

*[NOTE FROM SECRETARIAT – To facilitate the consideration of this modification the countries names would be rearranged in the French alphabetical order after its final consideration]*

SUP B9/347/13#32559

5.316A

MOD B9/347/14#32579

5.325A *Different category of service:*  in Brazil, Costa Rica, Cuba, Dominican Republic, El Salvador, Ecuador, the French overseas departments and communities in Region 2, Guatemala, Mexico, Paraguay and Uruguay, the frequency band 902-928 MHz is allocated to the land mobile service on a primary basis. In Colombia, the frequency band 902-905 MHz is allocated to the land mobile service on a primary basis.     (WRC‑2015)

SUP B9/347/15#32560

5.362C

MOD B9/347/16#32562

5 570-7 250 MHz

|  |  |  |
| --- | --- | --- |
| Allocation to services | | |
| Region 1 | Region 2 | Region 3 |
| 6 700-7 075 FIXED  FIXED-SATELLITE (Earth-to-space) (space-to-Earth) 5.441  MOBILE  5.458 5.458A 5.458B | | |

SUP B9/347/17#32561

5.458C

MOD B9/347/18#32563

5.562D *Additional allocation*:  In Korea (Rep. of), the frequency bands 128-130 GHz, 171-171.6 GHz, 172.2-172.8 GHz and 173.3-174 GHz are also allocated to the radio astronomy service on a primary basis. Radio astronomy stations in Korea (Rep. of) operating in the frequency bands referred to in this footnote shall not claim protection from, or constrain the use and development of, services in other countries operating in accordance with the Radio Regulations.     (WRC‑15)

ARTICLE 52

Special rules relating to the use of frequencies

Section VI − Use of frequencies for radiotelephony

52.216 C − Frequency bands between 4 000 kHz and 27 500 kHz

C2 − Call and reply

MOD B9/347/19#32545

52.221 § 97 1) Ship stations may use the following carrier frequencies for calling in radiotelephony:

4 125 kHz2, 3, 4

6 215 kHz3, 4

8 255 kHz

8 291 kHz4 (see also No. **52.221A**)

12 290 kHz4 (see also No. 52.221A)

16 420 kHz4 (see also No. 52.221A)

18 795 kHz

22 060 kHz

25 097 kHz (WRC‑15)

MOD B9/347/20#32547

52.221A 2) The carrier frequency 8 291 kHz is authorized on a simplex basis for distress and safety traffic only (see also Appendix **15**). Calling on the carrier frequencies 12 290 kHz and 16 420 kHz shall be permitted only to and from rescue coordination centres (see No. **30.6.1**), subject to the safeguards of Resolution **352 (WRC‑03)**. The alternative carrier frequencies 12 359 kHz and 16 537 kHz may be used by ship stations and coast stations for calling on a simplex basis, provided that the peak envelope power does not exceed 1 kW.     (WRC‑15)

APPENDIX 4 (REV.WRC‑12)

Consolidated list and tables of characteristics for use in the  
application of the procedures of Chapter III

ANNEX 1

Characteristics of stations in the terrestrial services[[1]](#footnote-1)1

Footnotes to Tables 1 and 2

MOD B9/347/21#32581

TABLE 1    (Rev. WRC‑15)

Characteristics for terrestrial services

| **Column No.** | **Item identifier** | **Notice related to**  **Description of data items and requirements** | **Broadcasting (sound and television) stations in  the VHF/UHF bands up to 960 MHz, for the  application of No. 11.2 and No. 9.21** | **Broadcasting (sound) stations in the LF/MF  bands, for the application of No. 11.2** | **Transmitting stations (except broadcasting  stations in the planned LF/MF bands, in the HF  bands governed by Article 12, and in the  VHF/UHF bands up to 960 MHz), for the  application of No. 11.2 and No. 9.21** | **Receiving land stations, for the application of  No. 11.9 and No. 9.21** | **Typical transmitting stations, for the application  of No. 11.17** | **Maritime mobile frequency allotment, for the  application of plan modification under Appendix  25 (Nos. 25/1.1.1, 25/1.1.2, 25/1.25)** | **Broadcasting stations in the HF bands, for the  application of No. 12.16** | **Item identifier** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1.5.10** |  | **For digital broadcasting (except assignments subject to § 5.1.3 of the GE06 Regional Agreement):** |  |  |  |  |  |  |  |  |
| **1.5.10.1** | **1EO** | the frequency offset, in kHz  Required if the centre frequency of the emission is offset from the assigned frequency | **+** |  |  |  |  |  |  | **1EO** |
| **7** |  | **CLASS OF EMISSION AND NECESSARY BANDWIDTH** *(in accordance with Article****2*** *and Appendix****1****)* |  | | | | | | | |
| **7.1** | **7A** | the class of emission  In the case of a VHF/UHF broadcasting station, required for digital broadcasting assignments | **+** | **X** | **X** | **X** | **X** | **X** |  | **7A** |
| **7.2** | **7AB** | the necessary bandwidth  In the case of a VHF/UHF broadcasting station, required for analogue sound and digital broadcasting assignments | **+** | **X** | **X** | **X** | **X** | **X** | **X** | **7AB** |

MOD B9/347/22#32574

APPENDIX 18 (REV.WRC‑15)

Table of transmitting frequencies in the  
VHF maritime mobile band

(See Article 52)

NOTE A – For assistance in understanding the Table, see Notes *a)* to *zz)* below.     (WRC‑15)

NOTE B – The Table below defines the channel numbering for maritime VHF communications based on 25 kHz channel spacing and use of several duplex channels. The channel numbering and the conversion of two-frequency channels for single-frequency operation shall be in accordance with Recommendation ITU‑R M.1084‑5 Annex 4, Tables 1 and 3. The Table below also describes the harmonized channels where the digital technologies defined in the most recent version of Recommendation ITU‑R M.1842 could be deployed.     (WRC‑15)

| Channel designator | Notes | Transmitting frequencies  (MHz) | | Inter-ship | Port operations  and ship movement | | Public corres-pondence |
| --- | --- | --- | --- | --- | --- | --- | --- |
| From ship stations | From coast stations | Single frequency | Two frequency |
| 60 | *m)* | 156.025 | 160.625 |  | x | x | x |
| 01 | *m)* | 156.050 | 160.650 |  | x | x | x |
| 61 | *m)* | 156.075 | 160.675 |  | x | x | x |
| 02 | *m)* | 156.100 | 160.700 |  | x | x | x |
| 62 | *m)* | 156.125 | 160.725 |  | x | x | x |
| 03 | *m)* | 156.150 | 160.750 |  | x | x | x |
| 63 | *m)* | 156.175 | 160.775 |  | x | x | x |
| 04 | *m)* | 156.200 | 160.800 |  | x | x | x |
| 64 | *m)* | 156.225 | 160.825 |  | x | x | x |
| 05 | *m)* | 156.250 | 160.850 |  | x | x | x |
| 65 | *m)* | 156.275 | 160.875 |  | x | x | x |
| 06 | *f)* | 156.300 |  | x |  |  |  |
| 2006 | *r)* | 160.900 | 160.900 |  |  |  |  |
| 66 | *m)* | 156.325 | 160.925 |  | x | x | x |
| 07 | *m)* | 156.350 | 160.950 |  | x | x | x |
| 67 | *h)* | 156.375 | 156.375 | x | x |  |  |
| 08 |  | 156.400 |  | x |  |  |  |
| 68 |  | 156.425 | 156.425 |  | x |  |  |
| 09 | *i)* | 156.450 | 156.450 | x | x |  |  |
| 69 |  | 156.475 | 156.475 | x | x |  |  |
| 10 | *h), q)* | 156.500 | 156.500 | x | x |  |  |
| 70 | *f), j)* | 156.525 | 156.525 | Digital selective calling for distress, safety and calling | | | |
| 11 | *q)* | 156.550 | 156.550 |  | x |  |  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 71 |  | 156.575 | 156.575 |  | x |  |  |
| 12 |  | 156.600 | 156.600 |  | x |  |  |
| 72 | *i)* | 156.625 |  | x |  |  |  |
| 13 | *k)* | 156.650 | 156.650 | x | x |  |  |
| 73 | *h), i)* | 156.675 | 156.675 | x | x |  |  |
| 14 |  | 156.700 | 156.700 |  | x |  |  |
| 74 |  | 156.725 | 156.725 |  | x |  |  |
| 15 | *g)* | 156.750 | 156.750 | x | x |  |  |
| 75 | *n), s)* | 156.775 | 156.775 |  | x |  |  |
| 16 | *f)* | 156.800 | 156.800 | DISTRESS, SAFETY AND CALLING | | | |
| 76 | *n), s)* | 156.825 | 156.825 |  | x |  |  |
| 17 | *g)* | 156.850 | 156.850 | x | x |  |  |
| 77 |  | 156.875 |  | x |  |  |  |
| 18 | *m)* | 156.900 | 161.500 |  | x | x | x |
| 78 | *m)* | 156.925 | 161.525 |  | x | x | x |
| 1078 |  | 156.925 | 156.925 |  | x |  |  |
| 2078 | *mm)* |  | 161.525 |  | x |  |  |
| 19 | *m)* | 156.950 | 161.550 |  | x | x | x |
| 1019 |  | 156.950 | 156.950 |  | x |  |  |
| 2019 | *mm)* |  | 161.550 |  | x |  |  |
| 79 | *m)* | 156.975 | 161.575 |  | x | x | x |
| 1079 |  | 156.975 | 156.975 |  | x |  |  |
| 2079 | *mm)* |  | 161.575 |  | x |  |  |
| 20 | *m)* | 157.000 | 161.600 |  | x | x | x |
| 1020 |  | 157.000 | 157.000 |  | x |  |  |
| 2020 | *mm)* |  | 161.600 |  | x |  |  |
| 80 | *y), w1)* | 157.025 | 161.625 |  | x | x | x |
| 21 | *y), w1)* | 157.050 | 161.650 |  | x | x | x |
| 81 | *y), w1)* | 157.075 | 161.675 |  | x | x | x |
| 22 | *y), w1)* | 157.100 | 161.700 |  | x | x | x |
| 82 | *x), y), w1)* | 157.125 | 161.725 |  | x | x | x |
| 23 | *x), y), w1)* | 157.150 | 161.750 |  | x | x | x |
| 83 | *x), y), w1)* | 157.175 | 161.775 |  | x | x | x |
| 24 | *w), ww), x), AAA)* | 157.200 | 161.800 |  | x | x | x |
| 1024 | *w), ww), x), AAA)* | 157.200 |  |  |  |  |  |
| 2024 | *w), ww), x), AAA)* | 161.800 | 161.800 | x  (digital only) |  |  |  |
| 84 | *w), ww), x), AAA)* | 157.225 | 161.825 |  | x | x | x |
| 1084 | *w), ww), x), AAA)* | 157.225 |  |  |  |  |  |
| 2084 | *w), ww), x), AAA)* | 161.825 | 161.825 | x  (digital only) |  |  |  |
| 25 | *w), ww), x), AAA)* | 157.250 | 161.850 |  | x | x | x |
| 1025 | *w), ww), x), AAA)* | 157.250 |  |  |  |  |  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 2025 | *w), ww), x), AAA)* | 161.850 | 161.850 | x  (digital only) |  |  |  |
| 85 | *w), ww), x), AAA)* | 157.275 | 161.875 |  | x | x | x |
| 1085 | *w), ww), x), AAA)* | 157.275 |  |  |  |  |  |
| 2085 | *w), ww), x), AAA)* | 161.875 | 161.875 | x  (digital only) |  |  |  |
| 26 | *w), ww), x)* | 157.300 | 161.900 |  | x | x | x |
| 1026 | *w), ww), x)* | 157.300 |  |  |  |  |  |
| 2026 | *w), ww), x)* |  | 161.900 |  |  |  |  |
| 86 | *w), ww), x)* | 157.325 | 161.925 |  | x | x | x |
| 1086 | *w), ww), x)* | 157.325 |  |  |  |  |  |
| 2086 | *w), ww), x)* |  | 161.925 |  |  |  |  |
| 27 | *z), zx)* | 157.350 | 161.950 |  |  | x | x |
| 1027 | *z), zz)* | 157.350 | 157.350 |  | x |  |  |
| 2027*\** | *z)* | 161.950 | 161.950 |  |  |  |  |
| 87 | *z), zz)* | 157.375 | 157.375 |  | x |  |  |
| 28 | *z), zx)* | 157.400 | 162.000 |  |  | x | x |
| 1028 | *z), zz)* | 157.400 | 157.400 |  | x |  |  |
| 2028*\** | *z)* | 162.000 | 162.000 |  |  |  |  |
| 88 | *z), zz)* | 157.425 | 157.425 |  | x |  |  |
| AIS 1 | *f), l), p)* | 161.975 | 161.975 |  |  |  |  |
| AIS 2 | *f), l), p)* | 162.025 | 162.025 |  |  |  |  |
| \* From 1 January 2019, channel 2027 will be designated ASM 1 and channel 2028 will be designated ASM 2. | | | | | | | |

*Editorial note: The note numbering below is provisional and will be aligned during final preparations of the new edition of the Radio Regulations.*

**Notes referring to the Table**

*General notes*

*a)* Administrations may designate frequencies in the inter-ship, port operations and ship movement services for use by light aircraft and helicopters to communicate with ships or participating coast stations in predominantly maritime support operations under the conditions specified in Nos. **51.69**, **51.73**, **51.74**, **51.75**, **51.76**, **51.77** and **51.78**. However, the use of the channels which are shared with public correspondence shall be subject to prior agreement between interested and affected administrations.

*b)* The channels of the present Appendix, with the exception of channels 06, 13, 15, 16, 17, 70, 75 and 76, may also be used for high-speed data and facsimile transmissions, subject to special arrangement between interested and affected administrations.

*c)* The channels of the present Appendix, with the exception of channels 06, 13, 15, 16, 17, 70, 75 and 76, may be used for direct-printing telegraphy and data transmission, subject to special arrangement between interested and affected administrations.     (WRC‑12)

*d)* The frequencies in this table may also be used for radiocommunications on inland waterways in accordance with the conditions specified in No. **5.226**.

*e)* Administrations may apply 12.5 kHz channel interleaving on a non-interference basis to 25 kHz channels, in accordance with the most recent version of Recommendation ITU‑R M.1084, provided:

– it shall not affect the 25 kHz channels of the present Appendix maritime mobile distress and safety, automatic identification system (AIS), and data exchange frequencies, especially the channels 06, 13, 15, 16, 17, 70, AIS 1 and AIS 2, nor the technical characteristics set forth in Recommendation ITU‑R M.489‑2 for those channels;

– implementation of 12.5 kHz channel interleaving and consequential national requirements shall be subject to coordination with affected administrations.     (WRC‑12)

*Specific notes*

*f)* The frequencies 156.300 MHz (channel 06), 156.525 MHz (channel 70), 156.800 MHz (channel 16), 161.975 MHz (AIS 1) and 162.025 MHz (AIS 2) may also be used by aircraft stations for the purpose of search and rescue operations and other safety-related communication.     (WRC‑07)

*g)* Channels 15 and 17 may also be used for on‑board communications provided the effective radiated power does not exceed 1 W, and subject to the national regulations of the administration concerned when these channels are used in its territorial waters.

*h)* Within the European Maritime Area and in Canada, these frequencies (channels 10, 67, 73) may also be used, if so required, by the individual administrations concerned, for communication between ship stations, aircraft stations and participating land stations engaged in coordinated search and rescue and anti-pollution operations in local areas, under the conditions specified in Nos. **51.69**, **51.73**, **51.74**, **51.75**, **51.76**, **51.77** and **51.78**.

*i)* The preferred first three frequencies for the purpose indicated in Note *a)* are 156.450 MHz (channel 09), 156.625 MHz (channel 72) and 156.675 MHz (channel 73).

*j)* Channel 70 is to be used exclusively for digital selective calling for distress, safety and calling.

*k)* Channel 13 is designated for use on a worldwide basis as a navigation safety communication channel, primarily for intership navigation safety communications. It may also be used for the ship movement and port operations service subject to the national regulations of the administrations concerned.

*l)* These channels (AIS 1 and AIS 2) are used for an automatic identification system (AIS) capable of providing worldwide operation, unless other frequencies are designated on a regional basis for this purpose. Such use should be in accordance with the most recent version of Recommendation ITU‑R M.1371.     (WRC‑07)

*m)* These channels may be operated as single frequency channels, subject to coordination with affected administrations. The following conditions apply for single frequency usage:

– The lower frequency portion of these channels may be operated as single frequency channels by ship and coast stations.

– Transmission using the upper frequency portion of these channels is limited to coast stations.

– If permitted by administrations and specified by national regulations, the upper frequency portion of these channels may be used by ship stations for transmission. All precautions should be taken to avoid harmful interference to channels AIS 1, AIS 2, 2027\* and 2028\*.     (WRC‑15)

\* From 1 January 2019, channel 2027 will be designated ASM 1 and channel 2028 will be designated ASM 2.

*n)* With the exception of AIS, the use of these channels (75 and 76) should be restricted to navigation-related communications only and all precautions should be taken to avoid harmful interference to channel 16, by limiting the output power to 1 W.     (WRC‑12)

*o)* (SUP - WRC‑12)

*p)* Additionally, AIS 1 and AIS 2 may be used by the mobile-satellite service (Earth-to-space) for the reception of AIS transmissions from ships.     (WRC‑07)

*q)* When using these channels (10 and 11), all precautions should be taken to avoid harmful interference to channel 70.     (WRC‑07)

*r)* In the maritime mobile service, this frequency is reserved for experimental use for future applications or systems (e.g. new AIS applications, man over board systems, etc.). If authorized by administrations for experimental use, the operation shall not cause harmful interference to, or claim protection from, stations operating in the fixed and mobile services.     (WRC‑12)

*s)* Channels 75 and 76 are also allocated to the mobile-satellite service (Earth-to-space) for the reception of long-range AIS broadcast messages from ships (Message 27; see the most recent version of Recommendation ITU‑R M.1371).     (WRC‑12)

*w)* In Regions 1 and 3:

Until 1 January 2017, the frequency bands 157.200-157.325 MHz and 161.800-161.925 MHz (corresponding to channels: 24, 84, 25, 85, 26 and 86) may be used for digitally modulated emissions, subject to coordination with affected administrations. Stations using these channels or frequency bands for digitally modulated emissions shall not cause harmful interference to, or claim protection from, other stations operating in accordance with Article **5**.

From 1 January 2017, the frequency bands 157.200‑157.325 MHz and 161.800-161.925 MHz (corresponding to channels: 24, 84, 25, 85, 26 and 86) are identified for the utilization of the VHF Data Exchange System (VDES) described in the most recent version of Recommendation ITU‑R M.2092. These frequency bands may also be used for analogue modulation described in the most recent version of Recommendation ITU‑R M.1084 by an administration that wishes to do so, subject to not causing harmful interference to, or claiming protection from other stations in the maritime mobile service using digitally modulated emissions and subject to coordination with affected administrations.     (WRC‑15)

*ww)* In Region 2, the frequency bands 157.200-157.325 and 161.800-161.925 MHz (corresponding to channels: 24, 84, 25, 85, 26 and 86) are designated for digitally modulated emissions in accordance with the most recent version of Recommendation ITU‑R M.1842.

In Canada and Barbados, from 1 January 2019 the frequency bands 157.200-157.275 and 161.800-161.875 MHz (corresponding to channels: 24, 84, 25 and 85) may be used for digitally modulated emissions, such as those described in the most recent version of Recommendation ITU‑R M.2092, subject to coordination with affected administrations.     (WRC‑15)

*x)* From 1 January 2017, in Angola, Botswana, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Democratic Republic of the Congo, Seychelles, South Africa, Swaziland, Tanzania, Zambia and Zimbabwe, the frequency bands 157.125-157.325 and 161.725-161.925 MHz (corresponding to channels: 82, 23, 83, 24, 84, 25, 85, 26 and 86) are designated for digitally modulated emissions.

From 1 January 2017, in China, the frequency bands 157.150-157.325 and 161.750-161.925 MHz (corresponding to channels: 23, 83, 24, 84, 25, 85, 26 and 86) are designated for digitally modulated emissions.     (WRC‑12)

*y)* These channels may be operated as single or duplex frequency channels, subject to coordination with affected administrations.     (WRC‑12)

*z)* Until 1 January 2019, these channels may be used for possible testing of future AIS applications without causing harmful interference to, or claiming protection from, existing applications and stations operating in the fixed and mobile services.

From 1 January 2019, these channels are each split into two simplex channels. The channels 2027 and 2028 designated as ASM 1 and ASM 2 are used for application specific messages (ASM) as described in the most recent version of Recommendation ITU-R M.2092.     (WRC‑15)

*AAA)* From 1 January 2019, the channels 24, 84, 25 and 85 may be merged in order to form a unique duplex channel with a bandwidth of 100 kHz in order to operate the VDES terrestrial component described in the most recent version of Recommendation ITU‑R M.2092.     (WRC‑15)

*mm)* Transmission on these channels is limited to coast stations. If permitted by administrations and specified by national regulations, these channels may be used by ship stations for transmission. All precautions should be taken to avoid harmful interference to channels AIS 1, AIS 2, 2027\* and 2028\*.     (WRC‑15)

\* From 1 January 2019, channel 2027 will be designated ASM 1 and channel 2028 will be designated ASM 2.

*w1)*  In Regions 1 and 3:

Until 1 January 2017, the frequency bands 157.025-157.175 MHz and 161.625-161.775 MHz (corresponding to channels: 80, 21, 81, 22, 82, 23 and 83) may be used for digitally modulated emissions, subject to coordination with affected administrations. Stations using these channels or frequency bands for digitally modulated emissions shall not cause harmful interference to, or claim protection from, other stations operating in accordance with Article **5**.

From 1 January 2017, the frequency bands 157.025‑157.100 MHz and 161.625-161.700 MHz (corresponding to channels: 80, 21, 81 and 22) are identified for utilization of the digital systems described in the most recent version of Recommendation ITU‑R M.1842 using multiple 25 kHz contiguous channels.

From 1 January 2017, the frequency bands 157.150‑157.175 MHz and 161.750-161.775 MHz (corresponding to channels: 23 and 83) are identified for utilization of the digital systems described in the most recent version of Recommendation ITU‑R M.1842 using two 25 kHz contiguous channels. From 1 January 2017, the frequencies 157.125 MHz and 161.725 MHz (corresponding to channel: 82) are identified for the utilization of the digital systems described in the most recent version of Recommendation ITU‑R M.1842.

The frequency bands 157.025‑157.175 MHz and 161.625-161.775 MHz (corresponding to channels: 80, 21, 81, 22, 82, 23 and 83) can also be used for analogue modulation described in the most recent version of Recommendation ITU‑R M.1084 by an administration that wishes to do so, subject to not claiming protection from other stations in the maritime mobile service using digitally modulated emissions and subject to coordination with affected administrations.     (WRC‑15)

*zx)* In the United States, these channels are used for communication between ship stations and coast stations for the purpose of public correspondence.     (WRC‑15)

*zz)* From 1 January 2019, channels 1027, 1028, 87 and 88 are used as single-frequency analogue channels for port operation and ship movement.     (WRC‑15)

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APPENDIX 26 (REV.WRC‑15)[[2]](#footnote-2)\*

Provisions and associated Frequency Allotment Plan for the aeronautical   
mobile (OR) service in the frequency bands allocated exclusively to that   
service between 3 025 kHz and 18 030 kHz

(See Article 43)

MOD B9/347/24#32566

APPENDIX 42 (REV.WRC‑15)

Table of allocation of international call sign series

(See Article 19)

|  |  |  |
| --- | --- | --- |
| Call sign series | Allocated to |  |
| ... | ... |  |
| ZQA-ZQZ | United Kingdom of Great Britain and Northern Ireland |  |
| ZRA-ZUZ | South Africa (Republic of) |  |
| ZVA-ZZZ | Brazil (Federative Republic of) |  |
| Z2A-Z2Z | Zimbabwe (Republic of) |  |
| Z3A-Z3Z | The Former Yugoslav Republic of Macedonia |  |
| Z8A-Z8Z | South Sudan (Republic of) |  |
|  |  |  |
| ... | ... |  |

MOD B9/347/25#32592

RESOLUTION 76 (REV.WRC-15)

Protection of geostationary fixed-satellite service and geostationary broadcasting-satellite service networks from the maximum aggregate   
equivalent power flux‑density produced by multiple non‑geostationary   
fixed-satellite service systems in frequency bands where equivalent  
power flux-density limits have been adopted

The World Radiocommunication Conference (Geneva, 2015),

considering

*a)* that WRC‑97 adopted, in Article **22**, provisional equivalent power flux-density (epfd) limits to be met by non‑geostationary fixed-satellite service (non-GSO FSS) systems in order to protect GSO FSS and GSO broadcasting-satellite service (BSS) networks in parts of the frequency range 10.7-30 GHz;

*b)* that WRC‑2000 revised Article **22** to ensure the limits contained therein provide adequate protection to GSO systems without placing undue constraints on any of the systems and services sharing these frequency bands;

*c)* that WRC‑2000 decided that a combination of single-entry validation, single-entry operational and, for certain antenna sizes, single-entry additional operational epfd limits, contained in Article **22**, along with the aggregate limits in Tables 1A to 1D as contained in Annex 1 to this Resolution, which apply to non‑GSO FSS systems, protects GSO networks in these frequency bands;

*d)* that these single-entry validation limits have been derived from aggregate epfd masks contained in Tables 1A to 1D, assuming a maximum effective number of non-GSO FSS systems of 3.5;

*e)* that the aggregate interference caused by all co-frequency non‑GSO FSS systems in these frequency bands into GSO FSS systems should not exceed the aggregate epfd levels in Tables 1A to 1D;

*f)* that WRC‑97 decided, and WRC‑2000 confirmed, that non‑GSO FSS systems in the frequency bands in question are to mutually coordinate the use of frequencies in these frequency bands under the provisions of No. **9.12**;

*g)* that the orbital characteristics of such systems are likely to be inhomogeneous;

*h)* that, as a result of this likely inhomogeneity, the aggregate epfd levels from multiple non‑GSO FSS systems will not be directly related to the actual number of systems sharing a frequency band, and the number of such systems operating co-frequency is likely to be small;

*i)* that the possible misapplication of single-entry limits should be avoided,

recognizing

*a)* that non-GSO FSS systems are likely to need to implement interference mitigation techniques to mutually share frequencies;

*b)* that, on account of the use of such interference mitigation techniques, it is likely that the number of non‑GSO systems will remain small, as will the aggregate interference caused by non‑GSO FSS systems into GSO systems;

*c)* that, notwithstanding *considering d)* and *e)* and *recognizing b)*, there may be instances where the aggregate interference from non‑GSO systems could exceed the interference levels given in Tables 1A to 1D;

*d)* that administrations operating GSO systems may wish to ensure that the aggregate epfd produced by all operating co-frequency non‑GSO FSS systems in the frequency bands referred to in *considering a)* above into GSO FSS and/or GSO BSS networks does not exceed the aggregate interference levels given in Tables 1A to 1D,

noting

Recommendation ITU‑R S.1588 “Methodologies for calculating aggregate downlink equivalent power flux-density produced by multiple non-geostationary fixed-satellite service systems into a geostationary fixed-satellite service network”,

resolves

1 that administrations operating or planning to operate non‑GSO FSS systems, for which coordination or notification information, as appropriate, was received after 21 November 1997, in the frequency bands referred to in *considering a)* above, individually or in collaboration, shall take all possible steps, including, if necessary, by means of appropriate modifications to their systems, to ensure that the aggregate interference into GSO FSS and GSO BSS networks caused by such systems operating co-frequency in these frequency bands does not cause the aggregate power levels given in Tables 1A to 1D to be exceeded (see No. **22.5K**);

2 that, in the event that the aggregate interference levels in Tables 1A to 1D are exceeded, administrations operating non‑GSO FSS systems in these frequency bands shall take all necessary measures expeditiously to reduce the aggregate epfd levels to those given in Tables 1A to 1D, or to higher levels where those levels are acceptable to the affected GSO administration (see No. 22.5K),

invites the ITU Radiocommunication Sector

1 to continue its studies and to develop , as appropriate, a suitable methodology for calculating the aggregate epfd produced by all non‑GSO FSS systems operating or planning to operate co-frequency in the frequency bands referred to in *considering a)* above into GSO FSS and GSO BSS networks, which may be used to determine whether the systems are in compliance with the aggregate power levels given in Tables 1A to 1D;

2 to continue its studies and to develop a Recommendation on the accurate modelling of interference from non‑GSO FSS systems into GSO FSS and GSO BSS networks in the frequency bands referred to in *considering a)* above, in order to assist administrations planning or operating non‑GSO FSS systems in their efforts to limit the aggregate epfd levels produced by their systems into GSO networks, and to provide guidance to GSO network designers on the maximum epfd↓ levels expected to be produced by all non‑GSO FSS systems when accurate modelling assumptions are used;

3 to develop a Recommendation containing procedures to be used among administrations in order to ensure that the aggregate epfd limits given in Tables 1A to 1D are not exceeded by operators of non-GSO FSS systems;

4 to attempt to develop measurement techniques to identify the interference levels from non-GSO systems in excess of the aggregate limits given in Tables 1A to 1D, and to confirm compliance with these limits,

instructs the Director of the Radiocommunication Bureau

1 to assist in the development of the methodology referred to in *invites the ITU Radiocommunication Sector*1above;

2 to report to a future competent conference on the results of studies in *invitesthe ITU Radiocommunication Sector* 1 and 3above.

ANNEX 1 TO RESOLUTION 76 (REV.WRC-15)

TABLE 1A1, 2, 3

Limits on aggregate epfd↓ radiated by non‑GSO FSS systems in certain frequency bands

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Frequency band (GHz) | epfd↓ (dB(W/m2)) | Percentage of time during which epfd↓ may not be exceeded | Reference bandwidth (kHz) | Reference antenna diameter, and reference radiation pattern4 |
| 10.7-11.7  in all Regions  11.7-12.2 in Region 2  12.2-12.5 in Region 3  12.5-12.75 in Regions 1 and 3 | −170  −168.6  −165.3  −160.4  −160  −160 | 0  90  99  99.97  99.99  100 | 40 | 60 cm  Recommendation  ITU-R S.1428 |
| −176.5  −173  −164  −161.6  −161.4  −160.8  −160.5  −160  −160 | 0  99.5  99.84  99.945  99.97  99.99  99.99  99.9975  100 | 40 | 1.2 m  Recommendation  ITU-R S.1428 |
| −185  −184  −182  −168  −164  −162  −160  −160 | 0  90  99.5  99.9  99.96  99.982  99.997  100 | 40 | 3 m 5 Recommendation  ITU-R S.1428 |
|  | −190  −190  −166  −160  −160 | 0  99  99.99  99.998  100 | 40 | 10 m 5  Recommendation  ITU-R S.1428 |
| 1 For certain GSO FSS receive earth stations, see also Nos. **9.7A** and **9.7B**.  2 In addition to the limits shown in Table 1A, the following aggregate epfd↓ limits apply to all antenna sizes greater than 60 cm in the frequency bands listed in Table 1A:   |  |  | | --- | --- | | 100% of the time epfd↓ (dB(W/(m2 · 40 kHz))) | Latitude (North or South) (degrees) | | −160 | 0 ≤ | Latitude | ≤ 57.5 | | −160  3.4(57.5 − | Latitude |)/4 | 57.5  | Latitude | ≤ 63.75 | | −165.3 | 63.75  | Latitude | |   3 For each reference antenna diameter, the limit consists of the complete curve on a plot which is linear in decibels for the epfd↓ levels and logarithmic for the time percentages, with straight lines joining the data points.  4 For this Table, reference patterns in Recommendation ITU‑R S.1428 shall be used only for the calculation of interference from non‑GSO FSS systems into GSO FSS systems. | | | | |

|  |
| --- |
| 5 The values for the 3 m and 10 m antennas are applicable only for the methodology referred to *invitesthe ITU Radiocommunication Sector* 1. |

TABLE 1B1, 2, 3

Limits on aggregate epfd↓ radiated by non‑GSO FSS systems in certain frequency bands

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Frequency band  (GHz) | epfd↓  (dB(W/m2)) | Percentage of time during which epfd↓ may not be exceeded | Reference bandwidth (kHz) | Reference antenna diameter, and reference radiation pattern4 |
| 17.8-18.6 | −170  −170  −164  −164 | 0  90  99.9  100 | 40 | 1 m  Recommendation  ITU-R S.1428 |
| −156  −156  −150  −150 | 0  90  99.9  100 | 1 000 |
|  | −173  −173  −166  −164  −164 | 0  99.4  99.9  99.92  100 | 40 | 2 m  Recommendation  ITU-R S.1428 |
| −159  −159  −152  −150  −150 | 0  99.4  99.9  99.92  100 | 1 000 |
|  | −180  −180  −172  −164  −164 | 0  99.8  99.8  99.992  100 | 40 | 5 m  Recommendation  ITU-R S.1428 |
| −166  −166  −158  −150  −150 | 0  99.8  99.8  99.992  100 | 1 000 |
| 1 For certain GSO FSS receive earth stations, see also Nos. **9.7A** and **9.7B**.  2 For each reference antenna diameter, the limit consists of the complete curve on a plot which is linear in decibels for the epfd↓ levels and logarithmic for the time percentages, with straight lines joining the data points.  3 A non-GSO system shall meet the limits of this Table in both the 40 kHz and the 1 MHz reference bandwidths.  4 For this Table, reference patterns in Recommendation ITU‑R S.1428 shall be used only for the calculation of interference from non‑GSO FSS systems into GSO FSS systems. | | | | |

TABLE 1C1, 2, 3

Limits on aggregate epfd↓ radiated by non‑GSO FSS systems in certain frequency bands

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Frequency band  (GHz) | epfd↓ (dB(W/m2)) | Percentage of time during which epfd↓ may not be exceeded | Reference bandwidth (kHz) | Reference antenna diameter, and reference radiation pattern4 |
| 19.7-20.2 | −182  −172  −154  −154 | 0  90  99.94  100 | 40 | 70 cm  Recommendation  ITU-R S.1428 |
| −168  −158  −140  −140 | 0  90  99.94  100 | 1 000 |
|  | −185  −176  −165  −160  −154  −154 | 0  91  99.8  99.8  99.99  100 | 40 | 90 cm  Recommendation  ITU-R S.1428 |
| −171  −162  −151  −146  −140  −140 | 0  91  99.8  99.8  99.99  100 | 1 000 |
|  | −191  −162  −154  −154 | 0  99.933  99.998  100 | 40 | 2.5 m  RecommendationITU-R S.1428 |
| −177  −148  −140  −140 | 0  99.933  99.998  100 | 1 000 |
|  | −195  −184  −175  −161  −154  −154 | 0  90  99.6  99.984  99.9992  100 | 40 | 5 m  Recommendation  ITU-R S.1428 |
| −181  −170  −161  −147  −140  −140 | 0  90  99.6  99.984  99.9992  100 | 1 000 |
| 1 For certain GSO FSS receive earth stations, see also Nos. **9.7A** and **9.7B**.  2 For each reference antenna diameter, the limit consists of the complete curve on a plot which is linear in decibels for the epfd↓ levels and logarithmic for the time percentages, with straight lines joining the data points.  3 A non-GSO system shall meet the limits of this Table in both the 40 kHz and the 1 MHz reference bandwidths.  4 For this Table, reference patterns in Recommendation ITU‑R S.1428 shall be used only for the calculation of interference from non‑GSO FSS systems into GSO FSS systems. | | | | |

TABLE 1D1, 2

Limits on aggregate epfd↓ radiated by non-GSO FSS systems in certain frequency bands   
into 30 cm, 45 cm, 60 cm, 90 cm, 120 cm, 180 cm, 240 cm and 300 cm BSS antennas

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Frequency band  (GHz) | epfd↓ (dB(W/m2)) | Percentage of time during which epfd↓ may not be exceeded | Reference bandwidth (kHz) | Reference antenna diameter, and reference radiation pattern3 |
| 11.7-12.5  in Region 1  11.7-12.2 and 12.5-12.75  in Region 3  12.2-12.7  in Region 2 | −160.4  −160.1  −158.6  −158.6  −158.33  −158.33 | 0  25  96  98  98  100 | 40 | 30 cm Recommendation  ITU-R BO.1443, Annex 1 |
| −170  −167  −164  −160.75  −160  −160 | 0  66  97.75  99.33  99.95  100 | 40 | 45 cm Recommendation  ITU-R BO.1443, Annex 1 |
|  | −171  −168.75  −167.75  −162  −161  −160.2  −160  −160 | 0  90  97.8  99.6  99.8  99.9  99.99  100 | 40 | 60 cm Recommendation  ITU-R BO.1443, Annex 1 |
|  | −173.75  −173  −171  −165.5  −163  −161  −160  −160 | 0  33  98  99.1  99.5  99.8  99.97  100 | 40 | 90 cm Recommendation  ITU-R BO.1443, Annex 1 |
|  | −177  −175.25  −173.75  −173  −169.5  −167.8  −164  −161.9  −161  −160.4  −160 | 0  90  98.9  98.9  99.5  99.7  99.82  99.9  99.965  99.993  100 | 40 | 120 cm Recommendation  ITU-R BO.1443, Annex 1 |

TABLE 1D1, 2 (*end*)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Frequency band  (GHz) | epfd↓ (dB(W/m2)) | Percentage of time during which epfd↓ may not be exceeded | Reference bandwidth (kHz) | Reference antenna diameter, and reference radiation pattern3 |
| 11.7-12.5  in Region 1  11.7-12.2 and 12.5-12.75 in Region 3  12.2-12.7  in Region 2 | −179.5  −178.66  −176.25  −163.25  −161.5  −160.35  −160  −160 | 0  33  98.5  99.81  99.91  99.975  99.995  100 | 40 | 180 cm Recommendation  ITU-R BO.1443, Annex 1 |
|  | −182  −180.9  −178  −164.4  −161.9  −160.5  −160  −160 | 0  33  99.25  99.85  99.94  99.98  99.995  100 | 40 | 240 cm Recommendation  ITU-R BO.1443, Annex 1 |
|  | −186.5  −184  −180.5  −173  −167  −162  −160  −160 | 0  33  99.5  99.7  99.83  99.94  99.97  100 | 40 | 300 cm Recommendation  ITU-R BO.1443,  Annex 1 |
| 1 For BSS antenna diameters of 180 cm, 240 cm and 300 cm, in addition to the aggregate limits shown in Table 1D, the following aggregate 100% of the time epfd↓ limits also apply:   |  |  | | --- | --- | | 100% of the time epfd↓ (dB(W/(m2 · 40 kHz))) | Latitude (North or South) (degrees) | | −160 | 0 ≤ | Latitude | ≤ 57.5 | | −160  3.4(57.5 − | Latitude |)/4 | 57.5  | Latitude | ≤ 63.75 | | −165.3 | 63.75  | Latitude | |   2 For each reference antenna diameter, the limit consists of the complete curve on a plot which is linear in decibels for the epfd↓ levels and logarithmic for the time percentages, with straight lines joining the data points. For BSS antenna of diameter 240 cm, in addition to the above aggregate 100% of the time epfd↓ limit, a −167 dB(W/(m2 · 40 kHz)) aggregate 100% of the time operational epfd↓ limit also applies to receive antennas located in Region 2, west of 140° W, north of 60° N, pointing toward GSO BSS satellites at 91° W, 101° W, 110° W, 119° W and 148° W with elevation angles greater than 5°. This limit is implemented during a transition period of 15 years.  3 For this Table, reference patterns in the Annex 1 to Recommendation ITU‑R BO.1443 shall be used only for the calculation of interference from non-GSO FSS systems into GSO BSS systems. | | | | |

MOD B9/347/26#32593

RESOLUTION 140 (REV.WRC-15)

Measures and studies associated with the equivalent power flux-density (epfd) limits in the frequency band 19.7-20.2 GHz

The World Radiocommunication Conference (Geneva, 2015),

considering

*a)* that, after several years of study, WRC‑2000 adopted epfd limits in a number of frequency bands to give practical effect to No. **22.2**, in order to facilitate non-geostationary-orbit (non‑GSO) systems in the fixed-satellite service (FSS) systems to operate while still ensuring protection of GSO FSS networks from unacceptable interference;

*b)* that in Resolution **76 (WRC‑2000)**, WRC‑2000 also adopted aggregate epfd↓ limits in the same frequency bands for the protection of GSO FSS systems;

*c)* that a small number of systems based on constellations of satellites in highly elliptical orbits (HEOs), in certain FSS bands, have been operating for many years;

*d)* that since the late 1990s, especially after WRC‑2000, there has been a growing interest in HEOs in a number of frequency bands and for several space services, predominantly in the FSS allocations below 30 GHz;

*e)* that ITU‑R studies reported to WRC‑03 considered HEO systems to be a sub‑category of non‑GSO systems and characterized their operational features;

*f)* that in the period between WRC‑2000 and WRC‑03, ITU‑R developed Recommendations concerning frequency sharing between HEO FSS systems and other systems, including GSO, low Earth orbit (LEO), medium Earth orbit (MEO) and HEO systems;

*g)* that certain types of HEO system would have difficulty in meeting the long-term portion of epfd↓ limits in force in the frequency band 19.7-20.2 GHz,

noting

*a)* that, in the long-term portion, the epfd↓ limits in the frequency band 19.7-20.2 GHz are considerably more stringent than those in the 17.8-18.6 GHz frequency band;

*b)* that Nos. **9.7A** and **9.7B** apply in this frequency band;

*c)* that the frequency band 19.7-20.2 GHz is one of the few bands identified by WRC‑03 on a global basis for high-density applications in the fixed-satellite service;

*d)* Recommendation ITU‑R S.1715 “Guidelines developed in response to the studies requested in Resolution **140 (WRC‑03)**”,

resolves to invite administrations

to consider using the relevant ITU‑R Recommendations regarding the protection of GSO FSS satellite networks from interference by non-GSO FSS systems as a guideline for consultation between administrations, to fulfil their obligations under No. **22.2** in the frequency band 19.7-20.2 GHz, and in the case where an administration responsible for a non-GSO FSS system requests the application of No. **22.5CA**,

instructs the Radiocommunication Bureau

in cases where an administration responsible for a non-GSO FSS system indicates in its coordination request its wish to apply No. **22.5CA** with respect to the epfd↓ limits in Table **22‑1C** in the frequency band 19.7-20.2 GHz but has not yet reached the necessary agreements, to make a qualified favourable finding with respect to this provision. This provisional finding regarding compliance with epfd↓ limits shall be changed to a definitive favourable finding at the notification stage, only if all explicit agreements from administrations for which epfd limits are exceeded are obtained and an indication thereof is provided to the Bureau within two years from the date of receipt of the coordination request. Otherwise, this provisional finding shall be changed to a definitive unfavourable finding.

MOD B9/347/27#32608

RESOLUTION 154 (rev.WRC‑15)

Consideration of technical and regulatory actions in order to support existing   
and future operation of fixed-satellite service earth stations within the  
frequency band 3 400-4 200 MHz, as an aid to the safe operation of aircraft   
and reliable distribution of meteorological information   
in some countries in Region 1

The World Radiocommunication Conference (Geneva, 2015),

considering

*a)* that the frequency band 3 400-4 200 MHz is allocated worldwide to the fixed-satellite service (FSS) in the space-to-Earth direction and to the fixed service on a primary basis;

*b)* that the frequency band 3 400-3 600 MHz is allocated on a primary basis to the mobile, except aeronautical mobile, service and identified for International Mobile Telecommunications (IMT) in Region 1 countries as specified in Article **5** of the Radio Regulations;

*c)* that in Region 1, the allocation to the mobile, except aeronautical mobile, service in the frequency band 3 400-3 600 MHz is subject to technical and regulatory conditions aimed at ensuring compatibility with co-primary services of neighbouring countries;

*d)* that a number of developing countries rely, to a great extent, on FSS systems using very small aperture terminals (VSAT) in the frequency band 3 400-4 200 MHz for the provision of communications as an aid to safe operation of aircraft and reliable distribution of meteorological information;

*e)* that, in some cases, where an adequate terrestrial communication infrastructure is not available, VSAT networks referred to in *considering* *d)* above are the only viable option to augment the communication infrastructure in order to satisfy the overall communications infrastructure requirements of the International Civil Aviation Organization (ICAO) and to ensure distribution of meteorological information under the auspices of the World Meteorological Organization (WMO);

*f)* that the relevant ITU Radiocommunication Sector (ITU‑R) studies showeda potential for interference from fixed wireless access and IMT stations into FSS receiving earth stations at distances from less than one kilometre up to hundreds of kilometres, depending on the parameters and deployment of stations of these services;

*g)* that WRC‑12, taking into account the studies mentioned in *considering f)* above, decided to study technical and regulatory measures to support the FSS earth stations referred to in *considering e)* above,

noting

*a)* that, by the date of this conference, several cases of harmful interference to the FSS VSATs used for aeronautical safety communications from fixed wireless access or IMT stations were reported;

*b)* that these reported cases of interference indicated difficulties that some administrations have encountered in the coordination of frequencies between the fixed wireless access or IMT systems and frequency assignments for VSATs used for aeronautical and meteorological purposes;

*c)* that, in many countries, FSS VSAT earth stations are not subject to individual licensing and not registered as specific stations in their national frequency databases and in the ITU Master International Frequency Register (MIFR) due to the considerable administrative work involved;

*d)* that knowledge of the location and operational frequencies of VSAT stations used for communications as an aid to the safe operation of aircraft and/or distribution of meteorological information is critically important for ensuring compatibility with applications of other services,

recognizing

*a)* that ITU‑R conducted comprehensive studies of compatibility between FSS on the one hand and fixed wireless access systems and IMT applications on the other hand in the frequency band 3 400-4 200 MHz, and summarized the results of the studies in Recommendation ITU‑R SF.1486 as well as Reports ITU‑R S.2199, ITU‑R M.2109 and ITU‑R S.2368;

*b)* that the Recommendation and Reports identified in *recognizing a)* offer a set of mitigation techniques that could be employed for international coordination and at a national level and to facilitate coexistence of FSS, fixed service and mobile service systems;

*c)* that Recommendation ITU‑R S.1856 contains methodologies for verification of compliance with the relevant power flux-density (pfd) limit set forth in the Radio Regulations,

resolves

1 to recommend that administrations in countries where the frequency band 3 400-3 600 MHz is allocated on a primary basis to the mobile, except aeronautical mobile, service in Region 1 and identified for IMT in Region 1 ensure compliance of IMT stations with the relevant provisions set forth in the Radio Regulations and apply the relevant coordination procedures before bringing these applications into use;

2 to urge administrations in Region 1, when planning and/or licensing fixed point-to-point, fixed wireless access and IMT systems in frequency bands referred to in *considering b)* above, to take into account the protection needs of existing and planned FSS earth stations within the frequency band 3 400-4 200 MHz, as an aid to the safe operation of aircraft and reliable distribution of meteorological information in some countries in Region 1;

3 to invite administrations in Region 1, taking into account the number of earth stations involved for this particular type of usage, to consider the possibility of licensing the FSS earth stations used for communications as an aid to the safe operation of aircraft and/or distribution of meteorological information on an individual basis and registering them in the MIFR as specific earth stations;

4 to encourage administrations in Region 1 to employ the appropriate mitigation techniques described in the ITU‑R publications referred to in *recognizing* *a)* above;

5 to invite administrations to ensure that the application of these technical and regulatory measures to FSS and the mobile service does not limit the use of the frequency band 3400-4200MHz by other existing and planned systems and services in other countries,

instructs the Secretary-General

to bring this resolution to the attention of ICAO and WMO.

MOD B9/347/28#32594

RESOLUTION 418 (Rev.WRC‑15)

Use of the frequency band 5 091-5 250 MHz by the aeronautical   
mobile service for telemetry applications

The World Radiocommunication Conference (Geneva, 2015),

considering

*a)* that there is a need to provide global spectrum to the mobile service for wideband aeronautical telemetry systems;

*b)* that the operation of aircraft stations is subject to national and international rules and regulations;

*c)* that the frequency band 5 030-5 150 MHz is allocated to the aeronautical radionavigation service on a primary basis;

*d)* that the allocation of the frequency band 5 091-5 250 MHz to the fixed-satellite service (Earth-to-space) is limited to feeder links of non-geostationary satellite systems in the mobile-satellite service;

*e)* that the frequency band 5 091-5 150 MHz is also allocated to the aeronautical mobile-satellite (R) service on a primary basis, subject to agreement obtained under No. **9.21**;

*f)* that WRC‑07 allocated the frequency band 5 091-5 150 MHz to the aeronautical mobile service on a primary basis subject to No. **5.444B**;

*g)* that the frequency band 5 150-5 250 MHz is also allocated to the mobile, except aeronautical mobile, service on a primary basis;

*h)* that WRC‑07 additionally allocated the frequency band 5 150-5 250 MHz to the aeronautical mobile service on a primary basis, subject to No. **5.446C**;

*i)* that aeronautical mobile telemetry (AMT) in the aeronautical mobile service is not considered an application of a safety service as defined in No. **1.59**,

noting

*a)* that results of studies show the feasibility of using the frequency band 5 091-5 250 MHz for the aeronautical mobile service on a primary basis, limited to transmissions of telemetry for flight testing, under certain conditions and arrangements;

*b)* that the identification by ITU‑R of technical and operational requirements for aircraft stations operating in the frequency band 5 091-5 250 MHz should prevent unacceptable interference to other services;

*c)* that the frequency band 5 091-5 150 MHz is to be used for the operation of the international standard microwave landing system (MLS) for precision approach and landing;

*d)* that MLS can be protected through the implementation of an adequate separation distance between an aeronautical mobile service transmitter to support telemetry and MLS receivers;

*e)* that ITU‑R studies have generated methods, described in Report ITU‑R M.2118, for ensuring compatibility and sharing between the aeronautical mobile service and the fixed-satellite service operating in the frequency band 5 091-5 250 MHz, which result in interference of no more than 1% Δ*Tsatellite*/*Tsatellite* from AMT aircraft station transmissions to fixed-satellite service spacecraft receivers;

*f)* that a method to facilitate sharing between MLS and aeronautical mobile service is contained in Recommendation ITU‑R M.1829;

*g)* that Recommendation ITU‑R M.1828 provides the technical and operational requirements for aircraft stations of the aeronautical mobile service, limited to transmissions of telemetry for flight testing;

*h)* that ITU‑R compatibility studies have been performed for AMT, limited to flight testing; such application is for the testing of aircraft during non-commercial flights for the purpose of development, evaluation and/or certification of aircraft in airspace designated by administrations for this purpose,

recognizing

*a)* that priority is to be given to MLS in accordance with No. **5.444** in the frequency band 5 030-5 091 MHz;

*b)* that studies have been performed within ITU‑R concerning the sharing and compatibility of AMT for flight testing with other services in the frequency band 5 091-5 250 MHz;

*c)* that Resolution **748 (Rev.WRC-15)** also provides guidance on the use of the frequency band 5 091-5 150 MHz by the aeronautical mobile service,

resolves

1 that administrations choosing to implement AMT shall limit AMT applications to those identified in *noting h)* in the frequency band 5 091-5 250 MHz, and shall utilize the criteria set forth in Annex 1 to this resolution;

2 that the pfd limits in § 3 and 4 of Annex 1 to this resolution which protect terrestrial services may be exceeded on the territory of any country whose administration has so agreed,

invites the ITU Radiocommunication Sector

to continue studying the conditions and arrangements stipulated in *noting a)*.

ANNEX 1 TO RESOLUTION 418 (Rev.WRC‑15)

1 In implementing aeronautical mobile telemetry (AMT), administrations shall utilize the following criteria:

– limit transmissions to those from aircraft stations only (see No. **1.83**);

– the operation of aeronautical telemetry systems within the frequency band 5 091-5 150 MHz shall be coordinated with administrations operating microwave landing systems (MLS) and whose territory is located within a distance *D* of the AMT flight area, where *D* is determined by the following equation:

*D*  43  10(127.55 − 20 log( *f* ) + *E*)/20

where:

*D* : separation distance (km) triggering the coordination

*f* : minimum frequency (MHz) used by the AMT system

*E* : peak equivalent isotropically radiated power density (dBW in 150 kHz) of the aircraft transmitter.

2 For the protection of the fixed-satellite service (FSS), a telemetry aircraft station in the frequency band 5 091-5 250 MHz shall be operated in such a manner that one aircraft station transmitter power flux-density be limited to −198.9 dB(W/(m2 · Hz)) at the FSS satellite orbit for spacecraft using Earth coverage receive antennas. Such pfd limit per aircraft transmitter has been derived under the assumptions that the FSS satellite orbit is at 1 414 km altitude and that a total of 21 co‑frequency AMT transmitters operate concurrently within the field of view of the FSS satellite. In case of fewer than 21 AMT co‑frequency transmitters operating simultaneously in view of the satellite, the transmitter power can be adjusted so as not to exceed an aggregate pfd at the satellite of −185.7 dB(W/(m2 · Hz)), which corresponds to a *Tsatellite*/*Tsatellite* of 1%.

3 For the protection of the mobile service in the frequency band 5 150-5 250 MHz, the maximum pfd produced at the surface of the Earth by emissions from an aircraft station of an aeronautical mobile service system, limited to transmissions of telemetry for flight testing, shall not exceed: −79.4 dB(W/(m2 · 20 MHz)) − *Gr* (θ).

*Gr* (θ) represents the mobile service receiver antenna gain versus elevation angle θ and is defined as follows:

Wireless access system elevation antenna pattern

|  |  |
| --- | --- |
| Elevation angle, θ (degrees) | Gain *Gr* (θ) (dBi) |
| 45 < θ ≤ 900 | − 4 |
| 35 < θ ≤ 450 | −3 |
| 0 < θ ≤ 350 | 0 |
| −15 < θ ≤ 000 | −1 |
| −30 < θ ≤ −15 | − 4 |
| −60 < θ ≤ −30 | − 6 |
| −90 < θ ≤ −60 | −5 |

4 For the protection of the aeronautical mobile (R) service (AM(R)S) in the frequency band 5 091-5 150 MHz, the maximum pfd produced at the surface of the Earth, where AM(R)S may be deployed in accordance with No. **5.444B**,by emissions from an aircraft station of an aeronautical mobile service system, limited to transmissions of telemetry for flight testing, shall not exceed: −89.4 dB(W/(m2 ⋅ 20 MHz)) − *Gr* (θ).

*Gr* (θ) represents the mobile service receiver antenna gain versus elevation angle θ and is defined as follows:







where:

*G*(θ) : gain relative to an isotropic antenna (dBi)

*G* (θ) : absolute value of the elevation angle relative to the angle of maximum gain (degrees).

MOD B9/347/29#32596

RESOLUTION 553 (rev.WRC‑15)

Additional regulatory measures for broadcasting-satellite networks in   
the frequency band and 21.4-22 GHz in Regions 1 and 3 for the enhancement   
of equitable access to this frequency band

The World Radiocommunication Conference (Geneva, 2015),

considering

*a)* that WARC‑92 allocated the frequency band 21.4-22 GHz in Regions 1 and 3 to the broadcasting-satellite service (BSS) to be implemented after 1 April 2007;

*b)* that the use of the frequency band since 1992 was subject to an interim procedure in accordance with Resolution **525 (WARC‑92**, **Rev.WRC‑03** and **Rev.WRC‑07)**;

*c)* that the frequency band 21.4-22 GHz in Regions 1 and 3 for the BSS was subject to Resolution **507 (Rev.WRC‑12**),

considering further

*a)* that *a priori* planning for BSS networks in the frequency band 21.4-22 GHz in Regions 1 and 3 is not necessary and should be avoided as it freezes access according to technological assumptions at the time of planning and then prevents flexible use taking account of real world demand and technical developments;

*b)* that WRC‑12established definitive arrangements for the use of the frequency band 21.4-22 GHz;

*c)* that Articles 12 and 44 of the ITU Constitution lay down the basic principles for the use of the radio-frequency spectrum and the geostationary-satellite and other satellite orbits, taking into account the needs of developing countries;

*d)* that those principles have been included in the Radio Regulations;

*e)* that all countries have equal rights in the use of both the radio frequencies allocated to various space radiocommunication services and geostationary-satellite orbit and other satellite orbits for these services;

*f)* that accordingly, a country or a group of countries having frequency assignments for the BSS in the frequency band 21.4-22 GHz need to take all practical measures to facilitate the use of new space systems by other countries or groups of countries;

*g)* that according to No. **23.13**, in devising the characteristics of a space station in the BSS, all technical means available shall be used to reduce, to the maximum, the radiation over the territory of other countries unless an agreement has been previously reached with such countries,

recognizing

*a)* that the “first-come first-served” concept can restrict and sometimes prevents access to and use of certain frequency bands and orbit positions;

*b)* the relative disadvantage for developing countries in coordination negotiations due to various reasons such as a lack of resources and expertise;

*c)* the perceived differences in consistency of application of the Radio Regulations,

recognizing further

*a)* that WRC‑12 received information provided by the Bureau or the various submissions received by the Bureau which include assignments in the BSS for Regions 1 or 3 in the frequency band 21.4‑22 GHz up until December 2011 and that the table below summarizes the data provided by the Bureau and shows the variations for the number of networks at the various stages;

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Advance publication information | Coordination request | Notification submission | Networks in MIFR | Resolution 49 | Confirmed brought into use |
| October 2008 | 605 | 115 | 21 | 2 | 18 |  |
| September 2009 | 599 | 158 | 24 | 9 | 22 | 18 |
| March 2010 | 558 | 199 | 22 | 11 | 20 | 19 |
| June 2010 | 664 | 229 | 22 | 12 | 23 | 19 |
| January 2011 | 703 | 242 | 20 | 7 | 18 | 14 |
| December 2011 | 890 | 291 | 13 | 8\* | 16 | 10\* |
| \* Clarification is awaited for one network. One network is suspended under No. **11.49**. | | | | | | |

*b)* that the number of submissions made by some administrations as contained in the above table in this frequency band is large, which may not be realistic and may be difficult to implement within the regulatory time-limit under Article **11**;

*c)* that the number of submissions as shown in *recognizing further a)* above, is complicating coordination of BSS systems already submitted or planned to be submitted by other administrations,

resolves

that as of 18 February 2012, the special procedure outlined in the Attachment to this Resolution for processing of coordination requests for BSS frequency assignments in Regions 1 and 3 in the frequency band 21.4-22 GHz shall be applied in respect of submissions of administrations meeting the specified requirements in the Attachment.

ATTACHMENT TO RESOLUTION 553 (rev.WRC‑15)

Special procedure to be applied for an assignment for a BSS system   
in the frequency band 21.4-22 GHz in Regions 1 and 3

1 The special procedure described in this attachment can only be applied once (except as described in § 3 below) by an administration or an administration acting on behalf of a group of named administrations when none of those administrations have a network in the MIFR, notified under Article **11** or successfully examined under No. **9.34** and published under No. **9.38** for the frequency band 21.4-22 GHz. In case of countries complying with § 3 below, the special procedures described in this attachment can also be applied[[3]](#footnote-3)1 by an administration when this administration has networks in the MIFR, notified under Article **11** or successfully examined under No. **9.34** and published under No. **9.38** for the frequency band 21.4-22 GHz, but which, combined, do not include its entire territory in the service area. Each one of the administrations in a group will lose its right to apply this special procedures individually or as a member of another group.

2 In the case that an administration that has already made a submission under this special procedure, either individually or as a part of a group (except as described in § 3 below), at a later stage submits a new submission, this new submission cannot benefit from this special procedure.

3 In order to meet the concerns of some countries with a large territory or dispersed territories that cannot be covered from one orbital location, under this procedure the requirement of such countries having large territory would be met by allowing them to apply this special procedure for submissions to cover their territories from an absolute minimum number of orbital locations[[4]](#footnote-4)2 that enable them to cover the entire territory in question.

4 Administrations seeking to apply this special procedure shall submit their request to the Bureau, with the following information:

*a)* the geographical coordinates of not more than 20 points for determining the minimal ellipse[[5]](#footnote-5)3 to cover its/their national territory[[6]](#footnote-6)4;

*b)* the height above sea level of each of its points;

*c)* any special requirement which is to be taken into account, to the extent practicable.

5 In submitting their request under § 4 above, administrations may seek the assistance of the Bureau to suggest candidate orbital locations for a submission.

6 Upon receipt of the complete information (mentioned in § 4 above) from an administration seeking the assistance of the Bureau under § 5, the Bureau shall expeditiously generate the minimum coverage ellipse and candidate orbital locations (if requested by the administration) for a prospective submission. The Bureau shall send this information to the requesting administration.

7 Before an administration notifies to the Bureau or brings into use a frequency assignment subject to this special procedure, it shall effect coordination with other administrations as required in § 10 below.

8 Upon receipt of the information under § 6 above, administrations seeking assistance in applying this special procedure shall submit advance publication information and a request for coordination together with the appropriate information listed in Appendix **4** to these Regulations[[7]](#footnote-7)5.

9 Administrations not seeking the assistance of the Bureau may submit advance publication information and a request for coordination together with the appropriate information listed in Appendix **4** to these Regulations5 at the same time as submitting the information under § 4.

10 On receipt of the complete information sent under § 8 or § 9 above, the Bureau shall, ahead of submissions not yet processed under No. **9.34**, promptly:

*a)* examine the information with respect to conformity with Annex 1 and § 1 to 3;

*b)* examine the information with respect to its conformity with No. **11.31**;

*c)* identify, in accordance with Annex 2 to this Attachment, any administration with which coordination may need to be effected[[8]](#footnote-8)6;

*d)* include their names in the publication under *e)* below;

*e)* publish[[9]](#footnote-9)7, as appropriate, the complete information in the BR IFIC within four months. Where the Bureau is not in a position to comply with the time-limit referred to above, it shall periodically so inform the administrations, giving the reasons therefor;

*f)* inform the administrations concerned of its actions and communicate the results of its calculations, drawing attention to the relevant BR IFIC.

11If the information is found to be incomplete, the Bureau shall immediately seek from the administration concerned any clarification required and information not provided.

12 The provisions in this Resolution are in addition to the provisions of Articles **9** and **11** of the Radio Regulations.

Annex 1  
  
to  
  
Attachment to Resolution 553 (rev.WRC‑15)

Technical parameters to be used for submissions for Regions 1 and 3 BSS networks under the special procedure of this Resolution

*a)* The receiving earth station antenna diameter should be in the range 45-120 cm. The radiation pattern of the receiving terminal antenna should comply with Recommendation ITU‑R BO.1900.

*b)* The noise temperature of the receiving earth station should be in the range 145-200 K.

*c)* The transmitting e.i.r.p. of the space station shall be in the range from 43.2 dBW/MHz to 58.2 dBW/MHz[[10]](#footnote-10)8.

*d)* The service area shall be limited by the national borders of the country and the minimum coverage ellipse generated by the Bureau.

*e)* In the case of an administration with a large territory or dispersed territories, requiring more than one orbit location to cover the territory of their country, the polygons drawn between the points submitted under § 4 above for each submitted orbital location shall not overlap each other and shall not overlap with service areas of networks of this administration successfully examined under No. **9.34** and published under No. **9.38**.

*f)* The minimum coverage ellipse, generated from not more than 20 points with associated geographical coordinates[[11]](#footnote-11)9.

*g)* The reference pattern of the transmitting space station shall be in compliance with Figure 1 below.

*h)* The maximum pointing error of the transmitting space station antenna shall be 0.1° in any direction.

*i)* The maximum rotational error of the transmitting space station antenna shall be ±1°.

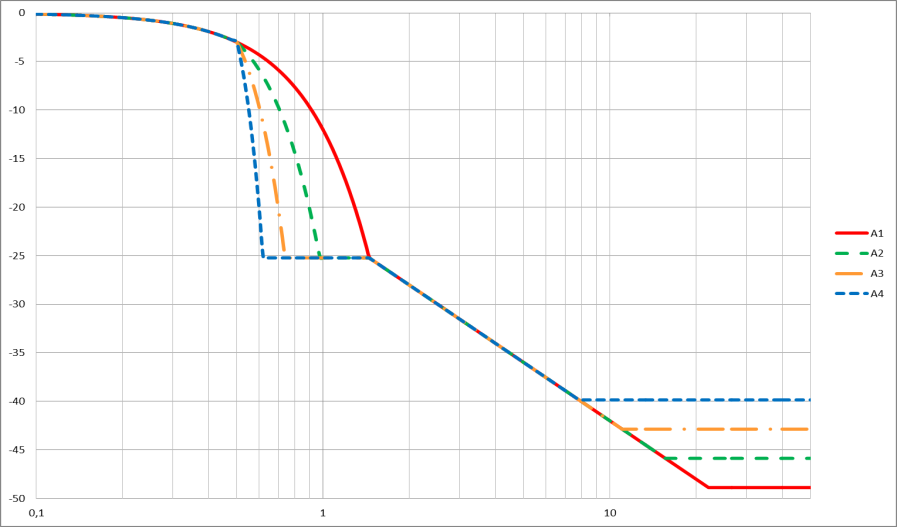
FIGURE 1[[12]](#footnote-12)\*     (WRC‑12)

Reference patterns for satellite antennas  
with fast roll-off in the main beam

Relative antenna gain (dB)

Relative angle (φ/φ0)

−20



−10

−30

−40

−50

0.1

1

10

50

5

0.5

20

2

0.2

0

Bmin = 0.6˚

φ0 = 0.6˚

φ0 = 1.2˚

φ0 = 2.4˚

φ0 = 4.8˚

*Gmax*  =  44.45 – 10 log (φ01 ⋅ φ02)       dBi    (WRC‑12)

*Curve A*: dB relative to main beam gain

−12 (φ/φ0)2  for 0 ≤ (φ/φ0) ≤ 0.5

– for 0.5 < (φ/φ0) ≤ 

–25.23 for 

−(22 + 20 log (φ/φ0)) for (φ/φ0) > 1.45

after intersection with Curve B: Curve B.

*Curve B*: Minus the on-axis gain (Curve B represents examples of four antennas having different values of φ0 as labelled in Fig. 1. The on-axis gains of these antennas are approximately 39.9, 42.9, 45.9 and 48.9 dBi, respectively)    (WRC‑12)

where:

φ: off-axis angle (degrees)

φ0: cross-sectional half-power beamwidth in the direction of interest (degrees)

φ01, φ02: major and minor axis half-power beamwidth, respectively, of elliptical beam (degrees)    (WRC‑12)



where:

*Bmin* = 0.6°

Annex 2  
  
to  
  
Attachment to Resolution 553 (rev.WRC‑15)

Technical criteria to determine coordination requirements for submissions under the special procedure to be applied for an assignment for a   
broadcasting-satellite service system in the frequency band 21.4-22 GHz   
in Regions 1 and 3

Coordination of assignments for a BSS space station with respect to other BSS networks is not required if the pfd produced under assumed free space propagation conditions does not exceed the threshold values shown below, anywhere within the service area of the potentially affected assignment:

*a)* this mask shall be applied for frequency assignments subject to this Resolution with regard to frequency assignments not subject to this Resolution for which:

*–* notification is not submitted under Article **11;** and

*–* complete information under Resolution **552 (Rev.WRC‑15)** is not received by the Bureau,

at the date of receipt of complete information under § 8 and 9 of the Attachment to this Resolution,

−146.88    dB(W/(m2 ⋅ MHz)) for 0° ≤ θ < 0.6°

−150.2 + 9.3 θ2 dB(W/(m2 ⋅ MHz)) for 0.6° ≤ θ < 1.05°

−140.5 + 27.2 log θ dB(W/(m2 ⋅ MHz)) for 1.05° ≤ θ < 2.65°

−138.1 + 1.3 θ2 dB(W/(m2 ⋅ MHz)) for 2.65° ≤ θ < 4.35°

−130.2 + 26.1 log θ dB(W/(m2 ⋅ MHz)) for 4.35° ≤ θ < 9.1°

−105 dB(W/(m2 · MHz)) for 9.1° ≤ θ

where θ is the minimum nominal geocentric orbital separation, in degrees, between the wanted and interfering space stations, taking into account the respective East-West station-keeping accuracies;

*b)* this mask shall be applied for frequency assignment subject to this Resolution with regard to:

– frequency assignments subject to this Resolution; or

– frequency assignments not subject to this Resolution for which:

– notification is submitted under Article **11**; or

– complete information under Resolution **552 (Rev.WRC‑15)** is received by the Bureau,

at the date of receipt of complete information under § 8 and 9 of the Attachment to this Resolution,

−149.88    dB(W/(m2 ⋅ MHz)) for 0° ≤ θ < 0.6°

−153.2 + 9.3 θ2 dB(W/(m2 ⋅ MHz)) for 0.6° ≤ θ < 1.05°

−143.5 + 27.2 log θ dB(W/(m2 ⋅ MHz)) for 1.05° ≤ θ < 2.65°

−141.1 + 1.3 θ2 dB(W/(m2 ⋅ MHz)) for 2.65° ≤ θ < 4.35°

−133.2 + 26.1 log θ dB(W/(m2 ⋅ MHz)) for 4.35° ≤ θ < 12°

−105 dB(W/(m2 · MHz)) for 12° ≤ θ

where θ is the minimum nominal geocentric orbital separation, in degrees, between the wanted and interfering space stations, taking into account the respective East-West station-keeping accuracies.

MOD B9/347/30#32597

RESOLUTION 555 (rev.WRC‑15)

Additional regulatory provisions for broadcasting-satellite service   
networks in the frequency band 21.4-22 GHz in Regions 1 and 3 for   
the enhancement of equitable access to this frequency band

The World Radiocommunication Conference (Geneva, 2015),

considering

*a)* that WARC‑92 allocated the frequency band 21.4-22 GHz in Regions 1 and 3 to the broadcasting-satellite service (BSS) to be implemented after 1 April 2007;

*b)* that the use of the frequency band since 1992 was subject to an interim procedure in accordance with Resolution **525 (WARC‑92**, **Rev.WRC‑03** and **Rev.WRC‑07)**;

*c)* that Article 44 of the ITU Constitution sets out the basic principles for the use of the radio-frequency spectrum and the geostationary-satellite and other satellite orbits, taking into account the needs of developing countries,

further considering

*a)* that *a priori* planning for BSS networks in the frequency band 21.4-22 GHz in Regions 1 and 3 is not necessary and should be avoided as it freezes access according to technological assumptions at the time of planning and then prevents flexible use taking account of real world demand and technical developments;

*b)* that interim arrangements for the use of the frequency bands were on a first-come first-served basis,

recognizing

*a)* that the number of filings made by some administrations in this frequency band is extremely large, which may not be realistic and may be difficult to implement within the regulatory time-limit under Article **11**;

*b)* that the number of filings (291 coordination requests received by the Bureau as at December 2011), including those referred to in *recognizing a)* above, is limiting the possibility of successful coordination of BSS systems already submitted or planned to be submitted by other administrations,

resolves

to urge administrations to make the utmost efforts to accommodate submissions received from other administrations with few filings, especially covering their own territories.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. 1 The Radiocommunication Bureau shall develop and keep up-to-date forms of notice to meet fully the statutory provisions of this Appendix and related decisions of future conferences. Additional information on the items listed in this Annex together with an explanation of the symbols is to be found in the Preface to the BR IFIC (Terrestrial Services). [↑](#footnote-ref-1)
2. \* This revision contains an up-to-date version of Part III, reflecting all amendments to Part III resulting from the application of the procedures of Part V, up to and including 28 November 2015, as well as those amendments, which resulted from geopolitical changes that occurred up to and including that date. [↑](#footnote-ref-2)
3. 1 The number of submissions shall not exceed the number of orbital locations for national assignments in the Appendix **30** Plan, reduced by the number of orbit locations of that administration for networks in the MIFR, submissions notified under Article **11** and submissions successfully examined under No. **9.34** and published under No. **9.38**. [↑](#footnote-ref-3)
4. 2 The number of orbital locations shall not exceed the number of orbital locations for national assignments in the Appendix **30** Plan. [↑](#footnote-ref-4)
5. 3 In some cases, use of composite beams may be necessary to provide required coverage while reducing undesired coverage of adjacent geographical areas. [↑](#footnote-ref-5)
6. 4 Countries requiring more than one orbital location to cover their national territory (see § 3 above) shall submit points for different orbital locations such that the polygons drawn between the points do not overlap with those from other orbital locations of the same administration. [↑](#footnote-ref-6)
7. 5 For submissions under this special procedure, the coordination information is receivable at the same date as that of the advance publication information. [↑](#footnote-ref-7)
8. 6 The Bureau shall also identify the specific satellite networks with which coordination needs to be effected. [↑](#footnote-ref-8)
9. 7 If the payments are not received in accordance with the provisions of Council Decision 482, as amended, on the implementation of cost recovery for satellite network filings, the Bureau shall cancel the publication, after informing the administration concerned. The Bureau shall inform all administrations of such action and that the network specified in the publication in question no longer has to be taken into consideration by the Bureau and other administrations. The Bureau shall send a reminder to the notifying administration not later than two months prior to the deadline for the payment in accordance with the above-mentioned Council Decision 482 unless the payment has already been received.     (WRC‑12) [↑](#footnote-ref-9)
10. 8 The maximum pfd produced at high elevation angles at the Earth’s surface under free-space conditions shall not exceed −105 dB(W/(m2 ∙ MHz)). [↑](#footnote-ref-10)
11. 9 In some cases use of composite beams may be necessary to provide required coverage while reducing undesired coverage of adjacent geographical areas. [↑](#footnote-ref-11)
12. \* Figure 1 represents patterns for some values of φ0.    (WRC‑12) [↑](#footnote-ref-12)