

FINAL ACTS WRC-12

WORLD RADIOCOMMUNICATION
CONFERENCE (GENEVA, 2012)



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TABLE OF CONTENTS

FINAL ACTS of the World Radiocommunication Conference (WRC-12) Geneva, 2012

	<i>Page</i>
Preamble	XIII
Final Protocol	XXIX
Declarations and reservations	XXXV
Additional Declarations and Reservations	LXXIII

Partial revision of the Radio Regulations

Articles

ARTICLE 3	Technical characteristics of stations	3
ARTICLE 4	Assignment and use of frequencies	4
ARTICLE 5	Frequency allocations	5
ARTICLE 9	Procedure for effecting coordination with or obtaining agreement of other administrations	44
ARTICLE 11	Notification and recording of frequency assignments	46
ARTICLE 13	Instructions to the Bureau	50
ARTICLE 15	Interferences	51
ARTICLE 16	International monitoring	52
ARTICLE 19	Identification of stations	53
ARTICLE 21	Terrestrial and space services sharing frequency bands above 1 GHz	54
ARTICLE 22	Space services	58
ARTICLE 29	Radio astronomy service	59

	<i>Page</i>
ARTICLE 29A	Radio services related to Earth observation..... 60
ARTICLE 33	Operational procedures for urgency and safety communications in the global maritime distress and safety system (GMDSS) 61
ARTICLE 34	Alerting signals in the global maritime distress and safety system (GMDSS) 62
ARTICLE 47	Operator's certificates 63
ARTICLE 51	Conditions to be observed in the maritime services 66
ARTICLE 52	Special rules relating to the use of frequencies..... 67
ARTICLE 59	Entry into force and provisional application of the Radio Regulations..... 69

Appendices

	<i>Page</i>
APPENDIX 1 (REV.WRC-12)	Classification of emissions and necessary bandwidths..... 73
APPENDIX 4 (REV.WRC-12)	Consolidated list and tables of characteristics for use in the application of the procedures of Chapter III 75
APPENDIX 5 (REV.WRC-12)	Identification of administrations with which coordination is to be effected or agreement sought under the provisions of Article 9 92
APPENDIX 7 (REV.WRC-12)	Methods for the determination of the coordination area around an earth station in frequency bands between 100 MHz and 105 GHz..... 104
APPENDIX 15 (REV.WRC-12)	Frequencies for distress and safety communications for the Global Maritime Distress and Safety System (GMDSS)..... 110
APPENDIX 17 (REV.WRC-12)	Frequencies and channelling arrangements in the high-frequency bands for the maritime mobile service..... 111
APPENDIX 18 (REV.WRC-12)	Table of transmitting frequencies in the VHF maritime mobile band..... 140
APPENDIX 30 (Rev.WRC-12)*	Provisions for all services and associated Plans and List ¹ for the broadcasting-satellite service in the frequency bands 11.7-12.2 GHz (in Region 3), 11.7-12.5 GHz (in Region 1) and 12.2-12.7 GHz (in Region 2)..... 145

APPENDIX 30A (REV.WRC-12)* Provisions and associated Plans and List ¹ for feeder links for the broadcasting-satellite service (11.7-12.5 GHz in Region 1, 12.2-12.7 GHz in Region 2 and 11.7-12.2 GHz in Region 3) in the frequency bands 14.5-14.8 GHz ² and 17.3-18.1 GHz in Regions 1 and 3, and 17.3-17.8 GHz in Region 2	159
APPENDIX 30B (REV.WRC-12) Provisions and associated Plan for the fixed-satellite service in the frequency bands 4 500-4 800 MHz, 6 725-7 025 MHz, 10.70-10.95 GHz, 11.2-11.45 GHz and 12.75-13.25 GHz	169

Resolutions and Recommendations

List of Resolutions and Recommendations approved for deletion by WRC-12.....	175
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Resolutions

RESOLUTION 11 (WRC-12) Use of satellite orbital positions and associated frequency spectrum to deliver international public telecommunication services in developing countries.....	179
RESOLUTION 12 (WRC-12) Assistance and support to Palestine.....	183
RESOLUTION 18 (REV.WRC-12) Relating to the procedure for identifying and announcing the position of ships and aircraft of States not parties to an armed conflict	185
RESOLUTION 27 (REV.WRC-12) Use of incorporation by reference in the Radio Regulations	187
RESOLUTION 42 (REV.WRC-12) Use of interim systems in Region 2 in the broadcasting-satellite and fixed-satellite (feeder-link) services in Region 2 for the bands covered by Appendices 30 and 30A	190
RESOLUTION 49 (REV.WRC-12) Administrative due diligence applicable to some satellite radiocommunication services	196
RESOLUTION 55 (REV.WRC-12) Electronic submission of notice forms for satellite networks, earth stations and radio astronomy stations	201
RESOLUTION 63 (REV.WRC-12) Protection of radiocommunication services against interference caused by radiation from industrial, scientific and medical (ISM) equipment	203
RESOLUTION 67 (WRC-12) Updating and rearrangement of the Radio Regulations.....	205

RESOLUTION 75 (REV.WRC-12) Development of the technical basis for determining the coordination area for coordination of a receiving earth station in the space research service (deep space) with transmitting stations of high-density applications in the fixed service in the 31.8-32.3 GHz and 37-38 GHz bands	207
RESOLUTION 98 (WRC-12) Provisional application of certain provisions of the Radio Regulations as revised by WRC-12 and abrogation of certain Resolutions and Recommendations	209
RESOLUTION 114 (REV.WRC-12) Studies on compatibility between new systems of the aeronautical radionavigation service and the fixed-satellite service (Earth-to-space) (limited to feeder links of the non-geostationary mobile-satellite systems in the mobile-satellite service) in the frequency band 5 091-5 150 MHz.....	211
RESOLUTION 125 (REV.WRC-12) Frequency sharing in the bands 1 610.6-1 613.8 MHz and 1 660-1 660.5 MHz between the mobile-satellite service and the radio astronomy service	213
RESOLUTION 145 (REV.WRC-12) Use of the bands 27.9-28.2 GHz and 31-31.3 GHz by high altitude platform stations in the fixed service	215
RESOLUTION 149 (REV.WRC-12) Submissions from new Member States of the Union relating to Appendix 30B of the Radio Regulations.....	218
RESOLUTION 150 (WRC-12) Use of the bands 6 440-6 520 MHz and 6 560-6 640 MHz by gateway links for high-altitude platform stations in the fixed service.....	219
RESOLUTION 151 (WRC-12) Additional primary allocations to the fixed-satellite service in frequency bands between 10 and 17 GHz in Region 1	222
RESOLUTION 152 (WRC-12) Additional primary allocations to the fixed-satellite service in the Earth-to-space direction in frequency bands between 13-17 GHz in Region 2 and Region 3	226
RESOLUTION 153 (WRC-12) The use of frequency bands allocated to the fixed-satellite service not subject to Appendices 30, 30A and 30B for the control and non-payload communications of unmanned aircraft systems in non-segregated airspace.....	229
RESOLUTION 154 (WRC-12) Consideration of technical and regulatory actions in order to support existing and future operation of fixed-satellite service earth stations within the 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	231
RESOLUTION 205 (REV.WRC-12) Protection of the systems operating in the mobile-satellite service in the band 406-406.1 MHz	233
RESOLUTION 215 (REV.WRC-12) Coordination process among mobile-satellite systems and efficient use of the allocations to the mobile-satellite service in the 1-3 GHz range	236

RESOLUTION 222 (REV.WRC-12) Use of the frequency bands 1 525-1 559 MHz and 1 626.5-1 660.5 MHz by the mobile-satellite service, and procedures to ensure long-term spectrum access for the aeronautical mobile-satellite (R) service.....	238
RESOLUTION 223 (REV.WRC-12) Additional frequency bands identified for IMT.....	243
RESOLUTION 224 (REV.WRC-12) Frequency bands for the terrestrial component of International Mobile Telecommunications below 1 GHz.....	247
RESOLUTION 225 (REV.WRC-12) Use of additional frequency bands for the satellite component of IMT	251
RESOLUTION 229 (REV.WRC-12) Use of the bands 5 150-5 250 MHz, 5 250-5 350 MHz and 5 470-5 725 MHz by the mobile service for the implementation of wireless access systems including radio local area networks	253
RESOLUTION 232 (WRC-12) Use of the frequency band 694-790 MHz by the mobile, except aeronautical mobile, service in Region 1 and related studies.....	257
RESOLUTION 233 (WRC-12) Studies on frequency-related matters on International Mobile Telecommunications and other terrestrial mobile broadband applications.....	260
RESOLUTION 234 (WRC-12) Additional primary allocations to the mobile-satellite service within the bands from 22 GHz to 26 GHz.....	263
RESOLUTION 331 (REV.WRC-12) Operation of the Global Maritime Distress and Safety System	265
RESOLUTION 343 (REV.WRC-12) Maritime certification for personnel of ship stations and ship earth stations for which a radio installation is not compulsory.....	268
RESOLUTION 344 (REV.WRC-12) Management of the maritime identity numbering resource	271
RESOLUTION 349 (REV.WRC-12) Operational procedures for cancelling false distress alerts in the Global Maritime Distress and Safety System	273
RESOLUTION 358 (WRC-12) Consideration of improvement and expansion of on-board communication stations in the maritime mobile service in the UHF bands	276
RESOLUTION 359 (WRC-12) Consideration of regulatory provisions for modernization of the Global Maritime Distress and Safety System and studies related to e-navigation	278
RESOLUTION 360 (WRC-12) Consideration of regulatory provisions and spectrum allocations for enhanced Automatic Identification System technology applications and for enhanced maritime radiocommunication	280
RESOLUTION 413 (REV.WRC-12) Use of the band 108-117.975 MHz by the aeronautical mobile (R) service.....	282

RESOLUTION 417 (REV.WRC-12) Use of the frequency band 960-1 164 MHz by the aeronautical mobile (R) service	284
RESOLUTION 418 (REV.WRC-12) Use of the band 5 091-5 250 MHz by the aeronautical mobile service for telemetry applications	287
RESOLUTION 422 (WRC-12) Development of methodology to calculate aeronautical mobile-satellite (R) service spectrum requirements within the frequency bands 1 545-1 555 MHz (space-to-Earth) and 1 646.5-1 656.5 MHz (Earth-to-space).....	291
RESOLUTION 423 (WRC-12) Consideration of regulatory actions, including allocations, to support Wireless Avionics Intra-Communications	293
RESOLUTION 507 (REV.WRC-12) Establishment of agreements and associated plans for the broadcasting-satellite service	295
RESOLUTION 526 (REV.WRC-12) Future adoption of procedures to ensure flexibility in the use of the frequency band allocated to the broadcasting-satellite service (BSS) for wide RF-band high-definition television (HDTV) and to the associated feeder links	296
RESOLUTION 548 (REV.WRC-12) Application of the grouping concept in Appendices 30 and 30A in Regions 1 and 3	297
RESOLUTION 552 (WRC-12) Long-term access to and development in the band 21.4-22 GHz in Regions 1 and 3	299
RESOLUTION 553 (WRC-12) Additional regulatory measures for broadcasting-satellite networks in the band 21.4-22 GHz in Regions 1 and 3 for the enhancement of equitable access to this band.....	303
RESOLUTION 554 (WRC-12) Application of pfd masks to coordination under No. 9.7 for broadcasting-satellite service networks in the band 21.4-22 GHz in Regions 1 and 3.....	311
RESOLUTION 555 (WRC-12) Additional regulatory provisions for broadcasting-satellite service networks in the band 21.4-22 GHz in Regions 1 and 3 for the enhancement of equitable access to this band.....	312
RESOLUTION 612 (REV.WRC-12) Use of the radiolocation service between 3 and 50 MHz to support oceanographic radar operations.....	314
RESOLUTION 644 (REV.WRC-12) Radiocommunication resources for early warning, disaster mitigation and relief operations	316
RESOLUTION 646 (REV.WRC-12) Public protection and disaster relief.....	318
RESOLUTION 647 (REV.WRC-12) Spectrum management guidelines for emergency and disaster relief radiocommunication.....	323
RESOLUTION 648 (WRC-12) Studies to support broadband public protection and disaster relief	327

RESOLUTION 649 (WRC-12) Possible allocation to the amateur service on a secondary basis at around 5 300 kHz.....	329
RESOLUTION 650 (WRC-12) Allocation for the Earth exploration-satellite service (Earth-to-space) in the 7-8 GHz range	331
RESOLUTION 651 (WRC-12) Possible extension of the current worldwide allocation to the Earth exploration-satellite (active) service in the frequency band 9 300-9 900 MHz by up to 600 MHz within the frequency bands 8 700-9 300 MHz and/or 9 900-10 500 MHz.....	333
RESOLUTION 652 (WRC-12) Use of the band 410-420 MHz by the space research service (space-to-space)	335
RESOLUTION 653 (WRC-12) Future of the Coordinated Universal Time time-scale.....	337
RESOLUTION 654 (WRC-12) Allocation of the band 77.5-78 GHz to the radiolocation service to support automotive short-range high-resolution radar operations	339
RESOLUTION 673 (REV.WRC-12) The importance of Earth observation radiocommunication applications	341
RESOLUTION 716 (REV.WRC-12) Use of the frequency bands 1 980-2 010 MHz and 2 170-2 200 MHz in all three Regions and 2 010-2 025 MHz and 2 160-2 170 MHz in Region 2 by the fixed and mobile-satellite services and associated transition arrangements	343
RESOLUTION 731 (REV.WRC-12) Consideration of sharing and adjacent-band compatibility between passive and active services above 71 GHz.....	346
RESOLUTION 732 (REV.WRC-12) Consideration of sharing between active services above 71 GHz	348
RESOLUTION 741 (REV.WRC-12) Protection of the radio astronomy service in the band 4 990-5 000 MHz from unwanted emissions of the radionavigation-satellite service (space-to-Earth) operating in the frequency band 5 010-5 030 MHz	350
RESOLUTION 748 (REV.WRC-12) Compatibility between the aeronautical mobile (R) service and the fixed-satellite service (Earth-to-space) in the band 5 091-5 150 MHz.....	352
RESOLUTION 749 (REV.WRC-12) Use of the band 790-862 MHz in countries of Region 1 and the Islamic Republic of Iran by mobile applications and by other services	354
RESOLUTION 750 (REV.WRC-12) Compatibility between the Earth exploration-satellite service (passive) and relevant active services.....	359
RESOLUTION 755 (WRC-12) Power flux-density limits for transmitting stations in the 21.4-22 GHz band.....	364

RESOLUTION 756 (WRC-12) Studies on possible reduction of the coordination arc and technical criteria used in application of No. 9.41 in respect of coordination under No. 9.7	365
RESOLUTION 757 (WRC-12) Regulatory aspects for nanosatellites and picosatellites	368
RESOLUTION 758 (WRC-12) Allocation to the fixed-satellite service and the maritime-mobile satellite service in the 7/8 GHz range	370
RESOLUTION 804 (REV.WRC-12) Principles for establishing agendas for world radiocommunication conferences	372
RESOLUTION 807 (WRC-12) Agenda for the 2015 World Radiocommunication Conference	376
RESOLUTION 808 (WRC-12) Preliminary agenda for the 2018 World Radiocommunication Conference.....	380
RESOLUTION 906 (REV.WRC-12) Electronic submission of notice forms for terrestrial services to the Radiocommunication Bureau and exchange of data between administrations.....	382
RESOLUTION 907 (WRC-12) Use of modern electronic means of communication for administrative correspondence related to advance publication, coordination and notification of satellite networks including that related to Appendices 30, 30A and 30B, earth stations and radio astronomy stations.....	385
RESOLUTION 908 (WRC-12) Electronic submission and publication of advance publication information.....	387
RESOLUTION 909 (WRC-12) Provisions relating to earth stations located on board vessels which operate in fixed-satellite service networks in the uplink bands 5 925-6 425 MHz and 14-14.5 GHz.....	389
RESOLUTION 957 (WRC-12) Studies towards review of the definitions of <i>fixed service</i> , <i>fixed station</i> and <i>mobile station</i>	390

Recommendations

Page

RECOMMENDATION 16 (WRC-12) Interference management for stations that may operate under more than one terrestrial radiocommunication service.....	393
RECOMMENDATION 34 (REV.WRC-12) Principles for the allocation of frequency bands	395
RECOMMENDATION 76 (WRC-12) Deployment and use of cognitive radio systems	397
RECOMMENDATION 206 (REV.WRC-12) Studies on the possible use of integrated mobile-satellite service and ground component systems in the bands 1 525- 1 544 MHz, 1 545-1 559 MHz, 1 626.5-1 645.5 MHz and 1 646.5-1 660.5 MHz.....	398

Preamble

The World Radiocommunication Conference (Geneva, 2007) resolved, by Resolution **805 (WRC-07)**, to recommend to the ITU Council that a World Radiocommunication Conference be held in 2011 for a period of four weeks.

At its 2008 session, the Council resolved, by its Resolution 1291 (MOD), that the Conference be convened in Geneva from 23 January to 17 February 2012, and established its agenda. The agenda, dates and place were approved by the required majority of the Member States of the Union.

The World Radiocommunication Conference (WRC-12) met in Geneva for the stipulated period and worked on the basis of the agenda approved by the Council. It adopted a revision of the Radio Regulations and Appendices thereto, as contained in these Final Acts.

In accordance with its agenda, the Conference also took other decisions that it considered necessary or appropriate, including the review and revision of existing Resolutions and Recommendations and the adoption of various new Resolutions and Recommendations as contained in these Final Acts.

The majority of the provisions revised by WRC-12, as contained in the revision of the Radio Regulations referred to in this Preamble, shall enter into force as from 1 January 2013; the remaining provisions shall apply as from the dates indicated in the Resolutions listed in Article **59** of the revised Radio Regulations.

The delegates signing the revision of the Radio Regulations contained in these Final Acts, which is subject to approval by their competent authorities, declare that, should a Member State of the Union make reservations concerning the application of one or more of the provisions of the revised Radio Regulations, no other Member State shall be obliged to observe that provision or those provisions in its relations with that particular Member State.

IN WITNESS WHEREOF, the delegates of the Member States of the International Telecommunication Union named below have, on behalf of their respective competent authorities, signed one copy of these Final Acts. In case of dispute, the French text shall prevail. This copy shall remain deposited in the archives of the Union. The Secretary-General shall forward one certified true copy to each Member State of the International Telecommunication Union.

Done at Geneva, 17 February 2012

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For the Czech Republic

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For Romania

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Bogdan IANA

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Pape Ciré CISSE

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For the Democratic Socialist Republic of Sri Lanka

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For the Confederation of Switzerland

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For the Republic of Suriname

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For Trinidad and Tobago

Carolyn SEEPERSAD-BACHAN

For Tunisia

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For the Eastern Republic of Uruguay

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For the Bolivarian Republic of Venezuela

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For the Socialist Republic of Viet Nam

Doan Quang HOAN

For the Republic of Yemen

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Sallam Ali ABDULHAMEED

Abdulhameed Mansoor MAGDI

For the Republic of Zambia

Luwani SOKO

For the Republic of Zimbabwe

Angeline KARONGA

Final Protocol

List of countries in alphabetical order giving the number(s) of their declarations and reservations:

Algeria (People's Democratic Republic of) (79, 87)

Angola (Republic of) (104)

Argentine Republic (21)

Armenia (Republic of) (49)

Australia (9, 113)

Austria (19, 33, 69, 113)

Azerbaijani Republic (33, 49, 103)

Bahrain (Kingdom of) (79, 98)

Bangladesh (People's Republic of) (7)

Barbados (46)

Belarus (Republic of) (49, 74)

Belgium (19, 33, 69, 113)

Benin (Republic of) (96)

Bosnia and Herzegovina (33)

Botswana (Republic of) (81)

Brazil (Federative Republic of) (11)

Brunei Darussalam (78)

Bulgaria (Republic of) (19, 66)

Burkina Faso (31)

Burundi (Republic of) (85)

Canada (33, 88, 113)

Chile (62)

China (People's Republic of) (42, 105)

Colombia (Republic of) (34)

Costa Rica (60)

Côte d'Ivoire (Republic of) (23)

Croatia (Republic of) (19, 33, 101, 113)

Cuba (57, 116)
 Cyprus (Republic of) (19, 33 54)
 Czech Republic (19, 33, 69, 113)
 Democratic Republic of the Congo (102)
 Denmark (19, 33, 113)
 Djibouti (Republic of) (26)
 Dominican Republic (75)
 Egypt (Arab Republic of) (35)
 El Salvador (Republic of) (40)
 Estonia (Republic of) (19, 33, 113)
 Finland (19, 33, 113)
 France (19, 33, 36, 113)
 Gabonese Republic (53)
 Georgia (33, 48, 113)
 Germany (Federal Republic of) (19, 33 63, 69, 113)
 Ghana (20)
 Greece (19, 33, 106, 113)
 Guatemala (Republic of) (18)
 Hungary (19, 33, 45, 69, 113)
 Iceland (3, 33, 113)
 India (Republic of) (22)
 Indonesia (Republic of) (16, 79)
 Iran (Islamic Republic of) (56, 79)
 Iraq (Republic of) (78, 108)
 Ireland (19, 33, 113)
 Israel (State of) (76, 77, 92)
 Italy (19, 27, 33, 113)
 Japan (44, 113)
 Kazakhstan (Republic of) (49)

Kenya (Republic of) (24)
 Korea (Republic of) (43)
 Kuwait (State of) (79)
 Kyrgyz Republic (49)
 Latvia (Republic of) (19, 33, 69)
 Lebanon (79)
 Lesotho (Kingdom of) (59)
 Libya (79, 117, 118)
 Liechtenstein (Principality of) (3, 33, 69, 113)
 Lithuania (Republic of) (19, 33, 69)
 Luxembourg (19, 33, 69, 113)
 Macedonia (the Former Yugoslav Republic of) (33, 113)
 Malawi (84)
 Malaysia (89)
 Mali (Republic of) (64)
 Malta (19, 33, 69, 113)
 Marshall Islands (Republic of the) (109)
 Mexico (83)
 Micronesia (Federated States of) (110)
 Moldova (Republic of) (33, 49, 113)
 Montenegro (32, 33)
 Morocco (Kingdom of) (55, 79, 99)
 Mozambique (Republic of) (30)
 Namibia (Republic of) (95)
 Netherlands (Kingdom of the) (19, 33, 113)
 New Zealand (15, 113)
 Niger (Republic of the) (14)
 Nigeria (Federal Republic of) (1)
 Norway (3, 33, 113)

Oman (Sultanate of) (68, 79)

Pakistan (Islamic Republic of) (79)

Papua New Guinea (86, 119)

Paraguay (Republic of) (2)

Philippines (Republic of the) (51)

Poland (Republic of) (19, 33, 113)

Portugal (19, 33, 107, 113)

Qatar (State of) (79)

Romania (19, 33, 113)

Russian Federation (49)

Rwanda (Republic of) (82)

San Marino (Republic of) (4, 33)

Saudi Arabia (Kingdom of) (10, 79)

Senegal (Republic of) (67)

Serbia (Republic of) (33)

Singapore (Republic of) (17)

Slovak Republic (19, 33, 69, 113)

Slovenia (Republic of) (19, 33, 113)

South Africa (Republic of) (91)

South Sudan (Republic of) (114)

Spain (73, 100)

Sudan (Republic of the) (37, 79)

Suriname (Republic of) (13)

Swaziland (Kingdom of) (97)

Sweden (19, 33, 61, 94, 113)

Switzerland (Confederation of) (6, 33, 69, 113)

Syrian Arab Republic (52, 79)

Tanzania (United Republic of) (28)

Thailand (8)

Togolese Republic (58)
Trinidad and Tobago (29)
Tunisia (79, 112)
Turkey (12, 33, 93, 113)
Uganda (Republic of) (70)
Ukraine (49)
United Arab Emirates (39)
United Kingdom of Great Britain and Northern Ireland (19, 33, 50, 90, 113)
United States of America (47, 111, 113, 115)
Uruguay (Eastern Republic of) (5)
Uzbekistan (Republic of) (49)
Vatican City State (25, 33)
Venezuela (Bolivarian Republic of) (80)
Viet Nam (Socialist Republic of) (65)
Yemen (Republic of) (41)
Zambia (Republic of) (71)
Zimbabwe (Republic of) (72)

Declarations and reservations*

At the time of the signing of the Final Acts of the World Radiocommunication Conference (Geneva, 2012), the undersigned delegates take note of the following declarations and reservations made by signatory delegations:

1

Original: English

For the Federal Republic of Nigeria:

The delegation of the Federal Republic of Nigeria to the 2012 World Radiocommunication Conference of the International Telecommunication Union (ITU) (Geneva, 2012) in signing the Final Acts of the Conference, reserves for its Government the right to make declarations and/or reservations until and up to the time of the deposit of its instrument of ratification of the amendments to the Radio Regulations.

The Government of the Federal Republic of Nigeria further reserves the rights to take any action it considers necessary to safeguard its interests should other Member States fail to observe the provisions of the Radio Regulations, or, should their continued reservations and failures jeopardize or hinder the operation of the Nigerian telecommunication/ICT services.

2

Original: Spanish

For the Republic of Paraguay:

The delegation of the Republic of Paraguay, in signing the Final Acts of the World Radiocommunication Conference (WRC-12), declares that it reserves for its Government the right:

- to take any action it considers necessary to safeguard its interests, should other Members of the International Telecommunication Union fail in any way to observe the Final Acts, the Annexes thereto and the Radio Regulations, or should reservations by other members jeopardize the proper functioning of its telecommunication services or its full sovereign rights;
- to formulate, under the Vienna Convention on the Law of Treaties of 1969, additional declarations or reservations to these Final Acts at any time it sees fit between the date of the signature and the date of the possible ratification of the international instruments constituting these Final Acts.

* *Note by the Secretary-General:* The texts of the Final Protocol are shown in the chronological order of their deposit.

Original: English

For Iceland, the Principality of Liechtenstein and Norway:

The delegations of the above-mentioned Member States of the European Economic Area declare that the above-mentioned Member States of the European Economic Area will apply the revision of the Radio Regulations adopted at this conference in accordance with their obligations under the Treaty establishing the European Economic Area.”

Original: English

For the Republic of San Marino:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2012), the delegation of the Republic of San Marino declares that it reserves for its Government the right:

- 1 to take any action and preservation measures it deems necessary should the consequences of reservations by any Member State put in danger San Marino's radiocommunication services or affect its sovereignty to comply with the provisions of the Final Acts, the Annexes thereto or the Radio Regulations;
- 2 to express declarations or reservations with respect to the Final Acts of the World Radiocommunication Conference (Geneva, 2012) at the time of deposit of the corresponding instruments of ratification with the International Telecommunication Union.

Original: Spanish

For the Eastern Republic of Uruguay:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2012), the delegation of the Eastern Republic of Uruguay declares that it reserves for its Government the right:

- to take any action it considers necessary to safeguard its interests, should other Members of the International Telecommunication Union fail in any way to observe the Final Acts, the Annexes thereto and the Radio Regulations, or should reservations by other Members jeopardize the proper functioning of its telecommunication services or its full sovereign rights;
- to make additional reservations, under the Vienna Convention on the Law of Treaties of 1969, to the Final Acts of the World Radiocommunication Conference (Geneva, 2012) at any time it sees fit between the date of the signature and the date of the possible ratification of the international instruments constituting these Final Acts.

Original: French**For the Confederation of Switzerland:**

The Swiss delegation reserves for the Government of the Confederation of Switzerland the right to take any measures it deems appropriate to safeguard its interests relating to the broadcasting service and other radiocommunication services should any Member of the Union fail to abide by its obligations arising from the provisions of the Final Acts of the World Radiocommunication Conference (Geneva, 2012), or should reservations made by or actions on the part of a Member State be such as to jeopardize or are aimed at hindering the smooth functioning of the said services in Switzerland.

Original: English**For the People's Republic of Bangladesh:**

- 1 In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2012), the delegation of the People's Republic of Bangladesh declares that it reserves for its Government the right to take any measures and actions it considers necessary to safeguard its interests, should any Member State of the Union fail to abide by the provisions of these Final Acts or comply with them or should reservations, made by other countries, jeopardize the efficient operation of its telecommunication services.
- 2 The delegation of the People's Republic of Bangladesh reserves for its Government the right to make additional reservations when ratifying the Final Acts of this Conference.

Original: English**For Thailand:**

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2012), the delegation of Thailand reserves the right for its Government to take any action or measures it may deem necessary to safeguard its national interests should the Final Acts drawn up in the World Radiocommunication Conference (Geneva, 2012) directly or indirectly affect its sovereignty, or be in contravention with the Constitution, Laws and Regulations of the Kingdom of Thailand which exist and may result from any principles of international law, should any Member State of the International Telecommunication Union (ITU) fail to respect fully the provisions and resolutions of the Final Acts or to comply the requirement with them and annexes attached thereto, or should reservations by any Member State jeopardize in any way the telecommunication services of the Royal Thai Government.

Original: English**For Australia:**

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2012), the delegation of Australia reserves for its Government the right to take any measures it might deem necessary to safeguard its interests if another Member State of the International Telecommunication Union in any way fails to respect the conditions specified in the Final Acts or if the reservations made by any Member State should be prejudicial to the operation of radiocommunication services in Australia or its full sovereign rights.

The delegation of Australia further declares that it reserves for its Government the right to make declarations or reservations when depositing its instrument of ratification for amendments to the Radio Regulations adopted at this World Radiocommunication Conference (Geneva, 2012).

Original: Arabic**For the Kingdom of Saudi Arabia:**

The delegation of the Kingdom of Saudi Arabia, in signing the Final Acts of the World Radiocommunication Conference (Geneva, 2012), reserves for the Kingdom of Saudi Arabia the right to take any actions and measures it deems necessary to protect its interests should any Member State of the International Telecommunication Union (ITU) fail to respect fully the provisions and Resolutions of the Final Acts or to comply with them, or should any actions or reservations by any Member State, during or after the Conference, jeopardize in any way the proper functioning of the telecommunication services of the Kingdom of Saudi Arabia.

Original: English**For the Federative Republic of Brazil:**

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2012), the Brazilian delegation reserves for its Administration the right to take such measures as it might deem necessary to safeguard its interests if any Member State of the Union should in any way fail to respect the conditions specified in the Final Acts, or if the reservation made by any Member State should be prejudicial to the operation of radiocommunication services in Brazil.

Furthermore, Brazil reserves the right to make additional specific declarations or reservations at the time of deposit of its notification to the International Telecommunication Union of its consent to be bound by the revisions to the Radio Regulations adopted by the World Radiocommunication Conference (Geneva, 2012).

Original: English**For Turkey:**

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2012), the delegation of Turkey reserves the rights of its Government to take any measures which it deems necessary to protect its interests on the decision taken by the conference in modifying, amending, deleting and adding provisions, footnotes, tables, resolutions and recommendations in the Radio Regulations, should any Member of the Union fail, in any way, to comply with the provisions of the Final Acts, Annexes and the Radio Regulations thereto, in using its existing services and introducing new services for space, terrestrial and other applications or should any reservation made by other Members jeopardize the proper operation of its telecommunication services.

The delegation of Turkey further reserves the rights of its Government to make additional declarations or reservations as may be necessary when depositing its instruments of ratification of the Final Acts of the World Radiocommunication Conference (Geneva, 2012).

Original: English**For the Republic of Suriname:**

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2012), the delegation of the Republic of Suriname declares that it reserves for its Government the right:

- 1 to take any action and preservation measures it deems necessary should the consequences of reservations by any Member State put in danger Surinamese radiocommunication services or affect its sovereignty to comply with the provisions of the Final Acts, the Annexes thereto or the Radio Regulations;
- 2 to express declarations or reservations with respect to the Final Acts of the World Radiocommunication Conference (Geneva, 2012) at the time of deposit of the corresponding instruments of ratification with the International Telecommunication Union.

Original: French**For the Republic of the Niger:**

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2012) which was held from 23 January to 17 February 2012, the delegation of the Republic of the Niger reserves for its Government the right:

- to take any measures it deems necessary to safeguard its interests should they be affected by decisions taken at the Conference, should other countries or administrations in any way fail to abide by the provisions of the instruments amending the ITU Constitution and Convention or the Annexes, Protocols or Regulations appended thereto, or should the reservations or declarations expressed by other countries or other administrations be prejudicial to the radiocommunication services of the Republic of the Niger;
- to express any additional declaration or reservation at the time of ratification of the Final Acts of the Conference.

Original: English**For New Zealand:**

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2012), the New Zealand delegation reserves for its Government the right to take such measures as it might deem necessary to safeguard its interests if any other country should in any way fail to respect the conditions specified in the Final Acts or if the reservations made by any other country should be prejudicial or detrimental to New Zealand's interests. In addition, New Zealand reserves the right to make appropriate specific reservations and statements prior to ratification of the Final Acts.

Original: English**For the Republic of Indonesia:**

On behalf of the Republic of Indonesia, the delegation of the Republic of Indonesia to the World Radiocommunication Conference 2012 (WRC-12) (Geneva, 2012):

- reserves the right for its Government to take any action and preservation measures it deems necessary to safeguard its national interests should any provision of the Constitution, the Convention and the Resolutions, as well as any decision of the World Radiocommunication Conference (WRC-12) (Geneva, 2012), directly or indirectly affect its sovereignty or be in contravention to the Constitution, Laws and Regulations of the Republic of Indonesia as well as the existing rights acquired by the Republic of Indonesia as a party to other treaties and conventions and any principles of international law;

- further reserves the right for its Government to take any action and preservation measures it deems necessary to safeguard its national interests should any Member in any way fail to comply with the provisions of the Constitution the Convention and the Resolutions, as well as any decision of the World Radiocommunication Conference 2012 (WRC-12) (Geneva, 2012) or should the consequences of reservations by any Member jeopardize its telecommunication services or result in an unacceptable increase of its contributory share towards defraying expenses of the Union.

17

Original: English**For the Republic of Singapore:**

The delegation of the Republic of Singapore reserves for its Government the right to take any action it considers necessary to safeguard its interests should any Member of the Union fail in any way to comply with the requirements of the Final Acts of the World Radiocommunication Conference (Geneva, 2012), or should reservations by any Member of the Union jeopardize the Republic of Singapore's telecommunication services, affect its sovereignty or lead to an increase in its contributory share towards defraying the expenses of the Union.

18

Original: Spanish**For the Republic of Guatemala:**

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2012), the delegation of the Republic of Guatemala declares that:

- a) it reserves for its Administration the adoption of any measures it may deem necessary, in accordance with domestic legislation and international law, to safeguard its interests should any other Members of the Union fail to observe those Final Acts or should reservations be expressed that are prejudicial to the operation of telecommunication services within its territory;
- b) the Republic of Guatemala further reserves the right to amend previous reservations and declarations and to express new reservations and declarations when it decides to deposit with the International Telecommunication Union its consent to be bound by the revisions to the Radio Regulations adopted by the 2012 World Radiocommunication Conference.

Original: English/
Spanish/
French

For the Federal Republic of Germany, Austria, Belgium, the Republic of Bulgaria, the Republic of Cyprus, Republic of Croatia, Denmark, Spain, Republic of Estonia, Finland, France, Greece, Hungary, Ireland, Italy, the Republic of Latvia, the Republic of Lithuania, Luxembourg, Malta, the Kingdom of the Netherlands, the Republic of Poland, Portugal, the Slovak Republic, the Czech Republic, Romania, the United Kingdom of Great Britain and Northern Ireland, the Republic of Slovenia and Sweden:

The delegations of the Member States of the European Union, and the Delegation of Croatia, which has signed an Accession Treaty with the European Union, hereby declare that the Member States of the European Union and Croatia will apply the revision of the Radio Regulations adopted at this Conference in accordance with their obligations under the Treaty on the European Union and the Treaty on the Functioning of the European Union.

Original: English

For Ghana:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2012), the Government of the Republic of Ghana lets it be known that it reserves the sovereign right:

- to take any measure that may be thought fit in order to regulate its domestic telecommunications in accordance with the applicable national laws and regulations;
- to take any measures it may deem necessary and appropriate in the event that domestic radiocommunication systems are affected, directly or indirectly, as a result of failure on the part of any other member administration of the International Telecommunication Union to comply with the provisions of the Final Acts of the World Radiocommunication Conference (Geneva, 2012), with the Radio Regulations or with any other associated instrument;
- to take any measures it may deem necessary and appropriate to protect and safeguard its national interests and rights with respect to radiocommunications, should they be affected or prejudiced, directly or indirectly, by reservations expressed by other administrations or by actions not in accordance with international law;
- to make allocations in addition to or different from those specified in the Radio Regulations of the International Telecommunication Union for any radio frequency range, in accordance with domestic laws and regulations, whenever such may be deemed fit, without this signifying failure to comply with the Final Acts of the World Radiocommunication Conference (Geneva, 2012);
- to make reservations and declarations prior to the ratification and deposit of the Final Acts of the World Radiocommunication Conference (Geneva, 2012);

- to accept, or not to accept, any consequences deriving from the application by other administrations, or telecommunication operating agencies in their territories, of the Final Acts of the World Radiocommunication Conference (Geneva, 2012), the Radio Regulations and associated instruments, should these be deemed prejudicial to Ghana's national interests or detrimental to its domestic telecommunications;
- to apply provisions deriving from the Final Acts of the World Radiocommunication Conference (Geneva, 2012) and the Radio Regulations when deemed necessary and when such provisions are in accordance with domestic regulations, or not to apply such provisions when the application thereof is deemed, directly or indirectly, to be prejudicial to the proper functioning and development of Ghana's national telecommunications.

21

Original: Spanish

For the Argentine Republic:

In signing the Final Acts of the World Radiocommunication Conference of the International Telecommunication Union, the delegation of Argentina declares that, having noted the declarations and reservations expressed by the Member States, its reserves for its Government:

The right to adopt any measures that it may deem necessary, in accordance with domestic legislation and international law, to safeguard national interests should other Member States fail to comply with the Final Acts of the World Radiocommunication Conference (Geneva, 2012) or should the reservations expressed by other Member States affect the radiocommunication services of the Argentine Republic or its sovereign rights.

The right to express reservations to the Final Acts of the World Radiocommunication Conference (Geneva, 2012) between the date of signature of the Final Acts and the date of the possible presentation of the instruments approving those Acts, in accordance with the Vienna Convention on the Law of Treaties of 1969.

The Argentine Republic recalls the reservation it made when ratifying the Constitution and the Convention of the International Telecommunication Union, signed in the city of Geneva, Switzerland, on 22 December 1992, and reaffirms its sovereignty over the Malvinas Islands, the South Georgia Islands, the South Sandwich Islands, the surrounding maritime areas and the Argentine Antarctic, which form an integral part of its national territory.

It further recalls that, in relation to the "Question of the Malvinas Islands", the United Nations General Assembly has adopted resolutions 2065 (XX), 3160 (XXVIII), 31/49, 37/9, 38/12, 39/6, 40/21, 41/40, 42/19 and 43/25, recognizing the existence of a dispute over sovereignty and requesting the Governments of the Argentine Republic and the United Kingdom of Great Britain and Northern Ireland to resume negotiations with a view to finding a lasting and peaceful solution to that dispute as soon as possible.

The Argentine Republic further points out that the United Nations Special Committee on Decolonization has made repeated pronouncements along the same lines, most recently through the resolution adopted on 21 June 2011, and that the General Assembly of the Organization of American States adopted a further similarly worded pronouncement on the question on 7 June 2011.

Original: English**For the Republic of India:**

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2012), the delegation of the Republic of India reserves for its Government the right to take such actions, as may be considered necessary, to safeguard its interests, should any administration make reservations and/or not accept the provisions of the Final Acts or fail to comply with one or more provisions of the Final Acts, including those which form a part of the Radio Regulations.

Original: French**For the Republic of Côte d'Ivoire:**

In signing the Final Acts of the World Radiocommunication Conference, the Republic of Côte d'Ivoire declares:

- 1 that it reserves for its Government the right to take any measures it may deem necessary to safeguard its interests should any Member State of the International Telecommunication Union fail, in any way, to comply with or apply the provisions of the Radio Regulations or of the Constitution and the Convention of the International Telecommunication Union;
- 2 that it also reserves for its Government the right to take any safeguard or other measures it may deem necessary should reservations by any Member State jeopardize the radiocommunication services or impair the sovereignty of Côte d'Ivoire;
- 3 that it reserves the right to make additional declarations or reservations with regard to the Final Acts of the World Radiocommunication Conference (Geneva, 2012) (WRC-12) at the time of deposit of the corresponding instrument of ratification with the International Telecommunication Union.

Original: English**For the Republic of Kenya:**

The delegation of the Republic of Kenya to the WRC-12 herewith declares on behalf of its Government and on behalf of the powers conferred on it:

- 1 that it reserves the right of its Government to take any action it may consider necessary to safeguard and protect its interests should any Member fail to comply as required with the provisions in the Final Acts and Annexes thereto adopted by this conference;
- 2 that the Government of the Republic of Kenya does not accept responsibility for consequences arising out of the reservations made by Members of the Union.

Original: English**For the Vatican City State:**

In signing the Final Acts of the World Radiocommunication Conference (Geneva 2012), the delegation of Vatican City State declares that it reserves for its Government the right:

- to express declarations or reservations with respect to the Final Acts of the World Radiocommunication Conference (Geneva, 2012) at the time of deposit of the corresponding instruments of ratification with the International Telecommunication Union.

Original: French**For the Republic of Djibouti:**

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2012), the delegation of the Republic of Djibouti:

- a) reserves for its Administration the right to take any measures it may consider necessary, in conformity with its domestic law and with international law, to safeguard its interests should any other Member of the Union fail to respect the Final Acts, or enter reservations that may jeopardize the operation of telecommunication services within its territory;
- b) reserves as well the right to amend the foregoing reservations and declarations and to enter further reservations or declarations at the time of depositing with the International Telecommunication Union its consent to be bound by the revisions to the Radio Regulations adopted by the World Radiocommunication Conference (Geneva, 2012).

Original: English**For Italy:**

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2012), the delegation of the Republic of Italy declares that it reserves for its Government the right:

- 1 to take any action and preservation measures it deems necessary should the consequences of reservations by any Member State put in danger Italy's radiocommunication services or affect its sovereignty to comply with the provisions of the Final Acts, the Annexes thereto or the Radio Regulations;
- 2 to express declarations or reservations with respect to the Final Acts of the World Radiocommunication Conference (Geneva, 2012) at the time of deposit of the corresponding instruments of ratification with the International Telecommunication Union.

Original: English**For the United Republic of Tanzania:**

In signing the Final Acts of the World Radiocommunication Conference (WRC-12, Geneva-2012), the delegation of the United Republic of Tanzania declares that it reserves the right for its Government:

- 1 to take any measures that it may deem necessary to safeguard its interests, should other members of the International Telecommunication Union, in anyway fail to comply with the provisions of the Constitution and Convention of the Union, the Radio Regulations of the Union and the Final Acts of the World Radiocommunication Conference (WRC-12, Geneva-2012), the Annexes thereto; and
- 2 to make such additional declarations and reservations that it may be necessary up to, and including, the time of ratification of the Final Acts of the World Radiocommunication Conference (WRC-12, Geneva-2012);
- 3 to take any measures it may deem necessary and appropriate to protect and safeguard its national interests and rights with respect to radiocommunications, should they be affected or prejudiced, directly or indirectly by reservations expressed by other administrations or by actions not in accordance with international law;
- 4 underscores the need for regional harmonization for the use of band 694-790/790-862 MHz in order to ensure both broadcasting and mobile services operate in a non-interference environment;
- 5 to accept or not accept any financial consequences that may arise from such reservations.

Original: English**For Trinidad and Tobago:**

The delegation of the Republic of Trinidad and Tobago hereby submits the following reservation:

In signing the Final Acts of the World Radiocommunication Conference of the International Telecommunication Union (Geneva, 2012), the Republic of Trinidad and Tobago reserves the right to take any action it deems necessary to safeguard its national interests should any Member State of the Union in any way fail to respect the conditions specified in the Final Acts or if the reservations made by any Member State should be prejudicial to the operation of radiocommunication services in the Republic of Trinidad and Tobago.

Original: English**For the Republic of Mozambique:**

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2012), the delegation of the Republic of Mozambique declares as follows:

- a) that, it reserves the rights of its Government to take any measures which it deems necessary to safeguard and protect its interests on the decision taken by the conference in modifying, amending, deleting and adding provisions, footnotes, tables, resolutions and recommendations in the Radio Regulations, should any Member of the Union fail, in any way, to comply with the provisions of the Final Acts, Annexes and the Radio Regulations thereto, in using its existing services and introducing new services for space, terrestrial and other applications or should any reservation made by other Members jeopardize the proper operation of its radiocommunication services, or infringe the full exercise of the sovereign rights of the Republic of Mozambique.
- b) that, the delegation of the Republic of Mozambique further reserves the rights of its Government to make additional declarations or reservations as may be necessary when depositing its instruments of ratification of the Final Acts of the World Radiocommunication Conference (Geneva, 2012).

Original: French**For Burkina Faso:**

In signing the Final Acts of the World Radiocommunication Conference (WRC-12) of the International Telecommunication Union (ITU) held in Geneva, Switzerland, from 23 January to 17 February 2012, the delegation of Burkina Faso reserves for its Government the sovereign right:

- 1 to take any action it deems necessary to ensure the effective and efficient utilization of the radio-frequency spectrum within its territory and to protect its national rights and interests should any Member of the Union fail in any way to respect the provisions of the Final Acts in question and jeopardize, directly or indirectly, its telecommunication/ICT services or endanger its national security and sovereignty;
- 2 to enter any additional reservations it deems necessary until such time as the instruments of ratification are deposited.

Original: English

For Montenegro:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2012), the delegation of Montenegro declares that it reserves for its Government the right:

- 1 to take any action and preservation measures it deems necessary should the consequences of reservations by any Member State put in danger Montenegro's radiocommunication services or affects its sovereignty to comply with the provisions of the Final Acts, the Annexes thereto or the Radio Regulations;
- 2 to express declarations or reservations with respect to the Final Acts of the World Radiocommunication Conference (Geneva, 2012) at the time of deposit of the corresponding instruments of ratification with the International Telecommunication Union.

Original: English

For the Federal Republic of Germany, Austria, the Azerbaijani Republic, Belgium, Bosnia and Herzegovina, the Republic of Cyprus, the Vatican City State, the Republic of Croatia, Denmark, Spain, the Republic of Estonia, Finland, France, Georgia, Greece, Hungary, Ireland, Iceland, Italy, the Republic of Latvia, the Former Yugoslav Republic of Macedonia, the Principality of Liechtenstein, the Republic of Lithuania, Luxembourg, Malta, the Republic of Moldova, Montenegro, Norway, the Kingdom of the Netherlands, the Republic of Poland, Portugal, the Slovak Republic, the Czech Republic, Romania, the United Kingdom of Great Britain and Northern Ireland, the Republic of San Marino, the Republic of Serbia, the Republic of Slovenia, Sweden, the Confederation of Switzerland and Turkey:

At the time of signing the Final Acts of the World Radiocommunication Conference (Geneva, 2012), the delegations of the above-mentioned countries formally declare that they maintain the declarations and reservations made by their countries when signing the Final Acts of previous treaty-making conferences of the Union as if they were made in full at this World Radiocommunication Conference.

Original: Spanish**For the Republic of Colombia:**

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2012), the delegation of the Republic of Colombia:

- 1 Declares that it reserves for its Government the right:
 - a) to take any measures it considers necessary, in conformity with its domestic legislation and international law, to safeguard its national interests should other members fail to comply with the provisions of the Final Acts of the World Radiocommunication Conference (Geneva, 2012), or should reservations by representatives of other States jeopardize the telecommunication services of the Republic of Colombia or its full sovereign rights;
 - b) to express reservations, under the Vienna Convention on the Law of Treaties of 1969, with regard to the Final Acts of the World Radiocommunication Conference (Geneva, 2012), at any time it sees fit between the date of the signature and the date of the possible ratification of the international instruments constituting those Final Acts.
- 2 Reaffirms, in their essence, reservations Nos. 40 and 79 made at the World Administrative Radio Conference (Geneva, 1979), and reservation No. 74 entered at the World Radiocommunication Conference (Geneva, 2007), especially with regard to the new provisions included in the documents of the Final Acts.
- 3 Declares that the Republic of Colombia shall only be bound by the instrument contained in the Final Acts insofar as it expressly and duly consents to be bound by that international instrument, and subject to the completion of the appropriate constitutional procedures.
- 4 Declares that, pursuant to its constitutional requirements, its Government cannot give provisional effect to the international instruments which constitute the Final Acts of the World Radiocommunication Conference (Geneva, 2012).

Original: English**For the Arab Republic of Egypt:**

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2012), the delegation of the Arab Republic of Egypt:

- a) reserves for its Administration the right to take any measures it may consider necessary, in conformity with its domestic law and with international law, to safeguard its interests should any other Member of the Union fail to respect the Final Acts, or enter reservations that may jeopardize the operation of telecommunication services within its territory;
- b) reserves as well the right to amend the foregoing reservations and declarations and to enter further reservations or declarations at the time of depositing with the International Telecommunication Union its consent to be bound by the revisions to the Radio Regulations adopted by the World Radiocommunication Conference (Geneva, 2012).

Original: French**For France:**

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2012), the delegation of France reserves for its Government:

- the right to enter further declarations or reservations at the time of depositing its instruments of ratification of these revisions of the Radio Regulations;
- the right to take any action it may deem necessary to safeguard its interests should any Member State of the Union fail in any way to comply with the provisions of these Final Acts, or should reservations made by other countries jeopardize the smooth operation of its telecommunication services.

Original: Arabic**For the Republic of Sudan:**

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2012), the delegation of the Republic of Sudan reserves for its Government the right to take any action and measures it may deem necessary to safeguard its national interests should any Member of the Union in any way fail to comply with the provisions of the Constitution and Convention of the International Telecommunication Union, the Radio Regulations and the Final Acts of the World Radiocommunication Conference (Geneva, 2012), or should reservation by any Member State jeopardize in any way the telecommunication service in its territory. The Republic of Sudan also reserves the right to respond appropriately to any other damages that may result from any attack on the sovereignty of its territory or its cultural and social heritage.

Original: English**For Canada:**

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2012), the delegation of Canada reserves for its Government the right to take any measures it might deem necessary to safeguard its interests if another Member State of the Union in any way fails to respect the conditions specified in the Final Acts or if the reservations made by any Member State should be prejudicial to the operation of radiocommunication services in Canada.

The delegation of Canada further declares that it reserves for its Government the right to make declarations or reservations when depositing its instrument of ratification for the amendments adopted at this World Radiocommunication Conference (Geneva, 2012) to the Radio Regulations. Canada further reiterates and incorporates by reference all reservations and declarations made at world radiocommunication conferences prior to signature of these Final Acts.

Original: English**For the United Arab Emirates:**

In considering the Final Acts of the World Radiocommunication Conference (Geneva, 2012), the delegation of the United Arab Emirates formally declares that:

- 1 The delegation of the United Arab Emirates reserves for its Government the right to take any action as it may consider necessary to safeguard its interests should they be affected by decisions taken at this conference, or by failure on the part of any other country or administration in any way to comply with the provisions of the instruments amending the Constitution and Convention of the International Telecommunication Union, or the Annexes or Protocols and Regulations attached thereto, or the Final Acts of this conference, or should the reservations, declarations or additional reservations and declarations by other countries or administrations jeopardize the proper and efficient operation of its telecommunication services, or infringe the full exercise of the sovereign rights of the United Arab Emirates.
- 2 The United Arab Emirates shall not be deemed to have consented to be bound by revisions to the Radio Regulations adopted at this conference without specific notification to the International Telecommunication Union by the United Arab Emirates of its consent to be bound.
- 3 The United Arab Emirates may find it necessary to make additional declarations or reservations. Accordingly, the United Arab Emirates reserves the right to make additional declarations or reservations at the time of deposit of its instruments of ratification of these revisions of the Radio Regulations.

Original: Spanish**For the Republic of El Salvador:**

In signing the Final Acts of the World Radiocommunication Conference (WRC-12), the delegation of the Republic of El Salvador declares:

- 1 that it reserves for its Government the right to take any action it considers necessary to safeguard its interests, should one of the Member States of the International Telecommunication Union fail in any way to observe the provisions of the Radio Regulations or the provisions of the Constitution or the Convention of the International Telecommunication Union;
- 2 that it further reserves for its Government the right to take any protective or other action that it considers necessary, should the consequences of the reservations expressed by a Member State jeopardize the proper functioning of the radiocommunication services of El Salvador or infringe on its sovereign rights;
- 3 that it reserves the right to express additional declarations or reservations with regard to the Final Acts of the World Radiocommunication Conference (WRC-12) at the time of deposit of the corresponding instrument of ratification with the International Telecommunication Union.

41

Original: Arabic**For the Republic of Yemen:**

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2012), the delegation of the Republic of Yemen reserves for its Government the right to take any action or preservation measures it deems necessary to safeguard its national interests should any Member of the Union fail, in any way, to comply with the provisions of the Radio Regulations or of the Constitution or the Convention of the International Telecommunication Union, or should reservations expressed by other Members of the Union jeopardize, directly or indirectly, the interests of its telecommunication services or undermine its national security or its sovereignty.

42

Original: Chinese**For the People's Republic of China:**

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2012), the delegation of the People's Republic of China declares:

The Chinese delegation reserves the right of its Government to take any measures and actions it may deem necessary to safeguard its interests should other Member States of the International Telecommunication Union in any way fail to comply with or to execute the provisions of the Final Acts or the Radio Regulations, or should reservations or declarations made by other Member States jeopardize the legitimate use by the Chinese Government of its radio spectrum and satellite orbit resources as well as the security of its radio services or the proper operation of its telecommunication services or affect the full exercise of its sovereign rights. In addition, it also reserves the right of its Government to make any additional reservation it may consider necessary up to and at the time of its ratification of these Final Acts.

43

Original: English**For the Republic of Korea:**

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2012), the delegation of the Republic of Korea reserves for its Government the right to take any measures it might deem necessary to safeguard its interests should any other Member States of the Union in any way fail to comply with the provisions specified in the Final Acts or the reservations made by other countries be prejudicial to the deployment and proper operation of its telecommunication services.

Original: English**For Japan:**

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2012), the delegation of Japan reserves for its Government the right to take such actions as it may consider necessary to safeguard its interests should any Member State fail in any way to comply with the requirements of the Constitution and Convention of the International Telecommunication Union, the Radio Regulations of the International Telecommunication Union, or the Final Acts of the World Radiocommunication Conference (Geneva, 2012), or should reservations by other countries jeopardize its interests in any way.

In addition, Japan reserves the right to make additional declarations or reservations prior to its notification to the International Telecommunication Union which expresses its consent to be bound by revisions to the Radio Regulations.

Original: English**For Hungary:**

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2012), the delegation of Hungary reserves for its Government the right to take such action as it may consider necessary to safeguard its interests should any Member State of the Union fail in any way to observe or comply with the provisions of these Final Acts or should reservations by other countries jeopardize the proper operation of its radiocommunication services.

The delegation of Hungary further declares that it reserves for its Government the right to make any additional statements or reservations when depositing its instruments of ratification for the Final Acts of the World Radiocommunication Conference (Geneva, 2012).

Original: English**For Barbados:**

In signing the Final Acts of the World Radiocommunication Conference of the International Telecommunication Union (Geneva, 2012) the Barbados Delegation reserves for its Government the right to take such measures as it may deem necessary to safeguard its interests if any other country should in any way fail to respect the conditions specified in the Final Acts or if subsequent reservations made by any other country should be prejudicial or detrimental to Barbados' interests. In addition, Barbados reserves the right to make appropriate specific reservations as may be necessary to the Final Acts adopted by the present Conference up to the deposit of the appropriate instrument of ratification.

Original: English**For the United States of America:**

1 The United States of America refers to Article 32 of the Convention of the International Telecommunication Union (Geneva, 1992), as amended, and notes that in considering the Final Acts of the World Radiocommunication Conference (Geneva, 2012), the United States of America may find it necessary to make additional declarations or reservations. Accordingly, the United States of America reserves the right to make additional declarations or reservations at the time of deposit of its instrument of ratification of these revisions of the Radio Regulations.

2 The United States of America shall not be deemed to have consented to be bound by revisions to the Radio Regulations adopted at this Conference without specific notification to the International Telecommunication Union by the United States of America of its consent to be bound.

3 The United States of America reiterates and incorporates by reference all declarations and reservations made at prior world administrative radiocommunication conferences and world radiocommunication conferences.

Original: English**For Georgia:**

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2012), the delegation of Georgia declares that it reserves for its Government the right:

- to take any measures which it might deem necessary to protect its interests should any Member State of the International Telecommunication Union (ITU) fail to fully respect or to violate the provisions and resolutions of the Final Acts and the sovereign right of Georgia or should any actions or reservations by any Member State jeopardize in any way the telecommunication and radiocommunication services of Georgia;
- to take any action and preservation measures it considers necessary in order to regulate its internal telecommunication and radiocommunication networks on the territory of Georgia in accordance with the existing national laws and international legislative acts. In this respect, the functioning of all radio-frequency equipment and radio-electronic devices within the territory of Georgia without a licence issued by the authorized governmental institution of Georgia will be assumed as illegal.

49

Original: Russian

For the Republic of Armenia, the Republic of Azerbaijan, the Republic of Belarus, the Russian Federation, the Republic of Kazakhstan, the Republic of Moldova, the Republic of Uzbekistan, the Kyrgyz Republic and Ukraine:

The delegations of the above-mentioned countries reserve for their respective Governments the right to take any action they may consider necessary to protect their interests should any Member State of the Union fail to comply with the provisions of the Final Acts of this Conference, or should reservations made upon signing the Final Acts, or other measures taken by any Member State of the Union, jeopardize the proper operation of those countries' telecommunication services.

50

Original: English

For the United Kingdom of Great Britain and Northern Ireland:

The delegation of the United Kingdom of Great Britain and Northern Ireland welcomes the revisions made at this conference to Article 11 of the Radio Regulations which have developed and clarified the regulatory provisions relating to the bringing into use of satellite networks. The United Kingdom of Great Britain and Northern Ireland considers that these new provisions should not be allowed to negatively affect the interests of bona-fide satellite operators which brought into use satellite networks prior to WRC-12 in line with the practice at the time.

This Administration reserves the right to take such action as may be necessary to meet the needs of bona-fide satellite operators which brought into use satellite networks prior to WRC-12.

51

Original: English

For the Republic of the Philippines:

The delegation of the Republic of the Philippines reserves for the State and its Government the right to take any action it deems necessary, sufficient and consistent with its national law to safeguard its interests, should reservations made by representatives of other Member States jeopardize its telecommunication services or prejudice its rights as a sovereign country.

The Philippine delegation further reserves for the State and its Government the right to make any declaration, reservation or any other appropriate action, as may be necessary, prior to the deposit of the instrument of ratification of the Constitution and Convention of the International Telecommunication Union.

Original: Arabic**For the Syrian Arab Republic:**

In signing the Final Acts of the World Radiocommunication Conference 2012 (Geneva, WRC-12), the delegation of the Syrian Arab Republic reserves for its Government, when depositing the approval of the said instruments, the right:

- 1 to confirm all written and oral declarations submitted by its delegation during the Conference, separately or jointly with other Arab delegations attending the Conference, and to make any other additional reservations upon ratification;
- 2 to take any measures it deems necessary to protect its interests, particularly its sovereign right to protect its wireless stations on its territory from harmful interference and its territory from any wireless transmission that is incompatible with its sovereign rights or that would endanger its security or its cultural values.
- 3 The signature of these Final Acts shall be considered valid only in respect of Member States of the International Telecommunication Union recognized by the Syrian Arab Republic.

Original: French**For the Gabonese Republic:**

In signing the Final Acts of the ITU World Radiocommunication Conference, held in Geneva (Switzerland) from 23 January to 17 February 2012, the delegation of the Gabonese Republic reserves for its Government the right:

- 1 to take any necessary measures to safeguard its interests should certain Member States fail, in any way, to comply with the provisions of the Radio Regulations of the International Telecommunication Union or the instruments of amendment adopted by the World Radiocommunication Conference (Geneva, 2012), or should the reservations made by other Member States during this Conference be such as to jeopardize the proper functioning of its telecommunication services;
- 2 to accept or not any financial consequences that may arise from such reservations;
- 3 to enter any additional reservations it may deem necessary until such time as the instruments of ratification are deposited.

Original: English**For the Republic of Cyprus:**

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2012), the delegation of the Republic of Cyprus reserves for its Government the right to take such measures as it may deem necessary to safeguard its interests should other Member States fail to comply with the provisions of these Final Acts or use their radiocommunication services for purposes contrary to those established in the Preamble to the Constitution of the International Telecommunication Union. Accordingly, the Republic of Cyprus reserves the right to make additional declarations or reservations at the time of deposit of its instruments of ratification of these revisions to the Radio Regulations. The Republic of Cyprus shall not be deemed to have consented to be bound by revisions to the Radio Regulations adopted at this Conference without the specific notification to the International Telecommunication Union by the Republic of Cyprus of its consent to be bound.

Original: French**For the Kingdom of Morocco:**

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2012), the delegation of the Kingdom of Morocco reserves for its Government the right to take any action or measures it may deem necessary to safeguard its interests, should a Member State of the International Telecommunication Union (ITU) fail to respect fully the provisions of the Final Acts of the Conference, or should reservations entered by a Member State in any way jeopardize the interests or the smooth operation of the telecommunication services of the Kingdom of Morocco.

Original: English**For the Islamic Republic of Iran:**

In the Name of God, the Compassionate, the Merciful.

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2012), the delegation of the Islamic Republic of Iran formally declares that:

- 1 The delegation of the Islamic Republic of Iran reserves for its Government the right to take any action as it may consider necessary to safeguard its interests should they be affected by decisions taken at this conference, or by failure on the part of any other country or administration in any way to comply with the provisions of the instruments amending the Constitution and Convention of the International Telecommunication Union, or the Annexes or Protocols and Regulations attached thereto, or the Final Acts of this conference, or should the reservations, declarations or additional reservations and operation of its telecommunication services, or infringe the full exercise of the sovereign rights of the Islamic Republic of Iran.

- 2 The delegation of the Islamic Republic of Iran reserves for its Government the right to make additional reservations when ratifying the Final Acts of this Conference.
- 3 Moreover the delegation of the Islamic Republic of Iran recognizing the rights of Member States as stipulated in the ITU Constitution, reserves its right to take all appropriate measures, to protect its national interest against transmission of any signals directed toward the territory under its jurisdiction in a manner incompatible with its sovereign rights including transmissions which do not observe the principle of non-intervention in its internal affairs or transmission of signals which may appear dangerous to its security or its public order or to its decency or incompatible to its cultural patrimony.

57

Original: Spanish**For Cuba:**

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2012), the delegation of Cuba reserves for its Government the right to take such action as it may consider necessary to safeguard its interests, should other Member States:

- fail to comply with the provisions of these Final Acts;
- use their radiocommunication services for purposes contrary to those established in the Preamble to the Constitution of the International Telecommunication Union;
- fail to fulfil their international obligations in regard to radiocommunications or fail to abide by the provisions of the Radio Regulations, and particularly the principle contained in No. 0.4 of the Preamble thereto, or should they use broadcasting stations operating aboard an aircraft to transmit solely into Cuban territory without Cuba's consent, a practice which WRC-07 determined to be contrary to the Radio Regulations.

The delegation of Cuba incorporates by reference the declarations and reservations entered in Cuba's name at previous world radiocommunication conferences, in particular Declaration 32 entered at the Plenipotentiary Conference (Guadalajara, 2010).

The delegation of Cuba reserves for its Government the right to make any additional declaration or reservation that it may consider necessary until the time of its ratification of these Final Acts.

58

Original: French**For the Togolese Republic:**

In signing the Final Acts of the World Radiocommunication Conference (WRC-12), the Togolese delegation reserves the right for Togo not to apply any provisions thereof which may be contrary to its laws or to the international agreements to which it is party.

In addition, it reserves the right for Togo not to apply the provisions of those Acts in respect of States and organizations that fail to abide by them or to apply them.

Original: English**For the Kingdom of Lesotho:**

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2012), the delegation of the Kingdom of Lesotho declares as follows:

- a) that, it reserves the rights of its Government to take any measures which it deems necessary to safeguard and protect its interests on the decision taken by the conference in modifying, amending, deleting and adding provisions, footnotes, tables, resolutions and recommendations in the Radio Regulations, should any Member of the Union fail, in any way, to comply with the provisions of the Final Acts, Annexes and the Radio Regulations thereto, in using its existing services and introducing new services for space, terrestrial and other applications or should any reservation made by other Members jeopardize the proper operation of its radiocommunication services, or infringe the full exercise of the sovereign rights of the Kingdom of Lesotho.
- b) that, the delegation of the Kingdom of Lesotho further reserves the rights of its Government to make additional declarations or reservations as may be necessary when depositing its instruments of ratification of the Final Acts of the World Radiocommunication Conference (Geneva, 2012).

Original: Spanish**For Costa Rica:**

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2012), the delegation of the Republic of Costa Rica declares that it reserves for its Government the right to:

- take any measures it considers necessary to safeguard its interests should other Members of the International Telecommunication Union fail to comply in any way with the Final Acts, their Annexes or the Radio Regulations, or should reservations by other Members jeopardize the smooth operation of its telecommunication services or its full sovereign rights;
- enter additional reservations, pursuant to the 1969 Vienna Convention on the Law of Treaties, to the Final Acts of the World Radiocommunication Conference (Geneva, 2012), at any time it sees fit between the date of signature and the date of the possible ratification of the international instruments constituting those Final Acts;
- carry out all the procedures required by the Constitution of the Republic of Costa Rica for the provisions of the Acts establishing new undertakings and obligations, especially those which may be subject to a legal right.

61

Original: English**For Sweden:**

Sweden reserves the right to make additional declarations or reservations at the time of deposit of its instruments of ratification of these revisions of the Radio Regulations.

62

Original: Spanish**For Chile:**

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2012), the delegation of Chile reserves for its Government the right:

- to take any action it considers necessary to protect and safeguard its interests, and, in particular, to protect its telecommunication networks, systems and services, both existing and planned, should any Member State of the Union in any way fail or cease to apply the provisions contained in these Acts, including the decisions, Recommendations, Resolutions and Annexes that form an integral part of the same, or the provisions contained in the Constitution or Convention of the International Telecommunication Union, or should the proper functioning of its telecommunication networks, systems or services be jeopardized by reason of any declarations or reservations entered by any Member State of the Union.

63

Original: English**For the Federal Republic of Germany:**

The delegation of the Federal Republic of Germany declares that it reserves for its Government the right to make declarations or reservations when depositing its corresponding instrument of ratification to the International Telecommunication Union for the amendments adopted at this World Radiocommunication Conference (Geneva, 2012) to the Radio Regulations and the amendments thereto.

Original: French**For the Republic of Mali:**

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2012), the delegation of the Republic of Mali reserves for its Government the right to take any measures it may deem necessary to safeguard its interests should Members fail to comply with the provisions of these Final Acts or the Annexes thereto, or should reservations by other countries cause harmful interference or jeopardize the smooth operation of its telecommunication services.

The Republic of Mali further reserves the right to enter any additional declarations or reservations it may deem necessary up until such time as it ratifies the Final Acts of the World Radiocommunication Conference (Geneva, 2012).

Original: English**For the Socialist Republic of Viet Nam:**

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2012), the delegation of the Socialist Republic of Viet Nam declares that:

- 1 it maintains the reservations made by Viet Nam at the Nairobi Plenipotentiary Conference (1982) and reaffirmed at the Nice (1989), Geneva (1992), Kyoto (1994), Minneapolis (1998), Marrakesh (2002), Antalya (2006) and Guadalajara (2010) Plenipotentiary Conferences;
- 2 it reserves for its Government the right to take any measures and actions as it might deem necessary to safeguard its interests if another Member of the International Telecommunication Union should in any way fail to respect the conditions specified in the Final Acts or if the reservation or declaration made by any Members of the Union should be prejudicial to the operation of telecommunication/information and communication technology services of Viet Nam or infringe fundamental principles of laws and public order of Viet Nam;
- 3 it reserves further for its Government the right to make any declaration or reservation at the time of its ratification of these Final Acts.

Original: English**For the Republic of Bulgaria:**

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2012), the delegation of the Republic of Bulgaria reserves for its Government the right to take such action as it may consider necessary to safeguard its interests should any Member State of the Union fail to comply with the provisions of the Final Acts adopted by the Conference or should reservations by other countries jeopardize the proper operation of its telecommunication services.

Original: French

For the Republic of Senegal:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2012), the delegation of the Republic of Senegal reserves the right:

- 1 to take all measures necessary to safeguard its interests, should any Members fail in any way whatsoever to comply with the decisions taken by WRC-12 (Geneva, 2012), or should reservations made by other Members be such as to jeopardize the operation of its radiocommunication services;
- 2 to accept, or not accept, the consequences of certain decisions that might impair its sovereignty.

Original: Arabic

For the Sultanate of Oman:

In signing the Final Acts of the World Radiocommunication Conference (WRC-12), the delegation of the Sultanate of Oman reserves for its Government the right:

- to take any actions and measures it may deem necessary and appropriate to protect and safeguard its national interests, should any Member State of the International Telecommunication Union (ITU) fail to fully respect the provisions and Resolutions of the Final Acts or to comply with them, or should reservations by any Member State jeopardize in any way the smooth operation of the telecommunication services of the Sultanate of Oman;
- to apply the provisions of the Radio Regulations adopted at this Conference, which the Conference revised and updated, in accordance with its obligations under the rules and regulations in force in the Sultanate of Oman;
- to express any additional reservations that it may deem necessary up to the time of its ratification of the Final Acts of this Conference.

Original: English

For the Federal Republic of Germany, Austria, Belgium, Hungary, the Republic of Latvia, the Principality of Liechtenstein, the Republic of Lithuania, Luxembourg, Malta, the Slovak Republic, the Czech Republic and the Confederation of Switzerland:

The delegations of the above-mentioned countries state, that they have accepted the compromise on the “Use of the band 694-790 MHz” with great reluctance and on an exceptional basis. Weight must be given to the fact that the compromise was made in the spirit of international cooperation and only to satisfy the urgent demand of those countries which made the proposals. However the delegations of the above-mentioned countries regret that WRC-12 did neither discuss nor clarify, whether the proposals belong to one of the Agenda items of the WRC-12 Agenda or its relation to the Agenda at all.

Original: English**For the Republic of Uganda:**

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2012), the delegation of Uganda (Republic of) declares that it reserves the right for its Government to take any measures that it may deem necessary and appropriate to:

- 1 safeguard its interests, should other members of the International Telecommunication Union, in any way fail to comply with the provisions of the Radio Regulations of the Union as a result of the decisions taken by the World Radiocommunication Conference (Geneva, 2012), the Annexes thereto; and,
- 2 protect and safeguard its national interests and rights with respect to radiocommunications, should they be affected or prejudiced, directly or indirectly by reservations expressed by other administrations or by actions not in accordance with international law to which Uganda is a contracting member.

Original: English**For the Republic of Zambia:**

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2012), the delegation of the Republic of Zambia, noting that it may find it necessary to make additional declarations or reservations to those expressed or agreed in principle during the World Radiocommunication Conference (Geneva, 2012) or revisions to the same:

- a) does so subject to ratification of the Final Acts in accordance with the country's appropriate internal ratification procures; and
- b) therefore reserves the right to express its final declarations or reservations with respect to the Final Acts of the World Radiocommunication Conference (Geneva, 2012) at the time of deposit of the corresponding instrument of ratification with the International Telecommunication Union.

The delegation of the Republic of Zambia shall not be deemed to have consented to be bound by revisions to the Radio Regulations adopted at this conference without specific notification to the International Telecommunication Union by Zambia of its consent to be bound.

Further, the delegation of the Republic of Zambia reserves the right of its Government to take any measures and actions it may deem necessary to safeguard its interests should any other Member State of the International Telecommunication Union in any way fail to comply with or to execute the provisions of the Final Acts or the Radio Regulations, or should reservations or declarations made by other Member States jeopardize the proper operation of the telecommunication services of Zambia or affect whether directly or indirectly the full exercise of its sovereign rights.

Original: English**For the Republic of Zimbabwe:**

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2012), the delegation of the Republic of Zimbabwe declares that the Government of the Republic of Zimbabwe reserves the right to take all measures it may deem necessary to protect its sovereignty and national interests, if any of the regulations are used by any country against the sovereign right of the Republic of Zimbabwe to regulate the orderly deployment and operation of its national and international telecommunication/ICT and radiocommunication networks.

Original: Spanish**For Spain:**

1 The delegation of Spain declares on behalf of its Government that it reserves for the Kingdom of Spain the right, in accordance with the Vienna Convention on the Law of Treaties of 23 May 1969, to express reservations to the Final Acts adopted by this Conference until such time as, in accordance with Article 54 of the Constitution of the International Telecommunication Union, it consents to be bound by the revision to the Radio Regulations contained in those Final Acts.

2 The delegation of Spain declares on behalf of its Government that any reference to “country” in the Radio Regulations and in the Resolutions and Recommendations adopted by this Conference, as subject to rights and obligations, will be understood only as constituting a sovereign State.

Original: Russian**For the Republic of Belarus:**

The Republic of Belarus reserves the right to take any measures it may consider necessary to protect its interests should any Member State of the Union fail to comply with the provisions of the Final Acts of the present World Radiocommunication Conference, or should reservations made upon signing these Final Acts, or other measures taken by any Member State of the Union, jeopardize the efficient operation of the telecommunication services of the Republic of Belarus.

The Government of the Republic of Belarus expresses its disagreement with the rule of procedure concerning a change of notifying administration which acts on behalf of a group of named administrations, approved by the Radio Regulations Board for application by the Radiocommunication Bureau of the provisions of the Radio Regulations, regional agreements and Resolutions and Recommendations of world and regional radiocommunication conferences, and will not accept responsibility for the consequences of applying the rule of procedure in question.

Original: Spanish**For the Dominican Republic:**

The delegation of the Dominican Republic reserves for its Government the right to:

- a) take any measures it may consider necessary, in conformity with its domestic law and with international law, to safeguard its interests with respect to reservations expressed by other Member States of the Union that may undermine the full enjoyment of its sovereign rights or the smooth operation of its telecommunication services, or should other Member States fail to abide by the provisions of the Constitution and the Convention of the International Telecommunication Union (Geneva, 1992), as amended by the Plenipotentiary Conferences of Kyoto (1994), Minneapolis (1998), Marrakesh (2002), Antalya (2006) and Guadalajara (2010);
- b) enter additional reservations and declarations, pursuant to the 1969 Vienna Convention on the Law of Treaties, to the Final Acts of the World Radiocommunication Conference (Geneva, 2012) at any time it sees fit between the date of signature and the date of the possible ratification of the international instruments constituting those Acts.

Original: English**For the State of Israel:**

1 The State of Israel hereby declares its right:

- a) to take any action it deems necessary to protect its interests and to safeguard the operation of its telecommunication services, should they be affected by the decisions or resolutions of this conference or by the reservations made by other Member States;
- b) to take any action to safeguard its interests should any Member State fail to comply with the Constitution and Convention of the International Telecommunication Union or the annexes and protocols attached thereto, the Radio Regulations and the Final Acts of the World Radiocommunication Conference (Geneva, 2012); or should reservations made by other Member States appear to be detrimental to the operation of its telecommunication services.

2 The State of Israel reserves the right to amend the foregoing reservations and declarations and to make any further reservations and declarations it may consider necessary up to the time of depositing its instrument of ratification of the Final Acts of the World Radiocommunication Conference (Geneva, 2012).

Original: English

For the State of Israel:

1 According to the International law principles, bilateral agreements have supremacy over multilateral treaties. This principle is also recognized in the ITU Constitution. In light of this principle, the State of Israel refers to Resolution 545 (WRC-12) on Assistance and Support to Palestine, and states its position that the interpretation and application of this resolution by all concerned must be in accordance with and subject to any existing or future bilateral agreements or arrangements between the State of Israel and the Palestinian side, in particular subject to the Israeli-Palestinian Interim Agreement of 28 September 1995 (“**Interim Agreement**”).

2 In light of the aforementioned principle, all technical Telecommunication issues, *inter alia* the obtaining and managing the radio spectrum, as mentioned in Resolution 545, should be made through the Joint Technical Committee as stipulated in the Interim Agreement. Furthermore, the State of Israel shall interpret and apply this resolution in accordance with and subject to applicable Israeli law.

3 Should any Member State that has sponsored the above-mentioned resolution act toward any interest of the State of Israel in a manner, which violates the State of Israel’s rights as a Member State of the ITU, or breaches such Member State’s obligations toward the State of Israel as such, the State of Israel reserves its right to act toward such Member State in a reciprocal manner.

Original: English

For Brunei Darussalam:

The delegation of Brunei Darussalam reserves for its Government the right to take any action which it deems necessary to safeguard its interests, should any Member of the Union fail in any way to comply with the Radio Regulations as amended by the Final Acts of the World Radiocommunication Conference (Geneva, 2012), or should any reservations by any Member of the Union jeopardize Brunei Darussalam’s radiocommunication and telecommunication services, affect its sovereignty or lead to an increase in its contributory share towards defraying the expenses of the Union.

The delegation of Brunei Darussalam further reserves for its Government the right to make any additional reservations which it deems necessary up to and including the time of its ratification of the Final Acts of the World Radiocommunication Conference (Geneva, 2012).

Original: Arabic

For the People's Democratic Republic of Algeria, the Kingdom of Saudi Arabia, the Kingdom of Bahrain, the United Arab Emirates, the Republic of Indonesia, the Islamic Republic of Iran, the Republic of Iraq, the State of Kuwait, Lebanon, Libya, the Kingdom of Morocco, the Sultanate of Oman, the Islamic Republic of Pakistan, the State of Qatar, the Syrian Arab Republic, the Republic of the Sudan and Tunisia:

The above-mentioned delegations to the World Radiocommunication Conference (Geneva, 2012) declare that the signature and possible ratification by their respective Governments of the Final Acts of this Conference are not valid for the Union Member under the name "Israel", and in no way whatsoever imply its recognition by those Governments.

Original: Spanish

For the Bolivarian Republic of Venezuela:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2012), the delegation of the Bolivarian Republic of Venezuela reserves for its Government the right to take any measures it may deem necessary to safeguard its national interests, should another ITU Member State fail to comply, in any way, with the Radio Regulations or with the provisions contained in the Final Acts of the Conference, or should the reservations entered by any country be detrimental to or affect in any way the smooth operation of the radiocommunication services of the Bolivarian Republic of Venezuela.

Original: English

For the Republic of Botswana:

In signing the Final Acts of the World Radiocommunication Conference 2012 (WRC-12), the delegation of the Republic of Botswana declares that its administration will comply with the provisions of the Final Acts without prejudice to the Republic of Botswana's sovereign right to take any measures that the Republic of Botswana may deem necessary to safeguard its radiocommunication services in the event of harmful interference caused to the said services by any Member of the Union failing to comply with the provisions of the Radio Regulations adopted by this conference.

The delegation of Botswana further declares that it reserves for its Government the right to make any statements or reservations when depositing its instruments of ratification of the Final Acts of the World Radiocommunication Conference (WRC-12).

Original: English

For the Republic of Rwanda:

In signing the Final Acts of the 2012 World Radiocommunication Conference, the delegation of the Republic of Rwanda reserves for its Government the right to take any measures it may deem necessary to safeguard its interests, in accordance with national legislation and the international treaties to which Rwanda is party, should any Member State of the International Telecommunication Union fail in any way to abide by the provisions of these Final Acts or should reservations expressed by other countries jeopardize its interests.

Original: Spanish

For Mexico:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2012), the delegation of the United Mexican States reserves for its Government the right:

- 1 to take any measures it considers necessary to protect and safeguard its sovereignty and interests, and, in particular, to protect its telecommunication networks, systems and services, both existing and planned, should any Member State of the Union in any way fail or cease to apply the provisions contained in these Acts, including the Decisions, Recommendations, Resolutions and Annexes that form an integral part of the same, or the provisions contained in the Constitution and Convention of the International Telecommunication Union, or should the proper functioning of its telecommunication networks, systems or services be jeopardized by reason of any declarations or reservations expressed by any Member State of the Union;
- 2 to take whatever measures it considers necessary to safeguard its interests with respect to the occupation and use of geostationary orbital positions and the associated radio frequencies, as well as with respect to the use of the radio spectrum to provide telecommunication services, should procedures relating to coordination, notification or registration of associated frequency assignments to satellite networks meet with delays or be hindered, causing prejudice to the country, whether *per se* or by acts of other Member States;
- 3 to express further reservations, pursuant to the Vienna Convention on the Law of Treaties, with regard to these Acts at any time it sees fit between the date of signature and the date of ratification of the same, in accordance with the procedures established in its domestic legislation; and not to consider itself bound by any provision in these Acts that might limit its right to express any reservations it may think fit; and, in addition to the foregoing, the reservations entered by the Government of the United Mexican States upon signing and ratifying the Final Acts of past World Radiocommunication Conferences and World Administrative Radio Conferences, as well as those entered at the time of the signature and ratification of the Final Acts of the Additional Plenipotentiary Conference (Geneva, 1992) and subsequent Plenipotentiary Conferences up to Guadalajara (2010), are reaffirmed and considered to be reproduced herein as if they had been repeated in full.

In addition to this reservation, the reservations entered by the Government of the United Mexican States upon signing and ratifying the Final Acts of past World Radiocommunication Conferences and World Administrative Radio Conferences, as well as those entered at the time of the signature and ratification of the Final Acts of the Additional Plenipotentiary Conference (Geneva, 1992) and subsequent Plenipotentiary Conferences up to Guadalajara (2010), are reaffirmed and considered to be reproduced herein as if they had been repeated in full.

84

Original: English

For Malawi:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2012), the delegation of the Republic of Malawi declares that:

- 1 it reserves the rights of its Government to take all measures it may deem necessary to safeguard and protect its sovereignty and national interests on all decisions taken by the Conference, should any Member of the Union fail, in any way, to comply with the provisions of the Final Acts, Annexes and Radio Regulations thereto;
- 2 the delegation of the Republic of Malawi further reserves the rights of its Government to make additional declarations or reservations as may be necessary when depositing its instruments of ratification of the Final Acts of the World Radiocommunication Conference (Geneva, 2012).

85

Original: French

For the Republic of Burundi:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2012), the delegation of the Republic of Burundi makes the following official declaration:

- a) the delegation Burundi reserves for its Government the right to take all measures it may deem necessary, in accordance with national legislation and the international treaties to which Burundi is party, to safeguard its national interests should a Member State of the International Telecommunication Union fail to abide by or comply with the provisions of these Final Acts;
- b) the delegation of Burundi further reserves for its Government the right to make additional reservations or declarations when ratifying the Final Acts of this World Radiocommunication Conference (Geneva, 2012);
- c) the delegation Burundi reserves for its Government the right to take any measures it may deem necessary and appropriate to safeguard its national interests and rights with respect to radiocommunications should they be affected or prejudiced, directly or indirectly, by reservations made by other administrations.

Original: English

For Papua New Guinea:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2012), the delegation of the Independent State of Papua New Guinea, on behalf of the Government of Papua New Guinea reserves for its Government the right to take such actions as it may consider necessary to safeguard and preserve its national interests, should any Member State of ITU fail to observe the provisions of the Final Acts adopted by this Conference and in doing so, cause harmful interference and or unacceptable interference to, or, should reservations or actions of such Member States jeopardize the proper operation of radiocommunications and or the telecommunication systems and services which are under the jurisdiction of the Government of Papua New Guinea.

Original: French

For the People's Democratic Republic of Algeria:

The Algerian delegation notes with regret the decision of countries that have opposed the inclusion in footnote 5.312 of the Radio Regulations, which already includes 19 other countries of Region 1.

The aeronautical radionavigation service has operated in Algeria for many years in the frequency band 645-862 MHz without causing any harmful interference. Algeria will continue to ensure that no interference is created affecting radiocommunication systems operating in neighbouring or nearby countries, in accordance with the Radio Regulations.

Every effort has been made by Algeria to have this service recognized in order to undertake the necessary coordination with the countries concerned. The one solution that would protect this radiocommunication service while enabling services in neighbouring and nearby countries to operate without hindrance would have been to include Algeria in footnote 5.312.

Unfortunately, despite the efforts made during WRC-12 to discuss with the delegations of the countries concerned solutions that would be satisfactory for all the parties, the neighbouring and nearby countries rejected our requests. We take due note of this.

However, not being included in the footnote in question does not prevent Algeria from taking all necessary measures to protect all its radiocommunication services, including the aeronautical radionavigation service, operating in all frequency bands, including the band 645-862 MHz.

Algeria has always adhered strictly to the Union's basic texts and the associated regulations. It wishes to make clear its total availability for any action aimed at coordinating the smooth operation of all radiocommunication services with neighbouring and nearby countries.

The delegation of the People's Democratic Republic of Algeria hereby declares that it reserves for its Government the right:

- 1 to take any measures that it may deem necessary in order to protect against all forms of interference the use on a primary basis of the frequency band 645-862 MHz by its aeronautical radionavigation service (ARNS), *should it be jeopardized by the decisions and resolutions of the present conference or by declarations and reservations entered by other Member States;*

- 2 to take any appropriate steps to safeguard its interests should other Members fail to comply with the provisions of the Radio Regulations or the Final Acts of world radiocommunication conferences, or should any reservations entered by other Members threaten the full exercise of its sovereign rights or the smooth operation of its radiocommunication services;
- 3 to formulate additional reservations, under the Vienna Convention on the Law of Treaties of 1969 and Article 32 of the Convention of the International Telecommunication Union (Geneva, 1992), concerning the Final Acts of the World Radiocommunication Conference of the International Telecommunication Union (Geneva, 2012), at any time it sees fit between the date of the signature and the date of the possible ratification of the international instruments constituting these Final Acts.

Signature of the Final Acts of the conference (Geneva, 2012) by the Algerian delegation shall not in any way be construed as implicit recognition of a Member of the Union not recognized by the Government of the People's Democratic Republic of Algeria, or of all or part of any international agreements to which Algeria has not expressly acceded.

Additional Declarations and Reservations

88

Original: English

For Canada:

Having noted the declarations and reservations contained in Document 546 of the World Radiocommunication Conference of the International Telecommunication Union (Geneva, 2012), the delegation of Canada further reserves on behalf of its Government the right to take whatever measures it may consider necessary to safeguard its interests should other Member States fail to comply with the provisions of the Radio Regulations, particularly to those pertaining to the use of radio frequencies and any associated satellite orbits, including the geostationary-satellite orbit.

89

Original: English

For Malaysia:

Having considered the declarations and reservations contained in Document 546, the delegation of Malaysia to the World Radiocommunication Conference (Geneva, 2012):

- 1 reserves the right of its Government to take any action or preservation measures it deems necessary to safeguard its national interests should the Final Acts drawn up in the World Radiocommunication Conference (Geneva, 2012) directly or indirectly affect its sovereignty or be in contravention with the Constitution, Laws and Regulations of Malaysia which exist and may result from any principles of international law or should reservations by any Member of the Union jeopardize Malaysia's telecommunication and radiocommunication services or lead to an increase in its contributory share towards defraying the expenses of the Union;
- 2 further reserves the right of its Government to make such reservations as may be necessary up to and including the time of ratification of the Final Acts of the World Radiocommunication Conference (Geneva, 2012).

Original: English

For the United Kingdom of Great Britain and Northern Ireland:

The delegation of the United Kingdom of Great Britain and Northern Ireland having noted all the reservations and declarations contained in Document 546 of 16 February 2012; declares on behalf of its Government, in response to Statement 21 entered by the delegation of the Argentine Republic, that the Government of the United Kingdom of Great Britain and Northern Ireland has no doubt about its sovereignty over the Falkland Islands, South Georgia and the South Sandwich Islands and in this context draws attention to Article IV of the Antarctic Treaty to which both the United Kingdom and Argentina are parties. The United Kingdom firmly rejects the claim by the Government of Argentina to sovereignty over those islands and maritime areas.

The principle of self-determination, enshrined in the Charter of the United Nations, underlies our position on the sovereignty of the Falkland Islands. There can be no negotiation on the sovereignty of the Falkland Islands unless and until such time as the Falkland Islanders so wish. The Islanders regularly make it clear that they wish the Falkland Islands to remain under British sovereignty.

Original: English

For the Republic of South Africa:

In signing the Final Acts of the World Radiocommunication Conference, 2012, the delegation of the Republic of South Africa, after having noted the declarations made by other administrations present at the conference, declares:

- 1 that it reserves its Government's right to take any such action as it may deem necessary to safeguard its interests should any Member of the Union, in any way, fail to comply with the provisions of the Constitution and Convention of the International Telecommunication Union, the Radio Regulations of the ITU and the Final Acts of the World Radiocommunication Conference, 2012;
- 2 should any reservation by a Member of the Union, directly or indirectly, affect the operation of its telecommunication services, the Republic of South Africa reserves its right to take any action that it may deem necessary;
- 3 the Republic of South Africa reiterates and incorporates by reference, all declarations made at all prior world radiocommunication conferences;
- 4 the delegation of the Republic of South Africa reserves the right of its Government to make any such additional declarations and reservations as may be necessary up to, and including, the time of ratification of the Final Acts of the World Radiocommunication Conference, 2012.

The delegation of the Republic of South Africa further reserves its Government's right:

- to take any such action as it may consider necessary to safeguard its interest, should any Member of the Union fail in any way to comply with the provisions of the Constitution and the Convention of the International Telecommunication Union (Plenipotentiary Conference, Guadalajara, 2010) or should reservations by such Members, directly or indirectly, affect the operations of its telecommunications services or its sovereignty.

Original: English**For the State of Israel:**

1 Declaration No. 79 (in Document 546) made by certain Member States in respect of the Final Acts, contravenes the principles and purposes of both the International Telecommunication Union and WRC, and is therefore devoid of legal validity.

2 The State of Israel wishes to put on record that it rejects the aforesaid declaration, which politicizes and undermines the work of both the ITU and WRC. The State of Israel will proceed on the assumption that this declaration has no bearing whatsoever with respect to the rights and duties of any Member State of the ITU.

3 Should any Member State that has made the foregoing declaration act toward any interest of the State of Israel in a manner which violates the State of Israel's rights as a Member State of the ITU, or breaches such Member State's obligations toward the State of Israel as such, the State of Israel reserves its right to act toward such a Member State in a reciprocal manner.

Original: English**For Turkey:**

The delegation of the Republic of Turkey, in signing the Final Acts of the World Radiocommunication Conference (WRC-12) and having read the declarations and reservations in Document 546, declares that it reserves the right for its Government to implement the provisions of the Final Acts only to the State parties with which it has diplomatic relations.

Original: English**For Sweden:**

Having noted the declarations and reservations contained in Document 546 of the World Radiocommunication Conference (Geneva, 2012), the delegation of Sweden further reserves for its Government the right to take any action it might deem necessary to safeguard its interests should any Member State of the Union fail to comply with the provisions of the Radio Regulations.

Original: English**For the Republic of Namibia:**

In signing the Final Acts of the World Radiocommunication Conference 2012 (WRC-12), the delegation of the Republic of Namibia, having noted the declarations and reservations contained in Document 546, declares:

- 1 that it reserves for its Government the sovereign right to take any measures that it deems necessary and appropriate to safeguard and protect its interest and services should any Member State of the International Telecommunication Union (ITU) fail to comply with the provisions of these Final Acts; and
- 2 that its Government reserves the right to make any additional reservations that it may deem necessary and appropriate up to the time of deposit of the instrument of ratification.

Original: French**For the Republic of Benin:**

Having taken note of Document 546, the Republic of Benin, having participated in the World Radiocommunication Conference (WRC-12) held in Geneva, Switzerland, from 23 January to 17 February 2012, in signing the Final Acts of that conference, reserves the sovereign right:

- 1 to take any necessary actions and measures to ensure appropriate utilization of spectrum resources and to protect its national rights and interests should any Member of the Union fail to respect the provisions of the Final Acts in question and jeopardize its telecommunication/ICT services or endanger its national security and sovereignty;
- 2 to enter any additional reservations it may deem necessary until such time as the instruments of ratification are deposited.

Original: English**For the Kingdom of Swaziland:**

Having taken note of the declarations contained in Document 546, the delegation of the Kingdom of Swaziland declares that its Administration will comply with the provisions of the Final Acts without prejudice to its sovereign right to take any measures that the Government of Swaziland deems necessary to safeguard its telecommunication services in the event of harmful interference caused to the said services by any member of the union failing to comply with the provisions of the Radio Regulations as revised and adopted by this Conference.

The delegation of the Kingdom of Swaziland further declares that it reserves the right to make any statements or reservations when depositing its instruments of ratification of the Final Acts of the World Radiocommunication Conference (Geneva, 2012).

Original: English**For the Kingdom of Bahrain:**

Having taken note of the declarations contained in Document 546, the delegation of the Kingdom of Bahrain, in signing the Final Acts of the World Radiocommunication Conference (Geneva, 2012), reserves for the Kingdom of Bahrain the right to take any actions and measures it deems necessary to protect its interests should any Member State of the International Telecommunication Union (ITU) fail to respect fully the provisions and Resolutions of the Final Acts or to comply with them, or should any actions or reservations by any Member State, during or after the Conference, jeopardize in any way the proper functioning of the telecommunication services of the Kingdom of Bahrain.

Original: French**For the Kingdom of Morocco:**

The delegation of the Kingdom of Morocco participating in the 2012 World Radiocommunication Conference (WRC-12), having noted declaration No. 87 by the People's Democratic Republic of Algeria, contained in WRC-12 Document 546, which stipulates, *inter alia*, "*the use on a primary basis of the frequency band 645-862 MHz by its aeronautical radionavigation service (ARNS)*", considers that the operation of the said service is not in conformity with the Radio Regulations.

Therefore, in the event of harmful interference affecting national radiocommunication services operated in accordance with the Radio Regulations, the Kingdom of Morocco reserves the right to take all necessary measures, in line with international regulations, to safeguard its interests.

Original: Spanish**For Spain:**

The delegation of Spain, on behalf of its Government, in the light of the reservations made to the Final Acts of this conference, declares that the use of each and every one of the frequency bands provided for in the Radio Regulations by each and every country must be in compliance with the relevant provisions set forth in the said Regulations. Likewise, Spain reserves the right to take any measure it considers necessary, within the framework set by the ITU Constitution, Convention and Radio Regulations, to protect its legitimate interests.

101

Original: English**For the Republic of Croatia:**

In reviewing the declarations and reservations made by Member States and contained in Document 546, the delegation of the Republic of Croatia on behalf of its Government declares the additional declaration as follows:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2012), the delegation of the Republic of Croatia reserves for its Government the right to take such action as it may consider necessary to safeguard its interests should any Member of the Union fail to comply with the provisions of the Final Acts adopted by the World Radiocommunication Conference (Geneva, 2012) or should reservations made by other countries jeopardize the proper operation of its electronic communications networks and services.

102

Original: French**For the Democratic Republic of the Congo:**

Having noted the declarations contained in Document 546, the delegation of the Democratic Republic of the Congo reserves for its Government the right to adopt any measures that it may deem necessary to safeguard its interests should another Member of the Union fail in any way to comply with the Final Acts adopted by the conference, or should the reservations entered by other countries jeopardize the smooth functioning of its telecommunication services.

103

Original: English**For the Azerbaijani Republic:**

Having considered the declarations included in Document 546, the delegation of the Republic of Azerbaijan in signing the Final Acts of the World Radiocommunication Conference (Geneva, 2012), reserves for its Government the right:

- to take measures it might deem necessary to safeguard its interests if another Member State of the Union should in any way fail to observe or violate the provisions contained in the Constitution and Convention of the International Telecommunication Union, or those set out in the Resolutions, Decisions, Recommendations, Annexes and Protocols constituting the Final Acts of the World Radiocommunication Conference (Geneva, 2012) or if the reservations made by any Member State should be prejudicial to the operation of radiocommunication services in the Republic of Azerbaijan;
- to take any measures that may be thought fit in order to regulate its domestic telecommunications in accordance with the applicable national laws and regulations on the territories of Azerbaijan. In this context, all radio transmitters or radiocommunication equipment operating within the territories of the Government of Azerbaijan, without prior agreement of the Government of Azerbaijan, will be assumed as operating illegally.

Original: English**For the Republic of Angola:**

The delegation of the Republic of Angola, after having noted the declarations made by other administrations present at the conference, contained in Document 546, declares that:

In signing the Final Acts of the World Radiocommunication Conference (WRC-12) for dealing with frequency allocations in certain parts of the spectrum, the delegation of the Republic of Angola states the intention of its Administration to comply with the provisions of the Final Acts of the Conference without prejudice to the Republic of Angola's sovereign right to safeguard and protect its broadcasting, telecommunication and other services from any Member failing to comply with the provisions of the Radio Regulations as revised by this Conference, particularly new allocations made by this Conference on the condition of causing no harmful interference to existing services.

Angola also incorporates by reference herein Additional Declaration No. 34 entered in the Final Acts of the International Telecommunication Union Plenipotentiary Conference (Guadalajara, 2010).

Original: Chinese**For the People's Republic of China:**

Having noted the declarations and reservations as contained in Document 546 of the World Radiocommunication Conference (Geneva, 2012), the delegation of the People's Republic of China reiterates and incorporates by reference all the declarations and reservations it has made at all previous ITU plenipotentiary conferences, world administrative radio conferences and world radiocommunication conferences.

Original: English**For Greece:**

Having taken note of the declarations contained in Document 546, the delegation of the Hellenic Republic declares that it reserves for its Government the right:

- 1 to take any action and preservation measures it deems necessary should the consequences of reservations by any Member State put in danger Hellenic radiocommunication services or affect its sovereignty to comply with the provisions of the Final Acts, the Annexes thereto or the Radio Regulations;
- 2 to make additional declarations or reservations at the time of deposit of its instruments of ratification of these revisions of the Radio Regulations.

Original: English**For Portugal:**

In reviewing the declarations made by the Member States of the Union and contained in Document 546 of the World Radiocommunication Conference 2012 the delegation of Portugal reserves for its Government:

- the right to enter further declarations or reservations at the time of depositing its instruments of ratification of these revisions of the Radio Regulations;
- the right to take any action it may deem necessary to safeguard its interests should any Member State of the Union fail in any way to comply with the provisions of these Final Acts, or should reservations made by other countries jeopardize the smooth operation of its telecommunication services.

Original: English**For the Republic of Iraq:**

Having taken note of the declarations contained in Document 546, the delegation of the Republic of Iraq, in signing the Final Acts of the World Radiocommunication Conference (Geneva, 2012), formally declares that:

- 1 The delegation of the Republic of Iraq reserves the right for its Government to take any action as it may consider necessary to safeguard its interests should they be affected negatively by decisions taken at this conference, or by the failure on the part of any other administration in any way to comply with the provisions of the instruments amending the Constitution and Convention of the International Telecommunication Union. This will include the Annexes or Protocols and Regulations attached thereto, or the Final Acts of this conference, or should the reservations, declarations or additional reservations and operation of its telecommunication services, or to infringe the full exercise and the rights of the sovereign nation of the Republic of Iraq.
- 2 Furthermore the delegation of the Republic of Iraq reserve its Government right to make additional reservations when ratifying the Final Acts of this Conference.
- 3 Finally the Republic of Iraq reserves its right to be recognized as per the Plenary statements in respect to the reduction in their EPM as results of non-reply during exceptional circumstances to the request for coordination under § 4.1.10 of their planned assignments under Appendices 30 and 30A. This drastic reduction in the EPM of assignments was due to the fact that the Republic of Iraq was not in a position to respond to any request for coordinating due to the fact that special circumstances prevailed that did not allow the Republic of Iraq to take the required necessary action.

The Republic of Iraq will continue its investigation to resolve this matter with the Bureau and the RRB as per the instructions of the conference in order to find a way and means to alleviate the situation with the highest priority.

109

Original: English**For the Republic of the Marshall Islands:**

Having considered the declarations and reservations made by other Member States, the delegation of the United States of America, acting on behalf of the Government of the Republic of the Marshall Islands, pursuant to Article 31 of the Convention of the International Telecommunication Union (Geneva, 1992), as amended, declares that it reserves for the Government of the Republic of the Marshall Islands the right to make any declarations or reservations necessary to Marshallese interests should declarations or reservations made by other Member States jeopardize the proper operations of the telecommunication services of the Republic of the Marshall Islands.

110

Original: English**For the Federated States of Micronesia:**

Having considered the declarations and reservations made by other Member States, the delegation of the United States of America, acting on behalf of the Government of the Federated States of Micronesia, pursuant to Article 31 of the Convention of the International Telecommunication Union (Geneva, 1992), as amended, declares that it reserves for the Government of the Federated States of Micronesia, the right to make any declarations or reservations necessary to the interests of the Federated States of Micronesia should declarations or reservations made by other Member States jeopardize the proper operations of the telecommunication services of the Federated States of Micronesia.

111

Original: English**For the United States of America:**

The United States of America refers to declarations and reservations made by various Member States reserving their right to take such actions as they may consider necessary to safeguard their interests with respect to application of the provisions of the Constitution and Convention of the International Telecommunication Union (Geneva, 1992), and any amendments thereto. The United States reserves the right to take whatever measures it deems necessary to safeguard U.S. interests in response to such actions.

Original: French

For Tunisia:

Having considered the declarations and reservations made by Member States and contained in Document 546 and in signing the Final Acts of the World Radiocommunication Conference (Geneva, 2012), the delegation of Tunisia on behalf of its Government makes the following additional declarations:

- it expresses its regret regarding the reservation that has prevented Tunisia from being included in footnote 5.316A. That reservation deprives Tunisia of its right to develop its broadband telecommunication network infrastructure before 2015 in the same way as countries already included in the footnote;
- it reserves for its Government the right to take any action it may deem necessary, in accordance with its national legislation and international law, to safeguard its interests should other Members of the Union fail in any way to comply with the Final Acts or enter reservations that may jeopardize the smooth functioning of the telecommunication services on its territory.

Original: English

For the Federal Republic of Germany, Australia, Austria, Belgium, Canada, the Republic of Croatia, Denmark, the Republic of Estonia, the United States of America, Finland, France, Georgia, Greece, Hungary, Ireland, Iceland, Italy, Japan, The Former Yugoslav Republic of Macedonia, the Principality of Liechtenstein, Luxembourg, Malta, the Republic of Moldova, Norway, New Zealand, the Kingdom of the Netherlands, the Republic of Poland, Portugal, the Slovak Republic, the Czech Republic, Romania, the United Kingdom of Great Britain and Northern Ireland, the Republic of Slovenia, Sweden, the Confederation of Switzerland and Turkey:

The delegations of the above-mentioned States, referring to the declaration made by the Republic of Colombia (No. 34), inasmuch as these and any similar statements refer to the Bogotá Declaration of 3 December 1976 by equatorial countries and to the claims of those countries to exercise sovereign rights over segments of the geostationary-satellite orbit, or to any related claims, consider that the claims in question cannot be recognized by this conference.

The above-mentioned delegations also wish to state that the reference in Article 44 of the Constitution to the “geographical situation of particular countries” does not imply recognition of a claim to any preferential rights to the geostationary-satellite orbit.

Original: English**For the Republic of South Sudan:**

In reviewing the declarations and reservations made by Member States and contained in Document 546, the delegation of the Republic of South Sudan to the WRC-12 herewith declares on behalf of its Government and on behalf of the powers conferred on it that:

- 1 it reserves the right for its Government to take any measures and actions it deems necessary to safeguard its interests, should any Member State of the Union fail to abide by the provisions of these Final Acts or comply with them or should reservations, made by other countries, jeopardize the efficient operation of its telecommunication services;
- 2 to accept, or not to accept, any consequences deriving from the application by other administrations, or telecommunication operating agencies in their territories, of the Final Acts of the World Radiocommunication Conference (Geneva, 2012), the Radio Regulations and associated instruments, should these be deemed prejudicial to South Sudan's national interests or detrimental to its domestic telecommunications;
- 3 the Republic of South Sudan reserves the right to make additional reservations at the time of deposit of its instruments of ratification of these revisions of the Radio Regulations.

Original: English**For the United States of America:**

The United States of America, noting Statement No. 57 entered by the delegation of Cuba, recalls its right to broadcast to Cuba on appropriate frequencies free of jamming or other wrongful interference and reserves its rights with respect to existing interference and any future interference by Cuba with U.S. broadcasting. The United States of America further notes that it disagreed with, and disassociated itself from, statements made at WRC-07 concerning broadcasting from aircraft.

Original: Spanish**For Cuba:**

Having taken note of the declarations and reservations made at the World Radiocommunication Conference (Geneva, 2012), the delegation of Cuba, in accordance with the principles laid down in the ITU Constitution, reserves for its Government the right to take all appropriate measures on its national territory to protect itself against any signal which is incompatible with its sovereign rights or which may constitute a danger to its security or conflict with its cultural heritage and values.

Original: English**For Libya:**

Having taken note of the reservations contained in Document 546, the delegation of Libya declares that it reserves the right for its Government:

- 1 to take any measures that it may deem necessary to safeguard its interests, should other members of the International Telecommunication Union, in any way fail to comply with the provisions of the Constitution and Convention of the Union, the Radio Regulations of the Union and the Final Acts of the World Radiocommunication Conference (WRC-12, Geneva, 2012), the Annexes thereto;
- 2 to take any measures it may deem necessary and appropriate to protect and safeguard its national interests and rights with respect to radiocommunications, should they be affected or prejudiced, directly or indirectly by reservations expressed by other administrations or by actions not in accordance with international law;
- 3 to make such additional declarations and reservations that it may be necessary up to, and including, the time of ratification of the Final Acts of the World Radiocommunication Conference (WRC-12, Geneva, 2012);
- 4 underscores the need for regional harmonization for the use of band 694-790/790-862 MHz in order to ensure both broadcasting and mobile services operate in a non-interference environment;
- 5 to accept or not accept any financial consequences that may arise from such reservations.

Original: Arabic**For Libya:**

In reference to the declarations contained in Document 546, the delegation of Libya makes the following declaration, as the delegation representing free Libya, attending such an international gathering as WRC for the first time.

We extend our greetings to the assembled delegates and value the efforts made to ensure the success of the conference, in order to bring a brighter future for the peoples and Member States who await the outcome of this conference, so as to achieve the development of telecommunication infrastructure, economic development and stability of peoples and societies.

We greet all the friends who stood by our side and supported us covertly and overtly in gaining our freedom and establishing the values of democracy and justice. We thank them all for their assistance to the Libyan people in its darkest hour to enable it to achieve its objectives of freedom and its right to life in dignity.

Libya hopes for cooperation and expects other to support our people and government technically and economically as a member of the international community in which peace and harmony prevail.

ITU-R and its resolutions and recommendations have a significant bearing on the stability and development of all services: mobile communications, satellite services and wireless data networks.

Libya seeks to draw benefits from the outcomes of the conference in the service of our people and country in order to build the structure for our social and economic development.

We look forward to support from developed industrial nations in the fields of technology and scientific experience in regard to radiocommunications and optimal use of the radio spectrum.

In conclusion, we hope that the outcome of this and future conferences will foster cooperation and remove international and regional differences, particularly with neighbouring countries with whom we should pursue coordination in order to prevent interference and safeguard national sovereignty, thus improving services and harnessing progress for the benefit of our peoples.

Original: English**For Papua New Guinea:**

Having reviewed the Declarations and Reservations contained in Document 546, the Delegation of the Independent State of Papua New Guinea further declares that it reserves for its Government the right to make appropriate specific reservations and statements prior to ratification of the Final Acts.

ARTICLES

ARTICLE 3

Technical characteristics of stations

MOD

3.7 Transmitting stations shall conform to the maximum permitted power levels for out-of-band emissions, or unwanted emissions in the out-of-band domain, specified for certain services and classes of emission in the present Regulations. In the absence of such specified maximum permitted power levels transmitting stations should, to the maximum extent possible, satisfy the requirements relating to the limitation of the out-of-band emissions, or unwanted emissions in the out-of-band domain, specified in the relevant ITU-R Recommendations. (WRC-12)

ARTICLE 4

Assignment and use of frequencies

Section I – General rules

SUP

4.15A

ADD

4.23 Transmissions to or from high altitude platform stations shall be limited to bands specifically identified in Article 5. (WRC-12)

ARTICLE 5

Frequency allocations**Section IV – Table of Frequency Allocations
(See No. 2.1)****MOD****8.3-110 kHz**

Allocation to services		
Region 1	Region 2	Region 3
Below 8.3	(Not allocated) 5.53 5.54	
8.3-9	METEOROLOGICAL AIDS 5.54A 5.54B 5.54C	
9-11.3	METEOROLOGICAL AIDS 5.54A RADIONAVIGATION	
11.3-14	RADIONAVIGATION	
14-19.95	FIXED MARITIME MOBILE 5.57 5.55 5.56	

MOD

5.53 Administrations authorizing the use of frequencies below 8.3 kHz shall ensure that no harmful interference is caused to services to which the bands above 8.3 kHz are allocated. (WRC-12)

MOD

5.54 Administrations conducting scientific research using frequencies below 8.3 kHz are urged to advise other administrations that may be concerned in order that such research may be afforded all practicable protection from harmful interference. (WRC-12)

ADD

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

ADD

5.54B *Additional allocation:* in Algeria, Saudi Arabia, Egypt, the United Arab Emirates, the Russian Federation, Iraq, Lebanon, Morocco, Qatar, the Syrian Arab Republic, Sudan and Tunisia, the frequency band 8.3-9 kHz is also allocated to the radionavigation, fixed and mobile services on a primary basis. (WRC-12)

ADD

5.54C *Additional allocation:* in China, the frequency band 8.3-9 kHz is also allocated to the maritime radionavigation and maritime mobile services on a primary basis. (WRC-12)

MOD

5.56 The stations of services to which the bands 14-19.95 kHz and 20.05-70 kHz and in Region 1 also the bands 72-84 kHz and 86-90 kHz are allocated may transmit standard frequency and time signals. Such stations shall be afforded protection from harmful interference. In Armenia, Azerbaijan, Belarus, the Russian Federation, Georgia, Kazakhstan, Kyrgyzstan, Tajikistan and Turkmenistan, the frequencies 25 kHz and 50 kHz will be used for this purpose under the same conditions. (WRC-12)

MOD

5.67B The use of the band 135.7-137.8 kHz in Algeria, Egypt, Iran (Islamic Republic of), Iraq, Lebanon, Syrian Arab Republic, Sudan, South Sudan and Tunisia is limited to the fixed and maritime mobile services. The amateur service shall not be used in the above-mentioned countries in the band 135.7-137.8 kHz, and this should be taken into account by the countries authorizing such use. (WRC-12)

MOD

5.68 *Alternative allocation:* in Angola, Congo (Rep. of the), the Dem. Rep. of the Congo and South Africa, the band 160-200 kHz is allocated to the fixed service on a primary basis. (WRC-12)

MOD

5.70 *Alternative allocation:* in Angola, Botswana, Burundi, the Central African Rep., Congo (Rep. of the), Ethiopia, Kenya, Lesotho, Madagascar, Malawi, Mozambique, Namibia, Nigeria, Oman, the Dem. Rep. of the Congo, South Africa, Swaziland, Tanzania, Chad, Zambia and Zimbabwe, the band 200-283.5 kHz is allocated to the aeronautical radionavigation service on a primary basis. (WRC-12)

MOD**200-495 kHz**

Allocation to services		
Region 1	Region 2	Region 3
415-435 MARITIME MOBILE 5.79 AERONAUTICAL RADIONAVIGATION	415-472 MARITIME MOBILE 5.79 Aeronautical radionavigation 5.77 5.80 5.78 5.82	
435-472 MARITIME MOBILE 5.79 Aeronautical radionavigation 5.77 5.82		
472-479 MARITIME MOBILE 5.79 Amateur 5.80A Aeronautical radionavigation 5.77 5.80 5.80B 5.82		
479-495 MARITIME MOBILE 5.79 5.79A Aeronautical radionavigation 5.77 5.82	479-495 MARITIME MOBILE 5.79 5.79A Aeronautical radionavigation 5.77 5.80 5.82	

SUP

5.72

MOD

5.77 *Different category of service:* in Australia, China, the French overseas communities of Region 3, Korea (Rep. of), India, Iran (Islamic Republic of), Japan, Pakistan, Papua New Guinea and Sri Lanka, the allocation of the frequency band 415-495 kHz to the aeronautical radionavigation service is on a primary basis. In Armenia, Azerbaijan, Belarus, the Russian Federation, Kazakhstan, Latvia, Uzbekistan and Kyrgyzstan, the allocation of the frequency band 435-495 kHz to the aeronautical radionavigation service is on a primary basis. Administrations in all the aforementioned countries shall take all practical steps necessary to ensure that aeronautical radionavigation stations in the frequency band 435-495 kHz do not cause interference to reception by coast stations of transmissions from ship stations on frequencies designated for ship stations on a worldwide basis. (WRC-12)

ADD

5.80A The maximum equivalent isotropically radiated power (e.i.r.p.) of stations in the amateur service using frequencies in the band 472-479 kHz shall not exceed 1 W. Administrations may increase this limit of e.i.r.p. to 5 W in portions of their territory which are at a distance of over 800 km from the borders of Algeria, Saudi Arabia, Azerbaijan, Bahrain, Belarus, China, Comoros, Djibouti, Egypt, United Arab Emirates, the Russian Federation, Iran (Islamic Republic of), Iraq, Jordan, Kazakhstan, Kuwait, Lebanon, Libya, Morocco, Mauritania, Oman, Uzbekistan, Qatar, Syrian Arab Republic, Kyrgyzstan, Somalia, Sudan, Tunisia, Ukraine and Yemen. In this frequency band, stations in the amateur service shall not cause harmful interference to, or claim protection from, stations of the aeronautical radionavigation service. (WRC-12)

ADD

5.80B The use of the frequency band 472-479 kHz in Algeria, Saudi Arabia, Azerbaijan, Bahrain, Belarus, China, Comoros, Djibouti, Egypt, United Arab Emirates, the Russian Federation, Iraq, Jordan, Kazakhstan, Kuwait, Lebanon, Libya, Mauritania, Oman, Uzbekistan, Qatar, Syrian Arab Republic, Kyrgyzstan, Somalia, Sudan, Tunisia and Yemen is limited to the maritime mobile and aeronautical radionavigation services. The amateur service shall not be used in the above-mentioned countries in this frequency band, and this should be taken into account by the countries authorizing such use. (WRC-12)

MOD

5.82 In the maritime mobile service, the frequency 490 kHz is to be used exclusively for the transmission by coast stations of navigational and meteorological warnings and urgent information to ships, by means of narrow-band direct-printing telegraphy. The conditions for use of the frequency 490 kHz are prescribed in Articles 31 and 52. In using the frequency band 415-495 kHz for the aeronautical radionavigation service, administrations are requested to ensure that no harmful interference is caused to the frequency 490 kHz. In using the frequency band 472-479 kHz for the amateur service, administrations shall ensure that no harmful interference is caused to the frequency 490 kHz. (WRC-12)

MOD**495-1 800 kHz**

Allocation to services		
Region 1	Region 2	Region 3
495-505	MARITIME MOBILE	
505-526.5 MARITIME MOBILE 5.79 5.79A 5.84 AERONAUTICAL RADIONAVIGATION	505-510 MARITIME MOBILE 5.79	505-526.5 MARITIME MOBILE 5.79 5.79A 5.84 AERONAUTICAL RADIONAVIGATION Aeronautical mobile Land mobile
	510-525 MARITIME MOBILE 5.79A 5.84 AERONAUTICAL RADIONAVIGATION	

SUP**5.82A****SUP****5.82B****MOD**

5.87 *Additional allocation:* in Angola, Botswana, Lesotho, Malawi, Mozambique, Namibia, Niger and Swaziland, the band 526.5-535 kHz is also allocated to the mobile service on a secondary basis. (WRC-12)

MOD

5.93 *Additional allocation:* in Angola, Armenia, Azerbaijan, Belarus, the Russian Federation, Georgia, Hungary, Kazakhstan, Latvia, Lithuania, Mongolia, Nigeria, Uzbekistan, Poland, Kyrgyzstan, Slovakia, Tajikistan, Chad, Turkmenistan and Ukraine, the bands 1 625-1 635 kHz, 1 800-1 810 kHz and 2 160-2 170 kHz are also allocated to the fixed and land mobile services on a primary basis, subject to agreement obtained under No. **9.21**. (WRC-12)

MOD

5.98 *Alternative allocation:* in Angola, Armenia, Azerbaijan, Belarus, Belgium, Cameroon, Congo (Rep. of the), Denmark, Egypt, Eritrea, Spain, Ethiopia, the Russian Federation, Georgia, Greece, Italy, Kazakhstan, Lebanon, Lithuania, the Syrian Arab Republic, Kyrgyzstan, Somalia, Tajikistan, Tunisia, Turkmenistan, Turkey and Ukraine, the band 1 810-1 830 kHz is allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. (WRC-12)

MOD

5.99 *Additional allocation:* in Saudi Arabia, Austria, Iraq, Libya, Uzbekistan, Slovakia, Romania, Slovenia, Chad, and Togo, the band 1 810-1 830 kHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. (WRC-12)

SUP**5.101**

MOD

5.107 *Additional allocation:* in Saudi Arabia, Eritrea, Ethiopia, Iraq, Libya, Somalia and Swaziland, the band 2 160-2 170 kHz is also allocated to the fixed and mobile, except aeronautical mobile (R), services on a primary basis. The mean power of stations in these services shall not exceed 50 W. (WRC-12)

MOD

5.112 *Alternative allocation:* in Denmark and Sri Lanka, the band 2 194-2 300 kHz is allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. (WRC-12)

MOD

5.114 *Alternative allocation:* in Denmark and Iraq, the band 2 502-2 625 kHz is allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. (WRC-12)

MOD

5.117 *Alternative allocation:* in Côte d'Ivoire, Denmark, Egypt, Liberia, Sri Lanka and Togo, the band 3 155-3 200 kHz is allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. (WRC-12)

MOD**3 230-5 003 kHz**

Allocation to services		
Region 1	Region 2	Region 3
4 438-4 488 FIXED MOBILE except aeronautical mobile (R) Radiolocation 5.132A 5.132B	4 438-4 488 FIXED MOBILE except aeronautical mobile (R) RADIOLOCATION 5.132A	4 438-4 488 FIXED MOBILE except aeronautical mobile Radiolocation 5.132A
4 488-4 650 FIXED MOBILE except aeronautical mobile (R)		4 488-4 650 FIXED MOBILE except aeronautical mobile

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-12)

ADD

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

ADD

5.132B *Alternative allocation:* in Armenia, Austria, Belarus, Moldova, Uzbekistan and Kyrgyzstan, the frequency band 4 438-4 488 kHz is allocated to the fixed and mobile, except aeronautical mobile (R), services on a primary basis. (WRC-12)

MOD**5 003-7 450 kHz**

Allocation to services		
Region 1	Region 2	Region 3
5 250-5 275 FIXED MOBILE except aeronautical mobile Radiolocation 5.132A 5.133A	5 250-5 275 FIXED MOBILE except aeronautical mobile RADIOLOCATION 5.132A	5 250-5 275 FIXED MOBILE except aeronautical mobile Radiolocation 5.132A
5 275-5 450	FIXED MOBILE except aeronautical mobile	

MOD

5.133 *Different category of service:* in Armenia, Azerbaijan, Belarus, the Russian Federation, Georgia, Kazakhstan, Latvia, Lithuania, Niger, Uzbekistan, Kyrgyzstan, Tajikistan, Turkmenistan and Ukraine, the allocation of the band 5 130-5 250 kHz to the mobile, except aeronautical mobile, service is on a primary basis (see No. 5.33). (WRC-12)

ADD

5.133A *Alternative allocation:* in Armenia, Austria, Belarus, Moldova, Uzbekistan and Kyrgyzstan, the frequency bands 5 250-5 275 kHz and 26 200-26 350 kHz are allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. (WRC-12)

MOD

5.140 *Additional allocation:* in Angola, Iraq, Kenya, Somalia and Togo, the band 7 000-7 050 kHz is also allocated to the fixed service on a primary basis. (WRC-12)

MOD

5.141 *Alternative allocation:* in Egypt, Eritrea, Ethiopia, Guinea, Libya, Madagascar and Niger, the band 7 000-7 050 kHz is allocated to the fixed service on a primary basis. (WRC-12)

MOD

5.141B *Additional allocation:* after 29 March 2009, in Algeria, Saudi Arabia, Australia, Bahrain, Botswana, Brunei Darussalam, China, Comoros, Korea (Rep. of), Diego Garcia, Djibouti, Egypt, United Arab Emirates, Eritrea, Indonesia, Iran (Islamic Republic of), Japan, Jordan, Kuwait, Libya, Morocco, Mauritania, Niger, New Zealand, Oman, Papua New Guinea, Qatar, the Syrian Arab Republic, Singapore, Sudan, South Sudan, Tunisia, Viet Nam and Yemen, the band 7 100-7 200 kHz is also allocated to the fixed and the mobile, except aeronautical mobile (R), services on a primary basis. (WRC-12)

MOD

5.143C *Additional allocation:* after 29 March 2009 in Algeria, Saudi Arabia, Bahrain, Comoros, Djibouti, Egypt, United Arab Emirates, Iran (Islamic Republic of), Jordan, Kuwait, Libya, Morocco, Mauritania, Niger, Oman, Qatar, the Syrian Arab Republic, Sudan, South Sudan, Tunisia and Yemen, the bands 7 350-7 400 kHz and 7 400-7 450 kHz are also allocated to the fixed service on a primary basis. (WRC-12)

MOD**7 450-13 360 kHz**

Allocation to services		
Region 1	Region 2	Region 3
9 040-9 305 FIXED	9 040-9 400 FIXED	9 040-9 305 FIXED
9 305-9 355 FIXED Radiolocation 5.145A 5.145B		9 305-9 355 FIXED Radiolocation 5.145A
9 355-9 400 FIXED		9 355-9 400 FIXED

ADD

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

ADD

5.145B *Alternative allocation:* in Armenia, Austria, Belarus, Moldova, Uzbekistan and Kyrgyzstan, the frequency bands 9 305-9 355 kHz and 16 100-16 200 kHz are allocated to the fixed service on a primary basis. (WRC-12)

MOD**13 360-18 030 kHz**

Allocation to services		
Region 1	Region 2	Region 3
13 410-13 450	FIXED Mobile except aeronautical mobile (R)	
13 450-13 550 FIXED Mobile except aeronautical mobile (R) Radiolocation 5.132A 5.149A	13 450-13 550 FIXED Mobile except aeronautical mobile (R) Radiolocation 5.132A	
13 550-13 570	FIXED Mobile except aeronautical mobile (R) 5.150	
15 800-16 100	FIXED 5.153	
16 100-16 200 FIXED Radiolocation 5.145A 5.145B	16 100-16 200 FIXED RADIOLOCATION 5.145A	16 100-16 200 FIXED Radiolocation 5.145A
16 200-16 360	FIXED	

ADD

5.149A *Alternative allocation:* in Armenia, Austria, Belarus, Moldova, Uzbekistan and Kyrgyzstan, the frequency band 13 450-13 550 kHz is allocated to the fixed service on a primary basis and to the mobile, except aeronautical mobile (R), service on a secondary basis. (WRC-12)

MOD**23 350-27 500 kHz**

Allocation to services		
Region 1	Region 2	Region 3
24 000-24 450	FIXED LAND MOBILE	
24 450-24 600 FIXED LAND MOBILE Radiolocation 5.132A 5.158	24 450-24 650 FIXED LAND MOBILE RADIOLOCATION 5.132A	24 450-24 600 FIXED LAND MOBILE Radiolocation 5.132A
24 600-24 890 FIXED LAND MOBILE	24 650-24 890 FIXED LAND MOBILE	24 600-24 890 FIXED LAND MOBILE
26 175-26 200	FIXED MOBILE except aeronautical mobile	
26 200-26 350 FIXED MOBILE except aeronautical mobile Radiolocation 5.132A 5.133A	26 200-26 420 FIXED MOBILE except aeronautical mobile RADIOLOCATION 5.132A	26 200-26 350 FIXED MOBILE except aeronautical mobile Radiolocation 5.132A
26 350-27 500 FIXED MOBILE except aeronautical mobile 5.150	26 420-27 500 FIXED MOBILE except aeronautical mobile 5.150	26 350-27 500 FIXED MOBILE except aeronautical mobile 5.150

ADD

5.158 *Alternative allocation:* in Armenia, Austria, Belarus, Moldova, Uzbekistan and Kyrgyzstan, the frequency band 24 450-24 600 kHz is allocated to the fixed and land mobile services on a primary basis. (WRC-12)

MOD

27.5-47 MHz

Allocation to services		
Region 1	Region 2	Region 3
38.25-39 FIXED MOBILE	38.25-39.986 FIXED MOBILE	38.25-39.5 FIXED MOBILE
39-39.5 FIXED MOBILE Radiolocation 5.132A 5.159		
39.5-39.986 FIXED MOBILE		39.5-39.986 FIXED MOBILE RADIOLOCATION 5.132A
39.986-40.02 FIXED MOBILE Space research		39.986-40 FIXED MOBILE RADIOLOCATION 5.132A Space research
		40-40.02 FIXED MOBILE Space research
...		
41.015-42	FIXED MOBILE 5.160 5.161 5.161A	
42-42.5 FIXED MOBILE Radiolocation 5.132A 5.160 5.161B	42-42.5 FIXED MOBILE 5.161	
42.5-44	FIXED MOBILE 5.160 5.161 5.161A	

ADD

5.159 *Alternative allocation:* in Armenia, Austria, Belarus, Moldova, Uzbekistan and Kyrgyzstan, the frequency band 39-39.5 MHz is allocated to the fixed and mobile services on a primary basis. (WRC-12)

MOD

5.160 *Additional allocation:* in Botswana, Burundi, Dem. Rep. of the Congo and Rwanda, the band 41-44 MHz is also allocated to the aeronautical radionavigation service on a primary basis. (WRC-12)

ADD

5.161A *Additional allocation:* in Korea (Rep. of) and the United States, the frequency bands 41.015–41.665 MHz and 43.35–44 MHz are also allocated to the radiolocation service on a primary basis. Stations in the radiolocation service shall not cause harmful interference to, or claim protection from, stations operating in the fixed or mobile services. Applications of the radiolocation service are limited to oceanographic radars operating in accordance with Resolution **612 (Rev.WRC-12)**. (WRC-12)

ADD

5.161B *Alternative allocation:* in Albania, Germany, Armenia, Austria, Belarus, Belgium, Bosnia and Herzegovina, Bulgaria, Cyprus, Vatican, Croatia, Denmark, Spain, Estonia, Finland, France, Greece, Hungary, Ireland, Iceland, Italy, Latvia, The Former Yugoslav Rep. of Macedonia, Liechtenstein, Lithuania, Luxembourg, Malta, Moldova, Monaco, Montenegro, Norway, Uzbekistan, Netherlands, Poland, Portugal, Kyrgyzstan, Slovakia, Czech Rep., Romania, United Kingdom, San Marino, Slovenia, Sweden, Switzerland, Turkey and Ukraine, the frequency band 42–42.5 MHz is allocated to the fixed and mobile services on a primary basis. (WRC-12)

MOD

5.162 *Additional allocation:* in Australia, the band 44–47 MHz is also allocated to the broadcasting service on a primary basis. (WRC-12)

MOD

5.162A *Additional allocation:* in Germany, Austria, Belgium, Bosnia and Herzegovina, China, Vatican, Denmark, Spain, Estonia, the Russian Federation, Finland, France, Ireland, Iceland, Italy, Latvia, The Former Yugoslav Republic of Macedonia, Liechtenstein, Lithuania, Luxembourg, Monaco, Montenegro, Norway, the Netherlands, Poland, Portugal, the Czech Rep., the United Kingdom, Serbia, Slovenia, Sweden and Switzerland the band 46–68 MHz is also allocated to the radiolocation service on a secondary basis. This use is limited to the operation of wind profiler radars in accordance with Resolution **217 (WRC-97)**. (WRC-12)

MOD

5.163 *Additional allocation:* in Armenia, Belarus, the Russian Federation, Georgia, Hungary, Kazakhstan, Latvia, Moldova, Uzbekistan, Kyrgyzstan, Tajikistan, Turkmenistan and Ukraine, the bands 47–48.5 MHz and 56.5–58 MHz are also allocated to the fixed and land mobile services on a secondary basis. (WRC-12)

MOD

5.164 *Additional allocation:* in Albania, Algeria, Germany, Austria, Belgium, Bosnia and Herzegovina, Botswana, Bulgaria, Côte d'Ivoire, Denmark, Spain, Estonia, Finland, France, Gabon, Greece, Ireland, Israel, Italy, Jordan, Lebanon, Libya, Liechtenstein, Lithuania, Luxembourg, Madagascar, Mali, Malta, Morocco, Mauritania, Monaco, Montenegro, Nigeria, Norway, the Netherlands, Poland, Syrian Arab Republic, Slovakia, Czech Rep., Romania, the United Kingdom, Serbia, Slovenia, Sweden, Switzerland, Swaziland, Chad, Togo, Tunisia and Turkey, the band 47–68 MHz, in South Africa the band 47–50 MHz, and in Latvia the band 48.5–56.5 MHz, are also allocated to the land mobile service on a primary basis. However, stations of the land mobile service in the countries mentioned in connection with each band referred to in this footnote shall not cause harmful interference to, or claim protection from, existing or planned broadcasting stations of countries other than those mentioned in connection with the band. (WRC-12)

MOD

5.165 *Additional allocation:* in Angola, Cameroon, Congo (Rep. of the), Madagascar, Mozambique, Niger, Somalia, Sudan, South Sudan, Tanzania and Chad, the band 47–68 MHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. (WRC-12)

MOD

5.166 *Alternative allocation:* in New Zealand, the band 50-51 MHz is allocated to the fixed and mobile services on a primary basis; the band 53-54 MHz is allocated to the fixed and mobile services on a primary basis. (WRC-12)

MOD

5.169 *Alternative allocation:* in Botswana, Lesotho, Malawi, Namibia, the Dem. Rep. of the Congo, Rwanda, South Africa, Swaziland, Zambia and Zimbabwe, the band 50-54 MHz is allocated to the amateur service on a primary basis. In Senegal, the band 50-51 MHz is allocated to the amateur service on a primary basis. (WRC-12)

MOD

5.171 *Additional allocation:* in Botswana, Lesotho, Malawi, Mali, Namibia, Dem. Rep. of the Congo, Rwanda, South Africa, Swaziland, Zambia and Zimbabwe, the band 54-68 MHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. (WRC-12)

MOD

5.178 *Additional allocation:* in Colombia, Cuba, El Salvador, Guatemala, Guyana, Honduras and Nicaragua, the band 73-74.6 MHz is also allocated to the fixed and mobile services on a secondary basis. (WRC-12)

MOD

5.179 *Additional allocation:* in Armenia, Azerbaijan, Belarus, China, the Russian Federation, Georgia, Kazakhstan, Lithuania, Mongolia, Kyrgyzstan, Tajikistan, Turkmenistan and Ukraine, the bands 74.6-74.8 MHz and 75.2-75.4 MHz are also allocated to the aeronautical radionavigation service, on a primary basis, for ground-based transmitters only. (WRC-12)

MOD

5.197 *Additional allocation:* in the Syrian Arab Republic, the band 108-111.975 MHz is also allocated to the mobile service on a secondary basis, subject to agreement obtained under No. **9.21**. In order to ensure that harmful interference is not caused to stations of the aeronautical radionavigation service, stations of the mobile service shall not be introduced in the band until it is no longer required for the aeronautical radionavigation service by any administration which may be identified in the application of the procedures invoked under No. **9.21**. (WRC-12)

MOD

5.201 *Additional allocation:* in Angola, Armenia, Azerbaijan, Belarus, Bulgaria, Estonia, the Russian Federation, Georgia, Hungary, Iran (Islamic Republic of), Iraq (Republic of), Japan, Kazakhstan, Latvia, Moldova, Mongolia, Mozambique, Uzbekistan, Papua New Guinea, Poland, Kyrgyzstan, Romania, Tajikistan, Turkmenistan and Ukraine, the band 132-136 MHz is also allocated to the aeronautical mobile (OR) service on a primary basis. In assigning frequencies to stations of the aeronautical mobile (OR) service, the administration shall take account of the frequencies assigned to stations in the aeronautical mobile (R) service. (WRC-12)

MOD

5.202 *Additional allocation:* in Saudi Arabia, Armenia, Azerbaijan, Belarus, Bulgaria, the United Arab Emirates, the Russian Federation, Georgia, Iran (Islamic Republic of), Jordan, Latvia, Oman, Uzbekistan, Poland, the Syrian Arab Republic, Kyrgyzstan, Romania, Tajikistan, Turkmenistan and Ukraine, the band 136-137 MHz is also allocated to the aeronautical mobile (OR) service on a primary basis. In assigning frequencies to stations of the aeronautical mobile (OR) service, the administration shall take account of the frequencies assigned to stations in the aeronautical mobile (R) service. (WRC-12)

MOD

5.211 *Additional allocation:* in Germany, Saudi Arabia, Austria, Bahrain, Belgium, Denmark, the United Arab Emirates, Spain, Finland, Greece, Ireland, Israel, Kenya, Kuwait, The Former Yugoslav Republic of Macedonia, Lebanon, Liechtenstein, Luxembourg, Mali, Malta, Montenegro, Norway, the Netherlands, Qatar, Slovakia, the United Kingdom, Serbia, Slovenia, Somalia, Sweden, Switzerland, Tanzania, Tunisia and Turkey, the band 138-144 MHz is also allocated to the maritime mobile and land mobile services on a primary basis. (WRC-12)

MOD

5.212 *Alternative allocation:* in Angola, Botswana, Cameroon, the Central African Rep., Congo (Rep. of the), Gabon, Gambia, Ghana, Guinea, Iraq, Jordan, Lesotho, Liberia, Libya, Malawi, Mozambique, Namibia, Niger, Oman, Uganda, Syrian Arab Republic, the Dem. Rep. of the Congo, Rwanda, Sierra Leone, South Africa, Swaziland, Chad, Togo, Zambia and Zimbabwe, the band 138-144 MHz is allocated to the fixed and mobile services on a primary basis. (WRC-12)

MOD

5.214 *Additional allocation:* in Eritrea, Ethiopia, Kenya, The Former Yugoslav Republic of Macedonia, Montenegro, Serbia, Somalia, Sudan, South Sudan and Tanzania, the band 138-144 MHz is also allocated to the fixed service on a primary basis. (WRC-12)

MOD**148-223 MHz**

Allocation to services		
Region 1	Region 2	Region 3
150.05-153 FIXED MOBILE except aeronautical mobile RADIO ASTRONOMY 5.149	150.05-154 FIXED MOBILE 5.225	
153-154 FIXED MOBILE except aeronautical mobile (R) Meteorological aids		
154-156.4875 FIXED MOBILE except aeronautical mobile (R) 5.225A 5.226	154-156.4875 FIXED MOBILE 5.226	154-156.4875 FIXED MOBILE 5.225A 5.226

MOD

5.221 Stations of the mobile-satellite service in the band 148-149.9 MHz shall not cause harmful interference to, or claim protection from, stations of the fixed or mobile services operating in accordance with the Table of Frequency Allocations in the following countries: Albania, Algeria, Germany, Saudi Arabia, Australia, Austria, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Benin, Bosnia and Herzegovina, Botswana, Brunei Darussalam, Bulgaria, Cameroon, China, Cyprus, Congo (Rep. of the), Korea (Rep. of), Côte d'Ivoire, Croatia, Cuba, Denmark, Djibouti, Egypt, the United Arab Emirates, Eritrea, Spain, Estonia, Ethiopia, the Russian Federation, Finland, France, Gabon, Ghana, Greece, Guinea, Guinea Bissau, Hungary, India, Iran (Islamic Republic of), Ireland, Iceland, Israel, Italy, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kuwait, The Former Yugoslav Republic of Macedonia, Lesotho, Latvia, Lebanon, Libya, Liechtenstein, Lithuania, Luxembourg, Malaysia, Mali, Malta, Mauritania, Moldova, Mongolia, Montenegro, Mozambique, Namibia, Norway, New Zealand, Oman, Uganda, Uzbekistan, Pakistan, Panama, Papua New Guinea, Paraguay, the Netherlands, the Philippines, Poland, Portugal, Qatar, the Syrian Arab Republic, Kyrgyzstan, Dem. People's Rep. of Korea, Slovakia, Romania, the United Kingdom, Senegal, Serbia, Sierra Leone, Singapore, Slovenia, Sudan, Sri Lanka, South Africa, Sweden, Switzerland, Swaziland, Tanzania, Chad, Thailand, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Ukraine, Viet Nam, Yemen, Zambia and Zimbabwe. (WRC-12)

ADD

5.225A *Additional allocation:* in Algeria, Armenia, Azerbaijan, Belarus, China, the Russian Federation, France, Iran (Islamic Republic of), Kazakhstan, Uzbekistan, Kyrgyzstan, Tajikistan, Turkmenistan, Ukraine and Viet Nam, the frequency band 154-156 MHz is also allocated to the radiolocation service on a primary basis. The usage of the frequency band 154-156 MHz by the radiolocation service shall be limited to space-object detection systems operating from terrestrial locations. The operation of stations in the radiolocation service in the frequency band 154-156 MHz shall be subject to agreement obtained under No. **9.21**. For the identification of potentially affected administrations in Region 1, the instantaneous field-strength value of 12 dB(μ V/m) for 10% of the time produced at 10 m above ground level in the 25 kHz reference frequency band at the border of the territory of any other administration shall be used. For the identification of potentially affected administrations in Region 3, the interference-to-noise ratio (I/N) value of -6 dB ($N = -161$ dBW/4 kHz), or -10 dB for applications with greater protection requirements, such as public protection and disaster relief (PPDR ($N = -161$ dBW/4 kHz)), for 1% of the time produced at 60 m above ground level at the border of the territory of any other administration shall be used. In the frequency bands 156.7625-156.8375 MHz, 156.5125-156.5375 MHz, 161.9625-161.9875 MHz, 162.0125-162.0375 MHz, out-of-band e.i.r.p. of space surveillance radars shall not exceed -16 dBW. Frequency assignments to the radiolocation service under this allocation in Ukraine shall not be used without the agreement of Moldova. (WRC-12)

MOD

148-223 MHz

Allocation to services		
Region 1	Region 2	Region 3
156.7625-156.7875 MARITIME MOBILE Mobile-satellite (Earth-to-space) 5.111 5.226 5.228	156.7625-156.7875 MARITIME MOBILE MOBILE-SATELLITE (Earth-to-space) 5.111 5.226 5.228	156.7625-156.7875 MARITIME MOBILE Mobile-satellite (Earth-to-space) 5.111 5.226 5.228
156.7875-156.8125	MARITIME MOBILE (distress and calling) 5.111 5.226	
156.8125-156.8375 MARITIME MOBILE Mobile-satellite (Earth-to-space) 5.111 5.226 5.228	156.8125-156.8375 MARITIME MOBILE MOBILE-SATELLITE (Earth-to-space) 5.111 5.226 5.228	156.8125-156.8375 MARITIME MOBILE Mobile-satellite (Earth-to-space) 5.111 5.226 5.228
156.8375-161.9625 FIXED MOBILE except aeronautical mobile 5.226	156.8375-161.9625 FIXED MOBILE 5.226	
161.9625-161.9875 FIXED MOBILE except aeronautical mobile Mobile-satellite (Earth-to-space) 5.228F 5.226 5.228A 5.228B	161.9625-161.9875 AERONAUTICAL MOBILE (OR) MARITIME MOBILE MOBILE-SATELLITE (Earth-to-space) 5.228C 5.228D	161.9625-161.9875 MARITIME MOBILE Aeronautical mobile (OR) 5.228E Mobile-satellite (Earth-to-space) 5.228F 5.226
161.9875-162.0125 FIXED MOBILE except aeronautical mobile 5.226 5.229	161.9875-162.0125 FIXED MOBILE 5.226	
162.0125-162.0375 FIXED MOBILE except aeronautical mobile Mobile-satellite (Earth-to-space) 5.228F 5.226 5.228A 5.228B 5.229	162.0125-162.0375 AERONAUTICAL MOBILE (OR) MARITIME MOBILE MOBILE-SATELLITE (Earth-to-space) 5.228C 5.228D	162.0125-162.0375 MARITIME MOBILE Aeronautical mobile (OR) 5.228E Mobile-satellite (Earth-to-space) 5.228F 5.226
162.0375-174 FIXED MOBILE except aeronautical mobile 5.226 5.229	162.0375-174 FIXED MOBILE 5.226 5.230 5.231 5.232	

SUP**5.227A****ADD**

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

ADD

5.228A The frequency bands 161.9625-161.9875 MHz and 162.0125-162.0375 MHz may be used by aircraft stations for the purpose of search and rescue operations and other safety-related communications. (WRC-12)

ADD

5.228B The use of the frequency bands 161.9625-161.9875 MHz and 162.0125-162.0375 MHz by the fixed and land mobile services shall not cause harmful interference to, or claim protection from, the maritime mobile service. (WRC-12)

ADD

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

ADD

5.228D The frequency bands 161.9625-161.9875 MHz (AIS 1) and 162.0125-162.0375 MHz (AIS 2) may continue to be used by the fixed and mobile services on a primary basis until 1 January 2025, at which time this allocation shall no longer be valid. Administrations are encouraged to make all practicable efforts to discontinue the use of these bands by the fixed and mobile services prior to the transition date. During this transition period, the maritime mobile service in these frequency bands has priority over the fixed, land mobile and aeronautical mobile services. (WRC-12)

ADD

5.228E The use of the automatic identification system in the frequency bands 161.9625-161.9875 MHz and 162.0125-162.0375 MHz by the aeronautical mobile (OR) service is limited to aircraft stations for the purpose of search and rescue operations and other safety-related communications. (WRC-12)

ADD

5.228F The use of the frequency bands 161.9625-161.9875 MHz and 162.0125-162.0375 MHz by the mobile-satellite service (Earth-to-space) is limited to the reception of automatic identification system emissions from stations operating in the maritime mobile service. (WRC-12)

MOD

5.231 *Additional allocation:* in Afghanistan and China, the band 167-174 MHz is also allocated to the broadcasting service on a primary basis. The introduction of the broadcasting service into this band shall be subject to agreement with the neighbouring countries in Region 3 whose services are likely to be affected. (WRC-12)

MOD

5.237 *Additional allocation:* in Congo (Rep. of the), Egypt, Eritrea, Ethiopia, Gambia, Guinea, Libya, Mali, Sierra Leone, Somalia and Chad, the band 174-223 MHz is also allocated to the fixed and mobile services on a secondary basis. (WRC-12)

MOD

5.259 *Additional allocation:* in Egypt and the Syrian Arab Republic, the band 328.6-335.4 MHz is also allocated to the mobile service on a secondary basis, subject to agreement obtained under No. **9.21**. In order to ensure that harmful interference is not caused to stations of the aeronautical radionavigation service, stations of the mobile service shall not be introduced in the band until it is no longer required for the aeronautical radionavigation service by any administration which may be identified in the application of the procedure invoked under No. **9.21**. (WRC-12)

MOD

5.262 *Additional allocation:* in Saudi Arabia, Armenia, Azerbaijan, Bahrain, Belarus, Botswana, Colombia, Cuba, Egypt, the United Arab Emirates, Ecuador, the Russian Federation, Georgia, Hungary, Iran (Islamic Republic of), Iraq, Israel, Jordan, Kazakhstan, Kuwait, Liberia, Malaysia, Moldova, Oman, Uzbekistan, Pakistan, the Philippines, Qatar, the Syrian Arab Republic, Kyrgyzstan, Singapore, Somalia, Tajikistan, Chad, Turkmenistan and Ukraine, the band 400.05-401 MHz is also allocated to the fixed and mobile services on a primary basis. (WRC-12)

SUP

5.272

SUP

5.273

MOD

5.274 *Alternative allocation:* in Denmark, Norway, Sweden and Chad, the bands 430-432 MHz and 438-440 MHz are allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. (WRC-12)

MOD

5.276 *Additional allocation:* in Afghanistan, Algeria, Saudi Arabia, Bahrain, Bangladesh, Brunei Darussalam, Burkina Faso, Djibouti, Egypt, the United Arab Emirates, Ecuador, Eritrea, Ethiopia, Greece, Guinea, India, Indonesia, Iran (Islamic Republic of), Iraq, Israel, Italy, Jordan, Kenya, Kuwait, Libya, Malaysia, Niger, Nigeria, Oman, Pakistan, the Philippines, Qatar, the Syrian Arab Republic, the Dem. People's Rep. of Korea, Singapore, Somalia, Sudan, Switzerland, Tanzania, Thailand, Togo, Turkey and Yemen, the band 430-440 MHz is also allocated to the fixed service on a primary basis and the bands 430-435 MHz and 438-440 MHz are also allocated to the mobile, except aeronautical mobile, service on a primary basis. (WRC-12)

MOD

5.277 *Additional allocation:* in Angola, Armenia, Azerbaijan, Belarus, Cameroon, Congo (Rep. of the), Djibouti, the Russian Federation, Georgia, Hungary, Israel, Kazakhstan, Mali, Mongolia, Uzbekistan, Poland, the Dem. Rep. of the Congo, Kyrgyzstan, Slovakia, Romania, Rwanda, Tajikistan, Chad, Turkmenistan and Ukraine, the band 430-440 MHz is also allocated to the fixed service on a primary basis. (WRC-12)

MOD

460-890 MHz

Allocation to services		
Region 1	Region 2	Region 3
460-470	FIXED MOBILE 5.286AA Meteorological-satellite (space-to-Earth) 5.287 5.288 5.289 5.290	
470-790 BROADCASTING	470-512 BROADCASTING Fixed Mobile 5.292 5.293	470-585 FIXED MOBILE BROADCASTING
	512-608 BROADCASTING 5.297	5.291 5.298
	608-614 RADIO ASTRONOMY Mobile-satellite except aeronautical mobile-satellite (Earth-to-space)	585-610 FIXED MOBILE BROADCASTING RADIONAVIGATION 5.149 5.305 5.306 5.307
	614-698 BROADCASTING Fixed Mobile 5.293 5.309 5.311A	610-890 FIXED MOBILE 5.313A 5.317A BROADCASTING
	698-806 MOBILE 5.313B 5.317A BROADCASTING Fixed	
	5.293 5.309 5.311A	
790-862 FIXED MOBILE except aeronautical mobile 5.316B 5.317A BROADCASTING 5.312 5.314 5.315 5.316 5.316A 5.319	806-890 FIXED MOBILE 5.317A BROADCASTING	
862-890 FIXED MOBILE except aeronautical mobile 5.317A BROADCASTING 5.322 5.319 5.323	5.317 5.318	5.149 5.305 5.306 5.307 5.311A 5.320

MOD

5.290 *Different category of service:* in Afghanistan, Azerbaijan, Belarus, China, the Russian Federation, Japan, Kyrgyzstan, Tajikistan and Turkmenistan, the allocation of the band 460-470 MHz to the meteorological-satellite service (space-to-Earth) is on a primary basis (see No. 5.33), subject to agreement obtained under No. 9.21. (WRC-12)

MOD

5.293 *Different category of service:* in Canada, Chile, Cuba, the United States, Guyana, Honduras, Jamaica, Mexico, Panama and Peru, the allocation of the bands 470-512 MHz and 614-806 MHz to the fixed service is on a primary basis (see No. 5.33), subject to agreement obtained under No. 9.21. In Canada, Chile, Cuba, the United States, Guyana, Honduras, Jamaica, Mexico, Panama and Peru, the allocation of the bands 470-512 MHz and 614-698 MHz to the mobile service is on a primary basis (see No. 5.33), subject to agreement obtained under No. 9.21. In Argentina and Ecuador, the allocation of the band 470-512 MHz to the fixed and mobile services is on a primary basis (see No. 5.33), subject to agreement obtained under No. 9.21. (WRC-12)

MOD

5.294 *Additional allocation:* in Saudi Arabia, Cameroon, Côte d'Ivoire, Egypt, Ethiopia, Israel, Kenya, Libya, the Syrian Arab Republic, South Sudan, Chad and Yemen, the band 470-582 MHz is also allocated to the fixed service on a secondary basis. (WRC-12)

MOD

5.296 *Additional allocation:* in Albania, Germany, Saudi Arabia, Austria, Bahrain, Belgium, Benin, Bosnia and Herzegovina, Burkina Faso, Cameroon, Congo (Rep. of the), Côte d'Ivoire, Croatia, Denmark, Djibouti, Egypt, United Arab Emirates, Spain, Estonia, Finland, France, Gabon, Ghana, Iraq, Ireland, Iceland, Israel, Italy, Jordan, Kuwait, Latvia, The Former Yugoslav Republic of Macedonia, Libya, Liechtenstein, Lithuania, Luxembourg, Mali, Malta, Morocco, Moldova, Monaco, Niger, Norway, Oman, the Netherlands, Poland, Portugal, Qatar, the Syrian Arab Republic, Slovakia, the Czech Republic, the United Kingdom, Sudan, Sweden, Switzerland, Swaziland, Chad, Togo, Tunisia and Turkey, the band 470-790 MHz, and in Angola, Botswana, Lesotho, Malawi, Mauritius, Mozambique, Namibia, Nigeria, South Africa, Tanzania, Zambia and Zimbabwe, the band 470-698 MHz are also allocated on a secondary basis to the land mobile service, intended for applications ancillary to broadcasting. 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-12)

MOD

5.300 *Additional allocation:* in Saudi Arabia, Cameroon, Egypt, United Arab Emirates, Israel, Jordan, Libya, Oman, Qatar, the Syrian Arab Republic, Sudan and South Sudan, the band 582-790 MHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a secondary basis. (WRC-12)

SUP**5.302****MOD**

5.312 *Additional allocation:* in Armenia, Azerbaijan, Belarus, the Russian Federation, Georgia, Kazakhstan, Uzbekistan, Kyrgyzstan, Tajikistan, Turkmenistan and Ukraine, the band 645-862 MHz, in Bulgaria the bands 646-686 MHz, 726-758 MHz, 766-814 MHz and 822-862 MHz, in Romania the band 830-862 MHz, and in Poland, the band 830-860 MHz until 31 December 2012 and the band 860-862 MHz until 31 December 2017, are also allocated to the aeronautical radionavigation service on a primary basis. (WRC-12)

ADD

5.312A In Region 1, the use of the band 694-790 MHz by the mobile, except aeronautical mobile, service is subject to the provisions of Resolution **232 (WRC-12)**. See also Resolution **224 (Rev.WRC-12)**. (WRC-12)

MOD

5.313A The band, or portions of the band 698-790 MHz, in Bangladesh, China, Korea (Rep. of), India, Japan, New Zealand, Pakistan, Papua New Guinea, Philippines and Singapore are identified for use by these administrations wishing to implement International Mobile Telecommunications (IMT). This identification does not preclude the use of these bands by any application of the services to which they are allocated and does not establish priority in the Radio Regulations. In China, the use of IMT in this band will not start until 2015. (WRC-12)

MOD

5.314 *Additional allocation:* in Austria, Italy, Moldova, Uzbekistan, Kyrgyzstan and the United Kingdom, the band 790-862 MHz is also allocated to the land mobile service on a secondary basis. (WRC-12)

MOD

5.315 *Alternative allocation:* in Greece, the band 790-838 MHz is allocated to the broadcasting service on a primary basis. (WRC-12)

MOD

5.316A *Additional allocation:* in Spain, France, Gabon and Malta, the band 790-830 MHz, in Albania, Angola, Bahrain, Benin, Botswana, Burundi, Congo (Rep. of the), Egypt, United Arab Emirates, Estonia, Gambia, Ghana, Guinea, Guinea-Bissau, Hungary, Iraq, Kuwait, Lesotho, Latvia, Lebanon, Lithuania, Luxembourg, Malawi, Morocco, Mauritania, Mozambique, Namibia, Niger, Nigeria, Oman, Uganda, Poland, Qatar, Slovakia, Czech Rep., Romania, Rwanda, Senegal, Sudan, South Sudan, South Africa, Swaziland, Tanzania, Chad, Togo, Yemen, Zambia, Zimbabwe and French overseas departments and communities of Region 1, the band 790-862 MHz and in Georgia, the band 806-862 MHz, are also allocated to the mobile, except aeronautical mobile, service on a primary basis subject to the agreement by the administrations concerned obtained under No. **9.21** and under the GE06 Agreement, as appropriate, including those administrations mentioned in No. **5.312**, where appropriate. See Resolutions **224 (Rev.WRC-12)** and **749 (Rev.WRC-12)**. This allocation is effective until 16 June 2015. (WRC-12)

MOD

5.316B In Region 1, the allocation to the mobile, except aeronautical mobile, service on a primary basis in the frequency band 790-862 MHz shall come into effect from 17 June 2015 and shall be subject to agreement obtained under No. **9.21** with respect to the aeronautical radionavigation service in countries mentioned in No. **5.312**. For countries party to the GE06 Agreement, the use of stations of the mobile service is also subject to the successful application of the procedures of that Agreement. Resolutions **224 (Rev.WRC-12)** and **749 (Rev.WRC-12)** shall apply, as appropriate. (WRC-12)

MOD

5.317A Those parts of the band 698-960 MHz in Region 2 and the band 790-960 MHz in Regions 1 and 3 which are allocated to the mobile service on a primary basis are identified for use by administrations wishing to implement International Mobile Telecommunications (IMT) – see Resolutions **224 (Rev.WRC-12)** and **749 (Rev.WRC-12)**, as appropriate. This identification does not preclude the use of these bands by any application of the services to which they are allocated and does not establish priority in the Radio Regulations. (WRC-12)

MOD

5.322 In Region 1, in the band 862-960 MHz, stations of the broadcasting service shall be operated only in the African Broadcasting Area (see Nos. **5.10** to **5.13**) excluding Algeria, Burundi, Egypt, Spain, Lesotho, Libya, Morocco, Malawi, Namibia, Nigeria, South Africa, Tanzania, Zimbabwe and Zambia, subject to agreement obtained under No. **9.21**. (WRC-12)

MOD

5.323 *Additional allocation:* in Armenia, Azerbaijan, Belarus, the Russian Federation, Kazakhstan, Uzbekistan, Kyrgyzstan, Tajikistan, Turkmenistan and Ukraine, the band 862-960 MHz, in Bulgaria the bands 862-890.2 MHz and 900-935.2 MHz, in Poland the band 862-876 MHz until 31 December 2017, and in Romania the bands 862-880 MHz and 915-925 MHz, are also allocated to the aeronautical radionavigation service on a primary basis. Such use is subject to agreement obtained under No. **9.21** with administrations concerned and limited to ground-based radiobeacons in operation on 27 October 1997 until the end of their lifetime. (WRC-12)

MOD**890-1 300 MHz**

Allocation to services		
Region 1	Region 2	Region 3
890-942 FIXED MOBILE except aeronautical mobile 5.317A BROADCASTING 5.322 Radiolocation 5.323	890-902 FIXED MOBILE except aeronautical mobile 5.317A Radiolocation 5.318 5.325	890-942 FIXED MOBILE 5.317A BROADCASTING Radiolocation 5.327
	902-928 FIXED Amateur Mobile except aeronautical mobile 5.325A Radiolocation 5.150 5.325 5.326	
	928-942 FIXED MOBILE except aeronautical mobile 5.317A Radiolocation 5.325	
942-960 FIXED MOBILE except aeronautical mobile 5.317A BROADCASTING 5.322 5.323	942-960 FIXED MOBILE 5.317A	942-960 FIXED MOBILE 5.317A BROADCASTING 5.320
960-1 164 AERONAUTICAL RADIONAVIGATION 5.328 AERONAUTICAL MOBILE (R) 5.327A		

MOD

5.327A The use of the frequency band 960-1 164 MHz by the aeronautical mobile (R) service is limited to systems that operate in accordance with recognized international aeronautical standards. Such use shall be in accordance with Resolution **417 (Rev.WRC-12)**. (WRC-12)

MOD

5.330 *Additional allocation:* in Angola, Saudi Arabia, Bahrain, Bangladesh, Cameroon, China, Djibouti, Egypt, the United Arab Emirates, Eritrea, Ethiopia, Guyana, India, Indonesia, Iran (Islamic Republic of), Iraq, Israel, Japan, Jordan, Kuwait, Nepal, Oman, Pakistan, the Philippines, Qatar, the Syrian Arab Republic, Somalia, Sudan, South Sudan, Chad, Togo and Yemen, the band 1 215-1 300 MHz is also allocated to the fixed and mobile services on a primary basis. (WRC-12)

MOD

5.331 *Additional allocation:* in Algeria, Germany, Saudi Arabia, Australia, Austria, Bahrain, Belarus, Belgium, Benin, Bosnia and Herzegovina, Brazil, Burkina Faso, Burundi, Cameroon, China, Korea (Rep. of), Croatia, Denmark, Egypt, the United Arab Emirates, Estonia, the Russian Federation, Finland, France, Ghana, Greece, Guinea, Equatorial Guinea, Hungary, India, Indonesia, Iran (Islamic Republic of), Iraq, Ireland, Israel, Jordan, Kenya, Kuwait, The Former Yugoslav Republic of Macedonia, Lesotho, Latvia, Lebanon, Liechtenstein, Lithuania, Luxembourg, Madagascar, Mali, Mauritania, Montenegro, Nigeria, Norway, Oman, Pakistan, the Netherlands, Poland, Portugal, Qatar, the Syrian Arab Republic, Dem. People's Rep. of Korea, Slovakia, the United Kingdom, Serbia, Slovenia, Somalia, Sudan, South Sudan, Sri Lanka, South Africa, Sweden, Switzerland, Thailand, Togo, Turkey, Venezuela and Viet Nam, the band 1 215-1 300 MHz is also allocated to the radionavigation service on a primary basis. In Canada and the United States, the band 1 240-1 300 MHz is also allocated to the radionavigation service, and use of the radionavigation service shall be limited to the aeronautical radionavigation service. (WRC-12)

MOD

5.338 In Kyrgyzstan, Slovakia and Turkmenistan, existing installations of the radionavigation service may continue to operate in the band 1 350-1 400 MHz. (WRC-12)

MOD

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

MOD

5.342 *Additional allocation:* in Armenia, Azerbaijan, Belarus, the Russian Federation, Uzbekistan, Kyrgyzstan and Ukraine, the band 1 429-1 535 MHz, and in Bulgaria the band 1 525-1 535 MHz, are also allocated to the aeronautical mobile service on a primary basis exclusively for the purposes of aeronautical telemetry within the national territory. As of 1 April 2007, the use of the band 1 452-1 492 MHz is subject to agreement between the administrations concerned. (WRC-12)

MOD**1 525-1 610 MHz**

Allocation to services										
Region 1		Region 2				Region 3				
1 535-1 559		MOBILE-SATELLITE (space-to-Earth) 5.208B 5.351A								
		5.341 5.351 5.353A 5.354 5.355 5.356 5.357 5.357A 5.359 5.362A								

MOD

5.352A In the band 1 525-1 530 MHz, stations in the mobile-satellite service, except stations in the maritime mobile-satellite service, shall not cause harmful interference to, or claim protection from, stations of the fixed service in France and French overseas communities of Region 3, Algeria, Saudi Arabia, Egypt, Guinea, India, Israel, Italy, Jordan, Kuwait, Mali, Morocco, Mauritania, Nigeria, Oman, Pakistan, the Philippines, Qatar, Syrian Arab Republic, Tanzania, Viet Nam and Yemen notified prior to 1 April 1998. (WRC-12)

MOD

5.355 *Additional allocation:* in Bahrain, Bangladesh, Congo (Rep. of the), Djibouti, Egypt, Eritrea, Iraq, Israel, Kuwait, Qatar, Syrian Arab Republic, Somalia, Sudan, South Sudan, Chad, Togo and Yemen, the bands 1 540-1 559 MHz, 1 610-1 645.5 MHz and 1 646.5-1 660 MHz are also allocated to the fixed service on a secondary basis. (WRC-12)

MOD

5.357A In applying the procedures of Section II of Article 9 to the mobile-satellite service in the frequency bands 1 545-1 555 MHz and 1 646.5-1 656.5 MHz, priority shall be given to accommodating the spectrum requirements of the aeronautical mobile-satellite (R) service providing transmission of messages with priority 1 to 6 in Article 44. Aeronautical mobile-satellite (R) service communications with priority 1 to 6 in Article 44 shall have priority access and immediate availability, by pre-emption if necessary, over all other mobile-satellite communications operating within a network. Mobile-satellite systems shall not cause unacceptable interference to, or claim protection from, aeronautical mobile-satellite (R) service communications with priority 1 to 6 in Article 44. Account shall be taken of the priority of safety-related communications in the other mobile-satellite services. (The provisions of Resolution 222 (WRC-12) shall apply.) (WRC-12)

MOD

5.359 *Additional allocation:* in Germany, Saudi Arabia, Armenia, Austria, Azerbaijan, Belarus, Benin, Cameroon, the Russian Federation, France, Georgia, Greece, Guinea, Guinea-Bissau, Jordan, Kazakhstan, Kuwait, Lithuania, Mauritania, Uganda, Uzbekistan, Pakistan, Poland, the Syrian Arab Republic, Kyrgyzstan, the Dem. People's Rep. of Korea, Romania, Tajikistan, Tanzania, Tunisia, Turkmenistan and Ukraine, the bands 1 550-1 559 MHz, 1 610-1 645.5 MHz and 1 646.5-1 660 MHz are also allocated to the fixed service on a primary basis. Administrations are urged to make all practicable efforts to avoid the implementation of new fixed-service stations in these bands. (WRC-12)

MOD

5.362B *Additional allocation:* The band 1 559-1 610 MHz is also allocated to the fixed service on a primary basis until 1 January 2010 in Algeria, Saudi Arabia, Cameroon, Jordan, Mali, Mauritania, Syrian Arab Republic and Tunisia. After this date, the fixed service may continue to operate on a secondary basis until 1 January 2015, at which time this allocation shall no longer be valid. The band 1 559-1 610 MHz is also allocated to the fixed service on a secondary basis in Algeria, Armenia, Azerbaijan, Belarus, Benin, Russian Federation, Gabon, Georgia, Guinea, Guinea-Bissau, Kazakhstan, Lithuania, Nigeria, Uzbekistan, Pakistan, Poland, Kyrgyzstan, Dem. People's Rep. of Korea, Romania, Senegal, Tajikistan, Tanzania, Turkmenistan and Ukraine until 1 January 2015, at which time this allocation shall no longer be valid. Administrations are urged to take all practicable steps to protect the radionavigation-satellite service and the aeronautical radionavigation service and not authorize new frequency assignments to fixed-service systems in this band. (WRC-12)

MOD

5.362C *Additional allocation:* in Congo (Rep. of the), Eritrea, Iraq, Israel, Jordan, Qatar, the Syrian Arab Republic, Somalia, Sudan, South Sudan, Chad, Togo and Yemen, the band 1 559-1 610 MHz is also allocated to the fixed service on a secondary basis until 1 January 2015, at which time this allocation shall no longer be valid. Administrations are urged to take all practicable steps to protect the radionavigation-satellite service and not authorize new frequency assignments to fixed-service systems in this band. (WRC-12)

MOD**1 610-1 660 MHz**

Allocation to services		
Region 1	Region 2	Region 3
1 610-1 610.6 MOBILE-SATELLITE (Earth-to-space) 5.351A AERONAUTICAL RADIONAVIGATION 5.341 5.355 5.359 5.364 5.366 5.367 5.368 5.369 5.371 5.372	1 610-1 610.6 MOBILE-SATELLITE (Earth-to-space) 5.351A AERONAUTICAL RADIONAVIGATION RADIODETERMINATION- SATELLITE (Earth-to-space) 5.341 5.364 5.366 5.367 5.368 5.370 5.372	1 610-1 610.6 MOBILE-SATELLITE (Earth-to-space) 5.351A AERONAUTICAL RADIONAVIGATION Radiodetermination-satellite (Earth-to-space) 5.341 5.355 5.359 5.364 5.366 5.367 5.368 5.369 5.372
1 610.6-1 613.8 MOBILE-SATELLITE (Earth-to-space) 5.351A RADIO ASTRONOMY AERONAUTICAL RADIONAVIGATION 5.149 5.341 5.355 5.359 5.364 5.366 5.367 5.368 5.369 5.371 5.372	1 610.6-1 613.8 MOBILE-SATELLITE (Earth-to-space) 5.351A RADIO ASTRONOMY AERONAUTICAL RADIONAVIGATION RADIODETERMINATION- SATELLITE (Earth-to-space) 5.149 5.341 5.364 5.366 5.367 5.368 5.370 5.372	1 610.6-1 613.8 MOBILE-SATELLITE (Earth-to-space) 5.351A RADIO ASTRONOMY AERONAUTICAL RADIONAVIGATION Radiodetermination-satellite (Earth-to-space) 5.149 5.341 5.355 5.359 5.364 5.366 5.367 5.368 5.369 5.372
1 613.8-1 626.5 MOBILE-SATELLITE (Earth-to-space) 5.351A AERONAUTICAL RADIONAVIGATION Mobile-satellite (space-to-Earth) 5.208B 5.341 5.355 5.359 5.364 5.365 5.366 5.367 5.368 5.369 5.371 5.372	1 613.8-1 626.5 MOBILE-SATELLITE (Earth-to-space) 5.351A AERONAUTICAL RADIONAVIGATION RADIODETERMINATION- SATELLITE (Earth-to-space) Mobile-satellite (space-to-Earth) 5.208B 5.341 5.364 5.365 5.366 5.367 5.368 5.370 5.372	1 613.8-1 626.5 MOBILE-SATELLITE (Earth-to-space) 5.351A AERONAUTICAL RADIONAVIGATION Mobile-satellite (space-to-Earth) 5.208B Radiodetermination-satellite (Earth-to-space) 5.341 5.355 5.359 5.364 5.365 5.366 5.367 5.368 5.369 5.372
1 626.5-1 660	MOBILE-SATELLITE (Earth-to-space) 5.351A 5.341 5.351 5.353A 5.354 5.355 5.357A 5.359 5.362A 5.374 5.375 5.376	

MOD

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

MOD

5.369 *Different category of service:* in Angola, Australia, China, Eritrea, Ethiopia, India, Iran (Islamic Republic of), Israel, Lebanon, Liberia, Madagascar, Mali, Pakistan, Papua New Guinea, Syrian Arab Republic, the Dem. Rep. of the Congo, Sudan, South Sudan, Togo and Zambia, the allocation of the band 1 610-1 626.5 MHz to the radiodetermination-satellite service (Earth-to-space) is on a primary basis (see No. **5.33**), subject to agreement obtained under No. **9.21** from countries not listed in this provision. (WRC-12)

MOD

5.371 *Additional allocation:* in Region 1, the band 1 610-1 626.5 MHz (Earth-to-space) is also allocated to the radiodetermination-satellite service on a secondary basis, subject to agreement obtained under No. **9.21**. (WRC-12)

MOD

5.381 *Additional allocation:* in Afghanistan, Cuba, India, Iran (Islamic Republic of) and Pakistan, the band 1 690-1 700 MHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. (WRC-12)

MOD

5.382 *Different category of service:* in Saudi Arabia, Armenia, Azerbaijan, Bahrain, Belarus, Congo (Rep. of the), Egypt, the United Arab Emirates, Eritrea, Ethiopia, the Russian Federation, Guinea, Iraq, Israel, Jordan, Kazakhstan, Kuwait, the Former Yugoslav Republic of Macedonia, Lebanon, Mauritania, Moldova, Mongolia, Oman, Uzbekistan, Poland, Qatar, the Syrian Arab Republic, Kyrgyzstan, Somalia, Tajikistan, Tanzania, Turkmenistan, Ukraine and Yemen, the allocation of the band 1 690-1 700 MHz to the fixed and mobile, except aeronautical mobile, services is on a primary basis (see No. **5.33**), and in the Dem. People's Rep. of Korea, the allocation of the band 1 690-1 700 MHz to the fixed service is on a primary basis (see No. **5.33**) and to the mobile, except aeronautical mobile, service on a secondary basis. (WRC-12)

MOD

5.387 *Additional allocation:* in Belarus, Georgia, Kazakhstan, Kyrgyzstan, Romania, Tajikistan and Turkmenistan, the band 1 770-1 790 MHz is also allocated to the meteorological-satellite service on a primary basis, subject to agreement obtained under No. **9.21**. (WRC-12)

MOD

5.388B In Algeria, Saudi Arabia, Bahrain, Benin, Burkina Faso, Cameroon, Comoros, Côte d'Ivoire, China, Cuba, Djibouti, Egypt, United Arab Emirates, Eritrea, Ethiopia, Gabon, Ghana, India, Iran (Islamic Republic of), Israel, Jordan, Kenya, Kuwait, Libya, Mali, Morocco, Mauritania, Nigeria, Oman, Uganda, Pakistan, Qatar, the Syrian Arab Republic, Senegal, Singapore, Sudan, South Sudan, Tanzania, Chad, Togo, Tunisia, Yemen, Zambia and Zimbabwe, for the purpose of protecting fixed and mobile services, including IMT-2000 mobile stations, in their territories from co-channel interference, a high altitude platform station (HAPS) operating as an IMT-2000 base station in neighbouring countries, in the bands referred to in No. **5.388A**, shall not exceed a co-channel power flux-density of $-127 \text{ dB(W/(m}^2 \cdot \text{MHz))}$ at the Earth's surface outside a country's borders unless explicit agreement of the affected administration is provided at the time of the notification of HAPS. (WRC-12)

MOD**2 170-2 520 MHz**

Allocation to services		
Region 1	Region 2	Region 3
2 483.5-2 500 FIXED MOBILE MOBILE-SATELLITE (space-to-Earth) 5.351A RADIODETERMINATION-SATELLITE (space-to-Earth) 5.398 Radiolocation 5.398A 5.150 5.399 5.401 5.402	2 483.5-2 500 FIXED MOBILE MOBILE-SATELLITE (space-to-Earth) 5.351A RADIOLOCATION RADIODETERMINATION-SATELLITE (space-to-Earth) 5.398 5.150 5.402	2 483.5-2 500 FIXED MOBILE MOBILE-SATELLITE (space-to-Earth) 5.351A RADIOLOCATION RADIODETERMINATION-SATELLITE (space-to-Earth) 5.398 5.150 5.401 5.402

SUP**5.397****ADD**

5.398A *Different category of service:* In Armenia, Azerbaijan, Belarus, the Russian Federation, Kazakhstan, Uzbekistan, Kyrgyzstan, Tajikistan and Ukraine, the band 2 483.5-2 500 MHz is allocated on a primary basis to the radiolocation service. The radiolocation stations in these countries shall not cause harmful interference to, or claim protection from, stations of the fixed, mobile and mobile-satellite services operating in accordance with the Radio Regulations in the frequency band 2 483.5-2 500 MHz. (WRC-12)

MOD

5.399 Except for cases referred to in No. **5.401**, stations of the radiodetermination-satellite service operating in the frequency band 2 483.5-2 500 MHz for which notification information is received by the Bureau after 17 February 2012, and the service area of which includes Armenia, Azerbaijan, Belarus, the Russian Federation, Kazakhstan, Uzbekistan, Kyrgyzstan, Tajikistan and Ukraine, shall not cause harmful interference to, and shall not claim protection from stations of the radiolocation service operating in these countries in accordance with No. **5.398A**. (WRC-12)

SUP**5.400****ADD**

5.401 In Angola, Australia, Bangladesh, Burundi, China, Eritrea, Ethiopia, India, Iran (Islamic Republic of), Lebanon, Liberia, Libya, Madagascar, Mali, Pakistan, Papua New Guinea, Syrian Arab Republic, Dem. Rep. of the Congo, Sudan, Swaziland, Togo and Zambia, the band 2 483.5-2 500 MHz was already allocated on a primary basis to the radiodetermination-satellite service before WRC-12, subject to agreement obtained under No. **9.21** from countries not listed in this provision. Systems in the radiodetermination-satellite service for which complete coordination information has been received by the Radiocommunication Bureau before 18 February 2012 will retain their regulatory status, as of the date of receipt of the coordination request information. (WRC-12)

SUP**5.405****MOD**

5.410 The band 2 500-2 690 MHz may be used for tropospheric scatter systems in Region 1, subject to agreement obtained under No. **9.21**. No. **9.21** does not apply to tropospheric scatter links situated entirely outside Region 1. Administrations shall make all practicable efforts to avoid developing new tropospheric scatter systems in this band. When planning new tropospheric scatter radio-relay links in this band, all possible measures shall be taken to avoid directing the antennas of these links towards the geostationary-satellite orbit. (WRC-12)

MOD

5.412 *Alternative allocation:* in Kyrgyzstan and Turkmenistan, the band 2 500-2 690 MHz is allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. (WRC-12)

MOD

5.418 *Additional allocation:* in Korea (Rep. of), India, Japan and Thailand, the band 2 535-2 655 MHz is also allocated to the broadcasting-satellite service (sound) and complementary terrestrial 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-03)**. The provisions of No. **5.416** and Table **21-4** of Article **21**, do not apply to this additional allocation. Use of non-geostationary-satellite systems in the broadcasting-satellite service (sound) is subject to Resolution **539 (Rev.WRC-03)**. Geostationary broadcasting-satellite service (sound) systems for which complete Appendix **4** coordination information has been received after 1 June 2005 are limited to systems intended for national coverage. The power flux-density at the Earth's surface produced by emissions from a geostationary broadcasting-satellite service (sound) space station operating in the band 2 630-2 655 MHz, and for which complete Appendix **4** coordination information has been received after 1 June 2005, shall not exceed the following limits, for all conditions and for all methods of modulation:

$-130 \text{ dB(W/(m}^2 \cdot \text{MHz))}$	for	$0^\circ \leq \theta \leq 5^\circ$
$-130 + 0.4 (\theta - 5) \text{ dB(W/(m}^2 \cdot \text{MHz))}$	for	$5^\circ < \theta \leq 25^\circ$
$-122 \text{ dB(W/(m}^2 \cdot \text{MHz))}$	for	$25^\circ < \theta \leq 90^\circ$

where θ is the angle of arrival of the incident wave above the horizontal plane, in degrees. These limits may be exceeded on the territory of any country whose administration has so agreed. As an exception to the limits above, the pfd value of $-122 \text{ dB(W/(m}^2 \cdot \text{MHz))}$ shall be used as a threshold for coordination under No. **9.11** in an area of 1 500 km around the territory of the administration notifying the broadcasting-satellite service (sound) system.

In addition, an administration listed in this provision shall not have simultaneously two overlapping frequency assignments, one under this provision and the other under No. **5.416** for systems for which complete Appendix **4** coordination information has been received after 1 June 2005. (WRC-12)

MOD

5.422 *Additional allocation:* in Saudi Arabia, Armenia, Azerbaijan, Bahrain, Belarus, Brunei Darussalam, Congo (Rep. of the), Côte d'Ivoire, Cuba, Djibouti, Egypt, the United Arab Emirates, Eritrea, Ethiopia, Gabon, Georgia, Guinea, Guinea-Bissau, Iran (Islamic Republic of), Iraq, Israel, Jordan, Kuwait, Lebanon, Mauritania, Mongolia, Montenegro, Nigeria, Oman, Pakistan, the Philippines, Qatar, Syrian Arab Republic, Kyrgyzstan, the Dem. Rep. of the Congo, Romania, Somalia, Tajikistan, Tunisia, Turkmenistan, Ukraine and Yemen, the band 2 690-2 700 MHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. Such use is limited to equipment in operation by 1 January 1985. (WRC-12)

MOD

5.428 *Additional allocation:* in Azerbaijan, Mongolia, Kyrgyzstan and Turkmenistan, the band 3 100-3 300 MHz is also allocated to the radionavigation service on a primary basis. (WRC-12)

MOD

5.429 *Additional allocation:* in Saudi Arabia, Bahrain, Bangladesh, Brunei Darussalam, Cameroon, China, Congo (Rep. of the), Korea (Rep. of), Côte d'Ivoire, Egypt, the United Arab Emirates, India, Indonesia, Iran (Islamic Republic of), Iraq, Israel, Japan, Jordan, Kenya, Kuwait, Lebanon, Libya, Malaysia, Oman, Uganda, Pakistan, Qatar, the Syrian Arab Republic, the Dem. Rep. of the Congo, the Dem. People's Rep. of Korea and Yemen, the band 3 300-3 400 MHz is also allocated to the fixed and mobile services on a primary basis. The countries bordering the Mediterranean shall not claim protection for their fixed and mobile services from the radiolocation service. (WRC-12)

MOD

5.430 *Additional allocation:* in Azerbaijan, Mongolia, Kyrgyzstan and Turkmenistan, the band 3 300-3 400 MHz is also allocated to the radionavigation service on a primary basis. (WRC-12)

MOD

5.430A *Different category of service:* in Albania, Algeria, Germany, Andorra, Saudi Arabia, Austria, Azerbaijan, Bahrain, Belgium, Benin, Bosnia and Herzegovina, Botswana, Bulgaria, Burkina Faso, Cameroon, Cyprus, Vatican, Congo (Rep. of the), Côte d'Ivoire, Croatia, Denmark, Egypt, Spain, Estonia, Finland, France and French overseas departments and communities in Region 1, Gabon, Georgia, Greece, Guinea, Hungary, Ireland, Iceland, Israel, Italy, Jordan, Kuwait, Lesotho, Latvia, The Former Yugoslav Republic of Macedonia, Liechtenstein, Lithuania, Malawi, Mali, Malta, Morocco, Mauritania, Moldova, Monaco, Mongolia, Montenegro, Mozambique, Namibia, Niger, Norway, Oman, Netherlands, Poland, Portugal, Qatar, the Syrian Arab Republic, the Dem. Rep. of the Congo, Slovakia, Czech Rep., Romania, United Kingdom, San Marino, Senegal, Serbia, Sierra Leone, Slovenia, South Africa, Sweden, Switzerland, Swaziland, Chad, Togo, Tunisia, Turkey, Ukraine, Zambia and Zimbabwe, the band 3 400-3 600 MHz is allocated to the mobile, except aeronautical mobile, service on a primary basis subject to agreement obtained under No. **9.21** with other administrations and is identified for International Mobile Telecommunications (IMT). 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. 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 the mobile service in this band, it shall ensure that the power flux-density (pfd) produced at 3 m above ground does not exceed $-154.5 \text{ dB(W/(m}^2 \cdot 4 \text{ kHz))}$ 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 in the band 3 400-3 600 MHz shall not claim more protection from space stations than that provided in Table **21-4** of the Radio Regulations (Edition of 2004). This allocation is effective from 17 November 2010. (WRC-12)

MOD

5.439 *Additional allocation:* in Iran (Islamic Republic of), the band 4 200-4 400 MHz is also allocated to the fixed service on a secondary basis. (WRC-12)

MOD**4 800-5 570 MHz**

Allocation to services		
Region 1	Region 2	Region 3
5 000-5 010	AERONAUTICAL MOBILE-SATELLITE (R) 5.443AA AERONAUTICAL RADIONAVIGATION RADIONAVIGATION-SATELLITE (Earth-to-space)	
5 010-5 030	AERONAUTICAL MOBILE-SATELLITE (R) 5.443AA AERONAUTICAL RADIONAVIGATION RADIONAVIGATION-SATELLITE (space-to-Earth) (space-to-space) 5.328B 5.443B	
5 030-5 091	AERONAUTICAL MOBILE (R) 5.443C AERONAUTICAL MOBILE-SATELLITE (R) 5.443D AERONAUTICAL RADIONAVIGATION 5.444	
5 091-5 150	AERONAUTICAL MOBILE 5.444B AERONAUTICAL MOBILE-SATELLITE (R) 5.443AA AERONAUTICAL RADIONAVIGATION 5.444 5.444A	

ADD

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

MOD

5.443B In order not to cause harmful interference to the microwave landing system operating above 5 030 MHz, the aggregate power flux-density produced at the Earth's surface in the band 5 030-5 150 MHz by all the space stations within any radionavigation-satellite service system (space-to-Earth) operating in the band 5 010-5 030 MHz shall not exceed -124.5 dB(W/m²) in a 150 kHz band. In order not to cause harmful interference to the radio astronomy service in the band 4 990-5 000 MHz, radionavigation-satellite service systems operating in the band 5 010-5 030 MHz shall comply with the limits in the band 4 990-5 000 MHz defined in Resolution **741 (Rev.WRC-12)**. (WRC-12)

ADD

5.443C The use of the frequency band 5 030-5 091 MHz by the aeronautical mobile (R) service is limited to internationally standardized aeronautical systems. Unwanted emissions from the aeronautical mobile (R) service in the frequency band 5 030-5 091 MHz shall be limited to protect RNSS system downlinks in the adjacent 5 010-5 030 MHz band. Until such time that an appropriate value is established in a relevant ITU-R Recommendation, the e.i.r.p. density limit of -75 dBW/MHz in the frequency band 5 010-5 030 MHz for any AM(R)S station unwanted emission should be used. (WRC-12)

ADD

5.443D In the frequency band 5 030-5 091 MHz, the aeronautical mobile-satellite (R) service is subject to coordination under No. **9.11A**. The use of this frequency band by the aeronautical mobile-satellite (R) service is limited to internationally standardized aeronautical systems. (WRC-12)

MOD

5.444 The frequency band 5 030-5 150 MHz is to be used for the operation of the international standard system (microwave landing system) for precision approach and landing. In the frequency band 5 030-5 091 MHz, the requirements of this system shall have priority over other uses of this band. For the use of the frequency band 5 091-5 150 MHz, No. **5.444A** and Resolution **114 (Rev.WRC-12)** apply. (WRC-12)

MOD

5.448B 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-12)**;
- aeronautical telemetry transmissions from aircraft stations (see No. **1.83**) in accordance with Resolution **418 (Rev.WRC-12)**. (WRC-12)

MOD

5.446 *Additional allocation:* in the countries listed in No. **5.369**, the band 5 150-5 216 MHz is also allocated to the radiodetermination-satellite service (space-to-Earth) on a primary basis, subject to agreement obtained under No. **9.21**. In Region 2, the band is also allocated to the radiodetermination-satellite service (space-to-Earth) on a primary basis. In Regions 1 and 3, except those countries listed in No. **5.369** and Bangladesh, the band is also allocated to the radiodetermination-satellite service (space-to-Earth) on a secondary basis. The use by the radiodetermination-satellite service is limited to feeder links in conjunction with the radiodetermination-satellite service operating in the bands 1 610-1 626.5 MHz and/or 2 483.5-2 500 MHz. The total power flux-density at the Earth's surface shall in no case exceed $-159 \text{ dB(W/m}^2\text{)}$ in any 4 kHz band for all angles of arrival. (WRC-12)

MOD

5.446A The use of the bands 5 150-5 350 MHz and 5 470-5 725 MHz by the stations in the mobile, except aeronautical mobile, service shall be in accordance with Resolution **229 (Rev.WRC-12)**. (WRC-12)

MOD

5.446C *Additional allocation:* in Region 1 (except in Algeria, Saudi Arabia, Bahrain, Egypt, United Arab Emirates, Jordan, Kuwait, Lebanon, Morocco, Oman, Qatar, Syrian Arab Republic, Sudan, South Sudan and Tunisia) and in Brazil, the band 5 150-5 250 MHz is also allocated to the aeronautical mobile service on a primary basis, limited to aeronautical telemetry transmissions from aircraft stations (see No. **1.83**), in accordance with Resolution **418 (WRC-07)**. These stations shall not claim protection from other stations operating in accordance with Article **5**. No. **5.43A** does not apply. (WRC-12)

MOD

5.447 *Additional allocation:* in Côte d'Ivoire, Egypt, Israel, Lebanon, the Syrian Arab Republic and Tunisia, the band 5 150-5 250 MHz is also allocated to the mobile service, on a primary basis, subject to agreement obtained under No. **9.21**. In this case, the provisions of Resolution **229 (Rev.WRC-12)** do not apply. (WRC-12)

MOD

5.448 *Additional allocation:* in Azerbaijan, Kyrgyzstan, Romania and Turkmenistan, the band 5 250-5 350 MHz is also allocated to the radionavigation service on a primary basis. (WRC-12)

MOD

5.450 *Additional allocation:* in Austria, Azerbaijan, Iran (Islamic Republic of), Kyrgyzstan, Romania, Turkmenistan and Ukraine, the band 5 470-5 650 MHz is also allocated to the aeronautical radionavigation service on a primary basis. (WRC-12)

MOD**5 570-7 250 MHz**

Allocation to services		
Region 1	Region 2	Region 3
5 925-6 700	FIXED 5.457 FIXED-SATELLITE (Earth-to-space) 5.457A 5.457B MOBILE 5.457C 5.149 5.440 5.458	

MOD

5.453 *Additional allocation:* in Saudi Arabia, Bahrain, Bangladesh, Brunei Darussalam, Cameroon, China, Congo (Rep. of the), Korea (Rep. of), Côte d'Ivoire, Djibouti, Egypt, the United Arab Emirates, Gabon, Guinea, Equatorial Guinea, India, Indonesia, Iran (Islamic Republic of), Iraq, Israel, Japan, Jordan, Kenya, Kuwait, Lebanon, Libya, Madagascar, Malaysia, Niger, Nigeria, Oman, Uganda, Pakistan, the Philippines, Qatar, the Syrian Arab Republic, the Dem. People's Rep. of Korea, Singapore, Sri Lanka, Swaziland, Tanzania, Chad, Thailand, Togo, Viet Nam and Yemen, the band 5 650-5 850 MHz is also allocated to the fixed and mobile services on a primary basis. In this case, the provisions of Resolution **229 (Rev.WRC-12)** do not apply. (WRC-12)

MOD

5.454 *Different category of service:* in Azerbaijan, the Russian Federation, Georgia, Kyrgyzstan, Tajikistan and Turkmenistan, the allocation of the band 5 670-5 725 MHz to the space research service is on a primary basis (see No. **5.33**). (WRC-12)

ADD

5.457 In Australia, Burkina Faso, Cote d'Ivoire, Mali and Nigeria, the allocation to the fixed service in the bands 6 440-6 520 MHz (HAPS-to-ground direction) and 6 560-6 640 MHz (ground-to-HAPS direction) may also be used by gateway links for high-altitude platform stations (HAPS) within the territory of these countries. Such use is limited to operation in HAPS gateway links and shall not cause harmful interference to, and shall not claim protection from, existing services, and shall be in compliance with Resolution **150 (WRC-12)**. Existing services shall not be constrained in future development by HAPS gateway links. The use of HAPS gateway links in these bands requires explicit agreement with other administrations whose territories are located within 1 000 kilometres from the border of an administration intending to use the HAPS gateway links. (WRC-12)

MOD

5.457B In the bands 5 925-6 425 MHz and 14-14.5 GHz, earth stations located on board vessels may operate with the characteristics and under the conditions contained in Resolution **902 (WRC-03)** in Algeria, Saudi Arabia, Bahrain, Comoros, Djibouti, Egypt, United Arab Emirates, Jordan, Kuwait, Libya, Morocco, Mauritania, Oman, Qatar, the Syrian Arab Republic, Sudan, South Sudan, Tunisia and Yemen, in the maritime mobile-satellite service on a secondary basis. Such use shall be in accordance with Resolution **902 (WRC-03)**. (WRC-12)

MOD**7 250-8 500 MHz**

Allocation to services		
Region 1	Region 2	Region 3
7 750-7 900	FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) 5.461B MOBILE except aeronautical mobile	

MOD

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

MOD

5.462A In Regions 1 and 3 (except for Japan), in the band 8 025-8 400 MHz, the Earth exploration-satellite service using geostationary satellites shall not produce a power flux-density in excess of the following values for angles of arrival (θ), without the consent of the affected administration:

$-135 \text{ dB(W/m}^2\text{)}$ in a 1 MHz band	for	$0^\circ \leq \theta < 5^\circ$	
$-135 + 0.5 (\theta - 5) \text{ dB(W/m}^2\text{)}$ in a 1 MHz band	for	$5^\circ \leq \theta < 25^\circ$	
$-125 \text{ dB(W/m}^2\text{)}$ in a 1 MHz band	for	$25^\circ \leq \theta \leq 90^\circ$	(WRC-12)

MOD

5.466 *Different category of service:* in Singapore and Sri Lanka, the allocation of the band 8 400-8 500 MHz to the space research service is on a secondary basis (see No. 5.32). (WRC-12)

MOD

5.468 *Additional allocation:* in Saudi Arabia, Bahrain, Bangladesh, Brunei Darussalam, Burundi, Cameroon, China, Congo (Rep. of the), Costa Rica, Djibouti, Egypt, the United Arab Emirates, Gabon, Guyana, Indonesia, Iran (Islamic Republic of), Iraq, Jamaica, Jordan, Kenya, Kuwait, Lebanon, Libya, Malaysia, Mali, Morocco, Mauritania, Nepal, Nigeria, Oman, Uganda, Pakistan, Qatar, Syrian Arab Republic, the Dem. People's Rep. of Korea, Senegal, Singapore, Somalia, Sudan, Swaziland, Tanzania, Chad, Togo, Tunisia and Yemen, the band 8 500-8 750 MHz is also allocated to the fixed and mobile services on a primary basis. (WRC-12)

MOD

5.469 *Additional allocation:* in Armenia, Azerbaijan, Belarus, the Russian Federation, Georgia, Hungary, Lithuania, Mongolia, Uzbekistan, Poland, Kyrgyzstan, the Czech Rep., Romania, Tajikistan, Turkmenistan and Ukraine, the band 8 500-8 750 MHz is also allocated to the land mobile and radionavigation services on a primary basis. (WRC-12)

MOD

5.471 *Additional allocation:* in Algeria, Germany, Bahrain, Belgium, China, Egypt, the United Arab Emirates, France, Greece, Indonesia, Iran (Islamic Republic of), Libya, the Netherlands, Qatar, Sudan and South Sudan, the bands 8 825-8 850 MHz and 9 000-9 200 MHz are also allocated to the maritime radionavigation service, on a primary basis, for use by shore-based radars only. (WRC-12)

MOD

5.477 *Different category of service:* in Algeria, Saudi Arabia, Bahrain, Bangladesh, Brunei Darussalam, Cameroon, Djibouti, Egypt, the United Arab Emirates, Eritrea, Ethiopia, Guyana, India, Indonesia, Iran (Islamic Republic of), Iraq, Jamaica, Japan, Jordan, Kuwait, Lebanon, Liberia, Malaysia, Nigeria, Oman, Pakistan, Qatar, Syrian Arab Republic, the Dem. People's Rep. of Korea, Singapore, Somalia, Sudan, South Sudan, Trinidad and Tobago, and Yemen, the allocation of the band 9 800-10 000 MHz to the fixed service is on a primary basis (see No. 5.33). (WRC-12)

MOD

5.481 *Additional allocation:* in Germany, Angola, Brazil, China, Costa Rica, Côte d'Ivoire, El Salvador, Ecuador, Spain, Guatemala, Hungary, Japan, Kenya, Morocco, Nigeria, Oman, Uzbekistan, Pakistan, Paraguay, Peru, the Dem. People's Rep. of Korea, Romania, Tanzania, Thailand and Uruguay, the band 10.45-10.5 GHz is also allocated to the fixed and mobile services on a primary basis. (WRC-12)

MOD

5.483 *Additional allocation:* in Saudi Arabia, Armenia, Azerbaijan, Bahrain, Belarus, China, Colombia, Korea (Rep. of), Costa Rica, Egypt, the United Arab Emirates, Georgia, Iran (Islamic Republic of), Iraq, Israel, Jordan, Kazakhstan, Kuwait, Lebanon, Mongolia, Qatar, Kyrgyzstan, the Dem. People's Rep. of Korea, Tajikistan, Turkmenistan and Yemen, the band 10.68-10.7 GHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. Such use is limited to equipment in operation by 1 January 1985. (WRC-12)

MOD

5.494 *Additional allocation:* in Algeria, Angola, Saudi Arabia, Bahrain, Cameroon, the Central African Rep., Congo (Rep. of the), Côte d'Ivoire, Djibouti, Egypt, the United Arab Emirates, Eritrea, Ethiopia, Gabon, Ghana, Guinea, Iraq, Israel, Jordan, Kuwait, Lebanon, Libya, Madagascar, Mali, Morocco, Mongolia, Nigeria, Oman, Qatar, the Syrian Arab Republic, the Dem. Rep. of the Congo, Somalia, Sudan, South Sudan, Chad, Togo and Yemen, the band 12.5-12.75 GHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. (WRC-12)

MOD

5.495 *Additional allocation:* in France, Greece, Monaco, Montenegro, Uganda, Romania, Tanzania and Tunisia, the band 12.5-12.75 GHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a secondary basis. (WRC-12)

MOD

5.499 *Additional allocation:* in Bangladesh and India, the band 13.25-14 GHz is also allocated to the fixed service on a primary basis. In Pakistan, the band 13.25-13.75 GHz is allocated to the fixed service on a primary basis. (WRC-12)

MOD

5.500 *Additional allocation:* in Algeria, Angola, Saudi Arabia, Bahrain, Brunei Darussalam, Cameroon, Egypt, the United Arab Emirates, Gabon, Indonesia, Iran (Islamic Republic of), Iraq, Israel, Jordan, Kuwait, Lebanon, Madagascar, Malaysia, Mali, Morocco, Mauritania, Niger, Nigeria, Oman, Qatar, the Syrian Arab Republic, Singapore, Sudan, South Sudan, Chad and Tunisia, the band 13.4-14 GHz is also allocated to the fixed and mobile services on a primary basis. In Pakistan, the band 13.4-13.75 GHz is also allocated to the fixed and mobile services on a primary basis. (WRC-12)

MOD

5.501 *Additional allocation:* in Azerbaijan, Hungary, Japan, Kyrgyzstan, Romania and Turkmenistan, the band 13.4-14 GHz is also allocated to the radionavigation service on a primary basis. (WRC-12)

MOD

5.504C In the band 14-14.25 GHz, the power flux-density produced on the territory of the countries of Saudi Arabia, Botswana, Côte d'Ivoire, Egypt, Guinea, India, Iran (Islamic Republic of), Kuwait, Nigeria, Oman, the Syrian Arab Republic and Tunisia by any aircraft earth station in the aeronautical mobile-satellite service shall not exceed the limits given in Annex 1, Part B of Recommendation ITU-R M.1643, unless otherwise specifically agreed by the affected administration(s). The provisions of this footnote in no way derogate the obligations of the aeronautical mobile-satellite service to operate as a secondary service in accordance with No. **5.29**. (WRC-12)

MOD

5.505 *Additional allocation:* in Algeria, Angola, Saudi Arabia, Bahrain, Botswana, Brunei Darussalam, Cameroon, China, Congo (Rep. of the), Korea (Rep. of), Djibouti, Egypt, the United Arab Emirates, Gabon, Guinea, India, Indonesia, Iran (Islamic Republic of), Iraq, Israel, Japan, Jordan, Kuwait, Lebanon, Malaysia, Mali, Morocco, Mauritania, Oman, the Philippines, Qatar, the Syrian Arab Republic, the Dem. People's Rep. of Korea, Singapore, Somalia, Sudan, South Sudan, Swaziland, Tanzania, Chad, Viet Nam and Yemen, the band 14-14.3 GHz is also allocated to the fixed service on a primary basis. (WRC-12)

MOD

5.508 *Additional allocation:* in Germany, France, Italy, Libya, The Former Yugoslav Rep. of Macedonia and the United Kingdom, the band 14.25-14.3 GHz is also allocated to the fixed service on a primary basis. (WRC-12)

MOD

5.508A In the band 14.25-14.3 GHz, the power flux-density produced on the territory of the countries of Saudi Arabia, Botswana, China, Côte d'Ivoire, Egypt, France, Guinea, India, Iran (Islamic Republic of), Italy, Kuwait, Nigeria, Oman, the Syrian Arab Republic, the United Kingdom and Tunisia by any aircraft earth station in the aeronautical mobile-satellite service shall not exceed the limits given in Annex 1, Part B of Recommendation ITU-R M.1643, unless otherwise specifically agreed by the affected administration(s). The provisions of this footnote in no way derogate the obligations of the aeronautical mobile-satellite service to operate as a secondary service in accordance with No. 5.29. (WRC-12)

MOD

5.509A In the band 14.3-14.5 GHz, the power flux-density produced on the territory of the countries of Saudi Arabia, Botswana, Cameroon, China, Côte d'Ivoire, Egypt, France, Gabon, Guinea, India, Iran (Islamic Republic of), Italy, Kuwait, Morocco, Nigeria, Oman, the Syrian Arab Republic, the United Kingdom, Sri Lanka, Tunisia and Viet Nam by any aircraft earth station in the aeronautical mobile-satellite service shall not exceed the limits given in Annex 1, Part B of Recommendation ITU-R M.1643, unless otherwise specifically agreed by the affected administration(s). The provisions of this footnote in no way derogate the obligations of the aeronautical mobile-satellite service to operate as a secondary service in accordance with No. 5.29. (WRC-12)

MOD

5.511 *Additional allocation:* in Saudi Arabia, Bahrain, Cameroon, Egypt, the United Arab Emirates, Guinea, Iran (Islamic Republic of), Iraq, Israel, Kuwait, Lebanon, Oman, Pakistan, Qatar, the Syrian Arab Republic and Somalia, the band 15.35-15.4 GHz is also allocated to the fixed and mobile services on a secondary basis. (WRC-12)

MOD**15.4-18.4 GHz**

Allocation to services		
Region 1	Region 2	Region 3
15.4-15.43	RADIOLOCATION 5.511E 5.511F AERONAUTICAL RADIONAVIGATION 5.511D	
15.43-15.63	FIXED-SATELLITE (Earth-to-space) 5.511A RADIOLOCATION 5.511E 5.511F AERONAUTICAL RADIONAVIGATION 5.511C	
15.63-15.7	RADIOLOCATION 5.511E 5.511F AERONAUTICAL RADIONAVIGATION 5.511D	

ADD

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

ADD

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

MOD

5.512 *Additional allocation:* in Algeria, Angola, Saudi Arabia, Austria, Bahrain, Bangladesh, Brunei Darussalam, Cameroon, Congo (Rep. of the), Costa Rica, Egypt, El Salvador, the United Arab Emirates, Eritrea, Finland, Guatemala, India, Indonesia, Iran (Islamic Republic of), Jordan, Kenya, Kuwait, Lebanon, Libya, Malaysia, Mali, Morocco, Mauritania, Montenegro, Nepal, Nicaragua, Niger, Oman, Pakistan, Qatar, Syrian Arab Republic, the Dem. Rep. of the Congo, Serbia, Singapore, Somalia, Sudan, South Sudan, Tanzania, Chad, Togo and Yemen, the band 15.7-17.3 GHz is also allocated to the fixed and mobile services on a primary basis. (WRC-12)

MOD

5.514 *Additional allocation:* in Algeria, Angola, Saudi Arabia, Bahrain, Bangladesh, Cameroon, El Salvador, the United Arab Emirates, Guatemala, India, Iran (Islamic Republic of), Iraq, Israel, Italy, Japan, Jordan, Kuwait, Libya, Lithuania, Nepal, Nicaragua, Nigeria, Oman, Uzbekistan, Pakistan, Qatar, Kyrgyzstan, Sudan and South Sudan, the band 17.3-17.7 GHz is also allocated to the fixed and mobile services on a secondary basis. The power limits given in Nos. **21.3** and **21.5** shall apply. (WRC-12)

MOD**18.4-22 GHz**

Allocation to services		
Region 1	Region 2	Region 3
21.4-22 FIXED MOBILE BROADCASTING-SATELLITE 5.208B 5.530A 5.530B 5.530C 5.530D	21.4-22 FIXED MOBILE 5.530A 5.530C	21.4-22 FIXED MOBILE BROADCASTING-SATELLITE 5.208B 5.530A 5.530B 5.530C 5.530D 5.531

MOD

5.524 *Additional allocation:* in Afghanistan, Algeria, Angola, Saudi Arabia, Bahrain, Brunei Darussalam, Cameroon, China, Congo (Rep. of the), Costa Rica, Egypt, the United Arab Emirates, Gabon, Guatemala, Guinea, India, Iran (Islamic Republic of), Iraq, Israel, Japan, Jordan, Kuwait, Lebanon, Malaysia, Mali, Morocco, Mauritania, Nepal, Nigeria, Oman, Pakistan, the Philippines, Qatar, the Syrian Arab Republic, the Dem. Rep. of the Congo, the Dem. People's Rep. of Korea, Singapore, Somalia, Sudan, South Sudan, Tanzania, Chad, Togo and Tunisia, the band 19.7-21.2 GHz is also allocated to the fixed and mobile services on a primary basis. This additional use shall not impose any limitation on the power flux-density of space stations in the fixed-satellite service in the band 19.7-21.2 GHz and of space stations in the mobile-satellite service in the band 19.7-20.2 GHz where the allocation to the mobile-satellite service is on a primary basis in the latter band. (WRC-12)

SUP**5.530**

ADD

5.530A Unless otherwise agreed between the administrations concerned, any station in the fixed or mobile services of an administration shall not produce a power flux-density in excess of $-120.4 \text{ dB(W/(m}^2 \cdot \text{MHz))}$ at 3 m above the ground of any point of the territory of any other administration in Regions 1 and 3 for more than 20% of the time. In conducting the calculations, administrations should use the most recent version of Recommendation ITU-R P.452 (see Recommendation ITU-R BO.1898). (WRC-12)

ADD

5.530B In the band 21.4-22 GHz, in order to facilitate the development of the broadcasting-satellite service, administrations in Regions 1 and 3 are encouraged not to deploy stations in the mobile service and are encouraged to limit the deployment of stations in the fixed service to point-to-point links. (WRC-12)

ADD

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

ADD

5.530D See Resolution **555 (WRC-12)**. (WRC-12)

MOD**22-24.75 GHz**

Allocation to services		
Region 1	Region 2	Region 3
22.55-23.15	FIXED INTER-SATELLITE 5.338A MOBILE SPACE RESEARCH (Earth-to-space) 5.532A 5.149	
23.15-23.55	FIXED INTER-SATELLITE 5.338A MOBILE	

ADD

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

MOD**22-24.75 GHz**

Allocation to services		
Region 1	Region 2	Region 3
24.65-24.75 FIXED FIXED-SATELLITE (Earth-to-space) 5.532B INTER-SATELLITE	24.65-24.75 INTER-SATELLITE RADIOLOCATION- SATELLITE (Earth-to-space)	24.65-24.75 FIXED FIXED-SATELLITE (Earth-to-space) 5.532B INTER-SATELLITE MOBILE 5.533

ADD

5.532B Use of the band 24.65-25.25 GHz in Region 1 and the band 24.65-24.75 GHz in Region 3 by the fixed-satellite service (Earth-to-space) is limited to earth stations using a minimum antenna diameter of 4.5 m. (WRC-12)

MOD**24.75-29.9 GHz**

Allocation to services		
Region 1	Region 2	Region 3
24.75-25.25 FIXED FIXED-SATELLITE (Earth-to-space) 5.532B	24.75-25.25 FIXED-SATELLITE (Earth-to-space) 5.535	24.75-25.25 FIXED FIXED-SATELLITE (Earth-to-space) 5.535 MOBILE

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. (WRC-12)

MOD

5.536B In Saudi Arabia, Austria, Belgium, Brazil, Bulgaria, China, Korea (Rep. of), Denmark, Egypt, United Arab Emirates, Estonia, Finland, Hungary, India, Iran (Islamic Republic of), Ireland, Israel, Italy, Jordan, Kenya, Kuwait, Lebanon, Libya, Liechtenstein, Lithuania, Moldova, Norway, Oman, Uganda, Pakistan, the Philippines, Poland, Portugal, the Syrian Arab Republic, Dem. People's Rep. of Korea, Slovakia, the Czech Rep., Romania, the United Kingdom, Singapore, Sweden, Switzerland, Tanzania, Turkey, Viet Nam and Zimbabwe, earth stations operating in the Earth exploration-satellite service in the band 25.5-27 GHz shall not claim protection from, or constrain the use and deployment of, stations of the fixed and mobile services. (WRC-12)

MOD

5.536C In Algeria, Saudi Arabia, Bahrain, Botswana, Brazil, Cameroon, Comoros, Cuba, Djibouti, Egypt, United Arab Emirates, Estonia, Finland, Iran (Islamic Republic of), Israel, Jordan, Kenya, Kuwait, Lithuania, Malaysia, Morocco, Nigeria, Oman, Qatar, Syrian Arab Republic, Somalia, Sudan, South Sudan, Tanzania, Tunisia, Uruguay, Zambia and Zimbabwe, earth stations operating in the space research service in the band 25.5-27 GHz shall not claim protection from, or constrain the use and deployment of, stations of the fixed and mobile services. (WRC-12)

MOD

5.537A In Bhutan, Cameroon, Korea (Rep. of), the Russian Federation, India, Indonesia, Iran (Islamic Republic of), Iraq, Japan, Kazakhstan, Malaysia, Maldives, Mongolia, Myanmar, Uzbekistan, Pakistan, the Philippines, Kyrgyzstan, the Dem. People's Rep. of Korea, Sudan, Sri Lanka, Thailand and Viet Nam, the allocation to the fixed service in the band 27.9-28.2 GHz may also be used by high altitude platform stations (HAPS) within the territory of these countries. Such use of 300 MHz of the fixed-service allocation by HAPS in the above countries is further limited to operation in the HAPS-to-ground direction and shall not cause harmful interference to, nor claim protection from, other types of fixed-service systems or other co-primary services. Furthermore, the development of these other services shall not be constrained by HAPS. See Resolution 145 (Rev.WRC-12). (WRC-12)

MOD

5.542 *Additional allocation:* in Algeria, Saudi Arabia, Bahrain, Brunei Darussalam, Cameroon, China, Congo (Rep. of the), Egypt, the United Arab Emirates, Eritrea, Ethiopia, Guinea, India, Iran (Islamic Republic of), Iraq, Japan, Jordan, Kuwait, Lebanon, Malaysia, Mali, Morocco, Mauritania, Nepal, Oman, Pakistan, Philippines, Qatar, the Syrian Arab Republic, the Dem. People's Rep. of Korea, Somalia, Sudan, South Sudan, Sri Lanka and Chad, the band 29.5-31 GHz is also allocated to the fixed and mobile services on a secondary basis. The power limits specified in Nos. **21.3** and **21.5** shall apply. (WRC-12)

MOD

5.543A In Bhutan, Cameroon, Korea (Rep. of), the Russian Federation, India, Indonesia, Iran (Islamic Republic of), Iraq, Japan, Kazakhstan, Malaysia, Maldives, Mongolia, Myanmar, Uzbekistan, Pakistan, the Philippines, Kyrgyzstan, the Dem. People's Rep. of Korea, Sudan, Sri Lanka, Thailand and Viet Nam, the allocation to the fixed service in the band 31-31.3 GHz may also be used by systems using high altitude platform stations (HAPS) in the ground-to-HAPS direction. The use of the band 31-31.3 GHz by systems using HAPS is limited to the territory of the countries listed above and shall not cause harmful interference to, nor claim protection from, other types of fixed-service systems, systems in the mobile service and systems operated under No. **5.545**. Furthermore, the development of these services shall not be constrained by HAPS. Systems using HAPS in the band 31-31.3 GHz shall not cause harmful interference to the radio astronomy service having a primary allocation in the band 31.3-31.8 GHz, taking into account the protection criterion as given in Recommendation ITU-R RA.769. In order to ensure the protection of satellite passive services, the level of unwanted power density into a HAPS ground station antenna in the band 31.3-31.8 GHz shall be limited to -106 dB(W/MHz) under clear-sky conditions, and may be increased up to -100 dB(W/MHz) under rainy conditions to mitigate fading due to rain, provided the effective impact on the passive satellite does not exceed the impact under clear-sky conditions. See Resolution **145 (Rev.WRC-12)**. (WRC-12)

MOD

5.545 *Different category of service:* in Armenia, Georgia, Kyrgyzstan, Tajikistan and Turkmenistan, the allocation of the band 31-31.3 GHz to the space research service is on a primary basis (see No. **5.33**). (WRC-12)

MOD

5.546 *Different category of service:* in Saudi Arabia, Armenia, Azerbaijan, Belarus, Egypt, the United Arab Emirates, Spain, Estonia, the Russian Federation, Georgia, Hungary, Iran (Islamic Republic of), Israel, Jordan, Lebanon, Moldova, Mongolia, Oman, Uzbekistan, Poland, the Syrian Arab Republic, Kyrgyzstan, Romania, the United Kingdom, South Africa, Tajikistan, Turkmenistan and Turkey, the allocation of the band 31.5-31.8 GHz to the fixed and mobile, except aeronautical mobile, services is on a primary basis (see No. **5.33**). (WRC-12)

MOD

5.549 *Additional allocation:* in Saudi Arabia, Bahrain, Bangladesh, Egypt, the United Arab Emirates, Gabon, Indonesia, Iran (Islamic Republic of), Iraq, Israel, Jordan, Kuwait, Lebanon, Libya, Malaysia, Mali, Morocco, Mauritania, Nepal, Nigeria, Oman, Pakistan, the Philippines, Qatar, the Syrian Arab Republic, the Dem. Rep. of the Congo, Singapore, Somalia, Sudan, South Sudan, Sri Lanka, Togo, Tunisia and Yemen, the band 33.4-36 GHz is also allocated to the fixed and mobile services on a primary basis. (WRC-12)

MOD**34.2-40 GHz**

Allocation to services		
Region 1	Region 2	Region 3
37-37.5	FIXED MOBILE except aeronautical mobile SPACE RESEARCH (space-to-Earth) 5.547	
37.5-38	FIXED FIXED-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile SPACE RESEARCH (space-to-Earth) Earth exploration-satellite (space-to-Earth) 5.547	

MOD

5.550 *Different category of service:* in Armenia, Azerbaijan, Belarus, the Russian Federation, Georgia, Kyrgyzstan, Tajikistan and Turkmenistan, the allocation of the band 34.7-35.2 GHz to the space research service is on a primary basis (see No. **5.33**). (WRC-12)

MOD**81-86 GHz**

Allocation to services		
Region 1	Region 2	Region 3
81-84	FIXED 5.338A FIXED-SATELLITE (Earth-to-space) MOBILE MOBILE-SATELLITE (Earth-to-space) RADIO ASTRONOMY Space research (space-to-Earth) 5.149 5.561A	
84-86	FIXED 5.338A FIXED-SATELLITE (Earth-to-space) 5.561B MOBILE RADIO ASTRONOMY 5.149	

MOD**86-111.8 GHz**

Allocation to services		
Region 1	Region 2	Region 3
92-94	FIXED 5.338A MOBILE RADIO ASTRONOMY RADIOLOCATION 5.149	

MOD**248-3 000 GHz**

Allocation to services		
Region 1	Region 2	Region 3
275-3 000	(Not allocated) 5.565	

MOD

5.565 The following frequency bands in the range 275-1 000 GHz are identified for use by administrations for passive service applications:

- radio astronomy service: 275-323 GHz, 327-371 GHz, 388-424 GHz, 426-442 GHz, 453-510 GHz, 623-711 GHz, 795-909 GHz and 926-945 GHz;
- Earth exploration-satellite service (passive) and space research service (passive): 275-286 GHz, 296-306 GHz, 313-356 GHz, 361-365 GHz, 369-392 GHz, 397-399 GHz, 409-411 GHz, 416-434 GHz, 439-467 GHz, 477-502 GHz, 523-527 GHz, 538-581 GHz, 611-630 GHz, 634-654 GHz, 657-692 GHz, 713-718 GHz, 729-733 GHz, 750-754 GHz, 771-776 GHz, 823-846 GHz, 850-854 GHz, 857-862 GHz, 866-882 GHz, 905-928 GHz, 951-956 GHz, 968-973 GHz and 985-990 GHz.

The use of the range 275-1 000 GHz by the passive services does not preclude use of this range by active services. Administrations wishing to make frequencies in the 275-1 000 GHz range available for active service applications are urged to take all practicable steps to protect these passive services from harmful interference until the date when the Table of Frequency Allocations is established in the above-mentioned 275-1 000 GHz frequency range.

All frequencies in the range 1 000-3 000 GHz may be used by both active and passive services. (WRC-12)

MOD

ARTICLE 9

Procedure for effecting coordination with or obtaining agreement of other administrations^{1, 2, 3, 4, 5, 6, 7, 8, 8bis} (WRC-12)

MOD

⁴ **A.9.4** Resolution **49 (Rev.WRC-12)** or Resolution **552 (WRC-12)**, as appropriate, shall also be applied with respect to those satellite networks and satellite systems that are subject to it. (WRC-12)

ADD

^{8bis} **A.9.8** In respect of submissions for Regions 1 and 3 satellite networks in the broadcasting-satellite service in the frequency band 21.4-22 GHz meeting special requirements, Resolution **553 (WRC-12)** applies. (WRC-12)

Section I – Advance publication of information on satellite networks or satellite systems

General

MOD

9.2 Amendments to the information sent in accordance with the provisions of No. **9.1** shall also be sent to the Bureau as soon as they become available. The use of an additional frequency band or modification of the orbital location by more than $\pm 6^\circ$ for a space station using the geostationary-satellite orbit will require the application of the advance publication procedure for this band or orbital location, as appropriate. Furthermore, where coordination is not required by Section II of Article **9**, the modification of the reference body or the modification of the direction of transmission for a space station using a non-geostationary-satellite orbit will require the application of the advance publication procedure. (WRC-12)

Section II – Procedure for effecting coordination^{12, 13}

Sub-Section IIA – Requirement and request for coordination

MOD

¹⁸ **9.7A.2** and **9.7B.2**

Editorial note: This modification concerns the Chinese version only.

MOD**9.12A**

Editorial note: This modification concerns the Chinese version only.

MOD

- 9.36** b) identify in accordance with No. **9.27** any administration with which coordination may need to be effected^{20, 21}; (WRC-12)

MOD

²¹ **9.36.2** In the case of coordination under Nos. **9.7**, **9.7A** and **9.7B**, the Bureau shall also identify the specific satellite networks or earth stations with which coordination needs to be effected (see also No. **9.42**). (WRC-12)

MOD

9.41 Following receipt of the BR IFIC referring to requests for coordination under Nos. **9.7** to **9.7B**, an administration believing that it, or any of its satellite networks not identified under No. **9.36.2**, should have been included in the request, or the initiating administration believing that an administration, or any of the satellite networks identified under No. **9.36.2**, in accordance with the provisions of No. **9.7** (GSO/GSO) (items 1) to 8) of the frequency band column), No. **9.7A** (GSO earth station/non-GSO system) or No. **9.7B** (non-GSO system/GSO earth station) of Table 5-1 of Appendix **5** should not have been included in the request, shall, within four months of the date of publication of the relevant BR IFIC, inform the initiating administration or the identified administration, as appropriate, and the Bureau, giving its technical reasons for doing so, and shall request that its name, or the name of any of its satellite networks not identified under No. **9.36.2**, be included, or that the name of the identified administration, or any of its satellite networks identified under No. **9.36.2**, be excluded, as appropriate. (WRC-12)

MOD

9.42 The Bureau shall study this information on the basis of Appendix **5** and shall inform both administrations of its conclusions. Should the Bureau agree to include or exclude, as appropriate, an administration and/or a satellite network in the request, it shall publish a Special Section, indicating the list of administrations and associated satellite networks with which coordination needs to be effected^{22bis}. (WRC-12)

ADD

^{22bis} **9.42.1** During coordination discussions between administrations, additional networks can be included in the coordination process on the basis of the agreement of the administrations concerned. (WRC-12)

MOD

ARTICLE 11

**Notification and recording of frequency
assignments**^{1, 2, 3, 4, 5, 6, 7, 7bis} (WRC-12)

MOD

² **A.11.2** Resolution **49 (Rev.WRC-12)** or Resolution **552 (WRC-12)**, as appropriate, shall also be applied with respect to those satellite networks and satellite systems that are subject to it. (WRC-12)

ADD

^{7bis} **A.11.7** In respect of submissions for Regions 1 and 3 satellite networks in the broadcasting-satellite service in the frequency band 21.4-22 GHz meeting special requirements, Resolution **554 (WRC-12)** applies. (WRC-12)

Section I – Notification

MOD

11.23

Editorial note: This modification concerns the Chinese version only.

MOD

11.26 Notices relating to assignments for high-altitude platform stations in the fixed service in the bands identified in Nos. **5.457**, **5.537A**, **5.543A**, and **5.552A** shall reach the Bureau not earlier than five years before the assignments are brought into use. (WRC-12)

**Section II – Examination of notices and recording of frequency assignments in the Master
Register**

MOD

11.28 Complete notices shall be marked by the Bureau with their date of receipt and shall be examined in the date order of their receipt. On receipt of a complete notice the Bureau shall, within no more than two months, publish its contents, with any diagrams and maps and the date of receipt, in the BR IFIC which shall constitute the acknowledgement to the notifying administration of receipt of its notice^{10bis}. When 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. (WRC-12)

ADD

^{10bis} **11.28.1** In case of satellite networks or systems not subject to the coordination procedure under Section II of Article 9, an administration believing that unacceptable interference may be caused to its existing or planned satellite networks or systems by submitted modifications to the characteristics initially published under No. **9.2B** may provide its comments to the notifying administration. Both administrations shall thereafter cooperate to resolve any difficulties. (WRC-12)

MOD

11.37 When the examination with respect to No. **11.32** leads to a favourable finding, the assignment shall be recorded in the Master Register indicating the administrations with which the coordination procedure has been completed.^{17, 18} When the finding is unfavourable, the notice shall be returned to the notifying administration, with an indication of the appropriate action, if Nos. **11.32A** or **11.33** do not apply. (WRC-12)

MOD

¹⁸ **11.37.2** When a frequency assignment to a space station in the broadcasting-satellite service in a non-planned band other than the frequency band 21.4-22 GHz is recorded in the Master Register, a note shall be entered in the remarks column indicating that such recording does not prejudice in any way the decisions to be included in the agreements and associated plans referred to in Resolution **507**. (WRC-12)

MOD

11.41 After a notice is returned under No. **11.38**, should the notifying administration resubmit the notice^{18bis} and insist upon its reconsideration, the Bureau shall enter the assignment in the Master Register with an indication of those administrations whose assignments were the basis of the unfavourable finding (see also No. **11.42** below). (WRC-12)

ADD

^{18bis} **11.41.2** When submitting notices in application of No. **11.41**, the notifying administration shall indicate to the Bureau that efforts have been made to effect coordination with those administrations whose assignments were the basis of the unfavourable findings under No. **11.38**, without success. (WRC-12)

SUP

¹⁹ **11.41.1**

ADD

11.41B Should the coordination procedure specified in No. **11.32** be completed with an administration whose assignments were the basis for the recording made under No. **11.41**, then, based on the updated information sent by the notifying administration, the relevant remarks or indications relating to assignments for which an unfavourable finding led to their recording under No. **11.41** shall be removed. (WRC-12)

MOD

11.42 Should harmful interference actually be caused by an assignment recorded under No. **11.41** to any recorded assignment which was the basis of the unfavourable finding, the administration responsible for the station using the frequency assignment recorded under No. **11.41** shall, upon receipt of a report providing the particulars relating to the harmful interference^{19bis}, immediately eliminate this harmful interference. (WRC-12)

ADD

^{19bis} **11.42.1** When providing the particulars relating to the harmful interference under No. **11.42**, administrations involved shall use, to the maximum extent possible, the format prescribed in Appendix **10** of the Radio Regulations. (WRC-12)

ADD

11.42A In applying No. **11.42** with respect to satellite networks, administrations involved shall cooperate in the elimination of harmful interference and may request the assistance of the Bureau, and shall exchange relevant technical and operational information required to resolve the issue. Should any administration involved in the matter inform the Bureau that all efforts to resolve the harmful interference have failed, the Bureau shall immediately inform other involved administrations and prepare a report, together with all necessary supporting documents (including comments from the administrations involved), for the next meeting of the Board for its consideration and any required action (including the possible cancellation of the assignment recorded under No. **11.41**), as appropriate. The Bureau shall thereafter implement the decision of the Board and inform the administrations concerned. (WRC-12)

MOD

11.44 The notified date^{20, 21} of bringing into use of any frequency assignment to a space station of a satellite network shall be not later than seven years following the date of receipt by the Bureau of the relevant complete information under No. **9.1** or **9.2**, as appropriate. Any frequency assignment not brought into use within the required period shall be cancelled by the Bureau after having informed the administration at least three months before the expiry of this period. (WRC-12)

MOD

²⁰ **11.44.1** In the case of space station frequency assignments that are brought into use prior to the completion of the coordination process, and for which the Resolution **49 (Rev.WRC-12)** or Resolution **552 (WRC-12)** data, as appropriate, have been submitted to the Bureau, the assignment shall continue to be taken into consideration for a maximum period of seven years from the date of receipt of the relevant information under No. **9.1**. If the first notice for recording of the assignments in question under No. **11.15** has not been received by the Bureau by the end of this seven-year period, the assignments shall be cancelled by the Bureau after having informed the notifying administration of its pending actions six months in advance. (WRC-12)

ADD

²¹ **11.44.2** The notified date of bringing into use of a frequency assignment to a space station in the geostationary-satellite orbit shall be the date of the commencement of the ninety-day period defined in No. **11.44B**. (WRC-12)

ADD

11.44B A frequency assignment to a space station in the geostationary-satellite orbit shall be considered as having been brought into use when a space station in the geostationary-satellite orbit with the capability of transmitting or receiving that frequency assignment has been deployed and maintained at the notified orbital position for a continuous period of ninety days. The notifying administration shall so inform the Bureau within thirty days from the end of the ninety-day period. (WRC-12)

MOD

11.48 If, after the expiry of the period of seven years from the date of receipt of the relevant complete information referred to in No. **9.1** or **9.2**, as appropriate, the administration responsible for the satellite network has not brought the frequency assignments to stations of the network into use, or has not submitted the first notice for recording of the frequency assignments under No. **11.15**, or, where required, has not provided the due diligence information pursuant to Resolution **49 (Rev.WRC-12)** or Resolution **552 (WRC-12)**, as appropriate, the corresponding information published under Nos. **9.2B** and **9.38**, as appropriate, shall be cancelled, but only after the administration concerned has been informed at least six months before the expiry date referred to in Nos. **11.44** and **11.44.1** and, where required, § 10 of Annex 1 of Resolution **49 (Rev.WRC-12)**. (WRC-12)

MOD

11.49 Wherever the use of a recorded frequency assignment to a space station is suspended for a period exceeding six months, the notifying administration shall, as soon as possible, but no later than six months from the date on which the use was suspended, inform the Bureau of the date on which such use was suspended. When the recorded assignment is brought back into use, the notifying administration shall, subject to the provisions of No. **11.49.1** when applicable, so inform the Bureau, as soon as possible. The date on which the recorded assignment is brought back into use²² shall be not later than three years from the date of suspension. (WRC-12)

ADD

²² **11.49.1** The date of bringing back into use of a frequency assignment to a space station in the geostationary-satellite orbit shall be the date of the commencement of the ninety-day period defined below. A frequency assignment to a space station in the geostationary-satellite orbit shall be considered as having been brought back into use when a space station in the geostationary-satellite orbit with the capability of transmitting or receiving that frequency assignment has been deployed and maintained at the notified orbital position for a continuous period of ninety days. The notifying administration shall so inform the Bureau within thirty days from the end of the ninety-day period. (WRC-12)

ARTICLE 13

Instructions to the Bureau**Section II – Maintenance of the Master Register and of World Plans by the Bureau****MOD**

- 13.6** *b)* whenever it appears from reliable information available that a recorded assignment has not been brought into use, or is no longer in use, or continues to be in use but not in accordance with the notified required characteristics as specified in Appendix 4, the Bureau shall consult the notifying administration and request clarification as to whether the assignment was brought into use in accordance with the notified characteristics or continues to be in use in accordance with the notified characteristics. In the event of a response and subject to the agreement of the notifying administration the Bureau shall cancel, suitably modify, or retain the basic characteristics of the entry. If the notifying administration does not respond within three months, the Bureau shall issue a reminder. In the event the notifying administration does not respond within one month of the first reminder, the Bureau shall issue a second reminder. In the event the notifying administration does not respond within one month of the second reminder, action taken by the Bureau to cancel the entry shall be subject to a decision of the Board. In the event of non-response or disagreement by the notifying administration, the entry will continue to be taken into account by the Bureau when conducting its examinations until the decision to cancel or modify the entry is made by the Board. In case of disagreement between the notifying administration and the Bureau, the matter shall be carefully investigated by the Board, including taking into account submissions of additional supporting materials from administrations through the Bureau within the deadlines as established by the Board. (WRC-12)

Section III – Maintenance of the Rules of Procedure by the Bureau**MOD****13.16**

Editorial note: This modification concerns the Chinese version only.

ARTICLE 15

Interferences

Section V – Reports of Infringements

MOD

15.21 § 13 If an administration has information of an infringement of the Constitution, the Convention or the Radio Regulations (in particular Article 45 of the Constitution and No. **15.1** of the Radio Regulations) committed by a station under its jurisdiction, the administration shall ascertain the facts and take the necessary actions. (WRC-12)

ARTICLE 16

International monitoring

MOD

16.6 Administrative and procedural requirements for use and operation of the international monitoring system should be in accordance with the most recent version of Recommendation ITU-R SM.1139. (WRC-12)

ARTICLE 19

Identification of stations**Section V – Selective call numbers in the maritime mobile service****MOD**

19.93 *a)* selective call numbers for ships will be supplied as required as single numbers or in blocks not exceeding 100 (one hundred); (WRC-12)

MOD**Section VI – Identities in the maritime mobile service** (WRC-12)

19.98 *A – General*

MOD

19.99 § 39 When a station⁶ operating in the maritime mobile service or the maritime mobile-satellite service is required to use maritime mobile service identities, the responsible administration shall assign the identity to the station in accordance with the provisions described in Annex 1 of Recommendation ITU-R M.585-6. In accordance with No. **20.16**, administrations shall notify the Radiocommunication Bureau immediately when assigning maritime mobile service identities. (WRC-12)

MOD

19.102 3) The types of maritime mobile service identities shall be as described in Annex 1 of Recommendation ITU-R M.585-6. (WRC-12)

19.108 *B – Maritime identification digits (MIDs)*

MOD

19.108A § 41 The maritime identification digits $M_1I_2D_3$ are an integral part of the maritime mobile service identity and denote, in principle, the administration responsible for the station so identified. In some cases, $M_1I_2D_3$ may denote a geographical area under the responsibility of a specific administration. Furthermore, as indicated in Recommendation ITU-R M.585, some maritime identification digits are reserved for maritime devices and do not correspond either to an administration or to a geographical area. (WRC-12)

19.110 *C – Maritime mobile service identities* (WRC-07)

MOD

19.111 § 43 1) Administrations shall follow Annex 1 of Recommendation ITU-R M.585-6 concerning the assignment and use of maritime mobile service identities. (WRC-12)

ARTICLE 21

Terrestrial and space services sharing frequency bands above 1 GHz**MOD****Section I – Choice of sites and frequencies***Editorial note:* This modification concerns the Chinese version only.**MOD**

21.2 § 2 1) As far as practicable, sites for transmitting^{1, 3} stations, in the fixed or mobile service, employing maximum values of equivalent isotropically radiated power (e.i.r.p.) exceeding the values given in Table **21-1** in the frequency bands indicated, should be selected so that the direction of maximum radiation of any antenna will be separated from the geostationary-satellite orbit by at least the angle in degrees shown in the Table, taking into account the effect of atmospheric refraction²: (WRC-12)

MOD

¹ **21.2.1** For their own protection receiving stations in the fixed or mobile service operating in bands shared with space radiocommunication services (space-to-Earth) should also avoid directing their antennas towards the geostationary-satellite orbit if their sensitivity is sufficiently high that interference from space station transmissions may be significant. In particular, in the band 21.4-22 GHz, it is recommended to maintain a minimum separation angle of 1.5° with respect to the direction of the geostationary-satellite orbit. (WRC-12)

Section II – Power limits for terrestrial stations**MOD**TABLE **21-2** (WRC-12)

Frequency band	Service	Limit as specified in Nos.
...	Fixed-satellite	21.2, 21.3, 21.4 and 21.5
2 655-2 670 MHz ⁵ (Regions 2 and 3)	Meteorological-satellite	
2 670-2 690 MHz ⁵ (Regions 2 and 3)	Space research	
...	Space operation	
...	Earth exploration-satellite	
...	Mobile-satellite	

Section III – Power limits for earth stations**MOD**TABLE 21-3 (*end*) (WRC-12)

Frequency band	Services
17.7-18.1 GHz	Fixed-satellite
22.55-23.15 GHz	Earth exploration-satellite
27.0-27.5 GHz ⁶ (for Regions 2 and 3)	Mobile-satellite
27.5-29.5 GHz	Space research
31.0-31.3 GHz (for the countries listed in No. 5.545)	
34.2-35.2 GHz (for the countries listed in No. 5.550 with respect to the countries listed in No. 5.549)	

Section V – Limits of power flux-density from space stations

MOD

TABLE 21-4 (continued) (WRC-12)

Frequency band	Service*	Limit in dB(W/m ²) for angles of arrival (δ) above the horizontal plane			Reference bandwidth
		0°-5°	5°-25°	25°-90°	
3 400-4 200 MHz	Fixed-satellite (space-to-Earth) (geostationary-satellite orbit)	-152	$-152 + 0.5(\delta - 5)$	-142	4 kHz
3 400-4 200 MHz	Fixed-satellite (space-to-Earth) (non-geostationary-satellite orbit)	$-138 - Y_{17,18}$	$-138 - Y + (12 + Y)(\delta - 5)/20^{17,18}$	-126^{18}	1 MHz
4 500-4 800 MHz 5 670-5 725 MHz (Nos. 5.453 and 5.455) 7 250-7 900 MHz	Fixed-satellite (space-to-Earth) Meteorological-satellite (space-to-Earth) Mobile-satellite Space research	-152	$-152 + 0.5(\delta - 5)$	-142	4 kHz
5 150-5 216 MHz	Fixed-satellite (space-to-Earth)	-164			4 kHz
6 700-6 825 MHz	Fixed-satellite (space-to-Earth)	-137^{14}	$-137 + 0.5(\delta - 5)$	-127	1 MHz
6 825-7 075 MHz	Fixed-satellite (space-to-Earth)	-154 and -134	$-154 + 0.5(\delta - 5)$ and $-134 + 0.5(\delta - 5)$	-144 and -124	4 kHz 1 MHz
8 025-8 500 MHz	Earth exploration-satellite (space-to-Earth) Space research (space-to-Earth)	-150	$-150 + 0.5(\delta - 5)$	-140	4 kHz
10.7-11.7 GHz	Fixed-satellite (space-to-Earth) (geostationary-satellite orbit)	-150	$-150 + 0.5(\delta - 5)$	-140	4 kHz
10.7-11.7 GHz	Fixed-satellite (space-to-Earth) (non-geostationary-satellite orbit) ²⁰	-126	$-126 + 0.5(\delta - 5)$	-116	1 MHz
10.7-11.7 GHz 11.7-12.5 GHz (Region 1) 12.5-12.75 GHz (Region 1 countries listed in Nos. 5.494 and 5.496) 11.7-12.7 GHz (Region 2) 11.7-12.75 GHz (Region 3)	Fixed-satellite (space-to-Earth) (non-geostationary-satellite orbit) ¹⁹	-129^{18}	$-129 + 0.75(\delta - 5)^{18}$	-114^{18}	1 MHz

MOD

TABLE 21-4 (continued) (WRC-12)

Frequency band	Service*	Limit in dB(W/m ²) for angles of arrival (δ) above the horizontal plane			Reference bandwidth
		0°-5°	5°-25°	25°-90°	
...					
19.3-19.7 GHz 21.4-22 GHz (Regions 1 and 3) 22.55-23.55 GHz 24.45-24.75 GHz 25.25-27.5 GHz 27.500- 27.501 GHz	Fixed-satellite (space-to-Earth) Broadcasting-satellite Earth exploration-satellite (space-to-Earth) Inter-satellite Space research (space-to-Earth)	-115 ^{13A}	-115 + 0.5($\delta - 5$) ^{13A}	-105 ^{13A}	1 MHz
...					

ARTICLE 22

Space services¹

Section III – Station keeping of space stations²⁷

MOD

22.16

Editorial note: This modification concerns the Chinese version only.

Section VI – Off-axis power limits on earth stations of a geostationary-satellite network in the fixed-satellite service^{33, 34} (WRC-2000)

MOD

22.35

Editorial note: This modification concerns the Chinese version only.

MOD

22.38

Editorial note: This modification concerns the Chinese version only.

MOD

22.39

Editorial note: This modification concerns the Chinese version only.

ARTICLE 29

Radio astronomy service

Section I – General provisions

MOD

29.4

Editorial note: This modification concerns the Chinese version only.

ADD

ARTICLE 29A

Radio services related to Earth observation

ADD

29A.1 § 1 Radio services related to Earth observations include the Earth exploration-satellite service (EESS), meteorological-satellite service (MetSat), meteorological aids service (MetAids) and specific applications of the radiolocation service (e.g. meteorological or oceanographic radars, wind profiler radars). In this respect, see Resolution **673 (Rev.WRC-12)**. (WRC-12)

ARTICLE 33

**Operational procedures for urgency and safety communications in
the global maritime distress and safety system (GMDSS)**

Section V – Transmission of maritime safety information²

MOD

33.47

Editorial note: This modification concerns the Chinese version only.

ARTICLE 34

Alerting signals in the global maritime distress and safety system (GMDSS)

Section I – Emergency position-indicating radiobeacon (EPIRB) and satellite EPIRB signals

MOD

34.1 § 1 The emergency position-indicating radiobeacon signal in the band 406-406.1 MHz shall be in accordance with Recommendation ITU-R M.633-4. (WRC-12)

Section II – Digital selective calling

MOD

34.2 § 2 The characteristics of the “distress call” (see No. **32.9**) in the digital selective calling system should be in accordance with the most recent version of Recommendation ITU-R M.493. (WRC-12)

ARTICLE 47

Operator's certificates

Section I – General provisions

SUP

47.18

SUP

47.18A

Section II – Categories of operator's certificates

MOD

A – GMDSS (SOLAS Convention) certificates (WRC-12)

47.19 § 6 1) There are four categories of certificates, shown in descending order of requirements, for personnel of ship stations and ship earth stations using the frequencies and techniques prescribed in Chapter VII. An operator meeting the requirements of a certificate automatically meets all of the requirements of lower order certificates. (WRC-12)

SUP

47.23A

SUP

47.23B

MOD

B – GMDSS (non-SOLAS Convention) certificates (WRC-12)

ADD

47.24A There are two categories of certificates, shown in descending order of requirements. An operator meeting the requirements of a certificate automatically meets all of the requirements of the lower order certificate. (WRC-12)

ADD

47.24B *a)* Long-range certificate (WRC-12)

ADD

47.24C *b)* Short-range certificate (WRC-12)

ADD

C – Other maritime radio operator certificates (WRC-12)

MOD

47.25 § 7 1) There are six categories of certificates. Maritime radio operator certificates of the categories listed in Nos. **47.26A** to **47.26F** may continue to be used for the purposes they were issued for. (WRC-12)

MOD

47.26 § 8 The following maritime radio operator's certificates are still valid: (WRC-12)

47.26A *a)* Radiocommunication operator's general certificate. (WRC-12)

47.26B *b)* First-class radio telegraph operator's certificate. (WRC-12)

47.26C *c)* Second-class radio telegraph operator's certificate. (WRC-12)

47.26D *d)* Radiotelegraph operator's special certificate. (WRC-12)

47.26E *e)* Radiotelephone operator's general certificate. (WRC-12)

47.26F *f)* Restricted radiotelephone operator's certificate. (WRC-12)

MOD

Section III – Conditions for the issuing of certificates

MOD

47.27 § 9 1) The requirements for the certificates listed in Nos. **47.20** to **47.23**, for which candidates must show proof of technical and professional knowledge and qualification, are shown in Table **47-1**. (WRC-12)

ADD

47.27A 2) The conditions for the issuing of long-range and short-range certificates listed in Nos. **47.24B** and **47.24C** are contained in Resolution **343 (Rev.WRC-12)**. (WRC-12)

ADD

47.27B 3) Each administration may determine the conditions, in addition to those identified in No. **47.27**, under which GMDSS (SOLAS Convention) certificates specified in Nos. **47.20** to **47.23** may be granted. (WRC-12)

ADD

47.27C § 10 Each administration may determine the conditions, in addition to those identified in No. **47.27A**, under which GMDSS (non-SOLAS Convention) certificates specified in Nos. **47.24B** to **47.24C** may be granted. (WRC-12)

ADD

47.27D Each administration may determine the conditions under which other maritime radio operator certificates specified in Nos. **47.26A** to **47.26F** may be granted. (WRC-12)

MOD

TABLE **47-1** (*end*) (WRC-12)

Suppress Note 2

ARTICLE 51

Conditions to be observed in the maritime services

Section I – Maritime mobile service

51.24 *C – Ship stations using digital selective calling*

MOD

51.25 § 12 The characteristics of the digital selective calling equipment should be in accordance with the most recent version of Recommendation ITU-R M.493. (WRC-12)

51.39 *CA – Ship stations using narrow-band direct-printing telegraphy*

MOD

51.41 2) The characteristics of the narrow-band direct-printing equipment shall be in accordance with Recommendations ITU-R M.476-5 and ITU-R M.625-3. The characteristics should also be in accordance with the most recent version of Recommendation ITU-R M.627. (WRC-12)

ARTICLE 52

Special rules relating to the use of frequencies**ADD****Section VII – Use of frequencies for data transmissions** (WRC-12)**ADD****52.261***A – General* (WRC-12)**ADD**

52.262 Frequencies assigned to coast stations for data transmissions shall be indicated in the List of Coast Stations and Special Service Stations (List IV). This List shall also indicate any other useful information concerning the service performed by each coast station. (WRC-12)

ADD**52.263***B – Bands between 4 000 kHz and 27 500 kHz* (WRC-12)**ADD****B1 – Mode of operation of stations** (WRC-12)**ADD**

52.264 The class of emissions to be used for data transmissions in this section should be in accordance with the most recent version of Recommendation ITU-R M.1798. Coast stations as well as ship stations should use radio systems specified in Recommendation ITU-R M.1798. (WRC-12)

ADD

52.265 Coast stations employing the class of emissions in accordance with No. **52.264** in the frequency bands between 4 000 kHz and 27 500 kHz shall not exceed a peak envelope power of 10 kW. (WRC-12)

ADD

52.266 Ship stations employing the class of emissions in accordance with No. **52.264** in the frequency bands between 4 000 kHz and 27 500 kHz shall not exceed a peak envelope power of 1.5 kW. (WRC-12)

SUP

ARTICLE 59

**Entry into force and provisional application
of the Radio Regulations** (WRC-2000)

ADD

CHAPTER X

Provisions for entry into force of the Radio Regulations (WRC-12)

ADD

ARTICLE 59

Entry into force and provisional application
of the Radio Regulations (WRC-12)

MOD

59.1 These Regulations, which complement the provisions of the Constitution and Convention of the International Telecommunication Union, and as revised and contained in the Final Acts of WRC-95, WRC-97, WRC-2000, WRC-03, WRC-07 and WRC-12, shall be applied, pursuant to Article 54 of the Constitution, on the following basis. (WRC-12)

MOD

59.8 – the revised provisions for which other effective dates of application are stipulated in Resolutions:
56 (Rev.WRC-03)**, 85 (WRC-03), 87 (WRC-03)****, 96 (WRC-03)****, 122 (Rev.WRC-03), 142 (WRC-03), 145 (WRC-03), 146 (WRC-03)****, 221 (Rev.WRC-03), 413 (WRC-03), 539 (Rev.WRC-03), 546 (WRC-03)****, 743 (WRC-03) and 902 (WRC-03).** (WRC-12)

MOD

59.10 – the revised provisions for which other effective dates of application are stipulated in Resolutions:
55 (Rev.WRC-07), 97 (WRC-07)**, 149 (WRC-07), 355 (WRC-07)**** and 905 (WRC-07)****.** (WRC-12)

ADD

59.11 The other provisions of these Regulations, as revised by WRC-12, shall enter into force on 1 January 2013, with the following exceptions: (WRC-12)

ADD

59.12 – the revised provisions for which other effective dates of application are stipulated in Resolution: **98 (WRC-12)** (WRC-12)

**** *Note by the Secretariat:* This Resolution was abrogated by WRC-07.

***** *Note by the Secretariat:* This Resolution was abrogated by WRC-12.

APPENDICES

MOD

APPENDIX 1 (REV.WRC-12)

Classification of emissions and necessary bandwidths

(See Article 2)

MOD

§ 1 1) Emissions shall be designated according to their necessary bandwidth and their classification as explained in this Appendix.

2) Formulae and examples of emissions designated in accordance with this Appendix are given in Recommendation ITU-R SM.1138-2. Further examples may be provided in other ITU-R Recommendations. These examples may also be published in the Preface to the International Frequency List. (WRC-12)

Section I – Necessary bandwidth

§ 2 1) The necessary bandwidth, as defined in No. **1.152** and determined in accordance with the formulae and examples, shall be expressed by three numerals and one letter. The letter occupies the position of the decimal point and represents the unit of bandwidth. The first character shall be neither zero nor K, M or G.

2) Necessary bandwidths¹:

between 0.001 and 999 Hz shall be expressed in Hz (letter H);

between 1.00 and 999 kHz shall be expressed in kHz (letter K);

between 1.00 and 999 MHz shall be expressed in MHz (letter M);

between 1.00 and 999 GHz shall be expressed in GHz (letter G).

3) For the full designation of an emission, the necessary bandwidth, indicated in four characters, shall be added just before the classification symbols. When used, the necessary bandwidth shall be determined by one of the following methods:

3.1) use of the formulae and examples of necessary bandwidths and designation of corresponding emissions given in Recommendation ITU-R SM.1138-2; (WRC-12)

- 3.2) computation, in accordance with other ITU-R Recommendations;
 3.3) measurement, in cases not covered by § 3.1) or 3.2) above.

¹ Examples:

0.002	Hz	=	H002	6	kHz	=	6K00	1.25	MHz	=	1M25
0.1	Hz	=	H100	12.5	kHz	=	12K5	2	MHz	=	2M00
25.3	Hz	=	25H3	180.4	kHz	=	180K	10	MHz	=	10M0
400	Hz	=	400H	180.5	kHz	=	181K	202	MHz	=	202M
2.4	kHz	=	2K40	180.7	kHz	=	181K	5.65	GHz	=	5G65

MOD

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 services¹

Footnotes to Tables 1 and 2

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).

TABLE 1
Characteristics for terrestrial services (WRC-12)

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, 25/1.1.2, 25/1.25)	Broadcasting stations in the HF bands, for the application of No. 12.16	Item identifier
3										
3.1	3A1	CALL SIGN AND STATION IDENTIFICATION the call sign used in accordance with Article 19 In the case of a transmitting station, for the fixed service below 28 MHz, mobile service, meteorological aids service, radiolocation service between 3 and 50 MHz (operating in accordance with Resolution 612 (Rev. WRC-12)), or standard frequency and time signal service, in application of Article 11, required if the station identification (3A2) is not provided	O	O	+				O	3A1
3.2	3A2	the station identification used in accordance with Article 19 In the case of a transmitting station, for the fixed service below 28 MHz, mobile service, meteorological aids service, radiolocation service between 3 and 50 MHz (operating in accordance with Resolution 612 (Rev. WRC-12)), or standard frequency and time signal service, in application of Article 11, required if the call sign (3A1) is not provided	O	O	+				O	3A2

Column No.	Item identifier	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
...	11									
COORDINATION AND AGREEMENT										
11.2	11D	a declaration by the notifying administration that all conditions associated with the remark are fully met for recording the submitted assignment in the Master International Frequency Register Required for a digital broadcasting assignment subject to § 5.1.2 of the GE06 Regional Agreement and for the broadcasting and other primary services assignments notified pursuant to No. 5.1.3 of the Agreement	+		+	+				11D

...	11.5	11F	<div>Notice related to</div> <div>Description of data items and requirements</div>	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, 25/1.2, 25/1.25)	Broadcasting stations in the HF bands, for the application of No. 12.16	Item identifier
...	11F	11F		Recognition by the notifying administration that the registration of assignments in the aeronautical mobile (R) service in the 5 030-5 091 MHz frequency band accords with the purposes of ITU, including No. 7 of Article 1 of the ITU Constitution. Required for an assignment in aeronautical mobile (R) service in the frequency band 5 030-5 091 MHz		+	+	+			

MOD

ANNEX 2

Characteristics of satellite networks, earth stations or radio astronomy stations² (WRC-07)

Items in Appendix	A - GENERAL CHARACTERISTICS OF THE SATELLITE NETWORK, EARTH STATION OR RADIO ASTRONOMY STATION									
...	A.4.b.4	For each orbital plane, where the Earth is the reference body:								
...	A.4.b.4.f	the minimum altitude of the space station above the surface of the Earth at which any satellite transmits								
...	A.4.b.6.b	Not used								

Items in Appendix	A.7.f	the antenna diameter, in metres Required only for fixed-satellite service earth stations operating in the frequency bands 13.75-14 GHz, 24.65-25.25 GHz (Region 1) and 24.65-24.75 GHz (Region 3)									
<i>A – GENERAL CHARACTERISTICS OF THE SATELLITE NETWORK, EARTH STATION OR RADIO ASTRONOMY STATION</i>	Advance publication of a geostationary-satellite network										
	Advance publication of a non-geostationary-satellite network subject to coordination under Section II of Article 9										
	Advance publication of a non-geostationary-satellite network not subject to coordination under Section II of Article 9										
	Notification or coordination of a geostationary-satellite network (including space operation functions under Article 2A of Appendices 30 or 30A)										
	Notification or coordination of a non-geostationary-satellite network										
	Notification or coordination of an earth station (including notification under Appendices 30A or 30B)	1									
	Notice for a satellite network in the broadcasting-satellite service under Appendix 30 (Articles 4 and 5)										
	Notice for a satellite network (feeder-link) under Appendix 30A (Articles 4 and 5)										
	Notice for a satellite network in the fixed-satellite service under Appendix 30B (Articles 6 and 8)										
	Items in Appendix	A.7.f									
	Radio astronomy										

Items in Appendix	<i>B - CHARACTERISTICS TO BE PROVIDED FOR EACH SATELLITE ANTENNA BEAM OR EACH EARTH STATION OR RADIO ASTRONOMY ANTENNA</i>										Radio astronomy
B.2	TRANSMISSION / RECEPTION INDICATOR FOR THE BEAM OF THE SPACE STATION OR THE ASSOCIATED SPACE STATION										B.2
B.2bis	CONTINUOUS/NON-CONTINUOUS TRANSMISSION INDICATOR FOR THE BEAM OF THE SPACE STATION										B.2bis
B.2bis.a	an indicator specifying whether the space station only transmits when visible from the notified service area In the case of advance publication, required only for frequency assignments of a non-geostationary satellite transmitting beam In the case of notification or coordination of a non-geostationary-satellite network, required only for frequency assignments of a non-geostationary satellite transmitting beam of a satellite network not subject to Nos. 22.5C , 22.5D or 22.5F										B.2bis.a
	Advance publication of a geostationary-satellite network	X									
	Advance publication of a non-geostationary-satellite network subject to coordination under Section II of Article 9	X									
	Advance publication of a non-geostationary-satellite network subject to coordination under Section II of Article 9	X									
	Notification of a non-geostationary-satellite network (including space operation functions under Article 2A of Appendices 30 or 30A)	X									
	Notification or coordination of a non-geostationary-satellite network	X								+	
	Notification or coordination of an earth station (including notification under Appendices 30A or 30B)									+	
	Notice for a satellite network in the broadcasting-satellite service under Appendix 30 (Articles 4 and 5)										
	Notice for a satellite network (feeder-link) under Appendix 30A (Articles 4 and 5)										
	Notice for a satellite network in the fixed-satellite service under Appendix 30B (Articles 6 and 8)	X									
Items in Appendix											

<div data-bbox="154 1449 292 1469" data-label="Text">Items in Appendix</div> <div data-bbox="194 948 253 1406" data-label="Section-Header"> <p>B – CHARACTERISTICS TO BE PROVIDED FOR EACH SATELLITE ANTENNA BEAM OR EACH EARTH STATION OR RADIO ASTRONOMY ANTENNA</p> </div>	<div data-bbox="393 1436 412 1490" data-label="Text">B.3.b.1</div> <div data-bbox="393 938 1020 1406" data-label="Text"> <p>the co-polar antenna gain contours plotted on a map of the Earth's surface, preferably in a radial projection from the satellite onto a plane perpendicular to the axis from the centre of the Earth to the satellite</p> <p>The space station antenna gain contours shall be drawn as isolines of the isotropic gain, at least for -2, -4, -6, -10 and -20 dB and at 10 dB intervals thereafter, as necessary, relative to the maximum antenna gain, when any of these contours is located either totally or partially anywhere within the limit of visibility of the Earth from the given geostationary satellite</p> <p>Whenever possible, the gain contours of the space station antenna should also be provided in a numerical format (e.g. equation or table)</p> <p>Where a steerable beam (see No. 1.191) is used, if the effective boresight area (see No. 1.175) is less than the global service area, the contours are the result of moving the boresight of the steerable beam around the limit defined by the effective boresight area and are to be provided as described above but shall also include the 0 dB relative gain isoline</p> <p>The antenna gain contours shall include the effects of the planned inclination excursion, longitudinal tolerance and the planned pointing accuracy of the antenna</p> <p><i>Note</i> – Taking due account of applicable technical restrictions and allowing some reasonable degree of flexibility for satellite operations, administrations should, to the extent practicable, align the areas the satellite steerable beams could cover with the service area of their networks with due regard to their service objectives.</p> <p>In the case of Appendix 30, 30A or 30B, required only for non-elliptical beams</p> </div>
Advance publication of a geostationary-satellite network	
Advance publication of a non-geostationary-satellite network subject to coordination under Section II of Article 9	
Advance publication of a non-geostationary-satellite network not subject to coordination under Section II of Article 9	
Notification or coordination of a geostationary-satellite network (including space operation functions under Article 2A of Appendices 30 or 30A)	X
Notification or coordination of a non-geostationary-satellite network	
Notification or coordination of an earth station (including notification under Appendices 30A or 30B)	
Notice for a satellite network in the broadcasting-satellite service under Appendix 30 (Articles 4 and 5)	+
Notice for a satellite network (feeder-link) under Appendix 30A (Articles 4 and 5)	+
Notice for a satellite network in the fixed-satellite service under Appendix 30B (Articles 6 and 8)	+
Items in Appendix	B.3.b.1
Radio astronomy	

Items in Appendix	B- CHARACTERISTICS TO BE PROVIDED FOR EACH SATELLITE ANTENNA BEAM OR EACH EARTH STATION OR RADIO ASTRONOMY ANTENNA										Items in Appendix	Radio astronomy
B.5	EARTH STATION ANTENNA CHARACTERISTICS										B.5	
B.5.a	the isotropic gain, in dBi, of the antenna in the direction of maximum radiation (see No. 1.160)										B.5.a	
B.5.b	the half-power beamwidth, in degrees										B.5.b	
B.5.c	either the measured radiation pattern of the antenna or the reference radiation pattern to be used for coordination For coordination under No. 9.7A, the reference radiation pattern is to be provided										B.5.c	
B.5.d	antenna dimension aligned with the geostationary arc (D_{GSO}), in metres (see the most recent version of Recommendation ITU-R S.1855) except in the case of Appendix 30 or 30A										B.5.d	
	Advance publication of a geostationary-satellite network											
	Advance publication of a non-geostationary-satellite network subject to coordination under Section II of Article 9											
	Advance publication of a non-geostationary-satellite network subject to coordination under Section II of Article 9											
	Notification or coordination of a geostationary-satellite network (including space operation functions under Article 2A or Appendices 30 or 30A)											
	Notification or coordination of a non-geostationary-satellite network											
	Notification or coordination of an earth station (including notification under Appendices 30A or 30B)	X										
	Notice for a satellite network in the broadcasting-satellite service under Appendix 30 (Articles 4 and 5)											
	Notice for a satellite network (feeder-link) under Appendix 30A (Articles 4 and 5)											
	Notice for a satellite network in the fixed-satellite service under Appendix 30B (Articles 6 and 8)											
	Items in Appendix											

...	Items in Appendix	C- CHARACTERISTICS TO BE PROVIDED FOR EACH GROUP OF FREQUENCY ASSIGNMENTS FOR A SATELLITE ANTENNA BEAM OR AN EARTH STATION OR RADIO ASTRONOMY ANTENNA	<div>Advance publication of a geostationary-satellite network</div> <div>Advance publication of a non-geostationary-satellite network subject to coordination under Section II of Article 9</div> <div>Advance publication of a non-geostationary-satellite network not subject to coordination under Section II of Article 9 of Article 9</div> <div>Notification or coordination of a geostationary-satellite network (including space operation functions under Article 2A of Appendices 30A or 30A)</div> <div>Notification or coordination of a non-geostationary-satellite network</div> <div>Notification (including notification under station Appendices 30A or 30B)</div> <div>Notice for a satellite network in the broadcasting-satellite service under Appendix 30 (Articles 4 and 5)</div> <div>Notice for a satellite network (feeder-link) under Appendix 30A (Articles 4 and 5)</div> <div>Notice for a satellite network in the fixed-satellite service under Appendix 30B (Articles 6 and 8)</div>	Items in Appendix	Radio astronomy
C.8	POWER CHARACTERISTICS OF THE TRANSMISSION <i>Not required for passive sensors</i>	C.8			
C.8.a	For the case where individual carriers can be identified:	C.8.a			
C.8.a.1	the maximum value of the peak envelope power, in dBW, supplied to the input of the antenna for each carrier type Required if neither C.8.b.1 nor C.8.b.3.a is provided	C.8.a.1			
C.8.a.2	the maximum power density, in dB(W/Hz), supplied to the input of the antenna for each carrier type ² Required if neither C.8.b.2 nor C.8.b.3.b is provided	C.8.a.2			

Items in Appendix	C- CHARACTERISTICS TO BE PROVIDED FOR EACH GROUP OF FREQUENCY ASSIGNMENTS FOR A SATELLITE ANTENNA BEAM OR AN EARTH STATION OR RADIO ASTRONOMY ANTENNA	Advance publication of a geostationary-satellite network	Advance publication of a non-geostationary-satellite network subject to coordination under Section II of Article 9	Advance publication of a non-geostationary-satellite network not subject to coordination under Section II of Article 9 of Article 9	Notification or coordination of a geostationary-satellite network (including space operation functions under Article 2A of Appendices 30 or 30A)	Notification or coordination of a non-geostationary-satellite network	Notification (including notification under Appendices 30A or 30B)	Notice for a satellite network in the broadcasting-satellite service under Appendix 30 (Articles 4 and 5)	Notice for a satellite network (feeder-link) under Appendix 30A (Articles 4 and 5)	Notice for a satellite network in the fixed-satellite service under Appendix 30B (Articles 6 and 8)	Items in Appendix	Radio astronomy
C.8.b	For the case where it is not appropriate to identify individual carriers: the total peak envelope power, in dBW, supplied to the input of the antenna For coordination or notification of an Appendix 30A earth station the values shall include the maximum range of power control Required if neither C.8.a.1 nor C.8.b.3.a is provided					+	+ ¹	X	X		C.8.b	
C.8.b.1											C.8.b.1	
C.8.b.2	the maximum power density, in dB(W/Hz), supplied to the input of the antenna ² For coordination or notification of an Appendix 30A earth station the values shall include the maximum range of power control Required if neither C.8.a.2 nor C.8.b.3.b is provided			+	+	+	+ ¹	X	X	X	C.8.b.2	
C.8.b.3	For the case of active sensors: the mean peak envelope power, in dBW, supplied to the input of the antenna Required if neither C.8.a.1 nor C.8.b.1 is provided										C.8.b.3	
C.8.b.3.a				+	+	+					C.8.b.3.a	
C.8.b.3.b	the mean power density, in dB(W/Hz), supplied to the input of the antenna Required if neither C.8.a.2 nor C.8.b.2 is provided		+	+	+	+					C.8.b.3.b	

Items in Appendix	C- CHARACTERISTICS TO BE PROVIDED FOR EACH GROUP OF FREQUENCY ASSIGNMENTS FOR A SATELLITE ANTENNA BEAM OR AN EARTH STATION OR RADIO ASTRONOMY ANTENNA	Advance publication of a geostationary-satellite network subject to coordination under Section II of Article 9 Advance publication of a non-geostationary-satellite network not subject to coordination under Section II of Article 9 Advance publication of a non-geostationary-satellite network (including space operation functions under Article 2A of Appendices 30 or 30A) Notification or coordination of a non-geostationary-satellite network Notification (including notification under Appendices 30A or 30B) Notice for a satellite network in the broadcasting-satellite service under Appendix 30 (Articles 4 and 5) Notice for a satellite network (feeder-link) under Appendix 30A (Articles 4 and 5) Notice for a satellite network in the fixed-satellite service under Appendix 30B (Articles 6 and 8)	Advance publication of a geostationary-satellite network	Advance publication of a non-geostationary-satellite network subject to coordination under Section II of Article 9	Advance publication of a non-geostationary-satellite network not subject to coordination under Section II of Article 9	Notification or coordination of a geostationary-satellite network (including space operation functions under Article 2A of Appendices 30 or 30A)	Notification or coordination of a non-geostationary-satellite network	Notification (including notification under Appendices 30A or 30B)	Notice for a satellite network in the broadcasting-satellite service under Appendix 30 (Articles 4 and 5)	Notice for a satellite network (feeder-link) under Appendix 30A (Articles 4 and 5)	Notice for a satellite network in the fixed-satellite service under Appendix 30B (Articles 6 and 8)	Items in Appendix	Radio astronomy
C.8.c	For all space applications, except active or passive sensors:											C.8.c	
C.8.c.1	the minimum value of the peak envelope power, in dBW, supplied to the input of the antenna for each carrier type If not provided, the reason for absence under C.8.c.2 if C.8.c.1 is not provided, the reason for absence of the minimum value of the peak envelope power						+	+				C.8.c.1	
C.8.c.2	the minimum power density, in dB(W/Hz), supplied to the input of the antenna for each carrier type ² If not provided, the reason for absence under C.8.c.4						+	+				C.8.c.2	
C.8.c.3							+	+				C.8.c.3	

MOD**Footnotes to Tables A, B, C and D**

¹ Not required for coordination under No. 9.7A.

² In calculating the maximum power density per Hz, see the most recent version of Recommendation ITU-R SF.675. For carriers below 15 GHz, the power density is averaged over the worst 4 kHz band. For carriers at or above 15 GHz, the power density is averaged over the worst 1 MHz band.

MOD

APPENDIX 5 (REV.WRC-12)

**Identification of administrations with which coordination is to be effected or
agreement sought under the provisions of Article 9**

MOD

TABLE 5-1 (WRC-12)
Technical conditions for coordination
 (see Article 9)

Reference of Article 9	Case	Frequency bands (and Region) of the service for which coordination is sought	Threshold/condition	Calculation method	Remarks
No. 9.7 GSO/GSO	A station in a satellite network using the geostationary-satellite orbit (GSO), in any space radiocommunication service, in a frequency band and in a Region where this service is not subject to a Plan, in respect of any other satellite network using that orbit, in any space radiocommunication service in a frequency band and in a Region where this service is not subject to a Plan, with the exception of the coordination between earth stations operating in the opposite direction of transmission	1) 3 400-4 200 MHz 5 725-5 850 MHz (Region 1) and 5 850-6 725 MHz 7 025-7 075 MHz 2) 10.95-11.2 GHz 11.45-11.7 GHz 11.7-12.2 GHz (Region 2) 12.2-12.5 GHz (Region 3) 12.5-12.75 GHz (Regions 1 and 3) 12.7-12.75 GHz (Region 2) and 13.75-14.5 GHz	i) Bandwidth overlap, and ii) any network in the fixed-satellite service (FSS) and any associated space operation functions (see No. 1.23) with a space station within an orbital arc of $\pm 8^\circ$ of the nominal orbital position of a proposed network in the FSS i) Bandwidth overlap, and ii) any network in the FSS or broadcasting-satellite service (BSS), not subject to a Plan, and any associated space operation functions (see No. 1.23) with a space station within an orbital arc of $\pm 7^\circ$ of the nominal orbital position of a proposed network in the FSS or BSS, not subject to a Plan		With respect to the space services listed in the threshold/condition column in the bands in 1), 2), 3), 4), 5), 6), 7) and 8), an administration may request, pursuant to No. 9.41, to be included in requests for coordination, indicating the networks for which the value of $\Delta T/T$ calculated by the method in § 2.2.1.2 and 3.2 of Appendix 8 exceeds 6%. When the Bureau, on request by an affected administration, studies this information pursuant to No. 9.42, the calculation method given in § 2.2.1.2 and 3.2 of Appendix 8 shall be used

TABLE 5-1 (continued) (WRC-12)

Reference of Article 9	Case	Frequency bands (and Region) of the service for which coordination is sought	Threshold/condition	Calculation method	Remarks
No. 9.7 GSO/GSO (cont.)		6bis) 21.4-22 GHz (Regions 1 and 3)	i) Bandwidth overlap; and ii) any network in the BSS and any associated space operation functions (see No. 1.23) with a space station within an orbital arc of $\pm 12^\circ$ of the nominal orbital position of a proposed network in the BSS (see also Resolutions 554 (WRC-12) and 553 (WRC-12)).		No. 9.41 does not apply.
		7) Bands above 17.3 GHz, except those defined in § 3) and 6)	i) Bandwidth overlap, and ii) any network in the FSS and any associated space operation functions (see No. 1.23) with a space station within an orbital arc of $\pm 8^\circ$ of the nominal orbital position of a proposed network in the FSS (see also Resolution 901 (Rev.WRC-07))		
		8) Bands above 17.3 GHz except those defined in § 4), 5) and 6bis)	i) Bandwidth overlap, and ii) any network in the FSS or BSS, not subject to a Plan, and any associated space operation functions (see No. 1.23) with a space station within an orbital arc of $\pm 16^\circ$ of the nominal orbital position of a proposed network in the FSS or BSS, not subject to a Plan, except in the case of a network in the FSS with respect to a network in the FSS (see also Resolution 901 (Rev.WRC-07))		

TABLE 5-1 (*continued*) (WRC-12)

Reference of Article 9	Case	Frequency bands (and Region) of the service for which coordination is sought	Threshold/condition	Calculation method	Remarks
No. 9.7 GSO/GSO (<i>cont.</i>)		9) All frequency bands, other than those in 1), 2), 3), 4), 5), 6), 6 <i>bis</i>), 7) and 8), allocated to a space service, and the bands in 1), 2), 3), 4), 5), 6), 6 <i>bis</i>), 7) and 8) where the radio service of the proposed network or affected networks is other than the space services listed in the threshold/ condition column, or in the case of coordination of space stations operating in the opposite direction of transmission	i) Bandwidth overlap, and ii) Value of $\Delta T/T$ exceeds 6%	Appendix 8	In application of Article 2A of Appendix 30 for the space operation functions using the guardbands defined in § 3.9 of Annex 5 of Appendix 30, the threshold/condition specified for the FSS in the bands in 2) applies. In application of Article 2A of Appendix 30A for the space operation functions using the guardbands defined in § 3.1 and 4.1 of Annex 3 of Appendix 30A, the threshold/condition specified for the FSS in the bands in 7) applies

MOD

TABLE 5-1 (*continued*) (WRC-12)

Reference of Article 9	Case	Frequency bands (and Region) of the service for which coordination is sought	Threshold/condition	Calculation method	Remarks
No. 9.11 GSO, non-GSO/ terrestrial	A space station in the BSS in any band shared on an equal primary basis with terrestrial services and where the BSS is not subject to a Plan, in respect of terrestrial services	620-790 MHz (see Resolution 549 (WRC-07)) 1 452-1 492 MHz 2 310-2 360 MHz (No. 5.393) 2 535-2 655 MHz (Nos. 5.417A and 5.418) 17.7-17.8 GHz (Region 2) 74-76 GHz	Bandwidths overlap: The detailed conditions for the application of No. 9.11 in the bands 2 630-2 655 MHz and 2 605-2 630 MHz are provided in Resolution 539 (Rev.WRC-03) for non-GSO BSS (sound) systems pursuant to Nos. 5.417A and 5.418 , and in Nos. 5.417A and 5.418 for GSO BSS (sound) networks pursuant to those provisions.	Check by using the assigned frequencies and bandwidths	

MOD

TABLE 5-1 (continued) (WRC-12)

Reference of Article 9	Case	Frequency bands (and Region) of the service for which coordination is sought	Threshold/condition	Calculation method	Remarks
No. 9.14 Non-GSO/ terrestrial, GSO/ terrestrial	A space station in a satellite network in the frequency bands for which a footnote refers to No. 9.11A or to No. 9.14, in respect of stations of terrestrial services where threshold(s) is (are) exceeded	1) Frequency bands for which a footnote refers to No. 9.11A; or 2) 11.7-12.2 GHz (Region 2) GSO FSS)	1) See § 1 of Annex 1 to this Appendix; In the bands specified in No. 5.414A, the detailed conditions for the application of No. 9.14 are provided in No. 5.414A for MSS networks or 2) In the band 11.7-12.2 GHz (Region 2) GSO FSS): -124 dB(W/(m ² · MHz)) for $0^\circ \leq \theta \leq 5^\circ$ -124 + 0.5 ($\theta - 5$) dB(W/(m ² · MHz)) for $5^\circ < \theta \leq 25^\circ$ -114 dB(W/(m ² · MHz)) for $\theta > 25^\circ$ where θ is the angle of arrival of the incident wave above the horizontal plane (degrees) 3) Bandwidth overlap	1) See § 1 of Annex 1 to this Appendix	
		3) 5 030-5 091 MHz			

TABLE 5-1 (continued) (WRC-12)

Reference of Article 9	Case	Frequency bands (and Region) of the service for which coordination is sought	Threshold/condition	Calculation method	Remarks
No. 9.19 Terrestrial, GSO, non-GSO/ GSO, non-GSO	Any transmitting station of a terrestrial service or a transmitting earth station in the FSS (Earth-to-space) in a frequency band shared on an equal primary basis with the BSS, with respect to typical earth stations included in the service area of a space station in the BSS	620-790 MHz (see Resolution 549 (WRC-07)) 1 452-1 492 MHz 2 310-2 360 MHz (terrestrial services in all three Regions in respect of BSS allocation in No. 5.393) 2 520-2 670 MHz (see No. 5.416) 11.7-12.7 GHz (see Article 6 of Appendix 30) 12.5-12.7 GHz (terrestrial services in Nos. 5.494 and 5.496 as well as in Regions 2 and 3, or transmitting earth station in the FSS (Earth-to-space) in Region 1, in respect of BSS allocation in Region 3) 12.7-12.75 GHz (terrestrial services in Nos. 5.494 and 5.496 as well as in Regions 2 and 3, or transmitting earth station in the FSS (Earth-to-space) in Regions 1 and 2, in respect of BSS allocation in Region 3)	i) Necessary bandwidths overlap; and ii) the power flux-density (pfd) of the interfering station at the edge of the service area exceeds the permissible level	Check by using the assigned frequencies and bandwidths	See also Article 6 of Appendix 30

TABLE 5-1 (end) (WRC-12)

Reference of Article 9	Case	Frequency bands (and Region) of the service for which coordination is sought	Threshold/condition	Calculation method	Remarks
		17.7-17.8 GHz (terrestrial services in all three Regions in respect of BSS allocation in Region 2) 17.3-17.8 GHz (transmitting earth stations in the FSS (Earth-to-space) in respect of BSS allocation in Region 2) (see Article 4 of Appendix 30A) 40.5-42.5 GHz 74-76 GHz			

MOD

ANNEX 1

1 Coordination thresholds for sharing between MSS (space-to-Earth) and terrestrial services in the same frequency bands and between non-GSO MSS feeder links (space-to-Earth) and terrestrial services in the same frequency bands and between RDSS (space-to-Earth) and terrestrial services in the same frequency bands (WRC-12)

MOD

1.2 Between 1 and 3 GHz

1.2.1 Objectives

Generally, pfd thresholds were used to determine the need for coordination between space stations of the MSS (space-to-Earth) and terrestrial services and for coordination between space stations of the RDSS (space-to-Earth) and terrestrial services. However, to facilitate sharing between digital fixed service stations and non-GSO MSS space stations, the concept of fractional degradation in performance (FDP) was adopted. This concept involves new methods described in this Annex.

As a consequence of this new concept, the need for coordination between space stations of the MSS (space-to-Earth) and terrestrial services is determined using two methods:

- simple method: FDP (simple definition of the MSS system and characteristics of reference FS stations are used in inputs) or power flux-density trigger value;
- more detailed method: system specific methodology (SSM) (specific characteristics of the MSS system and characteristics of reference fixed service stations are used in inputs) as described, for example, in Annex 1 to Recommendation ITU-R M.1143.

If one of the two methods gives a result that does not exceed the criteria relevant to each method, there is no need for coordination.

If only one method is available in an administration, the result of this method must be taken into account. (WRC-12)

MOD

1.2.3 Determination of the need for coordination between MSS and RDSS space stations (space-to-Earth) and terrestrial stations (WRC-12)

MOD**1.2.3.1 Method for the determination of the need for coordination between MSS and RDSS space stations (space-to-Earth) and other terrestrial services sharing the same frequency band in the 1 to 3 GHz range**

Coordination of assignments for transmitting space stations of the MSS and RDSS with respect to terrestrial services is not required if the pfd produced at the Earth's surface or the FDP of a station in the fixed service does not exceed the threshold values shown in the following table. (WRC-12)

MOD**1.2.3.2 A system specific methodology (SSM) to be used in determining the need for detailed coordination of non-GSO MSS (space-to-Earth) systems with fixed service systems**

The purpose of the SSM is to allow a detailed assessment of the need to coordinate frequency assignments to non-GSO MSS space stations (space-to-Earth) with frequency assignments to receiving stations in a fixed service network of a potentially affected administration. The SSM takes into account specific characteristics of the non-GSO MSS system and reference fixed service characteristics.

Those administrations planning to establish the need for coordination between non-GSO MSS networks and fixed service systems are encouraged to use Recommendation ITU-R M.1143. While urgent additional development work is being undertaken in the ITU-R to facilitate the use of the methodology described in Recommendation ITU-R M.1143, administrations may be able to effect coordination by applying this SSM. (WRC-12)

MOD

TABLE 5-2 (continued) (WRC-12)

Frequency band (MHz)	Terrestrial service to be protected	Coordination threshold values				
		GSO space stations		Non-GSO space stations		
		pfd (per space station) calculation factors (NOTE 2)		pfd (per space station) calculation factors (NOTE 2)		% FDP (in 1 MHz) (NOTE 1)
		P	r dB/degrees	P	r dB/degrees	
1 525-1 530	Analogue FS telephony (NOTE 5)	−146 dB(W/m ²) in 4 kHz and −128 dB(W/m ²) in 1 MHz	0.5	−146 dB(W/m ²) in 4 kHz and −128 dB(W/m ²) in 1 MHz	0.5	
	All other cases	−128 dB(W/m ²) in 1 MHz	0.5	−128 dB(W/m ²) in 1 MHz	0.5	25
2 160-2 200 (NOTE 3)	Analogue FS telephony (NOTE 5)	−146 dB(W/m ²) in 4 kHz and −128 dB(W/m ²) in 1 MHz	0.5	−141 dB(W/m ²) in 4 kHz and −123 dB (W/m ²) in 1 MHz (NOTE 6)	0.5	
	All other cases	−128 dB(W/m ²) in 1 MHz	0.5	−123 dB(W/m ²) in 1 MHz (NOTE 6)	0.5	25
2 483.5-2 500 (mobile-satellite service)	All cases	−146 dB(W/m ²) in 4 kHz and −128 dB(W/m ²) in 1 MHz	0.5	−144 dB(W/m ²) in 4 kHz and −126 dB(W/m ²) in 1 MHz (NOTE 9)	0.65	
2 483.5-2 500 (radiodetermination-satellite service) ADD (NOTE 10)	All cases except the radiolocation service in the countries listed in No. 5.398A	−152 dB(W/m ²) in 4 kHz −128 dB(W/m ²) in 1 MHz	-	−153 dB(W/m ²) in 4 kHz −129 dB(W/m ²) in 1 MHz (NOTE 9)		
2 500-2 520 (SUP – WRC-07)						
2 520-2 535 (SUP – WRC-07)						

SUP

NOTE 7

ADD

NOTE 9 – Instead of the values in the Table, the pfd coordination thresholds of $-142.5 \text{ dB(W/m}^2\text{)}$ in 4 kHz and $-124.5 \text{ dB(W/m}^2\text{)}$ in 1 MHz for the MSS and $-152 \text{ dB(W/m}^2\text{)}$ in 4 kHz and $-128 \text{ dB(W/m}^2\text{)}$ in 1 MHz for the RDSS shall apply in Albania, Germany, Andorra, Antigua and Barbuda, Argentina, Australia, Austria, Bahamas, Barbados, Belgium, Belize, Bolivia (Plurinational State of), Bosnia and Herzegovina, Brazil, Bulgaria, Canada, Chile, Cyprus, Vatican, Colombia, Congo (Rep. of the), Costa Rica, Croatia, Denmark, Dominican Rep., Dominica, El Salvador, Ecuador, Spain, Estonia, United States, Finland, France, Greece, Grenada, Guatemala, Guyana, Haiti, Honduras, Hungary, Ireland, Iceland, Israel, Italy, Jamaica, Latvia, The Former Yugoslav Rep. of Macedonia, Liechtenstein, Lithuania, Luxembourg, Malta, Mexico, Monaco, Montenegro, Nicaragua, Nigeria, Norway, Panama, Paraguay, Netherlands, Peru, Poland, Portugal, Slovakia, Czech Rep., Romania, United Kingdom, Saint Lucia, Saint Kitts and Nevis, San Marino, Saint Vincent and the Grenadines, Serbia, Slovenia, Sweden, Switzerland, Suriname, Trinidad and Tobago, Turkey, Uruguay and Venezuela. (WRC-12)

ADD

NOTE 10 – These pfd values apply only to systems submitted after 17 February 2012 and do not apply to systems for which complete coordination information has been received before 18 February 2012 (see No. **5.401**). (WRC-12)

MOD

APPENDIX 7 (REV.WRC-12)

Methods for the determination of the coordination area around an earth station in frequency bands between 100 MHz and 105 GHz

ANNEX 7

System parameters and predetermined coordination distances for determination of the coordination area around an earth station

3 Horizon antenna gain for a receiving earth station with respect to a transmitting earth station

TABLE 7b (WRC-12)
Parameters required for the determination of coordination distance for a transmitting earth station

Transmitting space radiocommunication service designation	Fixed- satellite, mobile- satellite	Aero- nautical mobile- satellite (R) service	Fixed- satellite radio- navigation	Aero- nautical mobile (R)	Fixed- satellite	Fixed- satellite	Space operation, space research	Fixed-satellite, mobile-satellite, interorogantical- satellite	Fixed- satellite	Fixed- satellite	Fixed- satellite	Fixed- satellite	Fixed- satellite	Fixed- satellite
Frequency bands (GHz)	2.655-2.690	5.030-5.091	5.091-5.150	5.091-5.150	5.725-5.850	5.725-7.075	7.100-7.235 ⁵	7.900-8.400	10.7-11.7	12.5-14.8	13.75-14.3	15.43-15.65	17.7-18.4	19.3-19.7
Receiving terrestrial service designations	Fixed, mobile	Aeronautical radio- navigation	Aeronautical radio- navigation	Aeronautical mobile (R)	Radio- location	Fixed, mobile	Fixed, mobile	Fixed, mobile	Fixed, mobile	Fixed, mobile	Radio-location radionavigation (land only)	Aeronautical radionavigation	Fixed, mobile	Fixed, mobile
Method to be used	§ 2.1	§ 2.1, § 2.2		§ 2.1, § 2.2	§ 2.1	§ 2.1	§ 2.1, § 2.2	§ 2.1	§ 2.1	§ 2.1, § 2.2	§ 2.1		§ 2.1, § 2.2	§ 2.2
Modulation at terrestrial station ¹	A					A, N	A, N	A, N	A, N	A, N	—		N	N
Terrestrial station interference parameters and criteria	P_{DQ} (%)	0.01				0.01	0.005	0.01	0.005	0.01	0.005		0.005	0.005
	n	2				2	2	2	2	2	2		2	2
	p (%)	0.005				0.005	0.0025	0.005	0.0025	0.005	0.0025		0.0025	0.0025
	N_L (dB)	0				0	0	0	0	0	0		0	0
	M_G (dB)	26 ²				33	37	33	37	33	40	1	25	25
	W (dB)	0				0	0	0	0	0	0		0	0
	G_T (dB) ⁴	49 ²	6	6		46	46	46	46	50	52		48	48
Terrestrial station parameters	T_e (K)	500 ²				750	750	750	750	1 500	1 500		1 100	1 100
Reference bandwidth	B (Hz)	4×10^3	150×10^3	10^6		4×10^3	4×10^3	4×10^3	4×10^3	4×10^3	10^6		10^6	10^6
Permissible interference power in B	$P_{A(p)}$ (dBW)	-140	-160	-143		-131	-103	-131	-103	-128	-98		-113	-113

MOD

TABLE 7c (WRC-12)

Parameters required for the determination of coordination distance for a transmitting earth station

Transmitting space radiocommunication service designation		Fixed- satellite	...
Frequency bands (GHz)		24.65-25.25 27.0-29.5	
Receiving terrestrial service designations		Fixed, mobile	
Method to be used		§ 2.1	
Modulation at terrestrial station ¹		N	
Terrestrial station interference parameters and criteria	p_0 (%)	0.005	
	n	1	
	p (%)	0.005	
	N_L (dB)	0	
	M_S (dB)	25	
	W (dB)	0	
Terrestrial station parameters	G_x (dBi) ⁴	50	
	T_e (K)	2 000	
Reference bandwidth	B (Hz)	10^6	
Permissible interference power	$P_f(p)$ (dBW) in B	-111	

TABLE 8c (REV.WRC-12)

Parameters required for the determination of coordination distance for a receiving earth station

Receiving space radiocommunication service designation	Fixed-satellite		Fixed-satellite, radio- determination satellite	Fixed- satellite	Fixed- satellite	Meteorolo- logical- satellite ^{1, 8}	Meteorolo- logical- satellite ⁹	Earth exploration- satellite ⁷	Earth exploration- satellite ⁸	Space research ¹⁰		Fixed-satellite	Broadcasting- satellite	Fixed- satellite ⁹	Broad- casting- satellite	Fixed- satellite ⁷
	§ 2.1	§ 2.2	§ 2.1	§ 2.2	§ 2.1	§ 2.1, § 2.2	§ 2.2	§ 2.1	§ 2.2	N	N	A	N	§ 2.1, § 2.2	§ 1.4.5	§ 2.1
Frequency bands (GHz)	4.500-4.800	5.150-5.216	6.700- 7.075	7.250-7.750	7.450-7.550 ⁷	7.750-7.900	8.025-8.400	8.400- 8.450	8.450- 8.500	Deep space		10.7-12.75	12.5-12.75 ¹³	15.4-15.7	17.7-17.8	17.7-18.8 19.3-19.7
Transmitting terrestrial service designations	Fixed, mobile	Aeronautical radionavigation	Fixed, mobile	Fixed, mobile	Fixed, mobile	Fixed, mobile	Fixed, mobile	Fixed, mobile	Fixed, mobile	Fixed, mobile		Fixed, mobile	Fixed, mobile	Aeronau- tical radio- navigation	Fixed	Fixed, mobile
Method to be used	§ 2.1	§ 2.1	§ 2.2	§ 2.1	§ 2.1, § 2.2	§ 2.2	§ 2.2	§ 2.1	§ 2.2	N	N	A	N	§ 2.1, § 2.2	§ 1.4.5	§ 2.1
Modulation station ¹	A	N	N	A	N	N	N	N	N	N	N	A	N	A	N	N
Earth station interference parameters and criteria	P_0 (%)	0.03	0.005	0.03	0.005	0.002	0.001	0.003	0.011	0.001	0.1	0.03	0.003	0.003	0.003	0.003
	n	3	3	3	3	2	2	2	2	1	2	2	2	1	2	2
	P (%)	0.01	0.0017	0.0017	0.0017	0.001	0.0005	0.0415	0.0055	0.001	0.05	0.015	0.0015	0.0015		0.0015
	N_L (dB)	1	1	1	1	—	—	1	0	0	0	1	1	1	1	1
	M_L (dB)	7	2	2	2	—	—	2	4.7	0.5	1	7	4	7	4	6
	W (dB)	4	0	0	4	—	—	0	0	0	0	4	0	4	0	0
Terrestrial station parameters	A	92 ³	55	55	55	55	55	55	55	25 ⁵	25 ⁵	40	40	55	55	35
	N	42 ⁴	42	42	42	42	42	42	42	-18	-18	43	43	42	42	40
	P_T	40 ³	13	13	13	13	13	13	13	-17 ⁵	-17 ⁵	-5	-5	10	10	-10
	N	0	0	0	0	0	0	0	0	-60	-60	-2	-2	-3	-3	-5
Reference band- width ⁶	G_X (dB)	52 ^{3, 4}	42	42	42	42	42	42	42	42	42	45	45	45	47	45
	B (Hz)	10 ⁶	10 ⁶	10 ⁶	10 ⁶	10 ⁷	10 ⁷	10 ⁶	10 ⁶	1	1	10 ⁶	27 × 10 ⁶	27 × 10 ⁶		10 ⁶
Permissible interference power	$P_{i,A}(P)$ in B (dBW)		-151.2			-125	-125	-154 ¹¹	-142	-220	-216		-131			-131

Notes to Table 8c:

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- A: analogue modulation; N: digital modulation.
- E is defined as the equivalent isotropically radiated power of the interfering terrestrial station in the reference bandwidth.
- In this band, the parameters for the terrestrial stations associated with transhorizon systems have been used. If an administration believes that transhorizon systems do not need to be considered, the line-of-sight radio-relay parameters associated with the frequency band 3.4-4.2 GHz may be used to determine the coordination area.
- Digital systems assumed to be non-transhorizon. Therefore $G_r = 42.0$ dBi. For digital transhorizon systems, parameters for analogue transhorizon systems above have been used.
- These values are estimated for 1 Hz bandwidth and are 30 dB below the total power assumed for emission.
- In certain systems in the fixed-satellite service it may be desirable to choose a greater reference bandwidth B . However, a greater bandwidth will result in smaller coordination distances and a later decision to reduce the reference bandwidth may require recoordination of the earth station.
- Geostationary-satellite systems.
- Non-geostationary satellites in the meteorological-satellite service notified in accordance with No. 5.461A may use the same coordination parameters.
- Non-geostationary-satellite systems.
- Space research earth stations in the band 8.4-8.5 GHz operate with non-geostationary satellites.
- For large earth stations: $P_f(p) = (G - 180)$ dBW
- For small earth stations: $P_f(20\%) = 2(G - 26) - 140$ dBW for $26 < G \leq 29$ dBi
- $P_f(20\%) = G - 163$ dBW for $G > 29$ dBi
- $P_f(p)\% = G - 163$ dBW for $G \leq 26$ dBi
- Applies to the broadcasting-satellite service in unplanned bands in Region 3.

TABLE 9a (WRC-12)

**Parameters required for the determination of coordination distance for a transmitting earth station
in bands shared bidirectionally with receiving earth stations**

Space service designation in which the transmitting earth station operates	Land mobile-satellite	Mobile-satellite	Land mobile-satellite	Earth exploration-satellite, meteorological-satellite	Mobile-satellite		Fixed-satellite, mobile-satellite	Aeronautical mobile-satellite (R) service		Fixed-satellite ³		Fixed-satellite, meteorological-satellite	Fixed-satellite
					Non-GSO	N		Non-GSO	GSO	Non-GSO	GSO		
Frequency bands (GHz)	0.1499-0.15005	0.272-0.273	0.3999-0.40005	0.401-0.402	0.401-0.402	1.670-1.675	2.655-2.690	5.030-5.091	5.150-5.216	6.700-7.075	8.025-8.400	8.025-8.400	
Space service designation in which the receiving earth station operates	Radio-navigation-satellite	Space operation	Radio-navigation-satellite	Space operation	Meteorological-satellite	Meteorological-satellite	Fixed-satellite, broadcasting-satellite	Aeronautical mobile-satellite (R) service	Radionavigation-satellite	Fixed-satellite	Earth exploration-satellite	Earth exploration-satellite	
Orbit ⁶		Non-GSO		Non-GSO	Non-GSO	GSO		Non-GSO	Non-GSO	Non-GSO	Non-GSO	GSO	
Modulation at receiving earth station		N		N	N	N				N	N	N	
p_0 (%)		1.0		0.1	0.006	0.011				0.005	0.011	0.083	
n		1		2	3	2				3	2	2	
p (%)		1.0		0.05	0.002	0.0055				0.0017	0.0055	0.0415	
M_L (dB)	0	0	0	0	0	0				1	0	1	
M_S (dB)	2	1	2	1	2.8	0.9	2		2	2	4.7	2	
W (dB)	0	0	0	0	0	0				0	0	0	
G_M (dB) ²	0	20	0	20	30	45		45	45	50.7			
G_T (dB) ⁴	0	19	0	19	19	8		8	10	10	10	8	
ϵ_{min} ⁵	3°	10°	3°	10°	5°	3°	3°	10°	3°	3°	5°	3°	
T_c (K) ⁷	200	500	200	500	370	118	75	340	340	75			
Reference bandwidth	4×10^3	10^3	4×10^3	1	10^6	4×10^3		37.5×10^3	37.5×10^3	10^6	10^6	10^6	
Permissible interference power in B	-172	-177	-172	-208	-145	-178		-163.5	-163.5	-151	-142	-154	

MOD

APPENDIX 15 (REV.WRC-12)

**Frequencies for distress and safety communications for the Global
Maritime Distress and Safety System (GMDSS)**

MOD

TABLE 15-2 (WRC-12)

Frequencies above 30 MHz (VHF/UHF)

Frequency (MHz)	Description of usage	Notes
*121.5	AERO-SAR	<p>The aeronautical emergency frequency 121.5 MHz is used for the purposes of distress and urgency for radiotelephony by stations of the aeronautical mobile service using frequencies in the band between 117.975 MHz and 137 MHz. This frequency may also be used for these purposes by survival craft stations. Use of the frequency 121.5 MHz by emergency position-indicating radio beacons shall be in accordance with Recommendation ITU-R M.690-1.</p> <p>Mobile stations of the maritime mobile service may communicate with stations of the aeronautical mobile service on the aeronautical emergency frequency 121.5 MHz for the purposes of distress and urgency only, and on the aeronautical auxiliary frequency 123.1 MHz for coordinated search and rescue operations, using class A3E emissions for both frequencies (see also Nos. 5.111 and 5.200). They shall then comply with any special arrangement between governments concerned by which the aeronautical mobile service is regulated.</p>

MOD

APPENDIX 17 (REV.WRC-12)

**Frequencies and channelling arrangements in the
high-frequency bands for the maritime mobile service**

(See Article 52)

ADD

This Appendix is separated into two annexes:

Annex 1 contains the existing frequency and channelling arrangements in the high-frequency bands for the maritime mobile service, in force until 31 December 2016.

Annex 2 contains the future frequency and channelling arrangements in the high-frequency bands for the maritime mobile service, as revised by WRC-12, which enter into force on 1 January 2017. (WRC-12)

ADD

ANNEX 1* (WRC-12)

**Frequencies and channelling arrangements in the high-frequency
bands for the maritime mobile service, in force
until 31 December 2016** (WRC-12)

ADD

ANNEX 2 (WRC-12)

**Frequency and channelling arrangements in the high-frequency
bands for the maritime mobile service, which
enter into force on 1 January 2017** (WRC-12)

PART A – Table of subdivided bands (WRC-12)

In the Table, where appropriate¹, the assignable frequencies in a given band for each usage are:

* Note by the Secretariat: Annex 1 contains the entire text of Appendix 17 (REV. WRC-07)

¹ Within the non-shaded boxes.

- indicated by the lowest and highest frequency, in heavy type, assigned in that band;
- regularly spaced, the number of assignable frequencies (*f*) and the spacing in kHz being indicated in italics.

**Table of frequencies (kHz) to be used in the band between 4 000 kHz and 27 500 kHz
allocated exclusively to the maritime mobile service**

Band (MHz)	4	6	8	12	16	18/19	22	25/26
Limits (kHz)	4 063	6 200	8 195	12 230	16 360	18 780	22 000	25 070
Frequencies assignable to ship stations for oceanographic data transmission <i>c)</i>	4 063.3 to 4 064.8 <i>6 f.</i> <i>0.3 kHz</i>							
Limits (kHz)	4 065	6 200	8 195	12 230	16 360	18 780	22 000	25 070
Frequencies assignable to ship stations for telephony, duplex operation <i>a) i) t) w)</i>	4 066.4 to 4 144.4 <i>27 f.</i> <i>3 kHz</i>	6 201.4 to 6 222.4 <i>8 f.</i> <i>3 kHz</i>	8 196.4 to 8 292.4 <i>33 f.</i> <i>3 kHz</i>	12 231.4 to 12 351.4 <i>41 f.</i> <i>3 kHz</i>	16 361.4 to 16 526.4 <i>56 f.</i> <i>3 kHz</i>	18 781.4 to 18 823.4 <i>15 f.</i> <i>3 kHz</i>	22 001.4 to 22 157.4 <i>53 f.</i> <i>3 kHz</i>	25 071.4 to 25 098.4 <i>10 f.</i> <i>3 kHz</i>
Limits (kHz)	4 146	6 224	8 294	12 353	16 528	18 825	22 159	25 100

**Table of frequencies (kHz) to be used in the band between 4 000 kHz and 27 500 kHz
allocated exclusively to the maritime mobile service (continued)**

Band (MHz)	4	6	8	12	16	18/19	22	25/26
Limits (kHz)	4 146	6 224	8 294	12 353	16 528	18 825	22 159	25 100
Frequencies assignable to ship stations as well as coast stations for telephony, simplex operation <i>a) u) v) w)</i>	4 147.4 to 4 150.4 <i>2 f.</i> <i>3 kHz</i>	6 225.4 to 6 231.4 <i>3 f.</i> <i>3 kHz</i>	8 295.4 to 8 298.4 <i>2 f.</i> <i>3 kHz</i>	12 354.4 to 12 366.4 <i>5 f.</i> <i>3 kHz</i>	16 529.4 to 16 547.4 <i>7 f.</i> <i>3 kHz</i>	18 826.4 to 18 844.4 <i>7 f.</i> <i>3 kHz</i>	22 160.4 to 22 178.4 <i>7 f.</i> <i>3 kHz</i>	25 101.4 to 25 119.4 <i>7 f.</i> <i>3 kHz</i>
Limits (kHz)	4 152	6 233	8 300	12 368	16 549	18 846	22 180	25 121
Frequencies assignable to ship stations for data transmission <i>e) m) p) q) r) u) w)</i>	4 153.5 to 4 168.5 <i>6 f.</i> <i>3 kHz</i>	6 234.5 to 6 258.5 <i>9 f.</i> <i>3 kHz</i>	8 301.5 to 8 337.5 <i>13 f.</i> <i>3 kHz</i>	12 369.5 to 12 417.5 <i>17 f.</i> <i>3 kHz</i>	16 550.5 to 16 613.5 <i>22 f.</i> <i>3 kHz</i>	18 847.5 to 18 871.5 <i>9 f.</i> <i>3 kHz</i>	22 181.5 to 22 238.5 <i>20 f.</i> <i>3 kHz</i>	25 122.5 to 25 176.5 <i>19 f.</i> <i>3 kHz</i>
Limits (kHz)	4 170	6 260	8 339	12 419	16 615	18 873	22 240	25 178
Frequencies assignable to ship as well as coast stations for data transmission <i>e) m) p) q) u) w)</i>								25 179.5 to 25 206.5 <i>10 f.</i> <i>3 kHz</i>
Limits (kHz)	4 170	6 260	8 339	12 419	16 615	18 873	22 240	25 208.25
Frequencies (paired and non-paired) assignable to ship stations for narrow-band direct-printing (NBDP) telegraphy and data transmission systems at speeds not exceeding 100 Bd for FSK and 200 Bd for PSK <i>b) d)</i>		6 260.25 to 6 260.75 <i>2 f.</i> <i>0.5 kHz</i>	8 339.25 to 8 339.75 <i>2 f.</i> <i>0.5 kHz</i>	12 419.25 to 12 419.75 <i>2 f.</i> <i>0.5 kHz</i>	16 615.25 to 16 616.75 <i>4 f.</i> <i>0.5 kHz</i>	18 873.5 to 18 880 <i>14 f.</i> <i>0.5 kHz</i>		
Limits (kHz)	4 170	6 261	8 340	12 420	16 617	18 880.25	22 240	25 208.25
Frequencies assignable to ship stations for oceanographic data transmission <i>c)</i>		6 261.3 to 6 262.5 <i>5 f.</i> <i>0.3 kHz</i>	8 340.3 to 8 341.5 <i>5 f.</i> <i>0.3 kHz</i>	12 420.3 to 12 421.5 <i>5 f.</i> <i>0.3 kHz</i>	16 617.3 to 16 618.5 <i>5 f.</i> <i>0.3 kHz</i>		22 240.3 to 22 241.5 <i>5 f.</i> <i>0.3 kHz</i>	
Limits (kHz)	4 170	6 262.75	8 341.75	12 421.75	16 618.75	18 880.25	22 241.75	25 208.25

**Table of frequencies (kHz) to be used in the band between 4 000 kHz and 27 500 kHz
allocated exclusively to the maritime mobile service (continued)**

Band (MHz)	4	6	8	12	16	18/19	22	25/26
Limits (kHz)	4 170	6 262.75	8 341.75	12 421.75	16 618.75	18 880.25	22 241.75	25 208.25
Frequencies (paired and non-paired) assignable to ship stations for narrow-band direct-printing (NBDP) telegraphy and data transmission systems at speeds not exceeding 100 Bd for FSK and 200 Bd for PSK <i>b) d) j)</i>	4 170.5 to 4 180 <i>20 f.</i> <i>0.5 kHz</i>	6 263 to 6 269.5 <i>14 f.</i> <i>0.5 kHz</i>		12 422 <i>1 f.</i> <i>0.5 kHz</i>				
Limits (kHz)	4 180.25	6 269.75	8 341.75	12 422.25	16 618.75	18 880.25	22 241.75	25 208.25
Frequencies assignable to ship stations for data transmission <i>e) m) p) q) u) w)</i>	4 181.75 to 4 187.75 <i>3f</i> <i>3 kHz</i>	6 271.25 to 6 277.25 <i>3 f.</i> <i>3 kHz</i>	8 343.25 to 8 358.25 <i>6 f.</i> <i>3 kHz</i>	12 423.75 to 12 450.75 <i>10 f.</i> <i>3 kHz</i>	16 620.25 to 16 680.25 <i>21 f.</i> <i>3 kHz</i>	18 881.75 to 18 893.75 <i>5 f.</i> <i>3 kHz</i>	22 243.25 to 22 288.25 <i>16 f.</i> <i>3 kHz</i>	
Limits (kHz)	4 189.25	6 278.75	8 359.75	12 452.25	16 681.75	18 895.25	22 289.75	25 208.25
Frequencies assignable to ship as well as coast stations for data transmission <i>e) m) p) q) u) w)</i>	4 190.75 to 4 196.75 <i>3f</i> <i>3 kHz</i>	6 280.25 to 6 310.25 <i>11 f.</i> <i>3 kHz</i>	8 361.25 to 8 373.25 <i>5 f.</i> <i>3 kHz</i>	12 453.75 to 12 474.75 <i>8 f.</i> <i>3 kHz</i>		18 896.75 <i>1 f.</i> <i>3 kHz</i>		
Limits (kHz)	4 198.25	6 311.75	8 374.75	12 476.25	16 681.75	18 898.25	22 289.75	25 208.25
Frequencies assignable to coast stations for data transmission <i>e) m) p) q) u) w)</i>	4 199.75 to 4 205.75 <i>3f</i> <i>3 kHz</i>							
Limits (kHz)	4 207.25	6 311.75	8 374.75	12 476.25	16 681.75	18 898.25	22 289.75	25 208.25

**Table of frequencies (kHz) to be used in the band between 4 000 kHz and 27 500 kHz
allocated exclusively to the maritime mobile service (continued)**

Band (MHz)	4	6	8	12	16	18/19	22	25/26
Limits (kHz)	4 207.25	6 311.75	8 374.75	12 476.25	16 681.75	18 898.25	22 289.75	25 208.25
Frequencies (paired and non-paired) assignable to ship stations for NBDP telegraphy and data transmission systems at speeds not exceeding 100 bauds for FSK and 200 bauds for PSK <i>b) d) j)</i>			8 375 to 8 383.5 <i>18 f.</i> <i>0.5 kHz</i>	12 476.5 to 12 522.5 <i>93 f.</i> <i>0.5 kHz</i>	16 682 to 16 698.5 <i>34 f.</i> <i>0.5 kHz</i>		22 290 to 22 299 <i>19 f.</i> <i>0.5 kHz</i>	
Limits (kHz)	4 207.25	6 311.75	8 383.75	12 522.75	16 698.75	18 898.25	22 299.25	25 208.25
Frequencies assignable to ship as well as coast stations for data transmission <i>e) p) q) u) w)</i>			8 385.5 to 8 406.5 <i>8 f.</i> <i>3 kHz</i>	12 524.25 to 12 575.25 <i>18 f.</i> <i>3 kHz</i>	16 700.5 to 16 802.5 <i>35 f.</i> <i>3 kHz</i>		22 300.75 to 22 372.75 <i>25 f.</i> <i>3 kHz</i>	
Limits (kHz)	4 207.25	6 311.75	8 408	12 576.75	16 804	18 898.25	22 374.25	25 208.25
Frequencies assignable to coast stations for data transmission <i>e) m) p) q) u) w)</i>			8 409.5 to 8 412.5 <i>2 f.</i> <i>3 kHz</i>					
Limits (kHz)	4 207.25	6 311.75	8 414	12 576.75	16 804	18 898.25	22 374.25	25 208.25

**Table of frequencies (kHz) to be used in the band between 4 000 kHz and 27 500 kHz
allocated exclusively to the maritime mobile service (continued)**

Band (MHz)	4	6	8	12	16	18/19	22	25/26
Limits (kHz)	4 207.25	6 311.75	8 414	12 576.75	16 804	18 898.25	22 374.25	25 208.25
Frequencies assignable to ship stations for digital selective calling <i>k) l)</i>	4 207.5 to 4 209 <i>4 f.</i> <i>0.5 kHz</i>	6 312 to 6 313.5 <i>4 f.</i> <i>0.5 kHz</i>	8 414.5 to 8 416 <i>4 f.</i> <i>0.5 kHz</i>	12 577 to 12 578.5 <i>4 f.</i> <i>0.5 kHz</i>	16 804.5 to 16 806 <i>4 f.</i> <i>0.5 kHz</i>	18 898.5 to 18 899.5 <i>3 f.</i> <i>0.5 kHz</i>	22 374.5 to 22 375.5 <i>3 f.</i> <i>0.5 kHz</i>	25 208.5 to 25 209.5 <i>3 f.</i> <i>0.5 kHz</i>
Limits (kHz)	4 209.25	6 313.75	8 416.25	12 578.75	16 806.25	18 899.75	22 375.75	25 210
Limits (kHz)	4 209.25	6 313.75	8 416.25	12 578.75	16 806.25	19 680.25	22 375.75	26 100.25
Frequencies (paired and non-paired) assignable to coast stations for NBDP and data transmission systems, at speeds not exceeding 100 Bd for FSK and 200 Bd for PSK <i>b) d) n) o)</i>	4 209.5 to 4 216 <i>14 f.</i> <i>0.5 kHz</i>	6 314 to 6 321.5 <i>16 f.</i> <i>0.5 kHz</i>	8 416.5 to 8 423.5 <i>15 f.</i> <i>0.5 kHz</i>	12 579 to 12 624.5 <i>92 f.</i> <i>0.5 kHz</i>	16 806.5 to 16 821.5 <i>31 f.</i> <i>0.5 kHz</i>	19 680.5 <i>1 f.</i> <i>0.5 kHz</i>	22 376 <i>1 f.</i> <i>0.5 kHz</i>	26 100.5 to 26 102.5 <i>5 f.</i> <i>0.5 kHz</i>
Limits (kHz)	4 216.25	6 321.75	8 423.75	12 624.75	16 821.75	19 680.75	22 376.25	26 102.75
Frequencies assignable to ship stations for data transmission <i>e) m) p) q) u) w)</i>							22 377.75 to 22 380.75 <i>2 f.</i> <i>3 kHz</i>	
Limits (kHz)	4 216.25	6 321.75	8 423.75	12 624.75	16 821.75	19 680.75	22 382.25	26 102.75
Frequencies assignable to ship as well as coast stations for data transmission <i>e) m) p) q) u) w)</i>	4 217.75 <i>1 f.</i> <i>3 kHz</i>				16 823.25 to 16 838.25 <i>6 f.</i> <i>3 kHz</i>			
Limits (kHz)	4 219.25	6 321.75	8 423.75	12 624.75	16 839.75	19 680.75	22 382.25	26 102.75

**Table of frequencies (kHz) to be used in the band between 4 000 kHz and 27 500 kHz
allocated exclusively to the maritime mobile service (continued)**

Band (MHz)	4	6	8	12	16	18/19	22	25/26
Limits (kHz)	4 219.25	6 321.75	8 423.75	12 624.75	16 839.75	19 680.75	22 382.25	26 102.75
Frequencies assignable to coast stations for data transmission <i>e) m) q) u) w)</i>		6 323.25 to 6 329.25 <i>3 f.</i> <i>3 kHz</i>	8 425.5 to 8 434.5 <i>4 f.</i> <i>3 kHz</i>	12 626.25 to 12 653.25 <i>10 f.</i> <i>3 kHz</i>	16 841.25 to 16 901.25 <i>21 f.</i> <i>3 kHz</i>	19 682.25 <i>1 f.</i> <i>3 kHz</i>		26 104.25 to 26 119.25 <i>6 f.</i> <i>3 kHz</i>
Limits (kHz)	4 219.25	6 330.75	8 436.25	12 654.75	16 902.75	19 683.75	22 382.25	26 120.75
Frequencies (paired and non-paired) assignable to coast stations for NBDP and data transmission systems, at speeds not exceeding 100 Bd for FSK and 200 Bd for PSK <i>b) d)</i>				12 655 to 12 656.5 <i>4 f.</i> <i>0.5 kHz</i>		19 684 to 19 691 <i>15 f.</i> <i>0.5 kHz</i>	22 382.5 to 22 389 <i>14 f.</i> <i>0.5 kHz</i>	
Limits (kHz)	4 219.25	6 330.75	8 436.25	12 656.75	16 902.75	19 691.25	22 389.25	26 120.75
Frequencies assignable to coast stations for data transmission <i>e) m) p) q) u) w)</i>						19 692.75 to 19 701.75 <i>4 f.</i> <i>3 kHz</i>	22 390.75 to 22 441.75 <i>18 f.</i> <i>3 kHz</i>	
Limits (kHz)	4 219.25	6 330.75	8 436.25	12 656.75	16 902.75	19 703.25	22 443.25	26 120.75
Frequencies (non-paired) assignable to coast stations for NBDP and data transmission systems, at speeds not exceeding 100 Bd for FSK and 200 Bd for PSK <i>b)</i>							22 443.5 <i>1 f.</i> <i>0.5 kHz</i>	
Limits (kHz)	4 219.25	6 330.75	8 436.25	12 656.75	16 902.75	19 703.25	22 443.75	26 120.75
Frequencies assignable to coast stations for digital selective calling <i>l)</i>	4 219.5 to 4 220.5 <i>3 f.</i> <i>0.5 kHz</i>	6 331 to 6 332 <i>3 f.</i> <i>0.5 kHz</i>	8 436.5 to 8 437.5 <i>3 f.</i> <i>0.5 kHz</i>	12 657 to 12 658 <i>3 f.</i> <i>0.5 kHz</i>	16 903 to 16 904 <i>3 f.</i> <i>0.5 kHz</i>	19 703.5 to 19 704.5 <i>3 f.</i> <i>0.5 kHz</i>	22 444 to 22 445 <i>3 f.</i> <i>0.5 kHz</i>	26 121 to 26 122 <i>3 f.</i> <i>0.5 kHz</i>
Limits (kHz)	4 221	6 332.5	8 438	12 658.5	16 904.5	19 705	22 445.5	26 122.5

**Table of frequencies (kHz) to be used in the band between 4 000 kHz and 27 500 kHz
allocated exclusively to the maritime mobile service (end)**

Band (MHz)	4	6	8	12	16	18/19	22	25/26
Limits (kHz)	4 221	6 332.5	8 438	12 658.5	16 904.5	19 705	22 445.5	26 122.5
Frequencies assignable for wide-band systems, facsimile, special and data transmission systems and direct-printing telegraphy systems <i>m) p) s)</i>								
Limits (kHz)	4 351	6 501	8 707	13 077	17 242	19 755	22 696	26 145
Frequencies assignable to coast stations for telephony, duplex operation <i>a) t) w)</i>	4 352.4 to 4 436.4 <i>29 f.</i> <i>3 kHz</i>	6 502.4 to 6 523.4 <i>8 f.</i> <i>3 kHz</i>	8 708.4 to 8 813.4 <i>36 f.</i> <i>3 kHz</i>	13 078.4 to 13 198.4 <i>41 f.</i> <i>3 kHz</i>	17 243.4 to 17 408.4 <i>56 f.</i> <i>3 kHz</i>	19 756.4 to 19 798.4 <i>15 f.</i> <i>3 kHz</i>	22 697.4 to 22 853.4 <i>53 f.</i> <i>3 kHz</i>	26 146.4 to 26 173.4 <i>10 f.</i> <i>3 kHz</i>
Limits (kHz)	4 438	6 525	8 815	13 200	17 410	19 800	22 855	26 175

a) See Part B, Section I.

b) See Part B, Section III.

c) The frequency bands may also be used by buoy stations for oceanographic data transmission and by stations interrogating these buoys.

d) See Part B, Section II.

e) See Part B, Section IV.

i) For the use of the carrier frequencies 4 125 kHz, 6 215 kHz, 8 291 kHz, 12 290 kHz and 16 420 kHz in these sub-bands by ship and coast stations for distress and safety purposes, by single-sideband radiotelephony, see Article 31.

j) For the use of the assigned frequencies 4 177.5 kHz, 6 268 kHz, 8 376.5 kHz, 12 520 kHz and 16 695 kHz in these sub-bands by ship and coast stations for distress and safety purposes, by NBDP telegraphy, see Article 31.

k) For the use of the assigned frequencies 4 207.5 kHz, 6 312 kHz, 8 414.5 kHz, 12 577 kHz and 16 804.5 kHz in these sub-bands by ship and coast stations for distress and safety purposes, by digital selective calling, see Article 31.

l) The following paired assigned frequencies (for ship/coast stations) 4 208/4 219.5 kHz, 6 312.5/6 331 kHz, 8 415/8 436.5 kHz, 12 577.5/12 657 kHz, 16 805/16 903 kHz, 18 898.5/19 703.5 kHz, 22 374.5/22 444 kHz and 25 208.5/26 121 kHz are the first choice international frequencies for digital selective calling (see Article 54).

m) Frequencies from these frequency bands may also be used for A1A or A1B Morse telegraphy subject to not claiming protection from other stations in the maritime mobile service using digitally modulated emissions. Any frequencies so assigned shall be multiples of 100 Hz. Administrations shall ensure a uniform distribution of such assignments within the bands.

n) The assigned frequencies 4 210 kHz, 6 314 kHz, 8 416.5 kHz, 12 579 kHz, 16 806.5 kHz, 19 680.5 kHz, 22 376 kHz and 26 100.5 kHz are the exclusive international frequencies for the transmission of maritime safety information (MSI) (see Articles 31 and 33).

o) The frequency 4 209.5 kHz is an exclusive international frequency for the transmission of NAVTEX type information (see Articles 31 and 33).

p) These sub-bands, except the frequencies referred to in Notes *i)*, *j)*, *n)* and *o)*, are designated for digitally modulated emissions in the maritime mobile service (e.g. as described in Recommendation ITU-R M.1798). The provisions of No. 15.8 apply.

q) These frequency bands may be used by narrow-band direct-printing applications by administrations, subject to not claiming protection from other stations in the maritime mobile service using digitally modulated emissions.

r) Frequencies in these bands may be used for wide-band telegraphy, facsimile and special data transmission on the condition that interference is not caused to and protection is not claimed from stations in the maritime mobile service using digitally modulated emissions.

s) The frequency bands 4 345-4 351 kHz, 6 495-6 501 kHz, 8 701-8 707 kHz may be used for simplex (single-sideband) telephone operation (regularly spaced by 3 kHz), in accordance with provision No. 52.177, subject to not claiming protection from other stations in the maritime mobile service using digitally modulated emissions.

t) The frequency bands 4 065-4 146 kHz, 4 351-4 438 kHz, 6 200-6 224 kHz, 6 501-6 525 kHz, 8 195-8 294 kHz, 8 707-8 815 kHz, 12 230-12 353 kHz, 13 077-13 200 kHz, 16 360-16 528 kHz, 17 242-17 410 kHz, 18 780-18 825 kHz, 19 755-19 800 kHz, 22 000-22 159 kHz, 22 696-22 855 kHz, 25 070-25 100 kHz and 26 145-26 175 kHz may be used, in accordance with the Appendix 25 allotment Plan, for digitally modulated emissions as described in Recommendation ITU-R M.1798 on the condition that it shall not cause harmful interference to, or claim protection from other stations in the maritime mobile service using radiotelephony operations. The digitally modulated emissions may be used provided that their occupied bandwidth does not exceed 2 800 Hz, it is situated wholly within one frequency channel and the peak envelope power of coast stations does not exceed 10 kW and the peak envelope power of ship stations does not exceed 1.5 kW per channel.

u) These frequency bands may be used for wide-band digitally modulated emissions by combining multiple 3 kHz contiguous channels.

v) The frequency bands 4 146-4 152 kHz, 6 224-6 233 kHz, 8 294-8 300 kHz, 12 353-12 368 kHz, 16 528-16 549 kHz, 18 825-18 846 kHz, 22 159-22 180 and 25 100-25 121 kHz may be used for simplex digitally modulated emissions as described in Recommendation ITU-R M.1798 on condition that it shall not cause harmful interference to, or claim protection from other stations in the maritime mobile service using radiotelephony operations. The digitally modulated emissions may be used provided that their occupied bandwidth does not exceed 2 800 Hz, it is situated wholly within one frequency channel and the peak envelope power of coast stations does not exceed 10 kW and the peak envelope power of ship stations does not exceed 1.5 kW per channel.

w) Administrations that intend to use Annex 2 to introduce data transmissions before 1 January 2017 for stations operating in the maritime mobile service shall not cause harmful interference to nor claim protection from stations in the maritime mobile service operating in accordance with Annex 1 of this Appendix and are encouraged to coordinate bilaterally with affected administrations.

PART B – Channelling arrangements (WRC-12)

Section I – Radiotelephony

1 Radiotelephone channelling arrangements for the frequencies to be used by coast and ship stations in the bands allocated to the maritime mobile service are indicated in the following Sub-Sections:

- Sub-Section A* – Table of single-sideband transmitting frequencies (kHz) for duplex (two-frequency) operation;
- Sub-Section B* – Table of single-sideband transmitting frequencies (kHz) for simplex (single-frequency) operation and for intership cross-band (two-frequency) operation;
- Sub-Section C-1* – Table of recommended single-sideband transmitting frequencies (kHz) for ship stations in the band 4 000-4 063 kHz shared with the fixed service;
- Sub-Section C-2* – Table of recommended single-sideband transmitting frequencies (kHz) for ship and coast stations in the band 8 100-8 195 kHz shared with the fixed service.

2 The technical characteristics for single-sideband transmitters are specified in Recommendation ITU-R M.1173.

3 One or more series of frequencies from Sub-Section A (with the exception of those frequencies mentioned in § 5 below) may be assigned to each coast station, which uses these frequencies associated in pairs (see No. **52.226**); each pair consists of a transmitting and a receiving frequency. The series shall be selected with due regard to the areas served and so as to avoid, as far as possible, harmful interference between the services of different coast stations.

4 The frequencies in Sub-Section B are provided for worldwide common use by ships of all categories, according to traffic requirements, for ship transmissions to coast stations and for intership communication. They are also authorized for worldwide common use for transmissions by coast stations (simplex operation) provided the peak envelope power does not exceed 1 kW.

5 The following frequencies in Sub-Section A are allocated for calling purposes:

- Channel No. 421 in the 4 MHz band;
- Channel No. 606 in the 6 MHz band;
- Channel No. 821 in the 8 MHz band;
- Channel No. 1221 in the 12 MHz band;
- Channel No. 1621 in the 16 MHz band;
- Channel No. 1806 in the 18 MHz band;
- Channel No. 2221 in the 22 MHz band;
- Channel No. 2510 in the 25 MHz band.

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)** (see Nos. **52.221A** and **52.222A**).

The remaining frequencies in Sub-Sections A, B, C-1 and C-2 are working frequencies.

5A For the use of the carrier frequencies:

- 4 125 kHz (Channel No. 421);
- 6 215 kHz (Channel No. 606);
- 8 291 kHz (Channel No. 833);
- 12 290 kHz (Channel No. 1221);
- 16 420 kHz (Channel No. 1621);

in Sub-Section A, by coast and ship stations for distress and safety purposes, see Article **31**.

6 *a)* Maritime radiotelephone stations using single-sideband emissions in the bands between 4 000 kHz and 27 500 kHz exclusively allocated to the maritime mobile service shall operate only on the carrier frequencies shown in the Sub-Sections A and B and, in the case of analogue radiotelephony, shall be in conformity with the technical characteristics specified in Recommendation ITU-R M.1173.

b) Ship stations, when using frequencies for single-sideband emissions in the bands 4 000-4 063 kHz and ship and coast stations, when using frequencies for single-sideband emissions in the band 8 100-8 195 kHz should operate on the carrier frequencies indicated in Sub-Sections C-1 and C-2 respectively. In the case of analogue radiotelephony technical characteristics of the equipment shall be those specified in Recommendation ITU-R M.1173.

c) Stations, when employing the single-sideband mode for analogue radiotelephony, shall use only class J3E emissions. For digital communications, class J2D emissions shall be used.

7 The channelling plan established in Sub-Section C-2 does not prejudice the rights of administrations to establish, and to notify assignments to stations in the maritime mobile service other than those using radiotelephony in the band 8 100-8 195 kHz, in conformity with the relevant provisions of these Regulations.

Sub-Section A**Table of single-sideband transmitting frequencies (kHz) for duplex
(two-frequency) operation**

Channel No.	4 MHz band			
	Coast stations		Ship stations	
	Carrier frequency	Assigned frequency	Carrier frequency	Assigned frequency
401	4 357	4 358.4	4 065	4 066.4
402	4 360	4 361.4	4 068	4 069.4
403	4 363	4 364.4	4 071	4 072.4
404	4 366	4 367.4	4 074	4 075.4
405	4 369	4 370.4	4 077	4 078.4
406	4 372	4 373.4	4 080	4 081.4
407	4 375	4 376.4	4 083	4 084.4
408	4 378	4 379.4	4 086	4 087.4
409	4 381	4 382.4	4 089	4 090.4
410	4 384	4 385.4	4 092	4 093.4
411	4 387	4 388.4	4 095	4 096.4
412	4 390	4 391.4	4 098	4 099.4
413	4 393	4 394.4	4 101	4 102.4
414	4 396	4 397.4	4 104	4 105.4
415	4 399	4 400.4	4 107	4 108.4
416	4 402	4 403.4	4 110	4 111.4
417	4 405	4 406.4	4 113	4 114.4
418	4 408	4 409.4	4 116	4 117.4
419	4 411	4 412.4	4 119	4 120.4
420	4 414	4 415.4	4 122	4 123.4
421	4 417 *	4 418.4 *	4 125 * ³	4 126.4 *
422	4 420	4 421.4	4 128	4 129.4
423	4 423	4 424.4	4 131	4 132.4
424	4 426	4 427.4	4 134	4 135.4
425	4 429	4 430.4	4 137	4 138.4
426	4 432	4 433.4	4 140	4 141.4
427	4 435	4 436.4	4 143	4 144.4
428 ^{1,2}	4 351	4 352.4	—	—
429 ^{1,2}	4 354	4 355.4	—	—

Channel No.	6 MHz band			
	Coast stations		Ship stations	
	Carrier frequency	Assigned frequency	Carrier frequency	Assigned frequency
601	6 501	6 502.4	6 200	6 201.4
602	6 504	6 505.4	6 203	6 204.4
603	6 507	6 508.4	6 206	6 207.4
604	6 510	6 511.4	6 209	6 210.4
605	6 513	6 514.4	6 212	6 213.4
606	6 516 *	6 517.4 *	6 215 * ⁴	6 216.4 *
607	6 519	6 520.4	6 218	6 219.4
608	6 522	6 523.4	6 221	6 222.4

Channel No.	8 MHz band			
	Coast stations		Ship stations	
	Carrier frequency	Assigned frequency	Carrier frequency	Assigned frequency
801	8 719	8 720.4	8 195	8 196.4
802	8 722	8 723.4	8 198	8 199.4
803	8 725	8 726.4	8 201	8 202.4
804	8 728	8 729.4	8 204	8 205.4
805	8 731	8 732.4	8 207	8 208.4
806	8 734	8 735.4	8 210	8 211.4
807	8 737	8 738.4	8 213	8 214.4
808	8 740	8 741.4	8 216	8 217.4
809	8 743	8 744.4	8 219	8 220.4
810	8 746	8 747.4	8 222	8 223.4
811	8 749	8 750.4	8 225	8 226.4
812	8 752	8 753.4	8 228	8 229.4
813	8 755	8 756.4	8 231	8 232.4
814	8 758	8 759.4	8 234	8 235.4
815	8 761	8 762.4	8 237	8 238.4
816	8 764	8 765.4	8 240	8 241.4
817	8 767	8 768.4	8 243	8 244.4
818	8 770	8 771.4	8 246	8 247.4
819	8 773	8 774.4	8 249	8 250.4
820	8 776	8 777.4	8 252	8 253.4
821	8 779 *	8 780.4 *	8 255 *	8 256.4 *
822	8 782	8 783.4	8 258	8 259.4
823	8 785	8 786.4	8 261	8 262.4
824	8 788	8 789.4	8 264	8 265.4
825	8 791	8 792.4	8 267	8 268.4
826	8 794	8 795.4	8 270	8 271.4
827	8 797	8 798.4	8 273	8 274.4
828	8 800	8 801.4	8 276	8 277.4
829	8 803	8 804.4	8 279	8 280.4
830	8 806	8 807.4	8 282	8 283.4
831	8 809	8 810.4	8 285	8 286.4
832	8 812	8 813.4	8 288	8 289.4
833	8 291 ⁶	8 292.4	8 291 ⁶	8 292.4
834 ^{2, 5}	8 707	8 708.4	—	—
835 ^{2, 5}	8 710	8 711.4	—	—
836 ^{2, 5}	8 713	8 714.4	—	—
837 ^{2, 5}	8 716	8 717.4	—	—

Channel No.	12 MHz band			
	Coast stations		Ship stations	
	Carrier frequency	Assigned frequency	Carrier frequency	Assigned frequency
1201	13 077	13 078.4	12 230	12 231.4
1202	13 080	13 081.4	12 233	12 234.4
1203	13 083	13 084.4	12 236	12 237.4
1204	13 086	13 087.4	12 239	12 240.4
1205	13 089	13 090.4	12 242	12 243.4
1206	13 092	13 093.4	12 245	12 246.4
1207	13 095	13 096.4	12 248	12 249.4
1208	13 098	13 099.4	12 251	12 252.4
1209	13 101	13 102.4	12 254	12 255.4
1210	13 104	13 105.4	12 257	12 258.4
1211	13 107	13 108.4	12 260	12 261.4
1212	13 110	13 111.4	12 263	12 264.4
1213	13 113	13 114.4	12 266	12 267.4
1214	13 116	13 117.4	12 269	12 270.4
1215	13 119	13 120.4	12 272	12 273.4
1216	13 122	13 123.4	12 275	12 276.4
1217	13 125	13 126.4	12 278	12 279.4
1218	13 128	13 129.4	12 281	12 282.4
1219	13 131	13 132.4	12 284	12 285.4
1220	13 134	13 135.4	12 287	12 288.4
1221	13 137 *	13 138.4 *	12 290 * ⁷	12 291.4 *
1222	13 140	13 141.4	12 293	12 294.4
1223	13 143	13 144.4	12 296	12 297.4
1224	13 146	13 147.4	12 299	12 300.4
1225	13 149	13 150.4	12 302	12 303.4
1226	13 152	13 153.4	12 305	12 306.4
1227	13 155	13 156.4	12 308	12 309.4
1228	13 158	13 159.4	12 311	12 312.4
1229	13 161	13 162.4	12 314	12 315.4
1230	13 164	13 165.4	12 317	12 318.4
1231	13 167	13 168.4	12 320	12 321.4
1232	13 170	13 171.4	12 323	12 324.4
1233	13 173	13 174.4	12 326	12 327.4
1234	13 176	13 177.4	12 329	12 330.4
1235	13 179	13 180.4	12 332	12 333.4
1236	13 182	13 183.4	12 335	12 336.4
1237	13 185	13 186.4	12 338	12 339.4
1238	13 188	13 189.4	12 341	12 342.4
1239	13 191	13 192.4	12 344	12 345.4
1240	13 194	13 195.4	12 347	12 348.4
1241	13 197	13 198.4	12 350	12 351.4

Channel No.	16 MHz band			
	Coast stations		Ship stations	
	Carrier frequency	Assigned frequency	Carrier frequency	Assigned frequency
1601	17242	17243.4	16360	16361.4
1602	17245	17246.4	16363	16364.4
1603	17248	17249.4	16366	16367.4
1604	17251	17252.4	16369	16370.4
1605	17254	17255.4	16372	16373.4
1606	17257	17258.4	16375	16376.4
1607	17260	17261.4	16378	16379.4
1608	17263	17264.4	16381	16382.4
1609	17266	17267.4	16384	16385.4
1610	17269	17270.4	16387	16388.4
1611	17272	17273.4	16390	16391.4
1612	17275	17276.4	16393	16394.4
1613	17278	17279.4	16396	16397.4
1614	17281	17282.4	16399	16400.4
1615	17284	17285.4	16402	16403.4
1616	17287	17288.4	16405	16406.4
1617	17290	17291.4	16408	16409.4
1618	17293	17294.4	16411	16412.4
1619	17296	17297.4	16414	16415.4
1620	17299	17300.4	16417	16418.4
1621	17302 *	17303.4 *	16420 * ⁸	16421.4 *
1622	17305	17306.4	16423	16424.4
1623	17308	17309.4	16426	16427.4
1624	17311	17312.4	16429	16430.4
1625	17314	17315.4	16432	16433.4
1626	17317	17318.4	16435	16436.4
1627	17320	17321.4	16438	16439.4
1628	17323	17324.4	16441	16442.4
1629	17326	17327.4	16444	16445.4
1630	17329	17330.4	16447	16448.4
1631	17332	17333.4	16450	16451.4
1632	17335	17336.4	16453	16454.4
1633	17338	17339.4	16456	16457.4
1634	17341	17342.4	16459	16460.4
1635	17344	17345.4	16462	16463.4
1636	17347	17348.4	16465	16466.4
1637	17350	17351.4	16468	16469.4
1638	17353	17354.4	16471	16472.4
1639	17356	17357.4	16474	16475.4
1640	17359	17360.4	16477	16478.4
1641	17362	17363.4	16480	16481.4
1642	17365	17366.4	16483	16484.4
1643	17368	17369.4	16486	16487.4
1644	17371	17372.4	16489	16490.4
1645	17374	17375.4	16492	16493.4
1646	17377	17378.4	16495	16496.4
1647	17380	17381.4	16498	16499.4
1648	17383	17384.4	16501	16502.4
1649	17386	17387.4	16504	16505.4
1650	17389	17390.4	16507	16508.4
1651	17392	17393.4	16510	16511.4
1652	17395	17396.4	16513	16514.4
1653	17398	17399.4	16516	16517.4
1654	17401	17402.4	16519	16520.4
1655	17404	17405.4	16522	16523.4
1656	17407	17408.4	16525	16526.4

Channel No.	18/19 MHz band			
	Coast stations		Ship stations	
	Carrier frequency	Assigned frequency	Carrier frequency	Assigned frequency
1801	19 755	19 756.4	18 780	18 781.4
1802	19 758	19 759.4	18 783	18 784.4
1803	19 761	19 762.4	18 786	18 787.4
1804	19 764	19 765.4	18 789	18 790.4
1805	19 767	19 768.4	18 792	18 793.4
1806	19 770 *	19 771.4 *	18 795 *	18 796.4 *
1807	19 773	19 774.4	18 798	18 799.4
1808	19 776	19 777.4	18 801	18 802.4
1809	19 779	19 780.4	18 804	18 805.4
1810	19 782	19 783.4	18 807	18 808.4
1811	19 785	19 786.4	18 810	18 811.4
1812	19 788	19 789.4	18 813	18 814.4
1813	19 791	19 792.4	18 816	18 817.4
1814	19 794	19 795.4	18 819	18 820.4
1815	19 797	19 798.4	18 822	18 823.4

Channel No.	22 MHz band			
	Coast stations		Ship stations	
	Carrier frequency	Assigned frequency	Carrier frequency	Assigned frequency
2201	22 696	22 697.4	22 000	22 001.4
2202	22 699	22 700.4	22 003	22 004.4
2203	22 702	22 703.4	22 006	22 007.4
2204	22 705	22 706.4	22 009	22 010.4
2205	22 708	22 709.4	22 012	22 013.4
2206	22 711	22 712.4	22 015	22 016.4
2207	22 714	22 715.4	22 018	22 019.4
2208	22 717	22 718.4	22 021	22 022.4
2209	22 720	22 721.4	22 024	22 025.4
2210	22 723	22 724.4	22 027	22 028.4
2211	22 726	22 727.4	22 030	22 031.4
2212	22 729	22 730.4	22 033	22 034.4
2213	22 732	22 733.4	22 036	22 037.4
2214	22 735	22 736.4	22 039	22 040.4
2215	22 738	22 739.4	22 042	22 043.4
2216	22 741	22 742.4	22 045	22 046.4
2217	22 744	22 745.4	22 048	22 049.4
2218	22 747	22 748.4	22 051	22 052.4
2219	22 750	22 751.4	22 054	22 055.4
2220	22 753	22 754.4	22 057	22 058.4
2221	22 756 *	22 757.4 *	22 060 *	22 061.4 *
2222	22 759	22 760.4	22 063	22 064.4
2223	22 762	22 763.4	22 066	22 067.4
2224	22 765	22 766.4	22 069	22 070.4
2225	22 768	22 769.4	22 072	22 073.4

Channel No.	22 MHz band (<i>end</i>)			
	Coast stations		Ship stations	
	Carrier frequency	Assigned frequency	Carrier frequency	Assigned frequency
2226	22 771	22 772.4	22 075	22 076.4
2227	22 774	22 775.4	22 078	22 079.4
2228	22 777	22 778.4	22 081	22 082.4
2229	22 780	22 781.4	22 084	22 085.4
2230	22 783	22 784.4	22 087	22 088.4
2231	22 786	22 787.4	22 090	22 091.4
2232	22 789	22 790.4	22 093	22 094.4
2233	22 792	22 793.4	22 096	22 097.4
2234	22 795	22 796.4	22 099	22 100.4
2235	22 798	22 799.4	22 102	22 103.4
2236	22 801	22 802.4	22 105	22 106.4
2237	22 804	22 805.4	22 108	22 109.4
2238	22 807	22 808.4	22 111	22 112.4
2239	22 810	22 811.4	22 114	22 115.4
2240	22 813	22 814.4	22 117	22 118.4
2241	22 816	22 817.4	22 120	22 121.4
2242	22 819	22 820.4	22 123	22 124.4
2243	22 822	22 823.4	22 126	22 127.4
2244	22 825	22 826.4	22 129	22 130.4
2245	22 828	22 829.4	22 132	22 133.4
2246	22 831	22 832.4	22 135	22 136.4
2247	22 834	22 835.4	22 138	22 139.4
2248	22 837	22 838.4	22 141	22 142.4
2249	22 840	22 841.4	22 144	22 145.4
2250	22 843	22 844.4	22 147	22 148.4
2251	22 846	22 847.4	22 150	22 151.4
2252	22 849	22 850.4	22 153	22 154.4
2253	22 852	22 853.4	22 156	22 157.4

Channel No.	25/26 MHz band			
	Coast stations		Ship stations	
	Carrier frequency	Assigned frequency	Carrier frequency	Assigned frequency
2501	26 145	26 146.4	25 070	25 071.4
2502	26 148	26 149.4	25 073	25 074.4
2503	26 151	26 152.4	25 076	25 077.4
2504	26 154	26 155.4	25 079	25 080.4
2505	26 157	26 158.4	25 082	25 083.4
2506	26 160	26 161.4	25 085	25 086.4
2507	26 163	26 164.4	25 088	25 089.4
2508	26 166	26 167.4	25 091	25 092.4
2509	26 169	26 170.4	25 094	25 095.4
2510	26 172 *	26 173.4 *	25 097 *	25 098.4 *

¹ These coast station frequencies may be paired with a ship station frequency from the Table of simplex frequencies for ship and coast stations (see Sub-Section B) or with a frequency from the band 4 000-4 063 kHz (see Sub-Section C-1) to be selected by the administration concerned.

² These channels may also be used for simplex (single frequency) operation.

³ For the conditions of use of the carrier frequency 4 125 kHz, see Nos. **52.224** and **52.225**, and Appendix **15**.

⁴ For the conditions of use of the carrier frequency 6 215 kHz, see Appendix **15**.

⁵ These coast station frequencies may be paired with a ship station frequency from the Table of simplex frequencies for ship and coast stations (see Sub-Section B) or with a frequency from the band 8 100-8 195 kHz (see Sub-Section C-2) to be selected by the administration concerned.

⁶ For the conditions of use of the carrier frequency 8 291 kHz, see Appendix **15**.

⁷ For the conditions of use of the carrier frequency 12 290 kHz, see Nos. **52.221A** and **52.222A** and Appendix **15**.

⁸ For the conditions of use of the carrier frequency 16 420 kHz, see Nos. **52.221A** and **52.222A** and Appendix **15**.

* The frequencies followed by an asterisk are calling frequencies (see Nos. **52.221** and **52.222**).

Sub-Section B

Table of single-sideband transmitting frequencies (kHz) for simplex (single-frequency) operation and for intership cross-band (two-frequency) operation

(See § 4 of Section I of this Appendix)

4 MHz band ¹		6 MHz band		8 MHz band ²		12 MHz band ³	
Carrier frequency	Assigned frequency	Carrier frequency	Assigned frequency	Carrier frequency	Assigned frequency	Carrier frequency	Assigned frequency
4 146	4 147.4	6 224	6 225.4	8 294	8 295.4	12 353	12 354.4
4 149	4 150.4	6 227	6 228.4	8 297	8 298.4	12 356	12 357.4
		6 230	6 231.4			12 362	12 363.4
						12 365	12 366.4

¹ These frequencies may be used for duplex operation with coast stations operating on Channel Nos. 428 and 429 (see Sub-Section A).

² These frequencies may be used for duplex operation with coast stations operating on Channel Nos. 834 up to and including 837 (see Sub-Section A).

³ For use of frequencies 12 359 kHz and 16 537 kHz, see Nos. **52.221A** and **52.222A**.

16 MHz band ³		18/19 MHz band		22 MHz band		25/26 MHz band	
Carrier frequency	Assigned frequency	Carrier frequency	Assigned frequency	Carrier frequency	Assigned frequency	Carrier frequency	Assigned frequency
16 528	16 529.4	18 825	18 826.4	22 159	22 160.4	25 100	25 101.4
16 531	16 532.4	18 828	18 829.4	22 162	22 163.4	25 103	25 104.4
16 534	16 535.4	18 831	18 832.4	22 165	22 166.4	25 106	25 107.4
		18 834	18 835.4	22 168	22 169.4	25 109	25 110.4
16 540	16 541.4	18 837	18 838.4	22 171	22 172.4	25 112	25 113.4
16 543	16 544.4	18 840	18 841.4	22 174	22 175.4	25 115	25 116.4
16 546	16 547.4	18 843	18 844.4	22 177	22 178.4	25 118	25 119.4

3

For use of frequencies 12 359 kHz and 16 537 kHz, see Nos. **52.221A** and **52.222A**.

Sub-Section C-1

Table of recommended single-sideband transmitting frequencies (kHz) for ship stations in the band 4 000-4 063 kHz shared with the fixed service

The frequencies in this Sub-Section may be used:

- for supplementing ship-to-shore channels for duplex operation in Sub-Section A;
- for intership simplex (single-frequency) and cross-band operation;
- for cross-band working with coast stations on channels in Sub-Section C-2;
- for duplex operation with coast stations working in the band 4 438-4 650 kHz;
- for duplex operation with Channel Nos. 428 and 429.

Channel No.	Carrier frequency	Assigned frequency	Channel No.	Carrier frequency	Assigned frequency
1	4 000*	4 001.4*	12	4 033	4 034.4
2	4 003*	4 004.4*	13	4 036	4 037.4
3	4 006	4 007.4	14	4 039	4 040.4
4	4 009	4 010.4	15	4 042	4 043.4
5	4 012	4 013.4	16	4 045	4 046.4
6	4 015	4 016.4	17	4 048	4 049.4
7	4 018	4 019.4	18	4 051	4 052.4
8	4 021	4 022.4	19	4 054	4 055.4
9	4 024	4 025.4	20	4 057	4 058.4
10	4 027	4 028.4	21	4 060	4 061.4
11	4 030	4 031.4			

* Administrations are requested to urge ship stations under their jurisdiction to refrain from using the band 4 000-4 005 kHz when navigating in Region 3 (see also No. **5.126**).

Sub-Section C-2**Table of recommended single-sideband transmitting frequencies (kHz) for ship and coast stations in the band 8 100-8 195 kHz shared with the fixed service**

(See § 7 of Section I of this Appendix)

The frequencies in this Sub-Section may be used:

- for supplementing ship-to-shore and shore-to-ship channels for duplex operation in Sub-Section A;
- for intership simplex (single frequency) and cross-band operation;
- for cross-band working with ship stations on channels in Sub-Section C-1;
- for ship-to-shore or shore-to-ship simplex operation;
- for duplex operation with Channel Nos. 834, 835, 836 and 837.

Channel No.	Carrier frequency	Assigned frequency	Channel No.	Carrier frequency	Assigned frequency
1	8 101	8 102.4	17	8 149	8 150.4
2	8 104	8 105.4	18	8 152	8 153.4
3	8 107	8 108.4	19	8 155	8 156.4
4	8 110	8 111.4	20	8 158	8 159.4
5	8 113	8 114.4	21	8 161	8 162.4
6	8 116	8 117.4	22	8 164	8 165.4
7	8 119	8 120.4	23	8 167	8 168.4
8	8 122	8 123.4	24	8 170	8 171.4
9	8 125	8 126.4	25	8 173	8 174.4
10	8 128	8 129.4	26	8 176	8 177.4
11	8 131	8 132.4	27	8 179	8 180.4
12	8 134	8 135.4	28	8 182	8 183.4
13	8 137	8 138.4	29	8 185	8 186.4
14	8 140	8 141.4	30	8 188	8 189.4
15	8 143	8 144.4	31	8 191	8 192.4
16	8 146	8 147.4			

Section II – Narrow-band direct-printing telegraphy (paired frequencies)

1 Each coast station which uses paired frequencies is assigned one or more frequency pairs from the following series; each pair consists of a transmitting and a receiving frequency.

2 The speed of the narrow-band direct-printing telegraphy and data systems shall not exceed 100 Bd for FSK and 200 Bd for PSK.

Table of frequencies for two-frequency operation by coast stations (kHz)

Channel No.	4 MHz band		6 MHz band		8 MHz band	
	Transmit	Receive	Transmit	Receive	Transmit	Receive
1	4 210.5	4 172.5	6 314.5	6 263	8 376.5	8 376.5
2	4 211	4 173	6 315	6 263.5	8 417	8 377
3	4 211.5	4 173.5	6 315.5	6 264	8 417.5	8 377.5
4	4 212	4 174	6 316	6 264.5	8 418	8 378
5	4 212.5	4 174.5	6 316.5	6 265	8 418.5	8 378.5
6	4 213	4 175	6 317	6 265.5	8 419	8 379
7	4 213.5	4 175.5	6 317.5	6 266	8 419.5	8 379.5
8	4 214	4 176	6 318	6 266.5	8 420	8 380
9	4 214.5	4 176.5	6 318.5	6 267	8 420.5	8 380.5
10	4 215	4 177	6 319	6 267.5	8 421	8 381
11	4 177.5	4 177.5	6 268	6 268	8 421.5	8 381.5
12	4 215.5	4 178	6 319.5	6 268.5	8 422	8 382
13	4 216	4 178.5	6 320	6 269	8 422.5	8 382.5
14			6 320.5	6 269.5	8 423	8 383
15					8 423.5	8 383.5

Table of frequencies for two-frequency operation by coast stations (kHz)

Channel No.	12 MHz band		16 MHz band		18/19 MHz band	
	Transmit	Receive	Transmit	Receive	Transmit	Receive
1	12 579.5	12 477	16 807	16 683.5		
2	12 580	12 477.5	16 807.5	16 684		
3	12 580.5	12 478	16 808	16 684.5		
4	12 581	12 478.5	16 808.5	16 685		
5	12 581.5	12 479	16 809	16 685.5		
6	12 582	12 479.5	16 809.5	16 686		
7	12 582.5	12 480	16 810	16 686.5	19 684	18 873.5
8	12 583	12 480.5	16 810.5	16 687	19 684.5	18 874
9	12 583.5	12 481	16 811	16 687.5	19 685	18 874.5
10	12 584	12 481.5	16 811.5	16 688	19 685.5	18 875
11	12 584.5	12 482	16 812	16 688.5	19 686	18 875.5
12	12 585	12 482.5	16 812.5	16 689	19 686.5	18 876
13	12 585.5	12 483	16 813	16 689.5	19 687	18 876.5
14	12 586	12 483.5	16 813.5	16 690	19 687.5	18 877
15	12 586.5	12 484	16 814	16 690.5	19 688	18 877.5
16	12 587	12 484.5	16 814.5	16 691	19 688.5	18 878
17	12 587.5	12 485	16 815	16 691.5	19 689	18 878.5
18	12 588	12 485.5	16 815.5	16 692	19 689.5	18 879
19	12 588.5	12 486	16 816	16 692.5	19 690	18 879.5
20	12 589	12 486.5	16 816.5	16 693	19 690.5	18 880
21	12 589.5	12 487	16 817	16 693.5		
22	12 590	12 487.5	16 817.5	16 694		
23	12 590.5	12 488	16 818	16 694.5		
24	12 591	12 488.5	16 695	16 695		
25	12 591.5	12 489	16 818.5	16 695.5		
26	12 592	12 489.5	16 819	16 696		
27	12 592.5	12 490	16 819.5	16 696.5		
28	12 593	12 490.5	16 820	16 697		
29	12 593.5	12 491	16 820.5	16 697.5		
30	12 594	12 491.5	16 821	16 698		
31	12 594.5	12 492	16 821.5	16 698.5		
32	12 595	12 492.5				
33	12 595.5	12 493				
34	12 596	12 493.5				
35	12 596.5	12 494				
36	12 597	12 494.5				
37	12 597.5	12 495				
38	12 598	12 495.5				
39	12 598.5	12 496				
40	12 599	12 496.5				
41	12 599.5	12 497				
42	12 600	12 497.5				
43	12 600.5	12 498				
44	12 601	12 498.5				
45	12 601.5	12 499				

Table of frequencies for two-frequency operation by coast stations (kHz)

Channel No.	12 MHz band <i>(end)</i>		16 MHz band <i>(end)</i>		18/19 MHz band <i>(end)</i>	
	Transmit	Receive	Transmit	Receive	Transmit	Receive
46	12 602	12 499.5				
47	12 602.5	12 500				
48	12 603	12 500.5				
49	12 603.5	12 501				
50	12 604	12 501.5				
51	12 604.5	12 502				
52	12 605	12 502.5				
53	12 605.5	12 503				
54	12 606	12 503.5				
55	12 606.5	12 504				
56	12 607	12 504.5				
57	12 607.5	12 505				
58	12 608	12 505.5				
59	12 608.5	12 506				
60	12 609	12 506.5				
61	12 609.5	12 507				
62	12 610	12 507.5				
63	12 610.5	12 508				
64	12 611	12 508.5				
65	12 611.5	12 509				
66	12 612	12 509.5				
67	12 612.5	12 510				
68	12 613	12 510.5				
69	12 613.5	12 511				
70	12 614	12 511.5				
71	12 614.5	12 512				
72	12 615	12 512.5				
73	12 615.5	12 513				
74	12 616	12 513.5				
75	12 616.5	12 514				
76	12 617	12 514.5				
77	12 617.5	12 515				
78	12 618	12 515.5				
79	12 618.5	12 516				
80	12 619	12 516.5				
81	12 619.5	12 517				
82	12 620	12 517.5				
83	12 620.5	12 518				
84	12 621	12 518.5				
85	12 621.5	12 519				
86	12 622	12 519.5				
87	12 520	12 520				
88	12 622.5	12 520.5				
89	12 623	12 521				
90	12 623.5	12 521.5				
91	12 624	12 522				
92	12 624.5	12 522.5				

Table of frequencies for two-frequency operation by coast stations (kHz)

Channel No.	22 MHz band	
	Transmit	Receive
13	22 382.5	22 290.5
14	22 383	22 291
15	22 383.5	22 291.5
16	22 384	22 292
17	22 384.5	22 292.5
18	22 385	22 293
19	22 385.5	22 293.5
20	22 386	22 294
21	22 386.5	22 294.5
22	22 387	22 295
23	22 387.5	22 295.5
24	22 388	22 296
25	22 388.5	22 296.5
26	22 389	22 297

Section III – Narrow-band direct-printing telegraphy (non-paired frequencies)

- 1 One or more frequencies are assigned to each ship station as transmitting frequencies.
- 2 All frequencies appearing in this Appendix may be used for NBDP duplex operation.
- 3 The speed of the narrow-band direct-printing telegraphy and data systems shall not exceed 100 Bd for FSK and 200 Bd for PSK.

Frequency bands								
Channel No.	4 MHz	6 MHz	8 MHz	12 MHz	16 MHz	18/19 MHz	22 MHz	25/26 MHz
1	4 170.5	6 260.25	8 339.25	12 419.25	16 615.25	19 691	22 290	26 101
2	4 171	6 260.75	8 339.75	12 419.75	16 615.75		22 297.5	26 101.5
3	4 171.5	6 321	8 375	12 422	16 616.25		22 298	26 102
4	4 172	6 321.5	8 375.5	12 476.5	16 616.75		22 298.5	26 102.5
5	4 179		8 376	12 655	16 682		22 299	
6	4 179.5			12 655.5	16 682.5		22 443.5	
7	4 180			12 656	16 683			
8				12 656.5				

Section IV – Data transmission

Table of frequencies (kHz) assignable to ship and coast stations
for data transmission (kHz)¹

Channel No.	4 MHz band		6 MHz band		8 MHz band	
	Coast Tx (ship Rx)	Ship Tx/Rx (coast Rx)	Coast Tx (ship Rx)	Ship Tx/Rx (coast Rx)	Coast Tx (ship Rx)	Ship Tx/Rx (coast Rx)
1		4 153.5 ^{3,4}		6 234.5 ^{3,4}		8 301.5 ^{3,4}
2		4 156.5 ^{3,4}		6 237.5 ^{3,4}		8 304.5 ^{3,4}
3		4 159.5 ^{3,4}		6 240.5 ^{3,4}		8 307.5 ^{3,4}
4		4 162.5 ^{3,4}		6 243.5 ^{3,4}		8 310.5 ^{3,4}
5		4 165.5 ^{3,4}		6 246.5 ^{3,4}		8 313.5 ^{3,4}
6		4 168.5 ^{3,4}		6 249.5 ^{3,4}		8 316.5 ^{3,4}
7	4 199.75	4 181.75		6 252.5 ^{3,4}		8 319.5 ^{3,4}
8	4 202.75	4 184.75		6 255.5 ^{3,4}		8 322.5 ^{3,4}
9	4 205.75	4 187.75		6 258.5 ^{3,4}		8 325.5 ^{3,4}
10	4 190.75 ^{2,3}	4 190.75 ^{2,3}	6 323.25	6 271.25		8 328.5 ^{3,4}
11	4 193.75 ^{2,3}	4 193.75 ^{2,3}	6 326.25	6 274.25		8 331.5 ^{3,4}
12	4 196.75 ^{2,3}	4 196.75 ^{2,3}	6 329.25	6 277.25		8 334.5 ^{3,4}
13	4 217.75 ²	4 217.75 ²	6 280.25 ^{2,3}	6 280.25 ^{2,3}		8 337.5 ^{3,4}
14			6 283.25 ^{2,3}	6 283.25 ^{2,3}	8 409.5	8 343.25
15			6 286.25 ^{2,3}	6 286.25 ^{2,3}	8 412.5	8 346.25
16			6 289.25 ^{2,3}	6 289.25 ^{2,3}	8 425.5	8 349.25
17			6 292.25 ^{2,3}	6 292.25 ^{2,3}	8 428.5 ³	8 352.25 ³
18			6 295.25 ^{2,3}	6 295.25 ^{2,3}	8 431.5 ³	8 355.25 ³
19			6 298.25 ^{2,3}	6 298.25 ^{2,3}	8 434.5 ³	8 358.25 ³
20			6 301.25 ^{2,3}	6 301.25 ^{2,3}	8 361.25 ^{2,3}	8 361.25 ^{2,3}
21			6 304.25 ^{2,3}	6 304.25 ^{2,3}	8 364.25 ^{2,3}	8 364.25 ^{2,3}
22			6 307.25 ^{2,3}	6 307.25 ^{2,3}	8 367.25 ^{2,3}	8 367.25 ^{2,3}
23			6 310.25 ^{2,3}	6 310.25 ^{2,3}	8 370.25 ^{2,3}	8 370.25 ^{2,3}
24					8 373.25 ^{2,3}	8 373.25 ^{2,3}
25					8 385.5 ^{2,3}	8 385.5 ^{2,3}
26					8 388.5 ^{2,3}	8 388.5 ^{2,3}
27					8 391.5 ^{2,3}	8 391.5 ^{2,3}
28					8 394.5 ^{2,3}	8 394.5 ^{2,3}
29					8 397.5 ^{2,3}	8 397.5 ^{2,3}
30					8 400.5 ^{2,3}	8 400.5 ^{2,3}
31					8 403.5 ^{2,3}	8 403.5 ^{2,3}
32					8 406.5 ^{2,3}	8 406.5 ^{2,3}

**Table of frequencies (kHz) assignable to ship and coast stations
for data transmission (kHz)¹**

Channel No.	12 MHz		16 MHz		18/19 MHz	
	Coast Tx (ship Rx)	Ship Tx/Rx (coast Rx)	Coast Tx (ship Rx)	Ship Tx/Rx (coast Rx)	Coast Tx (ship Rx)	Ship Tx/Rx (coast Rx)
1		12 369.5 ^{3,4}		16 550.5 ^{3,4}		18 847.5 ^{3,4}
2		12 372.5 ^{3,4}		16 553.5 ^{3,4}		18 850.5 ^{3,4}
3		12 375.5 ^{3,4}		16 556.5 ^{3,4}		18 853.5 ^{3,4}
4		12 378.5 ^{3,4}		16 559.5 ^{3,4}		18 856.5 ^{3,4}
5		12 381.5 ^{3,4}		16 562.5 ^{3,4}		18 859.5 ^{3,4}
6		12 384.5 ^{3,4}		16 565.5 ^{3,4}		18 862.5 ^{3,4}
7		12 387.5 ^{3,4}		16 568.5 ^{3,4}		18 865.5 ^{3,4}
8		12 390.5 ^{3,4}		16 571.5 ^{3,4}		18 868.5 ^{3,4}
9		12 393.5 ^{3,4}		16 574.5 ^{3,4}		18 871.5 ^{3,4}
10		12 396.5 ^{3,4}		16 577.5 ^{3,4}	19 682.25	18 881.75
11		12 399.5 ^{3,4}		16 580.5 ^{3,4}	19 692.75	18 884.75
12		12 402.5 ^{3,4}		16 583.5 ^{3,4}	19 695.75 ³	18 887.75 ³
13		12 405.5 ^{3,4}		16 586.5 ^{3,4}	19 698.75 ³	18 890.75 ³
14		12 408.5 ^{3,4}		16 589.5 ^{3,4}	19 701.75 ³	18 893.75 ³
15		12 411.5 ^{3,4}		16 592.5 ^{3,4}	18 896.75 ²	18 896.75 ²
16		12 414.5 ^{3,4}		16 595.5 ^{3,4}		
17		12 417.5 ^{3,4}		16 598.5 ^{3,4}		
18	12 626.25	12 423.75		16 601.5 ^{3,4}		
19	12 629.25	12 426.75		16 604.5 ^{3,4}		
20	12 632.25	12 429.75		16 607.5 ^{3,4}		
21	12 635.25	12 432.75		16 610.5 ^{3,4}		
22	12 638.25 ³	12 435.75 ³		16 613.5 ^{3,4}		
23	12 641.25 ³	12 438.75 ³	16 841.25	16 620.25		
24	12 644.25 ³	12 441.75 ³	16 844.25	16 623.25		
25	12 647.25 ³	12 444.75 ³	16 847.25	16 626.25		
26	12 650.25 ³	12 447.75 ³	16 850.25	16 629.25		
27	12 653.25 ³	12 450.75 ³	16 853.25	16 632.25		
28	12 453.75 ^{2,3}	12 453.75 ^{2,3}	16 856.25	16 635.25		
29	12 456.75 ^{2,3}	12 456.75 ^{2,3}	16 859.25	16 638.25		
30	12 459.75 ^{2,3}	12 459.75 ^{2,3}	16 862.25	16 641.25		
31	12 462.75 ^{2,3}	12 462.75 ^{2,3}	16 865.25	16 644.25		
32	12 465.75 ^{2,3}	12 465.75 ^{2,3}	16 868.25 ³	16 647.25 ³		
33	12 468.75 ^{2,3}	12 468.75 ^{2,3}	16 871.25 ³	16 650.25 ³		
34	12 471.75 ^{2,3}	12 471.75 ^{2,3}	16 874.25 ³	16 653.25 ³		
35	12 474.75 ^{2,3}	12 474.75 ^{2,3}	16 877.25 ³	16 656.25 ³		
36	12 524.25 ^{2,3}	12 524.25 ^{2,3}	16 880.25 ³	16 659.25 ³		
37	12 527.25 ^{2,3}	12 527.25 ^{2,3}	16 883.25 ³	16 662.25 ³		
38	12 530.25 ^{2,3}	12 530.25 ^{2,3}	16 886.25 ³	16 665.25 ³		
39	12 533.25 ^{2,3}	12 533.25 ^{2,3}	16 889.25 ³	16 668.25 ³		
40	12 536.25 ^{2,3}	12 536.25 ^{2,3}	16 892.25 ³	16 671.25 ³		
41	12 539.25 ^{2,3}	12 539.25 ^{2,3}	16 895.25 ³	16 674.25 ³		
42	12 542.25 ^{2,3}	12 542.25 ^{2,3}	16 898.25 ³	16 677.25 ³		
43	12 545.25 ^{2,3}	12 545.25 ^{2,3}	16 901.25 ³	16 680.25 ³		
44	12 548.25 ^{2,3}	12 548.25 ^{2,3}	16 700.5 ^{2,3}	16 700.5 ^{2,3}		
45	12 551.25 ^{2,3}	12 551.25 ^{2,3}	16 703.5 ^{2,3}	16 703.5 ^{2,3}		

Channel No.	12 MHz (<i>end</i>)		16 MHz (<i>end</i>)		18/19 MHz (<i>end</i>)	
	Coast Tx (ship Rx)	Ship Tx/Rx (coast Rx)	Coast Tx (ship Rx)	Ship Tx/Rx (coast Rx)	Coast Tx (ship Rx)	Ship Tx/Rx (coast Rx)
46	12 554.25 ^{2,3}	12 554.25 ^{2,3}	16 706.5 ^{2,3}	16 706.5 ^{2,3}		
47	12 557.25 ^{2,3}	12 557.25 ^{2,3}	16 709.5 ^{2,3}	16 709.5 ^{2,3}		
48	12 560.25 ^{2,3}	12 560.25 ^{2,3}	16 712.5 ^{2,3}	16 712.5 ^{2,3}		
49	12 563.25 ^{2,3}	12 563.25 ^{2,3}	16 715.5 ^{2,3}	16 715.5 ^{2,3}		
50	12 566.25 ^{2,3}	12 566.25 ^{2,3}	16 718.5 ^{2,3}	16 718.5 ^{2,3}		
51	12 569.25 ^{2,3}	12 569.25 ^{2,3}	16 721.5 ^{2,3}	16 721.5 ^{2,3}		
52	12 572.25 ^{2,3}	12 572.25 ^{2,3}	16 724.5 ^{2,3}	16 724.5 ^{2,3}		
53	12 575.25 ^{2,3}	12 575.25 ^{2,3}	16 727.5 ^{2,3}	16 727.5 ^{2,3}		
54			16 730.5 ^{2,3}	16 730.5 ^{2,3}		
55			16 733.5 ^{2,3}	16 733.5 ^{2,3}		
56			16 736.5 ^{2,3}	16 736.5 ^{2,3}		
57			16 739.5 ^{2,3}	16 739.5 ^{2,3}		
58			16 742.5 ^{2,3}	16 742.5 ^{2,3}		
59			16 745.5 ^{2,3}	16 745.5 ^{2,3}		
60			16 748.5 ^{2,3}	16 748.5 ^{2,3}		
61			16 751.5 ^{2,3}	16 751.5 ^{2,3}		
62			16 754.5 ^{2,3}	16 754.5 ^{2,3}		
63			16 757.5 ^{2,3}	16 757.5 ^{2,3}		
64			16 760.5 ^{2,3}	16 760.5 ^{2,3}		
65			16 763.5 ^{2,3}	16 763.5 ^{2,3}		
66			16 766.5 ^{2,3}	16 766.5 ^{2,3}		
67			16 769.5 ^{2,3}	16 769.5 ^{2,3}		
68			16 772.5 ^{2,3}	16 772.5 ^{2,3}		
69			16 775.5 ^{2,3}	16 775.5 ^{2,3}		
70			16 778.5 ^{2,3}	16 778.5 ^{2,3}		
71			16 781.5 ^{2,3}	16 781.5 ^{2,3}		
72			16 784.5 ^{2,3}	16 784.5 ^{2,3}		
73			16 787.5 ^{2,3}	16 787.5 ^{2,3}		
74			16 790.5 ^{2,3}	16 790.5 ^{2,3}		
75			16 793.5 ^{2,3}	16 793.5 ^{2,3}		
76			16 796.5 ^{2,3}	16 796.5 ^{2,3}		
77			16 799.5 ^{2,3}	16 799.5 ^{2,3}		
78			16 802.5 ^{2,3}	16 802.5 ^{2,3}		
79			16 823.25 ^{2,3}	16 823.25 ^{2,3}		
80			16 826.25 ^{2,3}	16 826.25 ^{2,3}		
81			16 829.25 ^{2,3}	16 829.25 ^{2,3}		
82			16 832.25 ^{2,3}	16 832.25 ^{2,3}		
83			16 835.25 ^{2,3}	16 835.25 ^{2,3}		
84			16 838.25 ^{2,3}	16 838.25 ^{2,3}		

**Table of frequencies (kHz) assignable to ship and coast stations
for data transmission (kHz)¹**

Channel No.	22 MHz		25/26 MHz	
	Coast Tx (ship Rx)	Ship Tx/Rx (coast Rx)	Coast Tx (ship Rx)	Ship Tx/Rx (coast Rx)
1		22 181.5 ^{3,4}		25 122.5 ^{3,4}
2		22 184.5 ^{3,4}		25 125.5 ^{3,4}
3		22 187.5 ^{3,4}		25 128.5 ^{3,4}
4		22 190.5 ^{3,4}		25 131.5 ^{3,4}
5		22 193.5 ^{3,4}		25 134.5 ^{3,4}
6		22 196.5 ^{3,4}		25 137.5 ^{3,4}
7		22 199.5 ^{3,4}		25 140.5 ^{3,4}
8		22 202.5 ^{3,4}		25 143.5 ^{3,4}
9		22 205.5 ^{3,4}		25 146.5 ^{3,4}
10		22 208.5 ^{3,4}		25 149.5 ^{3,4}
11		22 211.5 ^{3,4}		25 152.5 ^{3,4}
12		22 214.5 ^{3,4}		25 155.5 ^{3,4}
13		22 217.5 ^{3,4}		25 158.5 ^{3,4}
14		22 220.5 ^{3,4}	26 104.25	25 161.5
15		22 223.5 ^{3,4}	26 107.25	25 164.5
16		22 226.5 ^{3,4}	26 110.25	25 167.5
17		22 229.5 ^{3,4}	26 113.25 ³	25 170.5 ³
18		22 232.5 ^{3,4}	26 116.25 ³	25 173.5 ³
19		22 235.5 ^{3,4}	26 119.25 ³	25 176.5 ³
20		22 238.5 ^{3,4}	25 179.5 ^{2,3}	25 179.5 ^{2,3}
21	22 390.75	22 243.25	25 182.5 ^{2,3}	25 182.5 ^{2,3}
22	22 393.75	22 246.25	25 185.5 ^{2,3}	25 185.5 ^{2,3}
23	22 396.75	22 249.25	25 188.5 ^{2,3}	25 188.5 ^{2,3}
24	22 399.75	22 252.25	25 191.5 ^{2,3}	25 191.5 ^{2,3}
25	22 402.75	22 255.25	25 194.5 ^{2,3}	25 194.5 ^{2,3}
26	22 405.75	22 258.25	25 197.5 ^{2,3}	25 197.5 ^{2,3}
27	22 408.75 ³	22 261.25 ³	25 200.5 ^{2,3}	25 200.5 ^{2,3}
28	22 411.75 ³	22 264.25 ³	25 203.5 ^{2,3}	25 203.5 ^{2,3}
29	22 414.75 ³	22 267.25 ³	25 206.5 ^{2,3}	25 206.5 ^{2,3}
30	22 417.75 ³	22 270.25 ³		
31	22 420.75 ³	22 273.25 ³		
32	22 423.75 ³	22 276.25 ³		
33	22 426.75 ³	22 279.25 ³		
34	22 429.75 ³	22 282.25 ³		
35	22 432.75 ³	22 285.25 ³		
36	22 435.75 ³	22 288.25 ³		
37	22 300.75 ^{2,3}	22 300.75 ^{2,3}		
38	22 303.75 ^{2,3}	22 303.75 ^{2,3}		
39	22 306.75 ^{2,3}	22 306.75 ^{2,3}		
40	22 309.75 ^{2,3}	22 309.75 ^{2,3}		
41	22 312.75 ^{2,3}	22 312.75 ^{2,3}		
42	22 315.75 ^{2,3}	22 315.75 ^{2,3}		
43	22 318.75 ^{2,3}	22 318.75 ^{2,3}		
44	22 321.75 ^{2,3}	22 321.75 ^{2,3}		
45	22 324.75 ^{2,3}	22 324.75 ^{2,3}		

Channel No.	22 MHz (<i>end</i>)		25/26 MHz (<i>end</i>)	
	Coast Tx (ship Rx)	Ship Tx/Rx (coast Rx)	Coast Tx (ship Rx)	Ship Tx/Rx (coast Rx)
46	22 327.75 ^{2,3}	22 327.75 ^{2,3}		
47	22 330.75 ^{2,3}	22 330.75 ^{2,3}		
48	22 333.75 ^{2,3}	22 333.75 ^{2,3}		
49	22 336.75 ^{2,3}	22 336.75 ^{2,3}		
50	22 339.75 ^{2,3}	22 339.75 ^{2,3}		
51	22 342.75 ^{2,3}	22 342.75 ^{2,3}		
52	22 345.75 ^{2,3}	22 345.75 ^{2,3}		
53	22 348.75 ^{2,3}	22 348.75 ^{2,3}		
54	22 351.75 ^{2,3}	22 351.75 ^{2,3}		
55	22 354.75 ^{2,3}	22 354.75 ^{2,3}		
56	22 357.75 ^{2,3}	22 357.75 ^{2,3}		
57	22 360.75 ^{2,3}	22 360.75 ^{2,3}		
58	22 363.75 ^{2,3}	22 363.75 ^{2,3}		
59	22 366.75 ^{2,3}	22 366.75 ^{2,3}		
60	22 369.75 ^{2,3}	22 369.75 ^{2,3}		
61	22 372.75 ^{2,3}	22 372.75 ^{2,3}		
62	22 438.75	22 377.75		
63	22 441.75	22 380.75		

¹ The data transmission should be in accordance with the most recent version of Recommendation ITU-R M.1798.

² Non-paired (simplex) operations only.

³ Assignable for wide-band operation using multiple 3 kHz contiguous channels.

⁴ Channels may be paired with wide-band coast station channels in the same band.

MOD

APPENDIX 18 (REV.WRC-12)

**Table of transmitting frequencies in the
VHF maritime mobile band**

(See Article 52)

MODNOTE A – For assistance in understanding the Table, see Notes *a)* to *z)* below. (WRC-12)**MOD**

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.1084-4 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-12)

MOD

Channel designator	Notes	Transmitting frequencies (MHz)		Inter-ship	Port operations and ship movement		Public correspondence
		From ship stations	From coast stations		Single frequency	Two frequency	
60	<i>m)</i>	156.025	160.625		x	x	x
01	<i>m)</i>	156.050	160.650		x	x	x
61	<i>m)</i>	156.075	160.675		x	x	x
02	<i>m)</i>	156.100	160.700		x	x	x
62	<i>m)</i>	156.125	160.725		x	x	x
03	<i>m)</i>	156.150	160.750		x	x	x
63	<i>m)</i>	156.175	160.775		x	x	x
04	<i>m)</i>	156.200	160.800		x	x	x
64	<i>m)</i>	156.225	160.825		x	x	x
05	<i>m)</i>	156.250	160.850		x	x	x
65	<i>m)</i>	156.275	160.875		x	x	x
06	<i>f)</i>	156.300		x			
2006	<i>r)</i>	160.900	160.900				
66	<i>m)</i>	156.325	160.925		x	x	x
07	<i>m)</i>	156.350	160.950		x	x	x
67	<i>h)</i>	156.375	156.375	x	x		
08		156.400		x			

Channel designator	Notes	Transmitting frequencies (MHz)		Inter-ship	Port operations and ship movement		Public correspondence
		From ship stations	From coast stations		Single frequency	Two frequency	
68		156.425	156.425		x		
09	<i>i)</i>	156.450	156.450	x	x		
69		156.475	156.475	x	x		
10	<i>h), q)</i>	156.500	156.500	x	x		
70	<i>f), j)</i>	156.525	156.525	Digital selective calling for distress, safety and calling			
11	<i>q)</i>	156.550	156.550		x		
71		156.575	156.575		x		
12		156.600	156.600		x		
72	<i>i)</i>	156.625		x			
13	<i>k)</i>	156.650	156.650	x	x		
73	<i>h), i)</i>	156.675	156.675	x	x		
14		156.700	156.700		x		
74		156.725	156.725		x		
15	<i>g)</i>	156.750	156.750	x	x		
75	<i>n), s)</i>	156.775	156.775		x		
16	<i>f)</i>	156.800	156.800	DISTRESS, SAFETY AND CALLING			
76	<i>n), s)</i>	156.825	156.825		x		
17	<i>g)</i>	156.850	156.850	x	x		
77		156.875		x			
18	<i>m)</i>	156.900	161.500		x	x	x
78	<i>t), u), v)</i>	156.925	161.525		x	x	x
1078		156.925	156.925		x		
2078		161.525	161.525		x		
19	<i>t), u), v)</i>	156.950	161.550		x	x	x
1019		156.950	156.950		x		
2019		161.550	161.550		x		
79	<i>t), u), v)</i>	156.975	161.575		x	x	x
1079		156.975	156.975		x		
2079		161.575	161.575		x		
20	<i>t), u), v)</i>	157.000	161.600		x	x	x
1020		157.000	157.000		x		
2020		161.600	161.600		x		
80	<i>w), y)</i>	157.025	161.625		x	x	x
21	<i>w), y)</i>	157.050	161.650		x	x	x
81	<i>w), y)</i>	157.075	161.675		x	x	x
22	<i>w), y)</i>	157.100	161.700		x	x	x

Channel designator	Notes	Transmitting frequencies (MHz)		Inter-ship	Port operations and ship movement		Public correspondence
		From ship stations	From coast stations		Single frequency	Two frequency	
82	w), x), y)	157.125	161.725		x	x	x
23	w), x), y)	157.150	161.750		x	x	x
83	w), x), y)	157.175	161.775		x	x	x
24	w), ww), x), y)	157.200	161.800		x	x	x
84	w), ww), x), y)	157.225	161.825		x	x	x
25	w), ww), x), y)	157.250	161.850		x	x	x
85	w), ww), x), y)	157.275	161.875		x	x	x
26	w), ww), x), y)	157.300	161.900		x	x	x
86	w), ww), x), y)	157.325	161.925		x	x	x
27	z)	157.350	161.950			x	x
87	z)	157.375	157.375		x		
28	z)	157.400	162.000			x	x
88	z)	157.425	157.425		x		
AIS 1	f), l), p)	161.975	161.975				
AIS 2	f), l), p)	162.025	162.025				

Notes referring to the Table

General notes

MOD

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)

MOD

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

MOD

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)

SUP

o)

ADD

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)

ADD

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)

ADD

t) Until 1 January 2017, in Regions 1 and 3, the existing duplex channels 78, 19, 79 and 20 can continue to be assigned. These channels may be operated as single-frequency channels, subject to coordination with affected administrations. From that date, these channels shall only be assigned as single-frequency channels. However, existing duplex channel assignments may be preserved for coast stations and retained for vessels, subject to coordination with affected administrations. (WRC-12)

ADD

u) In Region 2, these channels may be operated as single-frequency channels, subject to coordination with affected administrations. (WRC-12)

ADD

v) After 1 January 2017, in the Netherlands, these channels may continue to be operated as duplex frequency channels, subject to coordination with affected administrations. (WRC-12)

ADD

w) In Regions 1 and 3:

Until 1 January 2017, the frequency bands 157.025-157.325 MHz and 161.625-161.925 MHz (corresponding to channels: 80, 21, 81, 22, 82, 23, 83, 24, 84, 25, 85, 26, 86) may be used for new technologies, subject to coordination with affected administrations. Stations using these channels or frequency bands for new technologies 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 157.025-157.325 MHz and 161.625-161.925 MHz (corresponding to channels: 80, 21, 81, 22, 82, 23, 83, 24, 84, 25, 85, 26, 86) are identified for the utilization of the digital systems described in the most recent version of Recommendation ITU-R M.1842. These frequency bands could 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-12)

ADD

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. (WRC-12)

ADD

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)

ADD

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

ADD

z) 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. (WRC-12)

MOD

APPENDIX 30 (REV.WRC-12)*

**Provisions for all services and associated Plans and List¹ for
the broadcasting-satellite service in the frequency bands
11.7-12.2 GHz (in Region 3), 11.7-12.5 GHz (in Region 1)
and 12.2-12.7 GHz (in Region 2) (WRC-03)**

ARTICLE 5 (REV.WRC-12)

**Notification, examination and recording in the Master International
Frequency Register of frequency assignments to space stations
in the broadcasting-satellite service¹⁸ (WRC-07)**

5.2 Examination and recording**ADD**

5.2.10 Wherever the use of a frequency assignment to a space station recorded in the Master Register and emanating from the Regions 1 and 3 List is suspended for a period exceeding six months, the notifying administration shall, as soon as possible, but no later than six months from the date on which the use was suspended, inform the Bureau of the date on which such use was suspended. When the recorded assignment is brought back into use, the notifying administration shall so inform the Bureau, as soon as possible. The date on which the recorded assignment is brought back into use^{20bis} shall be no later than three years from the date of suspension. (WRC-12)

ADD

^{20bis} The date of bringing back into use of a frequency assignment to a space station in the geostationary-satellite orbit shall be the commencement of the ninety-day period defined below. A frequency assignment to a space station in the geostationary-satellite orbit shall be considered as having been brought back into use when a space station in the geostationary-satellite orbit with the capability of transmitting or receiving that frequency assignment has been deployed and maintained at the notified orbital position for a continuous period of ninety days. The notifying administration shall inform the Bureau within thirty days from the end of the ninety-day period. (WRC-12)

¹⁸ 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 specified in § 5.1.6 and the corresponding entries in the Master Register under § 5.2.2, 5.2.2.1, 5.2.2.2 or 5.2.6, as appropriate, and the corresponding entries included in the Plan on and after 3 June 2000 or in the List, as appropriate, after informing the administration concerned. The Bureau shall inform all administrations of such action. 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. See also Resolution **905 (WRC-07)**. (WRC-07)

ADD

5.2.11 If a recorded frequency assignment stemming from the Regions 1 and 3 List is not brought back into use within three years from the date of suspension, the Bureau shall cancel the assignment from the Master Register and the assignment in the List, unless the assignment is one to which § 4.1.26 or § 4.1.27 is being applied. (WRC-12)

ARTICLE 11 (REV.WRC-12)

**Plan for the broadcasting-satellite service in the frequency bands
11.7-12.2 GHz in Region 3 and 11.7-12.5 GHz in Region 1**

SUP

9 Provisional beam. These assignments have been included in the Plan by WRC-2000. These assignments are for exclusive use by East Timor. (WRC-12)

SUP

TABLE 2 (WRC-07)

Affected administrations and corresponding networks/beams identified based on Note 5 in § 11.2 of Article 11

TABLE 2 (WRC-12)

Affected administrations and corresponding networks/beams identified based on Note 5 in § 11.2 of Article 11

Beam name	Channels	Ref. Table 1	Affected administrations*	Affected networks/beams/terrestrial stations*
ARS34000	40	c	CHN, G, HOL, J, KOR, MLA, PAK, THA, UAE, USA	AM-SAT A4, APSTAR-4, ASIASEAT-CKX, ASIASEAT-EK1, ASIASEAT-EKX, EMARSAT-1F, EMARSAT-1G, INTELSAT7 66E, JCSAT-3A, JCSAT-3B, KOREASAT-1, MEASAT-1, MEASAT-9I, 5E, N-SAT-110, N-SAT-110E, N-SAT-128, NSS-8, NSS-9, PAKSAT-1, SIC-1, THAICOM-A2B, THAICOM-C1, THAICOM-GIK
BEL01800	26, 28, 30, 32, 34, 36, 38, 40	c	PAK	PAKSAT-1
BFA10700	22, 24	c	E	HISPASAT-1, HISPASAT-2C3 KU
BHR25500	25	c	PAK	PAKSAT-1
CPV30100	2, 4, 6, 8, 10, 12	c	USA	INTELSAT7 325.5E
CVA08300	1, 3, 5, 7, 9, 11	c	USA	INTELSAT7 359E, INTELSAT8 359E, INTELSAT10 359E
CYP08600	1, 3, 5, 7, 9, 11, 13	c	USA	INTELSAT7 359E, INTELSAT8 359E
FSM00000	1, 3, 5, 7, 9, 11, 13	c	USA	INTELSAT7 157E
GMB30200	1, 5, 9, 13, 17	c	USA	USASAT-26A
GNB30400	22, 24	c	E	HISPASAT-1, HISPASAT-2C3 KU
GRCT01500	2, 4, 6, 8, 10, 12	c	USA	INTELSAT7 359E, INTELSAT8 359E, INTELSAT10 359E
GUL19200	2, 4, 6, 8, 10, 12, 14, 16, 18, 20	c	USA	USASAT-26A
IRL21100	1, 3, 5, 7, 9, 11, 13, 15, 17, 19	c	USA	USASAT-26A
ISL04900	27	a	GUY	GUY00302
ISL04900	29, 39	a	JMC	JMC00005
ISL04900	31, 33, 35, 37	a	GUY, JMC	GUY00302, JMC00005
ISL04900	23	c	B, HOL, USA	B-SAT1, INTELSAT8 304.5E, NSS-18, USASAT-14L, USASAT-26G
ISL05000	22, 24, 26	c	HOL	NSS-18
KIR_100	1, 3, 5, 7, 9, 11, 13	c	USA	INTELSAT7 174E, INTELSAT7 177E, INTELSAT7 178E, INTELSAT8 174E, INTELSAT8 178E, USASAT-14K
KIR_100	17, 21	c	USA	USASAT-14K
LBR24400	1, 5, 9, 13	c	USA	INTELSAT7 325.5E
MDA06300	28, 30, 32, 34, 36, 38, 40	c	THA	THAICOM-C1

ADD

Beam name	Channels	Ref. Table 1	Affected administrations*	Affected networks/beams/terrestrial stations*
MLI_100	1, 3, 5, 7, 9, 11, 13	c	USA	INTELSAT7 342E, INTELSAT7 340E, INTELSAT8 342E, INTELSAT8 340E
MNG24800	31, 35	c	CHN, THA	APSTAR-4, THAICOM-A2B, THAICOM-GIK
MOZ30700	2, 6, 10	c	USA	INTELSAT7 359E, INTELSAT8 359E, INTELSAT10 359E
NGR11500	2, 4, 6, 8, 10, 12, 14, 16, 18, 20	c	USA	USASAT-26A
NOR12000	1, 3, 5, 7, 9, 11, 13	c	USA	INTELSAT7 359E, INTELSAT8 359E, INTELSAT10 359E
POL13200	28, 30, 32, 34, 36, 38, 40	c	THA	THAICOM-C1
POR_100	1, 3, 5, 7, 9, 11, 13, 15, 17, 19	c	USA	USASAT-26A
RUS-4	28, 29, 33, 37	c	G, KOR	AM-SAT A4, KOREASAT-1, KOREASAT-2
RUS-4	31, 35, 39	c	G	AM-SAT A4
SEN22200	23	c	USA	USASAT-26A
SEY00000	26, 28, 30, 32, 34, 36, 38, 40	c	UAE	EMARSAT-1F
SOM31200	26, 28, 30, 32, 34, 36, 38, 40	c	PAK	PAKSAT-1
TGO22600	1, 3, 5, 7, 9, 11	c	USA	INTELSAT8 330.5E
TGO22600	13	c	E, USA	HISPASAT-1, HISPASAT-2C3 KU, INTELSAT8 330.5E
TGO22600	15, 17, 19	c	E	HISPASAT-1, HISPASAT-2C3 KU
TIK06900	26, 28, 30, 32, 34, 36, 38, 40	c	PAK, UAE	EMARSAT-1F, PAKSAT-1
TKM06800	26	c	HOL, PAK, UAE	EMARSAT-1F, EMARSAT-1G, NSS-8, PAKSAT-1
TKM06800	28	c	HOL, J. PAK, THA, UAE	EMARSAT-1F, EMARSAT-1G, JCSAT-3B, NSS-8, PAKSAT-1, THAICOM-C1
TKM06800	30, 32, 34, 36, 38, 40	c	HOL, J. KOR, PAK, THA, UAE	EMARSAT-1F, EMARSAT-1G, JCSAT-3B, KOREASAT-1, NSS-8, PAKSAT-1, SJ-C-1, THAICOM-C1
TON21500	2, 6, 10, 14, 18, 20, 22, 24	c	USA	USASAT-14K
UAE27400	27	c	HOL	NSS-8
UAE27400	31, 35, 39	c	HOL, THA	NSS-8, THAICOM-C1
ZWE13500	1, 3, 5, 7, 9, 11, 13	c	USA	INTELSAT7 359E, INTELSAT8 359E

* Administrations and corresponding networks/beams/terrestrial stations whose assignment(s) may receive interference from the beam shown in the left-hand column.

SUP

TABLE 3 (WRC-07)
Affecting administrations and corresponding networks/beams identified based on Notes 6 and 7 in § 11.2 of Article 11

ADD

TABLE 3 (WRC-12)
Affecting administrations and corresponding networks/beams identified based on Notes 6 and 7 in § 11.2 of Article 11

Beam name	Channels	Note	Affecting administrations*	Affecting networks/beams*
AGL29500	1, 3, 5, 7, 9, 11, 13	7	HOL, USA	INTELSAT7 338.5E, INTELSAT7 342E, INTELSAT8 338.5E
AND34100	2, 6, 10, 12	7	HOL, USA	INTELSAT7 319.5E, INTELSAT8 319.5E, USASAT-26A, INTELSAT8 328.5E
AND34100	14, 16, 18, 20	7	USA	USASAT-26A
ARM06400	26, 28, 30, 32, 34, 36, 38, 40	7	J	JCSAT-3B
ARS34000	40	7	J	JCSAT-3A, JCSAT-3B
ARS 100	26, 28, 30, 32, 34, 36, 38, 40	7	J	JCSAT-3A, JCSAT-3B
AUSB 100	4, 8, 12	7	USA	INTELSAT7 174E
AZE06400	25, 27, 29, 31, 33, 35, 37, 39	7	J	JCSAT-3A, JCSAT-3B
BFN23300	1, 3, 5, 7, 9, 11, 13	7	HOL, USA	INTELSAT7 338.5E, INTELSAT7 342E, INTELSAT8 338.5E
BFA10700	22, 24	7	E	HISPASAT-1, HISPASAT-2C3 KU
BHR25500	25, 27, 29, 31, 33, 35, 37, 39	7	J	JCSAT-3A, JCSAT-3B
COD 100	2, 4, 6, 8, 10, 12	7	HOL, USA	INTELSAT7 338.5E, INTELSAT7 342E, INTELSAT8 338.5E
COG23500	1, 3, 5, 7, 9, 11, 13	7	USA	INTELSAT7 342E
COM20700	25, 27, 29, 31, 33, 35, 37, 39	7	J	JCSAT-3B
CPV30100	2, 4, 6, 8, 10, 12	7	USA	INTELSAT8 328.5E
CTI23700	1, 3, 5, 7, 9, 11, 13	7	HOL, USA	INTELSAT7 338.5E, INTELSAT7 342E, INTELSAT8 338.5E
CVA08300	1, 3, 5, 7, 9, 11	7	USA	INTELSAT7 359E
CYP08600	1, 3, 5, 7, 9, 11, 13	7	USA	INTELSAT7 359E
CZE14401	1, 9	7	USA	INTELSAT7 342E
CZE14403	2	7	USA	INTELSAT7 342E
D 08700	1, 3, 5, 7, 9, 11, 13	7	HOL, USA	INTELSAT7 338.5E, INTELSAT7 342E, INTELSAT8 338.5E
DNK090XR	29	6	JMC	JMC00005
DNK090XR	33	6	GUY, JMC	GUY00302, JMC00005
DNK091XR	31, 35	6	GUY, JMC	GUY00302, JMC00005

Beam name	Channds	Note	Affecting administrations*	Affecting networks/beams*
DNK_100	1, 3, 5, 7, 9, 11, 13	7	HOL, USA	INTELSAT7 338.5E, INTELSAT7 342E, INTELSAT8 338.5E
EGY02600	2, 6, 8, 10, 12	7	USA	INTELSAT7 359E
ERI09200	25, 27, 29, 31, 33, 35, 37, 39	7	J	JCSAT-3B
FJI19300	1, 3, 5, 7, 9, 11, 13	7	HOL, USA	INTELSAT7 174E, INTELSAT7 177E, INTELSAT7 183E, INTELSAT 183E
F_100	25, 27, 29, 31, 33, 35, 37, 39	7	J	JCSAT-3A, JCSAT-3B
G_02700	2, 4, 6, 8, 10, 12	7	USA	INTELSAT8 328.5E
GAB26000	1, 3, 5, 7, 9, 11, 13	7	USA	INTELSAT7 342E
GMB30200	1, 3, 5, 7, 9, 11, 13	7	HOL, USA	INTELSAT7 319.5E, INTELSAT8 319.5E, USASAT-26A, INTELSAT8 328.5E
GMB30200	15, 17, 19	7	USA	USASAT-26A
GNB30400	22, 24	7	E	HISPASAT-1, HISPASAT-2C3 KU
GRC10500	2, 4, 6, 8, 10, 12	7	USA	INTELSAT7 359E
GUJ19200	2, 4, 6, 8, 10, 12	7	HOL, USA	INTELSAT7 319.5E, INTELSAT8 319.5E, USASAT-26A, INTELSAT8 328.5E
GUJ19200	14, 16, 18, 20	7	USA	USASAT-26A
HNG10601	3, 11	7	USA	INTELSAT7 342E
HNG10602	6	7	USA	INTELSAT7 342E
HNG10603	2	7	USA	INTELSAT7 342E
HRV14801	5, 13	7	USA	INTELSAT7 342E
HRV14802	10	7	USA	INTELSAT7 342E
HRV14803	2	7	USA	INTELSAT7 342E
IRL21100	1, 3, 5, 7, 9, 11, 13	7	HOL, USA	INTELSAT7 319.5E, INTELSAT8 319.5E, USASAT-26A
IRL21100	15, 17, 19	7	USA	USASAT-26A
ISL04900	27	6	GUY	GUY00302
ISL04900	29, 39	6	JMC	JMC00005
ISL04900	31, 33, 35, 37	6	GUY, JMC	GUY00302, JMC00005
KIR_100	1, 3, 5, 7, 9, 11, 13	7	USA	INTELSAT7 174E, INTELSAT7 177E, INTELSAT8 174E
KWT11300	26, 28, 30, 32, 34, 36, 38, 40	7	J	JCSAT-3A, JCSAT-3B
LBR24400	1, 5, 7, 9, 11, 13	7	USA	INTELSAT8 328.5E
LBV_100	2, 4, 6, 8, 10, 12	7	HOL, USA	INTELSAT7 338.5E, INTELSAT7 342E, INTELSAT8 338.5E
LSO30500	1, 3, 5, 7, 9, 11, 13	7	USA	INTELSAT7 359E
MAU_100	26, 28, 30, 32, 34, 36, 38, 40	7	J	JCSAT-3A, JCSAT-3B
MLI_100	1, 3, 5, 7, 9, 11, 13	7	HOL, USA	INTELSAT7 338.5E, INTELSAT7 342E, INTELSAT8 338.5E
MNG24800	27	7	J	JCSAT-3A, JCSAT-3B, APSTAR-4, JCSAT-1R, THAICOM-A2B, SUPERBIRD-C
MNG24800	29, 31, 33, 35, 37, 39	7	CHN, J, THA	JCSAT-3A, JCSAT-3B, APSTAR-4, JCSAT-1R, THAICOM-A2B, SUPERBIRD-C
MOZ30700	2, 6, 10, 12	7	USA	INTELSAT7 359E
MRC20900	1, 3, 5, 7, 9, 11, 13	7	HOL, USA	INTELSAT7 338.5E, INTELSAT7 342E, INTELSAT8 338.5E
MTN_100	22, 24, 26	7	USA	USASAT-26A
MWI30800	2, 4, 6, 8, 10, 12	7	USA	INTELSAT7 359E
NGR11500	2, 4, 6, 8, 10, 12	7	HOL, USA	INTELSAT7 319.5E, INTELSAT8 319.5E, USASAT-26A, INTELSAT8 328.5E
NGR11500	14, 16, 18, 20	7	USA	USASAT-26A

Beam name	Channls	Note	Affecting administrations*	Affecting networks/beams*
NOR12000	1, 3, 5, 7, 9, 11, 13	7	USA	INTELSAT7 359E
OMA12300	26, 28, 30, 32, 34, 36, 38, 40	7	J	JCSAT-3A, JCSAT-3B
POR_100	1, 3, 5, 7, 9, 11, 13	7	HOL, USA	INTELSAT7 319.5E, INTELSAT8 319.5E, USASAT-26A, INTELSAT8 328.5E
POR_100	15, 17, 19	7	USA	USASAT-26A
RUS-4	25	7	J	JCSAT-3A, JCSAT-3B, JCSAT-1R, SUPERBIRD-C
RUS-4	26, 27	7	J	JCSAT-3A, JCSAT-3B, JCSAT-1R, SUPERBIRD-C
RUS-4	28, 29	7	J, KOR	JCSAT-3A, JCSAT-3B, JCSAT-1R, SUPERBIRD-C, KOREASAT-1, KOREASAT-2
RUS-4	31, 33, 35, 37, 39	7	J, KOR	JCSAT-3A, JCSAT-3B, JCSAT-1R, SUPERBIRD-C, KOREASAT-1, KOREASAT-2
SEN22200	23, 25	7	USA	USASAT-26A
SEY00000	26, 28, 30, 32, 34, 36, 38, 40	7	J	JCSAT-3A, JCSAT-3B
SMO05700	1, 3, 5, 7, 9, 11, 13	7	HOL, USA	INTELSAT7 174E, INTELSAT7 177E, INTELSAT7 183E, INTELSAT 183E
SMR31100	1, 3, 5, 7, 9, 11, 13	7	HOL, USA	INTELSAT7 319.5E, INTELSAT8 319.5E, USASAT-26A, INTELSAT8 328.5E
SMR31100	15, 17, 19	7	USA	USASAT-26A
SOM31200	26, 28, 30, 32, 34, 36, 38, 40	7	J	JCSAT-3A, JCSAT-3B
SRL25900	27	6	GUY	GUY00302
SRL25900	29, 39	6	JMC	JMC00005
SRL25900	31, 33, 35, 37	6	GUY, JMC	GUY00302, JMC00005
STP24100	2, 4, 6, 8, 10, 12	7	USA	INTELSAT7 359E
SU114000	2, 4, 6, 8, 10, 12	7	HOL, USA	INTELSAT7 338.5E, INTELSAT7 342E, INTELSAT8 338.5E
SVK14401	7	7	USA	INTELSAT7 342E
SVK14403	2	7	USA	INTELSAT7 342E
SWZ31300	1, 3, 5, 7, 9, 11, 13	7	USA	INTELSAT7 359E
TGO22600	1, 3, 5, 7, 9, 11	7	USA	INTELSAT8 328.5E
TGO22600	13	7	E, USA	INTELSAT8 328.5E, HISPASAT-2C3 KU
TGO22600	15, 17, 19	7	E	HISPASAT-1, HISPASAT-2C3 KU
TIK06900	26, 28, 30, 32, 34, 36, 38, 40	7	J	JCSAT-3A, JCSAT-3B, JCSAT-1R
TKM06800	26, 28, 30, 32, 34, 36, 38, 40	7	J	JCSAT-3A, JCSAT-3B
TON21500	2, 4, 6, 8, 10, 12	7	USA	INTELSAT7 174E, INTELSAT7 177E, INTELSAT8 174E
TUV00000	2, 4, 6, 8, 10, 12	7	USA	INTELSAT7 174E, INTELSAT7 177E, INTELSAT8 174E
UAE27400	25, 27, 29, 31, 33, 35, 37, 39	7	J	JCSAT-3A, JCSAT-3B
ZWE13500	1, 3, 5, 7, 9, 11, 13	7	USA	INTELSAT7 359E

* Administrations and corresponding networks/beams whose assignment(s) may cause interference to the beam shown in the left-hand column.

SUP

TABLE 6A (WRC-07)
Basic characteristics of the Regions 1 and 3 Plan (sorted by administration)

ADD

TABLE 6A (WRC-12)
Basic characteristics of the Regions 1 and 3 Plan (sorted by administration)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Admin. symbol	Beam identification	Orbital position	Boresight		Space station antenna characteristics		Space station antenna code		Earth station antenna		Designation of emission	Identity of the space station	Group code	Status	Remarks
			Long.	Lat.	Major axis	Minor axis	Orientation	Shaped beam	Co-polar	Cross-polar	Code	Gain	Type	Angle	
AFG	100	50.00	65.88	33.86			CB TSS AFGA				MODRES	35.50	CL		
AFS		4.80	24.50	-28.00	3.13	1.68	27.00 R13TSS				MODRES	35.50	CL		P
AGL		-24.80	16.06	-12.45	2.42	1.88	77.88 R13TSS				MODRES	35.50	CL		P
ALB		62.00	20.04	41.23	0.60	0.60	61.32 R13TSS				MODRES	35.50	CL		P
ALG	100	-24.80	1.86	27.60			CB TSS ALGA				MODRES	35.50	CL		P
AND		-37.00	1.60	42.50	0.60	0.60	0.00 R13TSS				MODRES	35.50	CL		P
ARM		22.80	44.99	39.95	0.73	0.60	148.17 R13TSS				MODRES	35.50	CR		P
ARS	100	17.00	44.72	23.76			CB TSS ARSA				MODRES	35.50	CL		P
ARS		17.00	52.30	24.80	2.68	0.70	143.00 R13TSS				MODRES	35.50	CL		P
AUS		152.00	123.00	-24.20	3.06	2.17	102.00 R13TSS				MODRES	35.50	CR		P
AUS		152.00	98.83	-12.19	0.60	0.60	0.00 R13TSS				MODRES	35.50	CR		P
AUS		152.00	105.69	-10.45	0.60	0.60	0.00 R13TSS				MODRES	35.50	CR		P
AUS		152.00	110.52	-66.28	0.60	0.60	0.00 R13TSS				MODRES	35.50	CR		P
AUS		152.00	133.90	-18.40	2.82	1.74	105.00 R13TSS				MODRES	35.50	CL		P
AUS		152.00	136.60	-30.90	2.41	1.52	161.00 R13TSS				MODRES	35.50	CL		P
AUS		164.00	145.20	-38.10	2.12	1.02	147.00 R13TSS				MODRES	35.50	CR		P
AUS		164.00	159.94	-54.50	0.60	0.60	0.00 R13TSS				MODRES	35.50	CR		P
AUS		164.00	145.90	-21.70	3.62	1.63	136.00 R13TSS				MODRES	35.50	CL		P
AUS		164.00	147.30	-32.10	2.31	1.43	167.00 R13TSS				MODRES	35.50	CR		P
AUS		164.00	159.06	-31.32	0.60	0.60	0.00 R13TSS				MODRES	35.50	CR		P
AUS		164.00	167.93	-28.02	0.60	0.60	0.00 R13TSS				MODRES	35.50	CR		P
AUS		152.00	132.38	-38.37			CB TSS AUSA				MODRES	35.50	CR		P

1	2	3	4		5		6	7	8		9		10	11	12	13	14	15	16
Admin. symbol	Beam identification	Orbital position	Bore sight		Space station antenna characteristics		Space station antenna code	Shaped beam	Space station antenna gain		Earth station antenna		Polarization		e.l.p.	Identity of the space station	Group code	Status	Remarks
			Long.	Lat.	Major axis	Minor axis			Co-polar	Cross-polar	Code	Gain	Type	Angle					
AUS	AUSB 100	164.00	132.38	-38.37			CB TSS AUSB		48.88		MODRES	35.50	CL		58.9	27M0G7W		P	7
AUT	AUTO1600	-18.80	10.31	49.47	1.82	0.92	MOD13FRTSS		42.19		MODRES	35.50	CL		59.1	27M0G7W		P	
AZE	AZE06400	23.20	47.47	40.14	0.93	0.60	158.14 R13TSS		46.98		MODRES	35.50	CL		58.9	27M0G7W		P	7
BDI	BDI27000	11.00	29.90	-3.10	0.71	1.00	80.00 R13TSS		48.15		MODRES	35.50	CL		58.4	27M0G7W		P	
BEL	BEL01800	38.20	5.12	57.96	1.00	1.00	24.53 MOD13FRTSS		44.45		MODRES	35.50	CL		55.5	27M0G7W		P	5
BEN	BEN23000	-19.20	2.20	9.50	1.44	0.68	97.00 R13TSS		44.54		MODRES	35.50	CL		58.3	27M0G7W		P	7
BFA	BFA10700	-30.00	-1.50	12.20	1.45	1.14	29.00 R13TSS		42.26		MODRES	35.50	CL		57.0	27M0G7W		P	5, 7
BGD	BGD20200	74.00	90.30	23.60	1.46	0.84	135.00 R13TSS		43.56		MODRES	35.50	CL		58.7	27M0G7W		P	
BHR	BHR25000	34.00	50.50	26.10	0.60	0.00	MOD13FRTSS		48.88		MODRES	35.50	CR		54.5	27M0G7W		P	5, 7
BHJ	BHJ14800	56.00	19.22	43.97	0.60	0.60	90.00 R13TSS		48.88		MODRES	35.50	CL		58.9	27M0G7W		P	
BUR	BUR06200	37.80	27.91	53.06	1.21	0.60	114.71 R13TSS		45.83		MODRES	35.50	CL		58.9	27M0G7W		P	
BOT	BOT29700	-0.80	23.30	-22.20	2.13	1.50	36.00 R13TSS		39.40		MODRES	35.50	CL		58.7	27M0G7W		P	
BRU	BRU26800	104.00	98.97	18.67	3.33	1.66	91.58 R13TSS		37.04		MODRES	35.50	CL		58.9	27M0G7W		P	
BRU	BRU03000	74.00	114.70	4.40	0.60	0.60	0.00 R13TSS		48.88		MODRES	35.50	CR		57.3	27M0G7W		P	
BTN	BTN03100	86.00	99.44	27.05	0.72	0.60	175.47 R13TSS		48.11		MODRES	35.50	CR		58.3	27M0G7W		P	
BUL	BUL02000	-1.20	25.00	43.00	1.04	0.60	165.00 R13TSS		48.50		MODRES	35.50	CL		58.6	27M0G7W		P	
CAP	CAP25800	-13.20	21.00	6.30	2.25	1.88	31.00 R13TSS		38.67		MODRES	35.50	CL		59.3	27M0G7W		P	
CBG	CBG25600	66.00	104.82	12.94	1.04	0.96	9.45 R13TSS		44.91		MODRES	35.50	CR		59.3	27M0G7W		P	
CHN	CHN15500	62.00	88.18	31.20	3.03	1.24	163.23 R13TSS		38.69		MODRES	35.50	CL		57.0	27M0G7W		P	
CHN	CHN15800	134.00	113.29	39.70	2.80	1.55	35.44 R13TSS		38.07		MODRES	35.50	CR		57.9	27M0G7W		P	
CHN	CHN19000	122.00	114.17	23.32	0.91	0.60	2.88 MOD13FRTSS		47.08		MODRES	35.50	CR		58.9	27M0G7W		P	
CHN	CHN20000	122.00	113.55	22.20	0.60	0.60	0.00 MOD13FRTSS		48.88		MODRES	35.50	CL		57.0	27M0G7W		P	
CHN	CHN4 100	62.00	90.56	39.22			CB TSS CHNA		40.01		MODRES	35.50	CR		58.5	27M0G7W		P	
CHN	CHN4 100	134.00	105.77	27.56			CB TSS CHNC		39.51		MODRES	35.50	CL		57.1	27M0G7W		P	
CHN	CHN4 100	92.20	114.96	20.16			CB TSS CHNE		44.74		MODRES	35.50	CL		59.4	27M0G7W		P	
CHN	CHN4 100	92.20	123.54	45.76			CB TSS CHNF		43.71		MODRES	35.50	CR		60.4	27M0G7W		P	
CLN	CLN21900	50.00	80.60	7.70	1.18	0.60	106.00 R13TSS		45.95		MODRES	35.50	CL		56.7	27M0G7W		P	
CME	CME30000	-13.00	12.70	2.20	2.54	1.68	87.00 R13TSS		38.15		MODRES	35.50	CL		58.5	27M0G7W		P	
COD	COD 100	-19.20	21.85	-3.40			CB TSS CODA		38.36		MODRES	35.50	CR		59.1	27M0G7W		P	7
COD	COD32500	-13.20	14.60	-0.70	2.02	1.18	59.00 R13TSS		40.67		MODRES	35.50	CL		58.8	27M0G7W		P	7
COM	COM20700	29.00	44.10	-12.10	0.76	0.60	149.00 R13TSS		47.86		MODRES	35.50	CR		57.3	27M0G7W		P	7
CPV	CPV09100	-33.50	-24.12	16.09	0.77	0.63	94.46 R13TSS		47.56		MODRES	35.50	CL		58.7	27M0G7W		P	5, 7
CTI	CTI23200	-24.80	-5.78	7.19	1.50	1.36	111.24 R13TSS		41.67		MODRES	35.50	CL		60.2	27M0G7W		P	7
CVA	CVA48300	-1.20	13.02	42.09	0.75	0.66	20.53 R13TSS		47.50		MODRES	35.50	CR		58.5	27M0G7W		P	5, 7
CVA	CVA06500	-1.20	12.39	41.09	1.72	1.31	144.13 MOD13FRTSS		40.92		MODRES	35.50	CR		56.5	27M0G7W		P	
CYP	CYP48600	-12.00	33.45	35.72	0.60	0.60	MOD13FRTSS		48.88		MODRES	35.50	CL		58.8	27M0G7W		P	5, 7
CZE	CZE14401	-12.80	16.77	46.78	1.71	0.89	149.15 MOD13FRTSS		42.84		MODRES	35.50	CL		58.8	27M0G7W		P	
CZE	CZE14402	-12.80	16.77	46.78	1.71	0.89	149.15 MOD13FRTSS		42.84		MODRES	35.50	CR		58.8	27M0G7W		P	37
CZE	CZE14403	-12.80	16.77	46.78	1.71	0.89	149.15 MOD13FRTSS		42.84		MODRES	35.50	CR		58.8	27M0G7W		P	7
D	D 08700	-18.80	10.31	49.47	1.82	0.92	151.78 MOD13FRTSS		42.19		MODRES	35.50	CL		59.1	27M0G7W		P	7
DJI	DJI08900	16.80	40.68	11.69	0.60	0.60	90.00 R13TSS		48.88		MODRES	35.50	CL		57.5	27M0G7W		P	
DNK	DNK 100	-25.20	2.92	59.62			CB TSS DNKA		43.48		MODRES	35.50	CL		58.3	27M0G7W		P	7
DNK	DNK080XR	-33.50	13.27	60.86	1.99	0.63	151.38 MOD13FRTSS		43.48		MODRES	35.50	CR		54.5	27M0G7W		P	6

1	2	3	4		5		6	7	8		9		10		11	12	13	14	15	16
Admin. symbol	Beam identification	Orbital position	Boresight		Space station antenna characteristics		Space station antenna code	Shaped beam	Space station antenna gain		Earth station antenna		Polarization		e.l.p.	Designation of emission	Identity of the space station	Group code	Status	Remarks
			Long.	Lat.	Major axis	Minor axis			Orientation	Co-polar	Cross-polar	Code	Gain	Type						
DNK	DNK091XR	-33.50	-15.16	63.67	1.56	0.60	170.63	MOD13RTSS		44.73		MODRES	35.50	CR		58.6	27M0G7W		P	6
E	E-100	-30.00	-9.40	34.15				CB TSS E A		44.79		MODRES	35.50	CL		58.9	27M0G7W		01	
E	HISP3D1	-30.00	-4.00	39.00					COP	39.80	5.50	MODRES	35.50	CL		57.6	33M0G7W	HISPASAT-1	01	PE
E	HISP3D2	-30.00	-4.00	39.00					COP	39.80	5.50	MODRES	32.50	CL		57.6	33M0G7W	HISPASAT-1	01	PE
E	HISPA27D	-30.00	-4.00	39.00					COP	39.80	5.50	MODRES	38.43	CL		57.6	27M0G7W	HISPASAT-1	01	PE
E	HISPA34A	-30.00	-4.00	39.00					COP	39.80	5.50	MODRES	38.43	CL		57.6	27M0G7W	HISPASAT-1	01	PE
EGY	EGY02600	-7.00	29.70	26.80	2.33	1.72	136.00	R13TSS		38.42		MODRES	35.50	CL		58.1	27M0G7W		12	P
ERI	ERI09200	22.80	39.41	14.98	1.67	0.95	145.46	R13TSS		42.44		MODRES	35.50	CR		58.9	27M0G7W		P	7
EST	EST06100	44.50	25.06	58.00	0.77	0.60	122.7	R13TSS		47.81		MODRES	35.50	CR		58.7	27M0G7W		P	
ETH	ETH09200	36.00	40.23	8.95	2.87	2.16	174.06	R13TSS		38.52		MODRES	35.50	CL		58.8	27M0G7W		P	8
F	F 09300	-7.00	3.52	45.41	2.22	1.15	159.34	R13TSS		40.39		MODRES	35.50	CL		58.9	27M0G7W		P	7
F	F-100	-7.00	50.00	-15.65				CB TSS F A		48.88		MODRES	35.50	CR		58.9	27M0G7W		P	
F	NQ11000	-140.00	68.00	-21.00	1.14	0.72	146.00	R13TSS		46.30		MODRES	35.50	CR		58.3	27M0G7W		P	
F	OCE10100	-160.00	-45.00	-16.30	4.34	3.54	4.00	R13TSS		32.58		MODRES	35.50	CL		58.5	27M0G7W		P	8
F	WAL10200	-140.00	-176.80	-14.00	0.74	0.80	29.00	R13TSS		47.97		MODRES	35.50	CR		59.4	27M0G7W		P	
FIN	FIN10300	22.80	22.90	64.50	1.38	0.76	171.00	MOD13RTSS		44.24		MODRES	35.50	CL		54.5	27M0G7W		52	P
FIN	FIN10400	22.80	15.87	61.15	2.24	0.91	16.70	MOD13RTSS		47.37		MODRES	35.50	CL		54.5	27M0G7W		52	P
FIN	FJ19300	-178.00	179.62	-17.87	1.16	0.92	155.22	R13TSS		44.16		MODRES	35.50	CR		58.7	27M0G7W		P	7
FSM	FSM00000	158.00	151.90	54.81	5.15	1.57	167.00	R13TSS		35.38		MODRES	35.50	CR		58.9	27M0G7W		P	
G	G 02700	-33.50	-3.50	53.00	1.84	0.72	142.00	R13TSS		43.23		MODRES	35.50	CR		58.9	27M0G7W		P	7
GAB	GAB26000	-13.20	11.80	-0.60	1.43	1.12	64.00	R13TSS		42.40		MODRES	35.50	CR		58.3	27M0G7W		P	7
GEO	GEO06400	23.20	43.35	42.27	1.11	0.60	161.21	R13TSS		46.23		MODRES	35.50	CR		58.9	27M0G7W		P	
GHA	GHA10800	-25.00	-1.20	7.90	1.48	1.06	102.00	R13TSS		42.49		MODRES	35.50	CR		58.6	27M0G7W		P	
GMB	GMB30200	-37.20	-15.10	13.40	0.79	0.60	4.00	R13TSS		47.69		MODRES	35.50	CL		58.3	27M0G7W		P	5, 7
GNE	GNE30400	-30.00	-15.00	12.00	0.90	0.60	172.00	R13TSS		47.12		MODRES	35.50	CL		58.1	27M0G7W		P	5, 7
GNE	GNE30300	-18.80	10.30	1.50	0.68	0.80	10.00	R13TSS		48.34		MODRES	35.50	CL		58.8	27M0G7W		P	
GRC	GRC10500	-1.20	24.51	38.08	1.70	0.95	152.97	MOD13RTSS		42.40		MODRES	35.50	CL		56.3	27M0G7W		P	5, 7
GUI	GUI19200	-37.00	-11.00	10.20	1.58	1.04	147.00	R13TSS		42.29		MODRES	35.50	CR		58.4	27M0G7W		P	7
HNG	HNG10601	-12.80	16.77	46.78	1.71	0.89	149.15	MOD13RTSS		42.64		MODRES	35.50	CL		59.3	27M0G7W		P	7
HNG	HNG10602	-12.80	16.77	46.78	1.71	0.89	149.15	MOD13RTSS		42.64		MODRES	35.50	CR		59.3	27M0G7W		P	
HNG	HNG10603	-12.80	16.77	46.78	1.71	0.89	149.15	MOD13RTSS		42.64		MODRES	35.50	CR		59.3	27M0G7W		P	37
HOL	HOL21300	38.20	5.12	51.96	1.00	1.00	24.53	MOD13RTSS		44.45		MODRES	35.50	CL		58.5	27M0G7W		P	7
HRV	HRV14801	-12.80	16.77	46.78	1.71	0.89	149.15	MOD13RTSS		42.64		MODRES	35.50	CL		58.8	27M0G7W		P	7
HRV	HRV14802	-12.80	16.77	46.78	1.71	0.89	149.15	MOD13RTSS		42.64		MODRES	35.50	CR		58.3	27M0G7W		P	7
HRV	HRV14803	-12.80	16.77	46.78	1.71	0.89	149.15	MOD13RTSS		42.64		MODRES	35.50	CR		58.3	27M0G7W		P	7
I	I 06200	9.00	12.67	40.74	1.99	1.13	144.20	R13TSS		40.14		MODRES	35.50	CR		54.5	27M0G7W		P	8
IND	IND03700	68.00	93.00	25.50	1.46	1.13	40.00	R13TSS		42.27		MODRES	35.50	CL		58.9	27M0G7W		P	
IND	IND04700	68.00	93.30	11.10	1.92	0.60	96.00	R13TSS		43.83		MODRES	35.50	CR		58.4	27M0G7W		P	
IND	INDA 100	55.80	76.16					CB TSS INDA		45.66		MODRES	35.50	CR		58.9	27M0G7W		P	
IND	INDB 100	55.80	83.43	24.22				CB TSS INDB		43.15		MODRES	35.50	CL		58.9	27M0G7W		P	
IND	INDC 100	68.00	74.37	29.16				CB TSS INDC		41.80		MODRES	35.50	CR		59.3	27M0G7W		P	
INSA	INSA 100	80.20	108.82	-0.73				CB TSS INSA		38.88		MODRES	35.50	CR		58.2	27M0G7W		P	
INSB	INSB 100	104.00	129.75	-3.50				CB TSS INSB		37.53		MODRES	35.50	CL		58.8	27M0G7W		P	

1	2	3	4	5			6	7	8	9			10	11	12	13	14	15	16	
Admin. symbol	Beam identification	Orbital position	Bore sight		Space station antenna characteristics		Space station antenna code	Shaped beam	Space station antenna gain		Earth station antenna		Polarization		e.i.r.p.	Designation of emission	Identity of the space station	Group code	Status	Remarks
			Long.	Lat.	Major axis	Minor axis			Co-polar	Cross-polar	Code	Gain	Type	Angle						
IRL	IRL21100	-37.20	-8.25	53.22	0.72	0.60	157.56	R13TSS		48.08	MODRES	35.50	CL		59.2	27M0G7W		P		5, 7
IRN	IRN10900	34.00	54.20	32.40	3.82	1.82	149.00	R13TSS		38.03	MODRES	35.50	CL		57.8	27M0G7W		P		
IRQ	IRQ25600	50.00	43.78	33.28	1.74	1.23	156.76	R13TSS		41.14	MODRES	35.50	CL		58.3	27M0G7W		P		
ISL	ISL04900	-33.50	-19.00	64.90	1.00	0.60	177.00	R13TSS		46.67	MODRES	35.50	CL		60.8	27M0G7W		P		5, 6
ISL	ISL05000	-33.50	-15.35	63.25	1.58	0.60	169.00	R13TSS		44.67	MODRES	35.50	CR		57.3	27M0G7W		P		5
ISR	ISR11000	-4.00	34.95	31.32	0.73	0.60	110.02	R13TSS		48.01	MODRES	35.50	CR		58.8	27M0G7W		P		
J	00085-3N	109.85	134.50	31.50	3.52	3.30	68.00	R13TSS		33.80	MODRES	35.50	CR		*	27M0F8W	BS-3N	02	PE	
J	J 10985	109.85	134.50	31.50	3.52	3.30	68.00	R13TSS		33.80	MODRES	35.50	CR		*	34M5G7W		02	P	
J	J 11100	110.00	134.50	31.50	3.52	3.30	68.00	R13TSS		33.80	MODRES	35.50	CR		*	27M0F8W	BS-3M	02	PE	
J	J 1110E	110.00	134.50	31.50	3.52	3.30	68.00	R13TSS		33.80	MODRES	35.50	CR		*	34M5G7W		02	PE	
JOR	JOR2400	11.00	37.55	34.02	1.47	0.91	73.16	MOD13FRTSS		43.19	MODRES	35.50	CL		55.5	27M0G7W		P		8
KAZ	KAZ06600	56.40	65.73	46.40	4.58	1.76	177.45	R13TSS		35.38	MODRES	35.50	CL		58.9	27M0G7W		P		
KEN	KEN24900	-0.80	37.95	0.92	2.13	1.34	98.35	R13TSS		39.90	MODRES	35.50	CL		58.7	27M0G7W		P		
KGZ	KGZ07000	50.00	73.91	41.32	1.47	0.64	5.05	R13TSS		44.75	MODRES	35.50	CR		59.0	27M0G7W		P		
KIR	KIR 100	176.00	-70.31	-3.56				CB TSS KIRA		42.58	MODRES	35.50	CL		58.9	27M0G7W		P		5, 7
KOR	KOR1201D	116.00	127.50	36.00	1.24	1.02	168.00	R13TSS		43.40	MODRES	35.50	CL		**	27M0G7W	KOREASAT-1	03	PE	
KOR	KOR1200	116.00	127.50	36.00	1.24	1.02	168.00	R13TSS		43.40	MODRES	35.50	CL		**	27M0G7W		03	P	
KOR	KOR1201	116.00	127.50	36.00	1.24	1.02	168.00	R13TSS		43.40	MODRES	35.50	CL		**	27M0F8W	KOREASAT-1	03	PE	
KRE	KRE28600	140.00	128.45	40.32	1.63	0.68	18.89	R13TSS		44.00	MODRES	35.50	CL		59.0	27M0G7W		P		
KWT	KWT11300	11.00	47.48	29.12	0.60	0.60	90.00	R13TSS		48.88	MODRES	35.50	CR		58.2	27M0G7W		P		7
LAO	LAO28400	122.20	103.71	18.17	1.87	1.03	123.99	MOD13FRTSS		41.60	MODRES	35.50	CR		58.8	33M0G7W		P		
LBN	LBN27900	11.00	37.55	34.02	1.47	0.91	73.16	MOD13FRTSS		43.19	MODRES	35.50	CR		55.5	27M0G7W		P		
LBR	LBR24400	-33.50	-9.30	6.60	1.22	0.70	133.00	R13TSS		45.13	MODRES	35.50	CR		59.2	27M0G7W		P		5, 7
LBY	LBY 100	-24.80	17.62	26.55				CB TSS LBVA		40.30	MODRES	35.50	CL		58.0	27M0G7W		P		7
LIE	LIE2300	-18.80	10.31	49.47	1.82	0.92	151.78	MOD13FRTSS		42.19	MODRES	35.50	CL		59.1	27M0G7W		P		
LSO	LSO30500	4.80	27.80	-29.80	0.66	0.60	36.00	R13TSS		48.47	MODRES	35.50	CR		59.2	27M0G7W		P		7
LTU	LTU06100	23.20	24.51	56.09				CB TSS LTUA		48.21	MODRES	35.50	CL		56.9	27M0G7W		P		
LUX	LUX1400	28.20	5.21	49.20	0.60	0.60	90.00	R13TSS		48.88	MODRES	35.50	CL		57.9	27M0G7W		P	09	
LVA	LVA06100	23.20	24.51	56.09				CB TSS LVAA		48.21	MODRES	35.50	CL		56.9	27M0G7W		P		
MAU	MAU 100	29.00	59.61	-15.88				CB TSS MAUA		41.42	MODRES	35.50	CL		59.0	12M0G7W		P		7
MCO	MCO11600	34.20	7.93	43.59	1.28	0.60	21.73	MOD13FRTSS		45.58	MODRES	35.50	CL		58.6	27M0G7W		P		
MDA	MDA06300	50.00	28.45	46.99	0.60	0.60	90.00	R13TSS		48.88	MODRES	35.50	CR		58.9	27M0G7W		P		5
MDG	MDG23900	29.00	46.60	-19.80	2.72	1.14	65.00	R13TSS		39.53	MODRES	35.50	CL		58.3	27M0G7W		P		
MHL	MHL00000	146.00	167.64	9.83	2.07	0.90	157.42	R13TSS		41.75	MODRES	35.50	CR		59.0	27M0G7W		P		
MKD	MKD14800	22.80	21.61	41.56	0.60	0.60	90.00	R13TSS		48.88	MODRES	35.50	CR		58.9	27M0G7W		P		
MLA	MLA 100	91.50	106.05	4.00				CB TSS MLAA		43.00	MODRES	35.50	CR		58.4	27M0G7W		P		

* Channel 1: 58.2 dBW, channels 3, 5, 7: 59.2 dBW, channels 9, 11, 13: 59.3 dBW, other channels: 59.4 dBW.

** Channels 2, 4, 6: 63.6 dBW, channels 8, 10, 12: 63.7 dBW.

*** Channels 2, 4, 6: 59.0 dBW, other channels: 59.1 dBW.

1	2	3	4		5		6	7	8	9		10	11	12	13	14	15	16		
Admin. symbol	Beam identification	Orbital position	Bore sight		Space station antenna characteristics		Space station antenna code	Shaped beam	Space station antenna gain		Earth station antenna		Polarization	e-Lr.p.	Designation of emission	Identity of the space station	Group code	Status	Remarks	
			Long.	Lat.	Major axis	Minor axis			Co-polar	Cross-polar	Code	Gain								Type
	MLD30600	50.00	72.95	57.8	1.19	0.91	10.453	R13TSS		44.09		MODRES	35.50	CR				P		
	MLI_100	-19.20	-5.35	17.11				CB_TSS MLIB		41.21		MODRES	35.50	CR				P	5, 7	
	MLT14700	22.80	14.40	35.90	0.60	0.60	0.00	R13TSS		48.88		MODRES	35.50	CR				P		
	MNG24800	74.00	102.20	46.60	3.60	1.13	163.00	R13TSS		38.35		MODRES	35.50	CR				P	5, 7	
	MOZ102700	-1.00	34.00	-18.00	3.57	1.38	55.00	R13TSS		37.52		MODRES	35.50	CL				P	5, 7	
	MRC20900	-25.20	-8.95	28.98	3.56	1.23	49.23	R13TSS		38.02		MODRES	35.50	CR				P	7	
	MTN_100	-36.80	-10.52	19.66				CB_TSS MTNA		41.91		MODRES	35.50	CR				P	7	
	MWI30800	4.80	33.79	-13.35	1.56	0.70	92.69	R13TSS		44.10		MODRES	35.50	CR				P	7	
	NGR11500	-37.20	7.63	17.01	2.20	1.80	102.40	R13TSS		38.48		MODRES	35.50	CL				P	5, 7	
	NIG11900	-19.20	7.80	9.40	2.16	2.02	45.00	R13TSS		38.05		MODRES	35.50	CR				P		
	NMB02500	-18.80	17.50	-21.60	2.66	1.90	48.00	R13TSS		37.41		MODRES	35.50	CL				P		
	NOR12000	-0.80	13.42	62.76	1.43	0.60	19.61	MOD13RTSS		45.10		MODRES	35.50	CL				P	06	
	NOR12100	-0.80	13.00	62.73	1.67	0.83	23.95	R13TSS		43.02		MODRES	35.50	CL				P	06	
	NPL12200	50.00	83.70	28.30	1.72	0.80	163.00	R13TSS		44.31		MODRES	35.50	CR				P		
	NRU30900	134.00	167.00	-45.50	0.60	0.60	0.00	R13TSS		48.88		MODRES	35.50	CL				P		
	NZL_100	158.00	-170.68	-19.72				CB_TSS NZLA		48.88		MODRES	35.50	CL				P	7	
	OMA12300	17.20	55.60	21.00	1.88	1.02	100.00	R13TSS		41.62		MODRES	35.50	CR				P		
	PAK12700	38.20	69.60	29.50	2.30	2.16	14.00	R13TSS		37.49		MODRES	35.50	CR				P		
	PHL28500	98.00	121.30	11.10	3.46	1.76	99.00	R13TSS		36.60		MODRES	35.50	CL				P		
	PLW00000	140.00	132.98	5.51	1.30	0.60	55.41	R13TSS		45.53		MODRES	35.50	CR				P		
	PNG13100	134.00	148.07	-6.65	3.13	2.30	168.32	MOD13RTSS		35.87		MODRES	35.50	CR				P		
	POL13200	50.00	20.07	51.86	1.20	0.69	17.76	R13TSS		45.26		MODRES	35.50	CL				P	5	
	POR_100	-37.00	-15.92	37.65				CB_TSS POR A		47.17		MODRES	35.50	CR				P		
	PSE	-13.20	34.99	31.66	0.60	0.60	90.00	R13TSS		48.88		MODRES	35.50	CR				P	3	
	QAT124700	20.00	51.38	25.26	0.60	0.60	90.00	R13TSS		48.88		MODRES	35.50	CL				P		
	ROU13600	50.00	25.12	45.75	1.17	0.73	9.52	R13TSS		45.15		MODRES	35.50	CR				P		
	RWW31000	11.00	30.00	-2.10	0.66	0.60	42.00	R13TSS		48.47		MODRES	35.50	CL				P		
	RUS	RSTREAT1	36.00	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	35.50	CL				P	05
	RUS	RSTREAT2	36.00	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	35.50	CR				P	05
	RUS	RSTRED11	36.00	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	35.50	CL				P	05
	RUS	RSTRED12	36.00	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	35.50	CR				P	05
	RUS	RSTRED13	36.00	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	35.50	CL				P	05
	RUS	RSTRED14	36.00	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	35.50	CR				P	05
	RUS	RSTRED15	36.00	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	35.50	CL				P	05
	RUS	RSTRED16	36.00	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	35.50	CR				P	05
	RUS	RSTRED17	36.00	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	35.50	CL				P	05
	RUS	RSTRED18	36.00	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	35.50	CR				P	05
	RUS	RSTRED19	36.00	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	35.50	CL				P	05
	RUS	RSTRED20	36.00	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	35.50	CR				P	05
	RUS	RSTRED21	36.00	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	35.50	CL				P	05
	RUS	RSTRED22	36.00	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	35.50	CR				P	05
	RUS	RSTRED23	36.00	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	35.50	CL				P	05
	RUS	RSTRED24	36.00	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	35.50	CR				P	05
	RUS	RSTRED25	36.00	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	35.50	CL				P	05
	RUS	RSTRED26	36.00	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	35.50	CR				P	05
	RUS	RSTRED27	36.00	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	35.50	CL				P	05
	RUS	RSTRED28	36.00	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	35.50	CR				P	05
	RUS	RSTRED29	36.00	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	35.50	CL				P	05
	RUS	RSTRED30	36.00	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	35.50	CR				P	05
	RUS	RSTRED31	36.00	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	35.50	CL				P	05
	RUS	RSTRED32	36.00	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	35.50	CR				P	05
	RUS	RSTRED33	36.00	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	35.50	CL				P	05
	RUS	RSTRED34	36.00	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	35.50	CR				P	05
	RUS	RSTRED35	36.00	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	35.50	CL				P	05
	RUS	RSTRED36	36.00	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	35.50	CR				P	05
	RUS	RSTRED37	36.00	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	35.50	CL				P	05
	RUS	RSTRED38	36.00	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	35.50	CR				P	05
	RUS	RSTRED39	36.00	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	35.50	CL				P	05
	RUS	RSTRED40	36.00	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	35.50	CR				P	05
	RUS	RSTRED41	36.00	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	35.50	CL				P	05
	RUS	RSTRED42	36.00	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	35.50	CR				P	05
	RUS	RSTRED43	36.00	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	35.50	CL				P	05
	RUS	RSTRED44	36.00	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	35.50	CR				P	05
	RUS	RSTRED45	36.00	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	35.50	CL				P	05
	RUS	RSTRED46	36.00	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	35.50	CR				P	05
	RUS	RSTRED47	36.00	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	35.50	CL				P	05
	RUS	RSTRED48	36.00	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	35.50	CR				P	05
	RUS	RSTRED49	36.00	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	35.50	CL				P	05
	RUS	RSTRED50	36.00	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	35.50	CR				P	05
	RUS	RSTRED51	36.00	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	35.50	CL				P	05
	RUS	RSTRED52	36.00	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	35.50	CR				P	05
	RUS	RSTRED53	36.00	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70									

1	2	3	4		5		6	7	8		9		10	11	12	13	14	15	16
Admin. symbol	Beam identification	Orbital position	Bore sight		Space station antenna characteristics		Space station antenna code	Shaped beam	Space station antenna gain		Earth station antenna		Polarization		Designation of emission	Identity of the space station	Group code	Status	Remarks
			Long.	Lat.	Major axis	Minor axis			Co-polar	Cross-polar	Code	Gain	Type	Angle					
S	S 13800	5.00	16.20	61.00	1.04	0.98	14.00	R13TSS		44.36	MODRES	35.50	CL		55.6	27M0G7W	04	P	
S	SDN_100	-7.00	30.24	13.53			10.00	R13TSS		41.44	MODRES	35.50	CL		61.1	27M0G7W	04	P	
SEN	SEN22200	-37.00	-14.40	13.80	1.46	1.04	139.00	CB_TSS SDNA	40.26	42.63	MODRES	35.50	CR		59.4	27M0G7W	P	P	5, 7
SEY	SEY00000	42.50	51.86	-7.23	2.43	1.04	27.51	R13TSS	42.84	40.44	MODRES	35.50	CR		58.9	27M0G7W	P	P	5, 7
SJM	SJM00000	128.00	159.27	-8.40	1.35	1.08	118.59	R13TSS	42.81	48.88	MODRES	35.50	CL		58.9	27M0G7W	P	P	7
SMD	SMD05700	-178.00	-171.70	-13.87	0.60	0.60	90.00	R13TSS	48.88	48.88	MODRES	35.50	CR		58.9	27M0G7W	P	P	7
SMR	SMR31100	-36.80	12.60	14.70	0.60	0.60	0.00	R13TSS	48.88	48.88	MODRES	35.50	CR		57.4	27M0G7W	P	P	7
SNG	SNG15100	88.00	103.86	4.02	0.92	0.72	175.12	R13TSS	46.25	46.25	MODRES	35.50	CL		58.9	27M0G7W	P	P	5, 7
SOM	SOM41200	37.80	45.16	7.11	3.31	1.51	65.46	R13TSS	37.46	47.07	MODRES	35.50	CR		58.9	27M0G7W	P	P	5, 7
SOR	SOR14800	-7.00	20.50	43.98	0.91	0.60	145.16	R13TSS	47.07	47.07	MODRES	35.50	CR		58.9	27M0G7W	P	P	5, 7
SRI	SRI25900	-33.50	-11.80	8.60	0.78	0.68	114.00	R13TSS	47.20	48.56	MODRES	35.50	CR		58.4	27M0G7W	P	P	6
STP	STP24100	-7.00	6.17	1.45	0.65	0.60	153.51	R13TSS	48.56	48.56	MODRES	35.50	CR		58.4	27M0G7W	P	P	7
SUI	SUI14000	-18.80	10.31	49.47	1.82	0.92	151.78	MOD13RTSS	42.19	42.19	MODRES	35.50	CL		59.3	27M0G7W	P	P	7
SVK	SVK14401	-12.80	16.77	46.78	1.71	0.89	149.15	MOD13RTSS	42.84	42.84	MODRES	35.50	CR		59.3	27M0G7W	P	P	7
SVK	SVK14402	-12.80	16.77	46.78	1.71	0.89	149.15	MOD13RTSS	42.84	42.84	MODRES	35.50	CR		59.3	27M0G7W	P	P	7
SVK	SVK14403	-12.80	16.77	46.78	1.71	0.89	149.15	MOD13RTSS	42.84	42.84	MODRES	35.50	CR		59.3	27M0G7W	P	P	7
SVN	SVN14600	33.80	15.01	46.18	0.60	0.60	90.00	R13TSS	48.88	48.88	MODRES	35.50	CR		58.9	27M0G7W	P	P	7
SWZ	SWZ21300	4.80	37.39	-26.44	0.60	0.60	90.00	R13TSS	48.88	48.88	MODRES	35.50	CL		57.9	27M0G7W	P	P	7
SYR	SYR22900	11.00	37.55	34.02	1.47	0.91	73.16	MOD13RTSS	43.19	43.19	MODRES	35.50	CL		55.5	27M0G7W	53	P	
SYR	SYR33900	11.00	37.60	34.20	1.32	0.88	74.00	MOD13RTSS	43.80	43.80	MODRES	35.50	CL		56.4	27M0G7W	53	P	
TCO	TCO14300	17.00	18.36	15.47	3.23	2.05	82.89	R13TSS	36.23	36.23	MODRES	35.50	CR		58.9	27M0G7W	P	P	5, 7
TGO	TGO22600	-30.00	0.72	8.61	1.12	0.60	109.54	R13TSS	46.19	46.19	MODRES	35.50	CR		58.6	27M0G7W	P	P	5, 7
THA	THA14200	98.00	100.75	12.88	2.80	1.82	93.77	R13TSS	37.37	37.37	MODRES	35.50	CL		58.9	27M0G7W	P	P	5, 7
TJK	TJK06900	38.00	71.14	38.41	1.21	0.73	155.31	R13TSS	45.00	45.00	MODRES	35.50	CL		58.9	27M0G7W	P	P	5, 7
TQM	TQM06900	50.00	59.24	38.83	2.26	1.02	166.64	R13TSS	40.81	40.81	MODRES	35.50	CR		58.9	27M0G7W	P	P	5, 7
TLS	TLS00000	128.00	126.03	-8.72	0.66	0.60	13.92	R13TSS	48.50	48.50	MODRES	35.50	CR		58.9	27M0G7W	P	P	5, 7
TON	TON1500	170.75	-175.23	-18.19	1.59	0.60	71.33	R13TSS	44.64	44.64	MODRES	35.50	CR		58.9	27M0G7W	P	P	5, 7
TUN	TUN15000	-25.20	9.50	33.50	1.88	0.72	135.00	MOD13RTSS	43.13	43.13	MODRES	35.50	CR		57.3	27M0G7W	55	P	
TUN	TUN27200	-25.20	2.10	31.75	3.41	1.81	179.18	MOD13RTSS	36.34	36.34	MODRES	35.50	CR		55.5	27M0G7W	55	P	4
TUR	TUR14500	42.00	34.95	39.69	3.18	0.96	0.79	R13TSS	39.47	39.47	MODRES	35.50	CL		58.3	27M0G7W	36	P	
TUV	TUV09000	176.00	177.61	-7.11	0.94	0.60	137.58	R13TSS	46.93	46.93	MODRES	35.50	CR		58.9	27M0G7W	P	P	7
TZA	TZA22900	11.00	34.60	-6.20	2.41	1.72	129.00	R13TSS	38.27	38.27	MODRES	35.50	CR		58.7	27M0G7W	P	P	
UAE	UAE27400	52.50	53.85	24.34	1.19	0.85	3.72	R13TSS	42.39	42.39	MODRES	35.50	CR		58.7	27M0G7W	P	P	5, 7
UGA	UGA05100	17.00	32.20	1.04	1.50	1.02	66.73	R13TSS	42.82	42.82	MODRES	35.50	CL		58.7	27M0G7W	P	P	
UKR	UKR06300	38.20	31.74	48.22	2.29	0.96	177.78	R13TSS	47.01	47.01	MODRES	35.50	CR		58.9	27M0G7W	P	P	
USA	GU033100	122.00	144.50	13.10	0.60	0.60	0.00	R13TSS	48.88	48.88	MODRES	35.50	CL		58.5	27M0G7W	P	P	
USA	MR433200	121.80	145.90	16.90	1.20	0.60	76.00	R13TSS	45.87	45.87	MODRES	35.50	CR		58.5	27M0G7W	P	P	
USA	PLM33200	170.00	-161.40	7.00	0.60	0.60	0.00	R13TSS	48.88	48.88	MODRES	35.50	CL		57.4	27M0G7W	P	P	
USA	USA_100	170.00	-170.51	-12.72			CB_TSS USAA		48.88	48.88	MODRES	35.50	CR		56.1	27M0G7W	P	P	
USA	WAK33400	140.00	166.50	19.20	0.60	0.60	0.00	R13TSS	48.88	48.88	MODRES	35.50	CR		58.9	27M0G7W	P	P	
UZB	UZB07100	33.80	63.80	41.21	2.56	0.89	159.91	R13TSS	40.84	40.84	MODRES	35.50	CR		58.9	27M0G7W	P	P	
VTN	VTN2500	107.00	106.84	14.21	3.43	1.76	109.43	R13TSS	38.65	38.65	MODRES	35.50	CR		58.4	27M0G7W	P	P	

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Admin. symbol	Beam identification	Orbital position	Boresight		Space station antenna characteristics		Shaped beam	Space station antenna gain		Earth station antenna		Identity of the space station	Group code	Status	Remarks
			Long.	Lat.	Major axis	Minor axis		Co-polar	Cross-polar	Code	Gain				
VUT	VUT12800	140.00	168.00	-16.40	1.52	0.68	87.00	R13TSS		MODRES	35.50	CL		P	
YEM	YEM_100	111.00	48.05	-14.64				47.63		MODRES	35.50	CL		P	
ZMB	ZMB31400	-0.80	27.50	-13.10	2.38	1.48	39.00	R13TSS		MODRES	35.50	CR		P	
ZWE	ZWE13500	-0.80	29.60	-18.80	1.46	1.36	37.00	R13TSS		MODRES	35.50	CR		P	5,7

MOD

APPENDIX 30A (REV.WRC-12)*

Provisions and associated Plans and List¹ for feeder links for the broadcasting-satellite service (11.7-12.5 GHz in Region 1, 12.2-12.7 GHz in Region 2 and 11.7-12.2 GHz in Region 3) in the frequency bands 14.5-14.8 GHz² and 17.3-18.1 GHz in Regions 1 and 3, and 17.3-17.8 GHz in Region 2 (WRC-03)

(See Articles 9 and 11) (WRC-03)

ARTICLE 5 (REV.WRC-12)

Coordination, notification, examination and recording in the Master International Frequency Register of frequency assignments to feeder-link transmitting earth stations and receiving space stations in the fixed-satellite service^{21, 22} (WRC-07)

ADD

5.2.10 Wherever the use of a frequency assignment to a space station recorded in the Master Register and emanating from the Regions 1 and 3 List is suspended for a period exceeding six months, the notifying administration shall, as soon as possible, but no later than six months from the date on which the use was suspended, inform the Bureau of the date on which such use was suspended. When the recorded assignment is brought back into use, the notifying administration shall so inform the Bureau, as soon as possible. The date on which the recorded assignment is brought back into use^{24bis} shall be no later than three years from the date of suspension. (WRC-12)

²¹ Notification of assignments to transmitting feeder-link earth stations included in the Region 2 feeder-link Plan after 2 June 2000, or included in the feeder-link List, following successful application of Article 4, shall be effected applying the provisions of Article 11 following completion of the procedure of Article 9. (WRC-03)

²² 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 specified in § 5.1.10 and the corresponding entries in the Master Register under § 5.2.2, 5.2.2.1 or 5.2.2.2, as appropriate, and the corresponding entries included in the Plan on and after 3 June 2000 or in the List, as appropriate, after informing the administration concerned. The Bureau shall inform all administrations of such action. 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. See also Resolution 905 (WRC-07). (WRC-07)

ADD*24bis*

The date of bringing back into use of a frequency assignment to a space station in the geostationary-satellite orbit shall be the commencement of the ninety-day period defined below. A frequency assignment to a space station in the geostationary-satellite orbit shall be considered as having been brought back into use when a space station in the geostationary-satellite orbit with the capability of transmitting or receiving that frequency assignment has been deployed and maintained at the notified orbital position for a continuous period of ninety days. The notifying administration shall inform the Bureau within thirty days from the end of the ninety-day period. (WRC-12)

ADD

5.2.11 If a recorded frequency assignment stemming from the Regions 1 and 3 List is not brought back into use within three years from the date of suspension, the Bureau shall cancel the assignment from the Master Register and the assignment in the List, unless the assignment is one to which § 4.1.26 or § 4.1.27 is being applied. (WRC-12)

ARTICLE 9A (REV.WRC-12)

**Plan for feeder links for the broadcasting-satellite service in
the fixed-satellite service in the frequency bands
14.5-14.8 GHz and 17.3-18.1 GHz in Regions 1 and 3**

SUP

10 Provisional beam. These assignments have been included in the Regions 1 and 3 feeder-link Plan by WRC-2000. These assignments are for exclusive use by East Timor.

SUP

TABLE 3A2 (WRC-07)

**Basic characteristics of the Regions 1 and 3 feeder-link Plan in the frequency band 17.3-18.1 GHz (sorted by
administration)**

TABLE 3A2 (WRC-12)

Basic characteristics of the Regions 1 and 3 feeder-link Plan in the frequency band 17.3-18.1 GHz (sorted by administration)

1	2	3	4		5			6	7	8		9		10		11	12	13	14	15	16	17
Admin. symbol	Beam identification	Orbital position	Boresight		Space station antenna characteristics			Space station antenna code	Shaped beam	Space station antenna gain		Earth station antenna		Polarization		e.i.p.	Power control	Designation of emission	Identity of the space station	Group code	Status	Remarks
			Long.	Lat.	Major axis	Minor axis	Orien-tation			Co-polar	Cross-polar	Code	Gain	Type	Angle							
AFG	AFG24601	50.00	67.00	34.30	1.89	1.19	18.00	MODRSS		40.93		MODTES	57.00	CL		84.0		ZTN0G7W		71	P	
AFG	AFG24602	50.00	67.00	34.30	1.89	1.19	18.00	MODRSS		40.93		MODTES	57.00	CR		84.0		ZTN0G7W		71	P	
AGL	AGL29600	-24.80	16.43	-12.37	2.66	1.75	77.43	MODRSS		37.77		MODTES	57.00	CR		84.0		ZTN0G7W			P	
ALB	ALB29600	62.00	19.50	41.37	0.60	0.60	69.35	MODRSS		48.88		MODTES	57.00	CL		82.6		ZTN0G7W			P	
AUS	ALG25152	-24.80	1.50	27.60	3.65	2.94	135.00	MODRSS		34.14		MODTES	57.00	CL		84.0		ZTN0G7W		P		
AND	AND34100	-37.00	1.60	42.50	0.60	0.60	0.00	MODRSS		48.88		MODTES	57.00	CL		83.0		ZTN0G7W		P		
ARM	ARM0400	22.80	44.99	39.95	0.73	0.60	148.17	MODRSS		48.02		MODTES	57.00	CR		84.0		ZTN0G7W			P	
ARS	ARS00375	17.00	44.60	23.40	4.21	2.48	145.00	MODRSS		34.26		MODTES	57.00	CL		84.0		ZTN0G7W		54	P	
ARS	ARS34000	17.00	44.60	23.40	4.21	2.48	145.00	MODRSS		34.28		MODTES	57.00	CL		84.0		ZTN0G7W		54	P	
AUS	AUS0400	152.00	135.00	-24.20	7.19	5.20	140.00	MODRSS		28.71		MODTES	57.00	CL		87.0		ZTN0G7W		30	P	
AUS	AUS0401	152.00	96.83	-12.19	0.60	0.60	0.00	MODRSS		48.88		MODTES	57.00	CL		87.0		ZTN0G7W		30	P	
AUS	AUS0402	152.00	105.69	-10.45	0.60	0.60	0.00	MODRSS		48.88		MODTES	57.00	CL		87.0		ZTN0G7W		30	P	
AUS	AUS0403	152.00	110.52	-66.28	0.60	0.60	0.00	MODRSS		48.88		MODTES	57.00	CL		87.0		ZTN0G7W		30	P	
AUS	AUS0404	152.00	158.94	-54.50	0.60	0.60	0.00	MODRSS		48.88		MODTES	57.00	CL		87.0		ZTN0G7W		30	P	
AUS	AUS0405	152.00	150.06	-31.52	0.60	0.60	0.00	MODRSS		48.88		MODTES	57.00	CL		87.0		ZTN0G7W		30	P	
AUS	AUS0406	152.00	167.93	-29.02	0.60	0.60	0.00	MODRSS		48.88		MODTES	57.00	CL		87.0		ZTN0G7W		30	P	
AUS	AUS040A	152.00	135.36	-23.95	6.69	4.83	141.15	R123FR		29.23		MODTES	57.00	CL		87.0		ZTN0G7W		30	P	
AUS	AUS0500	152.00	135.00	-24.20	7.19	5.20	140.00	MODRSS		28.71		MODTES	57.00	CR		87.0		ZTN0G7W		41	P	
AUS	AUS0601	152.00	96.83	-12.19	0.60	0.60	0.00	MODRSS		48.88		MODTES	57.00	CR		87.0		ZTN0G7W		41	P	
AUS	AUS0602	152.00	105.69	-10.45	0.60	0.60	0.00	MODRSS		48.88		MODTES	57.00	CR		87.0		ZTN0G7W		41	P	
AUS	AUS0603	152.00	110.52	-66.28	0.60	0.60	0.00	MODRSS		48.88		MODTES	57.00	CR		87.0		ZTN0G7W		41	P	
AUS	AUS0604	152.00	158.94	-54.50	0.60	0.60	0.00	MODRSS		48.88		MODTES	57.00	CR		87.0		ZTN0G7W		41	P	
AUS	AUS0605	152.00	150.06	-31.52	0.60	0.60	0.00	MODRSS		48.88		MODTES	57.00	CR		87.0		ZTN0G7W		41	P	
AUS	AUS0606	152.00	167.93	-29.02	0.60	0.60	0.00	MODRSS		48.88		MODTES	57.00	CR		87.0		ZTN0G7W		41	P	
AUS	AUS0600	152.00	135.50	-24.20	7.19	5.20	140.00	MODRSS		28.71		MODTES	57.00	CR		87.0		ZTN0G7W		42	P	
AUS	AUS0601	152.00	96.83	-12.19	0.60	0.60	0.00	MODRSS		48.88		MODTES	57.00	CR		87.0		ZTN0G7W		42	P	
AUS	AUS0602	152.00	105.69	-10.45	0.60	0.60	0.00	MODRSS		48.88		MODTES	57.00	CR		87.0		ZTN0G7W		42	P	
AUS	AUS0603	152.00	110.52	-66.28	0.60	0.60	0.00	MODRSS		48.88		MODTES	57.00	CR		87.0		ZTN0G7W		42	P	
AUS	AUS0604	152.00	158.94	-54.50	0.60	0.60	0.00	MODRSS		48.88		MODTES	57.00	CR		87.0		ZTN0G7W		42	P	

1	2	3	4		5			6	7	8	9		10		11	12	13	14	15	16	17
Admin. symbol	Beam identification	Orbital position	Boresight		Space station antenna characteristics			Space station antenna code	Shaped beam	Space station antenna gain Co- polar	Earth station antenna		Polarization		e.i.-p.	Power control	Designation of emission	Identity of the space station	Group code	Status	Remarks
			Long.	Lat.	Major axis	Minor axis	Orien- tation				Code	Gain	Type	Angle							
AUS	AUS00605	152.00	159.06	-31.52	0.60	0.60	0.00	MODRSS		48.88	MODTES	57.00	CR		87.0		Z7M0G7W		42	P	
AUS	AUS00606	152.00	167.93	-29.02	0.60	0.60	0.00	MODRSS		48.88	MODTES	57.00	CR		87.0		Z7M0G7W		42	P	
AUS	AUS00700	164.00	136.00	-23.90	7.26	4.48	132.00	MODRSS		29.32	MODTES	57.00	CR		87.0		Z7M0G7W		31	P	
AUS	AUS00701	164.00	96.83	-12.19	0.60	0.60	0.00	MODRSS		48.88	MODTES	57.00	CR		87.0		Z7M0G7W		31	P	
AUS	AUS00702	164.00	105.69	-10.45	0.60	0.60	0.00	MODRSS		48.88	MODTES	57.00	CR		87.0		Z7M0G7W		31	P	
AUS	AUS00703	164.00	110.52	-66.28	0.60	0.60	0.00	MODRSS		48.88	MODTES	57.00	CR		87.0		Z7M0G7W		31	P	
AUS	AUS00704	164.00	159.94	-54.50	0.60	0.60	0.00	MODRSS		48.88	MODTES	57.00	CR		87.0		Z7M0G7W		31	P	
AUS	AUS00705	164.00	159.06	-31.52	0.60	0.60	0.00	MODRSS		48.88	MODTES	57.00	CR		87.0		Z7M0G7W		31	P	
AUS	AUS00706	164.00	167.93	-29.02	0.60	0.60	0.00	MODRSS		48.88	MODTES	57.00	CR		87.0		Z7M0G7W		31	P	
AUS	AUS0070A	164.00	136.62	-24.16	6.82	4.20	134.19	R123FR		29.87	MODTES	57.00	CR		87.0		Z7M0G7W		31	P	
AUS	AUS00800	164.00	136.00	-23.90	7.26	4.48	132.00	MODRSS		29.32	MODTES	57.00	CL		87.0		Z7M0G7W		44	P	
AUS	AUS00801	164.00	96.83	-12.19	0.60	0.60	0.00	MODRSS		48.88	MODTES	57.00	CL		87.0		Z7M0G7W		44	P	
AUS	AUS00802	164.00	105.69	-10.45	0.60	0.60	0.00	MODRSS		48.88	MODTES	57.00	CL		87.0		Z7M0G7W		44	P	
AUS	AUS00803	164.00	110.52	-66.28	0.60	0.60	0.00	MODRSS		48.88	MODTES	57.00	CL		87.0		Z7M0G7W		44	P	
AUS	AUS00804	164.00	159.94	-54.50	0.60	0.60	0.00	MODRSS		48.88	MODTES	57.00	CL		87.0		Z7M0G7W		44	P	
AUS	AUS00805	164.00	159.06	-31.52	0.60	0.60	0.00	MODRSS		48.88	MODTES	57.00	CL		87.0		Z7M0G7W		44	P	
AUS	AUS00806	164.00	167.93	-29.02	0.60	0.60	0.00	MODRSS		48.88	MODTES	57.00	CL		87.0		Z7M0G7W		44	P	
AUS	AUS00900	164.00	136.00	-23.90	7.26	4.48	132.00	MODRSS		29.32	MODTES	57.00	CR		87.0		Z7M0G7W		32	P	
AUS	AUS00901	164.00	96.83	-12.19	0.60	0.60	0.00	MODRSS		48.88	MODTES	57.00	CR		87.0		Z7M0G7W		32	P	
AUS	AUS00902	164.00	105.69	-10.45	0.60	0.60	0.00	MODRSS		48.88	MODTES	57.00	CR		87.0		Z7M0G7W		32	P	
AUS	AUS00903	164.00	110.52	-66.28	0.60	0.60	0.00	MODRSS		48.88	MODTES	57.00	CR		87.0		Z7M0G7W		32	P	
AUS	AUS00904	164.00	159.94	-54.50	0.60	0.60	0.00	MODRSS		48.88	MODTES	57.00	CR		87.0		Z7M0G7W		32	P	
AUS	AUS00905	164.00	159.06	-31.52	0.60	0.60	0.00	MODRSS		48.88	MODTES	57.00	CR		87.0		Z7M0G7W		32	P	
AUS	AUS00906	164.00	167.93	-29.02	0.60	0.60	0.00	MODRSS		48.88	MODTES	57.00	CR		87.0		Z7M0G7W		32	P	
AUS	AUS0090A	164.00	136.62	-24.16	6.82	4.20	134.19	R123FR		29.87	MODTES	57.00	CR		87.0		Z7M0G7W		32	P	
AUS	AUS00000	152.00	135.38	-23.95	6.89	4.83	141.15	R123FR		29.23	MODTES	57.00	CL		87.0		Z7M0G7W		40	P	
AUS	AUS00001	152.00	96.83	-12.19	0.60	0.60	0.00	MODRSS		48.88	MODTES	57.00	CL		87.0		Z7M0G7W		40	P	
AUS	AUS00002	152.00	105.69	-10.45	0.60	0.60	0.00	MODRSS		48.88	MODTES	57.00	CL		87.0		Z7M0G7W		40	P	
AUS	AUS00003	152.00	110.52	-66.28	0.60	0.60	0.00	MODRSS		48.88	MODTES	57.00	CL		87.0		Z7M0G7W		40	P	
AUS	AUS00004	152.00	159.94	-54.50	0.60	0.60	0.00	MODRSS		48.88	MODTES	57.00	CL		87.0		Z7M0G7W		40	P	
AUS	AUS00005	152.00	159.06	-31.52	0.60	0.60	0.00	MODRSS		48.88	MODTES	57.00	CL		87.0		Z7M0G7W		40	P	
AUS	AUS00006	152.00	167.93	-29.02	0.60	0.60	0.00	MODRSS		48.88	MODTES	57.00	CL		87.0		Z7M0G7W		40	P	
AUS	AUS00000	164.00	136.62	-24.16	6.82	4.20	134.19	R123FR		29.87	MODTES	57.00	CL		87.0		Z7M0G7W		43	P	
AUS	AUS00001	164.00	96.83	-12.19	0.60	0.60	0.00	MODRSS		48.88	MODTES	57.00	CL		87.0		Z7M0G7W		43	P	
AUS	AUS00002	164.00	105.69	-10.45	0.60	0.60	0.00	MODRSS		48.88	MODTES	57.00	CL		87.0		Z7M0G7W		43	P	
AUS	AUS00003	164.00	110.52	-66.28	0.60	0.60	0.00	MODRSS		48.88	MODTES	57.00	CL		87.0		Z7M0G7W		43	P	
AUS	AUS00004	164.00	159.94	-54.50	0.60	0.60	0.00	MODRSS		48.88	MODTES	57.00	CL		87.0		Z7M0G7W		43	P	

1	2	3	4		5		6	7	8	9	10		11	12	13	14	15	16	17
Admin. symbol	Beam identification	Orbital position	Bore-sight		Space station antenna characteristics		Space station antenna code	Shaped beam	Space station antenna gain Co-polar	Earth station antenna		Polarization		e.i.-p.	Power control	Designation of the space station	Group code	Status	Remarks
			Long.	Lat.	Major axis	Minor axis				Code	Gain	Type	Angle						
AUS	AUSB0005	164.00	159.06	-31.52	0.60	0.60	0.00	MODRSS	48.88	MODTES	57.00	CL		87.0		Z7M0G7W	43	P	
AUS	AUSB0006	164.00	167.93	-28.02	0.60	0.60	0.00	MODRSS	48.88	MODTES	57.00	CL		87.0		Z7M0G7W	43	P	
AUT	AUTO1600	-18.80	10.31	49.47	1.32	0.92	151.78	MODRSS	42.19	MODTES	57.00	CR		84.0		Z7M0G7W		P	
AZE	AZE06400	23.20	47.47	40.14	0.93	0.60	158.14	MODRSS	48.98	MODTES	57.00	CL		84.0		Z7M0G7W		P	
BDI	BDI27000	11.00	29.90	-3.10	0.71	0.60	80.00	MODRSS	48.15	MODTES	57.00	CL		81.0		Z7M0G7W		P	
BEL	BEL18000	38.20	51.2	51.96	1.00	1.00	0.00	MODRSS	44.44	MODTES	57.00	CR		85.5		Z7M0G7W		P	
BEN	BEN23300	-19.20	2.20	9.50	1.44	0.68	97.00	MODRSS	44.54	MODTES	57.00	CL		84.0		Z7M0G7W		P	
BFA	BFA10700	-30.00	-1.50	12.20	1.45	1.14	29.00	MODRSS	42.24	MODTES	57.00	CL		84.0		Z7M0G7W		P	
BGD	BGD22000	74.00	90.30	23.90	1.46	0.84	135.00	MODRSS	43.56	MODTES	57.00	CR		84.0		Z7M0G7W		P	
BHR	BHR25500	34.00	50.50	28.10	0.60	0.60	0.00	MODRSS	48.88	MODTES	57.00	CR		83.0		Z7M0G7W		P	
BH	BH18600	56.00	19.22	43.97	0.60	0.60	90.00	MODRSS	48.88	MODTES	57.00	CR		84.0		Z7M0G7W		P	
BLR	BLR06200	37.80	29.04	53.18	1.17	0.60	9.68	MODRSS	45.96	MODTES	57.00	CL		84.0		Z7M0G7W		P	
BOT	BOT29700	-0.80	23.30	-22.20	2.13	1.50	36.00	MODRSS	38.40	MODTES	57.00	CL		84.0		Z7M0G7W		P	
BRM	BRM29800	104.00	96.97	18.68	3.33	1.66	91.63	MODRSS	37.02	MODTES	57.00	CR		84.0		Z7M0G7W		P	
BRU	BRU2300A	74.00	114.70	4.40	0.80	0.60	0.00	MODRSS	48.88	MODTES	57.00	CR		84.0		Z7M0G7W		P	
BTN	BTN25100	86.00	90.44	27.05	0.72	0.60	175.47	MODRSS	48.11	MODTES	57.00	CR		84.0		Z7M0G7W		P	
BUL	BUL02000	-1.20	25.00	43.00	1.04	0.60	165.00	MODRSS	46.50	MODTES	57.00	CL		83.0		Z7M0G7W		P	
CAF	CAF25800	-13.20	21.00	6.30	2.25	1.68	31.00	MODRSS	36.67	MODTES	57.00	CR		84.0		Z7M0G7W		P	
C8G	C8G29900	86.00	104.89	12.79	1.12	0.94	32.89	MODRSS	44.22	MODTES	57.00	CR		84.0		Z7M0G7W		P	
CHN	CHN15400	62.00	101.90	33.50	5.10	2.80	143.00	MODRSS	32.90	MODTES	57.00	CR		84.0		Z7M0G7W	46	P	
CHN	CHN15500	62.00	101.90	33.50	5.10	2.80	143.00	MODRSS	32.90	MODTES	57.00	CL		84.0		Z7M0G7W	45	P	
CHN	CHN19800	134.00	113.21	34.27	6.40	3.16	107.4	MODRSS	31.39	MODTES	57.00	CL		84.0		Z7M0G7W	46	P	
CHN	CHN19900	134.00	113.21	34.27	6.40	3.16	107.4	MODRSS	31.39	MODTES	57.00	CR		84.0		Z7M0G7W	46	P	
CHN	CHN16000	82.20	108.10	33.70	5.00	4.00	148.00	MODRSS	31.44	MODTES	57.00	CR		84.0		Z7M0G7W	47	P	
CHN	CHN16100	92.20	108.10	33.70	5.00	4.00	148.00	MODRSS	31.44	MODTES	57.00	CL		84.0		Z7M0G7W	47	P	
CHN	CHN20000	122.00	113.55	22.20	0.60	0.60	0.00	MODRSS	48.88	MODTES	57.00	CL		84.0		Z7M0G7W		P	
CLN	CLN21900	50.00	80.60	7.70	1.18	0.60	108.00	MODRSS	45.95	MODTES	57.00	CL		84.0		Z7M0G7W		P	
COO	COO_100	-19.20	21.85	-3.40				CB RSS CODA	38.38	MODTES	57.00	CL		84.0		Z7M0G7W		P	
COG	COG233500	-13.20	14.60	-0.70	2.02	1.18	59.00	MODRSS	40.67	MODTES	57.00	CR		84.0		Z7M0G7W		P	
COM	COM23700	29.00	44.10	-12.10	0.76	0.60	149.00	MODRSS	47.86	MODTES	57.00	CR		84.0		Z7M0G7W		P	
CPV	CPV30100	-33.50	-24.12	16.09	0.77	0.63	94.46	MODRSS	41.73	MODTES	57.00	CL		84.0		Z7M0G7W		P	5.6
CTI	CTI23700	-24.80	-5.66	7.39	1.45	1.29	126.59	MODRSS	47.75	MODTES	57.00	CR		84.0		Z7M0G7W		P	
CVA	CVA08300	-1.20	13.02	42.09	0.75	0.66	20.53	MODRSS	47.48	MODTES	57.00	CR		84.0		Z7M0G7W		P	
CVA	CVA08500	-1.20	13.02	42.09	0.75	0.66	20.53	MODRSS	47.48	MODTES	57.00	CR		84.0		Z7M0G7W		P	
CYP	CYP06800	-1.20	33.45	35.12	0.60	0.60	90.00	MODRSS	48.88	MODTES	57.00	CL		84.0		Z7M0G7W		P	
CZE	CZE14401	-12.80	16.77	46.78	1.71	0.89	149.15	MODRSS	42.64	MODTES	57.00	CR		84.0		Z7M0G7W		P	
CZE	CZE14402	-12.80	16.77	46.78	1.71	0.89	149.15	MODRSS	42.64	MODTES	57.00	CL		84.0		Z7M0G7W		P	

1	2	3	4		5		6	7	8		9		10		11	12	13	14	15	16	17
Admin. symbol	Beam identification	Orbital position	Boresight		Space station antenna characteristics		Space station antenna code	Shaped beam	Space station antenna gain		Earth station antenna		Polarization		e.i.p.	Power control	Designation of the space station	Group code	Status	Remarks	
			Long.	Lat.	Major axis	Minor axis			Orientation	Co-polar	Cross-polar	Code	Gain	Type							Angle
CZE	CZE1403	-12.80	16.77	46.78	1.71	0.89	148.15	MODRSS	42.64		MODTES	57.00	CL		84.0		ZTM0G7W	37	P		
D	D 08700	-18.80	10.31	49.47	1.82	0.92	151.78	MODRSS	42.19	0.92	MODTES	57.00	CR		84.0		ZTM0G7W		P		
DJI	DJI0900	16.80	42.68	11.68	0.60	0.60	90.00	MODRSS	48.88		MODTES	57.00	CL		84.0		ZTM0G7W		P		
DNK	DNK_100	-25.20	5.28	61.93				CB_RSS_DNKA	48.88		MODTES	57.00	CL		79.5		ZTM0G7W		P		
DNK	DNK0900	-33.50	14.34	61.72	1.83	0.60	151.50	MODRSS	44.05		MODTES	57.00	CR		84.0		ZTM0G7W		P		
DNK	DNK09100	-33.50	-14.94	63.79	1.52	0.60	168.57	MODRSS	44.86		MODTES	57.00	CR		84.0		ZTM0G7W		P		
E	E_100	-30.00	-9.40	34.15				CB_RSS_E_A	44.79		MODTES	57.00	CR		84.0		ZTM0G7W	01	P	6	
E	HISPT2D4	-30.00	-3.10	39.90				ECO	43.00	18.70	R13TES	55.00	CR		82.5		ZTM0G7W-	HISPASAT-1	01	PE	
E	HISPT2D6	-30.00	-3.10	39.90				ECO	43.00	18.70	R13TES	56.50	CR		83.5		ZTM0G7W-	HISPASAT-1	01	PE	
E	HISPT3D4	-30.00	-3.10	39.90				ECO	43.00	18.70	MODTES	55.00	CR		82.5		33M0G7W-	HISPASAT-1	01	PE	
E	HISPT3D6	-30.00	-3.10	39.90				ECO	43.00	18.70	MODTES	56.50	CR		83.5		33M0G7W-	HISPASAT-1	01	PE	
E	HISPA544	-30.00	-3.10	39.90				ECO	43.00	18.70	R13TES	55.00	CR		82.5		ZTM0F8W	HISPASAT-1	01	PE	
E	HISPA546	-30.00	-3.10	39.90				ECO	43.00	18.70	R13TES	56.50	CR		83.5		ZTM0F8W	HISPASAT-1	01	PE	
EGY	EGY02600	-7.00	29.70	26.80	2.33	1.72	136.00	MODRSS	38.42		MODTES	57.00	CR		84.0		ZTM0G7W	12	P		
ERI	ERI09200	22.80	39.41	14.98	1.67	0.95	145.49	MODRSS	42.44	0.95	MODTES	57.00	CL		84.0		ZTM0G7W		P		
EST	EST06100	44.50	25.40	59.18	0.67	0.60	5.99	MODRSS	48.42		MODTES	57.00	CR		84.0		ZTM0G7W		P		
F	F 06300	-7.00	3.30	45.37	2.18	1.20	156.36	MODRSS	40.27		MODTES	57.00	CR		84.0		ZTM0G7W	21	P		
F	F_100	-7.00	29.16	13.43				CB_RSS_F_A	46.88		MODTES	57.00	CL		84.0		ZTM0G7W	12	P		
F	F_200	140.00	174.50	-17.30				CB_RSS_F_B	45.80		MODTES	57.00	CL		84.0		ZTM0G7W	7F	P		
F	F_300	140.00	174.65	-17.65				CB_RSS_F_C	47.97		MODTES	57.00	CR		84.0		ZTM0G7W	7F	P		
F	OCE10100	-160.00	-145.00	-16.30	4.34	3.54	4.00	MODRSS	32.58		MODTES	57.00	CL		84.0		ZTM0G7W		P		
FIN	FIN10300	22.80	17.61	61.54	2.18	0.90	11.59	MODRSS	41.53		MODTES	57.00	CL		84.0		ZTM0G7W	52	P		
FIN	FIN10400	22.80	17.61	61.54	2.18	0.90	11.59	MODRSS	41.53		MODTES	57.00	CL		84.0		ZTM0G7W	52	P		
FJI	FJI19300	-178.00	179.62	-17.87	1.16	0.92	155.22	MODRSS	44.16	0.92	MODTES	57.00	CR		84.0		ZTM0G7W		P		
FSM	FSM00000	159.00	151.90	5.48	5.15	1.57	167.00	MODRSS	35.38		MODTES	57.00	CR		84.0		ZTM0G7W		P		
G	G 02700	-33.50	-3.50	53.80	1.84	0.72	142.00	MODRSS	43.23		MODTES	57.00	CR		84.0		ZTM0G7W		P		
GAB	GAB26000	-13.20	11.80	-0.60	1.43	1.12	64.00	MODRSS	42.40	1.12	MODTES	57.00	CL		84.0		ZTM0G7W		P	5, 6	
GEO	GEO06400	23.20	43.35	42.27	1.11	0.60	161.21	MODRSS	46.23		MODTES	57.00	CL		84.0		ZTM0G7W		P		
GMB	GMB30200	-37.20	-15.10	13.40	0.79	0.60	4.00	MODRSS	47.69	0.60	MODTES	57.00	CL		83.0		ZTM0G7W		P		
GMB	GMB30400	-30.00	-15.00	12.00	0.90	0.60	172.00	MODRSS	47.12		MODTES	57.00	CL		84.0		ZTM0G7W		P		
GNE	GNE30300	-18.80	10.30	1.50	0.66	0.60	10.00	MODRSS	48.34		MODTES	57.00	CR		84.0		ZTM0G7W		P		
GRC	GRC10500	-1.20	24.52	38.11	1.70	0.95	152.55	MODRSS	42.37	0.95	MODTES	57.00	CR		84.0		ZTM0G7W		P		
GUL	GUL19200	-37.00	-11.00	10.20	1.58	1.04	147.00	MODRSS	44.29		MODTES	57.00	CR		85.0		ZTM0G7W		P		
HNG	HNG10601	-12.80	16.77	46.78	1.71	0.89	149.15	MODRSS	42.64		MODTES	57.00	CR		84.0		ZTM0G7W		P		
HNG	HNG10602	-12.80	16.77	46.78	1.71	0.89	149.15	MODRSS	42.64		MODTES	57.00	CL		84.0		ZTM0G7W		P		
HNG	HNG10603	-12.80	16.77	46.78	1.71	0.89	149.15	MODRSS	42.64		MODTES	57.00	CL		84.0		ZTM0G7W	37	P		
HOL	HOL21300	38.20	5.12	51.96	1.00	1.00	0.00	MODRSS	44.44		MODTES	57.00	CL		85.5		ZTM0G7W		P		

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Admin. symbol	Beam identification	Orbital position	Boresight		Space station antenna characteristics		Space station antenna gain	Earth station antenna		Polarization		Power control	Designation of the space station	Group code	Status	Remarks
			Long.	Lat.	Major axis	Minor axis		Code	Gain	Type	Angle					
HRV	HRV14801	-12.80	16.77	46.78	1.71	0.89	149.15	MODTES	57.00	CR			27M0G7W		P	
HRV	HRV14802	-12.80	16.77	46.78	1.71	0.89	149.15	MODRSS	57.00	CL			27M0G7W		P	
HRV	HRV14803	-12.80	16.77	46.78	1.71	0.89	149.15	MODRSS	57.00	CL			27M0G7W	37	P	
I	I08200	9.00	12.67	40.74	1.99	1.35	144.20	MODTES	57.00	CR			27M0G7W		P	
IND	IND03700	68.00	93.00	25.50	1.46	1.13	40.00	MODRSS	57.00	CL			27M0G7W		P	
IND	IND04701	68.00	93.30	11.10	1.92	0.60	96.00	MODRSS	57.00	CR			27M0G7W	7E	P	
IND	IND04702	68.00	93.30	11.10	1.92	0.60	96.00	MODRSS	57.00	CL			27M0G7W	7E	P	
IND	INDA_101	55.80	76.16	14.72			CB_RSS_INDIA	MODTES	57.00	CL			27M0G7W	7G	P	
IND	INDA_102	55.80	76.16	14.72			CB_RSS_INDIA	MODTES	57.00	CL			27M0G7W	7G	P	
IND	INDB_101	55.80	83.67	23.73			CB_RSS_INDB	MODTES	57.00	CR			27M0G7W	7H	P	
IND	INDB_102	55.80	83.67	23.73			CB_RSS_INDB	MODTES	57.00	CL			27M0G7W	7H	P	
IND	INDD_100	68.00	74.37	29.16			CB_RSS_INDD	MODTES	57.00	CR			27M0G7W		P	
INS	INS02600	80.20	113.60	-1.40	6.73	3.33	160.00	MODRSS	57.00	CR			27M0G7W		P	
INS	INS03601	104.00	115.20	-1.70	9.14	3.43	170.00	MODRSS	57.00	CL			27M0G7W	7D	P	
INS	INS03602	104.00	115.20	-1.70	9.14	3.43	170.00	MODRSS	57.00	CR			27M0G7W	7D	P	
IRL	IRL21700	-37.20	-3.25	53.22	0.72	0.60	157.56	MODRSS	57.00	CR			27M0G7W		P	
IRN	IRN10900	33.00	54.20	32.40	3.92	1.82	149.00	MODRSS	57.00	CL			27M0G7W		P	
ISL	ISL04900	-33.50	-19.00	64.90	1.00	0.60	177.00	MODRSS	57.00	CL			27M0G7W		P	
ISL	ISL05000	-33.50	-14.94	63.79	1.52	0.60	168.57	MODRSS	57.00	CL			27M0G7W		P	
ISR	ISR11000	-4.00	34.95	31.32	0.73	0.60	110.02	MODRSS	57.00	CR			27M0G7W		P	
J	J00055-3N	109.85	134.50	31.50	3.32	3.30	68.00	MODRSS	57.00	CR			27M0F8W	BS-3N	02	PE
J	J10885	109.85	134.50	31.50	3.32	3.30	68.00	MODRSS	57.00	CR			34M05G7W	02	P	
J	J11100	110.00	134.50	31.50	3.32	3.30	68.00	MODRSS	57.00	CR			34M05G7W	02	P	
J	J1110E	110.00	134.50	31.50	3.32	3.30	68.00	MODRSS	57.00	CR			27M0F8W	BS-3M	02	PE
JOR	JOR22400	11.00	37.55	34.02	1.47	0.91	73.16	MODRSS	57.00	CL			27M0G7W		P	
KAZ	KAZ06600	56.40	65.73	46.40	4.98	1.76	177.45	MODRSS	57.00	CL			27M0G7W		P	
KEN	KEN24900	-0.80	37.95	0.88	2.06	1.30	99.68	MODRSS	57.00	CR			27M0G7W		P	
KGZ	KGZ07000	50.00	73.91	41.32	1.47	0.64	5.05	MODRSS	57.00	CR			27M0G7W		P	
KIR	KIR_100	176.00	-170.31	-0.56			CB_RSS_KIRA	MODTES	57.00	CL			27M0G7W		P	
KOR	KOR1201	116.00	127.50	36.00	1.24	1.02	168.00	MODRSS	57.00	CL			27M0G7W	03	P	
KOR	KOR1202	116.00	127.50	36.00	1.24	1.02	168.00	MODRSS	57.00	CL			27M0G7W	03	P	
KRE	KRE28600	140.00	128.45	40.32	1.93	0.68	18.88	MODRSS	57.00	CL			27M0G7W		P	
KWT	KWT11300	11.00	47.45	29.12	0.60	0.60	90.00	MODRSS	57.00	CR			27M0G7W		P	
LAO	LAO28400	122.20	103.71	18.17	1.03	123.96	MODRSS	57.00	CR				33M0G7W		P	
LEB	LEB29000	11.00	37.55	34.02	1.47	0.91	73.16	MODRSS	57.00	CR			27M0G7W		P	
LBR	LBR24400	-33.50	-9.30	6.80	1.22	0.70	133.00	MODRSS	57.00	CR			27M0G7W		P	5.6
LBY	LBY28021	-24.80	17.50	26.30	3.68	1.84	130.00	MODRSS	57.00	CL			27M0G7W		P	

1	2	3	4		5			6	7	8	9		10		11	12	13	14	15	16	17
Admin. symbol	Beam identification	Orbital position	Boresight		Space station antenna characteristics			Space station antenna code	Shaped beam	Space station antenna gain		Earth station antenna		Polarization		e.i.p.	Power control	Designation of the space station	Group code	Status	Remarks
			Long.	Lat.	Major axis	Minor axis	Orientation			Co-polar	Cross-polar	Code	Gain	Type	Angle						
LE	LE25300	-18.80	10.31	49.47	1.92	0.92	151.78	MODRSS		42.19		MODTES	57.00	CL		84.0		ZTM0G7W		P	
LSO	LS030500	4.80	27.80	-0.80	0.06	0.60	36.00	MODRSS				MODTES	57.00	CL		84.0		ZTM0G7W		P	
LTU	LTU08100	23.20	24.52	56.11				CB_RSS_LITUA		47.92		MODTES	57.00	CR		84.0		ZTM0G7W		P	
LUX	LUX1400	28.20	5.21	49.20	0.60	0.60	90.00	MODRSS		48.88		MODTES	57.00	CL		84.0		ZTM0G7W	09	P	
LVA	LVA05100	23.20	24.52	56.11				CB_RSS_LVAAA		47.92		MODTES	57.00	CR		84.0		ZTM0G7W		P	
MAU	MAU_100	29.00	56.61	-15.88				CB_RSS_MAUAA		41.42		MODTES	57.00	CL		84.0		ZTM0G7W		P	
MCO	MCO1600	34.20	7.40	43.70	0.60	0.60	0.00	MODRSS		48.88		MODTES	57.00	CR		81.0		ZTM0G7W		P	
MDO	MDOA6300	50.00	28.45	46.99	0.60	0.60	90.00	MODRSS		48.88		MODTES	57.00	CR		84.0		ZTM0G7W		P	
MDO	MDOG2600	29.00	46.20	-18.80	2.97	0.80	67.00	MODRSS		41.32		MODTES	57.00	CL		84.0		ZTM0G7W		P	
MHL	MHL00000	146.00	167.64	9.83	2.07	0.90	157.42	MODRSS		41.75		MODTES	57.00	CR		84.0		ZTM0G7W		P	
MKD	MKD14800	22.80	21.53	41.94	0.60	0.60	90.00	MODRSS		48.88		MODTES	57.00	CL		84.0		ZTM0G7W		P	
MKA	MKA_100	91.90	108.07	3.92				CB_RSS_MKAAA		41.75		MODTES	57.00	CR		84.0		ZTM0G7W		P	
MAL	MALD0600	48.80	73.10	6.00	0.60	0.60	0.00	MODRSS		48.88		MODTES	57.00	CR		84.0		ZTM0G7W		P	
MLI	MLI_100	-19.20	-4.80	16.10				CB_RSS_MLIA		41.11		MODTES	57.00	CR		87.0		ZTM0G7W		P	
MLT	MLT14700	22.80	14.40	35.90	0.60	0.60	0.00	MODRSS		48.88		MODTES	57.00	CR		84.0		ZTM0G7W		P	
MNG	MNG24800	74.00	101.95	46.79	3.32	1.04	169.27	MODRSS		38.07		MODTES	58.92	CL		86.9		ZTM0G7W		P	
MRC	MRC20800	-25.20	-8.90	28.90	3.96	1.55	50.00	MODRSS		36.57		MODTES	57.00	CR		80.0		ZTM0G7W		P	
MTN	MTN_100	-36.80	-11.24	20.91				CB_RSS_MTNAA		37.55		MODTES	57.00	CR		86.0		ZTM0G7W		P	
MWI	MWI90800	4.80	33.79	-73.25	1.56	0.70	92.69	MODRSS		44.10		MODTES	57.00	CR		84.0		ZTM0G7W		P	
NGR	NGR11500	-37.20	7.63	16.97	2.20	1.80	100.58	MODRSS		38.47		MODTES	57.00	CL		84.0		ZTM0G7W		P	
NOR	NOR12000	-0.80	16.70	61.98	1.84	0.95	177.31	MODRSS		42.02		MODTES	57.00	CR		84.0		ZTM0G7W	06	P	
NOR	NOR12100	-0.80	16.70	61.98	1.84	0.95	177.31	MODRSS		42.02		MODTES	57.00	CL		84.0		ZTM0G7W	06	P	
NRU	NRU10800	134.00	167.00	-0.50	0.60	0.60	0.00	MODRSS		48.88		MODTES	57.00	CL		84.0		ZTM0G7W		P	
NZL	NZL_100	158.00	-174.35	-24.30				CB_RSS_NZLAA		48.88		MODTES	57.00	CL		84.0		ZTM0G7W		P	7
OMA	OMA12300	17.20	55.60	21.00	1.88	1.02	100.00	MODRSS		41.62		MODTES	57.00	CL		85.0		ZTM0G7W		P	
PHL	PHL28500	98.00	121.30	11.10	3.46	1.76	99.00	MODRSS		36.60		MODTES	57.00	CL		84.0		ZTM0G7W		P	
PLW	PLW00000	140.00	132.98	5.51	1.30	0.60	55.41	MODRSS		45.53		MODTES	57.00	CR		84.0		ZTM0G7W		P	
POL	POL13200	50.00	19.71	62.18	1.22	0.63	16.12	MODRSS		45.59		MODTES	57.00	CR		84.0		ZTM0G7W		P	
POR	POR_100	-37.00	-15.92	37.65				CB_RSS_PORAA		47.17		MODTES	57.00	CR		84.0		ZTM0G7W		P	
PSE	YY00001	-13.20	34.98	31.86	0.60	0.60	80.00	MODRSS		48.88		MODTES	57.00	CL		80.5		ZTM0G7W		P	8
QAT	QAT24700	20.00	51.59	25.35	0.60	0.60	90.00	MODRSS		45.15		MODTES	57.00	CL		84.0		ZTM0G7W		P	
ROU	ROU13600	50.00	25.12	45.75	1.17	0.73	9.52	MODRSS		48.88		MODTES	57.00	CL		84.0		ZTM0G7W		P	
RRW	RRW51000	11.00	30.00	-2.10	0.66	0.60	42.00	MODRSS		48.47		MODTES	57.00	CR		81.0		ZTM0G7W		P	
RUS	RSTREA11	36.00	38.00	53.00					COP	38.40	8.40	MODTES	57.00	CR		84.0		ZTM0F8W	RST-1	05	PE
RUS	RSTREA12	36.00	38.00	53.00					COP	38.40	8.40	MODTES	57.00	CL		84.0		ZTM0F8W	RST-1	05	PE
RUS	RSTRED11	36.00	36.00	53.00					COP	38.40	8.40	MODTES	57.00	CR		84.0		ZTM0G7W	RST-1	05	PE
RUS	RSTRED12	36.00	36.00	53.00					COP	38.40	8.40	MODTES	57.00	CL		84.0		ZTM0G7W	RST-1	05	PE

1	2	3	4		5		6	7	8	9		10		11	12	13	14	15	16	17
Admin. symbol	Beam identification	Orbital position	Boresight		Space station antenna characteristics		Space station antenna code	Shaped beam	Space station antenna gain		Earth station antenna	Polarization		e.i.-p.	Power control	Designation of the emission	Identity of the space station	Group code	Status	Remarks
			Long.	Lat.	Major axis	Minor axis			Co-polar	Cross-polar	Code	Gain	Type	Angle						
RUS	RSTRSD11	36.00	36.00	53.00				COP	36.40	8.40	MODTES	57.00	CR	84.0		ZW0G7W	RST-1	05	P	
RUS	RSTRSD12	36.00	36.00	53.00				COP	36.40	8.40	MODTES	57.00	CL	84.0		ZW0G7W	RST-1	05	P	
RUS	RSTRSD21	56.00	65.00	63.00				COP	36.40	8.40	MODTES	57.00	CR	84.0		ZW0G7W	RST-2	14	P	
RUS	RSTRSD22	56.00	65.00	63.00				COP	36.40	8.40	MODTES	57.00	CL	84.0		ZW0G7W	RST-2	14	P	
RUS	RSTRSD31	86.00	97.00	62.00				COP	36.40	8.40	MODTES	57.00	CR	84.0		ZW0G7W	RST-3	33	P	
RUS	RSTRSD32	86.00	97.00	62.00				COP	36.40	8.40	MODTES	57.00	CL	84.0		ZW0G7W	RST-3	33	P	
RUS	RSTRSD51	140.00	150.00	56.00				COP	36.40	8.40	MODTES	57.00	CR	84.0		ZW0G7W	RST-5	35	P	
RUS	RSTRSD52	140.00	150.00	56.00				COP	36.40	8.40	MODTES	57.00	CL	84.0		ZW0G7W	RST-5	35	P	
RUS	RUS0401	110.00	118.22	51.52				COP	36.40	8.40	MODTES	57.00	CR	84.0		ZW0G7W	RUS-4	34	P	
RUS	RUS0402	110.00	118.22	51.52				COP	36.40	8.40	MODTES	57.00	CL	84.0		ZW0G7W	RUS-4	34	P	
S	S 13800	5.00	17.00	61.50	2.00	1.00	10.00	MODRSS	41.44		MODTES	57.00	CL	84.0		ZW0G7W		04	P	
S	S 13900	5.00	17.00	61.50	2.00	1.00	10.00	MODRSS	41.44		MODTES	57.00	CL	84.0		ZW0G7W		04	P	
SEY	SEY00000	42.50	51.66	-7.23	2.43	1.04	27.51	MODRSS	40.44		MODTES	57.00	CR	84.0		ZW0G7W			P	
SIM	SIM00000	128.00	159.27	-8.40	1.35	1.08	118.59	MODRSS	42.81		MODTES	57.00	CL	84.0		ZW0G7W			P	
SNO	SNO05700	-178.00	-171.70	-13.97	0.80	0.60	90.00	MODRSS	48.88		MODTES	57.00	CL	84.0		ZW0G7W			P	
SMR	SMR31100	-36.80	12.50	43.50	0.60	0.60	0.00	MODRSS	48.88		MODTES	57.00	CL	83.0		ZW0G7W			P	
SNG	SNG15100	88.00	103.86	1.42	0.92	0.72	175.12	MODRSS	46.25		MODTES	57.00	CL	84.0		ZW0G7W			P	
SBB	SBB14800	-7.00	20.50	43.98	0.91	0.60	145.16	MODRSS	47.07		MODTES	57.00	CL	84.0		ZW0G7W			P	
SRL	SRL25900	-33.50	-11.80	8.60	0.78	0.68	114.00	MODRSS	47.20		MODTES	57.00	CR	84.0		ZW0G7W			P	
STP	STP24100	-7.00	7.00	0.80	0.60	0.60	0.00	MODRSS	48.88		MODTES	57.00	CL	84.0		ZW0G7W			P	
SUI	SUI14000	-18.80	10.31	49.47	1.82	0.92	151.78	MODRSS	42.19		MODTES	57.00	CL	84.0		ZW0G7W			P	
SVK	SVK14401	-12.80	16.77	46.78	1.71	0.89	149.15	MODRSS	42.64		MODTES	57.00	CR	84.0		ZW0G7W			P	
SVK	SVK14402	-12.80	16.77	46.78	1.71	0.89	149.15	MODRSS	42.64		MODTES	57.00	CL	84.0		ZW0G7W			P	
SVK	SVK14403	-12.80	16.77	46.78	1.71	0.89	149.15	MODRSS	42.64		MODTES	57.00	CL	84.0		ZW0G7W		37	P	
SVN	SVN14800	33.80	15.01	46.18	0.60	0.60	90.00	MODRSS	48.88		MODTES	57.00	CR	82.0		ZW0G7W			P	
SVZ	SVZ213100	4.80	31.39	-26.44	0.60	0.60	90.00	MODRSS	48.88		MODTES	57.00	CR	82.0		ZW0G7W		53	P	
SVR	SVR22900	11.00	37.55	34.02	1.47	0.91	73.16	MODRSS	43.19		MODTES	57.00	CL	84.0		ZW0G7W			P	
SVR	SVR39000	11.00	37.60	34.20	1.32	0.88	74.00	MODRSS	43.60		MODTES	57.00	CL	84.0		ZW0G7W		53	P	
TCD	TCD14300	17.00	18.39	15.52	3.21	2.05	83.26	MODRSS	36.26		MODTES	57.00	CR	84.0		ZW0G7W			P	
THA	THA14200	88.00	100.75	12.88	2.80	1.82	88.77	MODRSS	37.38		MODTES	57.00	CR	84.0		ZW0G7W			P	
TJK	TJK08900	38.00	71.14	38.41	1.21	0.73	155.31	MODRSS	45.01		MODTES	57.00	CL	85.0		ZW0G7W			P	
TKM	TKM68600	50.00	59.24	38.63	2.26	1.02	166.64	MODRSS	40.81		MODTES	57.00	CL	85.7		ZW0G7W			P	
TLS	TLS00000	128.00	128.03	-8.72	0.66	0.60	13.92	MODRSS	48.50		MODTES	57.00	CR	84.0		ZW0G7W			P	
TON	TON21500	170.75	-175.23	-18.19	1.99	0.60	71.33	MODRSS	44.64		MODTES	57.00	CR	84.0		ZW0G7W			P	
TUN	TUN15000	-25.20	9.50	33.00	1.88	0.72	135.00	MODRSS	43.13		MODTES	57.00	CR	84.0		ZW0G7W		55	P	
TUN	TUN27200	-25.20	2.50	32.00	3.99	1.75	175.00	MODRSS	36.47		MODTES	57.00	CR	84.0		ZW0G7W		55	P	
TUR	TUR14500	42.00	35.14	38.99	3.19	1.10	0.03	MODRSS	39.00		MODTES	57.00	CL	84.0		ZW0G7W		36	P	

1	2	3	4		5		6	7	8		9		10		11	12	13	14	15	16	17
Admin. symbol	Beam identification	Orbital position	Boresight		Space station antenna characteristics		Space station antenna code	Shaped beam	Space station antenna gain		Earth station antenna		Polarization		e.i.r.p.	Power control	Designation of emission station	Identity of the space station	Group code	Status	Remarks
			Long.	Lat.	Major axis	Minor axis			Orientation	Co-polar	Cross-polar	Code	Gain	Type							
TUV	TUV00000	176.00	177.61	-7.11	0.94	0.60	137.58	MODRSS		4633		MODTES	57.00	CR		84.0		Z7M0G7W		P	
TZA	TZA22500	11.00	34.60	-6.20	2.41	1.72	129.00	MODRSS		3827		MODTES	57.00	CR		84.0		Z7M0G7W		P	
UAE	UAE27400	52.50	53.98	24.37	1.23	0.84	6.62	MODRSS		4431		MODTES	57.00	CR		84.0		Z7M0G7W		P	
USA	USA051000	17.00	32.20	1.04	1.50	1.02	88.73	MODRSS		4262		MODTES	57.00	CR		84.0		Z7M0G7W		P	
UKR	UKR06300	38.20	31.82	48.19	2.32	0.95	177.32	MODRSS		4101		MODTES	57.00	CR		84.0		Z7M0G7W		P	
USA	GUM33101	122.00	155.56	13.21				CB_RSS_GUMA		4361		MODTES	57.00	CR		87.0		Z7M0G7W		7C	P
USA	GUM33102	122.00	155.56	13.21				CB_RSS_GUMA		4361		MODTES	57.00	CL		87.0		Z7M0G7W		7C	P
USA	MRA33200	121.80	155.56	13.21				CB_RSS_MRAA		4361		MODTES	57.00	CR		91.0		Z7M0G7W			P
USA	PLM33200	170.00	-145.55	19.50				CB_RSS_PLMA		3935		MODTES	57.00	CL		87.0		Z7M0G7W			P
USA	USA4-101	170.00	-145.55	19.50				CB_RSS_USAA		3935		MODTES	57.00	CR		87.0		Z7M0G7W		7A	P
USA	USA4-102	170.00	-145.55	19.50				CB_RSS_USAA		3935		MODTES	57.00	CL		87.0		Z7M0G7W		7A	P
UZB	UZB07100	33.80	63.80	41.21	2.56	0.89	159.91	MODRSS		4084		MODTES	57.00	CR		82.0		Z7M0G7W			P
VTN	VTN32500	107.00	106.84	14.21	3.43	1.76	109.43	MODRSS		3664		MODTES	57.00	CR		84.0		Z7M0G7W			P
VUT	VUT12801	140.00	168.00	-16.40	1.52	0.68	87.00	MODRSS		4430		MODTES	57.00	CL		84.0		Z7M0G7W		7B	P
VUT	VUT12802	140.00	168.00	-16.40	1.52	0.68	87.00	MODRSS		4430		MODTES	57.00	CR		84.0		Z7M0G7W		7B	P
ZMB	ZMB37400	-0.80	27.50	-13.10	2.38	1.48	39.00	MODRSS		3898		MODTES	57.00	CR		84.0		Z7M0G7W			P
ZWE	ZWE19500	-0.80	29.60	-18.80	1.46	1.36	37.00	MODRSS		4147		MODTES	57.00	CL		85.0		Z7M0G7W			P

MOD

APPENDIX 30B (REV.WRC-12)

**Provisions and associated Plan for the fixed-satellite service
in the frequency bands 4 500-4 800 MHz, 6 725-7 025 MHz,
10.70-10.95 GHz, 11.2-11.45 GHz and 12.75-13.25 GHz**

ARTICLE 6 (REV.WRC-12)

**Procedures for the conversion of an allotment into an assignment, for
the introduction of an additional system or for the modification of
an assignment in the List^{1, 2} (WRC-07)**

MOD

6.28 Should the assignments that were the basis of the unfavourable finding not be brought into use within the period specified in § 6.1 or within the extension period under § 6.31*bis*, then the status of the assignment in the List shall be reviewed accordingly. (WRC-12)

ADD

6.31*bis* The regulatory time-limit in § 6.31 for bringing into use of an assignment to a space station of a satellite network may be extended once by not more than three years due to launch failure in the following cases:

- the destruction of the satellite intended to bring the assignment into use;
- the destruction of the satellite launched to replace an already operating satellite which is intended to be relocated to bring another assignment into use; or
- the satellite is launched, but fails to reach its assigned orbital location.

¹ 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 specified in § 6.7 and/or 6.23 and the corresponding entries in the List under § 6.23 and/or 6.25, as appropriate, and reinstate any allotments back into the Plan 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. See also Resolution 905 (WRC-07).

² Resolution 49 (Rev.WRC-07) applies.

For this extension to be granted, the launch failure must have occurred at least five years after the date of receipt of the complete Appendix 4 data. In no case shall the period of the extension of the regulatory time-limit exceed the difference in time between the three-year period and the period remaining from the date of the launch failure to the end of the regulatory time-limit. In order to take advantage of this extension, the administration shall have, within one month of the launch failure or one month after 17 February 2012, whichever comes later, notified the Bureau in writing of such failure, and shall also provide the following information to the Bureau before the end of the regulatory time-limit of § 6.31:

- date of launch failure;
- due diligence information as required in Resolution 49 (Rev.WRC-12), if this resolution applies to the satellite network in which the space station is to operate, for the assignments with respect to the satellite that suffered the launch failure, if that information has not already been provided.

If, for a satellite network or satellite system to which Resolution 49 (Rev.WRC-12) applies, the administration has not provided to the Bureau updated Resolution 49 (Rev.WRC-12) information for the new satellite under procurement within one year of the request for extension, the related frequency assignments shall lapse. (WRC-12)

MOD

6.32 Thirty days prior to the date of bringing into use under § 6.31 or § 6.31*bis*, the Bureau shall dispatch a reminder telegram or fax to the notifying administration which has not brought its assignment into use, bringing the matter to its attention. (WRC-12)

MOD

6.33

When:

- i) an assignment is no longer required; *or*
- ii) an assignment recorded in the List and brought into use has been suspended for a period exceeding two years and ending after the expiry date specified in § 6.31; *or*
- iii) an assignment recorded in the List has not been brought into use within the eight-year period following the receipt by the Bureau of the relevant complete information under § 6.1 (or within the extended period in the event of an extension under § 6.31*bis*), with the exception of assignments submitted by new Member States where § 6.35 and 7.7 apply,

the Bureau shall:

- a) publish in a Special Section of its BR IFIC the cancellation of the related Special Sections and the assignments recorded in the Appendix 30B List;
- b) if the cancelled assignment is the result of a conversion of an allotment without modification, reinstate the allotment in the Appendix 30B Plan;
- c) if the cancelled assignment is the result of the conversion of an allotment with modifications, reinstate the allotment with the same orbital location and technical parameters of the cancelled assignment except for its service area, which shall be the national territory of the administration whose allotment is being reinstated; *and*
- d) update the reference situation for the allotments of the Plan and the assignments of the List. (WRC-12)

MOD

6.34 When a proposed new or modified frequency assignment has not fulfilled all the requirements for entering the List, in accordance with § 6.23 or 6.25, by the expiry date specified in § 6.31 or § 6.31*bis* in the event of an extension under that provision, the Bureau shall publish in a Special Section of the BR IFIC the cancellation of the related Special Sections. (WRC-12)

MOD

6.36 Should the assignments mentioned in § 6.35 over the national territory of the administration not be brought into use within the eight years following the receipt by the Bureau of the relevant complete information under § 6.1 or within the extension period under § 6.31*bis*, they would be retained in the List until the end of the World Radiocommunication Conference immediately following the successful completion of the procedure referred to in § 6.35. (WRC-12)

ARTICLE 8 (REV.WRC-12)

Procedure for notification and recording in the Master Register of assignments in the planned bands for the fixed-satellite service^{11, 12} (WRC-07)

MOD

8.13 A notice of a change in the characteristics of an assignment already recorded, as specified in Appendix 4, shall be examined by the Bureau under § 8.8 and § 8.9, as appropriate. Any changes to the characteristics of an assignment that has been notified and confirmed as having been brought into use shall be brought into use within eight years from the date of the notification of the modification. Any changes to the characteristics of an assignment that has been notified but not yet brought into use shall be brought into use within the period provided for in §§ 6.1, 6.31 or 6.31*bis* of Article 6. (WRC-12)

¹¹ 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 specified in § 8.5 and 8.12 and the corresponding entries in the Master Register under § 8.11, after informing the administration concerned. The Bureau shall inform all administrations of such action and that any resubmitted notice shall be considered to be a new notice. 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. See also Resolution 905 (WRC-07). (WRC-07)

¹² Resolution 49 (Rev.WRC-07) applies. (WRC-07)

MOD

8.16 All frequency assignments notified in advance of their being brought into use shall be entered provisionally in the Master Register. Any frequency assignment provisionally recorded under this provision shall be brought into use no later than the end of the period provided for in § 6.1 or § 6.31*bis* in the event of an extension under that provision. Unless the Bureau has been informed by the notifying administration of the bringing into use of the assignment, it shall, no later than 15 days before the end of the regulatory period established under § 6.1 or § 6.31*bis*, send a reminder requesting confirmation that the assignment has been brought into use within the regulatory period. If the Bureau does not receive that confirmation within 30 days following the period provided under § 6.1 or § 6.31*bis* in the event of an extension under that provision, it shall cancel the entry in the Master Register. In the event that an extension was requested under § 6.31*bis* but the Bureau determines that the conditions for an extension under § 6.31*bis* are not met, the Bureau shall inform the administration of its findings and cancel the entry in the Master Register. (WRC-12)

**RESOLUTIONS
AND
RECOMMENDATIONS**

**List of Resolutions and Recommendations approved
for deletion by WRC-12**

RESOLUTIONS	
97 (WRC-07)	Provisional application of certain provisions of the Radio Regulations as revised by WRC-07 and abrogation of certain Resolutions and Recommendations
124 (REV.WRC-2000)	Protection of the fixed service in the frequency band 8 025-8 400 MHz sharing with geostationary-satellite systems of the Earth exploration-satellite service (space-to-Earth)
136 (REV.WRC-03)	Frequency sharing in the range 37.5-50.2 GHz between geostationary fixed-satellite service networks and non-geostationary fixed-satellite service systems
231 (WRC-07)	Additional allocations to the mobile-satellite service with particular focus on the bands between 4 GHz and 16 GHz
342 (REV.WRC-2000)	New technologies to provide improved efficiency in the use of the band 156-174 MHz by stations in the maritime mobile service
345 (WRC-97)	Operation of Global Maritime Distress and Safety System equipment on and assignment of maritime mobile service identities to non-compulsory fitted vessels
351 (REV.WRC-07)	Review of the frequency and channel arrangements in the HF bands allocated to the maritime mobile service contained in Appendix 17 with a view to improving efficiency through the use of new digital technology by the maritime mobile service
355 (WRC-07)	Content, formats and periodicity of the maritime related service publications
357 (WRC-07)	Consideration of regulatory provisions and spectrum allocations for use by enhanced maritime safety systems for ships and ports
419 (WRC-07)	Considerations for use of the band 5 091-5 150 MHz by the aeronautical mobile service for certain aeronautical applications
420 (WRC-07)	Consideration of the frequency bands between 5 000 and 5 030 MHz for aeronautical mobile (R) service surface applications at airports
421 (WRC-07)	Consideration of appropriate regulatory provisions for the operation of unmanned aircraft systems
525 (REV.WRC-07)	Introduction of high-definition television systems of the broadcasting-satellite service in the band 21.4-22.0 GHz in Regions 1 and 3
533 (REV.WRC-2000)	Implementation of the decisions of WRC-2000 relating to processing of proposed networks submitted under Articles 4, 6 and 7 of Appendices 30 and 30A to the Radio Regulations
546 (WRC-03)	Implementation of the decisions of WRC 03 relating to processing of networks under Appendices 30 and 30A of the Radio Regulations

RESOLUTIONS (<i>end</i>)	
551 (WRC-07)	Use of the band 21.4-22 GHz for broadcasting-satellite service and associated feeder-link bands in Regions 1 and 3
611 (WRC-07)	Use of portion of the VHF band by the radiolocation service
613 (WRC-07)	Global primary allocation to the radiodetermination-satellite service in the frequency band 2 483.5-2 500 MHz (space-to-Earth)
614 (WRC-07)	Use of the band 15.4-15.7 GHz by the radiolocation service
671 (WRC-07)	Recognition of systems in the meteorological aids service in the frequency range below 20 kHz
672 (WRC-07)	Extension of the allocation to the meteorological-satellite service in the band 7 750-7 850 MHz
734 (REV.WRC-07)	Studies for spectrum identification for gateway links for high-altitude platform stations in the range from 5 850 to 7 075 MHz
753 (WRC-07)	Use of the band 22.55-23.15 GHz by the space research service
754 (WRC-07)	Consideration of modification of the aeronautical component of the mobile service allocation in the 37-38 GHz band for protection of other primary services in the band
805 (WRC-07)	Agenda for the 2011 World Radiocommunication Conference
905 (WRC-07)	Date of entry into force of certain provisions of the Radio Regulations relating to the non-payment of cost-recovery fees
950 (REV.WRC-07)	Consideration of the use of the frequencies between 275 and 3 000 GHz
951 (REV.WRC-07)	Enhancing the international spectrum regulatory framework
953 (WRC-07)	Protection of radiocommunication services from emissions by short-range radio devices
954 (WRC-07)	Harmonization of spectrum for use by terrestrial electronic news gathering systems
955 (WRC-07)	Consideration of procedures for free-space optical links
956 (WRC-07)	Regulatory measures and their relevance to enable the introduction of software-defined radio and cognitive radio systems

RECOMMENDATIONS	
104 (WRC-95)	Development of power flux-density and equivalent isotropically radiated power limits to be met by feeder links of non-geostationary satellite networks in the mobile-satellite service for the protection of geostationary-satellite networks in the fixed-satellite service in bands where No. 22.2 of the Radio Regulations applies

RESOLUTIONS

ADD

RESOLUTION 11 (WRC-12)

Use of satellite orbital positions and associated frequency spectrum to deliver international public telecommunication services in developing countries

The World Radiocommunication Conference (Geneva, 2012),

considering

- a) that Resolution 1721 (XVI) of the United Nations General Assembly sets forth the principle of the availability of satellite communications to the nations of the world on a global basis;
- b) that, in the United Nations Millennium Declaration (Resolution A/RES/55/2), the Heads of State and Government expressed their belief that the central challenge faced today is to ensure that globalization becomes a positive force for all the world's people; and further resolved *"to ensure that the benefits of new technologies, especially information and communication technologies ... are available to all"*;
- c) that United Nations General Assembly Resolution 56/183 endorsed the holding of a World Summit on the Information Society (WSIS);
- d) that the first phase of WSIS, held in Geneva in December 2003, adopted a Declaration of Principles and a Plan of Action;
- e) that in the Geneva Declaration of Principles it is recognized that: *"A well-developed information and communication network infrastructure and applications, adapted to regional, national and local conditions, easily-accessible and affordable, and making greater use of broadband and other innovative technologies where possible, can accelerate the social and economic progress of countries, and the well-being of all individuals, communities and peoples"*;
- f) that WSIS recognized the relevance of the regulatory regime and of international, open, interoperable and non-discriminatory standards, and the importance of radio-frequency spectrum management on the basis of the public interest;
- g) that the Geneva Plan of Action incorporates actions in order to *"promote the provision of global high-speed satellite services for underserved areas such as remote and sparsely populated areas"*;
- h) that the report of the Secretary-General for ECOSOC issued in May 2009 clearly recognized that *"satellite service continues to play a vital role in television broadcasting and in connecting more isolated and rural areas"*¹;

¹ Economic and Social Council (ECOSOC), Commission on Science and Technology for Development, twelfth session, Geneva, 25-29 May 2009, Report of the Secretary-General. Page 11, http://www.unctad.org/en/docs/ecn162009d2_en.pdf. (Progress made in the implementation of and follow-up to the World Summit on the Information Society outcomes at the regional and international levels - Development-oriented policies for socio-economic inclusive information society, including access, infrastructure and an enabling environment).

- i) that Resolution **15 (Rev.WRC-03)** invites the Council to consider in what way the work of ITU-T, ITU-R and ITU-D and other organs of the Union may be utilized in the most effective way for the information and assistance of administrations of Member States in the development of space radiocommunications;
- j) that bridging the digital divide (i.e. reducing the gap between technology-empowered and technology-excluded communities by providing universal access) was one of the main objectives of WSIS;
- k) that the Doha Action Plan adopted by the World Telecommunication Development Conference (WTDC-06) recognized that: *“ICTs are essential for political, economic, social and cultural development. They fuel the global information society and are rapidly transforming our lives and promoting better understanding among peoples. They also play an important role in poverty alleviation, job creation, environmental protection and the prevention and mitigation of natural and other disasters”*;
- l) that the Hyderabad Declaration adopted by the World Telecommunication Development Conference (WTDC-10) notes: *“... However, the digital divide remains, and is compounded by disparities in broadband access and infrastructure between and within countries, in particular between urban and rural areas. Rapid development of telecommunication/ICT infrastructure in rural and remote areas, using suitable technologies, is an immediate priority for many countries. Another major concern for many administrations is the lack of infrastructure to support telecommunication/ICT development in rural areas, for which suitable and affordable solutions have to be identified. Broadband access and usage, supported by strong national backbones, are increasingly considered as essential services that need to be universally available to all citizens in order to develop networked economies and information societies”*;
- m) that Article 44 of the ITU Constitution stipulates that: *“In using frequency bands for radio services, Member States shall bear in mind that radio frequencies and any associated orbits, including the geostationary-satellite orbit, are limited natural resources and that they must be used rationally, efficiently and economically, in conformity with the provisions of the Radio Regulations, so that countries or groups of countries may have equitable access to those orbits and frequencies, taking into account the special needs of the developing countries and the geographical situation of particular countries”*;
- n) that, by Resolution 71 (Rev. Guadalajara 2010) of the Plenipotentiary Conference, ITU adopted its strategic plan for the period 2012-2015, which contains, as one of the strategic goals of ITU-R: *“To seek ways and means to ensure rational, equitable, efficient and economical use of the radio-frequency spectrum and satellite-orbit resources and to promote flexibility for future expansion and new technological developments”*;
- o) that attainment of most of the Millennium Development Goals (MDGs) remains a challenge, particularly in the poorest countries, amid a climate of global economic downturn;
- p) that, in its final report (*“A 2010 Leadership Imperative: The Future Built on Broadband”*), the Broadband Commission recognizes that: *“the Internet and other information and communication technologies (ICTs) should be used for the benefit of all mankind”*, and that *“broadband will be the basis for digital invention and innovation and the foundation for digital and other investments that lie at the very heart of our shared knowledge economy and society”*;

q) that UN General Assembly Resolution A/65/65/141 of 20 December 2010 recognizes that “*while in recent years access to information and communications technologies, including the steady increase in Internet access ..., the need remains to reduce the digital divide and to ensure that the benefits of new technologies, especially information and communication technologies are available to all ...*” and “*that information and communications technologies present new opportunities and challenges and that there is a pressing need to address the major impediments that developing countries face in accessing the new technologies, such as insufficient resources, infrastructure, ...*”,

considering further

the need to assist developing countries in using satellite telecommunications to enable sustainable and affordable access to information and telecommunication services,

recognizing

a) that the introduction of competition into the international satellite telecommunication sector has led to an increase in the availability of diverse and innovative international telecommunication services in both developed and developing countries, including the availability of essential public services such as disaster relief and e-government;

b) the growing availability of mobile and fixed broadband communications in the developing world and the innovative and economically beneficial uses to which they are being put;

c) that governments and international and regional intergovernmental organizations are fostering innovation, affordability and broader availability of satellite services through ITU registration and deployment of their own satellite systems;

d) that broadband technologies, as a means of supporting vital telecommunication applications, should be accessible to everyone without discrimination;

e) that broadband satellite technologies contribute to reducing the digital (broadband) divide through the provision of telecommunication services, and that the expansion of broadband satellite services is generating growth in the developing countries through e-applications, such as e-health, e-learning, e-government, teleworking and residential and community Internet access, which can be used as a rapid and efficient tool for achieving each country’s ICT policy objectives;

f) that efficient use of the orbital resource and associated frequency spectrum helps both to ensure global coverage and to connect countries directly, instantly and reliably at an affordable price,

reaffirms

a) the important role played by international public telecommunication services by satellite in ensuring fulfilment of the MDGs;

b) ITU’s role in international management of the radio-frequency spectrum and satellite orbit resource;

c) the international rights and obligations of all administrations in respect of their own and other administrations’ frequency assignments;

d) that ITU satellite coordination and notification procedures specified in the Radio Regulations are used to obtain international recognition and protection for satellite network operations,

noting

a) that Programme 1 of the Telecommunication Development Bureau (BDT) on information and communication infrastructure and technology development, provides assistance to developing countries in the area of spectrum management and in the efficient and cost-effective development of rural, national and international broadband telecommunication networks, including by satellite;

b) the activities of the ITU-D Study Groups in preparing materials to assist developing countries in the areas of spectrum management, broadband access technologies, and telecommunications/ICTs for rural and remote areas and disaster management,

resolves

1 that ITU-R continue to collaborate with, and provide information when requested by, ITU-D, on satellite technologies and applications as defined in ITU-R Recommendations and Reports and on satellite regulatory procedures in the Radio Regulations that will help developing countries with development and implementation of satellite networks and services;

2 that ITU-R undertakes studies to determine whether it might be necessary to apply additional regulatory measures to enhance the availability of public international telecommunication services delivered through satellite technology,

instructs the Director of the Radiocommunication Bureau

1 to ensure that ITU-R collaborates with ITU-D in the implementation of this resolution;

2 to report the results of these studies to the next world radiocommunication conference,

invites the Director of the Telecommunication Development Bureau

1 to organize workshops, seminars and training courses that specifically address sustainable and affordable access to satellite telecommunications, including broadband, and to initiate activities or studies between the relevant study groups of ITU-D and ITU-R that will assist developing countries in building capacities in the development and use of satellite telecommunications;

2 to bring this resolution to the attention of the World Telecommunication Development Conference,

invites Member States and Sector Members

to contribute to the implementation of this resolution,

instructs the Secretary-General

to bring this Resolution to the attention of the International Telecommunication Satellite Organization (ITSO) and the International Mobile Satellite Organization (IMSO).

ADD

RESOLUTION 12 (WRC-12)

Assistance and support to Palestine

The World Radiocommunication Conference (Geneva, 2012),

recalling

- a)* Resolution 125 (Rev. Guadalajara, 2010) of the Plenipotentiary Conference, on assistance and support to Palestine for rebuilding its telecommunication networks;
- b)* Resolution 99 (Rev. Guadalajara, 2010) of the Plenipotentiary Conference, on the status of Palestine in ITU;
- c)* Resolution 18 (Rev. Hyderabad, 2010) of the World Telecommunication Development Conference, on Special Technical Assistance to the Palestinian Authority;
- d)* Nos. 6 and 7 of the ITU Constitution indicating among the purposes of the Union “to promote the extension of the benefits of the new telecommunication technologies to all the world’s inhabitants” and “to promote the use of telecommunication services with the objective of facilitating peaceful relations”;

considering

- a)* that the ITU Constitution and Convention are designed to strengthen peace and security in the world for the development of international cooperation and better understanding among the peoples concerned;
- b)* Resolution 125 (Rev. Guadalajara, 2010) of the Plenipotentiary Conference, which recognizes that ITU’s policy of assistance to Palestine for the development of its telecommunication and ICT sector has been efficient;
- c)* the statement by the Chairman of WRC-07 relating to the procedure to be applied by Palestine to obtain for its exclusive use assignments/an allotment in the Appendix 30B Plan, in accordance with the Interim Agreement and Resolution 99 (Rev. Guadalajara, 2010) of the Plenipotentiary Conference,

mindful

of the fundamental principles contained in the ITU Constitution,

reaffirming

- a)* the acceptance of the requirements of the Palestinian Authority under the digital broadcasting and television plan at the Regional Radiocommunication Conference (Geneva, 2006);
- b)* Palestine’s right, pursuant to the Appendix 30B Plan, to submit a request for assignments/an allotment intended for exclusive use by Palestine, in accordance with the Interim Agreement and Resolution 99 (Rev. Guadalajara, 2010), without prejudging future agreements between the concerned parties,

resolves

that assistance to the Palestinian Authority, pursuant to the relevant ITU resolutions and decisions shall be continued, in particular through capacity building, with the view to enabling the Palestinian Authority to obtain and manage the required radio spectrum in order to operate its telecommunication networks and wireless services,

instructs the Director of the Radiocommunication Bureau and the Director of the Telecommunication Development Bureau

to encourage all concerned parties in intensifying the bilateral negotiations and facilitate implementing the agreements and relevant resolutions, in order to agree on additional measures required for enhancing and developing the wireless telecommunication infrastructures, new technologies and services for the Palestinian Authority,

further instructs the Director of the Radiocommunication Bureau

1 to continue providing specialized assistance and support, in particular in the field of spectrum management and frequency assignment, to the Palestinian Authority in collaboration with ITU-D, pursuant to the relevant ITU resolutions;

2 to report to the next WRC-15 on the progress achieved in the implementation of this Resolution.

MOD

RESOLUTION 18 (REV.WRC-12)

Relating to the procedure for identifying and announcing the position of ships and aircraft of States not parties to an armed conflict¹

The World Radiocommunication Conference (Geneva, 2012),

considering

- a) that ships and aircraft encounter considerable risk in the vicinity of an area of armed conflict;
- b) that for the safety of life and property it is desirable for ships and aircraft of States not parties to an armed conflict to be able to identify themselves and announce their position in such circumstances;
- c) that radiocommunication offers such ships and aircraft a rapid means of self-identification and providing location information prior to their entering areas of armed conflict and during their passage through the areas;
- d) that it is considered desirable to provide a supplementary signal and procedure for use, in accordance with customary practice, in the area of armed conflict by ships and aircraft of States representing themselves as not parties to an armed conflict,

noting

that Recommendations ITU-R M.493 and ITU-R M.1371 may include appropriate signals for the digital selective-calling systems and automatic identification systems in the maritime mobile service,

resolves

- 1 that the frequencies for urgency signal and messages specified in the Radio Regulations may be used by ships and aircraft of States not parties to an armed conflict for self-identification and establishing communications. The transmission will consist of the urgency or safety signals, as appropriate, described in Article 33 followed by the addition of the single group “NNN” in radiotelegraphy and by the addition of the single word “NEUTRAL” pronounced as in French “neutral” in radiotelephony. As soon as practicable, communications shall be transferred to an appropriate working frequency;
- 2 that the use of the signal as described in the preceding paragraph indicates that the message which follows concerns a ship or aircraft of a State not party to an armed conflict. The message shall convey at least the following data:
 - a) call sign or other recognized means of identification of such ship or aircraft;
 - b) position of such ship or aircraft;

¹ Administrations are invited to study the text of this Resolution and provide any proposals to a future competent Conference.

- c) number and type of such ships or aircraft;
- d) intended route;
- e) estimated time en route and of departure and arrival, as appropriate;
- f) any other information, such as flight altitude, radio frequencies guarded, languages and secondary surveillance radar modes and codes;

3 that the provisions of Article 33 relating to urgency and safety transmissions, and medical transports shall apply as appropriate to the use of the urgency and safety signals, respectively, by such ship or aircraft;

4 that the identification and location of ships of a State not party to an armed conflict may be effected by means of appropriate standard maritime radar transponders. The identification and location of aircraft of a State not party to an armed conflict may be effected by the use of the secondary surveillance radar (SSR) system in accordance with procedures to be recommended by the International Civil Aviation Organization (ICAO);

5 that the use of the signals described above would not confer or imply recognition of any rights or duties of a State not party to an armed conflict or a party to the conflict, except as may be recognized by common agreement between the parties to the conflict and a non-party;

6 to encourage parties to a conflict to enter into such agreements,

requests the Secretary-General

to communicate the contents of this Resolution to the International Maritime Organization, the International Civil Aviation Organization, the International Committee of the Red Cross, and the International Federation of Red Cross and Red Crescent Societies for such action as they may consider appropriate.

MOD**RESOLUTION 27 (REV.WRC-12)****Use of incorporation by reference in the Radio Regulations**

The World Radiocommunication Conference (Geneva, 2012),

considering

- a) that the principles of incorporation by reference were adopted by WRC-95 and revised by subsequent conferences (see Annexes 1 and 2 to this Resolution);
- b) that there are provisions in the Radio Regulations containing references which fail to distinguish adequately whether the status of the referenced text is mandatory or non-mandatory,

noting

that references to Resolutions or Recommendations of a world radiocommunication conference (WRC) require no special procedures, and are acceptable for consideration, since such texts will have been agreed by a WRC,

resolves

- 1 that for the purposes of the Radio Regulations, the term “incorporation by reference” shall only apply to those references intended to be mandatory;
- 2 that when considering the introduction of new cases of incorporation by reference, such incorporation shall be kept to a minimum and made by applying the following criteria:
 - only texts which are relevant to a specific WRC agenda item may be considered;
 - the correct method of reference shall be determined on the basis of the principles set out in Annex 1 to this Resolution;
 - the guidance contained in Annex 2 to this Resolution shall be applied in order to ensure that the correct method of reference for the intended purpose is employed;
- 3 that the procedure described in Annex 3 to this Resolution shall be applied for approving the incorporation by reference of ITU-R Recommendations or parts thereof;
- 4 that existing references to ITU-R Recommendations shall be reviewed to clarify whether the reference is mandatory or non-mandatory in accordance with Annex 2 to this Resolution;
- 5 that ITU-R Recommendations, or parts thereof, incorporated by reference at the conclusion of each WRC, and a cross-reference list of the regulatory provisions, including footnotes and Resolutions, incorporating such ITU-R Recommendations by reference, shall be collated and published in a volume of the Radio Regulations (see Annex 3 to this Resolution),

instructs the Director of the Radiocommunication Bureau

- 1 to bring this Resolution to the attention of the Radiocommunication Assembly and the ITU-R Study Groups;

2 to identify the provisions and footnotes of the Radio Regulations containing references to ITU-R Recommendations and make suggestions on any further action to the second session of the Conference Preparatory Meeting (CPM) for its consideration, as well as for inclusion in the Director's Report to the next WRC;

3 to identify the provisions and footnotes of the Radio Regulations containing references to WRC Resolutions that contain references to ITU-R Recommendations, and make suggestions on any further action to the second session of the Conference Preparatory Meeting (CPM) for its consideration, as well as for inclusion in the Director's Report to the next WRC,

invites administrations

to submit proposals to future conferences, taking into account the CPM Report, in order to clarify the status of references, where ambiguities remain regarding the mandatory or non-mandatory status of the references in question, with a view to amending those references:

- i) that appear to be of a mandatory nature, identifying such references as being incorporated by reference by using clear linking language in accordance with Annex 2;
- ii) that are of a non-mandatory character, so as to refer to "the most recent version" of the Recommendations.

ANNEX 1 TO RESOLUTION 27 (REV.WRC-07)

Principles of incorporation by reference

1 For the purposes of the Radio Regulations, the term "incorporation by reference" shall apply only to those references intended to be mandatory.

2 Where the relevant texts are brief, the referenced material should be placed in the body of the Radio Regulations rather than using incorporation by reference.

3 Where a mandatory reference to an ITU-R Recommendation, or parts thereof, is included in the *resolves* of a WRC Resolution, which is itself cited in a provision or footnote of the Radio Regulations using mandatory language (i.e. "shall"), that ITU-R Recommendation or parts thereof shall also be considered as incorporated by reference.

4 Texts which are of a non-mandatory nature or which refer to other texts of a non-mandatory nature shall not be considered for incorporation by reference.

5 If, on a case-by-case basis, it is decided to incorporate material by reference on a mandatory basis, then the following provisions shall apply:

5.1 the text incorporated by reference shall have the same treaty status as the Radio Regulations themselves;

5.2 the reference must be explicit, specifying the specific part of the text (if appropriate) and the version or issue number;

5.3 the text incorporated by reference must be submitted for adoption by a competent WRC in accordance with *resolves* 3;

5.4 all texts incorporated by reference shall be published following a WRC, in accordance with *resolves* 5.

6 If, between WRCs, a text incorporated by reference (e.g. an ITU-R Recommendation) is updated, the reference in the Radio Regulations shall continue to apply to the earlier version incorporated by reference until such time as a competent WRC agrees to incorporate the new version. The mechanism for considering such a step is given in Resolution **28 (Rev.WRC-03)**.

ANNEX 2 TO RESOLUTION 27 (REV.WRC-07)

Application of incorporation by reference

When introducing new cases of incorporation by reference in the provisions of the Radio Regulations or reviewing existing cases of incorporation by reference, administrations and ITU-R should address the following factors in order to ensure that the correct method of reference is employed for the intended purpose, according to whether each reference is mandatory (i.e. incorporated by reference), or non-mandatory:

Mandatory references

- 1 mandatory references shall use clear linking language, i.e. “shall”;
- 2 mandatory references shall be explicitly and specifically identified, e.g. “Recommendation ITU-R M.541-8”;
- 3 if the intended reference material is, as a whole, unsuitable as treaty-status text, the reference shall be limited to just those portions of the material in question which are of a suitable nature, e.g. “Annex A to Recommendation ITU-R Z.123-4”.

Non-mandatory references

- 4 Non-mandatory references or ambiguous references that are determined to be of a non-mandatory character (i.e. not incorporated by reference) shall use appropriate language, such as “should” or “may”. This appropriate language may refer to “the most recent version” of a Recommendation. Any appropriate language may be changed at any future WRC.

ANNEX 3 TO RESOLUTION 27 (REV.WRC-12)

Procedures applicable by WRC for approving the incorporation by reference of ITU-R Recommendations or parts thereof

The referenced texts shall be made available to delegations in sufficient time for all administrations to consult them in the ITU languages. A single copy of the texts shall be made available to each administration as a conference document.

During the course of each WRC, a list of the texts incorporated by reference, and a cross-reference list of the regulatory provisions, including footnotes and Resolutions, incorporating such ITU-R Recommendations by reference, shall be developed and maintained by the committees. These lists shall be published as a conference document in line with developments during the conference.

Following the end of each WRC, the Bureau and General Secretariat will update the volume of the Radio Regulations which serves as the repository of texts incorporated by reference in line with developments at the conference as recorded in the above-mentioned document.

MOD

RESOLUTION 42 (REV.WRC-12)

**Use of interim systems in Region 2 in the broadcasting-satellite and
fixed-satellite (feeder-link) services in Region 2 for the bands
covered by Appendices 30 and 30A**

The World Radiocommunication Conference (Geneva, 2012),

considering

- a)* that the Regional Administrative Conference for the Planning of the Broadcasting-Satellite Service in Region 2, Geneva, 1983, prepared a Plan for the broadcasting-satellite service in the band 12.2-12.7 GHz and a Plan for the associated feeder links in the band 17.3-17.8 GHz with provisions for implementing interim systems in accordance with Resolution 2 (Sat-R2);
- b)* that in the implementation of their assignments in the Plans, administrations of Region 2 may find it more appropriate to adopt a phased approach and initially use characteristics different from those appearing in the appropriate Region 2 Plan;
- c)* that some administrations of Region 2 may cooperate in the joint development of a space system with a view to covering two or more service areas from the same orbital position or to using a beam which would encompass two or more service areas;
- d)* that some administrations of Region 2 may cooperate in the joint development of a space system with a view to covering two or more feeder-link service areas from the same orbital position or to using a beam which encompasses two or more feeder-link service areas;
- e)* that interim systems shall not adversely affect the Plans nor hamper the implementation and evolution of the Plans;
- f)* that the number of assignments to be used in an interim system shall not in any case exceed the number of assignments appearing in the Region 2 Plan which are to be suspended;
- g)* that the interim systems shall not in any case use orbital positions that are not in the Region 2 Plan;
- h)* that an interim system shall not be introduced without the agreement of all administrations whose space and terrestrial services are considered to be affected;
- i)* that WRC-2000 revised Regions 1 and 3 downlink and feeder-link Plans and established Lists together with regulatory procedures, protection criteria and calculation methods for sharing between services in the frequency bands of Appendices 30 and 30A;
- j)* that WRC-03 modified the regulatory procedures, protection criteria and calculation methods for sharing between services in the frequency bands of Appendices 30 and 30A,

resolves

that administrations and the Radiocommunication Bureau shall apply the procedure contained in the Annex to this Resolution, so long as Appendices 30 and 30A remain in force.

ANNEX TO RESOLUTION 42 (REV.WRC-12)

1 An administration or a group of administrations in Region 2 may, after successful application of the procedure contained in this Annex and with the agreement of the affected administrations, use an interim system during a specified period not exceeding ten years in order:

1.1 For an interim system in the broadcasting-satellite service

- a) to use an increased e.i.r.p. in any direction relative to that appearing in the Region 2 Plan provided that the power flux-density does not exceed the limits given in Annex 5 to Appendix 30;
- b) to use modulation characteristics¹ different from those appearing in the Annexes to the Region 2 Plan and resulting in an increased probability of harmful interference or in a wider assigned bandwidth;
- c) to change the coverage area by displacing boresight, or by increasing the major or minor axis, or by rotating them from an orbital position which shall be one of the corresponding orbital positions appearing in the Region 2 Plan;
- d) to use a coverage area appearing in the Region 2 Plan or a coverage area encompassing two or more coverage areas appearing in the Region 2 Plan from an orbital position which shall be one of the corresponding positions appearing in the Region 2 Plan;
- e) to use a polarization different from that in the Region 2 Plan.

1.2 For an interim feeder-link system

- a) to use an increased e.i.r.p. in any direction relative to that appearing in the Region 2 feeder-link Plan;
- b) to use modulation characteristics¹ different from those appearing in the Annexes to the Plan and resulting in an increased probability of harmful interference or in a wider assigned bandwidth;
- c) to change the feeder-link beam area by displacing the boresight, or by increasing the major or minor axis, or by rotating them in relation to an orbital position which shall be one of the corresponding orbital positions appearing in the Region 2 feeder-link Plan;
- d) to use a feeder-link beam area appearing in the Region 2 feeder-link Plan or a feeder-link beam area encompassing two or more feeder-link beam areas appearing in the Region 2 feeder-link Plan in relation to an orbital position which shall be one of the corresponding orbital positions appearing in the Region 2 feeder-link Plan;
- e) to use a polarization different from that in the Region 2 feeder-link Plan.

2 In all cases, an interim system shall correspond to assignments in the appropriate Region 2 Plan; the number of assignments to be used in an interim system shall not in any case exceed the number of assignments appearing in the Region 2 Plan which are to be suspended. During the use of an interim system, the use of the corresponding assignments in the Region 2 Plan is suspended; they shall not be brought into use before the cessation of the use of the interim system. However, the suspended assignments, but not the interim system's assignments, of an administration shall be taken into account when other administrations apply the procedure of Article 4 of Appendix 30 or of Article 4 of Appendix 30A, as appropriate, in order to modify the Region 2 Plan or to include new or modified assignments in the Regions 1 and 3 List, or the

¹ For example, modulation with sound channels frequency-multiplexed within the bandwidth of a television channel, digital modulation of sound and television signals, or other pre-emphasis characteristics.

procedure of this Annex in order to bring an interim system into use. The assignments of interim systems shall not be taken into account in applying the procedure of Article 6 or Article 7 of Appendix 30 and the procedure of Article 6 or Article 7 of Appendix 30A.

3 As a specific consequence of § 2 above, Region 2 interim system assignments shall not obtain protection from, or cause harmful interference to, new or modified assignments appearing in the Regions 1 and 3 List following the successful application of the procedure of Article 4 of Appendix 30 or of Article 4 of Appendix 30A, as appropriate, even if the assignment modification procedure is concluded and the assignments become operational within the time-limits specified in § 4 a).

4 When an administration proposes to use an assignment in accordance with § 1, it shall communicate to the Bureau the information listed in Appendix 4 not earlier than eight years but, preferably, not later than two years before the date of bringing into use. An assignment shall lapse if it is not brought into use by that date. The administration shall also indicate:

- a) the maximum specified period during which the interim assignment is intended to remain in use;
- b) the assignments in the Region 2 Plans the use of which will remain suspended for the duration of the use of the corresponding interim assignment;
- c) the names of the administrations with which an agreement for the use of the interim assignment has been reached, together with any comment relating to the period of use so agreed and the names of administrations with which an agreement may be required but has not yet been reached.

5 Administrations are considered to be affected as follows:

5.1 For an interim system in the broadcasting-satellite service

- a) an administration of Region 2 is considered to be affected if any overall equivalent protection margin of one of its assignments in the Region 2 Plan, calculated in accordance with Annex 5 to Appendix 30 including the cumulative effect of all interim uses during the maximum specified period of use of the interim system, but excluding the corresponding suspended assignments (§ 4 b)), becomes negative or a former negative value is made more negative;
- b) an administration of Region 1 or 3 is considered to be affected if it has an assignment which is in conformity with the Regions 1 and 3 Plan contained in Appendix 30 or with the List or in respect of which proposed new or modified assignments have been received by the Bureau in accordance with the provisions of Article 4 of that Appendix with a necessary bandwidth which falls within the necessary bandwidth of the proposed interim assignment and the appropriate limits of § 3 of Annex 1 to Appendix 30 are exceeded;
- c) an administration of Region 1 or 3 is considered to be affected if it has a frequency assignment in the fixed-satellite service which is recorded in the Master Register or which has been coordinated or is being coordinated under the provisions of No. 9.7 or under Article 7 of Appendix 30 or which has been published in accordance with No. 9.2B and the appropriate limits of § 6 of Annex 1 to Appendix 30 are exceeded;

- d) an administration of Region 1 or 3 is considered to be affected if, although having no frequency assignment in the appropriate Regions 1 and 3 Plan or List in the channel concerned, it nevertheless would receive on its territory a power flux-density value which exceeds the limits given in § 4 of Annex 1 to Appendix **30** as a result of the proposed interim assignment, or if it has such an assignment for which its associated service area does not cover the whole of the territory of the administration, and in its territory outside that service area the power flux-density from the interim system space station exceeds the above-mentioned limits;
- e) an administration of Region 2 is considered to be affected if, although having no frequency assignment in the appropriate Region 2 Plan in the channel concerned, it nevertheless would receive on its territory a power flux-density value which exceeds the limits given in § 4 of Annex 1 to Appendix **30** as a result of the proposed interim assignment, or if it has such an assignment for which its associated service area does not cover the whole of the territory of the administration, and in its territory outside that service area the power flux-density from the interim system space station exceeds the above-mentioned limits;
- f) an administration of Region 3 is considered to be affected if it has a frequency assignment to a space station in the broadcasting-satellite service in the band 12.5-12.7 GHz with a necessary bandwidth any portion of which falls within the necessary bandwidth of the proposed assignment, and which:
 - is recorded in the Master Register; *or*
 - has been coordinated or is being coordinated under the provisions of Sections A and B of Resolution **33 (Rev.WRC-03)** or under the provisions of Articles **9** to **14**, as appropriate (see Resolution **33 (Rev.WRC-03)**); *or*
 - appears in a Region 3 Plan to be adopted at a future radiocommunication conference, taking account of modifications which may be introduced subsequently in accordance with the Final Acts of that conference,
 and the limits of § 3, Annex 1 to Appendix **30** are exceeded.

5.2 For interim feeder-link systems

- a) an administration of Region 2 is considered to be affected if any overall equivalent protection margin of one of its assignments in the Plan, calculated in accordance with Annex 3 to Appendix **30A** including the cumulative effect of all interim uses during the maximum specified period of use of the interim system, but excluding the corresponding suspended assignment(s) (§ 4 b)), becomes negative or a former negative value is made more negative;
- b) an administration in Region 1 or 3 is considered to be affected if it has an assignment for feeder links in the fixed-satellite service (Earth-to-space), any portion of the necessary bandwidth of which falls within the necessary bandwidth of the proposed assignment, which is in conformity with the feeder-link Plan or List for Regions 1 and 3, or in respect of which proposed new or modified assignments in the List have already been received by the Bureau in accordance with the provisions of Article 4 of Appendix **30A** and for which the limits set out in § 5 of Annex 1 to Appendix **30A** are exceeded.

6 The Bureau shall publish in a Special Section of its International Frequency Information Circular (BR IFIC) the information received under § 4, together with the names of the administrations which the Bureau has identified in applying § 5.

7 When the Bureau finds that the suspended assignment of an administration having an interim system is not affected, it shall examine the projected interim system with respect to the interim system of that administration and if there is an incompatibility, it shall request the two administrations concerned to adopt any measures that may enable the new interim system to be operated.

8 The Bureau shall send a telegram to the administrations listed in the Special Section of the BR IFIC, drawing their attention to the information it contains and shall send them the results of its calculations.

9 Any administration not listed in the special section which considers that its planned interim assignment may be affected shall so inform the administration responsible for the interim system and the Bureau, and the two administrations shall endeavour to resolve the difficulty before the proposed date of bringing the interim assignment into use.

10 An administration which has not sent its comments either to the administration seeking agreement or to the Bureau within a period of four months following the date of the BR IFIC referred to in § 6 shall be understood as having agreed to the proposed interim use.

11 On the expiry of four months following the date of publication of the BR IFIC referred to in § 6, the Bureau shall review the matter, and, depending on the results obtained, shall inform the administration proposing the interim assignment that:

- a) it may notify its proposed use under Article 5 of Appendix **30** or Article 5 of Appendix **30A**, as appropriate, if no agreement is required or the required agreement has been obtained from the administrations concerned. In this case the Bureau shall update the Interim List;
- b) it may not bring into use its interim system before having obtained the agreement of the administrations affected, either directly or by applying the procedure described in Article 4 of Appendix **30** or Article 4 of Appendix **30A**, as appropriate, as a means of obtaining that agreement.

12 The Bureau shall include all the interim assignments in an Interim List in two parts, one each for the broadcasting-satellite service and the feeder-link assignments, and shall update it in accordance with this Annex. The Interim List shall be published together with the Region 2 Plans but does not constitute part of them.

13 One year prior to the expiry of the interim period, the Bureau shall draw the attention of the administration concerned to this fact and request it to notify in due time the deletion of the assignment from the Master Register and the Interim List.

14 If, notwithstanding the reminders by the Bureau, an administration does not reply to its request sent in application of § 13, the Bureau shall, at the termination of the interim period:

- a) enter a symbol in the Remarks Column of the Master Register to indicate the lack of response and that the entry is for information only;
- b) not take that assignment into account in the Interim List;
- c) inform the administrations concerned and affected of its action.

15 When an administration confirms the termination of the use of the interim assignment, the Bureau shall delete the assignment concerned from the Interim List and the Master Register. Any corresponding assignment in the Plan(s), suspended earlier, may then be brought into use.

16 An administration which considers that its interim system may continue to be used after the expiry of the interim period may extend it by not more than four years and to this effect shall apply the procedure described in this Annex.

17 When an administration applies the procedure in accordance with § 16, but is unable to obtain the agreement of one or more affected administrations, the Bureau shall indicate this situation by inserting an appropriate symbol in the Master Register. Upon receipt of a complaint of harmful interference, the administration shall immediately cease operation of the interim assignment.

18 When an administration, having been informed of a complaint of harmful interference, does not cease transmission within a period of thirty days after the receipt of complaint, the Bureau shall apply the provisions of § 14.

MOD

RESOLUTION 49¹ (REV.WRC-12)**Administrative due diligence applicable to some
satellite radiocommunication services**

The World Radiocommunication Conference (Geneva, 2012),

considering

a) that Resolution 18 of the Plenipotentiary Conference (Kyoto, 1994) instructed the Director of the Radiocommunication Bureau to initiate a review of some important issues concerning international satellite network coordination and to make a preliminary report to WRC-95 and a final report to WRC-97;

b) that the Director of the Bureau provided a comprehensive report to WRC-97, including a number of recommendations for action as soon as possible and for identifying areas requiring further study;

c) that one of the recommendations in the Director's report to WRC-97 was that administrative due diligence should be adopted as a means of addressing the problem of reservation of orbit and spectrum capacity without actual use;

d) that experience may need to be gained in the application of the administrative due diligence procedures adopted by WRC-97, and that several years may be needed to see whether administrative due diligence measures produce satisfactory results;

e) that new regulatory approaches may need to be carefully considered in order to avoid adverse effects on networks already going through the different phases of the procedures;

f) that Article 44 of the 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,

considering further

g) that WRC-97 decided to reduce the regulatory time-frame for bringing a satellite network into use;

h) that WRC-2000 has considered the results of the implementation of the administrative due diligence procedures and prepared a report to the 2002 Plenipotentiary Conference in response to Resolution 85 (Minneapolis, 1998),

resolves

1 that the administrative due diligence procedure contained in Annex 1 to this Resolution shall be applied as from 22 November 1997 for a satellite network or satellite system of the fixed-satellite service, mobile-satellite service or broadcasting-satellite service for which the advance publication information under No. **9.2B**, or for which the request for modifications of the Region 2 Plan under Article 4, § 4.2.1 *b)* of Appendices **30** and **30A** that involve the addition of new frequencies or orbit positions, or for which the request for modifications of the Region 2 Plan

¹ This Resolution does not apply to satellite networks or satellite systems of the broadcasting-satellite service in the 21.4-22 GHz band in Regions 1 and 3.

under Article 4, § 4.2.1 *a*) of Appendices **30** and **30A** that extend the service area to another country or countries in addition to the existing service area, or for which the request for additional uses in Regions 1 and 3 under § 4.1 of Article 4 of Appendices **30** and **30A**, or for which the submission of information under supplementary provisions applicable to additional uses in the planned bands as defined in Article 2 of Appendix **30B** (Section III of Article 6) has been received by the Bureau from 22 November 1997, or for which submission under Article 6 of Appendix **30B** (**Rev.WRC-07**) is received on or after 17 November 2007, with the exception of submissions of new Member States seeking the acquisition of their respective national allotments² for inclusion in the Appendix **30B** Plan;

2 that for a satellite network or satellite system within the scope of § 1 or 3 of Annex 1 to this Resolution not yet recorded in the Master International Frequency Register (MIFR) by 22 November 1997, for which the advance publication information under No. **1042** of the Radio Regulations (Edition of 1990, revised in 1994) or for the application of Section III of Article 6 of Appendix **30B** has been received by the Bureau before 22 November 1997, the responsible administration shall submit to the Bureau the complete due diligence information in accordance with Annex 2 to this Resolution not later than 21 November 2004, or before the expiry of the notified period for bringing the satellite network into use, plus any extension period which shall not exceed three years pursuant to the application of No. **1550** of the Radio Regulations (Edition of 1990, revised in 1994) or the dates specified in the relevant provisions Article 6 of Appendix **30B**, whichever date comes earlier. If the date of bringing into use, including extension specified above, is before 1 July 1998, the responsible administration shall submit to the Bureau the complete due diligence information in accordance with Annex 2 to this Resolution not later than 1 July 1998;

2bis that for a satellite network or satellite system within the scope of § 2 of Annex 1 to this Resolution not recorded in the MIFR by 22 November 1997, for which the request for a modification to the Plans of Appendices **30** and **30A** has been received by the Bureau before 22 November 1997, the responsible administration shall submit to the Bureau the complete due diligence information in accordance with Annex 2 to this Resolution as early as possible before the end of the period established as a limit to bringing into use in accordance with the relevant provisions of Article 4 of Appendix **30** and the relevant provisions of Article 4 of Appendix **30A**;

3 that for a satellite network or satellite system within the scope of § 1, 2 or 3 of Annex 1 to this Resolution recorded in the MIFR by 22 November 1997, the responsible administration shall submit to the Bureau the complete due diligence information in accordance with Annex 2 to this Resolution not later than 21 November 2000, or before the notified date of bringing the satellite network into use (including any extension period), whichever date comes later;

4 that six months before the expiry date specified in *resolves* 2 or *2bis* above, if the responsible administration has not submitted the due diligence information, the Bureau shall send a reminder to that administration;

² See § 2.3 of Appendix **30B** (**Rev.WRC-07**).

5 that if the due diligence information is found to be incomplete, the Bureau shall immediately request the administration to submit the missing information. In any case, the complete due diligence information shall be received by the Bureau before the expiry date specified in *resolves 2* or *2bis* above, as appropriate, and shall be published by the Bureau in the International Frequency Information Circular (BR IFIC);

6 that if the complete due diligence information is not received by the Bureau before the expiry date specified in *resolves 2* or *2bis* above, the request for coordination or request for a modification to the Plans of Appendices **30** and **30A** or for application of Section III of Article 6 of Appendix **30B** as covered by *resolves 1* above submitted to the Bureau shall be cancelled. Any modifications of the Plans (Appendices **30** and **30A**) shall lapse and any recording in the MIFR as well as recordings in the Appendix **30B** List shall be deleted by the Bureau after it has informed the concerned administration. The Bureau shall publish this information in the BR IFIC,

further resolves

that the procedures in this Resolution are in addition to the provisions under Article **9** or **11** of the Radio Regulations or Appendices **30**, **30A** or **30B**, as applicable, and, in particular, do not affect the requirement to coordinate under those provisions (Appendices **30**, **30A**) in respect of extending the service area to another country or countries in addition to the existing service area,

instructs the Director of the Radiocommunication Bureau

to report to future competent world radiocommunication conferences on the results of the implementation of the administrative due diligence procedure.

ANNEX 1 TO RESOLUTION 49 (REV.WRC-12)

1 Any satellite network or satellite system of the fixed-satellite service, mobile-satellite service or broadcasting-satellite service with frequency assignments that are subject to coordination under Nos. **9.7**, **9.11**, **9.12**, **9.12A** and **9.13** and Resolution **33 (Rev.WRC-03)** shall be subject to these procedures.

2 Any request for modifications of the Region 2 Plan under the relevant provisions of Article 4 of Appendices **30** and **30A** that involve the addition of new frequencies or orbit positions or for modifications of the Region 2 Plan under the relevant provisions of Article 4 of Appendices **30** and **30A** that extend the service area to another country or countries in addition to the existing service area or request for additional uses in Regions 1 and 3 under the relevant provisions of Article 4 of Appendices **30** and **30A** shall be subject to these procedures.

3 Any submission of information under Article 6 of Appendix **30B (Rev.WRC-07)**, with the exception of submissions of new Member States seeking the acquisition of their respective national allotments³ for inclusion in the Appendix **30B** Plan, shall be subject to these procedures.

4 An administration requesting coordination for a satellite network under § 1 above shall send to the Bureau as early as possible before the end of the period established as a limit to bringing into use in No. **9.1**, the due diligence information relating to the identity of the satellite network and the spacecraft manufacturer specified in Annex 2 to this Resolution.

³ See § 2.3 of Appendix **30B (Rev.WRC-07)**.

5 An administration requesting a modification of the Region 2 Plan or additional uses in Regions 1 and 3 under Appendices **30** and **30A** under § 2 above shall send to the Bureau as early as possible before the end of the period established as a limit to bringing into use in accordance with the relevant provisions of Article 4 of Appendix **30** and the relevant provisions of Article 4 of Appendix **30A**, the due diligence information relating to the identity of the satellite network and the spacecraft manufacturer specified in Annex 2 to this Resolution.

6 An administration applying Article 6 of Appendix **30B (Rev.WRC-07)** under § 3 above shall send to the Bureau as early as possible before the end of the period established as a limit to bringing into use in § 6.1 of that Article, the due diligence information relating to the identity of the satellite network and the spacecraft manufacturer specified in Annex 2 to this Resolution.

7 The information to be submitted in accordance with § 4, 5 or 6 above shall be signed by an authorized official of the notifying administration or of an administration that is acting on behalf of a group of named administrations.

8 On receipt of the due diligence information under § 4, 5 or 6 above, the Bureau shall promptly examine that information for completeness. If the information is found to be complete, the Bureau shall publish the complete information in a special section of the BR IFIC within 30 days.

9 If the information is found to be incomplete, the Bureau shall immediately request the administration to submit the missing information. In all cases, the complete due diligence information shall be received by the Bureau within the appropriate time period specified in § 4, 5 or 6 above, as the case may be, relating to the date of bringing the satellite network into use.

10 Six months before expiry of the period specified in § 4, 5 or 6 above and if the administration responsible for the satellite network has not submitted the due diligence information under § 4, 5 or 6 above, the Bureau shall send a reminder to the responsible administration.

11 If the complete due diligence information is not received by the Bureau within the time limits specified in this Resolution, the networks covered by § 1, 2 or 3 above shall be cancelled by the Bureau. The provisional recording in the MIFR shall be deleted by the Bureau after it has informed the concerned administration. The Bureau shall publish this information in the BR IFIC.

With respect to the request for modification of the Region 2 Plan or for additional uses in Regions 1 and 3 under Appendices **30** and **30A** under § 2 above, the modification shall lapse if the due diligence information is not submitted in accordance with this Resolution.

With respect to the request for application of Article 6 of Appendix **30B (Rev.WRC-07)** under § 3 above, the network shall also be deleted from the Appendix **30B** List. When an allotment under Appendix **30B** is converted into an assignment, the assignment shall be reinstated in the Plan in accordance with § 6.33 c) of Article 6 of Appendix **30B (Rev.WRC-07)**.

12 An administration notifying a satellite network under § 1, 2 or 3 above for recording in the MIFR shall send to the Bureau, as early as possible before the date of bringing into use, the due diligence information relating to the identity of the satellite network and the launch services provider specified in Annex 2 to this Resolution.

13 When an administration has completely fulfilled the due diligence procedure but has not completed coordination, this does not preclude the application of No. **11.41** by that administration.

ANNEX 2 TO RESOLUTION 49 (REV.WRC-12)

A Identity of the satellite network

- a)* Identity of the satellite network
- b)* Name of the administration
- c)* Country symbol
- d)* Reference to the advance publication information or to the request for modification of the Region 2 Plan or for additional uses in Regions 1 and 3 under Appendices **30** and **30A**; or reference to the information processed under Article 6 of Appendix **30B** (**Rev.WRC-07**)
- e)* Reference to the request for coordination (not applicable for Appendices **30**, **30A** and **30B**)
- f)* Frequency band(s)
- g)* Name of the operator
- h)* Name of the satellite
- i)* Orbital characteristics.

B Spacecraft manufacturer*

- a)* Name of the spacecraft manufacturer
- b)* Date of execution of the contract
- c)* Contractual “delivery window”
- d)* Number of satellites procured.

C Launch services provider

- a)* Name of the launch vehicle provider
- b)* Date of execution of the contract
- c)* Launch or in-orbit delivery window
- d)* Name of the launch vehicle
- e)* Name and location of the launch facility.

* NOTE – In cases where a contract for satellite procurement covers more than one satellite, the relevant information shall be submitted for each satellite.

MOD

RESOLUTION 55 (REV.WRC-12)

**Electronic submission of notice forms for satellite networks,
earth stations and radio astronomy stations**

The World Radiocommunication Conference (Geneva, 2012),

considering

that submission of notices for all satellite networks, earth stations and radio astronomy stations in electronic format would further facilitate the tasks of the Radiocommunication Bureau and of administrations, and would accelerate the processing of these notices,

recognizing

that, should the processing delays related to the coordination and notification procedures extend beyond the periods specified in Articles **9** and **11** as well as in Appendices **30**, **30A** and **30B**, administrations may be faced with a shortened time window in which to effect coordination,

resolves

1 that, as from 3 June 2000, all notices (AP4/II and AP4/III), radio astronomy notices (AP4/IV) and API (AP4/V and AP4/VI) and due diligence information (Resolution **49 (Rev.WRC-07)**) for satellite networks and earth stations submitted to the Radiocommunication Bureau pursuant to Articles **9** and **11** shall be submitted in electronic format compatible with the BR electronic notice form capture software (SpaceCap);

2 that, as from 17 November 2007, all notices for satellite networks, earth stations and radio astronomy stations submitted to the Radiocommunication Bureau pursuant to Articles **9** and **11**, as well as Appendices **30** and **30A** and Resolution **49 (Rev.WRC-07)**, shall be submitted in electronic format compatible with the BR electronic notice form capture software (SpaceCap and SpaceCom);

3 that, as from 1 June 2008, all notices for satellite networks and earth stations submitted to the Radiocommunication Bureau pursuant to Appendix **30B** shall be submitted in electronic format compatible with the BR electronic notice form capture software (SpaceCap);

4 that, as from 1 July 2009, comments/objections submitted to the Bureau in accordance with Nos. **9.3** and **9.52** with respect to Nos. **9.11** to **9.14** and **9.21** of Article **9**, or in accordance with §§ 4.1.7, 4.1.9, 4.1.10, 4.2.10, 4.2.13 or 4.2.14 of Appendices **30** and **30A** with respect to modification to the Region 2 Plan or to additional uses in Regions 1 and 3 under Article 4 and use of the guardbands under Article 2A of those Appendices, shall be submitted in electronic format compatible with the BR electronic notice form capture software (SpaceCom);

5 that, as from 18 February 2012, all requests for inclusion or exclusion submitted to the Bureau under No. **9.41** of Article **9** shall be submitted in electronic format compatible with the BR electronic notice form capture software (SpaceCom);

6 that, since 3 June 2000, all graphical data associated with the submissions addressed in *resolves* 1, 2 and 3 should be submitted in graphics data format compatible with the Bureau's data capture software (graphical interference management system (GIMS)); submission of graphics in paper form, however, continues to be accepted,

instructs the Radiocommunication Bureau

1 to make available coordination requests and notifications referred to in *resolves* 1, "as received", on its BR International Frequency Information Circular CD-ROM, within 30 days of receipt, and also on its website;

2 to provide administrations with the latest versions of the capture and validation software and any necessary technical means, training and manuals, along with any assistance requested by administrations to enable them to comply with *resolves* 1 to 4 above;

3 to integrate the validation software with the capture software to the extent practicable,

urges administrations

to submit, as soon as practicable, the graphical data relating to their notices in a format compatible with the Bureau's graphic data capture software.

MOD

RESOLUTION 63 (REV.WRC-12)

Protection of radiocommunication services against interference caused by radiation from industrial, scientific and medical (ISM) equipment

The World Radiocommunication Conference (Geneva, 2012),

considering

- a) that ISM applications are defined under RR No. 1.15 as “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*”;
- b) that ISM equipment may be situated in locations where outward radiation cannot always be avoided;
- c) that there is an increasing amount of ISM equipment working on various frequencies throughout the spectrum;
- d) that in some cases a considerable part of the energy may be radiated by ISM equipment outside its working frequency;
- e) that Recommendation ITU-R SM.1056 recommends to administrations the use of International Special Committee on Radio Interference (CISPR) Publication 11 as a guide for ISM equipment to protect radiocommunication services, but that CISPR 11 does not yet fully specify radiation limits for all frequency bands;
- f) that Report ITU-R SM.2180 introduces the interference analysis method and the radiation limits of ISM equipment developed by CISPR, and that the emission limits, which have been developed to protect analogue radiocommunication systems, may not provide protection to digital radiocommunication systems;
- g) that certain digital radiocommunication systems use receivers that may be more sensitive to interference from ISM equipment;
- h) that some radio systems, especially those using low field strengths, may suffer interference caused by radiation from ISM equipment, a risk which is unacceptable particularly in the case of systems belonging to radionavigation or other safety services;
- i) that, in order to limit the risks of interference to specified parts of the spectrum:
 - the preceding Radio Conferences of Atlantic City, 1947, and Geneva, 1959, designated some frequency bands within which the radiocommunication services must accept harmful interference produced by ISM equipment;

- WARC-79 accepted an increase in the number of bands to be designated for ISM equipment, but only on the condition that limits of radiation from such equipment be specified within the bands newly designated for worldwide use and outside all the bands designated for ISM equipment;

j) that the variety and evolution of digital technologies used in digital radiocommunication systems suggest a need for continuous review of CISPR Publication 11,

resolves

that, to ensure that radiocommunication services are adequately protected, studies are required on the limits to be imposed on the radiation from ISM equipment, within and outside the frequency bands designated in the Radio Regulations for this use,

invites ITU-R

1 to provide the necessary characteristics and protection criteria for relevant digital radiocommunication systems in order to enable CISPR to review and update, as needed, the limits on radiation from ISM equipment;

2 to continue, in collaboration with CISPR, its studies relating to radiation from ISM equipment, within and outside the frequency bands designated in the Radio Regulations for this use, in order to ensure adequate protection of radiocommunication services, including digital radiocommunication systems, with priority being given to the completion of studies which would permit CISPR to define limits in Publication CISPR 11 on radiation from ISM equipment inside all the bands designated in the Radio Regulations for the use of such equipment,

instructs the Director of the Radiocommunication Bureau

to bring this Resolution to the attention of CISPR.

ADD

RESOLUTION 67 (WRC-12)

Updating and rearrangement of the Radio Regulations

The World Radiocommunication Conference (Geneva, 2012),

considering

- a)* that the radio spectrum is a finite resource, and there is continuing evolution and demand for frequency requirements and an increasing multiplicity of radiocommunication applications;
- b)* that the Radio Regulations are founded on the principles outlined in their Preamble;
- c)* that subsequent to the ITU reorganization at APP-92, several attempts have been made to review, simplify and update the Radio Regulations;
- d)* that the majority of agenda items for past WRCs concern frequency allocations, currently contained in Article 5 and associated regulations;
- e)* that regulatory procedures should be continually assessed in order to meet the demands of administrations,

recognizing

- a)* that the rights of administrations to deploy, operate and protect services should be the guiding principle, without affecting other administrations;
- b)* that the studies for review to simplify the Radio Regulations may take more than one study cycle,

noting

- a)* that one of the purposes of the Radio Regulations is the effective management and use of spectrum;
- b)* that ITU-R Recommendations incorporated by reference as they would appear in Volume IV of the Radio Regulations may be limited to a list of titles and their cross-references in the Radio Regulations,

resolves to invite ITU-R

1 to initiate studies for possible updating, review and possible revision of outdated information, and rearrangement of certain parts of the Radio Regulations, except for Articles 1, 4, 5, 6, 7, 8, 9, 11, 13, 14, 15, 16, 17, 18, 21, 22, 23 and 59 and those parts which are being revised on a regular basis, as appropriate,

2 to submit the results of these studies for consideration by a future world radiocommunication conference in accordance with this Resolution,

invites ITU-R members

to participate actively in the studies by submitting contributions to ITU-R,

instructs the Director of the Radiocommunication Bureau

to report the status of the studies to WRC-15.

MOD

RESOLUTION 75 (REV.WRC-12)

Development of the technical basis for determining the coordination area for coordination of a receiving earth station in the space research service (deep space) with transmitting stations of high-density applications in the fixed service in the 31.8-32.3 GHz and 37-38 GHz bands

The World Radiocommunication Conference (Geneva, 2012),

considering

- a) that the band 31.8-32.3 GHz is allocated to the space research service for deep space operations only, the band 37-38 GHz is allocated to the space research service (space-to-Earth), and both bands are allocated to the fixed service for the use of high-density applications and to other services on a primary basis;
- b) that the 31.8-32.3 GHz band offers unique advantages in support of deep-space missions;
- c) that space research service earth stations operating in these bands employ very high-gain antennas and very low-noise amplifiers in order to receive weak signals from deep space;
- d) that fixed-service stations in these bands are expected to be deployed in large numbers over urban areas of large geographical extent;
- e) that studies are being initiated to characterize short-term (of the order of 0.001% of the time, commensurate with the protection criteria given in Recommendations ITU-R SA.1396 and ITU-R SA.1157) anomalous propagation from transmitting stations dispersed over a large geographical area to a single receiving earth station (area-to-point propagation);
- f) that preliminary ITU-R studies have indicated that the coordination distance between a space research service (deep space) earth station and a single urban area may be of the order of 250 km;
- g) that there are currently three space research service (deep space) earth stations in operation or planned for operation near Goldstone (United States of America), Madrid (Spain) and Canberra (Australia), and there are up to ten more earth stations planned in the future,

noting

- a) that Resolution **74 (Rev.WRC-03)** provides a mechanism to update Appendix 7 as required;

b) that Recommendations ITU-R F.1760 and ITU-R F.1765 provide methodologies to derive the aggregate equivalent isotropically radiated power (a.e.i.r.p.) for transmitting stations of high-density applications in the fixed service in bands above 30 GHz, which may be used to assess the potential interference from these stations to other services,

resolves to invite ITU-R

to develop, as a matter of urgency, the technical basis for determining the coordination area for coordination of a receiving earth station in the space research service (deep space) with transmitting stations of high-density systems in the fixed service in the 31.8-32.3 GHz and 37-38 GHz bands,

urges administrations

to participate actively in the aforementioned studies by submitting contributions to ITU-R.

ADD

RESOLUTION 98 (WRC-12)

**Provisional application of certain provisions of the Radio Regulations
as revised by WRC-12 and abrogation of certain
Resolutions and Recommendations**

The World Radiocommunication Conference (Geneva, 2012),

considering

- a)* that this Conference has, in accordance with its terms of reference adopted a partial revision to the Radio Regulations (RR), which will enter into force on 1 January 2013;
- b)* that some of the provisions, as amended by this Conference, need to apply provisionally before that date;
- c)* that, as a general rule, new and revised Resolutions and Recommendations enter into force at the time of the signing of the Final Acts of a Conference;
- d)* that, as a general rule, Resolutions and Recommendations which a WRC has decided to suppress are abrogated at the time of the signing of the Final Acts of a Conference,

resolves

- 1 that, as of 18 February 2012, the following provisions of the RR, as revised or established by WRC-12, shall provisionally apply: Table of Frequency Allocations 2 170-2 520 MHz, 18.4-22 GHz, 22-24.75 GHz and 24.75-29.9 GHz, Nos. **5.532A**, **5.532B**, **5.530B**, **5.530C**, **5.530A**, **5.530D**, **5.398A**, **5.401**, **5.371**, **5.399**, **5.446**, **A.9.4**, **A.9.8**, Nos. **A.11.2**, **A.11.7**, **11.37**, **11.37.2**, **11.44.1**, **11.48**, **21.2**, **21.2.1**, Table **21-3** (**Rev.WRC-12**), Table **21-4** (**Rev.WRC-12**), items A.7.f and C.10.d.7 of Annex 2 of Appendix **4** (**Rev.WRC-12**), paragraphs *6bis*, 8 and 9 of Table **5-1** and Annex 1 of Appendix **5** (**Rev.WRC-12**), Table **7c** of Annex 7 of Appendix **7** (**Rev.WRC-12**),
- 2 that, as of 1 January 2017, the following provisions of the RR, as revised or established by WRC-12, shall apply: Appendix **17**, Annex 2;
- 3 that, as of 18 February 2012, the following provisions, which are suppressed by WRC-12, shall be abrogated: Nos. **5.397**, **5.400** and **5.530**,

further resolves

1 to abrogate the following Resolutions as of 18 February 2012:

Resolution 97 (WRC-07)	Resolution 124 (Rev.WRC-2000)
Resolution 136 (Rev.WRC-03)	Resolution 231 (WRC-07)
Resolution 342 (Rev.WRC-2000)	Resolution 345 (WRC-97)
Resolution 351 (Rev.WRC-07)	Resolution 355 (WRC-07)
Resolution 357 (WRC-07)	Resolution 419 (WRC-07)
Resolution 420 (WRC-07)	Resolution 421 (WRC-07)
Resolution 525 (Rev.WRC-07)	Resolution 533 (Rev.WRC-2000)
Resolution 546 (WRC-03)	Resolution 551 (WRC-07)
Resolution 611 (WRC-07)	Resolution 613 (WRC-07)
Resolution 614 (WRC-07)	Resolution 671 (WRC-07)
Resolution 672 (WRC-07)	Resolution 734 (Rev.WRC-07)
Resolution 753 (WRC-07)	Resolution 754 (WRC-07)
Resolution 805 (WRC-07)	Resolution 905 (WRC-07)
Resolution 950 (Rev.WRC-07)	Resolution 951 (Rev.WRC-07)
Resolution 953 (WRC-07)	Resolution 954 (WRC-07)
Resolution 955 (WRC-07)	Resolution 956 (WRC-07)

2 to abrogate the following Recommendation as of 18 February 2012:

Recommendation **104 (WRC-95).**

MOD

RESOLUTION 114 (REV.WRC-12)

Studies on compatibility between new systems of the aeronautical radionavigation service and the fixed-satellite service (Earth-to-space) (limited to feeder links of the non-geostationary mobile-satellite systems in the mobile-satellite service) in the frequency band 5 091-5 150 MHz

The World Radiocommunication Conference (Geneva, 2012),

considering

- a) the current allocation of the frequency band 5 000-5 250 MHz to the aeronautical radionavigation service;
- b) the requirements of both the aeronautical radionavigation and the fixed-satellite (FSS) (Earth-to-space) (limited to feeder links of non-geostationary satellite (non-GSO) systems in the mobile-satellite service (MSS)) services in the above-mentioned band,

recognizing

- a) that priority must be given to the microwave landing system (MLS) in accordance with No. 5.444 and to other international standard systems of the aeronautical radionavigation service in the frequency band 5 030-5 150 MHz;
- b) that, in accordance with Annex 10 of the Convention of the International Civil Aviation Organization (ICAO) on international civil aviation, it may be necessary to use the frequency band 5 091-5 150 MHz for the MLS if its requirements cannot be satisfied in the frequency band 5 030-5 091 MHz;
- c) that the FSS providing feeder links for non-GSO systems in the MSS will need access to the frequency band 5 091-5 150 MHz in the short term,

noting

- a) that Recommendation ITU-R S.1342 describes a method for determining coordination distances between international standard MLS stations operating in the band 5 030-5 091 MHz and FSS earth stations providing Earth-to-space feeder links in the band 5 091-5 150 MHz;
- b) the small number of FSS stations to be considered;
- c) the development of new systems that will provide supplemental navigation information integral to the aeronautical radionavigation service,

resolves

- 1 that administrations authorizing stations providing feeder links for non-GSO systems in the MSS in the frequency band 5 091-5 150 MHz shall ensure that they do not cause harmful interference to stations of the aeronautical radionavigation service;

2 that the allocation to the aeronautical radionavigation service and the FSS in the frequency band 5 091-5 150 MHz should be reviewed at a future competent conference prior to 2018;

3 that studies be undertaken on compatibility between new systems of the aeronautical radionavigation service and systems of the FSS providing feeder links of the non-GSO systems in the MSS (Earth-to-space),

invites administrations

when assigning frequencies in the band 5 091-5 150 MHz before 1 January 2018 to stations of the aeronautical radionavigation service or to stations of the FSS providing feeder links of the non-GSO systems in the MSS (Earth-to-space), to take all practicable steps to avoid mutual interference between them,

invites ITU-R

to study the technical and operational issues relating to sharing of this band between new systems of the aeronautical radionavigation service and the FSS providing feeder links of the non-GSO systems in the MSS (Earth-to-space),

invites

1 ICAO to supply technical and operational criteria suitable for sharing studies for new aeronautical systems;

2 all Members of the Radiocommunication Sector, and especially ICAO, to participate actively in such studies,

instructs the Secretary-General

to bring this Resolution to the attention of ICAO.

MOD

RESOLUTION 125 (REV.WRC-12)

**Frequency sharing in the bands 1 610.6-1 613.8 MHz and 1 660-1 660.5 MHz
between the mobile-satellite service and the radio astronomy service**

The World Radiocommunication Conference (Geneva, 2012),

with a view

to enabling the mobile-satellite service (MSS) and the radio astronomy service to make the most efficient use of frequency bands allocated to them, having due regard to the other services to which those bands are also allocated,

considering

- a) that the bands 1 610.6-1 613.8 MHz and 1 660-1 660.5 MHz are allocated to the radio astronomy service and the MSS (Earth-to-space) on a co-primary basis;
- b) that No. **5.372** states that “Harmful interference shall not be caused to stations of the radio astronomy service using the band 1 610.6-1 613.8 MHz by stations of the radiodetermination-satellite and mobile-satellite services (No. **29.13** applies)”; and that Article **29** also points out that emissions from space or airborne stations can be particularly serious sources of interference to the radio astronomy service;
- c) that the nature of objects studied by the radio astronomy service in the bands 1 610.6-1 613.8 MHz and 1 660-1 660.5 MHz demands maximum flexibility in the planning of observation frequencies;
- d) that, in the bands 1 610.6-1 613.8 MHz and 1 660-1 660.5 MHz, which are shared between the radio astronomy service and the MSS, operational constraints are necessary for MSS mobile earth stations;
- e) that a former ITU-R Recommendation relating to sharing between the MSS and the radio astronomy service in the band 1 660-1 660.5 MHz noted that further studies were required, particularly in the areas of propagation models and assumptions used for the determination of separation distances;
- f) that Recommendation ITU-R M.1316 may be used in order to facilitate coordination between mobile earth stations and radio astronomy stations in the bands 1 610.6-1 613.8 MHz and 1 660-1 660.5 MHz;
- g) that no experience has been gained up to now with the use of the Recommendation mentioned in *considering f*);
- h) that the threshold levels of interference detrimental to the radio astronomy service are given in Recommendation ITU-R RA.769,

resolves

that a future competent conference should evaluate frequency sharing in the bands 1 610.6-1 613.8 MHz and 1 660-1 660.5 MHz between the MSS and the radio astronomy service, based upon the experience gained with the use of ITU-R M.1316 and other relevant ITU-R Recommendations,

invites ITU-R

to continue studies to evaluate the effectiveness of Recommendations aiming to facilitate sharing between the MSS and the radio astronomy service,

instructs the Director of the Radiocommunication Bureau

to provide the results of the studies in the Report of the Director to a future competent conference,

urges administrations

to participate actively in this evaluation.

MOD

RESOLUTION 145 (REV.WRC-12)

**Use of the bands 27.9-28.2 GHz and 31-31.3 GHz by
high altitude platform stations in the fixed service**

The World Radiocommunication Conference (Geneva, 2012),

considering

- a)* that WRC-97 made provision for the operation of high altitude platform stations (HAPS), also known as stratospheric repeaters, within a 2×300 MHz portion of the fixed-service allocation in the bands 47.2-47.5 GHz and 47.9-48.2 GHz;
- b)* that No. **4.23** specifies that transmissions to or from HAPS shall be limited to the bands specifically identified in Article 5;
- c)* that at WRC-2000, several countries in Region 3 and one country in Region 1 expressed a need for a lower frequency band for HAPS due to the excessive rain attenuation that occurs at 47 GHz in these countries;
- d)* that some countries in Region 2 have also expressed an interest in using a frequency range lower than those referred to in *considering a)*;
- e)* that, in order to accommodate the need expressed by the countries referred to in *considering c)*, WRC-2000 adopted Nos. **5.537A** and **5.543A**, which were modified at WRC-03 and then again at WRC-07 to permit the use of HAPS in the fixed service in the band 27.9-28.2 GHz and in the band 31-31.3 GHz in certain Region 1 and 3 countries on a non-harmful interference, non-protection basis;
- f)* that the bands 27.9-28.2 GHz and 31-31.3 GHz are already heavily used or planned to be used by a number of different services and a number of other types of applications in the fixed service;
- g)* that while the decision to deploy HAPS can be taken on a national basis, such deployment may affect neighbouring administrations, particularly in small countries;
- h)* that the 31.3-31.8 GHz band is allocated to the radio astronomy, Earth exploration-satellite (passive) and space research (passive) services, and that WRC-03 amended No. **5.543A** to specify signal levels that would protect satellite passive services and radio astronomy stations;
- i)* that ITU-R has conducted studies dealing with sharing between systems using HAPS in the fixed service and other types of systems in the fixed service in the bands 27.9-28.2 GHz and 31-31.3 GHz leading to Recommendation ITU-R F.1609;

- j) that results of some ITU-R studies indicate that, in the bands 27.9-28.2 GHz and 31-31.3 GHz, sharing between fixed-service systems using HAPS and other conventional fixed-service systems in the same area will require appropriate interference mitigation techniques to be developed and implemented;
- k) that ITU-R has conducted studies dealing with compatibility between systems using HAPS and the passive services in the 31.3-31.8 GHz band leading to Recommendations ITU-R F.1570 and ITU-R F.1612;
- l) that ITU-R has produced Recommendation ITU-R SF.1601 containing methodologies for evaluating interference from fixed-service systems using HAPS into GSO FSS systems in the band 27.9-28.2 GHz;
- m) that HAPS technical issues could continue to be studied in order to determine appropriate measures for protecting the fixed service and other co-primary services in the band 27.9-28.2 GHz,

resolves

- 1 that, notwithstanding No. **4.23**, in Region 2 the use of HAPS within the fixed-service allocations within the 27.9-28.2 GHz and 31-31.3 GHz bands shall not cause harmful interference to, nor claim protection from, other stations of services operating in accordance with the Table of Frequency Allocations of Article **5**, and, further, that the development of these other services shall proceed without constraints by HAPS operating pursuant to this Resolution;
- 2 that any use by HAPS of the fixed-service allocation at 27.9-28.2 GHz pursuant to *resolves* 1 above shall be limited to operation in the HAPS-to-ground direction, and that any use by HAPS of the fixed-service allocation at 31-31.3 GHz shall be limited to operation in the ground-to-HAPS direction;
- 3 that systems using HAPS in the band 31-31.3 GHz, in accordance with *resolves* 1 above, shall not cause harmful interference to the radio astronomy service having a primary allocation in the band 31.3-31.8 GHz, taking into account the protection criterion given in the relevant ITU-R Recommendation in the RA series. In order to ensure the protection of satellite passive services, the level of unwanted power density into the HAPS ground station antenna in the band 31.3-31.8 GHz shall be limited to -106 dB(W/MHz) under clear-sky conditions and may be increased up to -100 dB(W/MHz) under rainy conditions to mitigate fading due to rain, provided that the effective impact on the passive satellite does not exceed the impact under clear-sky conditions;
- 4 that the administrations listed in Nos. **5.537A** and **5.543A** which intend to implement systems using HAPS in the fixed service in the bands 27.9-28.2 GHz and 31-31.3 GHz shall seek explicit agreement of concerned administrations with regard to their stations of primary services to ensure that the conditions in Nos. **5.537A** and **5.543A** are met, and those administrations in Region 2 which intend to implement systems using HAPS in the fixed service in these bands shall seek explicit agreement of concerned administrations with regard to their stations of services operating in accordance with the Table of Frequency Allocations of Article **5** to ensure that the conditions in *resolves* 1 and *resolves* 3 are met;

5 that administrations planning to implement a HAPS system pursuant to *resolves* 1 above shall notify the frequency assignment(s) by submitting all mandatory elements of Appendix 4 to the Radiocommunication Bureau for the examination of compliance with *resolves* 3 and 4 above,

invites ITU-R

1 to continue to carry out studies on the appropriate interference mitigation techniques for the situations referred to in *considering j*);

2 to develop protection criteria for the mobile service having primary allocations in the frequency bands 27.9-28.2 GHz and 31-31.3 GHz from HAPS in the fixed service.

MOD

RESOLUTION 149 (REV.WRC-12)

Submissions from new Member States of the Union relating to Appendix 30B of the Radio Regulations

The World Radiocommunication Conference (Geneva, 2012),

considering

- a) that WARC Orb-88 adopted a Plan for the fixed-satellite service in the frequency bands 4 500-4 800 MHz, 6 725-7 025 MHz, 10.70-10.95 GHz, 11.20-11.45 GHz and 12.75-13.25 GHz as contained in Appendix **30B (WARC Orb-88)**;
- b) that WRC-07 revised the Appendix **30B** Plan and the associated regulatory procedures;
- c) that WRC-07 decided that the principle of guaranteed access to spectrum resources for all Members of the Union must be maintained and, as a consequence, the highest priority should be given to submissions from countries not having a national allotment in the Plan or an assignment in the List stemming from the conversion of an allotment;
- d) that under the regulatory provisions adopted by WARC Orb-88 and revised by subsequent conferences, submissions from Member States not having a national allotment in the Plan or an assignment in the List stemming from the conversion of an allotment are processed in order of receipt together with other submissions,

recognizing

that some countries that have joined, or may join, the Union as a Member State do not have a national allotment or an assignment in the List stemming from the conversion of an allotment,

resolves

1 that an administration of a country which has joined the Union as a Member State and does not have a national allotment in the Plan or an assignment in the List stemming from the conversion of an allotment shall have the right to request the Bureau to exclude its territory from the service area of an allotment or an assignment, whereupon the Bureau shall exclude the territory accordingly without adversely affecting the rest of the service area and subsequently recalculate the new reference situation for the Appendix **30B** Plan and List;

2 to urge administrations¹ to make utmost efforts to accommodate submissions received from new Member States of ITU.

¹ Those administrations which are the basis of unfavourable findings with respect to submissions from new Member States.

ADD

RESOLUTION 150 (WRC-12)

**Use of the bands 6 440-6 520 MHz and 6 560-6 640 MHz by gateway links
for high-altitude platform stations in the fixed service**

The World Radiocommunication Conference (Geneva, 2012),

considering

- a) that ITU has among its purposes “to promote the extension of the benefit of the new telecommunication technologies to all the world’s inhabitants” (No. 6 of the Constitution);
- b) that systems based on new technologies using high-altitude platform stations (HAPS) can potentially be used for various applications such as the provision of high-capacity services to urban and rural areas;
- c) that provision has been made in the Radio Regulations for the deployment of HAPS in specific bands, including as base stations to serve IMT networks;
- d) that at WRC-07, a need for provision for gateway links to serve HAPS operations was expressed;
- e) that WRC-07 invited ITU-R to conduct sharing studies, with a view to identifying two channels of 80 MHz each for gateway links for HAPS in the range from 5 850 to 7 075 MHz, in bands already allocated to the fixed service, while ensuring the protection of existing services;
- f) that for the purpose of protecting the operations of the Earth exploration-satellite service (EESS) (passive) in the band 6 425-7 075 MHz, No. **5.458** applies;
- g) that for the purpose of protecting the radio astronomy service in the band 6 650-6 675.2 MHz, No. **5.149** applies;
- h) that the range 5 850-7 075 MHz is already heavily used or planned to be used by a number of different services and a number of other types of applications in the fixed service;
- i) that in order to accommodate the need stated in *considering d)*, WRC-12 adopted No. **5.457** to permit the use of HAPS gateway links in the fixed service in the bands 6 440-6 520 MHz and 6 560-6 640 MHz in the limited number of countries listed in the footnote;
- j) that compatibility between HAPS and affected services will largely depend on the number of administrations deploying HAPS and the total number of such systems;
- k) that while the deployment of HAPS gateway links in the bands 6 440-6 520 MHz and 6 560-6 640 MHz is taken on a national basis, such deployment would affect other administrations;
- l) that Appendix 4 does not contain all the necessary data elements pertaining to HAPS gateway links,

recognizing

- a) that ITU-R has studied technical and operational characteristics of HAPS gateway links in the fixed service in the range 5 850-7 075 MHz resulting in Recommendation ITU-R F.1891;
- b) that Recommendation ITU-R F.2011 contains a methodology to evaluate interference from HAPS gateway downlinks in the fixed service to conventional fixed wireless systems in the range 5 850-7 075 MHz;
- c) that Report ITU-R F.2240 contains the results of interference analyses between HAPS gateway links in the fixed service and other systems/services in the range 5 850-7 075 MHz;
- d) that the World Summit on the Information Society has encouraged the development and application of emerging technologies to facilitate infrastructure and network development worldwide with special focus on under-served regions and areas,

resolves

- 1 that the antenna pattern for both the HAPS platform and the HAPS gateway station in the bands 6 440-6 520 MHz and 6 560-6 640 MHz shall meet the following antenna beam patterns:

$$\begin{array}{llll}
 G(\psi) = G_m - 3(\psi/\psi_b)^2 & \text{dBi} & \text{for} & 0^\circ \leq \psi \leq \psi_1 \\
 G(\psi) = G_m + L_N & \text{dBi} & \text{for} & \psi_1 < \psi \leq \psi_2 \\
 G(\psi) = X - 60 \log(\psi) & \text{dBi} & \text{for} & \psi_2 < \psi \leq \psi_3 \\
 G(\psi) = L_F & \text{dBi} & \text{for} & \psi_3 < \psi \leq 90^\circ
 \end{array}$$

where:

$G(\psi)$: gain at the angle ψ from the main beam direction (dBi)

G_m : maximum gain in the main lobe (dBi)

ψ_b : one-half of the 3 dB beamwidth in the plane considered (3 dB below G_m) (degrees)

L_N : near side-lobe level (dB) relative to the peak gain required by the system design, and has a maximum value of -25 dB

L_F : far side-lobe level, $G_m - 73$ dBi.

$$\psi_1 = \psi_b \sqrt{-L_N / 3} \quad \text{degrees}$$

$$\psi_2 = 3.745 \psi_b \quad \text{degrees}$$

$$X = G_m + L_N + 60 \log(\psi_2) \quad \text{dBi}$$

$$\psi_3 = 10^{(X - L_F) / 60} \quad \text{degrees}$$

$$\psi_b = \sqrt{7.442 / (10^{0.1G_m})} \quad \text{degrees};$$

2 that the maximum angle of deviation of the HAPS airborne antenna from the nadir for gateway links shall be limited to 60 degrees corresponding to the urban area coverage of the HAPS; and the maximum number of gateway stations operating with a single platform shall not exceed 5;

3 that the minimum antenna elevation angle of HAPS gateway stations on the ground shall be 30 degrees;

4 that for the purpose of protecting the fixed satellite service (Earth-to-space), the aggregate pfd of HAPS uplinks shall be limited to a maximum of -183.9 dBW/m^2 in 4 kHz at any point in the geostationary arc. To meet this aggregate pfd criterion, the maximum e.i.r.p. value of a single HAPS gateway link towards the geostationary arc shall not exceed -59.9 dBW/4 kHz in any direction within ± 5 degrees of the geostationary arc;

5 that for the purpose of protecting the fixed wireless systems in other administrations in the band 6 440-6 520 MHz, the e.i.r.p. of the HAPS downlink shall be limited to a maximum of -0.5 dBW/10 MHz for all off-axis angles from the nadir to 60 degrees from the nadir;

6 that for the purpose of protecting EESS passive operations over oceans, HAPS gateway stations shall maintain a minimum distance of 100 kilometres for a single HAPS gateway station and 150 kilometres for several HAPS gateway stations from coast lines;

7 that administrations planning to implement HAPS gateway links in the notification to the Bureau of the frequency assignment(s) shall submit all mandatory parameters for the examination by the Bureau for compliance with respect to *resolves* 1 to 6 above, and also the explicit agreement obtained pursuant to No. **5.457**,

invites

administrations to consult with the Director of the Radiocommunication Bureau to determine the data elements of HAPS gateway stations necessary for notification and examination of frequency assignments in accordance with the provisions of Article **11** and Appendix **4**,

instructs the Director of the Radiocommunication Bureau

to implement this resolution.

ADD

RESOLUTION 151 (WRC-12)

**Additional primary allocations to the fixed-satellite service
in frequency bands between 10 and 17 GHz in Region 1**

The World Radiocommunication Conference (Geneva, 2012),

considering

- a)* that the existing unplanned bands for the fixed-satellite service (FSS) in the 10-15 GHz range are extensively used for a large variety of applications, and these applications have triggered a rapid rise in the demand for this frequency range;
- b)* that, in ITU Region 3, the spectrum allocated to the unplanned FSS in the Earth-to-space and space-to-Earth directions in the 10-15 GHz band is 750 MHz and 1.05 GHz, respectively;
- c)* that, in ITU Region 2, the spectrum allocated to the unplanned FSS in the Earth-to-space and space-to-Earth directions in the 10-15 GHz band is 750 MHz and 1.0 GHz, respectively;
- d)* that WRC-12 adopted Resolution **152 (WRC-12)** to consider possible additional primary allocations to the fixed-satellite service (Earth-to-space) of 250 MHz in Region 2 and 300 MHz in Region 3;
- e)* that, in ITU Region 1, the spectrum allocated to the unplanned FSS in the Earth-to-space and space-to-Earth directions in the 10-15 GHz band is 750 MHz and 750 MHz, respectively;
- f)* that the existing difference of capacity in ITU Regions 2 and 3 and in ITU Region 1 will increase after implementation of *considering d)* and create an imbalance among these Regions, thus restricting satellite operators in different ITU Regions from fully and effectively utilizing the limited frequency resource to cope with the increasing spectrum demand in *considering a)*;
- g)* that there is a need to resolve the shortage of spectrum in Region 1 and Regions 2 and 3 in *considering b)* to *e)*, such that the rapid growth of spectrum demand in *considering a)* could be met and the limited spectrum resources could be used in an efficient and economical way in accordance with the principle of Article 44 of the ITU Constitution;
- h)* that frequency allocation should, wherever possible, allocate frequency bands on a worldwide basis (aligned services, categories of service and frequency band limits), taking into account safety, technical, operational, economic and other relevant factors,

recognizing

- a)* that studies will be required in order to develop regulatory changes, including additional allocations to the fixed-satellite service, to meet the growing spectrum requirements;
- b)* that it is important to ensure the FSS systems do not cause undue constraints to existing primary services having allocations in the band 10-17 GHz;

c) that there are assignments in the 14.5-14.8 GHz band in the Regions 1 and 3 BSS feeder-link Plan, contained in Appendix **30A**, for 22 countries in Africa, Middle East and Asia-Pacific;

d) that new assignments could be added to the Appendix **30A** List of assignments for Regions 1 and 3 following the successful application of Article 4 of Appendix **30A**;

e) that there are FSS (Earth-to-space) allotments and assignments in the Appendix **30B** Plan and List in the frequency band 12.75-13.25 GHz;

f) that the above-mentioned Appendix **30B** List in the Earth-to-space direction could be further developed using the procedures of Articles 6 and 7 of Appendix **30B**;

g) that there are assignments in the 11.7-12.5 GHz band in the Regions 1 and 3 BSS Plan, contained in Appendix **30**;

h) that transmitting or receiving earth stations, as the case may be, of these above-mentioned allotments or assignments in the Plans or the Lists could be located at any point within the service area of their associated satellite network,

further recognizing

a) that the 13.25-13.75 GHz band is allocated to the Earth exploration-satellite service (active) on a primary basis;

b) that EESS (active) satellites with three types of active sensor in 13.25-13.75 GHz – scatterometers, altimeters and precipitation radars – have been operating in this band for many years. The remote sensing systems of EESS (active) are used in backscatter echo mode to monitor weather, water and climate change and similar emergencies, with the aim of preventing natural disasters, which could suffer from interference resulting from FSS (uplink);

c) that, although EESS (active) satellites are currently operated by only a limited number of countries, measurements are performed worldwide and the remote sensing data and related analyses are distributed and used globally, and are performed for the benefit of the whole international community;

d) that the EESS (active) systems are crucial for the protection of human life and natural resources. It is necessary to ensure that the EESS (active) systems shall be protected without any undue constraints to their operations in the 13.25-13.75 GHz band;

e) that the 15.35-15.4 GHz band, in which No. **5.340** applies, is allocated to Earth exploration-satellite (passive), space research (passive) and radio astronomy services;

f) that the 13.75-14 GHz band is allocated to the fixed-satellite service and the radiolocation service on a primary basis, that the Earth exploration-satellite (passive), space research (passive) and standard frequency and time signal-satellite (Earth-to-space) services are allocated on a secondary basis, and that Nos. **5.502** and **5.503** and Resolution **144 (Rev.WRC-07)** apply in this band,

resolves

- 1 to complete, for WRC-15:
- i) studies of possible bands for a new primary allocation to the fixed-satellite service of 250 MHz in both directions in Region 1 within the bands 10-17 GHz, with particular focus on the frequency range that is contiguous (or near contiguous) to the existing fixed-satellite service allocations, taking into account sharing and compatibility studies, while protecting the existing primary services in the band(s);
- ii) studies that include consideration of utilizing existing allocations to the fixed-satellite service in both directions through a review of regulatory provisions, except for Nos. **5.502** and **5.503** and Resolution **144 (Rev.WRC-07)**, taking into account sharing and compatibility studies, while protecting the existing primary services in the band 10-17 GHz;
- 2 that if consideration is given to use of the 14.5-14.8 GHz band, appropriate measures need to be taken with regard to the Appendix **30A** Plan and List, as the case may be, to ensure the integrity and adequate protection of these bands, specifically taking into account:
 - i) required coordination procedures between Appendix **30A** networks, as the case may be, and the new fixed-satellite service utilization of the bands;
 - ii) the need for transmitting earth stations in the Appendix **30A** Plan and List to be able to be located anywhere within their respective service areas;
 - iii) the need to appropriately protect assignments in the Appendix **30A** Plan and List, as the case may be, from any new fixed-satellite service utilization of the bands;
- 3 that the 11.7-12.5 GHz band should be excluded from consideration; however, if consideration is given to use of the 11.7-12.5 GHz band in Region 1, appropriate measures need to be taken with regard to the Appendix **30** Plans and List, according to the case, to ensure the integrity and full protection of these bands, specifically taking into account:
 - i) required coordination procedures between Appendix **30** networks, as the case may be, and the new fixed-satellite service utilization of the bands;
 - ii) the need for receiving earth stations in the Appendix **30** Plans and List to be able to be located anywhere within their respective service areas;
 - iii) the need to appropriately protect assignments in the Appendix **30** Plans and List, as the case may be, from any new fixed-satellite service utilization of the bands;
- 4 that the 12.75-13.25 GHz band shall be excluded from the studies referred to in this Resolution;
- 5 that WRC-15 consider the results of the above studies and take appropriate action,

invites ITU-R

to conduct studies, as a matter of urgency, on technical (including necessary calculations and criteria), operational and regulatory issues on this topic, taking into account *resolves* 1, 2, 3 and 4, in time for WRC-15 to consider the results of these studies and take appropriate action,

invites administrations

to participate in the ITU-R studies through the submission of contributions.

ADD

RESOLUTION 152 (WRC-12)

**Additional primary allocations to the fixed-satellite service in the
Earth-to-space direction in frequency bands between 13-17 GHz
in Region 2 and Region 3**

The World Radiocommunication Conference (Geneva, 2012),

considering

a) that the existing unplanned bands for the fixed-satellite service (FSS) in the 10-15 GHz range are extensively used for a large variety of applications, and these applications, have triggered a rapid rise in the demand for this frequency range;

b) that, in ITU Region 3, the spectrum allocated to the unplanned FSS in the Earth-to-space and space-to-Earth directions in the 10-15 GHz band is 750 MHz and 1.05 GHz, respectively;

c) that, in ITU Region 2, the spectrum allocated to the unplanned FSS in the Earth-to-space and space-to-Earth directions in the 10-15 GHz band is 750 MHz and 1.0 GHz, respectively;

d) that the difference of capacity in *considering b)* and *c)* creates bandwidth limitation in the Earth-to-space direction and therefore restricts satellite operators from fully and effectively utilizing the limited frequency resource to cope with the increasing spectrum demand in *considering a)*;

e) that there is a need to resolve the shortage of spectrum in the Earth-to-space direction as described in *considering b)* and *c)*, such that the rapid growth of spectrum demand in *considering a)* could be met and the limited spectrum resources could be used in an efficient and economical way in accordance with the principle of Article 44 of the ITU Constitution;

f) that additional primary allocations to the unplanned FSS in the Earth-to-space direction that are contiguous (or near contiguous) to the existing allocations are necessary in order to solve the spectrum insufficiency issue in *considering b)* and *c)*;

g) that frequency allocation should, wherever possible, allocate frequency bands on a worldwide basis (aligned services, categories of service and frequency band limits), taking into account safety, technical, operational, economic and other relevant factors,

recognizing

a) that it is important to ensure the FSS systems do not cause undue constraints to existing primary services having allocations in the band 13-17 GHz;

b) that there are assignments in the 14.5-14.8 GHz band in the Regions 1 and 3 BSS feeder-link Plan, contained in Appendix 30A, for 22 countries in Africa, Middle East and Asia-Pacific;

c) that new assignments could be added to the Appendix **30A** List of assignments for Regions 1 and 3 following the successful application of Article 4 of Appendix **30A**;

d) that there are FSS (Earth-to-space) allotments and assignments in the Appendix **30B** Plan and List in the frequency band 12.75-13.25 GHz;

e) that the above-mentioned Appendix **30B** List in the Earth-to-space direction could be further developed using the procedures of Articles 6 and 7 of Appendix **30B**;

f) that transmitting earth stations of these above-mentioned allotments or assignments in the Plans or Lists, as the case may be, could be located at any point within the service area of its associated satellite network,

further recognizing

a) that the 13.25-13.75 GHz band has been allocated to the Earth exploration-satellite service (active) on a primary basis;

b) that EESS (active) satellites with three types of active sensor in 13.25-13.75 GHz – scatterometers, altimeters and precipitation radars – have been operating in this band for many years. The remote sensing systems of EESS (active) are used in backscatter echomode to monitor weather, water and climate change and similar emergencies, with the aim of preventing natural disasters, which could suffer from interference resulting from FSS (uplink);

c) that, although EESS (active) satellites are currently operated by only a limited number of countries, measurements are performed worldwide and the remote sensing data and related analyses are distributed and used globally, and are performed for the benefit of the whole international community;

d) that the EESS (active) systems are crucial for the protection of human life and natural resources. It is necessary to ensure that the EESS (active) systems shall be protected without any undue constraints to their operations in the 13.25-13.75 GHz band;

e) that the 15.35-15.4 GHz band, in which No. **5.340** applies, is allocated to Earth exploration-satellite (passive), space research (passive) and radio astronomy services;

f) that the 13.75-14 GHz band is allocated to the fixed-satellite service and the radiolocation service on a primary basis, that the Earth exploration-satellite (passive), space research (passive) and standard frequency and time signal-satellite (Earth-to-space) services are allocated on a secondary basis, and that Nos. **5.502** and **5.503** and Resolution **144 (Rev.WRC-07)** apply in this band,

resolves

1 to complete, for WRC-15:

i) studies of possible bands for a new primary allocation to the fixed-satellite service in the Earth-to-space direction of 250 MHz in Region 2 and 300 MHz in Region 3 within the bands 13-17 GHz, with particular focus on the frequency range that is contiguous (or near contiguous) to the existing fixed-satellite service allocations, taking into account sharing and compatibility studies, while protecting the existing primary services in the band(s);

ii) studies that include consideration of utilizing existing allocations to the fixed-satellite service in the Earth-to-space direction through a review of regulatory provisions, except for Nos. **5.502** and **5.503** and Resolution **144 (Rev.WRC-07)**, taking into account sharing and compatibility studies, while protecting the existing primary services in the band(s);

2 that if consideration is given to use of the 14.5-14.8 GHz band, appropriate measures need to be taken with regard to the Appendix **30A** Plan and List, as the case may be, to ensure the integrity and full protection of these bands, specifically taking into account:

- i) required coordination procedures between Appendix **30A** networks, as the case may be, and the new fixed-satellite service utilization of the bands;
- ii) the need for transmitting earth stations in the Appendix **30A** Plan and List to be able to be located anywhere within their respective service areas;
- iii) the need to appropriately protect assignments in the Appendix **30A** Plan and List, as the case may be, from any new fixed-satellite service utilization of the bands;

3 that the 13-13.25 GHz band shall be excluded from the studies referred to in this Resolution;

4 that WRC-15 consider the results of the above studies and take appropriate action,

invites ITU-R

1 to conduct studies, as a matter of urgency, on technical (including necessary calculations and criteria), operational and regulatory issues on this topic, taking into account *resolves* 1, 2, 3 and 4, in time for WRC-15 to consider the results of these studies and take appropriate action;

2 to consider appropriate measures regarding the use of provisional recording in respect of coordination between assignments in the Appendix **30A** Plan and List in the band 14.5-14.8 GHz and the new fixed-satellite service utilization,

invites administrations

to participate actively in these studies by submitting contributions to ITU-R.

ADD

RESOLUTION 153 (WRC-12)

The use of frequency bands allocated to the fixed-satellite service not subject to Appendices 30, 30A and 30B for the control and non-payload communications of unmanned aircraft systems in non-segregated airspaces

The World Radiocommunication Conference (Geneva, 2012),

considering

- a) that many applications of unmanned aircraft systems (UAS) exist that require access to non-segregated airspace;
- b) that unmanned aircraft (UA) need to operate seamlessly with manned aircraft in the non-segregated airspace and, to the extent practicable, use globally harmonized spectrum;
- c) that the safe flight operation of UAS needs reliable communication links and associated spectrum, especially for the remote pilot to command and control the flight and to relay the air traffic control communications, also referred to as control and non-payload communications (CNPC);
- d) that UAS CNPC links via satellite are part of UAS operations, in particular to relay transmissions beyond the horizon and maintain safe flight operation;
- e) that UAS already operate in fixed-satellite service (FSS) frequency bands for the UA-to-satellite CNPC links under No. 4.4 of the Radio Regulations;
- f) that the use of FSS for the UAS CNPC links, including but not limited to the links between geostationary satellite and mobile elements of the UAS, has to ensure the protection of incumbent services;
- g) that CNPC links will need the ability to operationally mitigate interference in order to ensure appropriate overall link integrity and availability that are consistent with UAS operations in non-segregated airspace;
- h) that multi-frequency CNPC architectures provide a means of improving link availabilities, and have the potential to mitigate interference;
- i) that it is necessary to take into account existing and future satellite networks when planning for growth of the use of FSS resources for UAS;
- j) that appropriate Article 11 notification status of a FSS network is required for use in high-reliability applications such as UAS CNPC links,

recognizing

- a) that, with the introduction of UA in non-segregated airspace, continued safety of other airspace users as well as life and property on the ground needs to be maintained;
- b) that studies are required to provide a basis for considering regulatory, technical and operational conditions, in order to use FSS links for the CNPC link between geostationary satellites and UAS in non-segregated airspaces in a compatible manner with incumbent services in the FSS frequency bands;
- c) that, in accordance with the Convention on International Civil Aviation, the operation of UAS in non-segregated airspace has to meet standards and recommended practices;
- d) that ITU-R reports have been approved dealing with UAS operation in non-segregated airspace, in particular Report ITU-R M.2171 and Report ITU-R M.2233;
- e) that, pursuant to No. 4.10 of the Radio Regulations, Member States recognize that the safety aspects of radionavigation and other safety services require special measures to ensure their freedom from harmful interference; it is necessary therefore to take this factor into account in the assignment and use of frequencies,

resolves to invite WRC-15

to consider, based on the results of the ITU-R studies referred to in *invites ITU-R* below, the possible regulatory actions to support the use of FSS frequency bands for the UAS CNPC links, as mentioned in the *considerings* above, ensuring the safe operation of UAS CNPC links, consistent with *recognizing e)*,

invites ITU-R

- 1 to conduct, in time for WRC-15, the necessary studies leading to technical, regulatory and operational recommendations to the Conference, enabling that Conference to decide on the usage of FSS for the CNPC links for the operation of UAS;
- 2 to include, in the studies referred to in *invites ITU-R* 1, sharing and compatibility studies with services already having allocations in those bands;
- 3 to take into account information from operations referred to in *considering e)*,

further invites

the International Civil Aviation Organization (ICAO), the International Air Transport Association, administrations and other organizations concerned to participate in the studies identified in *invites ITU-R* above,

instructs the Secretary-General

to bring this Resolution to the attention of ICAO.

ADD

RESOLUTION 154 (WRC-12)

Consideration of technical and regulatory actions in order to support existing and future operation of fixed-satellite service earth stations within the 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, 2012),

considering

- a) that remote and rural areas often still lack a terrestrial communication infrastructure that meets the evolving requirements of modern civil aviation;
- b) that the cost of providing and maintaining such an infrastructure could be expensive, particularly in remote regions;
- c) where an adequate terrestrial communication infrastructure is not available, fixed-satellite service (FSS) earth stations 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);
- d) that the use of FSS earth stations deployed in some countries in Region 1 for aeronautical communications has the potential to significantly enhance communications between air traffic control centres as well as with remote aeronautical stations,

noting

- a) that the FSS is not a safety service;
- b) that, by its Resolution **20 (Rev.WRC-03)**, WRC resolved to instruct the Secretary-General “to encourage ICAO to continue its assistance to developing countries which are endeavouring to improve their aeronautical telecommunications ...”;
- c) Recommendation ITU-R SF.1486 on sharing methodology between fixed wireless access systems in the fixed service (FS) and very small aperture terminals (VSATs) in the FSS in the 3 400-3 700 MHz band;
- d) Report ITU-R S.2199 on studies on compatibility of broadband wireless access systems and FSS networks in the 3 400-4 200 MHz band;
- e) Report ITU-R M.2109 on sharing studies between International Mobile Telecommunications-Advanced (IMT-Advanced) systems and geostationary-satellite networks in the fixed-satellite service in the 3 400-4 200 MHz and 4 500-4 800 MHz frequency bands,

resolves to invite ITU-R

to study possible technical and regulatory measures in some countries in Region 1 to support the existing and future FSS earth stations in the 3 400-4 200 MHz band used for satellite communications related to safe operation of aircraft and reliable distribution of meteorological information referred to in *considering c)*,

invites

all members of the Radiocommunication Sector, ICAO and WMO to contribute to these studies,

instructs the Director of the Radiocommunication Bureau

to include the results of these studies in his Report to WRC-15 for the purposes of considering adequate actions in response to *resolves to invite ITU-R* above,

instructs the Secretary-General

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

MOD

RESOLUTION 205 (REV.WRC-12)

Protection of the systems operating in the mobile-satellite service in the band 406-406.1 MHz

The World Radiocommunication Conference (Geneva, 2012),

considering

- a) that WARC-79 allocated the band 406-406.1 MHz to the mobile-satellite service in the Earth-to-space direction;
- b) that No. **5.266** limits the use of the band 406-406.1 MHz to low-power satellite emergency position-indicating radiobeacons (EPIRBs);
- c) that WARC Mob-83 made provision in the Radio Regulations for the introduction and development of a global distress and safety system;
- d) that the use of satellite EPIRBs is an essential element of this system;
- e) that, like any frequency band reserved for a distress and safety system, the band 406-406.1 MHz is entitled to full protection against all harmful interference;
- f) that Nos. **5.267** and **4.22** and Appendix **15** (Table 15-2) require the protection of the mobile-satellite service (MSS) within the frequency band 406-406.1 MHz from all emissions of systems, including systems operating in the lower adjacent bands (390-406 MHz) and in the upper adjacent bands (406.1-420 MHz);
- g) that Recommendation ITU-R M.1478 provides protection requirements for the various types of instruments mounted on board operational satellites receiving EPIRB signals in the frequency band 406-406.1 MHz against both broadband out-of-band emissions and narrowband spurious emissions;
- h) that studies are needed to adequately address the consequence of aggregate emissions from a large number of transmitters operating in adjacent bands and the consequent risk to space receivers intended to detect low-power distress-beacon transmissions,

considering further

- a) that some administrations have initially developed and implemented an operational low-altitude, near-polar orbiting satellite system (Cospas-Sarsat) operating in the frequency band 406-406.1 MHz to provide alerting and to aid in the locating of distress incidents;
- b) that thousands of human lives have been saved through the use of spaceborne distress-beacon detection instruments, initially on 121.5 MHz and 243 MHz, and subsequently in the frequency band 406-406.1 MHz;
- c) that the 406 MHz distress transmissions are relayed through many instruments mounted on geostationary, low-Earth and medium-Earth satellite orbits;

d) that the digital processing of these emissions provides accurate, timely and reliable distress alert and location data to help search and rescue authorities assist persons in distress;

e) that the International Maritime Organization (IMO) has decided that satellite EPIRBs operating in the Cospas-Sarsat system form part of the Global Maritime Distress and Safety System (GMDSS);

f) that observations of the use of frequencies in the band 406-406.1 MHz show that they are being used by stations other than those authorized by No. 5.266, and that these stations have caused harmful interference to the mobile-satellite service, and particularly to the reception of satellite EPIRB signals by the Cospas-Sarsat system,

recognizing

a) that it is essential for the protection of human life and property that bands allocated exclusively to a service for distress and safety purposes be kept free from harmful interference;

b) that the deployment of mobile systems near the frequency band 406-406.1 MHz is currently envisaged in many countries;

c) that this deployment raises significant concerns on the reliability of future distress and safety communications since the global monitoring of the 406 MHz search and rescue system already shows a high level of noise measured in many areas of the world for the frequency band 406-406.1 MHz;

d) that it is essential to preserve the MSS frequency band 406-406.1 MHz free from out-of-band emissions that would degrade the operation of the 406 MHz satellite transponders and receivers, with the risk that satellite EPIRB signals would go undetected,

noting

a) that the 406 MHz search and rescue system will be enhanced by placing 406-406.1 MHz transponders on global navigation satellite systems;

b) that this enhanced constellation of spaceborne search and rescue instruments will improve geographic coverage and reduce distress-alert transmission delays because of larger uplink footprints and an increased number of satellites;

c) that the characteristics of these spacecraft with larger footprints, and the low power available from satellite EPIRB transmitters, means that aggregate levels of electromagnetic noise, including noise from transmissions in adjacent bands, may present a risk of satellite EPIRB transmissions being undetected, or delayed in reception, thereby putting lives at risk,

resolves to invite ITU-R

1 to conduct, and complete in time for WRC-15, the appropriate regulatory, technical and operational studies with a view to ensuring the adequate protection of MSS systems in the frequency band 406-406.1 MHz from any emissions that could cause harmful interference (see No. 5.267), taking into account the current and future deployment of services in adjacent bands as noted in *considering f)*;

2 to consider whether there is a need for regulatory action, based on the studies carried out under *resolves* 1, to facilitate the protection of MSS systems in the frequency band 406-406.1 MHz, or whether it is sufficient to include the results of the above studies in appropriate ITU-R Recommendations and/or Reports,

instructs the Director of the Radiocommunication Bureau

1 to include the results of these studies in his Report to WRC-15 for the purposes of considering adequate actions in response to *resolves to invite ITU-R* above;

2 to organize monitoring programmes in the frequency band 406-406.1 MHz in order to identify the source of any unauthorized emission in that band,

urges administrations

1 to take part in monitoring programmes requested by the Bureau in accordance with No. **16.5**, in the frequency band 406-406.1 MHz, with a view to identifying and locating stations of services other than those authorized in the band;

2 to ensure that stations other than those operated under No. **5.266** abstain from using frequencies in the frequency band 406-406.1 MHz;

3 to take the appropriate measures to eliminate harmful interference caused to the distress and safety system;

4 to work with participating countries of the system and ITU to resolve reported cases of interference to the Cospas-Sarsat system;

5 to participate actively in the studies by submitting contributions to ITU-R.

MOD

RESOLUTION 215 (REV.WRC-12)

Coordination process among mobile-satellite systems and efficient use of the allocations to the mobile-satellite service in the 1-3 GHz range

The World Radiocommunication Conference (Geneva, 2012),

considering

- a) that space-to-Earth transmissions of mobile-satellite systems are constrained to limit their power flux-density over areas where the frequency band is shared with terrestrial systems;
- b) that a number of proposed mobile-satellite systems can provide a good service to users within the power flux-density limits given in Annex 1 to Appendix 5 to the Radio Regulations;
- c) that when maximum communication capacity is achieved by systems in the mobile-satellite service (MSS) a major portion of the interference into each of these systems will come from the other mobile-satellite systems sharing the frequency band, and, consequently, if one system starts to transmit at higher power, all others need to do the same in order to overcome mutual interference;
- d) that ITU-R is studying the efficient use of the radio spectrum and frequency sharing within the MSS, that Recommendations ITU-R M.1186 and ITU-R M.1187 are a basis for further study, and that additional preliminary texts are available or can be provided by administrations on this matter;
- e) that, in a codirectional, co-frequency and co-coverage sharing environment, capacities of systems using spread-spectrum multiple-access techniques are affected by technical and operational characteristics of other MSS systems using similar multiple-access techniques;
- f) that in many parts of the world and in certain frequency bands in the 1-3 GHz range, significant congestion already exists due to use by other terrestrial and space services;
- g) the need to make most efficient use of frequencies in the MSS allocations,

recognizing

that, as a means to ensure that the frequency bands allocated to the MSS can be used in an efficient manner, there is an urgent demand for:

- a) criteria to be established by ITU-R to be used in determining the need to coordinate between mobile-satellite systems; and
- b) detailed methods of interference calculation to be used by administrations in the coordination process;

c) ITU-R studies which should not impede the timely deployment of any MSS systems,
resolves to invite ITU-R

1 to continue its studies on this subject and develop, as a matter of urgency, criteria for determining the need to coordinate and calculation methods for determining levels of interference, as well as the required protection ratios between MSS networks;

2 to study, as a matter of urgency, the use of technically and operationally feasible techniques to allow for improvements in spectrum efficiency in MSS systems,

further resolves

1 that ITU-R studies should be focused on the technical and operational characteristics of systems using spread-spectrum multiple-access techniques that can allow co-frequency, co-coverage, codirectional sharing but which involve cooperation among systems' operators to maximize the efficient use of spectrum by multiple MSS systems using such access techniques;

2 that administrations responsible for the introduction of mobile-satellite systems are urged to implement, as practicable, the latest available technologies to improve spectrum efficiency consistent with the requirement to offer viable MSS services;

3 to recommend that administrations be encouraged to use the most advanced technology available when preparing to implement their global MSS systems in the 1-3 GHz range so that they may operate, if necessary, in different frequency bands in different regions, in accordance with the MSS allocations in the 1-3 GHz range decided by WRC-97.

MOD

RESOLUTION 222 (REV.WRC-12)

**Use of the frequency bands 1 525-1 559 MHz and 1 626.5-1 660.5 MHz
by the mobile-satellite service, and procedures to ensure long-term
spectrum access for the aeronautical mobile-satellite (R) service**

The World Radiocommunication Conference (Geneva, 2012),

considering

- a) that prior to WRC-97, the frequency bands 1 530-1 544 MHz (space-to-Earth) and 1 626.5-1 645.5 MHz (Earth-to-space) were allocated to the maritime mobile-satellite service and the frequency bands 1 545-1 555 MHz (space-to-Earth) and 1 646.5-1 656.5 MHz (Earth-to-space) were allocated on an exclusive basis to the aeronautical mobile-satellite (R) service (AMS(R)S) in most countries;
- b) that WRC-97 allocated the frequency bands 1 525-1 559 MHz (space-to-Earth) and 1 626.5-1 660.5 MHz (Earth-to-space) to the mobile-satellite service (MSS) to facilitate the assignment of spectrum to multiple MSS systems in a flexible and efficient manner;
- c) that WRC-97 adopted No. **5.353A** giving priority to accommodating spectrum requirements for, and protecting from unacceptable interference, distress, urgency and safety communications of the global maritime distress and safety system (GMDSS) in the frequency bands 1 530-1 544 MHz and 1 626.5-1 645.5 MHz and No. **5.357A** giving priority to accommodating spectrum requirements for, and protecting from unacceptable interference, AMS(R)S communications as defined within priority categories 1 to 6 in Article **44** for the frequency bands 1 545-1 555 MHz and 1 646.5-1 656.5 MHz;
- d) that AMS(R)S systems are an essential element of the International Civil Aviation Organization (ICAO) standardized communication infrastructure used in air traffic management for the provision of safety and regularity of flight in civil aviation;
- e) that currently some MSS systems provide distress, emergency and safety communications under the MSS allocations in the frequency bands 1 525-1 559 MHz (space-to-Earth) and 1 626.5-1 660.5 MHz (Earth-to-space);
- f) that it is necessary to ensure the long-term availability of the spectrum for AMS(R)S;
- g) that it is necessary to retain unchanged the generic allocation for the MSS in the frequency bands 1 525-1 559 MHz and 1 626.5-1 660.5 MHz without placing undue constraints on the existing systems operating in accordance with the Radio Regulations,

further considering

- a) that frequency coordination between satellite networks is required on a bilateral basis in accordance with the Radio Regulations, and that, in the frequency bands 1 525-1 559 MHz (space-to-Earth) and 1 626.5-1 660.5 MHz (Earth-to-space), frequency coordination is partially assisted by regional multilateral meetings;
- b) that, in these frequency bands, geostationary mobile-satellite system operators currently use a capacity-planning approach at frequency coordination meetings, with the guidance and support of their administrations, to periodically coordinate access to the spectrum needed to accommodate their requirements;
- c) that spectrum requirements for MSS networks, including the GMDSS and AMS(R)S, are currently accommodated through the capacity-planning approach and that, in the frequency bands to which Nos. **5.353A** or **5.357A** apply, this approach, supplemented, in the case of AMS(R)S, by additional procedures contained in the Annex to this Resolution, may assist in accommodating the long-term spectrum requirements for GMDSS and AMS(R)S;
- d) that Report ITU-R M.2073 has concluded that prioritization and inter-system pre-emption between different mobile-satellite systems is not practical and, without a significant advance in technology, is unlikely to be feasible for technical, operational and economic reasons;
- e) that there is existing and increasing demand for spectrum for AMS(R)S and non-AMS(R)S by several mobile satellite systems in the frequency bands 1 525-1 559 MHz and 1 626.5-1 660.5 MHz, and that the application of this Resolution may impact the provision of services by non-AMS(R)S systems in the MSS;
- f) that according to the ITU-R studies, the long-term AMS(R)S spectrum requirements for communications within priority categories 1 to 6 of Article **44** have been estimated, at the year 2025, to be less than the available 2×10 MHz identified by No. **5.357A**;
- g) that future requirements for GMDSS spectrum may require additional allocations,

recognizing

- a) that Article 40 of the ITU Constitution establishes the priority of telecommunications concerning safety of life;
- b) that ICAO has adopted standards and recommended practices addressing satellite communications with aircraft in accordance with the Convention on International Civil Aviation;
- c) that all air traffic communications as defined in Annex 10 to the Convention on International Civil Aviation fall within priority categories 1 to 6 of Article **44**;
- d) that Table 15-2 of Appendix **15** identifies the frequency bands 1 530-1 544 MHz (space-to-Earth) and 1 626.5-1 645.5 MHz (Earth-to-space) for distress and safety purposes in the maritime mobile-satellite service as well as for routine non-safety purposes;

e) that any administration having difficulty in applying the procedures of Articles 9 and 11 with respect to No. 5.357A and this Resolution may at any time request assistance from the Radiocommunication Bureau and the Board under the relevant provisions of the Radio Regulations, including Article 7, the relevant provisions of Articles 9 and 11, as well as Articles 13 and 14;

f) that ICAO has knowledge of aviation communication requirements,

noting

that, since spectrum resources are limited, there is a need to use them in the most efficient manner within and amongst various MSS systems, including GMDSS and AMS(R)S,

resolves

1 that, in frequency coordination of MSS networks in the frequency bands 1 525-1 559 MHz and 1 626.5-1 660.5 MHz, the notifying administrations of mobile-satellite networks shall ensure that the spectrum needed for distress, urgency and safety communications of GMDSS, as elaborated in Articles 32 and 33, in the frequency bands where No. 5.353A applies, and for the AMS(R)S communications within priority categories 1 to 6 of Article 44 in the frequency bands where No. 5.357A applies, is accommodated;

2 that notifying administrations of mobile-satellite networks shall ensure the use of the latest technical advances in their mobile-satellite systems, in order to achieve the most flexible, efficient and practical use of the generic allocations;

3 that the notifying administrations of mobile-satellite networks shall ensure that, in the event that the spectrum requirements of MSS, including AMS(R)S, networks are decreasing relative to the previous frequency coordination meeting, the corresponding unused spectrum resources shall be released to facilitate efficient use of spectrum;

4 that the notifying administrations of mobile-satellite networks shall ensure that MSS operators carrying non-safety-related traffic yield capacity, as and when necessary, to accommodate the spectrum requirements for distress, urgency and safety communication of GMDSS communications, as elaborated in Articles 32 and 33, and for AMS(R)S communications within priority categories 1 to 6 of Article 44; this could be achieved in advance through the coordination process in *resolves* 1, and in the case of AMS(R)S the procedures contained in the Annex to this Resolution shall apply,

invites

1 administrations, if they so desire, to have their AMS(R)S traffic requirements submitted to ICAO before the frequency coordination meeting;

2 ICAO to evaluate and, as appropriate, comment on the AMS(R)S traffic requirements received from individual administrations, on the basis of the known global and regional aviation traffic requirements, including the time-scale of regional and global communication requirements,

instructs the Secretary-General

to bring this Resolution to the attention of ICAO.

ANNEX TO RESOLUTION 222 (REV.WRC-12)

**Procedures to implement No. 5.357A and
Resolution 222 (REV.WRC-12)**

1 The notifying administrations of planned MSS, including AMS(R)S, networks shall submit to the Radiocommunication Bureau (BR) the required technical characteristics and other relevant information of their MSS networks in accordance with Appendix 4. Coordination of these MSS networks with other affected satellite networks operating in the frequency bands 1 525-1 559 MHz and 1 626.5-1 660.5 MHz shall proceed in accordance with Articles 9 and 11 and other relevant provisions of the Radio Regulations, as appropriate.

2 To further facilitate coordination under Articles 9 and 11, the notifying administrations of MSS, including AMS(R)S, networks may authorize their respective MSS satellite operators, including AMS(R)S satellite operators, to enter into bilateral and multilateral coordination processes to obtain operator agreements on access to spectrum for their satellite networks.

3 At frequency coordination meetings, including operator meetings as referred to in 2 above, the notifying administration of each AMS(R)S network claiming priority under No. 5.357A, or its respective satellite operator, shall present the spectrum requirements of each AMS(R)S network translated from their traffic requirements in accordance with an agreed methodology until such time as an ITU-R Recommendation is available pursuant to Resolution 422 (WRC-12) and accompanied with the information justifying such requirements.

The participants to the frequency coordination meeting then collectively validate the requirements.

The notifying administrations or their authorized MSS operators shall accommodate validated AMS(R)S spectrum requirements in accordance with No. 5.357A without placing undue constraints on the existing systems operating in accordance with the Radio Regulations.

4 The notifying administrations of MSS networks, including AMS(R)S, have responsibility to ensure that their respective assignments are compatible in the relevant bilateral or multilateral frequency coordination meetings (in particular when those networks span various geographic area(s)).

5 The notifying administrations shall inform BR about the total amount of spectrum assigned to AMS(R)S systems after each coordination meeting where the total AMS(R)S assignments are affected.

6 If a notifying AMS(R)S administration is of the opinion that its spectrum requirements have not been met in the frequency coordination process as per No. 5.357A, the notifying administration may notify the Director of BR of this and request that a Reassessment Meeting be called.

7 If the Bureau receives an announcement from an administration that their AMS(R)S spectrum requirements have not been met, the Director of the Bureau shall invite the notifying administrations of mobile-satellite networks involved in step 2 for a Reassessment Meeting to be held normally within three months. The Reassessment Meeting shall limit its task to consideration of the application of No. **5.357A** and shall not enter into specific coordination activities for the modification of the assignments to individual operators. The Reassessment Meeting shall be attended by the notifying administrations. These administrations may decide to invite other parties or BR in an advisory role if agreed by all notifying administrations.

8 If the Reassessment Meeting concludes that the AMS(R)S spectrum requirements of the concerned system have not been met, the Reassessment Meeting may call for an additional specific frequency coordination meeting of the notifying administrations of mobile-satellite networks involved in step 2 and their representative MSS operators, which is requested to adapt the coordination agreement, taking due account of the advice of the Reassessment Meeting. This frequency coordination meeting should take place as soon as possible and preferably immediately following the Reassessment Meeting.

9 At the conclusion of the Reassessment Meeting, a report containing information about the issue discussed and the conclusions shall be prepared by the participating notifying administrations and submitted to BR for publication.

10 If the matter remains unresolved at the administrations' frequency coordination meeting referred to in 8 above, the notifying AMS(R)S administration shall seek the assistance of the Radiocommunication Bureau pursuant to Articles **7** and **13** and notify the respective administrations indicating that its AMS(R)S requirements have not been satisfied. The Radiocommunication Bureau shall provide a report and assistance in accordance with No. **13.3**.

11 If the matter remains unresolved after the Bureau has communicated its conclusions to the notifying AMS(R)S administration involved, the notifying AMS(R)S administration may request a review of the decision of the Bureau in accordance with Article **14**.

MOD

RESOLUTION 223 (REV.WRC-12)

Additional frequency bands identified for IMT

The World Radiocommunication Conference (Geneva, 2012),

considering

- a) that International Mobile Telecommunications (IMT), including IMT-2000 and IMT-Advanced, is the ITU vision of global mobile access;
- b) that IMT systems provide telecommunication services on a worldwide scale regardless of location, network or terminal used;
- c) that IMT provides access to a wide range of telecommunication services supported by fixed telecommunication networks (e.g. PSTN/ISDN, high bit rate Internet access), and to other services which are specific to mobile users;
- d) that the technical characteristics of IMT are specified in ITU-R and ITU-T Recommendations, including Recommendations ITU-R M.1457 and ITU-R M.2012, which contain the detailed specifications of the terrestrial radio interfaces of IMT;
- e) that the evolution of IMT is being studied within ITU-R;
- f) that the review of IMT-2000 spectrum requirements at WRC-2000 concentrated on the bands below 3 GHz;
- g) that at WARC-92, 230 MHz of spectrum was identified for IMT-2000 in the bands 1 885-2 025 MHz and 2 110-2 200 MHz, including the bands 1 980-2 010 MHz and 2 170-2 200 MHz for the satellite component of IMT-2000, in No. **5.388** and under the provisions of Resolution **212 (Rev.WRC-07)**;
- h) that since WARC-92 there has been a tremendous growth in mobile communications including an increasing demand for broadband multimedia capability;
- i) that the bands identified for IMT are currently used by mobile systems or applications of other radiocommunication services;
- j) that Recommendation ITU-R M.1308 addresses the evolution of existing mobile communication systems to IMT-2000, and that Recommendation ITU-R M.1645 addresses the evolution of the IMT systems and maps out their future development;
- k) that harmonized worldwide bands for IMT are desirable in order to achieve global roaming and the benefits of economies of scale;
- l) that the bands 1 710-1 885 MHz and 2 500-2 690 MHz are allocated to a variety of services in accordance with the relevant provisions of the Radio Regulations;

- m)* that the band 2 300-2 400 MHz is allocated to the mobile service on a co-primary basis in the three ITU Regions;
- n)* that the band 2 300-2 400 MHz, or portions thereof, is used extensively in a number of administrations by other services including the aeronautical mobile service for telemetry in accordance with the relevant provisions in the Radio Regulations;
- o)* that IMT has already been deployed or is being considered for deployment in some countries in the band 1 710-1 885 MHz, 2 300-2 400 MHz and 2 500-2 690 MHz and equipment is readily available;
- p)* that the bands, or parts of the bands, 1 710-1 885 MHz, 2 300-2 400 MHz and 2 500-2 690 MHz are identified for use by administrations wishing to implement IMT;
- q)* that technological advancement and user needs will promote innovation and accelerate the delivery of advanced communication applications to consumers;
- r)* that changes in technology may lead to the further development of communication applications, including IMT;
- s)* that timely availability of spectrum is important to support future applications;
- t)* that IMT systems are envisaged to provide increased peak data rates and capacity that may require a larger bandwidth;
- u)* that ITU-R studies forecasted that additional spectrum may be required to support the future services of IMT and to accommodate future user requirements and network deployments,

emphasizing

- a)* that flexibility must be afforded to administrations:
 - to determine, at a national level, how much spectrum to make available for IMT from within the identified bands;
 - to develop their own transition plans, if necessary, tailored to meet their specific deployment of existing systems;
 - to have the ability for the identified bands to be used by all services having allocations in those bands;
 - to determine the timing of availability and use of the bands identified for IMT, in order to meet particular user demand and other national considerations;
- b)* that the particular needs of developing countries must be met;
- c)* that Recommendation ITU-R M.819 describes the objectives to be met by IMT-2000 in order to meet the needs of developing countries,

noting

- a) Resolutions **224 (Rev.WRC-12)** and **225 (Rev.WRC-12)**, which also relate to IMT;
- b) that the sharing implications between services sharing the bands identified for IMT in No. **5.384A**, as relevant, will need further study in ITU-R;
- c) that studies regarding the availability of the band 2 300-2 400 MHz for IMT are being conducted in many countries, the results of which could have implications for the use of those bands in those countries;
- d) that, due to differing requirements, not all administrations may need all of the IMT bands identified at WRC-07, or, due to the usage by and investment in existing services, may not be able to implement IMT in all of those bands;
- e) that the spectrum for IMT identified by WRC-07 may not completely satisfy the expected requirements of some administrations;
- f) that currently operating mobile communication systems may evolve to IMT in their existing bands;
- g) that services such as fixed, mobile (second-generation systems), space operations, space research and aeronautical mobile are in operation or planned in the band 1 710-1 885 MHz, or in portions of that band;
- h) that in the band 2 300-2 400 MHz, or portions of that band, there are services such as the fixed, mobile, amateur and radiolocation service which are currently in operation or planned to be in operation in the future;
- i) that services such as broadcasting-satellite, broadcasting-satellite (sound), mobile-satellite (in Region 3) and fixed (including multipoint distribution/communication systems) are in operation or planned in the band 2 500-2 690 MHz, or in portions of that band;
- j) that the identification of several bands for IMT allows administrations to choose the best band or parts of bands for their circumstances;
- k) that ITU-R has identified additional work to address further developments in IMT;
- l) that the IMT terrestrial radio interfaces as defined in Recommendations ITU-R M.1457 and ITU-R M.2012 are expected to evolve within the framework of ITU-R beyond those initially specified, to provide enhanced services and services beyond those envisaged in the initial implementation;
- m) that the identification of a band for IMT does not establish priority in the Radio Regulations and does not preclude the use of the band for any application of the services to which they are allocated;
- n) that the provisions of Nos. **5.317A**, **5.384A** and **5.388** do not prevent administrations from having the choice to implement other technologies in the frequency bands identified for IMT, based on national requirements,

recognizing

that for some administrations the only way of implementing IMT would be spectrum refarming, requiring significant financial investment,

resolves

1 to invite administrations implementing IMT or planning to implement IMT to make available, based on user demand and other national considerations, additional bands or portions of the bands above 1 GHz identified in No. **5.384A** for the terrestrial component of IMT; due consideration should be given to the benefits of harmonized utilization of the spectrum for the terrestrial component of IMT, taking into account the services to which the frequency band is currently allocated;

2 to acknowledge that the differences in the texts of Nos. **5.384A** and **5.388** do not confer differences in regulatory status,

invites ITU-R

1 to study the implications of sharing of IMT with other applications and services in the band 2 300-2 400 MHz and the implementation, sharing and frequency arrangements of IMT in the band 2 300-2 400 MHz;

2 to develop harmonized frequency arrangements for the 2 300-2 400 MHz band for operation of the terrestrial component of IMT, taking into account the results of the sharing studies;

3 to continue its studies on further enhancements of IMT, including the provision of Internet Protocol (IP)-based applications that may require unbalanced radio resources between the mobile and base stations;

4 to continue providing guidance to ensure that IMT can meet the telecommunication needs of the developing countries and rural areas in the context of the studies referred to above;

5 to include these frequency arrangements and the results of these studies in one or more ITU-R Recommendations.

MOD

RESOLUTION 224 (REV.WRC-12)

Frequency bands for the terrestrial component of International Mobile Telecommunications below 1 GHz

The World Radiocommunication Conference (Geneva, 2012),

considering

- a)* that International Mobile Telecommunications (IMT) is the root name, encompassing both IMT-2000 and IMT-Advanced (see Resolution ITU-R 56);
- b)* that IMT systems are intended to provide telecommunication services on a worldwide scale, regardless of location, network or terminal used;
- c)* that parts of the band 806-960 MHz are extensively used in the three Regions by mobile systems;
- d)* that IMT systems have already been deployed in the band 806-960 MHz in some countries of the three Regions;
- e)* that some administrations are planning to use the band 698-862 MHz, or part of that band, for IMT;
- f)* that, as a result of the transition from analogue to digital terrestrial television broadcasting, some countries are planning to make or are making the band 698-862 MHz, or parts of that band, available for applications in the mobile service (including uplinks);
- g)* that the band 450-470 MHz is allocated to the mobile service on a primary basis in the three Regions and that IMT systems have already been deployed in some countries of the three Regions;
- h)* that results of the sharing studies for the band 450-470 MHz are contained in Report ITU-R M.2110;
- i)* that cellular-mobile systems in the three Regions in the bands below 1 GHz operate using various frequency arrangements;
- j)* that, where cost considerations warrant the installation of fewer base stations, such as in rural and/or sparsely populated areas, bands below 1 GHz are generally suitable for implementing mobile systems, including IMT;
- k)* that bands below 1 GHz are important, especially for some developing countries and countries with large areas where economic solutions for low population density areas are necessary;
- l)* that Recommendation ITU-R M.819 describes the objectives to be met by IMT-2000 in order to meet the needs of developing countries, and in order to assist them to “bridge the gap” between their communication capabilities and those of developed countries;
- m)* that Recommendation ITU-R M.1645 also describes the coverage objectives of IMT,

recognizing

- a) that the evolution of cellular-based mobile networks to IMT can be facilitated if they are permitted to evolve within their current frequency bands;
- b) that the band 450-470 MHz and parts of the bands 746-806 MHz and 806-862 MHz are used extensively in many countries by various other terrestrial mobile systems and applications, including public protection and disaster relief radiocommunications (see Resolution **646 (Rev.WRC-12)**);
- c) that there is a need, in many developing countries and countries with large areas of low population density, for the cost-effective implementation of IMT, and that the propagation characteristics of frequency bands below 1 GHz identified in Nos. **5.286AA** and **5.317A** result in larger cells;
- d) that the band 450-470 MHz, or parts of that band, is also allocated to services other than the mobile service;
- e) that the band 460-470 MHz is also allocated to the meteorological-satellite service in accordance with No. **5.290**;
- f) that the frequency band 470-806/862 MHz is allocated to the broadcasting service on a primary basis in all three Regions and used predominantly by this service, and that the GE06 Agreement applies in all Region 1 countries, except Mongolia, and in the Islamic Republic of Iran in Region 3;
- g) that the GE06 Agreement contains provisions for the terrestrial broadcasting service and other primary terrestrial services, a Plan for digital television, and a list of stations of other primary terrestrial services;
- h) that the transition from analogue to digital television is expected to result in situations where the band 470-806/862 MHz will be used extensively for both analogue and digital terrestrial transmission, and the demand for spectrum during the transition period may be even greater than the standalone usage of analogue broadcasting systems;
- i) that the time-frame and transition period for analogue to digital television switchover may not be the same for all countries;
- j) that, after analogue to digital television switchover, some administrations may decide to use all or parts of the band 698-806/862 MHz for other services to which the band is allocated on a primary basis, in particular the mobile service for the implementation of IMT, while in other countries the broadcasting service will continue to operate in that band;
- k) that in the band 470-862 MHz, or parts of that band, there is an allocation on a primary basis for the fixed service;
- l) that, in some countries, the band 698-806/862 MHz is allocated to the mobile service on a primary basis;
- m) that the band 645-862 MHz is allocated on a primary basis to the aeronautical radionavigation service in the countries listed in No. **5.312**;
- n) that the compatibility of the mobile service with the broadcasting, fixed and aeronautical radionavigation services in the band referred to in *recognizing k)* and *m)* will need further study in ITU-R;
- o) that Recommendation ITU-R M.1036 provides frequency arrangements for implementation of the terrestrial component of IMT in the bands identified for IMT in the Radio Regulations;

p) that ITU-R has produced Reports ITU-R M.2241, ITU-R BT.2215 and ITU-R BT.2248 and is still continuing the compatibility studies in relation to this Resolution,

emphasizing

a) that in all administrations terrestrial broadcasting is a vital part of the communication and information infrastructure;

b) that flexibility must be afforded to administrations:

- to determine, at a national level, how much spectrum to make available for IMT from within the identified bands, taking into account current uses of the spectrum and the needs of other applications;
- to develop their own transition plans, if necessary, tailored to meet their specific deployment of existing systems;
- to have the ability for the identified bands to be used by all services having allocations in those bands;
- to determine the timing of availability and use of the bands identified for IMT, in order to meet particular market demand and other national considerations;

c) that the particular needs and national conditions and circumstances of developing countries, including least-developed countries, highly-indebted poor countries with economies in transition, and countries with large territories and territories with a low-subscriber density, must be met;

d) that due consideration should be given to the benefits of harmonized utilization of the spectrum for the terrestrial component of IMT, taking into account the current and planned use of these bands by all services to which these bands are allocated;

e) that the use of frequency bands below 1 GHz for IMT also helps to “bridge the gap” between sparsely-populated areas and densely-populated areas in various countries;

f) that the identification of a band for IMT does not preclude the use of this band by other services or applications to which it is allocated;

g) that the use of the band 470-862 MHz by the broadcasting service and other primary services is also covered by the GE06 Agreement;

h) that the requirements of the different services to which the band is allocated, including the mobile and broadcasting services, need to be taken into account,

resolves

1 that administrations which are implementing or planning to implement IMT consider the use of bands identified for IMT below 1 GHz and the possibility of cellular-based mobile network evolution to IMT, in the frequency band identified in Nos. **5.286AA** and **5.317A**, based on user demand and other considerations;

2 to encourage administrations to take into account the results of the ITU-R studies referred to in *invites ITU-R* below, and any recommended measures when implementing applications/systems in the bands 790-862 MHz in Region 1 and Region 3, in the band 698-806 MHz in Region 2, and in those administrations mentioned in No. **5.313A**;

3 that administrations should take into account the need to protect the existing and future broadcasting stations, both analogue and digital, in the 470-806/862 MHz band, as well as other primary terrestrial services;

4 that administrations planning to implement IMT in the bands mentioned in *resolves 2* shall effect coordination with all neighbouring administrations prior to implementation;

5 that in Region 1 (excluding Mongolia) and in the Islamic Republic of Iran the implementation of stations in the mobile service shall be subject to the applications of procedures contained in the GE06 Agreement. In so doing:

a) administrations which deploy stations in the mobile service for which coordination was not required, or without having obtained the prior consent of those administrations that may be affected, shall not cause unacceptable interference to, nor claim protection from, stations of the broadcasting service of administrations operating in conformity with the GE06 Agreement. This should include a signed commitment as required under § 5.2.6 of the GE06 Agreement;

b) administrations which deploy stations in the mobile service for which coordination was not required, or without having obtained the prior consent of those administrations that may be affected, shall not object nor prevent the entry into the GE06 plan or recording in the MIFR of additional future broadcasting allotments or assignments of any other administration in the GE06 Plan with reference to those stations;

6 that, in Region 2, implementation of IMT shall be subject to the decision of each administration on the transition from analogue to digital television,

invites ITU-R

1 to continue to study the potential use of the band 790-862 MHz in Region 1 and Region 3, the band 698-806 MHz in Region 2 and in those administrations mentioned in No. **5.313A** in Region 3 by new mobile and broadcasting applications, including the impact on the GE06 Agreement, where applicable as indicated in *recognizing f)*, and to develop ITU-R Recommendations on how to protect the services to which these bands are allocated, including the broadcasting service and in particular the GE06 Plan, as updated, and its future developments;

2 in the frequency bands mentioned in *invites ITU-R 1*, to study compatibility between mobile systems with different technical characteristics and provide guidance on any impact the new considerations may have on spectrum arrangements;

3 to include the results of the studies referred to in *invites ITU-R 2*, and in particular harmonization measures for IMT, in one or more ITU-R Recommendations by 2015,

invites the Director of the Telecommunication Development Sector

to draw the attention of the Telecommunication Development Sector to this Resolution.

MOD

RESOLUTION 225 (REV.WRC-12)

Use of additional frequency bands for the satellite component of IMT

The World Radiocommunication Conference (Geneva, 2012),

considering

a) that the bands 1 980-2 010 MHz and 2 170-2 200 MHz are identified for use by the satellite component of International Mobile Telecommunications (IMT) through No. **5.388** and Resolution **212 (Rev.WRC-07)**;

b) Resolutions **212 (Rev.WRC-07)**, **223 (Rev.WRC-12)** and **224 (Rev.WRC-12)** on the implementation of the terrestrial and satellite components of IMT;

c) that the bands 1 518-1 544 MHz, 1 545-1 559 MHz, 1 610-1 626.5 MHz, 1 626.5-1 645.5 MHz, 1 646.5-1 660.5 MHz, 1 668-1 675 MHz and 2 483.5-2 500 MHz are allocated on a co-primary basis to the mobile-satellite service and other services in accordance with the Radio Regulations;

d) that, in Region 3, the bands 2 500-2 520 MHz and 2 670-2 690 MHz are allocated on a co-primary basis to the mobile-satellite service and other services in accordance with the Radio Regulations;

e) that distress, urgency and safety communications of the Global Maritime Distress and Safety System and the aeronautical mobile-satellite (R) service have priority over all other mobile-satellite service communications in accordance with Nos. **5.353A** and **5.357A**,

recognizing

a) that services such as broadcasting-satellite, broadcasting-satellite (sound), mobile-satellite, fixed (including point-to-multipoint distribution/communication systems) and mobile are in operation or planned in the band 2 500-2 690 MHz, or in portions of that band;

b) that other services such as the mobile service, the radio astronomy service and radiodetermination-satellite service are in operation or planned, in accordance with the Table of Frequency Allocations, in the bands 1 518-1 559/1 626.5-1 660.5 MHz, 1 610-1 626.5/2 483.5-2 500 MHz and 1 668-1 670 MHz, or in portions of those bands, and that those bands, or portions thereof, are intensively used in some countries by applications other than the IMT satellite component, and the sharing studies within ITU-R are not finished;

c) that studies of potential sharing and coordination between the satellite component of IMT and the terrestrial component of IMT, mobile-satellite service applications and other high-density applications in other services such as point-to-multipoint communication/distribution systems in the bands 2 500-2 520 MHz and 2 670-2 690 MHz bands are not finished;

d) that the bands 2 520-2 535 MHz and 2 655-2 670 MHz are allocated to the mobile-satellite, except aeronautical mobile-satellite, service for operation limited to within national boundaries pursuant to Nos. **5.403** and **5.420**;

e) Resolution ITU-R 47 on studies under way on satellite radio transmission technologies for IMT,

resolves

1 that, in addition to the frequency bands indicated in *considering a)* and *resolves 2*, the frequency bands 1 518-1 544 MHz, 1 545-1 559 MHz, 1 610-1 626.5 MHz, 1 626.5-1 645.5 MHz, 1 646.5-1 660.5 MHz, 1 668-1 675 MHz and 2 483.5-2 500 MHz may be used by administrations wishing to implement the satellite component of IMT, subject to the regulatory provisions related to the mobile-satellite service in these frequency bands;

2 that the bands 2 500-2 520 MHz and 2 670-2 690 MHz as identified for IMT in No. **5.384A** and allocated to the mobile-satellite service in Region 3 may be used by administrations in that Region wishing to implement the satellite component of IMT; however, depending on user demand, it may be possible in the longer term that the administrations decide to use these bands for the terrestrial component of IMT (see the Preamble of the ITU Constitution);

3 that this identification of frequency bands for the satellite component of IMT does not preclude the use of these bands by any applications of the services to which they are allocated and does not establish priority in the Radio Regulations,

invites ITU-R

1 to study the sharing and coordination issues in the above bands related to use of the mobile-satellite service allocations for the satellite component of IMT and the use of this spectrum by the other allocated services, including the radiodetermination-satellite service;

2 to report the results of these studies to a future world radiocommunication conference,

invites the Director of the Telecommunication Development Bureau

to draw the attention of the Telecommunication Development Sector to this Resolution.

MOD

RESOLUTION 229 (REV.WRC-12)

**Use of the bands 5 150-5 250 MHz, 5 250-5 350 MHz and 5 470-5 725 MHz
by the mobile service for the implementation of wireless access systems
including radio local area networks**

The World Radiocommunication Conference (Geneva, 2012),

considering

- a) that WRC-03 allocated the bands 5 150-5 350 MHz and 5 470-5 725 MHz on a primary basis to the mobile service for the implementation of wireless access systems (WAS), including radio local area networks (RLANs);
- b) that WRC-03 decided to make an additional primary allocation for the Earth exploration-satellite service (EESS) (active) in the band 5 460-5 570 MHz and space research service (SRS) (active) in the band 5 350-5 570 MHz;
- c) that WRC-03 decided to upgrade the radiolocation service to a primary status in the 5 350-5 650 MHz band;
- d) that the band 5 150-5 250 MHz is allocated worldwide on a primary basis to the fixed-satellite service (FSS) (Earth-to-space), this allocation being limited to feeder links of non-geostationary-satellite systems in the mobile-satellite service (No. **5.447A**);
- e) that the band 5 150-5 250 MHz is also allocated to the mobile service, on a primary basis, in some countries (No. **5.447**) subject to agreement obtained under No. **9.21**;
- f) that the band 5 250-5 460 MHz is allocated to the EESS (active) and the band 5 250-5 350 MHz to the SRS (active) on a primary basis;
- g) that the band 5 250-5 725 MHz is allocated on a primary basis to the radiodetermination service;
- h) that there is a need to protect the existing primary services in the 5 150-5 350 MHz and 5 470-5 725 MHz bands;
- i) that results of studies in ITU-R indicate that sharing in the band 5 150-5 250 MHz between WAS, including RLANs, and the FSS is feasible under specified conditions;
- j) that studies have shown that sharing between the radiodetermination and mobile services in the bands 5 250-5 350 MHz and 5 470-5 725 MHz is only possible with the application of mitigation techniques such as dynamic frequency selection;
- k) that there is a need to specify an appropriate e.i.r.p. limit and, where necessary, operational restrictions for WAS, including RLANs, in the mobile service in the bands 5 250-5 350 MHz and 5 470-5 570 MHz in order to protect systems in the EESS (active) and SRS (active);

l) that the deployment density of WAS, including RLANs, will depend on a number of factors including intrasystem interference and the availability of other competing technologies and services,

further considering

a) that the interference from a single WAS, including RLANs, complying with the operational restrictions under *resolves* 2 will not on its own cause any unacceptable interference to FSS receivers on board satellites in the band 5 150-5 250 MHz;

b) that such FSS satellite receivers may experience an unacceptable effect due to the aggregate interference from these WAS, including RLANs, especially in the case of a prolific growth in the number of these systems;

c) that the aggregate effect on FSS satellite receivers will be due to the global deployment of WAS, including RLANs, and it may not be possible for administrations to determine the location of the source of the interference and the number of WAS, including RLANs, in operation simultaneously,

noting

a) that, prior to WRC-03, a number of administrations have developed regulations to permit indoor and outdoor WAS, including RLANs, to operate in the various bands under consideration in this Resolution;

b) that, in response to Resolution **229 (WRC-03)**, ITU-R developed Report ITU-R M.2115, which provides testing procedures for implementation of dynamic frequency selection,

recognizing

a) that in the band 5 600-5 650 MHz, ground-based meteorological radars are extensively deployed and support critical national weather services, according to footnote No. **5.452**;

b) that the means to measure or calculate the aggregate pfd level at FSS satellite receivers specified in Recommendation ITU-R S.1426 are currently under study;

c) that certain parameters contained in Recommendation ITU-R M.1454 related to the calculation of the number of RLANs tolerable by FSS satellite receivers operating in the band 5 150-5 250 MHz require further study;

d) that the performance and interference criteria of spaceborne active sensors in the EESS (active) are given in Recommendation ITU-R RS.1166;

e) that a mitigation technique to protect radiodetermination systems is given in Recommendation ITU-R M.1652;

f) that an aggregate pfd level has been developed in Recommendation ITU-R S.1426 for the protection of FSS satellite receivers in the 5 150-5 250 MHz band;

g) that Recommendation ITU-R RS.1632 identifies a suitable set of constraints for WAS, including RLANs, in order to protect the EESS (active) in the 5 250-5 350 MHz band;

h) that Recommendation ITU-R M.1653 identifies the conditions for sharing between WAS, including RLANs, and the EESS (active) in the 5 470-5 570 MHz band;

- i) that the stations in the mobile service should also be designed to provide, on average, a near-uniform spread of the loading of the spectrum used by stations across the band or bands in use to improve sharing with satellite services;
- j) that WAS, including RLANs, provide effective broadband solutions;
- k) that there is a need for administrations to ensure that WAS, including RLANs, meet the required mitigation techniques, for example, through equipment or standards compliance procedures,

resolves

1 that the use of these bands by the mobile service will be for the implementation of WAS, including RLANs, as described in the most recent version of Recommendation ITU-R M.1450;

2 that in the band 5 150-5 250 MHz, stations in the mobile service shall be restricted to indoor use with a maximum mean e.i.r.p.¹ of 200 mW and a maximum mean e.i.r.p. density of 10 mW/MHz in any 1 MHz band or equivalently 0.25 mW/25 kHz in any 25 kHz band;

3 that administrations may monitor whether the aggregate pfd levels given in Recommendation ITU-R S.1426² have been, or will be exceeded in the future, in order to enable a future competent conference to take appropriate action;

4 that in the band 5 250-5 350 MHz, stations in the mobile service shall be limited to a maximum mean e.i.r.p. of 200 mW and a maximum mean e.i.r.p. density of 10 mW/MHz in any 1 MHz band. Administrations are requested to take appropriate measures that will result in the predominant number of stations in the mobile service being operated in an indoor environment. Furthermore, stations in the mobile service that are permitted to be used either indoors or outdoors may operate up to a maximum mean e.i.r.p. of 1 W and a maximum mean e.i.r.p. density of 50 mW/MHz in any 1 MHz band, and, when operating above a mean e.i.r.p. of 200 mW, these stations shall comply with the following e.i.r.p. elevation angle mask where θ is the angle above the local horizontal plane (of the Earth):

-13 dB(W/MHz)	for $0^\circ \leq \theta < 8^\circ$
-13 - 0.716($\theta - 8$) dB(W/MHz)	for $8^\circ \leq \theta < 40^\circ$
-35.9 - 1.22($\theta - 40$) dB(W/MHz)	for $40^\circ \leq \theta \leq 45^\circ$
-42 dB(W/MHz)	for $45^\circ < \theta$;

5 that administrations may exercise some flexibility in adopting other mitigation techniques, provided that they develop national regulations to meet their obligations to achieve an equivalent level of protection to the EESS (active) and the SRS (active) based on their system characteristics and interference criteria as stated in Recommendation ITU-R RS.1632;

¹ In the context of this Resolution, "mean e.i.r.p." refers to the e.i.r.p. during the transmission burst which corresponds to the highest power, if power control is implemented.

² $-124 - 20 \log_{10}(h_{SAT}/1\,414)$ dB(W/(m² · 1 MHz)), or equivalently, $-140 - 20 \log_{10}(h_{SAT}/1\,414)$ dB(W/(m² · 25 kHz)), at the FSS satellite orbit, where h_{SAT} is the altitude of the satellite (km).

6 that in the band 5 470-5 725 MHz, stations in the mobile service shall be restricted to a maximum transmitter power of 250 mW³ with a maximum mean e.i.r.p. of 1 W and a maximum mean e.i.r.p. density of 50 mW/MHz in any 1 MHz band;

7 that in the bands 5 250-5 350 MHz and 5 470-5 725 MHz, systems in the mobile service shall either employ transmitter power control to provide, on average, a mitigation factor of at least 3 dB on the maximum average output power of the systems, or, if transmitter power control is not in use, then the maximum mean e.i.r.p. shall be reduced by 3 dB;

8 that, in the bands 5 250-5 350 MHz and 5 470-5 725 MHz, the mitigation measures found in Annex 1 to Recommendation ITU-R M.1652-1 shall be implemented by systems in the mobile service to ensure compatible operation with radiodetermination systems,

invites administrations

to adopt appropriate regulation if they intend to permit the operation of stations in the mobile service using the e.i.r.p. elevation angle mask in *resolves* 4, to ensure the equipment is operated in compliance with this mask,

invites ITU-R

1 to continue work on regulatory mechanisms and further mitigation techniques to avoid incompatibilities which may result from aggregate interference into the FSS in the band 5 150-5 250 MHz from a possible prolific growth in the number of WAS, including RLANS;

2 to continue studies on mitigation techniques to provide protection of EECS from stations in the mobile service,

3 to continue studies on suitable test methods and procedures for the implementation of dynamic frequency selection, taking into account practical experience.

³ Administrations with existing regulations prior to WRC-03 may exercise some flexibility in determining transmitter power limits.

ADD

RESOLUTION 232 (WRC-12)

Use of the frequency band 694-790 MHz by the mobile, except aeronautical mobile, service in Region 1 and related studies

The World Radiocommunication Conference (Geneva, 2012),

considering

- a) that IMT systems are intended to provide telecommunication services on a worldwide scale, regardless of location, network or terminal used;
- b) that some administrations are planning to use the band 694-862 MHz, or part of that band, for IMT;
- c) that the frequency band 470-806/862 MHz is allocated to the broadcasting service on a primary basis in all three Regions and used predominantly by this service, and that the GE06 Agreement applies in all Region 1 countries, except Mongolia, and in the Islamic Republic of Iran in Region 3;
- d) that the band 645-862 MHz is allocated on a primary basis to the aeronautical radionavigation service in the countries listed in No. 5.312;
- e) that cellular mobile systems in the three Regions in the bands below 1 GHz operate using various channelling arrangements;
- f) that where cost considerations warrant the installation of fewer base stations, such as in rural and/or sparsely populated areas, bands below 1 GHz are generally suitable for implementing mobile systems including IMT;
- g) that bands below 1 GHz are important, especially for some developing countries and countries with large areas where economic solutions for low population density areas are necessary,

noting

- a) that, as a result of the transition from analogue to digital terrestrial television broadcasting, some countries are planning to make, or are making, the band 694-862 MHz, or parts of that band, available for applications in the mobile service;
- b) that the transition from analogue to digital television shall end on 17 June 2015 at 0001 hours UTC according to Article 12.6 of the GE06 Agreement;
- c) that the transition from analogue to digital television is expected to result in situations where parts or all of the band 470-806/862 MHz will be used extensively for both analogue and digital terrestrial transmissions, and that the demand for spectrum during the transition period may be even greater than the stand-alone usage of analogue broadcasting systems;
- d) that Recommendation ITU-R M.819 describes the objectives to be met by IMT in order to meet the needs of developing countries, and in order to assist them to “bridge the gap” between their communication capabilities and those of developed countries;
- e) that Recommendation ITU-R M.1645 also describes the coverage objectives of IMT;

f) that WRC-12 has approved Resolution **233 (WRC-12)** which includes studies to be carried out by ITU-R in time for WRC-15,

recognizing

a) that there is a need, in many developing countries and countries with large areas of low population density, for the cost-effective implementation of IMT, and that the propagation characteristics of frequency bands below 1 GHz identified in Nos. **5.286AA** and **5.317A** result in larger cells;

b) that some countries also plan to use the band 470-862 MHz for HDTV and other higher definition modes;

c) that in Region 1, in accordance with No. **5.296**, a number of countries have deployments of applications ancillary to broadcasting operating on a secondary basis, which provide tools for the daily content production for the broadcast service;

d) that the GE06 Agreement contains provisions for the terrestrial broadcasting service and other primary terrestrial services, a Plan for digital television, and a list of stations of other primary terrestrial services;

e) that the time-frame and transition period for the analogue to digital television switchover may not be the same for all countries;

f) that there is a need for countries to assess the consequences of a new allocation for the mobile service below 790 MHz on the equitable access to spectrum in the GE06 Plan,

resolves

1 to allocate the frequency band 694-790 MHz in Region 1 to the mobile, except aeronautical mobile, service on a co-primary basis with other services to which this band is allocated on a primary basis and to identify it for IMT;

2 that the allocation in *resolves* 1 is effective immediately after WRC-15;

3 that use of the allocation in *resolves* 1 is subject to agreement obtained under No. **9.21** with respect to the aeronautical radionavigation service in countries listed in No. **5.312**;

4 that the lower edge of the allocation is subject to refinement at WRC-15, taking into account the ITU-R studies referred to in *invites ITU-R* below and the needs of countries in Region 1, in particular developing countries;

5 that WRC-15 will specify the technical and regulatory conditions applicable to the mobile service allocation referred to in *resolves* 1, taking into account the ITU-R studies referred to in *invites ITU-R* below,

invites ITU-R

1 to study the spectrum requirement for the mobile service and for the broadcasting service in this frequency band, in order to determine as early as possible the options for the lower edge referred to in *resolves* 4;

2 to study the channelling arrangements for the mobile service, adapted to the frequency band below 790 MHz, taking into account:

– the existing arrangements in Region 1 in the bands between 790 and 862 MHz and defined in the last version of Recommendation ITU-R M.1036, in order to ensure coexistence with the networks operated in the new allocation and the operational networks in the band 790-862 MHz;

- the desire for harmonization with arrangements across all Regions;
 - the compatibility with other primary services to which the band is allocated, including in adjacent bands;
- 3 to study coexistence between the different channelling arrangements which have been implemented in Region 1 above 790 MHz, as well as the possibility of further harmonization;
- 4 to study the compatibility between the mobile service and other services currently allocated in the frequency band 694-790 MHz and develop ITU-R Recommendations or Reports;
- 5 to study solutions for accommodating applications ancillary to broadcasting requirements;
- 6 to report, in time for WRC-15, the results of these studies,

invites the Director of the Radiocommunication Bureau

to work, in cooperation with the Director of the Telecommunication Development Bureau, to bring assistance to developing countries wishing to implement the new mobile allocation in order to help these administrations to determine the modifications of the Geneva-06 Plan necessary to keep sufficient capacity for broadcasting,

invites administrations

to participate in these studies and to indicate as quickly as possible, in the process of preparation for WRC-15, the spectrum requirement for the mobile service, the broadcasting service and the other services, in order to determine the options for the frequency band to be allocated to the mobile service, as well as the related channelling arrangements.

ADD

RESOLUTION 233 (WRC-12)

**Studies on frequency-related matters on International Mobile
Telecommunications and other terrestrial
mobile broadband applications**

The World Radiocommunication Conference (Geneva, 2012),

considering

- a) that since WRC-07 there has been tremendous growth in the demand for mobile broadband applications with multimedia capabilities;
- b) that International Mobile Telecommunications (IMT) systems have been the main method of delivering wide area mobile broadband applications;
- c) that IMT and other mobile broadband systems contribute to global economic and social development by providing a wide range of multimedia applications, such as mobile telemedicine, teleworking, distance learning and other applications;
- d) that in all countries where IMT systems are deployed there is a continuing significant growth in the number of users of IMT systems and in the quantity and rate of data carried, the latter being driven to a large extent by audiovisual content;
- e) that IMT and other mobile broadband systems could help reduce the digital divide between urban and rural areas, including underserved communities;
- f) that in many developing markets the main delivery mechanism for broadband access is expected to be through mobile devices;
- g) that other radiocommunication systems, such as radio local area networks (RLANs), support a wide range of mobile broadband applications;
- h) that adequate and timely availability of spectrum and supporting regulatory provisions is essential to support future growth of IMT and other mobile broadband systems;
- i) that there is a need to continually take advantage of technological developments in order to increase the efficient use of spectrum and facilitate spectrum access;
- j) that harmonized worldwide bands and harmonized frequency arrangements for IMT and other mobile broadband systems are highly desirable in order to achieve global roaming and the benefits of economies of scale;
- k) that many countries have not yet made available spectrum already identified in the Radio Regulations for IMT, for various reasons, including the use of this spectrum by other systems and services;
- l) that proximity to bands already identified for IMT may lead to reduced complexity in equipment design;
- m) the need to protect existing services when considering frequency bands for possible additional allocations to any service;

n) that frequency-related matters for IMT in certain frequency bands below 6 GHz were studied in preparation for WRC-07, and WRC-07 decided upon technical conditions and regulatory procedures in some of these bands;

o) Report ITU-R M.2109, on sharing studies between IMT-Advanced systems and geostationary-satellite networks in the fixed-satellite service in the 3 400-4 200 and 4 500-4 800 MHz frequency bands;

p) Report ITU-R M.2110, on sharing studies between radiocommunication services and IMT systems operating in the 450-470 MHz band;

q) Report ITU-R M.2111, on sharing studies between IMT-Advanced and the radiolocation service in the 3 400-3 700 MHz bands;

r) Report ITU-R M.2112, on compatibility/sharing of airport surveillance radars and meteorological radar with IMT systems within the 2 700-2 900 MHz band,

noting

a) that Report ITU-R M.2078, on spectrum estimates for IMT, approved in 2006, predicted total spectrum requirements for 2020 to be 1 280 MHz and 1 720 MHz for low and high user demand scenarios, respectively;

b) that Report ITU-R M.2243, approved in 2011, contains an assessment of the global mobile broadband deployments and forecasts for IMT;

c) that IMT encompasses both IMT-2000 and IMT-Advanced collectively, as described in Resolution ITU-R 56;

d) that Resolution ITU-R 57 addresses the principles for the process of development of IMT-Advanced, and Question ITU-R 77-7/5 considers the needs of developing countries in the development and implementation of IMT;

e) that Question ITU-R 229-3/5 seeks to address the further development of IMT;

f) that Recommendations ITU-R M.1457 and ITU-R M.2012 contain detailed specifications of the terrestrial radio interfaces of IMT-2000 and IMT-Advanced, respectively,

recognizing

a) that there is a fairly long lead time between the identification of frequency bands by world radiocommunication conferences and the deployment of systems in those bands, and timely availability of spectrum is therefore important to support the development of IMT and other terrestrial mobile broadband applications;

b) that IMT systems have been in operation since the year 2000;

c) that the need for cost-effective implementation of IMT, particularly in many developing countries and countries with large areas of low population density, and the particular advantages of lower frequency bands for these purposes;

d) that the advantages of the frequency bands below 1 GHz for wide coverage and those above 1 GHz for higher data rates with respect to use of IMT systems are noted in Resolutions **224 (Rev.WRC-12)** and **223 (Rev.WRC-12)**, respectively;

e) the use of relevant parts of the spectrum by other radiocommunication services, many of which involve significant investment in infrastructure or represent significant societal benefit, and the evolving needs of these services,

resolves to invite ITU-R

1 to study additional spectrum requirements, taking into account:

- technical and operational characteristics of IMT systems, including the evolution of IMT through advances in technology and spectrally-efficient techniques, and their deployment;
- the bands currently identified for IMT, the technical conditions of their use, and the possibility of optimizing the use of these bands with a view to increasing spectrum efficiency;
- the evolving needs, including user demand for IMT and other terrestrial mobile broadband applications;
- the needs of developing countries;
- the time-frame in which spectrum would be needed;

2 to study potential candidate frequency bands, taking into account the results of the studies under *resolves to invite ITU-R* 1, protection of existing services and the need for harmonization,

further resolves

1 that the studies referred to in *resolves to invite ITU-R* 2 include sharing and compatibility studies with services already having allocations in the potential candidate bands and in adjacent bands, as appropriate, taking into account the current and planned use of these bands by the existing services, as well as the applicable studies already performed in ITU-R;

2 to invite WRC-15 to consider the results of the above studies and take appropriate actions,

encourages administrations

to submit contributions during the study period on their assessment of the impact on the existing services, based on the studies carried out under this Resolution,

invites administrations

to participate in the studies by submitting contributions to ITU-R.

ADD

RESOLUTION 234 (WRC-12)

**Additional primary allocations to the mobile-satellite service
within the bands from 22 GHz to 26 GHz**

The World Radiocommunication Conference (Geneva, 2012),

considering

a) that ITU-R has studied the spectrum requirements for the satellite component of International Mobile Telecommunications (IMT) for the period 2010-2020, and the results are contained in Report ITU-R M.2077;

b) that the results in Report ITU-R M.2077 indicate a shortfall of spectrum available for the satellite component of IMT in the Earth-to-space direction of between 19 MHz and 90 MHz by the year 2020;

c) that the results in Report ITU-R M.2077 indicate a shortfall of spectrum available for the satellite component of IMT in the space-to-Earth direction of between 144 MHz and 257 MHz by the year 2020;

d) that MSS systems which are not part of the satellite component of IMT may also require additional spectrum,

further considering

a) that ITU-R has also studied the spectrum requirements for MSS broadband applications by the year 2020, and the results are contained in Report ITU-R M.2218;

b) that the results in Report ITU-R M.2218 indicate a shortfall of spectrum for MSS broadband applications of between 240 MHz and 335 MHz by the year 2020 in both the space-to-Earth and Earth-to-space directions,

recognizing

a) that MSS systems implementing the satellite component of IMT and broadband applications require additional spectrum;

b) that no allocations were made for the mobile-satellite service in the range 4-16 GHz at WRC-12, and therefore the shortfall of spectrum for satellite IMT and broadband applications still needs to be addressed,

further recognizing

a) that the bands from 22 GHz to 26 GHz include allocations to other services;

b) that unwanted emissions in the band 23.6-24 GHz (see No. **5.340**) will need to be limited to ensure protection of systems of the EESS (passive), SRS (passive) and radio astronomy services,

resolves to invite ITU-R

to complete, for WRC-15, sharing and compatibility studies towards additional allocations to the mobile-satellite service in the Earth-to-space and space-to-Earth directions, within portions of the bands between 22 GHz and 26 GHz, while ensuring protection of existing services within these bands as well as taking into account No. **5.340** and No. **5.149**,

invites administrations

to participate in the studies by submitting contributions to ITU-R.

MOD**RESOLUTION 331 (REV.WRC-12)****Operation of the Global Maritime Distress and Safety System**

The World Radiocommunication Conference (Geneva, 2012),

noting

that all ships subject to the International Convention for the Safety of Life at Sea (SOLAS), 1974, as amended, are required to be fitted for the Global Maritime Distress and Safety System (GMDSS),

noting further

- a) that a number of administrations have taken steps to implement the GMDSS also for classes of vessels not subject to SOLAS, 1974, as amended;
- b) that an increasing number of vessels not subject to SOLAS, 1974, as amended, are making use of the techniques and frequencies of the GMDSS prescribed in Chapter VII;
- c) that Chapter VII provides for maintaining interoperability between ships fitted for GMDSS and ships not yet fully equipped for GMDSS;
- d) that the International Maritime Organization (IMO) is of the view that SOLAS ships, while at sea, should be required to keep a listening watch on VHF channel 16, for the foreseeable future, with a view to providing:
 - a distress alerting and communication channel for non-SOLAS ships; and
 - bridge-to-bridge communications;
- e) that IMO has urged administrations to require all seagoing vessels under national legislation, and encourage all vessels voluntarily carrying VHF radio equipment to be fitted with facilities for transmitting and receiving distress alerts by digital selective calling (DSC) on VHF channel 70;
- f) that separate provisions in the existing Radio Regulations allow VHF channel 16 and 2 182 kHz to be used for general calling by radiotelephony;
- g) that several administrations have established Vessel Traffic Service (VTS) systems and require their vessels to keep watch on local VTS channels;
- h) that ships that are required by SOLAS to carry a radio station have been equipped with DSC, and many vessels subject to national carriage requirements are also being equipped with DSC, but the majority of vessels that carry a radio station on a voluntary basis might not yet have DSC equipment;
- i) that many administrations have established distress and safety service based on DSC watchkeeping, but the majority of port stations, pilot stations and other operational coast stations might not yet have been equipped with DSC facilities;

j) that ships not required by international agreement to carry GMDSS equipment can do so for safety purposes,

recognizing

a) that stations in the maritime mobile service are increasingly making use of the frequencies and techniques of GMDSS;

b) that there may be a need to maintain existing shore-based distress and safety services for reception of distress, urgency and safety calling by voice on VHF channel 16 for some years after this Conference so that ships whose ability to participate in GMDSS is limited to VHF channel 16 will be able to attract attention and obtain assistance from these services,

resolves

1 to urge all administrations to assist in enhancing safety at sea by:

- encouraging, where appropriate, establishment of shore-based facilities for GMDSS, either on an individual basis or in cooperation with other relevant parties in the area;
- encouraging the implementation of GMDSS techniques and frequencies on non-SOLAS vessels including national ships;
- encouraging all vessels carrying maritime VHF equipment to be fitted with DSC on VHF channel 70 as soon as possible, taking into account the relevant decisions of IMO;
- encouraging vessels to limit their use of VHF channel 16 and the frequency 2 182 kHz for calling to the minimum necessary, noting the provisions of No. **52.239**;

2 that coast stations that form part of shore-based arrangements for reception of distress calling by radiotelephony on VHF channel 16 should maintain an efficient watch on VHF channel 16. Such watch shall be indicated in the List of Coast Stations and Special Service Stations;

3 that administrations may release their coast stations from the listening watch on VHF channel 16 in respect of distress, urgency and safety calling by voice, in accordance with relevant decisions of IMO and ITU on aural watch-keeping requirements on channel 16, taking into account the GMDSS radio systems available in the area concerned;

when doing so, administrations should:

- inform IMO of their decisions and submit to IMO details on the area concerned;
- inform the Secretary-General of the necessary details for inclusion in the List of Coast Stations and Special Service Stations,

resolves further

that the Secretary-General should ensure that such arrangements and details regarding the area concerned be indicated in relevant maritime publications,

invites ITU-R

to monitor the development of and changes to the GMDSS, and to continue to develop techniques and systems relevant for the GMDSS,

instructs the Secretary-General

to bring this Resolution to the attention of IMO, the International Civil Aviation Organization (ICAO) and the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA).

MOD

RESOLUTION 343 (REV.WRC-12)

**Maritime certification for personnel of ship stations and ship earth stations
for which a radio installation is not compulsory**

The World Radiocommunication Conference (Geneva, 2012),

considering

- a)* that WRC-97 considered the question of certification for personnel of ship stations and ship earth stations within the Global Maritime Distress and Safety System (GMDSS);
- b)* that GMDSS was fully implemented on 1 February 1999 by vessels subject to an international agreement;
- c)* that vessels not subject to an international agreement have adopted GMDSS systems and techniques;
- d)* that use of GMDSS equipment should be accompanied by appropriate training and certification;
- e)* that the Radio Regulations stipulate that the service of every ship radio station working on frequencies assigned for international use shall be performed by operators holding a certificate;
- f)* that WRC-07 suppressed Appendix **13** to the Radio Regulations, which specified distress communications and operator's certificates by radiotelephones, and that, in order to incorporate provisions for non-GMDSS certificates, WRC-12 has further modified Article **47**,

noting

that a number of administrations currently issue radio operator certificates specially designed for the non-compulsory sector,

resolves

that administrations wishing to implement special certification for the non-compulsory sector should implement the certificates contained in the Annex to this Resolution,

invites ITU-R

to develop a Recommendation describing these certificates,

instructs the Secretary-General

to bring this Resolution to the attention of the International Maritime Organization (IMO).

ANNEX TO RESOLUTION 343 (REV.WRC-12)

**Examination syllabus for radio operator's certificates appropriate to vessels
using the frequencies and techniques of the Global Maritime Distress and
Safety System on a non-compulsory basis**

Introduction

The introduction of the Global Maritime Distress and Safety System (GMDSS) in February 1992 made it necessary to harmonize the examination requirements for certificates for professional radio operators. Harmonized examination procedures for the general operator's Certificate and restricted operator's Certificate, based on the syllabuses described in Article 47, have already been introduced for maritime radio operators performing radiocommunication duties on board vessels subject to the International Convention for the Safety of Life at Sea (SOLAS), 1974, as amended. The GMDSS was fully implemented on 1 February 1999 for vessels subject to SOLAS, 1974, as amended.

For vessels not subject to SOLAS, 1974, as amended, and which install radiocommunication equipment on a voluntary basis, there are significant advantages to also using the GMDSS. However, it was foreseen by some administrations that such vessels would use some, but not all, of the frequencies and techniques of the GMDSS and that radio personnel on board such vessels would not need the same level of certification as radio personnel on board vessels which use all of the frequencies and techniques of the GMDSS on a compulsory basis. A syllabus has been developed which provides the flexibility for a depth of study, level of knowledge, and length of course appropriate to meet the certification requirements of radio personnel on board vessels which use some of the frequencies and techniques of the GMDSS on a non-compulsory basis. The syllabus also provides for certification in the use of satellite equipment where appropriate.

This Annex describes the syllabus developed to meet the certification requirements referred to above, and which are implemented in a number of countries under the title "Long Range Certificate" and "Short Range Certificate". The Short Range Certificate should at least contain those elements of the syllabus which are relevant to sea area A1.

Examination syllabus

The examination should consist of theoretical and practical tests and should include at least:

A General knowledge of radiocommunications in the maritime mobile service

A.1 The general principles and basic features of the maritime mobile service.

B Detailed practical knowledge and ability to use radio equipment

B.1 The VHF radio installation. Use of VHF equipment in practice.

B.2 The MF/HF radio installation. Use of MF/HF equipment in practice.

B.3 Purpose and use of digital selective calling facilities and techniques.

C Operational procedures of the GMDSS and detailed practical operation of GMDSS subsystems and equipment

- C.1 Basic introduction to GMDSS procedures.
- C.2 Distress, urgency and safety communication procedures in the GMDSS.
- C.3 Distress, urgency and safety communication procedures by radiotelephony in the old distress and safety system.
- C.4 Protection of distress frequencies.
- C.5 Maritime safety information (MSI) systems in the GMDSS.
- C.6 Alerting and locating signals in the GMDSS.
- C.7 Procedures for cancelling an inadvertent false alert transmission.

D Operational procedures and regulations for radiotelephone communications

- D.1 Ability to exchange communications relevant to the safety of life at sea.
- D.2 Regulations, obligatory procedures and practices.
- D.3 Practical and theoretical knowledge of radiotelephone procedures.
- D.4 Use of the international phonetic alphabet and, where appropriate, parts of the IMO Standard Marine Communication Phrases.

E Optional examination module for the maritime mobile-satellite service for vessels not subject to a compulsory fit

- E.1 The general principles and basic features of the maritime mobile-satellite service.
- E.2 Operational procedures and detailed practical operation of ship earth stations in the GMDSS.

MOD**RESOLUTION 344 (REV.WRC-12)****Management of the maritime identity numbering resource**

The World Radiocommunication Conference (Geneva, 2012),

noting

- a)* that the installation of digital selective calling equipment or Inmarsat B, C or M ship earth station equipment on ships participating in the Global Maritime Distress and Safety System (GMDSS) on a mandatory or voluntary basis requires the assignment of a unique nine-digit maritime mobile service identity (MMSI);
- b)* that such equipment offers the possibility to connect with public telecommunication networks;
- c)* that only mobile-satellite systems have been able to resolve the various billing, routing, charging and signalling requirements needed to provide full two-way automatic connectivity between ships and the international public correspondence service;
- d)* that ships using the present generation of mobile-satellite ship earth stations have to be assigned an MMSI ending with three trailing zeros in order to support automatic access to public telecommunication networks through a diallable ship telephone number whose format is compliant with ITU-T Recommendation E.164 but can only accommodate the first six digits of the MMSI;
- e)* that the automatic identification system (AIS) and its related systems require MMSI or other maritime identities;
- f)* that radios capable of digital selective calling and intended to be used on non-SOLAS ships, require maritime identities;
- g)* that the first three digits of a ship station MMSI form the maritime identification digits (MID), which denote the ship's administration,

considering

- a)* that digital selective calling distress alerts require valid identities recognizable by search and rescue authorities in order to ensure a timely response;
- b)* that AIS and its related systems require valid identities recognizable by other ships and authorities for safety of navigation and search and rescue operations;
- c)* that Recommendation ITU-R M.585 contains guidance for the assignment and use of maritime identities, such as MMSIs and other maritime identities,

recognizing

- a) that even domestic ships which install the present generation of ship earth stations operating to Inmarsat B, C or M standards will require the assignment of MMSI numbers from those numbers originally intended for ships communicating worldwide, further depleting the resource;
- b) that future generations of mobile-satellite systems offering access to public telecommunication networks and participating in the GMDSS will employ a free-form numbering system that need not include any part of the MMSI;
- c) that future growth of AIS and its related systems will require further resources of MMSI and other maritime identities,

noting further

- a) that ITU-R is solely responsible for managing the MMSI and MID numbering resources;
- b) that ITU-R can monitor the status of the MMSI resource, through regular reviews of the spare capacity available within the MIDs already in use, and the availability of spare MIDs, taking account of regional variations,

resolves to instruct the Director of the Radiocommunication Bureau

1 to manage the allotment and distribution of the MID resource within the MMSI and other maritime identity numbering formats, taking into account:

- Sections II, V and VI of Article 19;
- regional variations in MMSI use;
- spare capacity within the MID resource; and
- the assignment, management and conservation of maritime identities contained in the most recent version of Recommendation ITU-R M.585, in particular as regards the reuse of MMSIs;

2 to report to each world radiocommunication conference on the use and status of the MMSI resource, noting in particular the anticipated reserve capacity and any indications of rapid exhaustion of the resource,

invites ITU-R

to keep under review the Recommendations for assigning MMSIs and other maritime identities, with a view to:

- improving the management of the MID, MMSI and other maritime identity resources; and
- identifying alternative resources if there is an indication of rapid exhaustion of these resources,

instructs the Secretary-General

to communicate this Resolution to the International Maritime Organization.

MOD

RESOLUTION 349 (REV.WRC-12)

**Operational procedures for cancelling false distress alerts in
the Global Maritime Distress and Safety System**

The World Radiocommunication Conference (Geneva, 2012),

considering

- a) that the 1974 International Convention for the Safety of Life at Sea (SOLAS), as amended, prescribes that ships subject to that Convention shall be fitted with Global Maritime Distress and Safety System (GMDSS) equipment as appropriate;
- b) that non-SOLAS vessels are also being equipped with GMDSS equipment;
- c) that the transmission and relay of false distress alerts is a significant problem within the GMDSS,

noting

that the International Maritime Organization (IMO) has developed similar operational procedures to cancel false distress alerts,

resolves

- 1 to urge administrations to take all necessary measures to avoid false distress alerts and to minimize the unnecessary burden on rescue organizations which occurs;
- 2 to urge administrations to encourage the correct use of GMDSS equipment, with particular attention to appropriate training;
- 3 to urge administrations to implement the operational procedures contained in the Annex to this Resolution;
- 4 that administrations should take any consequential appropriate action in this respect,

instructs the Secretary-General

to bring this Resolution to the attention of IMO.

ANNEX TO RESOLUTION 349 (REV.WRC-12)

Cancelling of false distress alerts

If a distress alert is inadvertently transmitted, the following steps shall be taken to cancel the distress alert.

1 VHF digital selective calling

- 1) Reset the equipment immediately;
- 2) If the DSC equipment is capable of cancellation, cancel the alert in accordance with the most recent version of Recommendation ITU-R M.493;
- 3) Set to channel 16; and
- 4) Transmit a broadcast message to “All Stations” giving the ship’s name, call sign and maritime mobile service identity (MMSI), and cancel the false distress alert.

2 MF digital selective calling

- 1) Reset the equipment immediately;
- 2) If the DSC equipment is capable of cancellation, cancel the alert in accordance with the most recent version of Recommendation ITU-R M.493;
- 3) Tune for radiotelephony transmission on 2 182 kHz; and
- 4) Transmit a broadcast message to “All Stations” giving the ship’s name, call sign and MMSI, and cancel the false alert.

3 HF digital selective calling

- 1) Reset the equipment immediately;
- 2) If the DSC equipment is capable of cancellation, cancel the alert in accordance with the most recent version of Recommendation ITU-R M.493;
- 3) Tune for radiotelephony on the distress and safety frequency in each band in which a false distress alert was transmitted (see Appendix 15); and
- 4) Transmit a broadcast message to “All Stations” giving the ship’s name, call sign and MMSI, and cancel the false alert on the distress and safety frequency in each band in which the false distress alert was transmitted.

4 Inmarsat ship earth station

Notify the appropriate rescue coordination centre that the alert is cancelled by sending a distress priority message by way of the same coast earth station through which the false distress alert was sent. Provide ship name, call sign and Inmarsat identity with the cancelled alert message.

5 Emergency position indicating radiobeacon (EPIRB)

If for any reason an EPIRB is activated inadvertently, immediately stop the inadvertent transmission and contact the appropriate rescue coordination centre through a coast station or land earth station and cancel the distress alert.

6 General

Notwithstanding the above, ships may use additional appropriate means available to them to inform the appropriate authorities that a false distress alert has been transmitted and should be cancelled.

ADD

RESOLUTION 358 (WRC-12)

Consideration of improvement and expansion of on-board communication stations in the maritime mobile service in the UHF bands

The World Radiocommunication Conference (Geneva, 2012),

considering

- a) that only six frequencies, in the bands between 450 and 470 MHz, are currently identified in No. **5.287** for on-board communication stations;
- b) that the technical characteristics of equipment used for on-board communications are identified in Recommendation ITU-R M.1174,

recognizing

- a) that on-board communication stations are intended for use for internal communications on board a ship, or between a ship and its lifeboats and life-rafts during lifeboat drills or operations, or for communication within a group of vessels being towed or pushed, as well as for line handling and mooring instructions;
- b) that on board many ships the existing channels are congested to the extent that ship and port operations are impacted by cross transmissions;
- c) that it is important that the services to which the frequency band is currently allocated need to be protected,

noting

that No. **5.286AA** identifies the frequency band 450-470 MHz for use by administrations wishing to implement International Mobile Telecommunications (IMT),

resolves to invite WRC-15

to consider, based on the results of ITU-R studies, the need to possibly identify additional UHF channels within the bands already allocated to the maritime mobile service for on-board communication stations,

invites ITU-R

to conduct, in time for WRC-15, studies to determine the spectrum requirements and potential frequency bands for on-board communication stations, taking into account the protection of services to which the frequency band is currently allocated,

invites ITU-R members

to contribute to these studies,

instructs the Secretary-General

to bring this Resolution to the attention of IMO, IEC and CIRM.

ADD

RESOLUTION 359 (WRC-12)

**Consideration of regulatory provisions for modernization of the
Global Maritime Distress and Safety System and
studies related to e-navigation**

The World Radiocommunication Conference (Geneva, 2012),

considering

- a)* that there is a continuing need in the Global Maritime Distress and Safety System (GMDSS), on a global basis, for improved communications to enhance maritime capabilities;
- b)* that the International Maritime Organization (IMO) has initiated work plans for GMDSS modernization;
- c)* that the Automatic Identification System (AIS) offers potential enhancements to VHF maritime safety communications;
- d)* that advanced maritime MF/HF/VHF data systems and satellite communication systems may be used to deliver Maritime Safety Information (MSI) and other GMDSS communications;
- e)* that additional global and regional GMDSS satellite providers may be considered by IMO;
- f)* that IMO is developing a strategy and implementation plan for e-navigation, defined as the harmonized collection, integration, exchange, presentation and analysis of marine information on board and ashore by electronic means to enhance berth-to-berth navigation and related services for safety and security at sea and protection of the marine environment;
- g)* that GMDSS modernization may be influenced by the development of e-navigation,

noting

that WRC-12:

- a)* has reviewed Appendix 17 and Appendix 18 to improve efficiency and introduce bands for new digital technology;
- b)* has reviewed the regulatory provisions and spectrum allocations for use by maritime safety systems for ships and ports,

recognizing

- a)* that advanced maritime communication systems may support the implementation of GMDSS modernization and e-navigation;
- b)* that IMO efforts to implement GMDSS modernization and e-navigation may require a review of the Radio Regulations to accommodate advanced maritime communication systems;

c) that due to the importance of these radio links in ensuring the safe operation of shipping and commerce and security at sea, they must be resilient to interference,

resolves to invite WRC-18

1 to consider possible regulatory actions, including spectrum allocations based on the ITU-R studies, to support GMDSS modernization;

2 to consider possible regulatory actions, including spectrum allocations based on the ITU-R studies, for maritime mobile service supporting e-navigation,

invites ITU-R

to conduct studies, as a matter of urgency, taking into consideration the activities of IMO, in order to determine spectrum requirements to support GMDSS modernization, the implementation of e-navigation and propose possible regulatory actions,

invites

all members of the Radiocommunication Sector, IMO, the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA), the International Electrotechnical Commission (IEC), the International Hydrographic Organization (IHO), the International Organization for Standardization (ISO) and the World Meteorological Organization (WMO) to contribute to these studies,

instructs the Secretary-General

to bring this Resolution to the attention of IMO and other international and regional organizations concerned.

ADD

RESOLUTION 360 (WRC-12)

Consideration of regulatory provisions and spectrum allocations for enhanced Automatic Identification System technology applications and for enhanced maritime radiocommunication

The World Radiocommunication Conference (Geneva, 2012),

considering

- a) that Automatic Identification System (AIS) is a proven maritime data system, with a large number of ships equipped and a supporting terrestrial and satellite infrastructure established;
- b) that AIS is used in the ship movement service for collision avoidance;
- c) that AIS enables the identification of stations using this system;
- d) that AIS provides information about a ship and its cargo;
- e) that AIS provides a means for ships to exchange ship data, including identification, position, course and speed, with other nearby ships and coast stations;
- f) that AIS has the capability for data exchange by application-specific messages for navigation and safety-related purposes;
- g) that, due to capacity concerns, the use of AIS application-specific messages is currently limited;
- h) that AIS use is increasing rapidly, with potential overloading of the current AIS1 and AIS2 (Appendix 18 of the Radio Regulations) frequencies;
- i) that the establishment of the maritime AIS offers potential enhancements to VHF maritime safety communications;
- j) that there is an increasing need, on a global basis, for maritime radiocommunications for enhanced maritime safety,

recognizing

- a) that the implementation of AIS globally offers the ability to improve search and rescue operations;
- b) that the AIS Search and Rescue Transmitter (SART) is identified by the International Maritime Organization (IMO) as an alternative device to the Radar SART;
- c) that AIS is used for channel management of AIS channels and future VHF digital data channels, and for ship-to-shore data exchange;
- d) that additional AIS channels may be required for radiocommunications involving, but not limited to, area warnings and meteorological and hydrographic data, as well as channel management of AIS, future VHF digital data and ship-to-shore data exchange;

- e) that additional channels for AIS may be required for search and rescue;
- f) that due to the importance of AIS in ensuring the safe operation of international shipping and commerce, it should be properly protected from harmful interference;
- g) that studies should be carried out to identify additional spectrum needed for emerging AIS terrestrial and satellite operational requirements;
- h) that, in ensuring the safe operation of international shipping and commerce, additional spectrum for AIS applications should be given priority in the maritime mobile and mobile-satellite services;
- i) that IMO is developing a Polar Code;
- j) that No. **5.353A** and No. **5.357A** and Resolution **222 (Rev.WRC-12)** are outside the scope of this Resolution,

resolves to invite WRC-15

1 to consider, based on the results of ITU-R studies, modifications to the Radio Regulations, including possible spectrum allocations, to enable new AIS terrestrial and satellite applications, while ensuring that these applications will not degrade the current AIS operations and other existing services;

2 to consider, based on the results of ITU-R studies, additional or new applications for maritime radiocommunication within existing maritime mobile and mobile-satellite service allocations, and if necessary to take appropriate regulatory measures,

invites ITU-R

1 to conduct, as a matter of urgency, studies that identify potential regulatory actions to accommodate emerging maritime mobile service and mobile-satellite service AIS requirements;

2 to conduct, as a matter of urgency, studies on additional or new applications for maritime radiocommunication within maritime mobile and mobile-satellite service allocations, and to identify potential regulatory actions to accommodate emerging maritime radiocommunication requirements;

3 to complete studies in time for WRC-15 taking into account existing systems and services that share the bands,

further invites

all members of the Radiocommunication Sector and IMO, the World Meteorological Organization (WMO), the International Hydrographic Organization (IHO), the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA), the International Electrotechnical Commission (IEC) and the International Radio Maritime Committee (CIRM) to contribute to these studies,

instructs the Secretary-General

to bring this Resolution to the attention of IMO, WMO, IHO, IEC, IALA, CIRM and other international and regional organizations concerned.

MOD

RESOLUTION 413 (REV.WRC-12)

Use of the band 108-117.975 MHz by the aeronautical mobile (R) service

The World Radiocommunication Conference (Geneva, 2012),

considering

- a) the current allocation of the frequency band 108-117.975 MHz to the aeronautical radionavigation service (ARNS);
- b) the current requirements of FM broadcasting systems operating in the frequency band 87-108 MHz;
- c) that digital sound broadcasting systems are capable of operating in the frequency band at about 87-108 MHz as described in Recommendation ITU-R BS.1114;
- d) the need for the aeronautical community to provide additional services by enhancing navigation systems through a radiocommunication data link;
- e) the need for the broadcasting community to provide digital terrestrial sound broadcasting services;
- f) that this allocation was made by WRC-07 in the knowledge that studies are ongoing with respect to the technical characteristics, sharing criteria and sharing capabilities;
- g) the need for the aeronautical community to provide additional services for radiocommunications, relating to safety and regularity of flight, in the band 112-117.975 MHz;
- h) that WRC-07 modified the allocation of the band 112-117.975 MHz to the aeronautical mobile (R) service (AM(R)S) in order to make available this frequency band for new AM(R)S systems, and in doing so enabled further technical developments, investments and deployment;
- i) that the frequency band 117.975-137 MHz currently allocated to the AM(R)S is reaching saturation in certain areas of the world;
- j) that this new allocation is intended to support the introduction of applications and concepts in air traffic management which are data intensive, and which could support data links that carry safety-critical aeronautical data;
- k) that additional information is needed about the new technologies which will be used, the amount of spectrum required, the characteristics and sharing capabilities/conditions, and that therefore studies are urgently required on which AM(R)S systems will be used, the amount of spectrum required, the characteristics and the conditions for sharing with ARNS systems,

recognizing

- a) that precedence must be given to the ARNS operating in the frequency band 108-117.975 MHz;
- b) that, in accordance with Annex 10 to the Convention on International Civil Aviation, all aeronautical systems must meet standards and recommended practices (SARPs) requirements;

c) that within ITU-R, compatibility criteria between FM broadcasting systems operating in the frequency band 87-108 MHz and the ARNS operating in the frequency band 108-117.975 MHz already exist, as indicated in the most recent version of Recommendation ITU-R SM.1009;

d) that all compatibility issues between FM broadcasting systems and International Civil Aviation Organization (ICAO) standard ground-based systems for the transmission of radionavigation-satellite differential correction signals have been addressed,

noting

a) that aeronautical systems are converging towards a radiocommunication data link environment to support aeronautical navigation and surveillance functions, which need to be accommodated in existing radio spectrum;

b) that some administrations are planning to introduce digital sound broadcasting systems in the frequency band at about 87-108 MHz;

c) that no compatibility criteria currently exist between FM broadcasting systems operating in the frequency band 87-108 MHz and the planned additional aeronautical systems in the adjacent band 108-117.975 MHz using aircraft transmission;

d) that no compatibility criteria currently exist between digital sound broadcasting systems capable of operating in the frequency band at about 87-108 MHz and aeronautical services in the band 108-117.975 MHz,

resolves

1 that any aeronautical mobile (R) service systems operating in the band 108-117.975 MHz shall not cause harmful interference to, nor claim protection from ARNS systems operating in accordance with international aeronautical standards;

2 that any AM(R)S systems planned to operate in the frequency band 108-117.975 MHz shall, as a minimum, meet the FM broadcasting immunity requirements contained in Annex 10 to the Convention on International Civil Aviation for existing aeronautical radionavigation systems operating in this frequency band;

3 that AM(R)S systems operating in the band 108-117.975 MHz shall place no additional constraints on the broadcasting service or cause harmful interference to stations operating in the bands allocated to the broadcasting service in the frequency band 87-108 MHz and No. 5.43 does not apply to systems identified in *recognizing d*);

4 that frequencies below 112 MHz shall not be used for AM(R)S systems excluding the ICAO systems identified in *recognizing d*);

5 that any AM(R)S operating in the frequency band 108-117.975 MHz shall meet SARPs requirements published in Annex 10 to the Convention on International Civil Aviation,

invites ITU-R

to study any compatibility issues between the broadcasting service and AM(R)S in the band 108-117.975 MHz that may arise from the introduction of appropriate digital sound broadcasting systems, described in Recommendation ITU-R BS.1114, and to develop new or revised ITU-R Recommendations as appropriate,

instructs the Secretary-General

to bring this Resolution to the attention of ICAO.

MOD**RESOLUTION 417 (REV.WRC-12)****Use of the frequency band 960-1 164 MHz by the aeronautical mobile (R) service**

The World Radiocommunication Conference (Geneva, 2012),

considering

- a) that WRC-07 allocated the frequency band 960-1 164 MHz to the aeronautical mobile (R) service (AM(R)S) in order to make available this frequency band for AM(R)S systems, and in doing so enabled further technical developments, investments and deployment;
- b) that the frequency band 960-1 164 MHz is currently allocated to the aeronautical radionavigation service (ARNS);
- c) that new technologies are being developed to support communications and air navigation, including airborne and ground surveillance applications;
- d) that the allocation of the frequency band 960-1 164 MHz to the aeronautical mobile (R) service is intended to support the introduction of applications and concepts in air traffic management which are data intensive and which could support data links that carry safety critical aeronautical data;
- e) that in Armenia, Azerbaijan, Belarus, Bulgaria, China, the Russian Federation, Kazakhstan, Mongolia, Uzbekistan, Kyrgyzstan, Tajikistan and Ukraine, the frequency band 960-1 164 MHz is also used by systems in the ARNS for which standards and recommended practices (SARPs) have not been developed nor published by the International Civil Aviation Organization (ICAO);
- f) that, furthermore, the frequency band 960-1 164 MHz is also used by a non-ICAO system operating in the ARNS that has characteristics similar to those of ICAO standard distance measuring equipment,

recognizing

- a) that Annex 10 to the Convention on International Civil Aviation contains SARPs for aeronautical radionavigation and radiocommunication systems used by international civil aviation;
- b) that all compatibility issues between the ICAO Standard Universal Access Transceiver (UAT) operating under the AM(R)S allocation and other systems which operate in the same frequency range, excluding the system identified in *considering e)*, have been addressed;
- c) that in the frequency band 1 024-1 164 MHz the sharing conditions are more complex than in the frequency band 960-1 024 MHz,

noting

- a) that the development of compatibility criteria between AM(R)S systems proposed for operations in the frequency band 960-1 164 MHz and ICAO-standardized aeronautical systems in this band is the responsibility of ICAO;
- b) that the development of compatibility criteria between AM(R)S systems operating in the frequency band 960-1 164 MHz and radionavigation-satellite service (RNSS) receivers on the same aircraft is the responsibility of ICAO;
- c) that practical operational measures should be developed to facilitate the coordination between AM(R)S systems and non-ICAO ARNS systems,

resolves

- 1 that any AM(R)S system operating in the frequency band 960-1 164 MHz shall meet SARPs requirements published in Annex 10 to the Convention on International Civil Aviation;
- 2 that, with the exception of the system described in *recognizing b)*, any operation of AM(R)S systems in the frequency band 960-1 164 MHz with aircraft stations operating within 934 km or/and ground stations operating within 465 km from the border of the territory of Armenia, Azerbaijan, Belarus, Bulgaria, China, the Russian Federation, Kazakhstan, Mongolia, Uzbekistan, Kyrgyzstan, Tajikistan and Ukraine is subject to coordination with the concerned administrations of the countries listed above for the protection of aeronautical radionavigation systems (see *considering e)*) operating in the same band in these countries. An administration not responding within a four-month period after receiving a request to seek agreement shall be regarded as unaffected;
- 3 the system described in *recognizing b)* shall not cause harmful interference to, or claim protection from, the systems described in *considering e)*;
- 4 that administrations authorizing AM(R)S systems in the frequency band 960-1 164 MHz shall ensure compatibility with systems indicated under *considering f)* whose characteristics are described in Annex 1 of Recommendation ITU-R M.2133;
- 5 that such compatibility between any AM(R)S systems in the frequency band 960-1 164 MHz and systems in *considering f)* is a matter to be dealt with in ICAO;
- 6 that administrations intending to implement AM(R)S in the frequency band 960-1 164 MHz, in order not to cause harmful interference to the RNSS in the band 1 164-1 215 MHz, shall utilize the criteria set forth below:
- any ground station operating under the AM(R)S allocation in the frequency band 960-1 164 MHz shall limit its maximum equivalent isotropically radiated power (e.i.r.p.) to the values presented in the following table:

Emissions in the frequency band 960-1 164 MHz (Maximum allowable e.i.r.p. in the frequency band 960-1 164 MHz as a function of the carrier central frequency) for non-pulsed AM(R)S ground station transmissions				Emissions in the frequency band 1 164-1 215 MHz	
AM(R)S centre frequency < 1 091 MHz	AM(R)S centre frequency 1 091-1 119 MHz	AM(R)S centre frequency 1 119-1 135 MHz	AM(R)S centre frequency 1 135-1 164 MHz	1 164-1 197.6 MHz	1 197.6-1 215 MHz
51.6 dBW	Linearly decreasing from 51.6 to 23.6 dBW	Linearly decreasing from 23.6 to -2.4 dBW	Linearly decreasing from -2.4 to -68.4 dBW	-90.8 dBW in any 1 MHz of the band 1 164-1 197.6 MHz	-90.8 dBW in any 1 MHz of the band 1 197.6-1 215 MHz

- any airborne station operating under the AM(R)S allocation in the frequency band 960-1 164 MHz shall limit its maximum e.i.r.p. to the values presented in the following table:

Emissions in the frequency band 960-1 164 MHz (Maximum allowable e.i.r.p. in the frequency band 960-1 164 MHz as a function of the carrier central frequency) for non-pulsed AM(R)S airborne station transmissions				Emissions in the frequency band 1 164-1 215 MHz	
AM(R)S centre frequency < 1 091 MHz	AM(R)S centre frequency 1 091-1 119 MHz	AM(R)S centre frequency 1 119-1 135 MHz	AM(R)S centre frequency 1 135-1 164 MHz	1 164-1 197.6 MHz	1 197.6-1 215 MHz
55.3 dBW	Linearly decreasing from 55.3 to 27.3 dBW	Linearly decreasing from 27.3 to -1.3 dBW	Linearly decreasing from -1.3 to -64.7 dBW	-84 dBW in any 1 MHz of the band 1 164-1 197.6 MHz	-92.4 dBW in any 1 MHz of the band 1 197.6-1 215 MHz

- 7 that future AM(R)S systems operating in the frequency band 960-1 164 MHz with pulsed emissions shall demonstrate that they limit AM(R)S ground and airborne station emission characteristics in order to provide protection to RNSS systems equivalent to the protection provided by non-pulsed emission AM(R)S ground and airborne stations operating in the 960-1 164 MHz band at the maximum e.i.r.p. levels in *resolves* 6 above,

instructs the Secretary-General

to bring this Resolution to the attention of ICAO.

MOD

RESOLUTION 418 (REV.WRC-12)

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

The World Radiocommunication Conference (Geneva, 2012),

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 radio-navigation service on a primary basis;
- d)* that the allocation of the 5 091-5 250 MHz band 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 band 5 000-5 150 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 band 5 091-5 150 MHz to the aeronautical mobile service on a primary basis subject to No. **5.444B**;
- g)* that the 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 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 conducted in accordance with Resolution **230 (Rev.WRC-03)** show the feasibility of using the 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 band 5 091-5 250 MHz should prevent unacceptable interference to other services;
- c)* that the 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 band 5 091-5 250 MHz, which result in interference of no more than 1% $\Delta T_{\text{satellite}}/T_{\text{satellite}}$ 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 band 5 091-5 250 MHz;

c) that Resolution **748 (Rev.WRC-12)** also provides guidance on the use of the 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 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 ITU-R

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

ANNEX 1 TO RESOLUTION 418 (WRC-12)

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 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 band 5 091-5 250 MHz shall be operated in such a manner that one aircraft station transmitter power flux-density be limited to $-198.9 \text{ dB(W/(m}^2 \cdot \text{Hz))}$ 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 $-185.7 \text{ dB(W/(m}^2 \cdot \text{Hz))}$, which corresponds to a $\Delta T_{\text{satellite}}/T_{\text{satellite}}$ of 1%.

3 For the protection of the mobile service in the 5 150-5 250 MHz frequency band, 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: $-79.4 \text{ dB(W/(m}^2 \cdot 20 \text{ MHz))} - G_r(\theta)$.

$G_r(\theta)$ 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 $G_r(\theta)$ (dBi)
$45 < \theta \leq 90$	-4
$35 < \theta \leq 45$	-3
$0 < \theta \leq 35$	0
$-15 < \theta \leq 0$	-1
$-30 < \theta \leq -15$	-4
$-60 < \theta \leq -30$	-6
$-90 < \theta \leq -60$	-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: $-89.4 \text{ dB(W/(m}^2 \cdot 20 \text{ MHz))} - G_r(\theta)$.

$G_r(\theta)$ represents the mobile service receiver antenna gain versus elevation angle θ and is defined as follows:

$$G_r(\theta) = \max [G_1(\theta), G_2(\theta)]$$

$$G_1(\theta) = 6 - 12 \left(\frac{\theta}{27} \right)^2$$

$$G_2(\theta) = -6 + 10 \log \left[\left(\max \left\{ \frac{|\theta|}{27}, 1 \right\} \right)^{-1,5} + 0,7 \right]$$

where:

$G(\theta)$: gain relative to an isotropic antenna (dBi)

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

ADD

RESOLUTION 422 (WRC-12)

Development of methodology to calculate aeronautical mobile-satellite (R) service spectrum requirements within the frequency bands 1 545-1 555 MHz (space-to-Earth) and 1 646.5-1 656.5 MHz (Earth-to-space)

The World Radiocommunication Conference (Geneva, 2012),

considering

a) that coordination between satellite networks is required on a bilateral basis in accordance with the Radio Regulations, and that, in the frequency bands 1 525-1 559 MHz (space-to-Earth) and 1 626.5-1 660.5 MHz (Earth-to-space), coordination is partially assisted by regional multilateral meetings;

b) that, in these frequency bands, geostationary mobile-satellite system operators currently use a capacity-planning approach at multilateral coordination meetings, with the guidance and support of their administrations, to periodically coordinate access to the spectrum needed to accommodate their requirements, including aeronautical mobile-satellite (R) service (AMS(R)S) spectrum requirements;

c) that within ITU-R, there is no agreed methodology for calculating AMS(R)S spectrum requirements related to the priority categories 1 to 6 of Article 44;

d) that within ITU-R, some administrations have expressed a desire to develop an agreed methodology for calculating AMS(R)S spectrum requirements on an ongoing basis for purposes of bilateral and multilateral mobile-satellite service (MSS) coordinations conducted pursuant to Article 9 of the Radio Regulations;

e) that, since spectrum resources are limited, there is a need to use them in the most efficient manner within and amongst various MSS networks,

recognizing

a) that WRC-97 allocated the frequency bands 1 525-1 559 MHz (space-to-Earth) and 1 626.5-1 660.5 MHz (Earth-to-space) to the MSS to facilitate the assignment of spectrum to multiple MSS networks in a flexible and efficient manner;

b) that WRC-97 adopted No. 5.357A giving priority to accommodating spectrum requirements for, and protecting from unacceptable interference, the AMS(R)S providing transmission of messages with priority categories 1 to 6 in Article 44 in the frequency bands 1 545-1 555 MHz and 1 646.5-1 656.5 MHz,

noting

that AMS(R)S systems are an essential element of the International Civil Aviation Organization (ICAO) standardized communications infrastructure used in air traffic management for the provision of safety and regularity of flight in civil aviation,

resolves to invite ITU-R

to conduct studies on, and develop in one or more ITU-R Recommendations, a methodology, including clear definitions of input parameters and assumptions to be used, to calculate spectrum requirements within the frequency bands 1 545-1 555 MHz (space-to-Earth) and 1 646.5-1 656.5 MHz (Earth-to-space) for AMS(R)S communications related to the priority categories 1 to 6 of Article 44, and to take into account *considering b)* in conducting these studies,

invites

ICAO, the International Air Transport Association (IATA), administrations and other concerned organizations to participate in the studies identified in *resolves* above,

instructs the Secretary-General

to bring this Resolution to the attention of ICAO.

ADD

RESOLUTION 423 (WRC-12)

**Consideration of regulatory actions, including allocations, to support
Wireless Avionics Intra-Communications**

The World Radiocommunication Conference (Geneva, 2012),

considering

- a)* that the future generation of aircraft is being designed to enhance efficiency, reliability and safety, as well as to be more environmentally friendly;
- b)* that Wireless Avionics Intra-Communications (WAIC) systems are restricted to radiocommunications between two or more points integrated into or installed on a single aircraft;
- c)* that WAIC systems do not include communications between an aircraft and the ground, another aircraft or a satellite;
- d)* that WAIC systems have to ensure the safe operation of an aircraft and have to operate with an appropriate level of protection to comply with the safety and regularity of flight;
- e)* that WAIC systems will be operated on the ground and during all phases of flight;
- f)* that aircraft equipped with WAIC systems will be operated globally and will cross national borders,

recognizing

- a)* that WAIC systems are being developed to operate safely and efficiently in one or more non-contiguous radio-frequency bands, emphasizing those currently allocated to the aeronautical mobile service and aeronautical radionavigation service;
- b)* that WAIC systems operating inside an aircraft will benefit from fuselage attenuation and other aircraft surface attenuation in order to facilitate sharing with other services;
- c)* that Report ITU-R M.2197 provides technical characteristics and operational objectives for WAIC systems,

resolves

that WRC-15 consider, based on the results of ITU-R studies, possible regulatory actions, including appropriate aeronautical allocations, to support the implementation of WAIC systems, while taking into account spectrum requirements for WAIC and protection requirements for systems operating in accordance with existing allocations,

invites ITU-R

- 1 to conduct, in time for WRC-15, the necessary studies to determine the spectrum requirements needed to support WAIC systems;
- 2 to conduct sharing and compatibility studies, based on the results of *invites ITU-R 1*, to determine appropriate frequency bands and regulatory actions;
- 3 when conducting studies in accordance with *invites ITU-R 2*, to consider:
 - i) frequency bands within existing worldwide aeronautical mobile service, aeronautical mobile (R) service and aeronautical radionavigation service allocations;
 - ii) additional frequency bands above 15.7 GHz for aeronautical services if spectrum requirements cannot be met in frequency bands studied under *invites ITU-R 3 i*),

invites

the International Civil Aviation Organization (ICAO) to contribute to these studies,

instructs the Secretary-General

to bring this Resolution to the attention of ICAO.

MOD

RESOLUTION 507 (REV.WRC-12)

**Establishment of agreements and associated plans for
the broadcasting-satellite service¹**

The World Radiocommunication Conference (Geneva, 2012),

considering

- a) that it is important to make the best possible use of the geostationary-satellite orbit and of the frequency bands allocated to the broadcasting-satellite service;
- b) that the great number of receiving installations using such directional antennas as could be set up for a broadcasting-satellite service may be an obstacle to changing the location of space stations in that service on the geostationary-satellite orbit, as of the date of their being brought into use;
- c) that satellite broadcasts may create harmful interference over a large area of the Earth's surface;
- d) that the other services with allocations in the same band need to use the band before the broadcasting-satellite service is set up,

resolves

1 that stations in the broadcasting-satellite service shall be established and operated in accordance with agreements and associated plans adopted by world or regional administrative conferences, and/or world or regional radiocommunication conferences, as the case may be, in which all the administrations concerned and the administrations whose services are liable to be affected may participate;

2 that during the period before the entry into force of such agreements and associated plans the administrations and the Radiocommunication Bureau shall apply the procedure contained in Resolution **33 (Rev.WRC-03)**,

invites the Council

to keep under review the question of world radiocommunication conferences, and/or regional radiocommunication conferences, as required, with a view to fixing suitable dates, places and agenda.

¹ This Resolution does not apply to the 21.4-22 GHz band.

MOD

RESOLUTION 526 (REV.WRC-12)

Future adoption of procedures to ensure flexibility in the use of the frequency band allocated to the broadcasting-satellite service (BSS) for wide RF-band high-definition television (HDTV) and to the associated feeder links

The World Radiocommunication Conference (Geneva, 2012),

considering

a) that WARC-92 has added an allocation to the BSS in the band 17.3-17.8 GHz in Region 2 for use by wide RF-band HDTV;

b) that in the longer term regulatory provisions designed to ensure flexible and equitable use of the BSS (HDTV) and associated feeder-link allocations will be necessary,

resolves to invite ITU-R

to study the development of future regulatory provisions for BSS (HDTV) to ensure flexibility in the use of the band 17.3-17.8 GHz in Region 2, having regard to the interests of all countries and the state of technical development of this new service,

instructs the Secretary-General

to bring this Resolution to the attention of the Council with a view to placing an appropriate item on the agenda of a future world radiocommunication conference.

MOD

RESOLUTION 548 (REV.WRC-12)

**Application of the grouping concept in Appendices 30 and 30A
in Regions 1 and 3¹**

The World Radiocommunication Conference (Geneva, 2012),

considering

- a) that the grouping concept as it is applied in Appendices 30 and 30A with respect to Regions 1 and 3 was considered by WRC-03;
- b) that the protection of assignments in the Plan and the List in Appendices 30 and 30A is based upon an equivalent protection margin criterion;
- c) that concerns have been raised that the use of the grouping concept by one administration may reduce access to spectrum resources by others;
- d) that coordination of one network² in a group shall not lead to a reduction of coordination requirements for other networks in the same group;
- e) that WRC-2000 accepted grouping in the Regions 1 and 3 List for some networks which are separated by up to 0.2° in the geostationary arc according to their respective nominal orbital locations,

noting

- a) that the 2002 Conference Preparatory Meeting considered a proposed solution in which there is a limit to the number of assignments in a group or number of groups in one orbital location;
- b) that the Radio Regulations Board has developed Rules of Procedure with respect to the application of the grouping concept,

resolves

- 1 that a grouping of networks with an overall separation of not more than 0.4° in the geostationary arc, in accordance with their respective nominal orbital locations, is regarded as a grouping at the same orbital location;
- 2 that the limitations referred to in *resolves* 4 do not apply to grouping of networks before the inclusion of the assignments in the List;
- 3 that the limitations in *resolves* 4 do not apply to grouping within one network;

¹ It is noted that the application of the grouping concept in Region 2 does not require any change. Therefore, the Radiocommunication Bureau shall continue to apply the grouping concept in Region 2 as it has applied it prior to WRC-03.

² In the application of this Resolution, a network is understood as being a submission by one administration, or one administration acting on behalf of a group of administrations, to the Bureau of a set of assignments, received on the same date, with the same name for the satellite network and at the same orbital location.

4 that under Appendices **30** and **30A** in Regions 1 and 3 the following principles with respect to the application of the grouping concept between networks at the same orbital location shall apply:

- a) these limitations apply for networks with overlapping frequency bands;
- b) for networks for which a submission is received by the Bureau under § 4.1.3 of Appendix **30** or **30A** after 4 July 2003, not more than three networks within the same overlapping frequency bandwidth can be in a group in the List;
- c) for networks for which a submission was received by the Bureau under § 4.1.3 of Appendix **30** or **30A** before 5 July 2003, not more than five networks within the same overlapping frequency bandwidth can be in a group in the List;
- d) if the number of networks in a group in the List reaches the maximum limit specified above, no new networks can be entered into the List in this group without removal of another overlapping part of a network from the List;

5 that, as from 5 July 2003, in the processing and publication by the Bureau of submissions relating to Regions 1 and 3 under Article 4 of Appendix **30** or **30A** received after 2 June 2000 and the identification of affected administrations in accordance with § 4.1.5, each network in a group is examined separately, without taking into account the other networks in the group³.

³ In applying § 4.1.11, the application of the new methodology in this *resolves* to networks received before 3 June 2000 shall not result in additional coordination requirements for those networks.

ADD

RESOLUTION 552 (WRC-12)

**Long-term access to and development in the
band 21.4-22 GHz in Regions 1 and 3**

The World Radiocommunication Conference (Geneva, 2012),

considering

- a) that WARC-92 allocated the 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 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 Resolution **551 (WRC-07)** instructed ITU-R to continue technical and regulatory studies on harmonization of spectrum usage, coordination procedures or other procedures, and BSS technologies, in preparation for WRC-12, in the 21.4-22 GHz band and the associated feeder-link bands in Regions 1 and 3;
- d) 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;
- e) that a due diligence process was first adopted by WRC-97 with a view to providing, as early as possible, information on the industrial project behind a satellite network submitted to ITU;
- f) that providing information required under this due diligence process was a prerequisite to qualifying for a two-year extension of the regulatory period to bring into use a satellite network in non-planned bands;
- g) that WRC-03 decided to remove the two-year extension by setting the regulatory period to bring into use a satellite network in non-planned bands to seven years;
- h) that data concerning the manufacturer, launch service provider and launch date of a satellite will be more accurate and useful if submitted after the launch of the satellite,

resolves

- 1 that this Resolution applies to geostationary-satellite networks in the BSS in the 21.4-22 GHz band;
- 2 that for frequency assignments to satellite networks as described in *resolves* 1 for which confirmation of the date of bringing into use under the provisions of Article **11** was not received by the Bureau before 18 February 2012 or which were suspended under No. **11.49** at that date, the procedure contained in Annex 1 to this Resolution shall be applied at the time of first bringing into use or when resuming use after a suspension, as appropriate;

3 that for frequency assignments to satellite networks as described in *resolves* 1 for which the confirmation of the date of bringing into use under the provisions of Article 11 was received by the Bureau before 18 February 2012, the provisions of §§ 5 to 8 of Annex 1 to this Resolution and the procedure contained in Annex 3 to this Resolution shall be applied, as appropriate,

further resolves

that the procedures in this Resolution are in addition to the provisions under Articles 9 and 11 of the Radio Regulations,

instructs the Director of the Radiocommunication Bureau

to include in his report to future competent world radiocommunication conferences the results of the implementation of this Resolution.

ANNEX 1 TO RESOLUTION 552 (WRC-12)

1 Within 30 days after the actual commencement, or resumption, of use of the frequency assignments to a satellite network subject to these procedures, the notifying administration shall send to the Bureau the information specified in Annex 2 to this Resolution.

2 The information to be submitted in accordance with § 1 above shall be signed by an authorized official of the notifying administration.

3 If the spacecraft is used for the first time under this Resolution, the due diligence information to be submitted in accordance with § 1 above could be supplemented by a copy of the contract with the launch services provider.

4 On receipt of the information under § 1 above, the Bureau shall promptly examine its completeness. If the information is found to be complete, the Bureau shall publish the complete information in a special section of the BR IFIC within two months. If the information is found to be incomplete, the Bureau shall request the notifying administration to submit the missing information within 30 days.

5 The information submitted in accordance with § 1 above and § 1 of Annex 3 to this Resolution shall be updated and resubmitted to the Bureau by the notifying administration not later than 30 days after the end of life or the relocation of the spacecraft associated with the submission under § 1 above and § 1 of Annex 3 to this Resolution. In case of end of life of a spacecraft, the corresponding ITU ID number associated to such a spacecraft shall no longer be used.

6 On receipt of the information under § 5 above, the Bureau shall promptly examine its completeness. If the information is found to be complete, the Bureau shall publish the complete information in a special section of the BR IFIC within two months. If the information is found to be incomplete, the Bureau shall request the notifying administration to submit the missing information within 30 days.

7 If the complete information specified in §§ 1 and 5 above is not received by the Bureau within the time-limits specified in §§ 1, 4, 5 and 6 above, the Bureau shall immediately inform the notifying administration and take appropriate measures under § 8, if required.

8 Within 30 days after the end of the seven-year period following the date of receipt by the Bureau of the relevant complete information under No. 9.1 or 9.2, as appropriate, and after the end of the three-year period following the date of suspension under No. 11.49, if the complete information under this Resolution is not yet received by the Bureau, the corresponding frequency assignments shall be cancelled by the Bureau, which subsequently informs the administration accordingly.

ANNEX 2 TO RESOLUTION 552 (WRC-12)

Information to be submitted

- 1 Identity of the satellite network
 - a) Identity of the satellite network
 - b) Name of the notifying administration
 - c) Orbital characteristics
 - d) Reference to the advance publication information
 - e) Reference to the request for coordination
 - f) Reference to the notification, when available
 - g) Frequency band(s) included in the relevant special sections of the satellite network
 - h) First date of bringing into use¹
 - i) Regulatory status
 - Satellite network under operation (only data listed in § 2 shall be provided), or
 - Satellite network suspended (only data listed in § 3 shall be provided)
- 2 Identity of the spacecraft² (if satellite network filing is under operation)
 - a) ITU ID number, or
 - b) Spacecraft manufacturer
 - Name of the spacecraft manufacturer
 - Date of execution of the contract
 - Delivery date
 - c) Launch services provider
 - Name of the launch vehicle provider
 - Date of execution of the contract
 - Name of the launch vehicle
 - Name and location of the launch facility
 - Launch date

¹ This information has already been provided by the administration under the provisions of Article 11 and will be inserted by the Bureau.

² If data about the spacecraft are submitted for the first time under this Resolution, items “Spacecraft manufacturer”, “Launch services provider” and “Frequency band(s) present on board the spacecraft” shall be provided. Otherwise, if data about the spacecraft were already submitted under this Resolution, the ID number (based on the ITU filing number) given by the Bureau to this spacecraft at that time shall be indicated.

- d) Frequency band(s) present on board the spacecraft (i.e. frequency bands for each transponder that are able to be transmitted by a transponder located on board the spacecraft within the band 21.4-22 GHz)
- 3 Suspension information (if satellite network filing is suspended)
- a) Date of suspension³
- b) Reason of suspension:
 - Spacecraft moved to another orbital position, or
 - In-orbit failure of the spacecraft, or
 - Spacecraft de-orbited,
 - Other reasons (to be specified).

ANNEX 3 TO RESOLUTION 552 (WRC-12)

Transitional measures

1 For frequency assignments to satellite networks as described in *resolves* 3 to this Resolution, the notifying administration shall submit to the Bureau, not later than 17 August 2012, the complete information relevant to the operational situation as of 18 February 2012, in accordance with Annex 2 to this Resolution.

2 The information to be submitted in accordance with § 1 above could be supplemented by a copy of the contract with the spacecraft manufacturer and/or launch services provider.

3 On receipt of the information under § 1 above, the Bureau shall promptly examine its completeness. If the information is found to be complete, the Bureau shall publish the complete information in a special section of the BR IFIC within two months. If the information is found to be incomplete, the Bureau shall request the notifying administration to submit the missing information within 30 days.

4 If the complete information specified in § 1 above is not received by the Bureau before the expiry date specified in §§ 1 or 3 above, as appropriate, the frequency assignments of a satellite network in the broadcasting-satellite service in the 21.4-22 GHz band shall be cancelled by the Bureau, if appropriate. The Bureau shall publish this information in the BR IFIC.

³ This information has already been provided by the administration under the provisions of Article 11 and will be inserted by the Bureau.

ADD

RESOLUTION 553 (WRC-12)

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

The World Radiocommunication Conference (Geneva, 2012),

considering

- a) that WARC-92 allocated the 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 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 Resolution **551 (WRC-07)** instructed ITU-R to continue technical and regulatory studies on harmonization of spectrum usage, coordination procedures or other procedures, and BSS technologies, in the 21.4-22 GHz band and the associated feeder-link bands in Regions 1 and 3;
- d) that the band 21.4-22 GHz in Regions 1 and 3 for the BSS was subject to Resolution **507 (Rev.WRC-03)**,

considering further

- a) that *a priori* planning for BSS networks in the 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-12 established definitive arrangements for the use of the 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 21.4-22 GHz band 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 21.4-22 GHz band 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 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 21.4-22 GHz band shall be applied in respect of submissions of administrations meeting the specified requirements in the Attachment.

ATTACHMENT TO RESOLUTION 553 (WRC-12)

**Special procedure to be applied for an assignment for a BSS system
in the 21.4-22 GHz frequency band 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 band 21.4-22 GHz. In case of countries complying with § 3 below, the special procedures described in this attachment can also be applied¹ 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 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 locations² 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 ellipse³ to cover its/their national territory⁴;
- 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.

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.

² The number of orbital locations shall not exceed the number of orbital locations for national assignments in the Appendix 30 Plan.

³ In some cases, use of composite beams may be necessary to provide required coverage while reducing undesired coverage of adjacent geographical areas.

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.

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 Regulations⁵.

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 effected⁶;
- d) include their names in the publication under e) below;
- e) publish⁷, 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.

11 If 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.

⁵ For submissions under this special procedure, the coordination information is receivable at the same date as that of the advance publication information.

⁶ The Bureau shall also identify the specific satellite networks with which coordination needs to be effected.

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)

ANNEX 1

TO

ATTACHMENT TO RESOLUTION 553 (WRC-12)

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

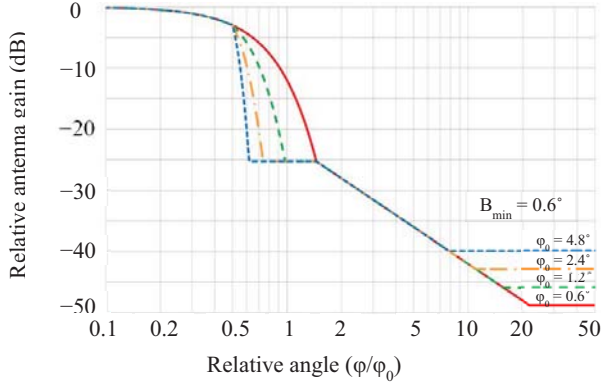
- a) The receiving earth station antenna diameter should be in the range 45-120 cm. The radiation pattern of the receiving terminal antenna should comply with Recommendation ITU-R BO.1900.
- b) The noise temperature of the receiving earth station should be in the range 145-200 K.
- c) The transmitting e.i.r.p. of the space station shall be in the range from 43.2 dBW/MHz to 58.2 dBW/MHz⁸.
- 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 coordinates⁹.
- 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°.

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)).

⁹ In some cases use of composite beams may be necessary to provide required coverage while reducing undesired coverage of adjacent geographical areas.

FIGURE 1* (WRC-12)

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



$$G_{max} = 44.45 - 10 \log (\varphi_{01} \cdot \varphi_{02}) \quad \text{dBi} \quad (\text{WRC-12})$$

Curve A: dB relative to main beam gain

$$-12 (\varphi/\varphi_0)^2$$

$$\text{for } 0 \leq (\varphi/\varphi_0) \leq 0.5$$

$$-12 \left[\frac{(\varphi/\varphi_0) - x}{B_{min}/\varphi_0} \right]^2$$

$$\text{for } 0.5 < (\varphi/\varphi_0) \leq \left(\frac{1.45 B_{min}}{\varphi_0} + x \right)$$

$$-25.23$$

$$\text{for } \left(\frac{1.45 B_{min}}{\varphi_0} + x \right) < (\varphi/\varphi_0) \leq 1.45$$

$$-(22 + 20 \log (\varphi/\varphi_0))$$

$$\text{for } (\varphi/\varphi_0) > 1.45$$

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 φ_0 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)

φ_0 : cross-sectional half-power beamwidth in the direction of interest (degrees)

$\varphi_{01}, \varphi_{02}$: major and minor axis half-power beamwidth, respectively, of elliptical beam (degrees) (WRC-12)

$$x = 0.5 \left(1 - \frac{B_{min}}{\varphi_0} \right)$$

where:

$$B_{min} = 0.6^\circ$$

* Figure 1 represents patterns for some values of φ_0 . (WRC-12)

ANNEX 2

TO

ATTACHMENT TO RESOLUTION 553 (WRC-12)

**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 21.4-22 GHz
frequency band 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 (WRC-12) 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/(m ² · MHz))	for	0° ≤ θ < 0.6°
–150.2 + 9.3 θ ²	dB(W/(m ² · MHz))	for	0.6° ≤ θ < 1.05°
–140.5 + 27.2 log θ	dB(W/(m ² · MHz))	for	1.05° ≤ θ < 2.65°
–138.1 + 1.3 θ ²	dB(W/(m ² · MHz))	for	2.65° ≤ θ < 4.35°
–130.2 + 26.1 log θ	dB(W/(m ² · MHz))	for	4.35° ≤ θ < 9.1°
–105	dB(W/(m ² · 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 (WRC-12) 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	$\text{dB}(W/(\text{m}^2 \cdot \text{MHz}))$	for	$0^\circ \leq \theta < 0.6^\circ$
$-153.2 + 9.3 \theta^2$	$\text{dB}(W/(\text{m}^2 \cdot \text{MHz}))$	for	$0.6^\circ \leq \theta < 1.05^\circ$
$-143.5 + 27.2 \log \theta$	$\text{dB}(W/(\text{m}^2 \cdot \text{MHz}))$	for	$1.05^\circ \leq \theta < 2.65^\circ$
$-141.1 + 1.3 \theta^2$	$\text{dB}(W/(\text{m}^2 \cdot \text{MHz}))$	for	$2.65^\circ \leq \theta < 4.35^\circ$
$-133.2 + 26.1 \log \theta$	$\text{dB}(W/(\text{m}^2 \cdot \text{MHz}))$	for	$4.35^\circ \leq \theta < 12^\circ$
-105	$\text{dB}(W/(\text{m}^2 \cdot \text{MHz}))$	for	$12^\circ \leq \theta$

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.

ADD

RESOLUTION 554 (WRC-12)

Application of pfd masks to coordination under No. 9.7 for broadcasting-satellite service networks in the band 21.4-22 GHz in Regions 1 and 3

The World Radiocommunication Conference (Geneva, 2012),

considering

- a) that more precise criteria to apply No. 9.7 have the potential to reduce undue protection requirements for assignments in respect of incoming assignments in their vicinity;
- b) that reduction of undue protection requirements will facilitate coordination of submissions of new networks;
- c) that the use of pfd thresholds to identify coordination requirements will encourage use of more homogeneous technical parameters and support efficient spectrum usage,

resolves

1 that coordination of assignments for a broadcasting-satellite service (BSS) space station in Regions 1 and 3 in the 21.4-22 GHz band 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:

-149.88	dB(W/(m ² · MHz))	for 0° ≤ θ < 0.6°
-153.2 + 9.3 θ ²	dB(W/(m ² · MHz))	for 0.6° ≤ θ < 1.05°
-143.5 + 27.2 log θ	dB(W/(m ² · MHz))	for 1.05° ≤ θ < 2.65°
-141.1 + 1.3 θ ²	dB(W/(m ² · MHz))	for 2.65° ≤ θ < 4.35°
-133.2 + 26.1 log θ	dB(W/(m ² · MHz))	for 4.35° ≤ θ < 12°
-105	dB(W/(m ² · 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;

2 that when the Bureau, under No. 11.32, conducts its examination of notifications of satellite networks in respect of compliance with the coordination procedures, it shall base its findings on the coordination requirements set by No. 9.7 in Table 5-1 of Appendix 5 as revised by WRC-12 for those networks received under No. 9.30 before 18 February 2012.

ADD

RESOLUTION 555 (WRC-12)

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

The World Radiocommunication Conference (Geneva, 2012),

considering

- a) that WARC-92 allocated the 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 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 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 bands were on a first-come first-served basis,

recognizing

- a) that the number of filings made by some administrations in this 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

1 that administrations, in compliance with Article 44 of the Constitution, review their submissions in the band 21.4-22 GHz submitted before 18 February 2012, with a view to reducing the number of their submissions to the absolute minimum necessary, and indicate to the Bureau, before 30 June 2012, the networks which are no longer required to be considered and processed by the Bureau and administrations under Articles **9** and **11**;

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

3 that, for submissions received before 18 February 2012 but not yet processed by the Bureau, the notifying administration may modify, without any change in their initial date of receipt, the characteristics of the submissions and supply new values within the ranges specified in Annex 1 to the Attachment to Resolution **553 (WRC-12)** or Report ITU-R BO.2071;

4 that, for submissions received before 18 February 2012 and processed by the Bureau, the notifying administration may modify, without any change in their initial date of receipt, the characteristics within the ranges specified in Annex 1 to the Attachment to Resolution **553 (WRC-12)** or Report ITU-R BO.2071, provided that such modifications do not cause more interference than the current submitted parameters,

instructs the Director of the Radiocommunication Bureau

to report to future competent world radiocommunication conferences on the results of the implementation of this Resolution,

invites the ITU Council

to consider modifying Decision 482 (modified 2008) to exempt submissions under *resolves* 3 and 4 above from cost-recovery charges.

MOD

RESOLUTION 612 (REV.WRC-12)

**Use of the radiolocation service between 3 and 50 MHz to support
oceanographic radar operations**

The World Radiocommunication Conference (Geneva, 2012),

considering

- a)* that there is increasing interest, on a global basis, in the operation of oceanographic radars for measurement of coastal sea surface conditions to support environmental, oceanographic, meteorological, climatological, maritime and disaster mitigation operations;
- b)* that oceanographic radars are also known in parts of the world as HF ocean radars, HF wave height sensing radars or HF surface wave radars;
- c)* that oceanographic radars operate through the use of ground-waves intended to propagate over the sea;
- d)* that oceanographic radar technology has applications in global maritime domain awareness by allowing the long-range sensing of surface vessels, which provides a benefit to the global safety and security of shipping and ports;
- e)* that operation of oceanographic radars provides benefits to society through environmental protection, disaster preparedness, public health protection, improved meteorological operations, increased coastal and maritime safety and enhancement of national economies;
- f)* that oceanographic radars have been operated on an experimental basis around the world, providing an understanding of spectrum needs and spectrum sharing considerations, as well as an understanding of the benefits these systems provide;
- g)* that performance and data requirements dictate the regions of spectrum that can be used by oceanographic radar systems for ocean observations;
- h)* that below approximately 30 MHz, unintended skywave propagation from oceanographic radar may occur when appropriate propagation conditions exist,

recognizing

- a)* that oceanographic radars have been operated under provision No. 4.4 since the 1970s by several administrations;
- b)* that developers of the systems in *recognizing a)* have implemented techniques to make the most efficient use of the spectrum and mitigate interference to other radio services;

c) that protection of stations of existing services from interference caused by oceanographic radars could be ensured if the interfering signal at the receiving antenna location, assuming rural and quiet rural man-made and natural noise characteristics as defined in Recommendation ITU-R P.372-10, does not result in an I/N ratio of more than -6 dB, and if this value was used to calculate the minimum separation distances for coordination between an oceanographic radar and a potentially affected country;

d) that for the purpose of protecting existing services from harmful interference, the impact of oceanographic radars via ground-wave propagation can be checked by Report ITU-R M.2234, based on Recommendation ITU-R P.368-9,

resolves

1 that, when oceanographic radars are brought into use after 17 February 2012 and notified to the Bureau, the notification shall be in accordance with No. **11.2** of the Radio Regulations and shall contain the station identification (call sign);

2 that the peak e.i.r.p. of an oceanographic radar shall not exceed 25 dBW;

3 that each oceanographic radar station shall transmit a station identification (call sign) on the assigned frequency, in international Morse code at manual speed, at the end of each data acquisition cycle, but at an interval of no more than 20 minutes;

4 that oceanographic radars should, where applicable, use techniques that allow multiples of such radars to operate on the same frequency, reducing to a minimum the spectral occupancy of a regional or global deployment of radars;

5 that oceanographic radars should use directional antennas, where applicable and as required, to facilitate sharing, thereby reducing the e.i.r.p. in the direction of the transmit antenna backlobe;

6 that the separation distances between an oceanographic radar and the border of other countries shall be greater than the distances specified in the following table, unless prior explicit agreements from affected administrations are obtained:

Frequency (MHz)	Land path (km)		Sea or mixed path (km)	
	Rural	Quiet rural	Rural	Quiet rural
5 (± 1 MHz)	120	170	790	920
9 (± 1 MHz)	100	130	590	670
13 (± 1 MHz)	100	110	480	520
16 (± 1 MHz)	80	100	390	450
25 (± 3 MHz)	80	100	280	320
42 (± 3 MHz)	80	100	200	230

MOD

RESOLUTION 644 (REV.WRC-12)

Radiocommunication resources for early warning, disaster mitigation and relief operations

The World Radiocommunication Conference (Geneva, 2012),

considering

- a) that administrations have been urged to take all practical steps to facilitate the rapid deployment and effective use of telecommunication resources for early warning, disaster mitigation and disaster relief operations by reducing and, where possible, removing regulatory barriers and strengthening global, regional and transborder cooperation between States;
- b) that modern telecommunication technologies are an essential tool for disaster mitigation and relief operations and the vital role of telecommunications and ICT for the safety and security of relief workers in the field;
- c) the particular needs of developing countries and the special requirements of the inhabitants living in high risk areas exposed to disasters, as well as those living in remote areas;
- d) the work carried out by the Telecommunication Standardization Sector in standardizing the common alerting protocol (CAP), through the approval of the relevant CAP Recommendation;
- e) that, under the Strategic Plan of the Union 2012-2015, “the need for effective use of telecommunications/ICTs and modern technologies during critical emergencies, as a crucial part of disaster prediction, detection, early-warning, mitigation, management and relief strategies” is considered a priority for ITU in this period;
- f) that the majority of terrestrial networks in affected areas were damaged during recent disasters,

recognizing

- a) Article 40 of the Constitution, on priority of telecommunications concerning safety of life;
- b) Article 46 of the Constitution, on distress calls and messages;
- c) No. 91 of the Tunis Agenda for the Information Society adopted by the second phase of the World Summit on the Information Society and in particular provision c): “Working expeditiously towards the establishment of standards-based monitoring and worldwide early-warning systems linked to national and regional networks and facilitating emergency disaster response all over the world, particularly in high-risk regions”;
- d) Resolution 34 (Rev. Hyderabad, 2010) of the World Telecommunication Development Conference, on the role of telecommunications/information and communication technologies in disaster preparedness, early warning, rescue, mitigation, relief and response, as well as ITU-D Question 22-1/2 “Utilization of telecommunications/ICT for disaster preparedness, mitigation and response”;

e) Resolution 36 (Rev. Guadalajara, 2010) of the Plenipotentiary Conference, on telecommunications/information and communication technology in the service of humanitarian assistance;

f) Resolution 136 (Rev. Guadalajara, 2010) of the Plenipotentiary Conference, on the use of telecommunications/information and communication technologies for monitoring and management in emergency and disaster situations for early warning, prevention, mitigation and relief;

g) Resolution ITU-R 53, on the use of radiocommunications in disaster response and relief;

h) Resolution ITU-R 55, on the ITU-R studies of disaster prediction, detection, mitigation and relief,

noting

the close relation of this Resolution with Resolution **646 (Rev.WRC-12)**, on public protection and disaster relief, and Resolution **647 (Rev.WRC-12)**, on spectrum management guidelines for emergency and disaster relief radiocommunication, and the need to coordinate activities under these Resolutions in order to prevent any possible overlap,

resolves

1 that the ITU Radiocommunication Sector (ITU-R) continue to study, as a matter of urgency, those aspects of radiocommunications/ICT that are relevant to early warning, disaster mitigation and relief operations, such as decentralized means of telecommunications that are appropriate and generally available, including amateur terrestrial and satellite radio facilities, mobile and portable satellite terminals, as well as the use of passive space-based sensing systems;

2 to urge the ITU-R Study Groups, taking into account the scope of ongoing studies/activities appended to Resolution ITU-R 55, to accelerate their work, particularly in the areas of disaster prediction, detection, mitigation and relief,

instructs the Director of the Radiocommunication Bureau

1 to support administrations in their work towards the implementation of both Resolutions 36 (Rev. Guadalajara, 2010) and 136 (Rev. Guadalajara, 2010), as well as the Tampere Convention;

2 to collaborate, as appropriate, with the United Nations Working Group on Emergency Telecommunications (WGET);

3 to participate in, and contribute to, the Telecommunications for Disaster Relief and Mitigation – Partnership Coordination Panel (PCP-TDR);

4 to synchronize activities between this Resolution, Resolution **646 (Rev.WRC-12)** and Resolution **647 (Rev.WRC-12)** to prevent a possible overlap.

MOD

RESOLUTION 646 (REV.WRC-12)

Public protection and disaster relief

The World Radiocommunication Conference (Geneva, 2012),

considering

- a) that the term “public protection radiocommunication” refers to radiocommunications used by responsible agencies and organizations dealing with maintenance of law and order, protection of life and property and emergency situations;
- b) that the term “disaster relief radiocommunication” refers to radiocommunications used by agencies and organizations dealing with a serious disruption of the functioning of society, posing a significant widespread threat to human life, health, property or the environment, whether caused by accident, natural phenomena or human activity, and whether developing suddenly or as a result of complex, long-term processes;
- c) the growing telecommunication and radiocommunication needs of public protection agencies and organizations, including those dealing with emergency situations and disaster relief, that are vital to the maintenance of law and order, protection of life and property, disaster relief and emergency response;
- d) that many administrations wish to promote interoperability and interworking between systems used for public protection and disaster relief, both nationally and for cross-border operations in emergency situations and for disaster relief;
- e) that current public protection and disaster relief applications are mostly narrow-band supporting voice and low data-rate applications, typically in channel bandwidths of 25 kHz or less;
- f) that, although there will continue to be narrow-band requirements, many future applications will be wideband (indicative data rates in the order of 384-500 kbit/s) and/or broadband (indicative data rates in the order of 1-100 Mbit/s) with channel bandwidths dependent on the use of spectrally efficient technologies;
- g) that new technologies for wideband and broadband public protection and disaster relief applications are being developed in various standards organizations¹;

¹ For example, a joint standardization programme between the European Telecommunications Standards Institute (ETSI) and the Telecommunications Industry Association (TIA), known as Project MESA (Mobility for Emergency and Safety Applications) has commenced for broadband public protection and disaster relief. Also, the Working Group on Emergency Telecommunications (WGET), convened by the United Nations Office for Humanitarian Affairs (OCHA), is an open forum to facilitate the use of telecommunications in the service of humanitarian assistance comprising United Nations entities, major non-governmental organizations, the International Committee of the Red Cross (ICRC), ITU and experts from the private sector and academia. Another platform for coordination and to foster harmonized global Telecommunication for Disaster Relief (TDR) standards is the TDR Partnership Coordination Panel, which was established under the coordination of ITU with participation of international telecommunication service providers, related government departments, standards development organizations, and disaster relief organizations.

h) that continuing development of new technologies such as International Mobile Telecommunications (IMT) and Intelligent Transportation Systems (ITS) may be able to support or supplement advanced public protection and disaster relief applications;

i) that some commercial terrestrial and satellite systems are complementing the dedicated systems in support of public protection and disaster relief, that the use of commercial solutions will be in response to technology development and market demands and that this may affect the spectrum required for those applications and for commercial networks;

j) that Resolution 36 (Rev. Guadalajara, 2010) of the Plenipotentiary Conference urges Member States Parties to the Tampere Convention to take all practical steps for the application of the Tampere Convention and to work closely with the operational coordinator as provided for therein;

k) that Recommendation ITU-R M.1637 offers guidance to facilitate the global circulation of radiocommunication equipment in emergency and disaster relief situations;

l) that some administrations may have different operational needs and spectrum requirements for public protection and disaster relief applications depending on the circumstances;

m) that the Tampere Convention on the Provision of Telecommunications Resources for Disaster Mitigation and Relief Operations (Tampere, 1998), an international treaty deposited with the United Nations Secretary-General and related United Nations General Assembly Resolutions and Reports are also relevant in this regard,

recognizing

a) the benefits of spectrum harmonization such as:

- increased potential for interoperability;
- a broader manufacturing base and increased volume of equipment resulting in economies of scale and expanded equipment availability;
- improved spectrum management and planning; and
- enhanced cross-border coordination and circulation of equipment;

b) that the organizational distinction between public protection activities and disaster relief activities are matters for administrations to determine at the national level;

c) that national spectrum planning for public protection and disaster relief needs to have regard to cooperation and bilateral consultation with other concerned administrations, which should be facilitated by greater levels of spectrum harmonization;

d) the benefits of cooperation between countries for the provision of effective and appropriate humanitarian assistance in case of disasters, particularly in view of the special operational requirements of such activities involving multinational response;

- e) the needs of countries, particularly the developing countries², for low-cost communication equipment;
- f) that the trend is to increase the use of technologies based on Internet Protocols;
- g) that currently some bands or parts thereof have been designated for existing public protection and disaster relief operations, as documented in Report ITU-R M.2033³;
- h) that for solving future bandwidth requirements, there are several emerging technology developments such as software-defined radio, advanced compression and networking techniques that may reduce the amount of new spectrum required to support some public protection and disaster relief applications;
- i) that in times of disasters, if most terrestrial-based networks are destroyed or impaired, amateur, satellite and other non-ground-based networks may be available to provide communication services to assist in public protection and disaster relief efforts;
- j) that the amount of spectrum needed for public protection on a daily basis can differ significantly between countries, that certain amounts of spectrum are already in use in various countries for narrow-band applications, and that in response to a disaster, access to additional spectrum on a temporary basis may be required;
- k) that in order to achieve spectrum harmonization, a solution based on regional frequency ranges⁴ may enable administrations to benefit from harmonization while continuing to meet national planning requirements;
- l) that not all frequencies within an identified common frequency range will be available within each country;
- m) that the identification of a common frequency range within which equipment could operate may ease the interoperability and/or inter-working, with mutual cooperation and consultation, especially in national, regional and cross-border emergency situations and disaster relief activities;
- n) that when a disaster occurs, the public protection and disaster relief agencies are usually the first on the scene using their day-to-day communication systems, but that in most cases other agencies and organizations may also be involved in disaster relief operations,

noting

- a) that many administrations use frequency bands below 1 GHz for narrow-band public protection and disaster relief applications;
- b) that applications requiring large coverage areas and providing good signal availability would generally be accommodated in lower frequency bands and that applications requiring wider bandwidths would generally be accommodated in progressively higher bands;

² Taking into account, for example, the ITU-D Handbook on disaster relief.

³ 3-30, 68-88, 138-144, 148-174, 380-400 MHz (including CEPT designation of 380-385/390-395 MHz), 400-430, 440-470, 764-776, 794-806 and 806-869 MHz (including CITELE designation of 821-824/866-869 MHz).

⁴ In the context of this Resolution, the term "frequency range" means a range of frequencies over which a radio equipment is envisaged to be capable of operating but limited to specific frequency band(s) according to national conditions and requirements.

c) that public protection and disaster relief agencies and organizations have an initial set of requirements, including but not limited to interoperability, secure and reliable communications, sufficient capacity to respond to emergencies, priority access in the use of non-dedicated systems, fast response times, ability to handle multiple group calls and the ability to cover large areas as described in Report ITU-R M.2033;

d) that, while harmonization may be one method of realizing the desired benefits, in some countries, the use of multiple frequency bands can contribute to meeting the communication needs in disaster situations;

e) that many administrations have made significant investments in public protection and disaster relief systems;

f) that flexibility must be afforded to disaster relief agencies and organizations to use current and future radiocommunications, so as to facilitate their humanitarian operations,

emphasizing

a) that the frequency bands identified in this Resolution are allocated to a variety of services in accordance with the relevant provisions of the Radio Regulations and are currently used intensively by the fixed, mobile, mobile satellite and broadcasting services;

b) that flexibility must be afforded to administrations:

- to determine, at national level, how much spectrum to make available for public protection and disaster relief from the bands identified in this Resolution in order to meet their particular national requirements;
- to have the ability for bands identified in this Resolution to be used by all services having allocations within those bands according to the provisions of the Radio Regulations, taking into account the existing applications and their evolution;
- to determine the need and timing of availability as well as the conditions of usage of the bands identified in this Resolution for public protection and disaster relief in order to meet specific national situations,

resolves

1 to strongly recommend administrations to use regionally harmonized bands for public protection and disaster relief to the maximum extent possible, taking into account the national and regional requirements and also having regard to any needed consultation and cooperation with other concerned countries;

2 to encourage administrations, for the purposes of achieving regionally harmonized frequency bands/ranges for advanced public protection and disaster relief solutions, to consider the following identified frequency bands/ranges or parts thereof when undertaking their national planning:

- in Region 1: 380-470 MHz as the frequency range within which the band 380-385/390-395 MHz is a preferred core harmonized band for permanent public protection activities within certain countries of Region 1 which have given their agreement;
- in Region 2⁵: 746-806 MHz, 806-869 MHz, 4 940-4 990 MHz;

⁵ Venezuela has identified the band 380-400 MHz for public protection and disaster relief applications.

- in Region 3⁶: 406.1-430 MHz, 440-470 MHz, 806-824/851-869 MHz, 4 940-4 990 MHz and 5 850-5 925 MHz;
- 3 that the identification of the above frequency bands/ranges for public protection and disaster relief does not preclude the use of these bands/frequencies by any application within the services to which these bands/frequencies are allocated and does not preclude the use of nor establish priority over any other frequencies for public protection and disaster relief in accordance with the Radio Regulations;
- 4 to encourage administrations, in emergency and disaster relief situations, to satisfy temporary needs for frequencies in addition to what may be normally provided for in agreements with the concerned administrations;
- 5 that administrations encourage public protection and disaster relief agencies and organizations to utilize both existing and new technologies and solutions (satellite and terrestrial), to the extent practicable, to satisfy interoperability requirements and to further the goals of public protection and disaster relief;
- 6 that administrations may encourage agencies and organizations to use advanced wireless solutions taking into account *considering h) and i)* for providing complementary support to public protection and disaster relief;
- 7 to encourage administrations to facilitate cross-border circulation of radiocommunication equipment intended for use in emergency and disaster relief situations through mutual cooperation and consultation without hindering national legislation;
- 8 that administrations encourage public protection and disaster relief agencies and organizations to utilize relevant ITU-R Recommendations in planning spectrum use and implementing technology and systems supporting public protection and disaster relief;
- 9 to encourage administrations to continue to work closely with their public protection and disaster relief community to further refine the operational requirements for public protection and disaster relief activities;
- 10 that manufacturers should be encouraged to take this Resolution into account in future equipment designs, including the need for administrations to operate within different parts of the identified bands,

invites ITU-R

- 1 to continue its technical studies and to make recommendations concerning technical and operational implementation, as necessary, for advanced solutions to meet the needs of public protection and disaster relief radiocommunication applications, taking into account the capabilities, evolution and any resulting transition requirements of the existing systems, particularly those of many developing countries, for national and international operations;
- 2 to conduct further appropriate technical studies in support of possible additional identification of other frequency ranges to meet the particular needs of certain countries in Region 1 which have given their agreement, especially in order to meet the radiocommunication needs of public protection and disaster relief agencies.

⁶ Some countries in Region 3 have also identified the bands 380-400 MHz and 746-806 MHz for public protection and disaster relief applications.

MOD

RESOLUTION 647 (REV.WRC-12)

Spectrum management guidelines for emergency and disaster relief radiocommunication¹

The World Radiocommunication Conference (Geneva, 2012),

considering

- a) that natural disasters have underscored the importance of utilizing effective measures to mitigate their effects, including prediction, detection and alerting through the coordinated and effective use of radio-frequency spectrum;
- b) ITU's comprehensive role in emergency communications, not only in the field of radiocommunications, but also in the area of technical standards to facilitate interconnection and interoperability of networks for monitoring and management at the onset of and during emergency and disaster situations, and as an integral part of the telecommunication development agenda through the Hyderabad Action Plan;
- c) that Resolution **644 (Rev.WRC-12)**, on radiocommunication resources for early warning, disaster mitigation and relief operations, resolves that ITU-R continue to study, as a matter of urgency, those aspects of radiocommunications/ICT that are relevant to early warning, disaster mitigation and relief operations;
- d) that Resolution **646 (Rev.WRC-12)** addresses the broader category of public protection and disaster relief (PPDR) and encourages administrations to consider identified frequency bands/ranges or parts thereof when undertaking their national planning for the purposes of achieving regionally harmonized frequency bands/ranges for advanced public protection and disaster relief solutions;
- e) that Resolution 36 (Rev. Guadalajara, 2010) addresses the role of telecommunications/ICTs in the service of humanitarian assistance, Resolution 136 (Rev. Guadalajara, 2010) addresses the use of ICTs for monitoring and management in emergency and disaster situations for early warning, prevention, mitigation and relief, and Resolution 34 (Rev. Hyderabad, 2010) addresses the role of telecommunications/ICTs in disaster preparedness, early warning, rescue, mitigation, relief and response,

¹ The term "emergency and disaster relief radiocommunication" refers to radiocommunications used by agencies and organizations dealing with a serious disruption of the functioning of society, posing a significant widespread threat to human life, health, property or the environment, whether caused by accident, natural phenomena or human activity, and whether occurring suddenly or as a result of complex, long-term processes.

recognizing

- a) that the Tampere Convention on the Provision of Telecommunications Resources for Disaster Mitigation and Relief Operations (Tampere, 1998)², an international treaty deposited with the United Nations Secretary-General, calls on the States Parties, when possible, and in conformity with their national law, to develop and implement measures to facilitate the availability of telecommunication resources for such operations;
- b) that some administrations may have different operational needs and spectrum requirements for emergency and disaster-relief applications, depending on their circumstances;
- c) that the immediate availability of spectrum to support emergency radiocommunication equipment is important for successful telecommunications in the very early stages of humanitarian assistance intervention for disaster relief,

aware

of the progress made in regional organizations around the world, and in particular in regional telecommunication organizations, on matters related to emergency communications planning and response,

recognizing further

- a) Resolution ITU-R 55, which invites the ITU-R Study Groups to take into consideration the scope of ongoing studies/activities outlined in the annex to the Resolution, and to develop guidelines related to the management of radiocommunications in disaster prediction, detection, mitigation and relief, collaboratively and cooperatively, within ITU and with organizations external to the Union, in order to avoid duplication of effort;
- b) Resolution ITU-R 53, which instructs the Director of the Radiocommunication Bureau to assist Member States with their emergency radiocommunication preparedness activities such as the listing of currently available frequencies for use in emergency situations for inclusion in a database maintained by the Bureau,

noting

- a) that when a disaster occurs, the disaster relief agencies are usually the first on the scene using their day-to-day communication systems, but that in most cases other agencies and organizations may also be involved in disaster relief operations;
- b) that there is a critical requirement to perform immediate spectrum management actions, including frequency coordination, sharing and spectrum reuse, within a disaster area;
- c) that national spectrum planning for emergency and disaster relief should take into account the need for cooperation and bilateral consultation with other concerned administrations, which can be facilitated by spectrum harmonization, as well as agreed spectrum management guidelines pertaining to disaster relief and emergency planning;

² However, a number of countries have not ratified the Tampere Convention.

d) that in times of disasters, radiocommunication facilities may be destroyed or impaired and the national regulatory authorities may not be able to provide the necessary spectrum management services for the deployment of radio systems for relief operations;

e) that the identification of frequency availability within individual administrations within which equipment could operate may ease the interoperability and/or interworking, with mutual cooperation and consultation, especially in national, regional and cross-border emergency situations and disaster relief activities,

noting further

a) that flexibility must be afforded to disaster relief agencies and organizations to use current and future radiocommunications, so as to facilitate their humanitarian operations;

b) that it is in the interest of administrations and disaster relief agencies and organizations to have access to updated information on national spectrum planning for emergency and disaster relief,

taking into account

a) BR Circular Letters CR/281 (13 March 2008), CR/283 (6 May 2008) and its Corrigendum 1 (13 May 2008), CR/288 (17 July 2008) and CR/291 (9 October 2008), concerning the preparatory steps towards the establishment of a database of available frequencies/frequency bands for use by terrestrial and space services in emergency situations, as well as the data formats for their submission;

b) that, pursuant to BR Circular Letter CR/323 (31 March 2011), the Bureau advised all administrations that only limited information had been received for both terrestrial and space services,

resolves

1 to encourage administrations to communicate to BR, as soon as possible, the frequencies available for use in emergency and disaster relief;

2 to reiterate to administrations the importance of having frequencies available for use in the very early stages of humanitarian assistance intervention for disaster relief,

instructs the Director of the Radiocommunication Bureau

1 to continue to assist Member States with their emergency communication preparedness activities by maintaining the database³ of currently available frequencies for use in emergency situations, which are not limited to those listed in Resolution **646 (Rev.WRC-12)**, and by issuing an appropriate listing, taking into account Resolution ITU-R 53;

³ The database may be accessed at <http://www.itu.int/ITU-R/go/res647>.

2 to maintain the database and facilitate online access thereto by administrations, national regulatory authorities, disaster relief agencies and organizations, in particular the United Nations Emergency Relief Coordinator, in accordance with the operating procedures developed for disaster situations;

3 to collaborate with the United Nations Office for the Coordination of Humanitarian Affairs and other organizations, as appropriate, in the development and dissemination of standard operating procedures and relevant spectrum management practices for use in the event of a disaster situation;

4 to take into consideration all relevant activities in ITU's other two Sectors and General Secretariat;

5 to report on the progress on this Resolution to subsequent World Radiocommunication Conferences,

invites ITU-R

to conduct studies as necessary, and as a matter of urgency, in support of the establishment of appropriate spectrum management guidelines applicable in emergency and disaster relief operations,

invites the Director of the Telecommunication Standardization Bureau and the Director of the Telecommunication Development Bureau

to collaborate closely with the Director of the Radiocommunication Bureau to ensure that a consistent and coherent approach is adopted in the development of strategies in response to emergency and disaster situations,

urges administrations

1 to participate in the emergency communication preparedness activities described above and to provide the relevant information to the Bureau concerning their national frequency allocations and spectrum management practices for emergency and disaster relief radiocommunications, taking into account Resolution ITU-R 53;

2 to assist in keeping the database up to date by advising the Bureau on an ongoing basis of any modifications to the information requested above.

ADD

RESOLUTION 648 (WRC-12)

Studies to support broadband public protection and disaster relief

The World Radiocommunication Conference (Geneva, 2012),

considering

- a) that Resolution **646 (Rev.WRC-12)** encouraged administrations, for the purpose of achieving regionally harmonized frequency bands, to consider certain identified frequency bands on a regional basis for public protection and disaster relief (PPDR) solutions;
- b) that the scenarios for operational requirements for PPDR activities have undergone changes since 2003;
- c) that the demand for global development and enhancement of PPDR applications for public protection requirements has shown significant increase since 2003, in order to enable more efficient and more effective responses to both natural and man-made disasters, in addition to responding to routine daily events;
- d) that there has been remarkable growth in the data-traffic demand for broadband mobile public protection applications, including real-time mobile video applications, and for safety applications, and this tendency will continue to increase on a worldwide basis;
- e) that these demands are leading to the development of broadband PPDR technologies and applications;
- f) that the benefits of regionally or internationally harmonized frequency bands for PPDR include:
 - i) economies of scale and lower costs for implementing specialized systems for PPDR;
 - ii) interoperability of systems on a regional and worldwide basis;
 - iii) facilitation of local, regional and world planning and coordination activities in spectrum use;
- g) that significant economic and service interoperability benefits are known to accrue from the adoption of harmonized frequency bands;
- h) that there is increased potential for cooperation among public protection entities from various countries during incidents of criminal activity spanning multiple countries;
- i) that the ongoing development of various broadband technologies including IMTs can be suitable to support or complement advanced applications required for PPDR,

noting

- a) Report ITU-R M.2033, on radiocommunication objectives and requirements for public protection and disaster relief;
- b) Recommendation ITU-R M.1826, on harmonized frequency channel plan for broadband public protection and disaster relief operations at 4 940-4 990 MHz in Regions 2 and 3;
- c) draft new Recommendation ITU-R M.2015, on frequency arrangements for public protection and disaster relief (PPDR) radiocommunication systems in UHF bands in accordance with Resolution **646 (Rev.WRC-12)**;
- d) draft new Recommendation ITU-R M.2009, on radio interface standards for use by public protection and disaster relief operations in some parts of UHF bands in accordance with Resolution **646 (Rev.WRC-12)**;
- e) the changes that have occurred in the requirements for PPDR applications and the emerging demand for broadband PPDR applications, including high-speed data, video and multimedia,

recognizing

- a) that many new PPDR applications and scenarios, in particular the need for mobile video by PPDR organizations, were not envisaged during WRC-03;
- b) that it is timely to review Resolution **646 (Rev.WRC-12)** in order to consider the future direction of spectrum needs of public safety and disaster management agencies,

resolves to invite WRC-15

to consider the studies in *invites ITU-R* below on broadband PPDR and take appropriate action with regard to revision of Resolution **646 (Rev.WRC-12)**,

invites ITU-R

to study technical and operational issues relating to broadband PPDR and its further development, and to develop recommendations, as required, on:

- technical requirements for PPDR services and applications;
- the evolution of broadband PPDR through advances in technology;
- the needs of developing countries,

invites administrations

to participate in the studies by submitting contributions to ITU-R.

ADD

RESOLUTION 649 (WRC-12)

Possible allocation to the amateur service on a secondary basis at around 5 300 kHz

The World Radiocommunication Conference (Geneva, 2012),

considering

- a) that amateur stations are regularly used for emergency radiocommunications in the event of hurricanes, typhoons, floods, fires, volcanic eruptions, earthquakes and other disaster situations;
- b) that Recommendation ITU-R M.1042-3, on disaster communications in the amateur and amateur-satellite services, encourages the development of such services capable of providing radiocommunications in the event of natural disasters, and recommends that their networks be robust, flexible and independent of other telecommunication services and capable of operating from emergency power;
- c) that communications in the HF bands allocated to the amateur service play a major role in work to mitigate catastrophes and in the delivery of communications in support of relief operations in areas where the telecommunication infrastructure is weak or has collapsed;
- d) that the various frequency bands allocated to the amateur service are contained in the Table of Frequency Allocations in Article 5 of the Radio Regulations,

recognizing

- a) that radiocommunication in the HF bands is dependent on propagation factors, with the result that frequencies in different bands have to be used to maintain stable communication for a relatively sustained period of time, with frequency changes in the case of communications with different correspondents located at very different distances;
- b) that it is essential that, in all cases, the maximum usable frequency (MUF) should not be excessively far from the next band allocated to the amateur service, so as to permit the setting up of communications in this band using typical amateur service antennas and power levels;
- c) that, in the current allocations to the amateur service in the HF bands, there is a significant jump, which causes many problems in terms of communication when the MUF falls below 7 MHz and the lowest usable frequency (LUF) is above 4 MHz, with the result that amateur stations would need to be able to access spectrum at around 5 MHz in order to fulfil their communication functions, particularly when they are engaged in providing emergency communications in response to disaster situations,

noting

- a) that the band 5 250-5 450 kHz is allocated to the fixed and mobile services, except aeronautical mobile, on a primary basis;
- b) that an allocation of an appropriate amount of spectrum, not necessarily contiguous, to the amateur service at around 5 300 kHz would be adequate to better satisfy its needs associated with use for providing communications in disaster situations and during relief operations;
- c) that the band 10 100-10 150 kHz is already allocated to the fixed service on a primary basis and to the amateur service on a secondary basis, and that effective use of both services has been possible,

resolves to invite WRC-15

to consider, based on the results of the ITU-R studies referred to in *invites ITU-R* below, the possibility of making an allocation of an appropriate amount of spectrum, not necessarily contiguous, to the amateur service on a secondary basis within the band 5 250-5 450 kHz,

invites ITU-R

- 1 to study spectrum requirements for a secondary allocation to the amateur service within the band 5 250-5 450 kHz;
- 2 to carry out sharing studies on the impact to other services currently allocated in the band referred to in *invites ITU-R* 1 and in the adjacent bands;
- 3 to complete studies in time for WRC-15.

ADD

RESOLUTION 650 (WRC-12)

**Allocation for the Earth exploration-satellite service
(Earth-to-space) in the 7-8 GHz range**

The World Radiocommunication Conference (Geneva, 2012),

considering

- a)* that there is limited bandwidth available in the 2 025-2 110 MHz and 2 200-2 290 MHz bands for Earth exploration-satellite (EESS) satellite tracking, telemetry and control (TT&C) due to the fact that hundreds of satellites use these bands;
- b)* that an EESS (Earth-to-space) allocation in the 7-8 GHz range would allow its use for TT&C in combination with the existing EESS (space-to-Earth) allocation in the band 8 025-8 400 MHz, thereby alleviating the problem mentioned in *considering a)*;
- c)* that a preliminary sharing analysis indicates that the frequency range 7 145-7 235 MHz may present a favourable sharing scenario with the existing services;
- d)* that an EESS (Earth-to-space) allocation in the 7-8 GHz range would allow for uplinks and downlinks on the same transponder, increasing efficiency and reducing satellite complexity,

recognizing

that congestion in the 2 025-2 110 MHz and 2 220-2 290 MHz bands increases the probability of harmful interference, which could contribute to deleterious effects on critical environmental data available only through EESS satellite resources,

further recognizing

- a)* that the number of EESS ground station receivers in the band 8 025-8 400 MHz is small and that they are usually located at high latitudes;
- b)* that EESS telecommand uplinks and corresponding EESS ground station receivers typically share the same ground station locations;
- c)* that space research service (Earth-to-space) (deep space) transmitters operate in the 7 145-7 190 MHz band at several locations throughout the world,

resolves to invite ITU-R

- 1 to study spectrum requirements in the 7-8 GHz range for EESS (Earth-to-space) telecommand operations in order to complement telemetry operations of EESS (space-to-Earth) in the 8 025-8 400 MHz band;

2 to conduct compatibility studies between EESS (Earth-to-space) systems and existing services, with priority to the band 7 145-7 235 MHz, and then within other portions of the 7-8 GHz range only if the band 7 145-7 235 MHz is found not to be suitable;

3 to complete the studies as a matter of urgency, taking into account the present use of the allocated band, with a view to presenting, at the appropriate time, the technical basis for the work of WRC-15,

resolves to invite WRC-15

to review the results of these studies with a view to providing a worldwide primary allocation to EESS (Earth-to-space) in the range 7-8 GHz with priority to the band 7 145-7 235 MHz,

invites administrations

to participate actively in the studies by submitting contributions to ITU-R,

instructs the Secretary-General

to bring this Resolution to the attention of the World Meteorological Organization (WMO) and other international and regional organizations concerned.

ADD

RESOLUTION 651 (WRC-12)

Possible extension of the current worldwide allocation to the Earth exploration-satellite (active) service in the frequency band 9 300-9 900 MHz by up to 600 MHz within the frequency bands 8 700-9 300 MHz and/or 9 900-10 500 MHz

The World Radiocommunication Conference (Geneva, 2012),

considering

- a)* that there is a growing demand for increasing radar image resolution to satisfy global environmental monitoring which can only be achieved with greater transmission bandwidth;
- b)* that there is a need to provide additional frequency spectrum around the existing allocation to the Earth exploration-satellite service (EESS) (active) in the frequency band 9 300-9 900 MHz, in order to increase the available bandwidth by 600 MHz to satisfy the demand in *considering a)*;
- c)* that radars in EESS (active) operate worldwide in the frequency band 9 300-9 800 MHz on a primary basis under the constraints of No. **5.476A**, and in the frequency band 9 800-9 900 MHz on a secondary basis with respect to the radionavigation and the fixed services, which are both allocated in the frequency band 9 300-9 900 MHz;
- d)* that Recommendation ITU-R M.1796 contains the technical characteristics and protection criteria for radars in the frequency range 8 500-10 500 MHz;
- e)* that Report ITU-R RS.2094 contains studies related to the compatibility between EESS (active) and the radiodetermination service in the frequency bands 9 300-9 500 MHz and 9 800-10 000 MHz and between EESS (active) and the fixed service in the frequency band 9 800-10 000 MHz,

recognizing

- a)* that the EESS (active) is of great value for the global community as identified in Part A of Report ITU-R RS.2178 and Recommendation ITU-R RS.1859;
- b)* that the envisaged resolution performance of space-borne radars in the EESS (active) in the 9 GHz range requires an additional transmission bandwidth of 600 MHz since the resolution performance of a radar is directly related to its transmission bandwidth;
- c)* that the aeronautical radionavigation service operating in the frequency band 9 000-9 200 MHz and the maritime radionavigation service operating in the frequency band 9 200-9 500 MHz are used by safety service systems, in accordance with Nos. **1.59** and **4.10**;
- d)* that it is important to ensure the protection of the existing primary services, including fixed and mobile services, having allocations in the frequency bands 8 700-9 300 MHz and 9 900-10 500 MHz;

e) that it is important to ensure the protection of existing primary space research service operations in the frequency bands 8 400-8 500 MHz and 10.6-10.7 GHz;

f) that it is important to protect the existing primary radio astronomy service and EESS (passive) in the frequency band 10.6-10.7 GHz,

noting

that Resolution 174 (Guadalajara, 2010) of the Plenipotentiary Conference highlights the importance of ICTs, especially for developing countries, for the monitoring and observation of climate change, the management of natural resources and reduction of the risk of natural disasters,

resolves

that, taking into account the results of ITU-R studies, WRC-15 consider the possible extension of the current worldwide allocation to the EESS (active) in the frequency band 9 300-9 900 MHz by up to 600 MHz on a primary and/or secondary basis, as appropriate, within the frequency range 8 700-9 300 MHz and/or 9 900-10 500 MHz while ensuring protection of existing services and taking due account of the safety services allocated in the frequency band 9 000 to 9 300 MHz,

invites ITU-R

to conduct and complete, in time for WRC-15, compatibility studies addressing:

- EESS (active) and existing services in the frequency bands 8 700-9 300 MHz and 9 900-10 500 MHz in order to ensure the protection of the existing services, taking into account the constraints as per No. **5.476A**;
- unwanted emissions from stations operating in the EESS (active) within the frequency band 8 700-9 300 MHz into stations of the space research service operating in the frequency band 8 400-8 500 MHz;
- unwanted emissions from stations operating in the EESS (active) within the frequency band 9 900-10 500 MHz into stations of the radio astronomy service, space research service (passive) and EESS (passive) operating in the frequency band 10.6-10.7 GHz,

instructs the Secretary-General

to bring this Resolution to the attention of the International Civil Aviation Organization (ICAO), and International Maritime Organization (IMO).

ADD

RESOLUTION 652 (WRC-12)

Use of the band 410-420 MHz by the space research service (space-to-space)

The World Radiocommunication Conference (Geneva, 2012),

considering

- a)* that the band 410-420 MHz is allocated to the fixed, mobile (except aeronautical mobile) and space research (space-to-space) services on a primary basis subject to No. **5.268**;
- b)* that No. **5.268** restricts the space research service (SRS) (space-to-space) to operations within 5 km of an orbiting manned space vehicle;
- c)* that No. **5.268** further identifies use of the band 410-420 MHz by SRS (space-to-space) for extra-vehicular activities (EVA),

recognizing

- a)* that use of the band 410-420 MHz for proximity operations by space vehicles approaching orbiting manned space vehicles, such as the International Space Station (ISS), would be advantageous as the propagation and physical properties of this frequency range enable comparable coverage performance in the highly multipath environment of the ISS;
- b)* that space vehicles, whether manned or robotic, operating in the vicinity or approaching the ISS or other orbiting manned space vehicles, need to communicate over distances greater than 5 km to ensure safe operations and docking manoeuvres;
- c)* that power flux-density (pfd) limits contained in No. **5.268** ensure the protection of terrestrial stations operating in the fixed and mobile services independent of the distance from, or the source of, space-to-space communications in the SRS,

recognizing further

- a)* that administrations operating orbiting manned space vehicles carefully coordinate frequency usage on and in the vicinity of the manned space vehicle to ensure safe operation;
- b)* that EVA operations would not be conducted simultaneously with visiting vehicle approach and docking manoeuvres,

resolves to invite ITU-R

- 1 to conduct sharing studies between SRS (space-to-space) systems communicating in proximity with orbiting manned space vehicles and systems operating in the fixed and mobile (except aeronautical mobile) services in the band 410-420 MHz;

2 to complete the studies, as a matter of urgency, taking into account the present use of the allocated band, with a view to presenting, at the appropriate time, the technical basis for the work of WRC-15,

resolves to invite WRC-15

1 to review No. **5.268**, taking into account the results of ITU-R studies, including the possible removal or relaxation of the 5 km distance limitation without modifying the current pfd limits;

2 to review No. **5.268** to allow more general use of the 410-420 MHz band for SRS (space-to-space) systems beyond extra-vehicular activities,

invites administrations

to participate actively in the studies by submitting contributions to ITU-R,

instructs the Secretary-General

to bring this resolution to the attention of the Space Frequency Coordination Group (SFCG) and other international and regional organizations concerned.

ADD

RESOLUTION 653 (WRC-12)

Future of the Coordinated Universal Time time-scale

The World Radiocommunication Conference (Geneva, 2012),

considering

- a)* that the procedures for maintaining the Coordinated Universal Time (UTC) time-scale are described by Recommendation ITU-R TF.460-6;
- b)* that UTC is the legal basis for time-keeping for most countries in the world, and *de facto* is the time-scale used in most others;
- c)* that Recommendation ITU-R TF.460-6 states that all standard-frequency and time signal emissions should conform as closely as possible to UTC;
- d)* that Recommendation ITU-R TF.460-6 describes the procedure for the occasional insertion of leap seconds into UTC to ensure that it does not differ by more than 0.9 seconds from the time determined by the rotation of the Earth (UT1);
- e)* that the occasional insertion of leap seconds into UTC may create difficulties for systems and applications that depend on accurate timing,

recognizing

- a)* that some organizations involved with space activities, global navigation satellite systems, metrology, telecommunications, network synchronization and electric power distribution have requested a continuous time-scale;
- b)* that for local time-of-day and for other specialized systems, there is a need for a time-scale reckoned with respect to the rotation of the Earth, such as the mean solar time at the prime meridian, formerly known as GMT;
- c)* that a change in the reference time-scale may have operational and therefore economic consequences,

noting

- a)* that No. **1.14** defines UTC as a time-scale based on the second (SI), as defined in Recommendation ITU-R TF.460-6;
- b)* that modification of the definition of UTC may have consequential changes to Nos. **1.14**, **2.5**, **2.6** and some other provisions,

resolves to invite WRC-15

to consider the feasibility of achieving a continuous reference time-scale, whether by the modification of UTC or some other method, and take appropriate action, taking into account ITU-R studies,

invites ITU-R

1 to conduct the necessary studies on the feasibility of achieving a continuous reference time-scale for dissemination by radiocommunication systems;

2 to study issues related to the possible implementation of a continuous reference time-scale (including technical and operational factors);

invites administrations

to participate in the studies by submitting contributions to ITU-R,

instructs the Director of the Radiocommunication Bureau

to bring this Resolution to the attention of ITU-T,

instructs the Secretary-General

to bring this Resolution to the attention of relevant organizations such as the International Maritime Organization (IMO), the International Civil Aviation Organization (ICAO), the General Conference of Weights and Measures (CGPM), the Consultative Committee for Time and Frequency (CCTF), the Bureau International des Poids et Mesures (BIPM), the International Earth Rotation and Reference Systems Service (IERS), the International Union of Geodesy and Geophysics (IUGG), the International Union of Radio Science (URSI), the International Organization for Standardization (ISO), the World Meteorological Organization (WMO) and the International Astronomical Union (IAU).

ADD

RESOLUTION 654 (WRC-12)

Allocation of the band 77.5-78 GHz to the radiolocation service to support automotive short-range high-resolution radar operations

The World Radiocommunication Conference (Geneva 2012),

considering

- a)* that the use of information and communication technologies (ICT) within intelligent transport systems (ITS), such as automotive short-range high-resolution radars (SRR), may significantly contribute to the improvement of road safety;
- b)* that the availability of spectrum for components of ITS such as SRR would contribute to the goal of improving road safety, including distracted driving, transport efficiency and the quality of the environment;
- c)* that ITU-R has been studying short-range vehicular radars;
- d)* that worldwide compatibility of spectrum allocation would be beneficial in terms of efficient use of spectrum and economies of scale, in order to give the automotive industry as well as the components industry the confidence to make substantial investment in SRR technology;
- e)* that the frequency bands 76-77.5 GHz and 78-81 GHz are already allocated to the radiolocation service on a primary basis in all three ITU Regions;
- f)* that the 77-81 GHz frequency band seems to be the most suitable band for SRR, since 76-77 GHz is designated for long-range automotive radars in many countries and sharing studies have concluded that sharing is not achievable between short-range and long-range automotive radars;
- g)* that the frequency band 77-81 GHz is already designated for SRR in many countries worldwide;
- h)* that the frequency band 77.5-78 GHz is allocated to the amateur and amateur-satellite services on a primary basis and to the radio astronomy service (RAS) and space research (space-to-Earth) service on a secondary basis;
- i)* that the aggregate effect of the automotive SRR must be considered;
- j)* that the 76-77.5 GHz and 79-81 GHz bands are allocated to the RAS on a primary basis, and the 77.5-79 GHz band is allocated to the RAS on a secondary basis;
- k)* that the 76-77.5 GHz and 78-81 GHz bands are allocated to the amateur, amateur-satellite and space research (space-to-Earth) services on a secondary basis;
- l)* that sharing with the radio astronomy service has been studied in some countries concluding that SRR operating in the vicinity of radio astronomy stations may cause interference to those stations, but that regulatory measures could be identified enabling coexistence between SRR and the radio astronomy service in the frequency band 77-81 GHz, which is dependent on the aggregated impact of SRR devices transmitting in the direction of a radio astronomy station;

m) that Resolution ITU-R 54-1 calls for studies to achieve harmonization for SRDs,
recognizing

ITU Council Resolution 1318 (Council 2010), on ITU's role in ICTs and improving road safety,
noting

a) that Recommendation ITU-R M.1890, on intelligent transport systems (ITS) – guidelines and objectives, provides general guidelines for ITS radiocommunication systems which covers also SRR;

b) that Recommendation ITU-R M.1452 provides guidance on the use of millimetre wave vehicular radar equipment and on technical characteristics of millimetre wave radiocommunication systems for data communications to be used for ITS;

c) that, while vehicular SRR is expected to contribute significantly to road safety, such applications have not been defined as a safety service according to No. **1.59** or subject to No. **4.10**,

resolves to invite WRC-15

to consider a primary allocation to the radiolocation service in the 77.5-78 GHz frequency band, taking into account the results of ITU-R studies,

invites ITU-R

to conduct, as a matter of urgency, and in time for consideration by WRC-15, the appropriate technical, operational and regulatory studies, including:

- i)* sharing studies and regulatory solutions to consider a primary allocation to the radiolocation service in the band 77.5-78 GHz, taking into account incumbent services and existing uses of the band;
- ii)* compatibility studies in the band 77.5-78 GHz with services operating in the adjacent bands 76-77.5 GHz and 78-81 GHz;
- iii)* spectrum requirements, operational characteristics and evaluation of ITS safety-related applications that would benefit from global or regional harmonization,

invites administrations

to contribute actively to ITU-R studies on this issue,

instructs the Secretary-General

to bring this Resolution to the attention of the international and regional organizations concerned, including ISO and the ITU's Collaboration on ITS Communication Standards.

MOD

RESOLUTION 673 (REV.WRC-12)

The importance of Earth observation radiocommunication applications

The World Radiocommunication Conference (Geneva, 2012),

considering

- a) that the collection and exchange of Earth observation data are essential for maintaining and improving the accuracy of weather forecasts, which contribute to the protection of life and preservation of property throughout the world;
- b) that Earth observation data are also essential for monitoring and predicting climate changes, for disaster prediction, monitoring and mitigation, for increasing the understanding, modelling and verification of all aspects of climate change, and for related policy-making;
- c) that Earth observations are also used to obtain pertinent data regarding natural resources, this being particularly crucial for the benefit of developing countries;
- d) that observations of the Earth's surface are also used for a large variety of other applications (e.g. urban developments, utilities deployments, agriculture, security);
- e) that many observations are performed over the entire world which require spectrum-related issues to be considered on a worldwide basis;
- f) that the importance of Earth observation radiocommunication applications has been stressed by a number of international bodies such as the World Meteorological Organization (WMO), the Intergovernmental Panel on Climate Change (IPCC) and the Group on Earth Observation (GEO), and that ITU-R collaboration with these bodies is essential;
- g) that, although meteorological and Earth observation satellites are currently operated by only a limited number of countries, the data and/or related analyses resulting from their operation are distributed and used globally, in particular by national weather services in developed and developing countries and by climate change-related organizations;
- h) that Earth observations are performed for the benefit of the whole international community and the data are generally made available at no cost,

recalling

- a) the Plan of Action of the World Summit on the Information Society (Geneva, 2003), on e-environment, calling for the establishment of monitoring systems, using information and communication technologies (ICT), to forecast and monitor the impact of natural and man-made disasters, particularly in developing countries, least developed countries and small economies;
- b) Resolution 136 (Rev. Guadalajara, 2010) of the Plenipotentiary Conference, on the use of telecommunications/information and communication technologies for monitoring and management in emergency and disaster situations for early warning, prevention, mitigation and relief;

c) Resolution 182 (Guadalajara, 2010) of the Plenipotentiary Conference, on the role of telecommunications/information and communication technologies on climate change and the protection of the environment,

recognizing

a) Recommendations ITU-R RS.1859 “Use of remote sensing systems for data collection to be used in the event of natural disasters and similar emergencies” and ITU-R RS.1883 “Use of remote sensing systems in the study of climate change and the effects thereof”;

b) the Report on Question ITU-D 22/2 “Utilization of ICT for disaster management, resources and active and passive space-based sensing systems as they apply to disaster and emergency relief situations”;

c) joint WMO-ITU Handbook on “Use of Radio Spectrum for Meteorology: Weather, Water and Climate Monitoring and Prediction” and ITU-R Handbook on “Earth exploration-satellite service”,

further recognizing

Report ITU-R RS.2178 “The essential role and global importance of radio spectrum use for Earth observations and for related applications”,

noting

a) that *in situ* and remote Earth observation capabilities depend on the availability of radio frequencies under a number of radio services, allowing for a wide range of passive and active applications on satellite- or ground-based platforms (see Report ITU-R RS.2178);

b) that, according to the United Nations Framework Convention on Climate Change (UNFCCC), more than 90 per cent of natural disasters are climate- or weather-related;

c) that for certain Earth observation applications, long-term consistency of measurements is essential (e.g. climate change);

d) that certain frequency bands used by Earth observation applications have unique physical characteristics (e.g. spectral lines), so that migration to alternative frequency bands is not possible;

e) that some essential passive frequency bands are covered by No. **5.340** of the Radio Regulations;

f) that some essential passive Earth observation sensors could suffer from interference resulting in erroneous data or even complete loss of data,

resolves

1 to continue to recognize that the use of spectrum by Earth observation applications has a considerable societal and economic value;

2 to urge administrations to take into account Earth observation radio-frequency requirements and in particular protection of the Earth observation systems in the related frequency bands;

3 to encourage administrations to consider the importance of the use and availability of spectrum for Earth observation applications prior to taking decisions that would negatively impact the operation of these applications.

MOD

RESOLUTION 716 (REV.WRC-12)

**Use of the frequency bands 1 980-2 010 MHz and 2 170-2 200 MHz in
all three Regions and 2 010-2 025 MHz and 2 160-2 170 MHz in
Region 2 by the fixed and mobile-satellite services
and associated transition arrangements**

The World Radiocommunication Conference (Geneva, 2012),

considering

- a)* that WARC-92 allocated the bands 1 980-2 010 MHz and 2 170-2 200 MHz for the mobile-satellite service (MSS) with a date of entry into force of 1 January 2005, these allocations being co-primary with fixed and mobile service allocations;
- b)* that the use of the frequency bands 1 980-2 010 MHz and 2 170-2 200 MHz in all three Regions and 2 010-2 025 MHz and 2 160-2 170 MHz in Region 2 by the MSS, in accordance with the provisions of Nos. **5.389A** and **5.389C** of the Radio Regulations, as adopted by WRC-95 and WRC-97, is subject to a date of entry into force of 1 January 2000, 1 January 2002 (for Region 2) or 1 January 2005;
- c)* that these bands are shared with the fixed and mobile¹ services on a primary basis and that they are widely used by the fixed service in many countries;
- d)* that the studies made have shown that, while sharing of the MSS with the fixed service in the short to medium term would be generally feasible, in the long term sharing will be complex and difficult in both bands, so that it would be advisable to transfer the fixed service stations operating in the bands in question to other segments of the spectrum;
- e)* that for many developing countries, the use of the 2 GHz band offers a substantial advantage for their radiocommunication networks and that it is not attractive to transfer these systems to higher frequency bands because of the economic consequences that this would entail;
- f)* that ITU-R has developed a new frequency plan for the fixed service in the 2 GHz band, set out in Recommendation ITU-R F.1098 which will facilitate the introduction of new fixed service systems in band segments that do not overlap with the above-mentioned MSS allocations at 2 GHz;
- g)* that sharing between fixed service systems using tropospheric scatter and Earth-to-space links in the MSS in the same frequency band segments is generally not feasible;
- h)* that some countries utilize these bands in application of Article 48 of the Constitution (Geneva, 1992),

¹ This Resolution does not apply to the mobile service. In this respect, the use of these bands by the MSS is subject to coordination with the mobile service under the provisions of No. **9.11A**, where applicable.

recognizing

a) that the bands 1 885-2 025 MHz and 2 110-2 200 MHz have been identified for worldwide use by International Mobile Telecommunications (IMT), the satellite component being limited to the bands 1 980-2 010 MHz and 2 170-2 200 MHz, and that the development of IMT can offer great potential in helping the developing countries develop more rapidly their telecommunication infrastructure;

b) that WARC-92 resolved to request the Telecommunication Development Bureau, when formulating its immediate plans for assistance to the developing countries, to consider the introduction of specific modifications in the radiocommunication networks of the developing countries and that a future world development conference should examine the needs of developing countries and should assist them with the resources needed to implement the required modifications to their radiocommunication networks,

noting

that in response to Resolution **716 (WRC-95)**, ITU-R developed Recommendation ITU-R F.1335, which provides planning tools necessary to assist those administrations considering replanning of their terrestrial networks to accommodate the MSS in the 2 GHz bands,

resolves

1 to request administrations to notify to the Radiocommunication Bureau the basic characteristics of frequency assignments to existing or planned fixed stations requiring protection, or those typical² of existing and planned fixed stations brought into use before 1 January 2000 in the frequency bands 1 980-2 010 MHz and 2 170-2 200 MHz in all three Regions and 2 010-2 025 MHz and 2 160-2 170 MHz in Region 2;

2 that administrations proposing to bring an MSS system into service must take account of the fact that, when coordinating their system with administrations having terrestrial services, such administrations may have existing or planned installations covered by Article 48 of the Constitution;

3 that in respect of stations of the fixed service taken into account in the application of No. **9.11A**, administrations responsible for MSS networks operating in the bands 1 980-2 010 MHz and 2 170-2 200 MHz in all three Regions and 2 010-2 025 MHz and 2 160-2 170 MHz in Region 2 shall ensure that unacceptable interference is not caused to fixed service stations notified and brought into use before 1 January 2000;

4 that to facilitate the introduction and future use of the 2 GHz bands by the MSS:

4.1 administrations are urged to ensure that frequency assignments to new fixed service systems, to be brought into operation after 1 January 2000, do not overlap with the 1 980-2 010 MHz and 2 170-2 200 MHz in all three Regions and 2 010-2 025 MHz and 2 160-2 170 MHz in Region 2 MSS allocations, for example by using the channel plans of Recommendation ITU-R F.1098;

² With respect to the notification of frequency assignments to stations in the fixed and mobile services, it was possible to notify the characteristics of typical stations in the fixed service in accordance with No. **11.17** without restriction up until 1 January 2000.

4.2 administrations are urged to take all practicable steps to phase out troposcatter systems operating in the band 1 980-2 010 MHz in all three Regions and 2 010-2 025 MHz in Region 2 by 1 January 2000. New troposcatter systems shall not be brought into operation in these bands;

4.3 administrations are encouraged, where practicable, to draw up plans for the gradual transfer of the frequency assignments to their fixed service stations in the bands 1 980-2 010 MHz and 2 170-2 200 MHz in all three Regions and 2 010-2 025 MHz and 2 160-2 170 MHz in Region 2 to non-overlapping bands, giving priority to the transfer of their frequency assignments in the band 1 980-2 010 MHz in all three Regions and 2 010-2 025 MHz in Region 2, considering the technical, operational and economical aspects;

5 that administrations responsible for the introduction of mobile-satellite systems should take into account and address the concerns of affected countries, especially developing countries, to minimize the possible economic impact of transition measures in respect to existing systems;

6 to invite the Telecommunication Development Bureau to provide assistance to developing countries requesting it for the introduction of specific modifications to their radiocommunication networks that will facilitate their access to the new technologies being developed in the 2 GHz band as well as in all coordination activities;

7 that administrations responsible for the introduction of mobile-satellite systems urge their mobile-satellite system operators to participate in the protection of terrestrial fixed services especially in the least developed countries,

invites ITU-R

to conduct, as a matter of urgency, further studies, in conjunction with the Bureau, to develop and provide to administrations the necessary tools in a timely manner to assess the impact of interference in the detailed coordination of mobile-satellite systems,

invites ITU-D

to evaluate, as a matter of urgency, the financial and economic impact on the developing countries of the transfer of fixed services, and to present its results to a future competent world radiocommunication conference and/or world telecommunication development conference,

invites the Director of the Telecommunication Development Bureau

to implement *invites ITU-D* by encouraging joint activities between the relevant study groups of both ITU-D and ITU-R,

instructs the Director of the Radiocommunication Bureau

to submit a report on the implementation of this Resolution to world radiocommunication conferences.

MOD

RESOLUTION 731 (REV.WRC-12)

**Consideration of sharing and adjacent-band compatibility
between passive and active services above 71 GHz**

The World Radiocommunication Conference (Geneva, 2012),

considering

- a) that the changes made to the Table of Frequency Allocations by the World Radiocommunication Conference (Istanbul, 2000) in bands above 71 GHz were based on the requirements known at the time of that Conference;
- b) that the passive service spectrum requirements above 71 GHz are based on physical phenomena and therefore are well known, and are reflected in the changes made to the Table of Frequency Allocations by that Conference;
- c) that several bands above 71 GHz are already used by Earth exploration-satellite service (passive) and space research service (passive) because they are unique bands for the measurement of specific atmospheric parameters;
- d) that there is currently only limited knowledge of requirements and implementation plans for the active services that will operate in bands above 71 GHz;
- e) that, in the past, technological developments have led to viable communication systems operating at increasingly higher frequencies, and that this can be expected to continue so as to make communication technology available in the future in the frequency bands above 71 GHz;
- f) that, in the future, alternative spectrum needs for the active and passive services should be accommodated when the new technologies become available;
- g) that, following the revisions to the Table of Frequency Allocations by the World Radiocommunication Conference (Istanbul, 2000), sharing studies may still be required for services in some bands above 71 GHz;
- h) that interference criteria for passive sensors have been developed and are given in Recommendation ITU-R RS.1029;
- i) that protection criteria for radio astronomy have been developed and are given in Recommendation ITU-R RA.769;
- j) that several satellite downlink allocations have been made in bands adjacent to those allocated to the radio astronomy service;
- k) that, sharing criteria for active and passive services in bands above 71 GHz have not yet been fully developed within ITU-R;
- l) that, in order to ensure protection of passive services above 71 GHz, the World Radiocommunication Conference (Istanbul, 2000) avoided making allocations to both active and passive services in some bands such as 100-102 GHz, 148.5-151.5 GHz and 226-231.5 GHz, so as to prevent potential sharing problems,

recognizing

that, to the extent practicable, the burden of sharing among active and passive services should be equitably distributed among the services to which allocations are made,

resolves

to invite a future competent world radiocommunication conference to consider the results of ITU-R studies referred to in *invites ITU-R* below with a view to taking the necessary action, as appropriate, in order to accommodate the emerging requirements of active services, taking into account the requirements of the passive services, in bands above 71 GHz,

urges administrations

to note the possibility of changes to Article 5 to accommodate emerging requirements for active services, as indicated in this Resolution, and to take this into account in the development of national policies and regulations,

invites ITU-R

1 to continue its studies to determine if and under what conditions sharing is possible between active and passive services in the bands above 71 GHz, such as, but not limited to, 100-102 GHz, 116-122.25 GHz, 148.5-151.5 GHz, 174.8-191.8 GHz, 226-231.5 GHz and 235-238 GHz;

2 to study means of avoiding adjacent-band interference from space services (downlinks) into radio astronomy bands above 71 GHz;

3 to take into account the principles of burden-sharing to the extent practicable in their studies;

4 to complete the necessary studies when the technical characteristics of the active services in these bands are known;

5 to develop Recommendations specifying sharing criteria for those bands where sharing is feasible,

instructs the Secretary-General

to bring this Resolution to the attention of the international and regional organizations concerned.

MOD

RESOLUTION 732 (REV.WRC-12)

Consideration of sharing between active services above 71 GHz

The World Radiocommunication Conference (Geneva, 2012),

considering

- a) that the World Radiocommunication Conference (Istanbul, 2000) has made changes to the Table of Frequency Allocations above 71 GHz, following consideration of science service issues;
- b) that there are several co-primary active services in some bands above 71 GHz in the Table of Frequency Allocations as revised by the World Radiocommunication Conference (Istanbul, 2000);
- c) that there is still limited knowledge of characteristics of active services that may be developed to operate in bands above 71 GHz;
- d) that sharing criteria for sharing between active services in bands above 71 GHz have not yet been fully developed within ITU-R;
- e) that sharing between multiple co-primary active services may hinder the development of each active service in bands above 71 GHz;
- f) that the technology for some active services may be commercially available earlier than for some other active services;
- g) that adequate spectrum should be available for the active services for which the technology is available at a later time,

noting

that sharing criteria need to be developed and included in ITU-R Recommendations, which may be used by a future competent conference, for determining to what extent sharing between multiple co-primary active services is possible in each of the bands,

resolves

- 1 that appropriate measures should be taken to meet the spectrum requirements for active services for which the technology will be commercially available at a later time;
- 2 that sharing criteria be developed for co-primary active services in bands above 71 GHz;
- 3 that the sharing criteria developed should form the basis for a review of active service allocations above 71 GHz at a future competent conference, if necessary,

urges administrations

to note the possibility of changes to Article 5 to accommodate emerging requirements for active services, as indicated in this Resolution, and to take this into account in the development of national policies and regulations,

invites ITU-R

to complete the necessary studies and develop ITU-R Recommendation(s) with a view to presenting, at the appropriate time, the technical information likely to be required as a basis for the work of a future competent conference,

instructs the Secretary-General

to bring this Resolution to the attention of the international and regional organizations concerned.

MOD

RESOLUTION 741 (REV.WRC-12)

Protection of the radio astronomy service in the band 4 990-5 000 MHz from unwanted emissions of the radionavigation-satellite service (space-to-Earth) operating in the frequency band 5 010-5 030 MHz

The World Radiocommunication Conference (Geneva, 2012),

considering

- a) that unwanted emissions from space stations of the radionavigation-satellite service (RNSS) operating in the frequency band 5 010-5 030 MHz may cause interference to the radio astronomy service (RAS) in the band 4 990-5 000 MHz;
- b) that WRC-2000 decided to introduce a provisional power flux-density (pfd) limit in the band 4 990-5 000 MHz to protect the RAS, and invited ITU-R to conduct studies to review this limit;
- c) that protection requirements for the RAS are given in Recommendations ITU-R RA.769 and ITU-R RA.1513, and are different for geostationary (GSO) and non-GSO satellite systems,

noting

- a) that Recommendation ITU-R M.1583 provides a methodology based on the equivalent pfd (epfd) concept for calculation of interference resulting from unwanted emissions from non-GSO systems of the mobile-satellite service or RNSS into radio astronomy stations;
- b) that Recommendation ITU-R RA.1631 provides antenna patterns and maximum antenna gain to be used for compatibility analyses between non-GSO systems and RAS stations based on the epfd concept;
- c) that Recommendation ITU-R RA.1513 recommends acceptable levels of data loss to radio astronomy observations, stating in particular that the percentage of data loss caused by any system should be lower than 2%;
- d) that as from the end of WRC-03, the Radiocommunication Bureau reviewed all RNSS systems for which complete coordination or notification information, as appropriate, had been received for the band 5 010-5 030 MHz, and revised its findings regarding compliance with No. **5.443B**, taking into account additional information received under *resolves* 4,

resolves

1 that in order not to cause harmful interference to the RAS in the band 4 990-5 000 MHz, the pfd produced in this band by any GSO RNSS network operating in the 5 010-5 030 MHz band shall not exceed $-171 \text{ dB(W/m}^2\text{)}$ in a 10 MHz band at any radio astronomy station;

2 that in order not to cause harmful interference to the RAS in the band 4 990-5 000 MHz, over the whole sky, for elevations higher than the minimum operating elevation angle θ_{min} ¹ specified for the radio telescope, the epfd produced in this band by all space stations within any non-GSO RNSS system operating in the 5 010-5 030 MHz band shall not exceed $-245 \text{ dB(W/m}^2\text{)}$ in a 10 MHz band at any radio astronomy station for more than 2% of the time, using the methodology in Recommendation ITU-R M.1583-1 and a reference antenna with a radiation pattern and maximum antenna gain given in Recommendation ITU-R RA.1631;

3 that the limits referred to in *resolves* 1 and 2 shall apply to RNSS systems as from 3 June 2000;

4 that administrations planning to operate a GSO or a non-GSO RNSS system in the band 5 010-5 030 MHz, for which complete coordination or notification information, as appropriate, has been received by the Bureau after 2 June 2000, shall send to the Bureau the value of the maximum level of pfd as referred to in *resolves* 1 or the value of the maximum level of epfd as referred to in *resolves* 2, as appropriate.

¹ Until adoption of a definition of θ_{min} by ITU-R, and publication of notified radio astronomy observatory data, a value of 5° should be assumed in appropriate calculations.

MOD

RESOLUTION 748 (REV.WRC-12)

Compatibility between the aeronautical mobile (R) service and the fixed-satellite service (Earth-to-space) in the band 5 091-5 150 MHz

The World Radiocommunication Conference (Geneva, 2012),

considering

- a) that the allocation of the 5 091-5 150 MHz band to the fixed-satellite service (FSS) (Earth-to-space) is limited to feeder links of non-geostationary-satellite (non-GSO) systems in the mobile-satellite service (MSS);
- b) that the frequency band 5 000-5 150 MHz is currently allocated to the aeronautical mobile-satellite (R) service (AMS(R)S), subject to agreement obtained under No. **9.21**, and to the aeronautical radionavigation service (ARNS);
- c) that WRC-07 allocated the band 5 091-5 150 MHz to the aeronautical mobile service (AMS) on a primary basis subject to No. **5.444B**;
- d) that the International Civil Aviation Organization (ICAO) is in the process of identifying the technical and operating characteristics of new systems operating in the AM(R)S in the band 5 091-5 150 MHz;
- e) that the compatibility of one AM(R)S system, to be used by aircraft operating on the airport surface, and the FSS has been demonstrated in the 5 091-5 150 MHz band;
- f) that ITU-R studies have examined potential sharing among AMS applications and have shown that the aggregate interference from aeronautical telemetry and AM(R)S should total no more than 3% $\Delta T_s/T_s$;
- g) that the frequency band 117.975-137 MHz currently allocated to the AM(R)S is reaching saturation in certain areas of the world, and therefore that band would not be available to support additional surface applications at airports;
- h) that this new allocation is intended to support the introduction of applications and concepts in air traffic management which are data intensive, and which will support data links that carry safety-critical aeronautical data,

recognizing

- a) that in the frequency band 5 030-5 091 MHz priority is to be given to the microwave landing system (MLS) in accordance with No. **5.444**;
- b) that ICAO publishes recognized international aeronautical standards for AM(R)S systems;
- c) that Resolution **114 (Rev.WRC-12)** applies to the sharing conditions between the FSS and ARNS in the 5 091-5 150 MHz band,

noting

- a) that the number of FSS transmitting stations required may be limited;

b) that the use of the band 5 091-5 150 MHz by the AM(R)S needs to ensure protection of the current or planned use of this band by the FSS (Earth-to-space);

c) that ITU-R studies describe methods for ensuring compatibility between the AM(R)S and FSS operating in the band 5 091-5 150 MHz, and compatibility has been demonstrated for the AM(R)S system referred to in *considering e)*,

resolves

1 that any AM(R)S systems operating in the band 5 091-5 150 MHz shall not cause harmful interference to, nor claim protection from, systems operating in the ARNS;

2 that any AM(R)S systems operating in the frequency band 5 091-5 150 MHz shall meet the SARPs requirements published in Annex 10 of the ICAO Convention on International Civil Aviation and the requirements of Recommendation ITU-R M.1827, to ensure compatibility with FSS systems operating in that band;

3 that, in part to meet the provisions of No. **4.10**, the coordination distance with respect to stations in the FSS operating in the band 5 091-5 150 MHz shall be based on ensuring that the signal received at the AM(R)S station from the FSS transmitter does not exceed -143 dB(W/MHz), where the required basic transmission loss shall be determined using the methods described in Recommendations ITU-R P.525-2 and ITU-R P.526-11,

invites

1 administrations to supply technical and operational criteria necessary for sharing studies for the AM(R)S, and to participate actively in such studies;

2 ICAO and other organizations to actively participate in such studies,

instructs the Secretary-General

to bring this Resolution to the attention of ICAO.

MOD

RESOLUTION 749 (REV.WRC-12)

Use of the band 790-862 MHz in countries of Region 1 and the Islamic Republic of Iran by mobile applications and by other services

The World Radiocommunication Conference (Geneva, 2012),

considering

- a) that the favourable propagation characteristics of the band 470-862 MHz are beneficial to provide cost-effective solutions for coverage, including large areas of low population density;
- b) that the operation of broadcasting stations and base stations of the mobile service in the same geographical area may create incompatibility issues;
- c) that many communities are particularly underserved compared to urban centres;
- d) that applications ancillary to broadcasting are sharing the band 470-862 MHz with the broadcasting service in all three Regions, and are expected to continue their operations in this band;
- e) that it is necessary to adequately protect, *inter alia*, terrestrial television broadcasting and other systems in this band,

recognizing

- a) that, in Article 5 of the Radio Regulations, the band 790-862 MHz, or parts of that band, is allocated, and is used on a primary basis, for various services including broadcasting;
- b) that the GE06 Agreement applies in all Region 1 countries except Mongolia and in Iran (Islamic Republic of) in the frequency bands 174-230/470-862 MHz;
- c) that the transition from analogue to digital television is expected to result in situations where the band 790-862 MHz will be used for both analogue and digital terrestrial transmission; and the demand for spectrum during the transition period may be even greater than the stand-alone usage of analogue broadcasting systems;
- d) that the switch-over to digital may result in spectrum opportunities for new applications;
- e) that the timing of the switch-over to digital is likely to vary from country to country;
- f) that the use of spectrum for different services should take into account the need for sharing studies;
- g) that the Radio Regulations provide that the identification of a given band for IMT does not preclude the use of that band by any application of the services to which it is allocated and does not establish priority in the Radio Regulations;

h) that the GE06 Agreement contains provisions for the terrestrial broadcasting service and other terrestrial services, a Plan for digital TV, and the List of other primary terrestrial services;

i) that the GE06 Agreement established, for the band 470-862 MHz, 16 June 2015 as the date when the transition period ends, meaning that the assignments in the analogue Plan shall no longer be protected and shall not cause unacceptable interference in countries which are Contracting Members to the Agreement;

j) that the studies carried out by ITU-R pursuant to Resolution **749 (WRC-07)** showed that the potential impact of the cumulative effect of interference from base stations, which individually did not trigger the need for coordination with broadcasting, could be significant; on the other hand, the potential impact of cumulative interference might be less significant in practice;

k) that ITU-R initiated studies, with a view to developing and completing comprehensive Recommendations and Reports, in accordance with Resolution **224 (Rev.WRC-07)**, which need to take into account the cumulative effect of interference,

further recognizing

a) that the frequency band 790-862 MHz, as part of a wider frequency band, was allocated to the mobile service in Region 3 (including Iran (Islamic Republic of)) since 1971 (prior to WRC-07);

b) that the GE06 Agreement, in its relevant Annexes, establishes the relation between digital terrestrial broadcasting, on the one hand, and other primary terrestrial services, including the aeronautical radionavigation service in the countries mentioned in No. **5.312**, on the other hand;

c) that WRC-07, under No. **5.316B**, allocated the frequency band 790-862 MHz in Region 1 to the mobile, except aeronautical mobile, service on a primary basis, and that this allocation shall come into effect as of 17 June 2015 and shall be subject to agreement obtained under No. **9.21** with respect to the aeronautical radionavigation service in countries mentioned in No. **5.312**;

d) that the band 790-862 MHz in Region 1 and the band 790-806 MHz in Region 3 were identified by WRC-07 for use by administrations wishing to implement International Mobile Telecommunications (IMT), whereas the band 806-960 MHz in Region 3 was identified for IMT in WRC-2000;

e) that for Contracting Members to the GE06 Agreement, the use of stations of the mobile service in relation to the broadcasting service is also subject to the successful application of the procedures of the GE06 Agreement;

f) that in Resolution **749 (WRC-07)**, WRC resolved to invite ITU-R to conduct sharing studies for Regions 1 and 3 in the band 790-862 MHz between the mobile service and other services in order to protect the services to which the frequency band is currently allocated and to report the results of the studies for consideration by WRC-12 to take appropriate action;

g) that the coordination between terrestrial services (fixed, mobile and broadcasting) in the frequency band 790-862 MHz between Iran (Islamic Republic of), on the one hand, and the other countries of Region 3, on the other hand, is a matter to be left to the administrations concerned, based on bilateral or multilateral negotiations, if it is mutually agreed by those administrations,

noting

- a) that Resolution ITU-R 57 provides principles for the process of development of IMT-Advanced and that this process had already started after WRC-07;
- b) that in the band 790-862 MHz, Resolution **224 (Rev.WRC-12)** applies,

emphasizing

- a) that the use of the band 470-862 MHz by broadcasting and other primary services is also covered by the GE06 Agreement;
- b) that the requirements of the different services to which the band is allocated, including the mobile, aeronautical radionavigation (in accordance with No. **5.312**), fixed and broadcasting services, shall be taken into account,

taking into account

that the results of the studies carried out by ITU-R pursuant to Resolution **749 (WRC-07)** indicate that there is a need to protect other primary terrestrial services from the mobile service in Region 1,

resolves

- 1 that in Region 1:

in accordance with Nos. **5.316A** and **5.316B**, and based on the criteria contained in Annex 1 to this Resolution, administrations implementing the mobile service in Region 1 shall seek agreement under No. **9.21** with respect to the aeronautical radionavigation service in the countries mentioned in No. **5.312** of the Radio Regulations;

- 2 that for Region 1 and Iran (Islamic Republic of):

2.1 when coordination between administrations is being effected, the protection ratios applicable to the generic case NB contained in the GE06 Agreement for the protection of the broadcasting service shall be used only for mobile systems with a bandwidth of 25 kHz. If another bandwidth is used, the relevant protection ratios are to be found in Recommendation ITU-R BT.1368;

- 2.2 to invite administrations to take into account, *inter alia*, the results of the sharing studies conducted by ITU-R in response to Resolution **749 (WRC-07)**;

- 3 that with respect to adjacent channel interference within the band 790-862 MHz:

3.1 adjacent channel interference within a given country is a national matter and needs to be dealt with by each administration as a national matter;

3.2 adjacent channel interference should be treated among administrations concerned, using mutually agreed criteria or those contained in relevant ITU-R Recommendations (see also the most recent versions of Recommendations ITU-R BT.1368 and ITU-R BT.1895 when sharing with the broadcasting service is concerned), as appropriate,

further resolves

to invite administrations to contribute further to the studies conducted by ITU-R in accordance with Resolution **224 (Rev.WRC-12)** and *recognizing k)* above,

instructs the Director of the Radiocommunication Bureau

to implement this Resolution and to take appropriate actions.

ANNEX 1 TO RESOLUTION 749 (REV.WRC-12)

The criteria for identifying potentially affected administrations with respect to the aeronautical radionavigation service in countries listed in No. 5.312

To identify potentially affected administrations when applying the procedure for seeking agreement under No. **9.21** by the mobile service with respect to the aeronautical radionavigation service (ARNS) operating in countries mentioned in No. **5.312**, as stipulated in Nos. **5.316A** and **5.316B**, the coordination distances (between a base station in the mobile service and a potentially affected ARNS station) indicated below should be used.

When applying Nos. **5.316A** and **5.316B**, notifying administrations may indicate in the notice sent to BR the list of administrations with which bilateral agreement has already been reached. BR shall take this into account in determining the administrations with which coordination under No. **9.21** is required.

1 Case where the mobile service is operated according to the frequency arrangement where the base stations transmit only in the band 791-821 MHz and receive only in the band 832-862 MHz

ARNS station	System type code	Coordination distances for receiving base stations of MS (km)	Coordination distances for transmitting base stations of MS (km)
RSBN (ground receiver)	AA8	-	70/125/175**
RLS 2 (Type 2) (aircraft receiver)	BC	70/150*	-
RLS 1 (Types 1 and 2) (ground receiver)	AB	70/125/175**	-

* The first value should be used when the notifying administration indicates in the notice form that aggregate e.i.r.p. value of all user equipment operating simultaneously with the notified base station is assumed not to exceed 21 dBm in 1 MHz. The second value should be used in other cases.

** 90% ≤ land path ≤ 100% / 50% ≤ land path < 90% / 0% ≤ land path < 50%.

2 Other cases

ARNS station	System type code	Coordination distances for MS receiving base stations (km)	Coordination distances for MS transmitting base stations (km)
RSBN	AA8	50	125/175*
RLS 2 (Type 1) (aircraft receiver)	BD	410	432
RLS 2 (Type 1) (ground receiver)	BA	50	250/275*
RLS 2 (Type 2) (aircraft receiver)	BC	150	432
RLS 2 (Type 2) (ground receiver)	AA2	50/75*	300/325*
RLS 1 (Types 1 and 2) (ground receiver)	AB	125/175*	400/450*
Other types of ARNS terrestrial station	Not applicable	125/175*	400/450*
Other types of ARNS airborne station	Not applicable	410	432

* $50\% \leq \text{land path} \leq 100\%$ / $0\% \leq \text{land path} < 50\%$.

MOD**RESOLUTION 750 (REV.WRC-12)****Compatibility between the Earth exploration-satellite service (passive) and relevant active services**

The World Radiocommunication Conference (Geneva, 2012),

considering

- a) that primary allocations have been made to various space services such as the fixed-satellite service (Earth-to-space), the space operation service (Earth-to-space) and the inter-satellite service and/or to terrestrial services such as the fixed service, the mobile service and the radiolocation service, hereinafter referred to as “active services”, in bands adjacent or nearby to bands allocated to the Earth exploration-satellite service (EESS) (passive) subject to No. **5.340**;
- b) that unwanted emissions from active services have the potential to cause unacceptable interference to EESS (passive) sensors;
- c) that, for technical or operational reasons, the general limits in Appendix 3 may be insufficient in protecting the EESS (passive) in specific bands;
- d) that, in many cases, the frequencies used by EESS (passive) sensors are chosen to study natural phenomena producing radio emissions at frequencies fixed by the laws of nature, and therefore shifting frequency to avoid or mitigate interference problems is not possible;
- e) that the band 1 400-1 427 MHz is used for measuring soil moisture, and also for measuring sea-surface salinity and vegetation biomass;
- f) that long-term protection of the EESS in the bands 23.6-24 GHz, 31.3-31.5 GHz, 50.2-50.4 GHz, 52.6-54.25 GHz and 86-92 GHz is vital to weather prediction and disaster management, and measurements at several frequencies must be made simultaneously in order to isolate and retrieve each individual contribution;
- g) that, in many cases, the bands adjacent or nearby to passive service bands are used and will continue to be used for various active service applications;
- h) that it is necessary to ensure equitable burden sharing for achieving compatibility between active and passive services operating in adjacent or nearby bands,

noting

- a) that the compatibility studies between relevant active and passive services operating in adjacent and nearby bands are documented in Report ITU-R SM.2092;
- b) that Report ITU-R F.2239 provides the results of studies covering various scenarios between the fixed service, operating in the frequency band 81-86 GHz and/or 92-94 GHz, and the Earth exploration-satellite service (passive), operating in the band 86-92 GHz;
- c) that Recommendation ITU-R RS.1029 provides the interference criteria for satellite passive remote sensing,

noting further

that, for the purpose of this Resolution:

- point-to-point communication is defined as radiocommunication provided by a link, for example a radio-relay link, between two stations located at specified fixed points;
- point-to-multipoint communication is defined as radiocommunication provided by links between a single station located at a specified fixed point (also called “hub station”) and a number of stations located at specified fixed points (also called “customer stations”),

recognizing

that studies documented in Report ITU-R SM.2092 do not consider point-to-multipoint communication links in the fixed service in the bands 1 350-1 400 MHz and 1 427-1 452 MHz,

resolves

- 1 that unwanted emissions of stations brought into use in the bands and services listed in Table 1-1 below shall not exceed the corresponding limits in that table, subject to the specified conditions;
- 2 to urge administrations to take all reasonable steps to ensure that unwanted emissions of active service stations in the bands and services listed in Table 1-2 below do not exceed the recommended maximum levels contained in that table, noting that EESS (passive) sensors provide worldwide measurements that benefit all countries, even if these sensors are not operated by their country;
- 3 that the Radiocommunication Bureau shall not make any examination or finding with respect to compliance with this Resolution under either Article 9 or 11.

TABLE 1-1

EESS (passive) band	Active service band	Active service	Limits of unwanted emission power from active service stations in a specified bandwidth within the EESS (passive) band¹
23.6-24.0 GHz	22.55-23.55 GHz	Inter-satellite	–36 dBW in any 200 MHz of the EESS (passive) band for non-geostationary (non-GSO) inter-satellite service (ISS) systems for which complete advance publication information is received by the Bureau before 1 January 2020, and –46 dBW in any 200 MHz of the EESS (passive) band for non-GSO ISS systems for which complete advance publication information is received by the Bureau on or after 1 January 2020
31.3-31.5 GHz	31-31.3 GHz	Fixed (excluding HAPS)	For stations brought into use after 1 January 2012: –38 dBW in any 100 MHz of the EESS (passive) band. This limit does not apply to stations that have been authorized prior to 1 January 2012
50.2-50.4 GHz	49.7-50.2 GHz	Fixed-satellite (E-to-s) ²	For stations brought into use after the date of entry into force of the Final Acts of WRC-07: –10 dBW into the 200 MHz of the EESS (passive) band for earth stations having an antenna gain greater than or equal to 57 dBi –20 dBW into the 200 MHz of the EESS (passive) band for earth stations having an antenna gain less than 57 dBi
50.2-50.4 GHz	50.4-50.9 GHz	Fixed-satellite (E-to-s) ²	For stations brought into use after the date of entry into force of the Final Acts of WRC-07: –10 dBW into the 200 MHz of the EESS (passive) band for earth stations having an antenna gain greater than or equal to 57 dBi –20 dBW into the 200 MHz of the EESS (passive) band for earth stations having an antenna gain less than 57 dBi
52.6-54.25 GHz	51.4-52.6 GHz	Fixed	For stations brought into use after the date of entry into force of the Final Acts of WRC-07: –33 dBW in any 100 MHz of the EESS (passive) band

¹ The unwanted emission power level is to be understood here as the level measured at the antenna port.

² The limits apply under clear-sky conditions. During fading conditions, the limits may be exceeded by earth stations when using uplink power control.

TABLE 1-2

EESS (passive) band	Active service band	Active service	Recommended maximum level of unwanted emission power from active service stations in a specified bandwidth within the EESS (passive) band ¹
1 400-1 427 MHz	1 350-1 400 MHz	Radiolocation ²	–29 dBW in the 27 MHz of the EESS (passive) band
		Fixed	–45 dBW in the 27 MHz of the EESS (passive) band for point-to-point
		Mobile	–60 dBW in the 27 MHz of the EESS (passive) band for mobile service stations except transportable radio-relay stations –45 dBW in the 27 MHz of the EESS (passive) band for transportable radio-relay stations
	1 427-1 429 MHz	Space operation (E-to-s)	–36 dBW in the 27 MHz of the EESS (passive) band
	1 427-1 429 MHz	Mobile except aeronautical mobile	–60 dBW in the 27 MHz of the EESS (passive) band for mobile service stations except transportable radio-relay stations ³ –45 dBW in the 27 MHz of the EESS (passive) band for transportable radio-relay stations
		Fixed	–45 dBW in the 27 MHz of the EESS (passive) band for point-to-point
	1 429-1 452 MHz	Mobile	–60 dBW in the 27 MHz of the EESS (passive) band for mobile service stations except transportable radio-relay stations ³ –45 dBW in the 27 MHz of the EESS (passive) band for transportable radio-relay stations –28 dBW in the 27 MHz of the EESS (passive) band for aeronautical telemetry stations ⁴
		Fixed	–45 dBW in the 27 MHz of the EESS (passive) band for point-to-point
31.3-31.5 GHz	30.0-31.0 GHz	Fixed-satellite (E-to-s) ⁵	–9 dBW into the 200 MHz of the EESS (passive) band for earth stations having an antenna gain greater than or equal to 56 dBi –20 dBW into the 200 MHz of the EESS (passive) band for earth stations having an antenna gain less than 56 dBi
86-92 GHz ⁶	81-86 GHz	Fixed	–41 – 14(f – 86) dBW/100 MHz for $86.05 \leq f \leq 87$ GHz –55 dBW/100 MHz for $87 \leq f \leq 91.95$ GHz where f is the centre frequency of the 100 MHz reference bandwidth expressed in GHz
	92-94 GHz	Fixed	–41 – 14(92 – f) dBW/100 MHz for $91 \leq f \leq 91.95$ GHz –55 dBW/100 MHz for $86.05 \leq f \leq 91$ GHz where f is the centre frequency of the 100 MHz reference bandwidth expressed in GHz

¹ The unwanted emission power level is to be understood here as the level measured at the antenna port.

² The mean power is to be understood here as the total power measured at the antenna port (or an equivalent thereof) in the band 1 400-1 427 MHz, averaged over a period of the order of 5 s.

³ Stations of the mobile service for cellular systems, including those complying with Recommendation ITU-R M.1457 or IMT standards, are likely to meet this unwanted emission power level.

⁴ The band 1 429-1 435 MHz is also allocated to the aeronautical mobile service in eight Region 1 administrations on a primary basis exclusively for the purposes of aeronautical telemetry within their national territory (No. **5.342**).

⁵ The recommended maximum levels apply under clear-sky conditions. During fading conditions, these levels may be exceeded by earth stations when using uplink power control.

⁶ Other maximum unwanted emission levels may be developed based on different scenarios provided in Report ITU-R F.2239 for the band 86-92 GHz.

ADD

RESOLUTION 755 (WRC-12)

**Power flux-density limits for transmitting stations
in the 21.4-22 GHz band**

The World Radiocommunication Conference (Geneva, 2012),

considering

- a) that the band 21.4-22 GHz is allocated on a primary basis to the broadcasting-satellite service in Regions 1 and 3 and to the fixed and mobile services in all three Regions;
- b) that, prior to 18 February 2012, use of the band 21.4-22 GHz by satellite networks in the broadcasting-satellite service in Regions 1 and 3 was subject to the provisions of Resolution **525 (WARC-92, Rev.WRC-03 and Rev.WRC-07)**;
- c) that, as of 18 February 2012, transmitting stations in the fixed and mobile services in all three ITU-R Regions are subject to power flux-density (pfd) limits, specified in No. **5.530A**;
- d) that, as of 18 February 2012, transmitting space stations in the broadcasting-satellite service in ITU-R Regions 1 and 3 are subject to pfd limits, specified in No. **21.16**,

recognizing

- a) that, at 18 February 2012, there were assignments to transmitting stations in the fixed and mobile services already recorded in the MIFR;
- b) that, at 18 February 2012, there were submissions for transmitting space stations in the broadcasting-satellite service already received by the Bureau,

resolves

1 that frequency assignments of stations in the fixed and mobile services recorded in the MIFR or notified under the provisions of Article **11** before 18 February 2012 shall comply with the limit specified in No. **5.530A** by 31 December 2015, or the first day of the next world radiocommunication conference, whichever is earlier;

2 that frequency assignments to space stations in the broadcasting-satellite service in Regions 1 and 3,

- recorded in the MIFR under the provisions of Article **11** before 18 February 2012; or
- coordinated under the provisions of Article **9** before 18 February 2012; or
- for which a complete notice under No. **9.30** was received by the Bureau before 18 February 2012,

shall comply with the limits specified in Table 21-4 of Article **21** as of 18 February 2012,

instructs the Director of the Radiocommunication Bureau

to issue a circular letter to all ITU administrations, bringing to their attention these new pfd limits and the requirements in respect of transmitting stations submitted before 18 February 2012.

ADD

RESOLUTION 756 (WRC-12)

Studies on possible reduction of the coordination arc and technical criteria used in application of No. 9.41 in respect of coordination under No. 9.7

The World Radiocommunication Conference (Geneva, 2012),

considering

- a) that the coordination arc methodology was introduced as a means to streamline the examination of coordination filings and thus reduce the efforts of the Bureau;
- b) that a more efficient coordination process is desirable;
- c) that further reduction in the coordination arc together with appropriate criteria for identification of affected administrations is desirable;
- d) that, currently, the of $\Delta T/T$ criterion is used for the identification of affected administrations,

recognizing

- a) that this Conference has reduced the coordination arc to be used to identify coordination requirements in the 6/4 GHz and 14/10/11/12 GHz frequency bands*;
- b) that further reductions in the coordination arc in these bands may be warranted;
- c) that it may also be appropriate to reduce the coordination arc in the 30/20 GHz frequency bands** used by the FSS;
- d) that the improvement of the coordination process in the 6/4 GHz and 14/10/11/12 GHz frequency bands also depends on the technical criteria used in the application of No. 9.41;
- e) that the frequency bands where the current $\Delta T/T$ criterion is used in application of No. 9.41 for coordination sought under No. 9.7 are listed in Table 5-1 to Appendix 5 of the Radio Regulations;
- f) that there may be other criteria (e.g. C/I , pfd) that could be used for the identification of affected administrations and in the coordination process,

* 3 400-4 200 MHz (space-to-Earth), 5 725-5 850 MHz (Earth-to-space) in Region 1, 5 850-6 725 MHz (Earth-to-space), 7 025-7 075 MHz (space-to-Earth) and (Earth-to-space), 10.95-11.2 GHz (space-to-Earth), 11.45-11.7 GHz (space-to-Earth), 11.7-12.2 GHz (space-to-Earth) in Region 2, 12.2-12.5 GHz (space-to-Earth) in Region 3, 12.5-12.75 GHz (space-to-Earth) in Regions 1 and 3, 12.7-12.75 GHz (Earth-to-space) in Region 2, and 13.75-14.5 GHz (Earth-to-space).

** 27.5-30 GHz (Earth-to-space), 17.7-20.2 GHz (space-to-Earth).

resolves to invite ITU-R

1 to carry out studies to examine the effectiveness and appropriateness of the current criterion ($\Delta T/T > 6\%$) used in the application of No. **9.41** and consider any other possible alternatives (including the alternatives outlined in Annexes 1 and 2 to this Resolution), as appropriate, for the bands referred to in *recognizing e*);

2 to study whether additional reductions in the coordination arcs in RR Appendix **5 (Rev.WRC-12)** are appropriate for the 6/4 GHz and 14/10/11/12 GHz frequency bands, and whether it is appropriate to reduce the coordination arc in the 30/20 GHz band,

instructs the Director of the Radiocommunication Bureau

to include in his Report, for consideration by WRC-15:

- the results of the ITU-R studies referred to in *resolves* 1 and 2 above;
- statistics on the use of No. **9.41** in respect of coordination under No. **9.7** for the bands identified in *recognizing d*).

ANNEX 1

Possible example of application of No. 11.32A to coordination under No. 9.7 in certain radiocommunication services and frequency bands

One possible alternative to the $\Delta T/T > 6\%$ criterion for triggering GSO-to-GSO coordination is to use more precise criteria in an effort to reduce undue protection requirements stemming from assignments recorded in the MIFR and preventing the successful conclusion of coordination of incoming assignments in their vicinity. This method would consist in a more precise quantification of the probability of harmful interference as referred to in No. **11.32A** and should reduce the use of No. **11.41**.

This method could be applied, at least initially in applying No. **11.32A**, to coordination under No. **9.7** between frequency assignments to geostationary-satellite networks in the fixed-satellite, broadcasting-satellite and mobile-satellite services in the following bands:

- 3 400-4 200 MHz (space-to-Earth), 5 725-6 725 MHz (Earth-to-space), 7 025-7 075 MHz (Earth-to-space);
- 10.95-11.2 GHz (space-to-Earth), 11.45-11.7 GHz (space-to-Earth), 11.7-12.2 GHz (space-to-Earth, Region 2), 12.2-12.5 GHz (space-to-Earth, Region 3), 12.5-12.75 GHz (space-to-Earth, Regions 1 and 3), 13.75-14.5 GHz (Earth-to-space),

Under this method, the Bureau would, in conducting its review under No. **11.32A**, consider the probability of harmful interference to be negligible and issue a favourable finding if the power flux-density (pfd) is less than or equal to a prescribed limit.

If the above-mentioned pfd limits are not met, the Bureau would potentially use the relevant Rules of Procedure to determine whether the probability of harmful interference is considered to be negligible or not.

ANNEX 2

Possible application of a different interference criterion to coordination under No. 9.7 in certain radiocommunication services and frequency bands

A second possible alternative to the $\Delta T/T > 6\%$ criterion for triggering GSO-to-GSO coordination is to use more precise criteria in an effort to reduce undue protection requirements stemming from assignments recorded in the MIFR and preventing the successful conclusion of coordination of incoming assignments in their vicinity. This method would consist in using the C/I criterion instead of the $\Delta T/T$ criterion when justifying the inclusion of additional affected administrations outside the coordination arc where No. 9.41 is applied. Under this method, the C/I level would be calculated in accordance with, for example, the method in Recommendation ITU-R S.741. Networks outside the coordination arc where the C/I level is lower than the threshold established would be included as networks with which coordination is needed.

Studies could look at the suitability both of the method for replacing the $\Delta T/T > 6\%$ criterion and of including in the Radio Regulations (for example, in Appendix 8) the methodology for calculation of interference between satellite networks using the C/I criterion set out in Section B3 of Part B of the Rules of Procedure, and whether corresponding modifications would need to be made in RR Appendix 5.

ADD

RESOLUTION 757 (WRC-12)

Regulatory aspects for nanosatellites and picosatellites

The World Radiocommunication Conference (Geneva, 2012),

considering

- a) that nanosatellites and picosatellites, commonly described as ranging in mass from 0.1 to 10 kg and measuring less than 0.5 m in any linear dimension, have physical characteristics that differ from those of larger satellites;
- b) that nanosatellites and picosatellites are satellites which typically have a short (1-2 years) development time and are low cost, often using off-the-shelf components;
- c) that the operational lifetime of these satellites ranges from several weeks up to a few (< 5) years depending on their mission;
- d) that nanosatellites and picosatellites are being used for a wide variety of missions and applications, including remote sensing, space weather research, upper atmosphere research, astronomy, communications, technology demonstration and education, as well as commercial applications, and therefore may operate under various radiocommunication services;
- e) that these satellites are typically launched as secondary payloads;
- f) that some missions performed with these satellites require the simultaneous launch and operation of several such satellites;
- g) that, currently, many nanosatellites and picosatellites use spectrum allocated to the amateur satellite service and the MetSat service in the frequency range 30-3 000 MHz although their missions are potentially inconsistent with these services;
- h) that nanosatellites and picosatellites may have limited orbit control capabilities and therefore have unique orbital characteristics;
- i) that the standing Agenda item 7 of WRCs has up to now not led to consideration of regulatory procedures for notifying nanosatellites and picosatellites,

further considering

- a) that successful and timely development and operation of picosatellites and nanosatellites may require regulatory procedures which take account of the short development cycle, the short lifetimes and the typical missions of such satellites;
- b) that the existing provisions of the Radio Regulations for coordination and notification of satellites under Articles 9 and 11 may need to be adapted to take account of the nature of these satellites,

resolves to invite WRC-18

to consider whether modifications to the regulatory procedures for notifying satellite networks are needed to facilitate the deployment and operation of nanosatellites and picosatellites, and to take the appropriate actions,

invites ITU-R

to examine the procedures for notifying space networks and consider possible modifications to enable the deployment and operation of nanosatellites and picosatellites, taking into account the short development time, short mission time and unique orbital characteristics,

instructs the Director of the Radiocommunication Bureau

to report to WRC-15 on the results of these studies,

invites administrations and Sector Members

to participate actively in the studies by submitting contributions to ITU-R.

ADD

RESOLUTION 758 (WRC-12)

Allocation to the fixed-satellite service and the maritime-mobile satellite service in the 7/8 GHz range

The World Radiocommunication Conference (Geneva, 2012),

considering

- a)* that the frequency bands 7 250-7 750 MHz (space-to-Earth) and 7 900-8 400 MHz (Earth-to-space) are allocated worldwide to the fixed-satellite service (FSS);
- b)* that these bands, or parts thereof, are also allocated worldwide to other services such as the fixed and mobile services, the meteorological-satellite service and the Earth exploration-satellite service (space-to-Earth);
- c)* that the bands 7 250-7 375 MHz (space-to-Earth) and 7 900-8 025 MHz (Earth-to-space) are also allocated to the mobile-satellite service on a primary basis, subject to agreement obtained under No. **9.21** through No. **5.461**;
- d)* that some administrations have reported a shortfall of spectrum available for their current and future applications in these bands;
- e)* that the additional bandwidth requirements for data transmission on these next-generation satellites are estimated to be around a maximum of 100 MHz;
- f)* that the adjacent bands 7 150-7 250 MHz and 8 400-8 500 MHz are currently allocated to the fixed and mobile services as well as to the space research service (SRS);
- g)* that in the SRS, the use of the bands 7 145-7 190 MHz (Earth-to-space) and 8 400-8 450 MHz (space-to-Earth) is limited to deep space and that there are currently no space services co-allocated with SRS (deep space) anywhere in the Radio Regulations;
- h)* that the ubiquitous deployment of small very small aperture terminal (VSAT)-like FSS earth stations is generally not compatible with the protection of the SRS;
- i)* that the spectrum requirements considered under the maritime mobile-satellite service address operation beyond territorial waters,

noting

the specific provisions of Nos. **5.458**, **5.459**, **5.460**, **5.465** and **5.466**,

resolves to invite ITU-R

1 to conduct technical and regulatory studies on the possible new allocations to the FSS in the frequency bands 7 150-7 250 MHz (space-to-Earth) and 8 400-8 500 MHz (Earth-to-space) in order to ensure compatibility with existing services, with a view to extending the current worldwide allocation to the FSS in the bands 7 250-7 750 MHz (space-to-Earth) and 7 900-8 400 MHz (Earth-to-space);

2 to conduct the appropriate regulatory studies to ensure that any new FSS allocation referred to in *resolves* 1 above is limited to FSS systems operated from a fixed known location in order to enable compatibility with systems of other services, taking into account that the operational requirements in the bands 7 150-7 250 MHz (space-to-Earth) and 8 400-8 500 MHz (Earth-to-space) do not encompass small VSAT-like FSS earth stations;

3 to conduct technical and regulatory studies on the possibility of allocating the bands 7 375-7 750 MHz (space-to-Earth) and 8 025-8 400 MHz (Earth-to-space), or parts thereof, to the maritime-mobile satellite service, while ensuring compatibility with existing services;

4 to complete these studies in time for WRC-15,

invites administrations

to participate actively in the ITU-R studies.

MOD

RESOLUTION 804 (REV.WRC-12)

Principles for establishing agendas for world radiocommunication conferences

The World Radiocommunication Conference (Geneva, 2012),

considering

- a) that, in accordance with No. 118 of the ITU Convention, the general scope of the agendas for world radiocommunication conferences (WRCs) should be established four to six years in advance;
- b) Article 13 of the ITU Constitution relating to the competence and scheduling of WRCs and Article 7 of the Convention relating to their agendas;
- c) that No. 92 of the Constitution and Nos. 488 and 489 of the Convention require conferences to be fiscally responsible;
- d) that in Resolution 71 (Rev. Marrakesh, 2002), concerning the strategic plan of the Union, the Plenipotentiary Conference noted the increasingly complex and lengthy agendas for world radiocommunication conferences;
- e) that Resolution 80 (Rev. Marrakesh, 2002) of the Plenipotentiary Conference and Resolution **72 (Rev.WRC-07)** recognize the positive contribution of regional and informal groups and the need for improved efficiency and fiscal prudence;
- f) the relevant Resolutions of previous WRCs,

noting

- a) that the number of issues addressed in agendas for WRCs has been growing, and that some issues could not be resolved adequately in the time allotted to the Conference, including conference preparations;
- b) that some agenda items may have a greater impact on the future of radiocommunications than others;
- c) that the human and financial resources of ITU are limited;
- d) that there is a need to limit the agenda of conferences, taking account of the needs of developing countries, in a manner that allows the major issues to be dealt with equitably and efficiently;
- e) that, in accordance with No. 90 of the Constitution, the interval between WRCs should normally be three to four years, to ensure that changes in technology and requirements of Member States are adequately reflected in conference agendas,

resolves

that the principles in Annex 1 should be used when developing future WRC agendas,

resolves to invite administrations

- 1 to use the template in Annex 2 in proposing agenda items for WRCs;
- 2 to participate in regional activities for the preparation of future WRC agendas.

ANNEX 1 TO RESOLUTION 804 (REV.WRC-12)

Principles for establishing agendas for WRCs

A conference agenda shall include:

- 1) items assigned to it by the ITU Plenipotentiary Conference;
- 2) items on which the Director of the Radiocommunication Bureau has been requested to report;
- 3) items concerning instructions to the Radio Regulations Board and the Radiocommunication Bureau regarding their activities, and concerning the review of those activities.

In general, a conference may include on a future conference agenda an item proposed by a group of administrations or an administration, if all the following conditions are met:

- 1) it addresses issues of a worldwide or regional character;
- 2) it is expected that changes in the Radio Regulations, including WRC Resolutions and Recommendations, may be necessary;
- 3) it is expected that required studies can be completed (e.g. that appropriate ITU-R Recommendations will be approved) prior to that conference;
- 4) resources associated with the subject are kept within a range which is manageable for Member States and Sector Members, the Radiocommunication Bureau and ITU-R Study Groups, Conference Preparatory Meeting (CPM) and the Special Committee.

To the extent possible, agenda items arising from previous conferences, normally reflected in Resolutions, and which have been considered by two successive conferences, should not be considered, unless justified.

In addition, there may be issues that could be addressed through actions undertaken by a Radiocommunication Assembly, particularly those not involving amendments to the Radio Regulations.

In developing the conference agenda, efforts should be made to:

- a) encourage regional and interregional coordination on the subjects to be considered in the preparatory process for the WRC, in accordance with Resolution **72 (Rev.WRC-07)** and Resolution 80 (Rev. Marrakesh, 2002) of the Plenipotentiary Conference, with a view to addressing potentially difficult issues well before a WRC;
- b) include, to the extent possible, agenda items that are prepared within regional groups, taking into account the equal right of individual administrations to submit proposals for agenda items;

- c)* ensure that proposals are submitted with an indication of priority;
- d)* include in proposals an assessment of their financial and other resource implications (with the assistance of the Radiocommunication Bureau) to ensure that they are within the agreed budgetary limits for ITU-R;
- e)* ensure that the objectives and scope of proposed agenda items are complete and unambiguous;
- f)* take into account the status of the ITU-R studies related to the potential agenda items before considering them as possible candidates for future agendas;
- g)* distinguish between items intended to result in changes to the Radio Regulations and those dealing solely with the progress of studies;
- h)* arrange items on the agenda by subject to the extent possible.

ANNEX 2 TO RESOLUTION 804 (WRC-07)

Template for the submission of proposals for agenda items**Subject:****Origin:****Proposal:****Background/reason:****Radiocommunication services concerned:****Indication of possible difficulties:****Previous/ongoing studies on the issue:****Studies to be carried out by:****with the participation of:****ITU-R Study Groups concerned:****ITU resource implications, including financial implications (refer to CV126):****Common regional proposal:** Yes/No**Multicountry proposal:** Yes/No**Number of countries:****Remarks**

ADD

RESOLUTION 807 (WRC-12)

Agenda for the 2015 World Radiocommunication Conference

The World Radiocommunication Conference (Geneva, 2012),

considering

- a) that, in accordance with No. 118 of the ITU Convention, the general scope of the agenda for a world radiocommunication conference should be established four to six years in advance and that a final agenda shall be established by the Council two years before the conference;
- b) Article 13 of the ITU Constitution relating to the competence and scheduling of world radiocommunication conferences and Article 7 of the Convention relating to their agendas;
- c) the relevant resolutions and recommendations of previous world administrative radio conferences (WARCs) and world radiocommunication conferences (WRCs),

recognizing

- a) that WRC-12 has identified a number of urgent issues requiring further examination by WRC-15;
- b) that, in preparing this agenda, some items proposed by administrations could not be included and have had to be deferred to future conference agendas,

resolves

to recommend to the Council that a world radiocommunication conference be held in 2015 for a maximum period of four weeks, with the following agenda:

1 on the basis of proposals from administrations, taking account of the results of WRC-12 and the Report of the Conference Preparatory Meeting, and with due regard to the requirements of existing and future services in the bands under consideration, to consider and take appropriate action in respect of the following items:

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)**;

1.2 to examine the results of ITU-R studies, in accordance with Resolution **232 (WRC-12)**, on the use of the frequency band 694-790 MHz by the mobile, except aeronautical mobile, service in Region 1 and take the appropriate measures;

1.3 to review and revise Resolution **646 (Rev.WRC-12)** for broadband public protection and disaster relief (PPDR), in accordance with Resolution **648 (WRC-12)**;

1.4 to consider possible new allocation to the amateur service on a secondary basis within the band 5 250-5 450 kHz in accordance with Resolution **649 (WRC-12)**;

1.5 to consider the use of frequency bands allocated to the fixed-satellite service not subject to Appendices **30**, **30A** and **30B** for the control and non-payload communications of unmanned aircraft systems (UAS) in non-segregated airspaces, in accordance with Resolution **153 (WRC-12)**;

1.6 to consider possible additional primary allocations:

1.6.1 to the fixed-satellite service (Earth-to-space and space-to-Earth) of 250 MHz in the range between 10 GHz and 17 GHz in Region 1;

1.6.2 to the fixed-satellite service (Earth-to-space) of 250 MHz in Region 2 and 300 MHz in Region 3 within the range 13-17 GHz;

and review the regulatory provisions on the current allocations to the fixed-satellite service within each range, taking into account the results of ITU-R studies, in accordance with Resolutions **151 (WRC-12)** and **152 (WRC-12)**, respectively;

1.7 to review the use of the band 5 091-5 150 MHz by the fixed-satellite service (Earth-to-space) (limited to feeder links of the non-geostationary mobile-satellite systems in the mobile-satellite service) in accordance with Resolution **114 (Rev.WRC-12)**;

1.8 to review the provisions relating to earth stations located on board vessels (ESVs), based on studies conducted in accordance with Resolution **909 (WRC-12)**;

1.9 to consider, in accordance with Resolution **758 (WRC-12)**:

1.9.1 possible new allocations to the fixed-satellite service in the frequency bands 7 150-7 250 MHz (space-to-Earth) and 8 400-8 500 MHz (Earth-to-space), subject to appropriate sharing conditions;

1.9.2 the possibility of allocating the bands 7 375-7 750 MHz and 8 025-8 400 MHz to the maritime-mobile satellite service and additional regulatory measures, depending on the results of appropriate studies;

1.10 to consider spectrum requirements and possible additional spectrum allocations for the mobile-satellite service in the Earth-to-space and space-to-Earth directions, including the satellite component for broadband applications, including International Mobile Telecommunications (IMT), within the frequency range from 22 GHz to 26 GHz, in accordance with Resolution **234 (WRC-12)**;

1.11 to consider a primary allocation for the Earth exploration-satellite service (Earth-to-space) in the 7-8 GHz range, in accordance with Resolution **650 (WRC-12)**;

1.12 to consider an extension of the current worldwide allocation to the Earth exploration-satellite (active) service in the frequency band 9 300-9 900 MHz by up to 600 MHz within the frequency bands 8 700-9 300 MHz and/or 9 900-10 500 MHz, in accordance with Resolution **651 (WRC-12)**;

1.13 to review No. **5.268** with a view to examining the possibility for increasing the 5 km distance limitation and allowing space research service (space-to-space) use for proximity operations by space vehicles communicating with an orbiting manned space vehicle, in accordance with Resolution **652 (WRC-12)**;

- 1.14 to consider the feasibility of achieving a continuous reference time-scale, whether by the modification of coordinated universal time (UTC) or some other method, and take appropriate action, in accordance with Resolution **653 (WRC-12)**;
- 1.15 to consider spectrum demands for on-board communication stations in the maritime mobile service in accordance with Resolution **358 (WRC-12)**;
- 1.16 to consider regulatory provisions and spectrum allocations to enable possible new Automatic Identification System (AIS) technology applications and possible new applications to improve maritime radiocommunication in accordance with Resolution **360 (WRC-12)**;
- 1.17 to consider possible spectrum requirements and regulatory actions, including appropriate aeronautical allocations, to support wireless avionics intra-communications (WAIC), in accordance with Resolution **423 (WRC-12)**;
- 1.18 to consider a primary allocation to the radiolocation service for automotive applications in the 77.5-78.0 GHz frequency band in accordance with Resolution **654 (WRC-12)**;
- 2 to examine the revised ITU-R Recommendations incorporated by reference in the Radio Regulations communicated by the Radiocommunication Assembly, in accordance with Resolution **28 (Rev.WRC-03)**, and to decide whether or not to update the corresponding references in the Radio Regulations, in accordance with the principles contained in Annex 1 to Resolution **27 (Rev.WRC-12)**;
- 3 to consider such consequential changes and amendments to the Radio Regulations as may be necessitated by the decisions of the Conference;
- 4 in accordance with Resolution **95 (Rev.WRC-07)**, to review the resolutions and recommendations of previous conferences with a view to their possible revision, replacement or abrogation;
- 5 to review, and take appropriate action on, the Report from the Radiocommunication Assembly submitted in accordance with Nos. 135 and 136 of the Convention;
- 6 to identify those items requiring urgent action by the Radiocommunication Study Groups in preparation for the next world radiocommunication conference;
- 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)** to facilitate rational, efficient, and economical use of radio frequencies and any associated orbits, including the geostationary-satellite orbit;
- 8 to consider and take appropriate action on requests from administrations to delete their country footnotes or to have their country name deleted from footnotes, if no longer required, taking into account Resolution **26 (Rev.WRC-07)**;
- 9 to consider and approve the Report of the Director of the Radiocommunication Bureau, in accordance with Article 7 of the Convention:
- 9.1 on the activities of the Radiocommunication Sector since WRC-12;
- 9.2 on any difficulties or inconsistencies encountered in the application of the Radio Regulations; and
- 9.3 on action in response to Resolution **80 (Rev.WRC-07)**;

10 to recommend to the Council items for inclusion in the agenda for the next WRC, and to give its views on the preliminary agenda for the subsequent conference and on possible agenda items for future conferences, in accordance with Article 7 of the Convention,

resolves further

to activate the Conference Preparatory Meeting,

invites the Council

to finalize the agenda and arrange for the convening of WRC-15, and to initiate as soon as possible the necessary consultations with Member States,

instructs the Director of the Radiocommunication Bureau

to make the necessary arrangements to convene meetings of the Conference Preparatory Meeting and to prepare a report to WRC-15,

instructs the Secretary-General

to communicate this Resolution to international and regional organizations concerned.

ADD

RESOLUTION 808 (WRC-12)

Preliminary agenda for the 2018 World Radiocommunication Conference

The World Radiocommunication Conference (Geneva, 2012),

considering

- a) that, in accordance with No. 118 of the ITU Convention, the general scope of the agenda for WRC-18 should be established four to six years in advance;
- b) Article 13 of the ITU Constitution relating to the competence and scheduling of world radiocommunication conferences and Article 7 of the Convention relating to their agendas;
- c) the relevant resolutions and recommendations of previous world administrative radio conferences (WARCs) and world radiocommunication conferences (WRCs),

resolves to give the view

that the following items should be included in the preliminary agenda for WRC-18:

- 1 to take appropriate action in respect of those urgent issues that were specifically requested by WRC-15;
- 2 on the basis of proposals from administrations and the Report of the Conference Preparatory Meeting, and taking account of the results of WRC-15, to consider and take appropriate action in respect of the following items:
 - 2.1 to consider regulatory actions, including spectrum allocations, to support GMDSS modernization and implementation of e-navigation in accordance with Resolution **359 (WRC-12)**;
 - 2.2 to consider the appropriate regulatory procedures for notifying satellite networks needed to facilitate the deployment and operation of nanosatellites and picosatellites, in accordance with Resolution **757 (WRC-12)**;
- 3 to examine the revised ITU-R Recommendations incorporated by reference in the Radio Regulations communicated by the Radiocommunication Assembly, in accordance with Resolution **28 (Rev.WRC-03)**, and to decide whether or not to update the corresponding references in the Radio Regulations, in accordance with the principles contained in Annex 1 to Resolution **27 (Rev.WRC-12)**;
- 4 to consider such consequential changes and amendments to the Radio Regulations as may be necessitated by the decisions of the Conference;
- 5 in accordance with Resolution **95 (Rev.WRC-07)**, to review the resolutions and recommendations of previous conferences with a view to their possible revision, replacement or abrogation;
- 6 to review, and take appropriate action on, the Report from the Radiocommunication Assembly submitted in accordance with Nos. 135 and 136 of the Convention;

7 to identify those items requiring urgent action by the Radiocommunication Study Groups;

8 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)** to facilitate the rational, efficient, and economical use of radio frequencies and any associated orbits, including the geostationary-satellite orbit;

9 to consider and take appropriate action on requests from administrations to delete their country footnotes or to have their country name deleted from footnotes, if no longer required, taking into account Resolution **26 (Rev.WRC-07)**;

10 to consider and approve the Report of the Director of the Radiocommunication Bureau, in accordance with Article 7 of the Convention:

10.1 on the activities of the Radiocommunication Sector since WRC-15;

10.2 on any difficulties or inconsistencies encountered in the application of the Radio Regulations; and

10.3 on action in response to Resolution **80 (Rev.WRC-07)**;

11 to recommend to the Council items for inclusion in the agenda for the following WRC, in accordance with Article 7 of the Convention,

invites the Council

to consider the views given in this Resolution,

instructs the Director of the Radiocommunication Bureau

to make the necessary arrangements to convene meetings of the Conference Preparatory Meeting and to prepare a report to WRC-18,

instructs the Secretary-General

to communicate this Resolution to international and regional organizations concerned.

MOD

RESOLUTION 906 (REV.WRC-12)

**Electronic submission of notice forms for terrestrial services
to the Radiocommunication Bureau and exchange of
data between administrations**

The World Radiocommunication Conference (Geneva, 2012),

considering

- a)* that the electronic format for submission of notifications concerning terrestrial services under Article 11 and Plans annexed to Regional Agreements has been used by the Radiocommunication Bureau since September 1994;
- b)* that, since 8 December 1998, submission of high-frequency broadcasting schedule requirements under Article 12 has been in electronic format only;
- c)* that, since 3 June 2001 for space services, all notice forms and related information submitted to the Radiocommunication Bureau pursuant to Articles 9 and 11 have been submitted in electronic format only;
- d)* that, since January 2009, the submission of notice forms for terrestrial services is done in electronic format only, using the secured ITU web interface WISFAT (Web Interface for the Submission of Frequency Assignments/Allotments to Terrestrial Services) in accordance with Circular Letter CR/297;
- e)* that RRC-06 decided that all submissions in the application of Articles 4 and 5 of the GE06 Regional Agreement shall be in electronic format only;
- f)* that preparation of notice forms for terrestrial services in electronic format allows administrations to validate the data prior to submission using Radiocommunication Bureau software tools;
- g)* that submission of notice forms for terrestrial services in electronic format removes the need for the Radiocommunication Bureau to transcribe the data, avoids the potential for the introduction of errors and reduces the data processing effort required by the Radiocommunication Bureau;
- h)* that the submission of notice forms for terrestrial services in electronic format only may require appropriate training on the Radiocommunication Bureau's software tools, especially in developing and least-developed countries;
- i)* that, for some administrations, the submission of notice forms for terrestrial services in electronic format only may require the adaptation of their national procedures and the development of appropriate electronic facilities;
- j)* that information in electronic format could be used to fulfil administrations' database requirements and facilitate the exchange of information between administrations and with the Radiocommunication Bureau;

k) that administrations have the sovereign right to establish bilateral agreements pertaining to cross-border coordination issues, including the definition of the format for the mutual exchange of information;

l) that administrations recognize the importance and requirement of electronic submission of notice forms for terrestrial services to the Radiocommunication Bureau,

further considering

a) that the use of an electronic format for the submission of notice forms for terrestrial services to the Radiocommunication Bureau tends to reduce its costs and allows a better publication of data;

b) that the Radiocommunication Bureau makes available free of charge to administrations terrestrial notification software (TerRaNotices) through the distribution of its BR International Frequency Information Circular (BR IFIC) for terrestrial services;

c) that in its Resolution 9 (Rev. Hyderabad, 2010), on the participation of countries, particularly developing countries, in spectrum management, WTDC recognizes the importance of facilitating access to radiocommunication-related documentation in order to facilitate the task of radio-frequency spectrum managers;

d) that in its Decision 12 (Guadalajara, 2010), on free online access to ITU publications, the Plenipotentiary Conference instructed the Secretary-General of ITU to prepare a report on an ongoing basis on sales of ITU software and databases, and to present this report to the Council, which will decide on further policies for improving access to ITU publications, software and databases;

e) that an automated spectrum management system would, among other things, facilitate national spectrum management and monitoring, coordination among administrations and notification to the Radiocommunication Bureau;

f) that Recommendation ITU-R SM.1370 provides design guidelines for developing automated spectrum management systems at the national level;

g) that data elements used in national spectrum management for international coordination and notification have been reflected in Appendix 4 of the Radio Regulations and in Recommendation ITU-R SM.1413;

h) that the Radiocommunication Advisory Group has established a task group to review the Radiocommunication Bureau's information systems used for the submission and treatment of notice forms for terrestrial and space services;

i) the difficulty faced by many countries, particularly developing and least-developed countries, in participating in the activities of ITU-R world radiocommunication seminars and study group meetings dealing with terrestrial services,

resolves

1 that administrations are encouraged to accelerate migration to the use of an electronic format and electronic facilities for the submission of notice forms to the Bureau and for the exchange of coordination data between administrations;

2 that the format established by ITU-R for electronic notice forms be considered by administrations for the exchange of information,

instructs the Director of the Radiocommunication Bureau

1 to refine, as required, the specification of the electronic format and related software to be used for the submission of notice forms for terrestrial services;

2 to provide assistance, as required, to any administration in the use of the electronic format for the submission of notice forms for terrestrial services;

3 to support developing and least-developed countries while deploying electronic facilities for the submission of electronic notice forms to the Bureau and for the exchange of coordination data between administrations;

4 to include in radiocommunication seminars and regional workshops appropriate training in the use of the electronic format and related software for the submission of notices for terrestrial services.

ADD

RESOLUTION 907 (WRC-12)

**Use of modern electronic means of communication for administrative
correspondence related to advance publication, coordination and
notification of satellite networks including that related to
Appendices 30, 30A and 30B, earth stations and
radio astronomy stations**

The World Radiocommunication Conference (Geneva, 2012),

considering

that the use of electronic means of communication for administrative correspondence related to advance publication, coordination and notification of satellite networks, earth stations and radio astronomy stations would facilitate the tasks of the Radiocommunication Bureau and of administrations and has the potential to improve the coordination and notification process by reducing the amount of duplicated correspondence,

noting

that Decision 5 (Rev. Guadalajara, 2010) includes, in its Annex 2, paragraph 20, which proposes to “move, to the extent practicable, from present communications by fax between the Union and Member States to modern electronic communication methods”,

recognizing

that administrations could use the time freed by a reduction of administrative correspondence to effect coordination,

resolves

1 that modern electronic means of communication shall be used whenever possible in the administrative correspondence between administrations and the Radiocommunication Bureau related to advance publication, coordination and notification, including correspondence related to Appendices **30**, **30A** and **30B** and, where applicable, to due diligence for satellite networks, earth stations and radio astronomy stations;

2 that other, traditional means of communication can continue to be used if modern electronic means are not available,

instructs the Radiocommunication Bureau

1 to provide administrations with the necessary technical means to ensure that the modern electronic correspondence between administrations and the Radiocommunication Bureau is secure;

2 to inform administrations of the availability of such means and of the associated schedule of implementation;

3 to automatically acknowledge receipt of all electronic correspondence;

4 to report to the next world radiocommunication conference on the experience gained in the application of this Resolution, with a view to making any necessary consequential amendments to the Radio Regulations,

urges administrations

to use, to the extent possible, modern electronic means of communication in the administrative correspondence between themselves related to advance publication, coordination and notification of satellite networks, including that related to Appendices **30**, **30A** and **30B**, and to earth stations and radio astronomy stations, recognizing that other means of communication may still be used if necessary (see also *resolves* 2).

ADD

RESOLUTION 908 (WRC-12)

**Electronic submission and publication of
advance publication information**

The World Radiocommunication Conference (Geneva, 2012),

considering

- a)* that the volume of advance publication information (API) on satellite networks or systems subject to the coordination procedure under Section II of Article 9 of the Radio Regulations has been steadily increasing in recent years;
- b)* that this increasing trend may be due in part to the fact that there is no cost-recovery fee for these APIs;
- c)* that the Bureau has also observed that many of the APIs are not followed by a coordination request within the period of 24 months prescribed under No. 9.5D;
- d)* that a significant amount of effort is therefore required to update the relevant databases by deleting either in total or partially the obsolete APIs,

considering further

- a)* that a paperless electronic approach for the submission of APIs on satellite networks would make API information readily accessible to all, and would limit the workload for administrations and the Bureau in the processing of APIs for satellite networks or systems subject to coordination;
- b)* that, at the end of 24-month period prescribed in No. 9.5D, the entries will automatically be removed from the list;
- c)* that coordination requests that are submitted within the 24-month period, together with relevant API information (date of receipt, nominal orbital position), will then be processed and entered in the SNS database in the normal way,

noting

- a)* that the API requested under Section IB of Article 9 of the Radio Regulations contains only a limited amount of information, the most pertinent being the date of receipt of complete information, the frequency bands and, for GSO networks, the orbital position;
- b)* that the current API publication will continue to apply to the advance publication of information on satellite networks or systems which are not subject to coordination procedures under Section II of Article 9,

resolves

that administrations shall submit API using a secure paperless electronic approach upon being advised that the means for electronic submission of API for satellite networks or systems subject to coordination has been implemented and upon receiving assurances that such means are indeed secure,

instructs the Director of the Radiocommunication Bureau

to implement a secure paperless electronic approach for the electronic submission and publication of API for satellite networks or systems subject to coordination, taking into account the conditions mentioned in the *resolves* of this resolution.

ADD

RESOLUTION 909 (WRC-12)

**Provisions relating to earth stations located on board vessels
which operate in fixed-satellite service networks in the
uplink bands 5 925-6 425 MHz and 14-14.5 GHz**

The World Radiocommunication Conference (Geneva, 2012),

considering

- a) that WRC-03 introduced provisions relating to the use of earth stations on board vessels (ESVs) in certain bands allocated to the fixed-satellite service (FSS);
- b) that the technology used by ESVs has advanced considerably since their introduction, including the use of spread-spectrum modulation and other techniques which may improve compatibility with terrestrial co-frequency services;
- c) that ESV applications can provide high-bandwidth connectivity in areas where no alternative exists;
- d) that ESVs may have the potential to cause unacceptable interference to terrestrial services operating in the same bands;
- e) that earlier ITU-R studies, using technical criteria appropriate at the time, resulted in a set of limitations on the operation of ESVs contained in Resolution **902 (WRC-03)**, in order to protect terrestrial services operating in the same bands;
- f) that these limitations and restrictions need to be reviewed in light of the new technologies being deployed;
- g) that there are situations where there is no potential for unacceptable interference but current rules still require that an agreement be obtained from concerned administrations,

recognizing

- a) that there are several other services than FSS to which the frequency bands 5 925-6 425 MHz and 14-14.5 GHz are allocated;
- b) that these other services need to be protected,

resolves to invite ITU-R

- 1 to review the provisions relating to ESVs which operate in the FSS in the uplink bands 5 925-6 425 MHz and 14-14.5 GHz and consider possible modifications to Resolution **902 (WRC-03)** in order to reflect current ESV technologies and technical characteristics that are being used or planned to be used, while protecting the other services referred to in *recognizing a) and b) above*;
- 2 to complete the referenced studies in time for WRC-15.

ADD

RESOLUTION 957 (WRC-12)

Studies towards review of the definitions of *fixed service*, *fixed station* and *mobile station*

The World Radiocommunication Conference (Geneva, 2012),

considering

- a) that the current technological environment for some applications is substantively different from the one which prevailed when the current definitions were established;
- b) that in the study period leading up to WRC-12, studies were undertaken to address fixed and mobile convergence, and that one method proposed to address this was revisions to the definitions of *fixed service*, *fixed station* and *mobile station*;
- c) that regulatory procedures should be continually assessed in order to meet the demands of administrations;
- d) that the review of the definitions in *considering b)* should aim to support the implementation of efficient spectrum management practices and spectrum use,

recognizing

- a) that No. **1003** of the Convention defines *mobile service*;
- b) that Article **1** of the Radio Regulations defines *fixed service*, *fixed station* and *mobile station*,

resolves

- 1 to review the definitions of *fixed service*, *fixed station* and *mobile station* contained in Article **1** for possible modification;
- 2 to study the potential impact on regulatory procedures in the Radio Regulations (coordination, notification and recording) and the impact on current frequency assignments and other services resulting from possible changes to the definitions referred to in *resolves 1*,

invites ITU-R

to conduct the necessary studies described in *resolves 1* and *2* in time for consideration by WRC-15, as referred to in *instructs the Director of the Radiocommunication Bureau* below,

invites administrations

to participate actively in the ITU-R studies,

instructs the Director of the Radiocommunication Bureau

to provide the results of these studies in his report to WRC-15 for consideration under agenda item 9.1 (see Resolution **807 (WRC-12)**) and appropriate action.

RECOMMENDATIONS

ADD

RECOMMENDATION 16 (WRC-12)

Interference management for stations that may operate under more than one terrestrial radiocommunication service

The World Radiocommunication Conference (Geneva, 2012),

considering

- a) that radiocommunication services and spectrum allocation aim at achieving international uniformity in spectrum usage in order to simplify interference management rules and promote equitable spectrum access;
- b) that the principles behind radiocommunication services and spectrum allocation have been adopted since the first Radio Telegraph Conference of Berlin in 1906, where frequency bands were allocated to the maritime service;
- c) that technological, market and regulatory developments are resulting in significant changes to the radiocommunication environment, especially in bands below 6 GHz;
- d) that these changes to the radiocommunication environment, and in particular the convergence of services, will make the classification of certain radio stations under existing radiocommunication services increasingly difficult;
- e) that the issues raised by the convergence of services may not always be addressed through the redefinition of radiocommunication services;
- f) that previous world radiocommunication conferences (WRCs) have considered the possibility of enhancing the international spectrum regulatory framework in the light of the changing radiocommunication environment;
- g) that ITU-R studies to enhance the international spectrum management framework have so far been carried out under the traditional framework of radiocommunication services and spectrum allocation only;
- h) that administrations have adopted, or are in the process of adopting, approaches to spectrum management on a national basis that are not based on the above traditional framework, with a view to improving flexibility and to catering for the changing radiocommunication environment;
- i) that in order to obtain the required degree of flexibility at national level while not causing harmful interference at international level, these administrations may use No. 4.4 of the Radio Regulations;
- j) that through the application of No. 4.4, administrations having adopted national spectrum management that is not based on the above traditional framework and that is in derogation of the Table of Frequency Allocations and of the provisions of the Radio Regulations cannot claim protection for their radio stations from cross-border harmful interference, or cause harmful interference to stations operated in conformance with the Radio Regulations by other administrations,

recognizing

- a) that improvement of the international spectrum management framework is a continuous process;
- b) that Question ITU-R 224/1 calls for studies on the impact of technical convergence on the national and international radio regulatory environment;
- c) that Article 42 of the Constitution provides that administrations reserve for themselves the right to make special arrangements on telecommunications matters which do not concern Member States in general, so far as this is not in conflict with the provisions of the Constitution, the Convention or the Administrative Regulations, so far as concerns harmful interference which their operation might cause to the radio operations of other Member States,

recommends

that ITU-R study all aspects of interference management resulting from the impact of technical convergence on the radio regulatory environment, involving stations that may operate under more than one terrestrial radiocommunication service, particularly cross-border interference cases (see also *recognizing b)* above), to ensure harmful interference is not caused to stations of other Member States,

invites administrations

to participate actively in the studies by submitting contributions to ITU-R under Question ITU-R 224/1.

MOD

RECOMMENDATION 34 (REV.WRC-12)

Principles for the allocation of frequency bands

The World Radiocommunication Conference (Geneva, 2012),

considering

- a) that the Radio Regulations contain an international Table of Frequency Allocations covering the radio-frequency spectrum;
- b) that it may be desirable, in certain cases, to allocate frequency bands to the most broadly defined services of Article 1 in order to improve flexibility of use but without detriment to other services;
- c) that the development of common worldwide allocations is desirable in order to improve and harmonize utilization of the radio-frequency spectrum;
- d) that adherence to these principles for the allocation of spectrum will allow the Table of Frequency Allocations to focus on matters of regulatory significance while enabling greater flexibility in national spectrum use;
- e) that technological developments occur at a rapid pace and administrations desire to take advantage of such developments to increase spectrum efficiency and facilitate spectrum access;
- f) that the needs of developing countries need to be taken into account;
- g) that Recommendation ITU-R SM.1133 provides a guide to the use of broadly-defined services;
- h) that radiocommunications play a significant role in achieving national, as well as regional and global priorities, including those found in relevant ITU Plenipotentiary Conference and WRC Resolutions,

recognizing

that Resolution **26 (Rev.WRC-07)** provides guidelines for the use of footnotes, including additions, modifications or deletions,

recommends that future world radiocommunication conferences

- 1 should, wherever possible, allocate frequency bands to the most broadly defined services with a view to providing the maximum flexibility to administrations in spectrum use, taking into account safety, technical, operational, economic and other relevant factors;
- 2 should, wherever possible, allocate frequency bands on a worldwide basis (aligned services, categories of service and frequency band limits) taking into account safety, technical, operational, economic and other relevant factors;
- 3 should, wherever possible, keep the number of footnotes in Article 5 to a minimum when allocating frequency bands through footnotes, in line with Resolution **26 (Rev.WRC-07)**;

4 should take into account relevant studies by the Radiocommunication Sector and report(s) of the relevant Conference Preparatory Meeting(s) (CPM), as appropriate, considering also contributions by members, including technical and operational developments, forecasts and usages as per the agenda of the WRC,

recommends administrations

in making proposals to world radiocommunication conferences, to take account of *recommends* 1 to 4 and *considering a) to g)*,

invites administrations

to actively participate in ITU-R studies, providing their technical and operational developments, forecasts and usages,

instructs the Director of the Radiocommunication Bureau and requests the ITU-R study groups

1 when carrying out technical studies relating to a frequency band, to examine the compatibility of broadly defined services with the existing utilizations and the possibility of aligning allocations on a worldwide basis, having regard to *considerings a) to g)* and *recommends* 1 to 4 above;

2 to conduct these studies, with the participation of the International Civil Aviation Organization (ICAO), the International Maritime Organization (IMO), the World Meteorological Organization (WMO) and other international organizations concerned, where appropriate;

3 to submit a report to future world radiocommunication conferences containing the results of these studies,

invites ITU-R

to identify areas for study and to undertake the studies necessary to determine the impact on existing services of those agenda items of future world radiocommunication conferences which involve broadening the scope of existing service allocations,

instructs the Secretary-General

to communicate this Recommendation to ICAO, IMO, WMO and other international organizations concerned, where appropriate,

invites the Director of the Radiocommunication Bureau

to bring this Recommendation to the attention of ITU-T and ITU-D.

ADD

RECOMMENDATION 76 (WRC-12)

Deployment and use of cognitive radio systems

The World Radiocommunication Conference (Geneva, 2012),

considering

- a)* that a cognitive radio system (CRS) is defined as *a radio system employing technology that allows the system to obtain knowledge of its operational and geographical environment, established policies and its internal state; to dynamically and autonomously adjust its operational parameters and protocols according to its obtained knowledge in order to achieve predefined objectives; and to learn from the results obtained* (Report ITU-R SM.2152);
- b)* that a method of spectrum management to be used for aiding frequency assignment for terrestrial services in border areas can be found in Recommendation ITU-R SM.1049;
- c)* that ITU-R is studying the implementation and use of CRS in accordance with Resolution ITU-R 58;
- d)* that studies on regulatory measures related to the implementation of CRS are outside the scope of Resolution ITU-R 58;
- e)* that there are plans to deploy CRS in some radiocommunication services,

recognizing

- a)* that any radio system implementing CRS technology needs to operate in accordance with the provisions of the Radio Regulations;
- b)* that the use of CRS does not exempt administrations from their obligations with regard to the protection of stations of other administrations operating in accordance with the Radio Regulations;
- c)* that CRSs are expected to provide flexibility and improved efficiency to overall spectrum use,

recommends

that administrations participate actively in the ITU-R studies conducted under Resolution ITU-R 58, taking into account *recognizing a) and b)*.

MOD

RECOMMENDATION 206 (REV.WRC-12)

Studies on the possible use of integrated mobile-satellite service and ground component systems in the bands 1 525-1 544 MHz, 1 545-1 559 MHz, 1 626.5-1 645.5 MHz and 1 646.5-1 660.5 MHz

The World Radiocommunication Conference (Geneva, 2012),

considering

- a) that mobile-satellite service (MSS) systems may provide service to a wide area;
- b) that integrated MSS systems employ a satellite component and a ground component where the ground component is complementary to the satellite component and operates as, and is, an integral part of the MSS system. In such systems, the ground component is controlled by the satellite resource and network management system. Further, the ground component uses the same portions of MSS frequency bands as the associated operational mobile-satellite system;
- c) that MSS systems have a limited capacity for providing reliable radiocommunication services in urban areas on account of natural or man-made obstacles and that the ground component of an integrated MSS system can mitigate blockage areas, as well as allow for indoor service coverage;
- d) that MSS systems can improve coverage of rural areas, thus being one element that can bridge the digital divide in terms of geography;
- e) that MSS systems are suitable for public protection and disaster relief communications, as stated in Resolution **646 (Rev.WRC-12)**;
- f) that the bands 1 525-1 544 MHz, 1 545-1 559 MHz, 1 626.5-1 645.5 MHz and 1 646.5-1 660.5 MHz are allocated on a primary basis to the mobile-satellite service and to other services but that none of these bands are allocated to the mobile service on a primary basis except by country footnote;
- g) that within their territories in some of the bands identified in *considering f)*, some administrations have authorized or plan to authorize integrated MSS systems;
- h) that ITU-R has performed frequency sharing studies and has determined that the coexistence between independent systems in the MSS and systems in the mobile services in the same spectrum without harmful interference is not feasible in the same or adjacent geographical area,

recognizing

- a) that ITU-R has not performed studies on sharing, technical or regulatory issues with regard to integrated MSS systems, but that some administrations have performed such studies;

b) that the radionavigation-satellite service in the 1 559-1 610 MHz band and the radio astronomy service in the bands 1 610.6-1 613.8 MHz and 1 660-1 670 MHz need to be protected from harmful interference;

c) that the MSS in the 1 525-1 559 MHz and 1 626.5-1 660.5 MHz bands needs to be protected from harmful interference that may be caused due to co-channel and/or adjacent channel operation of the ground component of integrated MSS systems;

d) that Nos. **5.353A** and **5.357A** are applicable to MSS systems in different portions of the bands 1 525-1 559 MHz and 1 626.5-1 660.5 MHz with respect to the spectrum requirements and prioritization of communications for the Global Maritime Distress and Safety System and the aeronautical mobile-satellite (R) service;

e) that, subject to satisfactory measures being taken to protect RNSS systems, integrated MSS systems may be deployed in the 1 980-2 010 MHz, 2 170-2 200 MHz, 2 483.5-2 500 MHz bands in all three Regions and also in the 2 010-2 025 MHz band in Region 2, all of which bands are allocated both to the MSS and MS services, without the need for ITU-R studies,

noting

a) that the combined wide-area and urban coverage capabilities of integrated MSS systems may contribute to meeting the particular needs of developing countries such as is noted in Resolution **212 (Rev.WRC-07)**;

b) that some administrations that are planning to implement or are implementing integrated systems within their national territories have imposed limitations, in rules and authorization actions, on the e.i.r.p. density that the ground component of such systems may produce into bands allocated to the radionavigation-satellite service;

c) that there are a limited number of frequency bands allocated to the MSS, that these bands are already congested, and that the introduction of integrated ground components may in some instances make spectrum access for other MSS systems more difficult;

d) that administrations implementing integrated MSS systems may provide, in bilateral consultations of administrations, information on system characteristics of the ground component,

recommends

to invite ITU-R to conduct studies on the possible use of integrated MSS systems in the bands 1 525-1 544 MHz, 1 545-1 559 MHz, 1 626.5-1 645.5 MHz and 1 646.5-1 660.5 MHz, as appropriate, taking into account the need to protect existing and planned systems, as well as the above *considering*, *recognizing* and *noting*, and in particular *recognizing a), b) and c)*,

invites administrations

to participate as necessary in the ITU-R studies taking into account *recognizing a)*.



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