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International Telecommunication Union



FINAL ACTS WRC-03

**WORLD
RADIOCOMMUNICATION
CONFERENCE
(GENEVA, 2003)**



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Telecommunication
Union

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Telecommunication
Union**

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Geneva, 2003

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Preamble

The World Radiocommunication Conference (Istanbul, 2000) resolved, by Resolution **800 (WRC-2000)**, to recommend to the ITU Council that a World Radiocommunication Conference be held in 2003 for a period of four weeks.

At its 2000 session, the Council resolved, by its Resolution 1156, that the Conference be convened in Geneva from 9 June to 4 July 2003, 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-03) 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 the World Radiocommunication Conference (Geneva, 2003), as contained in the revision of the Radio Regulations referred to in this Preamble, shall enter into force as from 1 January 2005; 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, 4 July 2003

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For the State of Israel:

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For the Kingdom of Lesotho:

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For Romania:

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For Serbia and Montenegro:

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For the Republic of Seychelles:

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Totsaporn GETU-ADISORN
Chaturon CHOKSAWAT
Nattawat ARD-PARU
Pranot PAJONGSILVIVAT
Ngamwilai SOMKID
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Fathi DABBABI

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Osman ATES
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Yunus Suayip CETİN
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For the Eastern Republic of Uruguay:

Juan Eduardo PIAGGIO MAZZARA

For the Bolivarian Republic of Venezuela:

Layla MACC ADAN

For the Socialist Republic of Viet Nam:

Hoan DOAN QUANG

For the Republic of Yemen:

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For the Republic of Zambia:

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For the Republic of Zimbabwe:

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Obert MUGANYURA
Charles Manzi SIBANDA
Cleopas ZVIRAWA

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Final Protocol

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Declarations and reservations*

At the time of signing the Final Acts of the World Radiocommunication Conference (Geneva, 2003), the undersigned delegates take note of the following declarations and reservations made by signatory delegations:

1

Original: Spanish

For the Dominican Republic:

In signing the Final Acts of the World Radiocommunication Conference of the International Telecommunication Union (Geneva, 2003), the delegation of the Dominican Republic reserves the right to express further reservations to these Acts at any time it deems appropriate, between the date of signature and the date of ratification, in accordance with the procedures established in Dominican legislation.

The delegation of the Dominican Republic does not accept the establishment and application of any financial burden additional to that approved by the World Radiocommunication Conference (Geneva, 2003).

The delegation of the Dominican Republic reserves the right to take any action it considers necessary to protect and safeguard the sovereignty of the Dominican Republic should any Member State 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, 2003).

2

Original: Spanish

For the Eastern Republic of Uruguay:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2003), 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 fail in any way to observe the Final Acts, the Annexes thereto and the Radio Regulations, or should reservations by other Members jeopardize its full sovereign rights or the proper functioning of its telecommunication services;
- to make additional declarations or reservations, under the Vienna Convention on the Law of Treaties of 1969, to the Final Acts of the World Radiocommunication Conference (Geneva, 2003) 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.

3

Original: French

For the Republic of Guinea:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2003), the delegation of the Republic of Guinea 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 should 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 Guinea.

4

Original: Spanish

For the Argentine Republic:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2003), the delegation of the Argentine Republic declares that it reserves for its Government the right:

- to take any measures that it may deem necessary to safeguard its interests, should other Members of the International Telecommunication Union fail in any way to comply with the provisions of the Final Acts, the Annexes thereto or the Radio Regulations; and
- to express declarations or reservations with respect to the Final Acts of the World Radiocommunication Conference (Geneva, 2003) at the time of deposit of the corresponding instrument of ratification with the International Telecommunication Union.

5

Original: Spanish

For the Bolivarian Republic of Venezuela:

The delegation of the Bolivarian Republic of Venezuela reserves for its Government the right to take such action as it may consider necessary to safeguard its interests should another country fail in any way to comply with the provisions of these Final Acts or should reservations by any country be prejudicial to the radiocommunication services of Venezuela.

6

*Original: French/
English/
Spanish*

For the Federal Republic of Germany, Austria, Belgium, the Republic of Cyprus, Denmark, Spain, the Republic of Estonia, Finland, France, Greece, the Republic of 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, the United Kingdom of Great Britain and Northern Ireland, the Republic of Slovenia and Sweden:

The delegations of the Member States and future Member States of the European Union declare that the Member States and future Member States of the European Union will apply the revision of the Radio Regulations adopted at this Conference in accordance with their obligations under the EC Treaty.

7

*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, 2003), 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.

8

*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.

9

*Original: French**For Burkina Faso:*

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2003), the delegation of Burkina Faso declares:

- 1 that it reserves for its Government the right to take any action it considers appropriate to safeguard the interests of Burkina Faso and to protect the operation of telecommunication services in Burkina Faso should any Member State of the Union fail to comply in any way whatsoever with the provisions of these Final Acts;
- 2 that its Government will not accept responsibility for the consequences of reservations expressed by Members of the Union.

10

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

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2003), the delegation of the Republic of Indonesia:

- 1 reserves the right for its Government to take any action and preservation measures it deems necessary to safeguard its national interests should any provision, recommendation and resolution of the World Radiocommunication Conference (Geneva, 2003), directly or indirectly affect its sovereignty or be in contravention to the Constitution, Laws and Regulations of the Republic of Indonesia as a party to other treaties and conventions and any principles of international law;
- 2 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 Radio Regulations, the Constitution and Convention of the International Telecommunication Union, or should the consequences of reservations by any Member jeopardize its telecommunication services or result in an increase of its contributory share towards defraying expenses of the Union.

11

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

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2003), the delegation of the Republic of Cameroon declares:

- 1 that it reserves for its Government the right to take any measures that it may deem necessary and appropriate to safeguard its interests should any Member State of the International Telecommunication Union fail to comply with the provisions of these Final Acts;
- 2 that its Government will not accept responsibility for the consequences of reservations expressed by Member States of the International Telecommunication Union;
- 3 that its Government reserves the right to express any additional reservations that it may deem necessary up to the time of deposit of the instruments of ratification.

12

*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, 2003), or should any reservations by any Member of the Union jeopardize Brunei Darussalam's radiocommunication or 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, 2003).

13

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

In signing the Final Acts of the World Radiocommunication Conference of the International Telecommunication Union, held in Geneva (Switzerland) from 9 June to 4 July 2003, the delegation of the Gabonese Republic reserves for its Government the right:

- 1 to take any necessary action 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, and the instruments of amendment adopted by the World Radiocommunication Conference (Istanbul, 2000), 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.

14

*Original: English**For Malta:*

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2003), the delegation of Malta 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 in any way to observe or 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.

15

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

The Kingdom of Lesotho declares that it reserves its sovereign right to protect its rights and to act accordingly in response to any attempt at tampering with rights by another administration.

16

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

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2003), the delegation of the Republic of El Salvador reserves the sovereign right to apply such measures as it may deem appropriate to protect its interests should another country fail, in any way, to observe the conditions set out in these Final Acts, or should reservations by any other country be prejudicial to the radiocommunication services of El Salvador. Furthermore, it will make allocations additional to those laid down in the Radio Regulations for the future use of radiocommunication services within the national territory, and in particular will allocate on an additional basis to the fixed and mobile services in the following frequency bands: 1 690-1 700 MHz; 8 500-8 750 MHz; 10.68-10.70 GHz and 14.0-14.3 GHz.

17

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

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2003), the delegation of Panama reserves for its Government the right to take any action it deems necessary to safeguard its legitimate interests should those interests be affected by any failure, on the part of a Member State of the International Telecommunication Union (ITU), to comply with the provisions of these Final Acts.

The delegation of Panama further reserves the right, under the Vienna Convention on the Law of Treaties of 1969, to enter reservations to the Final Acts of the World Radiocommunication Conference (Geneva, 2003), at any time it sees fit between the date of the signature and the date of the ratification, if any, of the international instruments constituting these Final Acts, provided that the latter are considered to be incompatible with the National Constitution, its laws and regulations.

For the Kingdom of Saudi Arabia:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2003), the delegation of the Kingdom of Saudi Arabia reserves for its Government 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 reservations by any Member State jeopardize in any way the telecommunication services of the Kingdom of Saudi Arabia.

For the Republic of Senegal:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2003), the delegation of the Republic of Senegal reserves for its Government the right:

- 1 to take all measures necessary to safeguard its interests, should any Members fail in any way whatsoever to comply with decisions taken by the World Radiocommunication Conference (Geneva, 2003), or should reservations expressed 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 have a direct adverse effect upon its sovereignty.

For the Republic of Estonia, the Republic of Latvia and the Republic of Lithuania:

At the time of signing the Final Acts of the World Radiocommunication Conference (Geneva, 2003) the delegations of the above-mentioned countries reserve for their Governments the right to take any action they consider necessary to safeguard their interests should any Member of the Union fail in any way to comply with the requirements of these Final Acts.

For the Republic of Guatemala:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2003), the Government of the Republic of Guatemala 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, 2003), 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, 2003);
- to make reservations and declarations prior to the ratification and deposit of the Final Acts of the World Radiocommunication Conference (Geneva, 2003);
- 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, 2003), the Radio Regulations and associated instruments, should these be deemed prejudicial to Guatemala's national interests or detrimental to its domestic telecommunications;
- to apply provisions deriving from the Final Acts of the World Radiocommunication Conference (Geneva, 2003) 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 Guatemala's national telecommunications.

22

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

The delegation of the Republic of Zambia in signing these Final Acts on behalf of its Government, which is a sovereign State, reserves its rights, in the event of any of the administrations who are party to these Final Acts and the ITU Convention not abiding to these regulations, to take all necessary steps to protect and regulate the orderly developments of all its national and international telecommunication services in its territory.

23

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

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2003), 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 States 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, 2003).

24

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

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2003), the delegation of the Republic of Burundi reserves for its Government the right to take all necessary measures to protect and safeguard its interests, should certain Members of the Union fail to observe the provisions contained in the Final Acts of WRC-03 or should reservations expressed by other Members jeopardize the proper functioning of its radiocommunication services.

For the Republic of Zimbabwe:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2003), the delegation of the Republic of Zimbabwe formally declares that it reserves the right of the Government of Zimbabwe to take all subsequent measures it may deem necessary to protect its sovereignty and national interests should any of the regulations be used by other countries, particularly against the sovereign right of the Republic of Zimbabwe to regulate the orderly development of its national as well as international telecommunications and radiocommunications.

For the Republic of Botswana:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2003), 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 Government of Botswana 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 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 (Geneva, 2003).

For Ecuador:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2003), the delegation of Ecuador:

- 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 any other Members fail to comply with the provisions of the Final Acts of the World Radiocommunication Conference (Geneva, 2003), or should reservations by representatives of other States jeopardize the radiocommunication services of Ecuador 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, 2003), 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 Declares that Ecuador is 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.
- 3 Declares that its Government cannot give provisional effect to the international instruments which constitute the Final Acts of the World Radiocommunication Conference (Geneva, 2003).

Original: English

For Ghana:

- 1 The delegation of Ghana in signing the Final Acts of the World Radiocommunication Conference (Geneva, 2003) held in Geneva, Switzerland from 9 June to 4 July 2003, reserves for its Government the right to take any such action it may consider necessary to safeguard its interests, should any Member of the Union fail to comply with the provisions of the Constitution and Convention of the International Telecommunication Union, the Radio Regulations of ITU and the Final Acts of the World Radiocommunication Conference (Geneva, 2003).
- 2 The Government of Ghana further reserves the right to express reservations on any provisions of the Final Acts deemed to be incompatible with the constitution, laws and regulations of the country.

Original: English

For the People's Democratic Republic of Algeria, the Kingdom of Saudi Arabia, the Kingdom of Bahrain, the United Arab Emirates, the Islamic Republic of Iran, the State of Kuwait, the Socialist People's Libyan Arab Jamahiriya, the Syrian Arab Republic and the Republic of Yemen:

The delegations of the above-mentioned countries to the World Radiocommunication Conference (Geneva, 2003), declare that the signature and possible ratifications by their respective Governments of the Final Acts of this Conference shall not be valid for the ITU Member under the name of "Israel", and in no way whatsoever imply its recognition by these Governments.

Original: English

For the Kingdom of Tonga:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2003), the delegation of the Kingdom of Tonga:

- 1 Declares that it reserves for its Government the right:
 - a) to take any measures it may deem necessary, in conformity with its domestic law and with international law, to safeguard its national interests should any other Member fail to comply with the provisions of the Radio Regulations or any other documents contained in the Final Acts of the Conference, or should the Acts or reservations by representatives of other States affect its national sovereignty or its national telecommunications;
 - b) not to be bound by any provisions in the Final Acts of the World Radiocommunication Conference (Geneva, 2003), which are, or which are potentially, retroactive in character and which could prejudice the legal situation established under the Radio Regulations in force on the date of signature of the present Final Acts unless it expressly and duly consents to be bound, and subject to the completion of the appropriate procedures established in its domestic law;
 - c) to make, under the Vienna Convention on the Law of Treaties of 1969, reservations to the above-mentioned Final Acts at any time it considers proper between the date of signature and the date of their ratification or approval and not to be bound by any provision of these Final Acts or of the Constitution and the Convention of the International Telecommunication Union restricting its sovereign right to make reservations.

- 2 Declares that the eventual ratification by the Kingdom of Tonga of any provisions of the Final Acts of the World Radiocommunication Conference (Geneva, 2003) which are, or which are potentially, retroactive in their application is done so only on the basis that any such ratification of retroactive provisions is made on an exceptional basis. The Kingdom of Tonga does not accept that the inclusion of the Final Acts of the World Radiocommunication Conference (Geneva, 2003) of any provisions which have, or which potentially have, a retroactive application sets a precedent for a similar approval of retroactive provisions by future conferences.
- 3 Declares that the Kingdom of Tonga considers itself bound by the revision of the Radio Regulations by the World Radiocommunication Conference (Geneva, 2003), only insofar as it expressly and duly consents to be bound, and subject to the completion of the appropriate procedures established in its domestic law.

31

Original: English

For Jamaica:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2003), the delegation of Jamaica reserves for its Government the right to take such measures deemed necessary to safeguard its interests should any Member 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 legitimate operations of its telecommunication services or prejudice its ability to provide future telecommunication services in Jamaica.

32

Original: French

For the Republic of the Congo:

In signing the Final Acts of the World Radiocommunication Conference (WRC-03), the delegation of the Republic of the Congo reserves for its Government the right:

- 1 to take any measures it may deem necessary to protect its interests, should other Members of the International Telecommunication Union fail in any way whatsoever to comply with the provisions of the Final Acts, of the Annexes thereto or of the Radio Regulations, or should reservations entered by other Members jeopardize the proper functioning of its telecommunication services;
- 2 to enter further reservations prior to the ratification of the Final Acts of WRC-03.

33

Original: English

For Turkey:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2003), 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 formally declares that reservations previously made with regard to the modifying, amending, deleting and adding provisions, footnotes, tables, Resolutions and Recommendations in the Radio Regulations, Final Acts, Annexes and Radio Regulations of the Union shall prevail unless otherwise declared.

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, 2003).

34

Original: English

For the Republic of India:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2003), 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.

35

Original: English

For Thailand:

The delegation of Thailand to the World Radiocommunication Conference (WRC-03), reserves the right of its Government to take any action that it deems necessary to safeguard its interests should any Member or Members of the International Telecommunication Union fail, in any way, to comply with the Final Acts of this Conference and the Annexes attached thereto, or should any of the reservations made by other Members jeopardize its telecommunication services or infringe its national sovereignty.

36

Original: French

For the People's Democratic Republic of Algeria:

In signing these Final Acts of WRC-03, the delegation of the People's Democratic Republic of Algeria reserves for its country the right to take any measures it deems necessary to safeguard its rights with respect to the utilization of the radio-frequency spectrum and the geostationary-satellite orbit against any infringement of provisions of the Radio Regulations.

37

Original: French

For the Republic of Mali:

The Administration of Mali reserves the right to express reservations with respect to any application of WRC-03 decisions that is improper or not in accord with the regulations, and which might jeopardize the interests of Mali.

Original: English

For the Syrian Arab Republic:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2003), the delegation of the Syrian Arab Republic reserves for its Government the right:

- 1 to confirm and make use of all written and oral declarations and reservations made by its delegation during this Conference jointly with the Arab States and/or individually;
- 2 to make additional declarations and reservations at the time of its notification to the International Telecommunication Union of its ratification of these Final Acts;
- 3 to take any measures it might deem necessary to protect 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.

In addition, the Syrian delegation to this Conference states the following reservations:

- 1 the Syrian Arab Republic is not in a position to authorize the use of an earth station on board airplane, landing in Syria or crossing its national air space, unless such request is accompanied by the detailed technical specifications confirming its compliance as an earth station with the typical earth station working in the relevant fixed-satellite service (FSS) network already coordinated;
- 2 the Syrian Arab Republic would like to stress its understanding of WRC-07 agenda item No. 1.12 “possible changes in response to Resolution 86 (PP-Marrakesh, 2002)” to be strictly limited to the main purpose of this Resolution and not to be used to enlarge and/or modify, in any way, the next WRC agenda items.

Original: Russian

For the Republic of Armenia, 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 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 of the Union, jeopardize the proper operation of those countries’ telecommunication services.

Original: English

For the Republic of Cyprus:

The Republic of Cyprus refers to Article 32, Section 16, of the International Telecommunication Convention (Geneva, 1992) and notes that in considering the Final Acts of the World Radiocommunication Conference (Geneva, 2003), the Republic of Cyprus may find it necessary to make additional declarations or reservations. 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 specific notification to the International Telecommunication Union by the Republic of Cyprus of its consent to be bound.

Original: Spanish

For the Republic of Colombia:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2003), 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 any other Members fail to comply with the provisions of the Final Acts of the World Radiocommunication Conference (Geneva, 2003), 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, 2003), 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), 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, 2003).

Original: Spanish

For Costa Rica:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2003), the delegation of the Republic of Costa Rica:

- 1 declares that it reserves for its Government the right to take any measures it considers necessary, in conformity with its domestic legislation and international law, to safeguard its national interests should any other Members fail to comply with the provisions of the Final Acts of the World Radiocommunication Conference (Geneva, 2003), or should reservations by representatives of other States jeopardize the telecommunication services of the Republic of Costa Rica or its full sovereign rights;
- 2 declares that the Republic of Costa Rica shall only be bound by the provisions contained in the Final Acts of the World Radiocommunication Conference (Geneva, 2003) insofar as it expressly and duly consents to be bound, and subject to the completion of the appropriate constitutional procedures.

Original: English

For the Federal Republic of Nigeria:

In signing the Final Acts of the World Radiocommunication Conference held in Geneva, the delegation of the Federal Republic of Nigeria declares:

- a) that it acknowledges the need for the development of radiocommunications worldwide as a means of enhancing sustainable development in the interest of humanity and the environment;
- b) that, however, it reserves the right to take any action it considers necessary to safeguard its interests and in particular to protect its existing or planned telecommunication networks, systems and services, should a Member of the Union not comply with the provision of these Acts in such a way that affects the proper functioning of the telecommunication network, systems and services;
- c) further, it reserves the right to make an additional declaration and reservation at the time of its notification to the ITU of its ratification of these Final Acts.

Original: French

For the Islamic Republic of Mauritania:

In signing the Final Acts of the World Radiocommunication Conference (WRC-03), the delegation of the Islamic Republic of Mauritania reserves for its Government the right to take any measures it deems necessary to safeguard its telecommunication services in the event of their being affected.

Original: Spanish

For the Republic of Honduras:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2003), the delegation of the Republic of Honduras:

- 1 declares that it reserves for its Government the right to take any measures it considers necessary, in conformity with its domestic legislation and international law, to safeguard its national interests should any other Members fail to comply with the provisions of the Final Acts of the World Radiocommunication Conference (Geneva, 2003), or should reservations by representatives of other States jeopardize the telecommunication services of the Republic of Honduras or its full sovereign rights;
- 2 declares that the Republic of Honduras shall only be bound by the provisions contained in the Final Acts of the World Radiocommunication Conference (Geneva, 2003) insofar as it expressly and duly consents to be bound, and subject to the completion of the appropriate constitutional procedures.

Original: French

For the Republic of Côte d'Ivoire:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2003), the delegation of the Republic of Côte d'Ivoire declares that it reserves for its Government the right:

- a) to take any action it considers necessary to safeguard its interests should any Member State of the Union fail, in any way, to comply with the provisions of the Radio Regulations (2001 edition) as amended by this Conference; or should reservations by any Member of the Union jeopardize the proper functioning of its radiocommunication networks and/or impair its sovereignty;

- b) to enter declarations or reservations at the time of the approval of the Final Acts of this Conference.

47

Original: English

For the Republic of Bulgaria:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2003), 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 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.

48

Original: English

For the Islamic Republic of Iran:

IN THE NAME OF GOD

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2003), 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 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 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.

49

Original: English

For the Commonwealth of the Bahamas:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2003), the delegation of the Commonwealth of the Bahamas reserves for its Government the right to take any measure it may deem necessary to safeguard its interest if another country should in any way fail to respect the conditions specified in the Final Acts or if the reservations made by any country should be prejudicial to the operation of the radiocommunication services of the Commonwealth of the Bahamas.

The delegation of the Commonwealth of the Bahamas further reserves for its Government the right to make any statement or declaration when depositing its instruments of its consent to be bound by the revision of the Radio Regulations by the World Radiocommunication Conference (Geneva, 2003).

For the Republic of Korea:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2003), the delegation of the Republic of Korea reserves for its Government the right to take any measures as it might deem necessary to safeguard its interests if any other Member State of the Union should in any way fail to respect the conditions specified in the Final Acts or if the reservations made by other countries should be prejudicial to the efficient operation of its telecommunication services.

For Barbados:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2003), the delegation of Barbados reserves for its Government the right to take such measures deemed necessary to safeguard its interest should any Member 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 legitimate operations of its telecommunication services or prejudices its ability to provide future telecommunication services in Barbados.

For Eritrea:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2003), the delegation of the State of Eritrea 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 take action, if necessary, to protect all its domestic and international broadcast (sound and TV) services as covered by GE75, HFBC, GE84 and GE89, under any circumstances whatsoever, in safeguarding its interests and for its satisfactory operations of all its above services as may be stipulated under its national regulations.

For Mexico:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2003), 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 neglect to apply the provisions contained in these Acts, including the Decisions, Recommendations, Resolutions and Annexes that form an integral part of the same, or those 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 associated frequency assignments 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.

Lastly, 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), the Plenipotentiary Conference (Kyoto, 1994), the Plenipotentiary Conference (Minneapolis, 1998) and the Plenipotentiary Conference (Marrakesh, 2002), are reaffirmed and considered to be reproduced herein as if they had been repeated in full.

54

Original: English

For New Zealand:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2003), 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.

55

Original: English

For the Republic of the Philippines:

In signing the Final Acts of the World Radiocommunication Conference 2003 held in Geneva from 9 June to 4 July 2003, the delegation of the Republic of the Philippines:

- 1 reserves for its Government, the right to take any and all actions it deems necessary, appropriate and sufficient, consistent and in harmony with its national law, to safeguard and protect, in the event that delegations of other States should make reservations that may or could jeopardize its telecommunication services and/or prejudice its rights as a sovereign country;
- 2 reserves for its Government, the right to make any and all declarations or reservations prior to the deposit of the instrument for ratification of the Final Acts of this World Radiocommunication Conference 2003.

Original: English

For the United States of America:

- 1 The United States of America refers to Article 32, Section 16, of the International Telecommunication Convention (Geneva, 1992), as amended by the Plenipotentiary Conference (Kyoto, 1994), and notes that in considering the Final Acts of the World Radiocommunication Conference (Geneva, 2003), 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 instruments of ratification of these revisions to 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 the People's Republic of China:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2003), 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 proper operation of the telecommunication services of China 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.

Original: English

For Canada:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2003), 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 should 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 Canada.

The delegation of Canada further declares that it reserves for its Government the right to make any statements or reservations when depositing its instruments of ratification for the Final Acts of the World Radiocommunication Conference (Geneva, 2003).

Original: English

For Papua New Guinea:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2003), the delegation of Papua New Guinea, on behalf of the Government of Papua New Guinea, in light of declarations and reservations deposited by other Member States of ITU, is obliged to reserve 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 so doing cause harmful interference to, or, should reservations or actions by such Member States jeopardize the proper operation of radiocommunication and/or telecommunication systems and services which are under the jurisdiction of the Government of Papua New Guinea.

Original: French

For the Togolese Republic:

In signing the Final Acts of the World Radiocommunication Conference 2003 (WRC-03), the delegation of the Togolese Republic reserves for its Government the right:

- not to be bound by any provisions of the said Final Acts which may impair its sovereignty or offend against the laws of the Togolese Republic;
- to take all necessary action to safeguard its interests should certain Members fail to comply with the provisions of these Acts or should any reservations by other countries be contrary to its interests;
- to enter further reservations upon ratification of the instruments adopted by WRC-03.

Original: English

For Greece:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2003), the delegation of Greece declares:

- 1 that it reserves for its Government the right:
 - a) to take any action consistent with its national and international law that it may consider or deem necessary or useful to protect and safeguard its sovereign and inalienable rights and legitimate interests, should any Member of the International Telecommunication Union fail in any way to comply with or apply the provisions of these Final Acts, which include the Radio Regulations, Resolutions and Recommendations of the Conference, or should the acts of other entities or third parties affect its national sovereignty or the proper operation of its telecommunication services;
 - b) to make, under the Vienna Convention on the Law of Treaties, 1969, reservations to the above-mentioned Final Acts at any time it considers proper between the date of signature and the date of their ratification or approval and not to be bound by any provision of these Final Acts or of the Constitution and the Convention of the International Telecommunication Union restricting its sovereign right to make reservations;
- 2 that it is fully established that the term “country”, used in the provisions of these Final Acts and in any other instrument or act of the International Telecommunication Union with regard to its Members and their rights and obligations, is regarded as being synonymous in all respects with the term “sovereign State” as legally constituted and internationally recognized.

Original: French

For France:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2003), the French delegation expresses reservations against the possibility that the number and complexity of the texts adopted within a very limited time and the risks due to the speeding up of the process for the approval of documents might give rise to interpretations which were not in conformity with the final consensus of the Conference.

The delegation of France reserves for its Government the right to enter further declarations or reservations upon depositing its instruments of ratification of these revisions of the Radio Regulations.

More generally, the delegation of France reserves for its Government the right to take any measures it might deem necessary to protect its interests should any Member State of the Union fail to respect the provisions of these Final Acts or to comply with them or should reservations made by other countries jeopardize the efficient operation of its telecommunication services.

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 the provisions of 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 a 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: Spanish

For Cuba:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2003), the delegation of Cuba 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, or in violation of the provisions of the Radio Regulations themselves, and particularly the principle contained in No. 0.4 of the Preamble thereto.

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

Original: English

For the Republic of South Africa:

- 1 The delegation of the Republic of South Africa, in signing the Final Acts, reserves its Government's right to take any such action as it may consider 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 (Geneva, 2003).
- 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 (Geneva, 2003).

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 interests, 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 (Marrakesh, 2002), or should reservations by such Members, directly or indirectly, affect the operations of its telecommunication services or its sovereignty.

Original: English

For the Republic of Hungary:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2003), the delegation of the Republic 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 the Republic 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, 2003).

Original: English

For the Lao People's Democratic Republic:

In signing the Final Acts of WRC-03, the delegation of Lao P.D.R. reserves for its Government the right to take any measures which it deems necessary to protect its rights and interests in any decision taken by the Conference related to modifying, amending, deleting and adding provisions, footnotes, tables, Appendices, Resolutions, Recommendations, etc. in the Radio Regulations. Moreover, the delay in processing, by the Bureau, of the backlog of filings must not prejudice the rights and interests of Lao P.D.R. in any of its filings.

In addition, should any Member of the Union fail, in any way, to comply with the provisions of the Final Acts, Plans, Lists, Annexes and Radio Regulations and all related decisions of the Conference, including any agreements entered into during the course of the Conference, 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 Lao P.D.R. reserves for its Government the right to take any measures which it deems necessary to protect its rights and interests.

Except as specified in agreements between Lao P.D.R. and other administrations entered into prior to 4 July 2003, the delegation of Lao P.D.R. reserves for its Government the position it has taken in ratifying the Final Acts of WRC-2000 on the matter of the adoption and application of RR 23.13 including any related regulatory and procedural provisions.

68

Original: English

For the State of Israel:

- 1 The Government of 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, 2003); or should reservations made by other Member States appear to be detrimental to the operation of its telecommunication services.
- 2 The Government of 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, 2003).

69

Original: English

For the Federal Republic of Germany, the Republic of Cyprus, Denmark, Spain, the Republic of Estonia, France, the Republic of Hungary, Ireland, Iceland, Italy, the Republic of Latvia, the Principality of Liechtenstein, Luxembourg, Malta, the Kingdom of the Netherlands, Portugal, the Slovak Republic, the Czech Republic, the United Kingdom of Great Britain and Northern Ireland, Sweden and the Confederation of Switzerland:

At the time of signing the Final Acts of the World Radiocommunication Conference (Geneva, 2003), 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.

For the Czech Republic:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2003), the delegation of the Czech Republic declares that it reserves for its Government the right to take any action which it may deem necessary to safeguard its interests should any Member State fail to comply with the provisions of the Constitution and Convention of the International Telecommunication Union, its Annexes and the Protocols attached thereto and the Radio Regulations.

The same reservation is made for the Government with regard to the Final Acts of the World Radiocommunication Conference (Geneva, 2003) and with regard to any reservations or actions by other Member States, which could affect adversely its telecommunication and radiocommunication services.

For the Slovak Republic:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2003), the delegation of the Slovak Republic reserves for its Government the right to take any action as it may consider necessary, to safeguard its interests should any Member of the ITU fail in any way to observe or comply with the provisions of the Final Acts and Annexes adopted by the Conference or should the reservations made by the representatives of other States jeopardize the proper operation of its telecommunication services.

Additional declarations and reservations

72

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

- 1 Declaration No. 29, made by certain Member States in respect of the Final Acts, contravenes the principles and purposes of the International Telecommunication Union, and is therefore devoid of legal validity.
- 2 The Government of the State of Israel wishes to put on record that it rejects the aforesaid declaration, which politicizes and undermines the work of ITU.
- 3 Should any Member State that has made the foregoing declaration act towards Israel in a manner which violates Israel's rights as a Member State of ITU, or breaches such Member State's obligations towards Israel as such, the State of Israel reserves its right to act towards such Member State in a reciprocal fashion.

73

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

Taking note of declarations in Document 399 and in signing the Final Acts of the World Radiocommunication Conference (WRC-03) (Geneva, 2003), the delegation of Egypt (Arab Republic of) reserves for its Government the right to take any action and preservation measures it deems necessary to safeguard its national interests should any Member of the Union in any way 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 of the Union, jeopardize the proper operation of its country's telecommunication services.

74

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

In reviewing the declarations and reservations made by Member States and contained in Document 399, the delegation of Croatia on behalf of its Government declares the additional declaration as follows:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2003), the delegation of Croatia expresses reservations against the possibility that the number and complexity of documents adopted within a very limited time and the risks due to the speeding up of the process for the approval of documents might give rise to interpretations which were not in conformity with the final consensus of the Conference.

Additionally, the delegation of Croatia 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 should in any way fail to respect the conditions specified in the Final Acts of the World Radiocommunication Conference (Geneva, 2003) or if the reservations made by any Member State should be prejudicial to the operation of radiocommunication and telecommunication services in Croatia.

*Original: English**For Bosnia and Herzegovina:*

For reviewing the declarations and reservations made by Member States and contained in Document 399, the delegation of Bosnia and Herzegovina on behalf of its Government declares the additional declarations as follows:

In signing the Final Acts of the World Radiocommunication Conference (Geneva, 2003), the delegation of Bosnia and Herzegovina 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 should 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 Bosnia and Herzegovina.

The delegation of Bosnia and Herzegovina 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 for the World Radiocommunication Conference (Geneva, 2003).

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

Having taken note of some of the declarations of the Member States, the delegation of the Republic of Kenya to the World Radiocommunication Conference (Geneva, 2003), reserves, for its Government, the right to take such actions as it may consider necessary to safeguard and protect its interests should any Member fail in any way to comply with the provisions of the Constitution and Convention of the International Telecommunication Union (Geneva, 1992), the Radio Regulations of the ITU and the Final Acts of the World Radiocommunication Conference (Geneva, 2003) and/or any other instruments associated therewith.

The declaration further affirms that the Government of the Republic of Kenya does not accept responsibility for the consequences arising out of any reservations made by other Members of the Union.

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

Having noted some of the declarations of the Member States, the delegation of the Republic of Uganda to the World Radiocommunication Conference (Geneva, 2003), reserves for its Government the right to take such measures it considers appropriate to safeguard its legitimate interests on the decisions taken by the Conference.

The Government of Uganda, within the provisions of the International Telecommunication Union and the Radio Regulations as revised and contained in the Final Acts of the World Radiocommunication Conference (Geneva, 2003), further reserves the right to take any action it deems necessary to safeguard its national interests should the reservations by any administration or administrations affect its national sovereignty.

Original: English

For the United States of America:

The United States of America, noting Declaration 64 entered by the delegation of Cuba, and the statement by the delegate of Cuba contained in Document 139 of the World Radiocommunication Conference (Geneva, 2003), recalls its right to broadcast to Cuba on appropriate frequencies free of jamming and other wrongful interference and reserves its right with respect to existing interference and any future interference by Cuba with US broadcasting.

Original: English

For the Federated States of Micronesia:

After having considered the declarations and reservations contained in Document 399, 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 International Telecommunication Union Convention (Geneva, 1992), as amended by the Plenipotentiary Conference (Kyoto, 1994), declares that it reserves for the Government of the Federated States of Micronesia the right to make any declarations or reservations necessary to Micronesian interests should declarations or reservations made by other Member States jeopardize the proper operation of the telecommunication services of the Federated States of Micronesia.

Original: English

For the Federal Republic of Germany, Australia, Belgium, the Republic of Cyprus, Denmark, the United States of America, France, Greece, the Republic of Hungary, Ireland, Japan, the Principality of Liechtenstein, Luxembourg, Malta, the Federated States of Micronesia, Norway, New Zealand, the Kingdom of the Netherlands, Portugal, the Slovak Republic, the Czech Republic, the United Kingdom of Great Britain and Northern Ireland, Sweden and the Confederation of Switzerland:

The delegations of the above-mentioned countries referring to the declaration made by the Republic of Colombia (No. 41), inasmuch as this statement refers to the Bogota 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, and similar statements, consider the claims in question cannot be recognized by this Conference. Further, the above-mentioned delegations wish to affirm or reaffirm the declarations made on behalf of a number of the above-mentioned administrations in this regard when signing the Final Acts of previous conferences of the International Telecommunication Union as of these declarations were here repeated in full.

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

Original: English

For the United Republic of Tanzania:

Having considered the declarations included in Document 399, the delegation of the United Republic of Tanzania:

- 1 declares that it reserves for its Government the right to take any action it may consider necessary to safeguard its interests should any Member of the Union, in anyway, 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 (Geneva, 2003);
- 2 should any reservation by a Member of the Union, directly or indirectly, affect operation of its telecommunication services, the United Republic of Tanzania reserves its right to take any action that it may deem necessary;
- 3 further, the delegation of the United Republic of Tanzania reserves the right of its Government to make 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 (Geneva, 2003).

Original: English

For Papua New Guinea:

After having considered the declarations and reservations contained in Document 399, the delegation of Papua New Guinea further declares that it reserves for its Government the right to make any additional statements or reservations it may consider necessary up to and including the time when it deposits its instruments of ratification for the Final Acts of the World Radiocommunication Conference (Geneva, 2003).

ARTICLES

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ARTICLE 1

Terms and definitions**MOD**

1.14 *Coordinated Universal Time (UTC)*: Time scale, based on the second (SI), as defined in Recommendation ITU-R TF.460-6. (WRC-03)

ADD

1.146A *out-of-band domain* (of an emission): The frequency range, immediately outside the necessary bandwidth but excluding the *spurious domain*, in which *out-of-band emissions* generally predominate. *Out-of-band emissions*, defined based on their source, occur in the out-of-band domain and, to a lesser extent, in the *spurious domain*. *Spurious emissions* likewise may occur in the out-of-band domain as well as in the *spurious domain*. (WRC-03)

ADD

1.146B *spurious domain* (of an emission): The frequency range beyond the *out-of-band domain* in which *spurious emissions* generally predominate. (WRC-03)

MOD

1.189 *geostationary satellite*: A *geosynchronous satellite* whose circular and direct orbit lies in the plane of the Earth's equator and which thus remains fixed relative to the Earth; by extension, a *geosynchronous satellite* which remains approximately fixed relative to the Earth. (WRC-03)

ARTICLE 3

Technical characteristics of stations**MOD**

3.6 Transmitting stations shall conform to the maximum permitted power levels for spurious emissions or for unwanted emissions in the spurious domain specified in Appendix 3. (WRC-03)

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 most recent ITU-R Recommendations (see Resolution **27 (Rev.WRC-03)**). (WRC-03)

ARTICLE 4

Assignment and use of frequencies**Section I – General rules****MOD**

4.8 Where, in adjacent Regions or sub-Regions, a band of frequencies is allocated to different services of the same category (see Sections I and II of Article 5), the basic principle is the equality of right to operate. Accordingly, the stations of each service in one Region or sub-Region must operate so as not to cause harmful interference to any service of the same or higher category in the other Regions or sub-Regions. (WRC-03)

ARTICLE 5

Frequency allocations**Section IV – Table of Frequency Allocations**

(See No. 2.1)

MOD

5.56 The stations of services to which the bands 14-19.95 kHz and 20.05-70 kHz and in Region 1 also the bands 72-84 kHz and 86-90 kHz are allocated may transmit standard frequency and time signals. Such stations shall be afforded protection from harmful interference. In Armenia, Azerbaijan, Belarus, Bulgaria, the Russian Federation, Georgia, Kazakhstan, Mongolia, Kyrgyzstan, Slovakia, the Czech Rep., Tajikistan and Turkmenistan, the frequencies 25 kHz and 50 kHz will be used for this purpose under the same conditions. (WRC-03)

MOD

5.68 *Alternative allocation:* in Angola, Burundi, Congo (Rep. of the), Malawi, Dem. Rep. of the Congo, Rwanda and South Africa, the band 160-200 kHz is allocated to the fixed service on a primary basis. (WRC-03)

MOD

5.70 *Alternative allocation:* in Angola, Botswana, Burundi, Cameroon, the Central African Rep., Congo (Rep. of the), Ethiopia, Lesotho, Madagascar, Malawi, Mozambique, Namibia, Nigeria, Oman, Dem. Rep. of the Congo, Rwanda, 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-03)

MOD

5.87 *Additional allocation:* in Angola, Botswana, Lesotho, Malawi, Mozambique, Namibia, South Africa, Swaziland and Zimbabwe, the band 526.5-535 kHz is also allocated to the mobile service on a secondary basis. (WRC-03)

MOD

5.96 In Germany, Armenia, Austria, Azerbaijan, Belarus, Denmark, Estonia, the Russian Federation, Finland, Georgia, Hungary, Ireland, Iceland, Israel, Kazakhstan, Latvia, Liechtenstein, Lithuania, Malta, Moldova, Norway, Uzbekistan, Poland, Kyrgyzstan, Slovakia, the Czech Rep., the United Kingdom, Sweden, Switzerland, Tajikistan, Turkmenistan and Ukraine, administrations may allocate up to 200 kHz to their amateur service in the bands 1 715-1 800 kHz and 1 850-2 000 kHz. However, when allocating the bands within this range to their amateur service, administrations shall, after prior consultation with administrations of neighbouring countries, take such steps as may be necessary to prevent harmful interference from their amateur service to the fixed and mobile services of other countries. The mean power of any amateur station shall not exceed 10 W. (WRC-03)

MOD

5.98 *Alternative allocation:* in Angola, Armenia, Azerbaijan, Belarus, Belgium, Bulgaria, Cameroon, Congo (Rep. of the), Denmark, Egypt, Eritrea, Spain, Ethiopia, the Russian Federation, Georgia, Greece, Italy, Kazakhstan, Lebanon, Lithuania, Moldova, 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-03)

MOD

5.99 *Additional allocation:* in Saudi Arabia, Austria, Bosnia and Herzegovina, Iraq, Libyan Arab Jamahiriya, Uzbekistan, Slovakia, Romania, Serbia and Montenegro. 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-03)

MOD

5.107 *Additional allocation:* in Saudi Arabia, Eritrea, Ethiopia, Iraq, Lesotho, Libyan Arab Jamahiriya, 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-03)

MOD

5.112 *Alternative allocation:* in Bosnia and Herzegovina, Denmark, Malta, Serbia and Montenegro. 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-03)

MOD

5.114 *Alternative allocation:* in Bosnia and Herzegovina, Denmark, Iraq, Malta, and Serbia and Montenegro, the band 2 502-2 625 kHz is allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. (WRC-03)

MOD

5.117 *Alternative allocation:* in Bosnia and Herzegovina, Côte d'Ivoire, Denmark, Egypt, Liberia, Malta, Serbia and Montenegro, 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-03)

MOD

5.118 *Additional allocation:* in the United States, Mexico, Peru and Uruguay, the band 3 230-3 400 kHz is also allocated to the radiolocation service on a secondary basis. (WRC-03)

MOD**6 765-8 100 kHz**

Allocation to services		
Region 1	Region 2	Region 3
6 765-7 000	FIXED MOBILE except aeronautical mobile (R) 5.138 5.138A 5.139	
7 000-7 100	AMATEUR AMATEUR-SATELLITE 5.140 5.141 5.141A	
7 100-7 200	AMATEUR 5.141A 5.141B 5.141C 5.142	
7 200-7 300 BROADCASTING	7 200-7 300 AMATEUR 5.142	7 200-7 300 BROADCASTING
7 300-7 400	BROADCASTING 5.134 5.143 5.143A 5.143B 5.143C 5.143D	
7 400-7 450 BROADCASTING 5.143B 5.143C	7 400-7 450 FIXED MOBILE except aeronautical mobile (R)	7 400-7 450 BROADCASTING 5.143A 5.143C
7 450-8 100	FIXED MOBILE except aeronautical mobile (R) 5.143E 5.144	

MOD

5.134 The use of the bands 5 900-5 950 kHz, 7 300-7 350 kHz, 9 400-9 500 kHz, 11 600-11 650 kHz, 12 050-12 100 kHz, 13 570-13 600 kHz, 13 800-13 870 kHz, 15 600-15 800 kHz, 17 480-17 550 kHz and 18 900-19 020 kHz by the broadcasting service as from 1 April 2007 is subject to the application of the procedure of Article 12. Administrations are urged to use these bands to facilitate the introduction of digitally modulated emissions in accordance with the provisions of Resolution **517 (Rev.WRC-03)**. (WRC-03)

ADD

5.138A Until 29 March 2009, the band 6 765-7 000 kHz is allocated to the fixed service on a primary basis and to the land mobile service on a secondary basis. After this date, this band is allocated to the fixed and the mobile except aeronautical mobile (R) services on a primary basis. (WRC-03)

MOD

5.139 *Different category of service:* until 29 March 2009, in Armenia, Azerbaijan, Belarus, the Russian Federation, Georgia, Kazakhstan, Latvia, Lithuania, Moldova, Mongolia, Uzbekistan, Kyrgyzstan, Tajikistan, Turkmenistan and Ukraine, the allocation of the band 6 765-7 000 kHz to the land mobile service is on a primary basis (see No. **5.33**). (WRC-03)

MOD

5.140 *Additional allocation:* in Angola, Iraq, Kenya, Rwanda, Somalia and Togo, the band 7 000-7 050 kHz is also allocated to the fixed service on a primary basis. (WRC-03)

ADD

5.141A *Additional allocation:* in Uzbekistan and Kyrgyzstan, the bands 7 000-7 100 kHz and 7 100-7 200 kHz are also allocated to the fixed and land mobile services on a secondary basis. (WRC-03)

ADD

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, Libyan Arab Jamahiriya, Morocco, Mauritania, New Zealand, Oman, Papua New Guinea, Qatar, Syrian Arab Republic, Singapore, 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-03)

ADD

5.141C In Regions 1 and 3, the band 7 100-7 200 kHz is allocated to the broadcasting service until 29 March 2009 on a primary basis. (WRC-03)

MOD

5.142 Until 29 March 2009, the use of the band 7 100-7 300 kHz in Region 2 by the amateur service shall not impose constraints on the broadcasting service intended for use within Region 1 and Region 3. After 29 March 2009 the use of the band 7 200-7 300 kHz in Region 2 by the amateur service shall not impose constraints on the broadcasting service intended for use within Region 1 and Region 3. (WRC-03)

ADD

5.143A In Region 3, the band 7 350-7 450 kHz is allocated, until 29 March 2009, to the fixed service on a primary basis and to the land mobile service on a secondary basis. After 29 March 2009, frequencies in this band may be used by stations in the above-mentioned services, communicating only within the boundary of the country in which they are located, on condition that harmful interference is not caused to the broadcasting service. When using frequencies for these services, administrations are urged to use the minimum power required and to take account of the seasonal use of frequencies by the broadcasting service published in accordance with the Radio Regulations. (WRC-03)

ADD

5.143B In Region 1, the band 7 350-7 450 kHz is allocated, until 29 March 2009, to the fixed service on a primary basis and to the land mobile service on a secondary basis. After 29 March 2009, on condition that harmful interference is not caused to the broadcasting service, frequencies in the band 7 350-7 450 kHz may be used by stations in the fixed and land mobile services communicating only within the boundary of the country in which they are located, each station using a total radiated power that shall not exceed 24 dBW. (WRC-03)

ADD

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, Libyan Arab Jamahiriya, Morocco, Mauritania, Oman, Qatar, Syrian Arab Republic, 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-03)

ADD

5.143D In Region 2, the band 7350-7400 kHz is allocated, until 29 March 2009, to the fixed service on a primary basis and to the land mobile service on a secondary basis. After 29 March 2009, frequencies in this band may be used by stations in the above-mentioned services, communicating only within the boundary of the country in which they are located, on condition that harmful interference is not caused to the broadcasting service. When using frequencies for these services, administrations are urged to use the minimum power required and to take account of the seasonal use of frequencies by the broadcasting service published in accordance with the Radio Regulations. (WRC-03)

ADD

5.143E Until 29 March 2009, the band 7450-8 100 kHz is allocated to the fixed service on a primary basis and to the land mobile service on a secondary basis. (WRC-03)

MOD

5.152 *Additional allocation:* in Armenia, Azerbaijan, China, Côte d'Ivoire, the Russian Federation, Georgia, Iran (Islamic Republic of), Kazakhstan, Uzbekistan, Kyrgyzstan, Tajikistan, Turkmenistan and Ukraine, the band 14 250-14 350 kHz is also allocated to the fixed service on a primary basis. Stations of the fixed service shall not use a radiated power exceeding 24 dBW. (WRC-03)

MOD

5.154 *Additional allocation:* in Armenia, Azerbaijan, the Russian Federation, Georgia, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Ukraine, the band 18 068-18 168 kHz is also allocated to the fixed service on a primary basis for use within their boundaries, with a peak envelope power not exceeding 1 kW. (WRC-03)

MOD

5.155 *Additional allocation:* in Armenia, Azerbaijan, Belarus, Bulgaria, the Russian Federation, Georgia, Kazakhstan, Moldova, Mongolia, Uzbekistan, Kyrgyzstan, Slovakia, the Czech Rep., Tajikistan, Turkmenistan and Ukraine, the band 21 850-21 870 kHz is also allocated to the aeronautical mobile (R) services on a primary basis. (WRC-03)

MOD

5.163 *Additional allocation:* in Armenia, Azerbaijan, Belarus, the Russian Federation, Georgia, Hungary, Kazakhstan, Latvia, Lithuania, Moldova, Mongolia, Uzbekistan, Kyrgyzstan, Slovakia, the Czech Rep., 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-03)

MOD

5.164 *Additional allocation:* in Albania, Germany, Austria, Belgium, Bosnia and Herzegovina, Botswana, Bulgaria, Côte d'Ivoire, Denmark, Spain, Estonia, Finland, France, Gabon, Greece, Ireland, Israel, Italy, Jordan, Lebanon, Libyan Arab Jamahiriya, Liechtenstein, Luxembourg, Madagascar, Mali, Malta, Morocco, Mauritania, Monaco, Nigeria, Norway, the Netherlands, Poland, Syrian Arab Republic, the United Kingdom, Serbia and Montenegro, Slovenia, Sweden, Switzerland, Swaziland, Chad, Togo, Tunisia and Turkey, the band 47-68 MHz, in Romania the band 47-58 MHz, in South Africa the band 47-50 MHz, and in the Czech Rep. the band 66-68 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-03)

MOD

5.174 *Alternative allocation:* in Bulgaria, Hungary and Romania, the band 68-73 MHz is allocated to the broadcasting service on a primary basis and used in accordance with the decisions in the Final Acts of the Special Regional Conference (Geneva, 1960). (WRC-03)

MOD

5.177 *Additional allocation:* in Armenia, Azerbaijan, Belarus, Bulgaria, the Russian Federation, Georgia, Kazakhstan, Latvia, Moldova, Uzbekistan, Kyrgyzstan, Tajikistan, Turkmenistan and Ukraine, the band 73-74 MHz is also allocated to the broadcasting service on a primary basis, subject to agreement obtained under No. **9.21**. (WRC-03)

MOD

5.179 *Additional allocation:* in Armenia, Azerbaijan, Belarus, Bulgaria, China, the Russian Federation, Georgia, Kazakhstan, Lithuania, Moldova, Mongolia, Kyrgyzstan, Slovakia, 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-03)

MOD

5.181 *Additional allocation:* in Egypt, Israel and Syrian Arab Republic, the band 74.8-75.2 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-03)

MOD**75.2-137.175 MHz**

Allocation to services		
Region 1	Region 2	Region 3
108-117.975	AERONAUTICAL RADIONAVIGATION 5.197 5.197A	

ADD

5.197A The band 108-117.975 MHz may also be used by the aeronautical mobile (R) service on a primary basis, limited to systems that transmit navigational information in support of air navigation and surveillance functions in accordance with recognized international aviation standards. Such use shall be in accordance with Resolution **413 (WRC-03)** and shall not cause harmful interference to nor claim protection from stations operating in the aeronautical radionavigation service which operate in accordance with international aeronautical standards. (WRC-03)

MOD

5.203B *Additional allocation:* in Saudi Arabia, United Arab Emirates, Oman and Syrian Arab Republic, the band 136-137 MHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a secondary basis until 1 January 2005. (WRC-03)

MOD

5.204 *Different category of service:* in Afghanistan, Saudi Arabia, Bahrain, Bangladesh, Bosnia and Herzegovina, Brunei Darussalam, China, Cuba, the United Arab Emirates, India, Indonesia, Iran (Islamic Republic of), Iraq, Malaysia, Oman, Pakistan, the Philippines, Qatar, Serbia and Montenegro, Singapore, Thailand and Yemen, the band 137-138 MHz is allocated to the fixed and mobile, except aeronautical mobile (R), services on a primary basis (see No. **5.33**). (WRC-03)

MOD

5.210 *Additional allocation:* in France, Italy, the Czech Rep. and the United Kingdom, the bands 138-143.6 MHz and 143.65-144 MHz are also allocated to the space research service (space-to-Earth) on a secondary basis. (WRC-03)

MOD

5.212 *Alternative allocation:* in Angola, Botswana, Burundi, Cameroon, the Central African Rep., Congo (Rep. of the), Gabon, Gambia, Ghana, Guinea, Iraq, Jordan, Lesotho, Liberia, Libyan Arab Jamahiriya, Malawi, Mozambique, Namibia, Oman, Uganda, 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-03)

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, 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, Libyan Arab Jamahiriya, Liechtenstein, Lithuania, Luxembourg, Malaysia, Mali, Malta, Mauritania, Moldova, Mongolia, Mozambique, Namibia, Norway, New Zealand, Oman, Uganda, Uzbekistan, Pakistan, Panama, Papua New Guinea, Paraguay, the Netherlands, the Philippines, Poland, Portugal, Qatar, Syrian Arab Republic, Kyrgyzstan, Slovakia, Romania, the United Kingdom, Senegal, Serbia and Montenegro, Sierra Leone, Singapore, Slovenia, 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-03)

MOD

5.237 *Additional allocation:* in Congo (Rep. of the), Eritrea, Ethiopia, Gambia, Guinea, Libyan Arab Jamahiriya, Malawi, Mali, Sierra Leone, Somali, Chad and Zimbabwe, the band 174-223 MHz is also allocated to the fixed and mobile services on a secondary basis. (WRC-03)

MOD

220-335.4 MHz

Allocation to services		
Region 1	Region 2	Region 3
235-267	FIXED MOBILE 5.111 5.199 5.252 5.254 5.256 5.256A	

MOD

5.254 The bands 235-322 MHz and 335.4-399.9 MHz may be used by the mobile-satellite service, subject to agreement obtained under No. **9.21**, on condition that stations in this service do not cause harmful interference to those of other services operating or planned to be operated in accordance with the Table of Frequency Allocations except for the additional allocation made in footnote No. **5.256A**. (WRC-03)

ADD

5.256A *Additional allocation:* in China, the Russian Federation, Kazakhstan and Ukraine, the band 258-261 MHz is also allocated to the space research service (Earth-to-space) and space operation service (Earth-to-space) on a primary basis. Stations in the space research service (Earth-to-space) and space operation service (Earth-to-space) shall not cause harmful interference to, nor claim protection from, nor constrain the use and development of the mobile service systems and mobile-satellite service systems operating in the band. Stations in space research service (Earth-to-space) and space operation service (Earth-to-space) shall not constrain the future development of fixed service systems of other countries. (WRC-03)

MOD

5.262 *Additional allocation:* in Saudi Arabia, Armenia, Azerbaijan, Bahrain, Belarus, Bosnia and Herzegovina, Botswana, Bulgaria, Colombia, Costa Rica, Cuba, Egypt, the United Arab Emirates, Ecuador, the Russian Federation, Georgia, Hungary, Iran (Islamic Republic of), Iraq, Israel, Jordan, Kazakhstan, Kuwait, Liberia, Malaysia, Moldova, Uzbekistan, Pakistan, the Philippines, Qatar, Syrian Arab Republic, Kyrgyzstan, Romania, Serbia and Montenegro, Singapore, Somalia, Tajikistan, Turkmenistan and Ukraine, the band 400.05-401 MHz is also allocated to the fixed and mobile services on a primary basis. (WRC-03)

MOD**410-470 MHz**

Allocation to services		
Region 1	Region 2	Region 3
430-432 AMATEUR RADIOLOCATION 5.271 5.272 5.273 5.274 5.275 5.276 5.277	430-432 RADIOLOCATION Amateur 5.271 5.276 5.277 5.278 5.279	
432-438 AMATEUR RADIOLOCATION Earth exploration-satellite (active) 5.279A 5.138 5.271 5.272 5.276 5.277 5.280 5.281 5.282	432-438 RADIOLOCATION Amateur Earth exploration-satellite (active) 5.279A 5.271 5.276 5.277 5.278 5.279 5.281 5.282	
438-440 AMATEUR RADIOLOCATION 5.271 5.273 5.274 5.275 5.276 5.277 5.283	438-440 RADIOLOCATION Amateur 5.271 5.276 5.277 5.278 5.279	

MOD

5.271 *Additional allocation:* in Azerbaijan, Belarus, China, India, Latvia, Lithuania, Kyrgyzstan and Turkmenistan, the band 420-460 MHz is also allocated to the aeronautical radionavigation service (radio altimeters) on a secondary basis. (WRC-03)

MOD

5.273 *Different category of service:* in Libyan Arab Jamahiriya, the allocation of the bands 430-432 MHz and 438-440 MHz to the radiolocation service is on a secondary basis (see No. 5.32). (WRC-03)

MOD

5.277 *Additional allocation:* in Angola, Armenia, Azerbaijan, Belarus, Cameroon, Congo (Rep. of the), Djibouti, the Russian Federation, Georgia, Hungary, Israel, Kazakhstan, Mali, Moldova, Mongolia, Uzbekistan, Poland, Kyrgyzstan, Slovakia, the Czech Rep., Romania, Rwanda, Tajikistan, Chad, Turkmenistan and Ukraine, the band 430-440 MHz is also allocated to the fixed service on a primary basis. (WRC-03)

ADD

5.279A The use of this band by sensors in the Earth exploration-satellite service (active) shall be in accordance with Recommendation ITU-R SA.1260-1. Additionally, the Earth exploration-satellite service (active) in the band 432-438 MHz shall not cause harmful interference to the aeronautical radionavigation service in China.

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

MOD

5.288 In the territorial waters of the United States and the Philippines, the preferred frequencies for use by on-board communication stations shall be 457.525 MHz, 457.550 MHz, 457.575 MHz and 457.600 MHz paired, respectively, with 467.750 MHz, 467.775 MHz, 467.800 MHz and 467.825 MHz. The characteristics of the equipment used shall conform to those specified in Recommendation ITU-R M.1174-1. (WRC-03)

MOD

5.294 *Additional allocation:* in Burundi, Cameroon, Congo (Rep. of the), Côte d'Ivoire, Ethiopia, Israel, Kenya, Lebanon, Libyan Arab Jamahiriya, Malawi, Syrian Arab Republic, Sudan, Chad and Yemen, the band 470-582 MHz is also allocated to the fixed service on a secondary basis. (WRC-03)

MOD

5.296 *Additional allocation:* in Germany, Austria, Belgium, Côte d'Ivoire, Denmark, Spain, Finland, France, Ireland, Israel, Italy, Libyan Arab Jamahiriya, Lithuania, Malta, Morocco, Monaco, Norway, the Netherlands, Portugal, Syrian Arab Republic, the United Kingdom, Sweden, Switzerland, Swaziland and Tunisia, the band 470-790 MHz is 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-03)

MOD

5.311 Within the frequency band 620-790 MHz, assignments may be made to television stations using frequency modulation in the broadcasting-satellite service subject to agreement between the administrations concerned and those having services, operating in accordance with the Table, which may be affected (see Resolutions **33 (Rev.WRC-03)** and **507 (Rev.WRC-03)**). Such stations shall not produce a power flux-density in excess of the value $-129 \text{ dB(W/m}^2\text{)}$ for angles of arrival less than 20° (see Recommendation **705**) within the territories of other countries without the consent of the administrations of those countries. Resolution **545 (WRC-03)** applies. (WRC-03)

MOD

5.312 *Additional allocation:* in Armenia, Azerbaijan, Belarus, Bulgaria, the Russian Federation, Georgia, Hungary, Kazakhstan, Moldova, Mongolia, Uzbekistan, Poland, Kyrgyzstan, Slovakia, the Czech Rep., Romania, Tajikistan, Turkmenistan and Ukraine, the band 645-862 MHz is also allocated to the aeronautical radionavigation service on a primary basis. (WRC-03)

MOD

5.316 *Additional allocation:* in Germany, Saudi Arabia, Bosnia and Herzegovina, Burkina Faso, Cameroon, Côte d'Ivoire, Croatia, Denmark, Egypt, Finland, Greece, Israel, Jordan, Kenya, The Former Yugoslav Republic of Macedonia, Libyan Arab Jamahiriya, Liechtenstein, Mali, Monaco, Norway, the Netherlands, Portugal, the United Kingdom, Syrian Arab Republic, Serbia and Montenegro, Sweden and Switzerland, the band 790-830 MHz, and in these same countries and in Spain, France, Gabon and Malta, the band 830-862 MHz, are also allocated to the mobile, except aeronautical mobile, service on a primary basis. However, stations of the 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, stations of services operating in accordance with the Table in countries other than those mentioned in connection with the band. (WRC-03)

MOD

5.323 *Additional allocation:* in Armenia, Azerbaijan, Belarus, Bulgaria, the Russian Federation, Hungary, Kazakhstan, Moldova, Mongolia, Uzbekistan, Poland, Kyrgyzstan, Slovakia, the Czech Rep., Romania, Tajikistan, Turkmenistan and Ukraine, the band 862-960 MHz is 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-03)

MOD**890-1 300 MHz**

Allocation to services		
Region 1	Region 2	Region 3
960-1 164	AERONAUTICAL RADIONAVIGATION 5.328	
1 164-1 215	AERONAUTICAL RADIONAVIGATION 5.328 RADIONAVIGATION-SATELLITE (space-to-Earth) (space-to-space) 5.328B 5.328A	
1 215-1 240	EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION RADIONAVIGATION-SATELLITE (space-to-Earth) (space-to-space) 5.328B 5.329 5.329A SPACE RESEARCH (active) 5.330 5.331 5.332	
1 240-1 300	EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION RADIONAVIGATION-SATELLITE (space-to-Earth) (space-to-space) 5.328B 5.329 5.329A SPACE RESEARCH (active) Amateur 5.282 5.330 5.331 5.332 5.335 5.335A	

MOD

5.328A Stations in the radionavigation-satellite service in the band 1 164-1 215 MHz shall operate in accordance with the provisions of Resolution **609 (WRC-03)** and shall not claim protection from stations in the aeronautical radionavigation service in the band 960-1 215 MHz. No. **5.43A** does not apply. The provisions of No. **21.18** shall apply. (WRC-03)

ADD

5.328B The use of the bands 1 164-1 300 MHz, 1 559-1 610 MHz and 5 010-5 030 MHz by systems and networks in the radionavigation-satellite service for which complete coordination or notification information, as appropriate, is received by the Radiocommunication Bureau after 1 January 2005 is subject to the application of the provisions of Nos. **9.12**, **9.12A** and **9.13**. Resolution **610 (WRC-03)** shall also apply. (WRC-03)

MOD

5.329 Use of the radionavigation-satellite service in the band 1 215-1 300 MHz shall be subject to the condition that no harmful interference is caused to, and no protection is claimed from, the radionavigation service authorized under No. **5.331**. Furthermore, the use of the radionavigation-satellite service in the band 1 215-1 300 MHz shall be subject to the condition that no harmful interference is caused to the radiolocation service. No. **5.43** shall not apply in respect of the radiolocation service. Resolution **608 (WRC-03)** shall apply. (WRC-03)

MOD

5.330 *Additional allocation:* in Angola, Saudi Arabia, Bahrain, Bangladesh, Cameroon, China, the United Arab Emirates, Eritrea, Ethiopia, Guyana, India, Indonesia, Iran (Islamic Republic of), Iraq, Israel, Japan, Jordan, Kuwait, Lebanon, Libyan Arab Jamahiriya, Mozambique, Nepal, Pakistan, the Philippines, Qatar, Syrian Arab Republic, Somalia, 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-03)

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, Liechtenstein, Lithuania, Luxembourg, Madagascar, Mali, Mauritania, Nigeria, Norway, Oman, the Netherlands, Poland, Portugal, Qatar, Syrian Arab Republic, Slovakia, the United Kingdom, Serbia and Montenegro, Slovenia, Somalia, 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-03)

MOD

5.334 *Additional allocation:* in Canada and the United States, the band 1 350-1 370 MHz is also allocated to the aeronautical radionavigation service on a primary basis. (WRC-03)

MOD**1 350-1 525 MHz**

Allocation to services		
Region 1	Region 2	Region 3
1 350-1 400 FIXED MOBILE RADIOLOCATION 5.149 5.338 5.339 5.339A	1 350-1 400 RADIOLOCATION 5.149 5.334 5.339 5.339A	
...		
1 429-1 452 FIXED MOBILE except aeronautical mobile 5.339A 5.341 5.342	1 429-1 452 FIXED MOBILE 5.343 5.339A 5.341	
1 452-1 492 FIXED MOBILE except aeronautical mobile BROADCASTING 5.345 5.347 BROADCASTING-SATELLITE 5.345 5.347 5.347A 5.341 5.342	1 452-1 492 FIXED MOBILE 5.343 BROADCASTING 5.345 5.347 BROADCASTING-SATELLITE 5.345 5.347 5.347A 5.341 5.344	
1 492-1 518 FIXED MOBILE except aeronautical mobile 5.341 5.342	1 492-1 518 FIXED MOBILE 5.343 5.341 5.344	1 492-1 518 FIXED MOBILE 5.341
1 518-1 525 FIXED MOBILE except aeronautical mobile MOBILE-SATELLITE (space-to-Earth) 5.348 5.348A 5.348B 5.348C 5.341 5.342	1 518-1 525 FIXED MOBILE 5.343 MOBILE-SATELLITE (space-to-Earth) 5.348 5.348A 5.348B 5.348C 5.341 5.344	1 518-1 525 FIXED MOBILE MOBILE-SATELLITE (space-to-Earth) 5.348 5.348A 5.348B 5.348C 5.341

MOD

5.338 In Azerbaijan, Mongolia, Kyrgyzstan, Slovakia, the Czech Rep., Romania and Turkmenistan, existing installations of the radionavigation service may continue to operate in the band 1 350-1 400 MHz. (WRC-03)

ADD

5.339A *Additional allocation:* the band 1 390-1 392 MHz is also allocated to the fixed-satellite service (Earth-to-space) on a secondary basis and the band 1 430-1 432 MHz is also allocated to the fixed-satellite service (space-to-Earth) on a secondary basis. These allocations are limited to use for feeder links for non-geostationary-satellite networks in the mobile-satellite service with service links below 1 GHz, and Resolution **745 (WRC-03)** applies. (WRC-03)

MOD

5.340 All emissions are prohibited in the following bands:

1 400-1 427 MHz,
 2 690-2 700 MHz, except those provided for by No. **5.422**,
 10.68-10.7 GHz, except those provided for by No. **5.483**,
 15.35-15.4 GHz, except those provided for by No. **5.511**,
 23.6-24 GHz,
 31.3-31.5 GHz,
 31.5-31.8 GHz, in Region 2,
 48.94-49.04 GHz, from airborne stations
 50.2-50.4 GHz²,
 52.6-54.25 GHz,
 86-92 GHz,
 100-102 GHz,
 109.5-111.8 GHz,
 114.25-116 GHz,
 148.5-151.5 GHz,
 164-167 GHz,
 182-185 GHz,
 190-191.8 GHz,
 200-209 GHz,
 226-231.5 GHz,
 250-252 GHz. (WRC-03)

MOD

5.347 *Different category of service:* in Bangladesh, Bosnia and Herzegovina, Botswana, Bulgaria, Burkina Faso, Cuba, Denmark, Egypt, Greece, Ireland, Italy, Mozambique, Portugal, Serbia and Montenegro, Sri Lanka, Swaziland, Yemen and Zimbabwe, the allocation of the band 1 452-1 492 MHz to the broadcasting-satellite service and the broadcasting service is on a secondary basis until 1 April 2007. (WRC-03)

ADD

5.347A In the bands:

1 452-1 492 MHz,
 1 525-1 559 MHz,
 1 613.8-1 626.5 MHz,
 2 655-2 670 MHz,
 2 670-2 690 MHz,
 21.4-22 GHz,

Resolution **739 (WRC-03)** applies. (WRC-03)

MOD

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

MOD

5.348A In the band 1 518-1 525 MHz, the coordination threshold in terms of the power flux-density levels at the surface of the Earth in application of No. **9.11A** for space stations in the mobile-satellite (space-to-Earth) service, with respect to the land mobile service use for specialized mobile radios or used in conjunction with public switched telecommunication networks (PSTN) operating within the territory of Japan, shall be $-150 \text{ dB(W/m}^2\text{)}$ in any 4 kHz band for all angles of arrival, instead of those given in Table 5-2 of Appendix 5. In the band 1 518-1 525 MHz stations in the mobile-satellite service shall not claim protection from stations in the mobile service in the territory of Japan. No. **5.43A** does not apply. (WRC-03)

ADD

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

ADD

5.348C For the use of the bands 1 518-1 525 MHz and 1 668-1 675 MHz by the mobile-satellite service, see Resolution **225 (Rev.WRC-03)**. (WRC-03)

MOD**1 525-1 610 MHz**

Allocation to services		
Region 1	Region 2	Region 3
1 525-1 530 SPACE OPERATION (space-to-Earth) FIXED MOBILE-SATELLITE (space-to-Earth) 5.347A 5.351A Earth exploration-satellite Mobile except aeronautical mobile 5.349 5.341 5.342 5.350 5.351 5.352A 5.354	1 525-1 530 SPACE OPERATION (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 5.347A 5.351A Earth exploration-satellite Fixed Mobile 5.343 5.341 5.351 5.354	1 525-1 530 SPACE OPERATION (space-to-Earth) FIXED MOBILE-SATELLITE (space-to-Earth) 5.347A 5.351A Earth exploration-satellite Mobile 5.349 5.341 5.351 5.352A 5.354
1 530-1 535 SPACE OPERATION (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 5.347A 5.351A 5.353A Earth exploration-satellite Fixed Mobile except aeronautical mobile 5.341 5.342 5.351 5.354	1 530-1 535 SPACE OPERATION (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 5.347A 5.351A 5.353A Earth exploration-satellite Fixed Mobile 5.343 5.341 5.351 5.354	
1 535-1 559	MOBILE-SATELLITE (space-to-Earth) 5.347A 5.351A 5.341 5.351 5.353A 5.354 5.355 5.356 5.357 5.357A 5.359 5.362A	
1 559-1 610	AERONAUTICAL RADIONAVIGATION RADIONAVIGATION-SATELLITE (space-to-Earth) (space-to-space) 5.328B 5.329A 5.341 5.362B 5.362C 5.363	

MOD

5.355 *Additional allocation:* in Bahrain, Bangladesh, Congo (Rep. of the), Egypt, Eritrea, Iraq, Israel, Kuwait, Lebanon, Malta, Qatar, Syrian Arab Republic, Somalia, 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-03)

MOD

5.359 *Additional allocation:* in Germany, Saudi Arabia, Armenia, Austria, Azerbaijan, Belarus, Benin, Bosnia and Herzegovina, Bulgaria, Cameroon, Spain, the Russian Federation, France, Gabon, Georgia, Greece, Guinea, Guinea-Bissau, Hungary, Jordan, Kazakhstan, Kuwait, Lebanon, Libyan Arab Jamahiriya, Lithuania, Mauritania, Moldova, Mongolia, Uganda, Uzbekistan, Pakistan, Poland, Syrian Arab Republic, Kyrgyzstan, the Dem. People's Rep. of Korea, Romania, Swaziland, 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-03)

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 2005 in Germany, Armenia, Azerbaijan, Belarus, Benin, Bosnia and Herzegovina, Bulgaria, Spain, the Russian Federation, France, Gabon, Georgia, Greece, Guinea, Guinea-Bissau, Hungary, Kazakhstan, Lithuania, Moldova, Mongolia, Nigeria, Uganda, Uzbekistan, Pakistan, Poland, Kyrgyzstan, the Dem. People's Rep. of Korea, Romania, Senegal, Swaziland, Tajikistan, Tanzania, Turkmenistan and Ukraine, and until 1 January 2010 in Saudi Arabia, Cameroon, Jordan, Kuwait, Lebanon, Libyan Arab Jamahiriya, Mali, Mauritania, Syrian Arab Republic and Tunisia. After these dates, 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. 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-03)

MOD**1 610-1 660 MHz**

Allocation to services		
Region 1	Region 2	Region 3
1 613.8-1 626.5 MOBILE-SATELLITE (Earth-to-space) 5.351A AERONAUTICAL RADIONAVIGATION Mobile-satellite (space-to-Earth) 5.347A 5.341 5.355 5.359 5.363 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) 5.347A 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) 5.347A 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

MOD

5.369 *Different category of service:* in Angola, Australia, Burundi, China, Eritrea, Ethiopia, India, Iran (Islamic Republic of), Israel, Lebanon, Liberia, Libyan Arab Jamahiriya, Madagascar, Mali, Pakistan, Papua New Guinea, Syrian Arab Republic, Dem. Rep. of the Congo, Sudan, Swaziland, 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-03)

MOD

1 660-1 710 MHz

Allocation to services		
Region 1	Region 2	Region 3
1 660.5-1 668	RADIO ASTRONOMY SPACE RESEARCH (passive) Fixed Mobile except aeronautical mobile 5.149 5.341 5.379 5.379A	
1 668-1 668.4	MOBILE-SATELLITE (Earth-to-space) 5.348C 5.379B 5.379C RADIO ASTRONOMY SPACE RESEARCH (passive) Fixed Mobile except aeronautical mobile 5.149 5.341 5.379 5.379A 5.379D	
1 668.4-1 670	METEOROLOGICAL AIDS FIXED MOBILE except aeronautical mobile MOBILE-SATELLITE (Earth-to-space) 5.348C 5.379B 5.379C RADIO ASTRONOMY 5.149 5.341 5.379D 5.379E	
1 670-1 675	METEOROLOGICAL AIDS FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE 5.380 MOBILE-SATELLITE (Earth-to-space) 5.348C 5.379B 5.341 5.379D 5.379E 5.380A	
1 675-1 690	METEOROLOGICAL AIDS FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile 5.341	
1 690-1 700 METEOROLOGICAL AIDS METEOROLOGICAL-SATELLITE (space-to-Earth) Fixed Mobile except aeronautical mobile 5.289 5.341 5.382	1 690-1 700 METEOROLOGICAL AIDS METEOROLOGICAL-SATELLITE (space-to-Earth) 5.289 5.341 5.381	
1 700-1 710 FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile 5.289 5.341	1 700-1 710 FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile 5.289 5.341 5.384	

SUP

5.377

ADD

5.379B The use of the band 1 668-1 675 MHz by the mobile-satellite service is subject to coordination under No. **9.11A**. (WRC-03)

ADD

5.379C In order to protect the radio astronomy service in the band 1 668-1 670 MHz, the aggregate power flux-density values produced by mobile earth stations in a network of the mobile-satellite service operating in this band shall not exceed $-181 \text{ dB(W/m}^2\text{)}$ in 10 MHz and $-194 \text{ dB(W/m}^2\text{)}$ in any 20 kHz at any radio astronomy station recorded in the Master International Frequency Register, for more than 2% of integration periods of 2 000 s. (WRC-03)

ADD

5.379D For sharing of the band 1 668-1 675 MHz between the mobile-satellite service and the fixed, mobile and space research (passive) services, Resolution **744 (WRC-03)** shall apply. (WRC-03)

ADD

5.379E In the band 1 668.4-1 675 MHz, stations in the mobile-satellite service shall not cause harmful interference to stations in the meteorological aids service in China, Iran (Islamic Republic of), Japan and Uzbekistan. In the band 1 668.4-1 675 MHz, administrations are urged not to implement new systems in the meteorological aids service and are encouraged to migrate existing meteorological aids service operations to other bands as soon as practicable. (WRC-03)

ADD

5.380A In the band 1 670-1 675 MHz, stations in the mobile-satellite service shall not cause harmful interference to, nor constrain the development of, existing earth stations in the meteorological-satellite service notified in accordance with Resolution **670 (WRC-03)**. (WRC-03)

MOD

5.381 *Additional allocation:* in Afghanistan, Costa Rica, 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-03)

MOD

5.382 *Different category of service:* in Saudi Arabia, Armenia, Azerbaijan, Bahrain, Belarus, Bosnia and Herzegovina, Bulgaria, Congo (Rep. of the), Egypt, the United Arab Emirates, Eritrea, Ethiopia, the Russian Federation, Guinea, Hungary, Iraq, Israel, Jordan, Kazakhstan, Kuwait, the Former Yugoslav Republic of Macedonia, Lebanon, Mauritania, Moldova, Mongolia, Oman, Uzbekistan, Poland, Qatar, Syrian Arab Republic, Kyrgyzstan, Romania, Serbia and Montenegro, 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-03)

MOD**1 710-2 170 MHz**

Allocation to services		
Region 1	Region 2	Region 3
1 710-1 930	FIXED MOBILE 5.380 5.384A 5.388A 5.149 5.341 5.385 5.386 5.387 5.388	
1 930-1 970 FIXED MOBILE 5.388A 5.388	1 930-1 970 FIXED MOBILE 5.388A Mobile-satellite (Earth-to-space) 5.388	1 930-1 970 FIXED MOBILE 5.388A 5.388
1 970-1 980	FIXED MOBILE 5.388A 5.388	
1 980-2 010	FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) 5.351A 5.388 5.389A 5.389B 5.389F	
2 010-2 025 FIXED MOBILE 5.388A 5.388	2 010-2 025 FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) 5.388 5.389C 5.389E 5.390	2 010-2 025 FIXED MOBILE 5.388A 5.388
...		
2 160-2 170 FIXED MOBILE 5.388A 5.388 5.392A	2 160-2 170 FIXED MOBILE MOBILE-SATELLITE (space-to-Earth) 5.388 5.389C 5.389E 5.390	2 160-2 170 FIXED MOBILE 5.388A 5.388

MOD

5.386 *Additional allocation:* the band 1 750-1 850 MHz is also allocated to the space operation (Earth-to-space) and space research (Earth-to-space) services in Region 2, in Australia, Guam, India, Indonesia and Japan on a primary basis, subject to agreement obtained under No. **9.21**, having particular regard to troposcatter systems. (WRC-03)

MOD

5.387 *Additional allocation:* in Azerbaijan, Belarus, Georgia, Kazakhstan, Mongolia, Kyrgyzstan, Slovakia, 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-03)

MOD

5.388A In Regions 1 and 3, the bands 1885-1980 MHz, 2010-2025 MHz and 2110-2170 MHz and, in Region 2, the bands 1885-1980 MHz and 2110-2160 MHz may be used by high altitude platform stations as base stations to provide International Mobile Telecommunications-2000 (IMT-2000), in accordance with Resolution **221 (Rev.WRC-03)**. Their use by IMT-2000 applications using high altitude platform stations as base stations does not preclude the use of these bands by any station in the services to which they are allocated and does not establish priority in the Radio Regulations. (WRC-03)

ADD

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, Libyan Arab Jamahiriya, Jordan, Kenya, Kuwait, Mali, Morocco, Mauritania, Nigeria, Oman, Uganda, Qatar, Syrian Arab Republic, Senegal, Singapore, 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 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-03)

SUP**5.389D****MOD**

5.395 In France and Turkey, the use of the band 2310-2360 MHz by the aeronautical mobile service for telemetry has priority over other uses by the mobile service. (WRC-03)

MOD

5.400 *Different category of service:* in Angola, Australia, Bangladesh, Burundi, China, Eritrea, Ethiopia, India, Iran (Islamic Republic of), Lebanon, Liberia, Libyan Arab Jamahiriya, Madagascar, Mali, Pakistan, Papua New Guinea, Dem. Rep. of the Congo, Syrian Arab Republic, Sudan, Swaziland, Togo and Zambia, the allocation of the band 2483.5-2500 MHz to the radiodetermination-satellite service (space-to-Earth) 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-03)

MOD

2 520-2 700 MHz

Allocation to services		
Region 1	Region 2	Region 3
2 520-2 655 FIXED 5.409 5.410 5.411 MOBILE except aeronautical mobile 5.384A BROADCASTING-SATELLITE 5.413 5.416 5.339 5.403 5.405 5.412 5.417C 5.417D 5.418B 5.418C	2 520-2 655 FIXED 5.409 5.411 FIXED-SATELLITE (space-to-Earth) 5.415 MOBILE except aeronautical mobile 5.384A BROADCASTING-SATELLITE 5.413 5.416 5.339 5.403 5.417C 5.417D 5.418B 5.418C	2 520-2 535 FIXED 5.409 5.411 FIXED-SATELLITE (space-to-Earth) 5.415 MOBILE except aeronautical mobile 5.384A BROADCASTING-SATELLITE 5.413 5.416 5.403 5.415A 2 535-2 655 FIXED 5.409 5.411 MOBILE except aeronautical mobile 5.384A BROADCASTING-SATELLITE 5.413 5.416 5.339 5.418 5.417A 5.417B 5.417C 5.417D 5.418A 5.418B 5.418C
2 655-2 670 FIXED 5.409 5.410 5.411 MOBILE except aeronautical mobile 5.384A BROADCASTING-SATELLITE 5.347A 5.413 5.416 Earth exploration-satellite (passive) Radio astronomy Space research (passive) 5.149 5.420	2 655-2 670 FIXED 5.409 5.411 FIXED-SATELLITE (Earth-to-space) (space-to-Earth) 5.347A 5.415 MOBILE except aeronautical mobile 5.384A BROADCASTING-SATELLITE 5.347A 5.413 5.416 Earth exploration-satellite (passive) Radio astronomy Space research (passive) 5.149 5.420	2 655-2 670 FIXED 5.409 5.411 FIXED-SATELLITE (Earth-to-space) 5.415 MOBILE except aeronautical mobile 5.384A BROADCASTING-SATELLITE 5.347A 5.413 5.416 Earth exploration-satellite (passive) Radio astronomy Space research (passive) 5.149 5.420
2 670-2 690 FIXED 5.409 5.410 5.411 MOBILE except aeronautical mobile 5.384A MOBILE-SATELLITE (Earth-to-space) 5.351A Earth exploration-satellite (passive) Radio astronomy Space research (passive) 5.149 5.412 5.419 5.420	2 670-2 690 FIXED 5.409 5.411 FIXED-SATELLITE (Earth-to-space) (space-to-Earth) 5.347A 5.415 MOBILE except aeronautical mobile 5.384A MOBILE-SATELLITE (Earth-to-space) 5.351A Earth exploration-satellite (passive) Radio astronomy Space research (passive) 5.149 5.419 5.420	2 670-2 690 FIXED 5.409 5.411 FIXED-SATELLITE (Earth-to-space) 5.415 MOBILE except aeronautical mobile 5.384A MOBILE-SATELLITE (Earth-to-space) 5.351A Earth exploration-satellite (passive) Radio astronomy Space research (passive) 5.149 5.419 5.420 5.420A
2 690-2 700 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340 5.422		

MOD

5.416 The use of the band 2520-2670 MHz by the broadcasting-satellite service is limited to national and regional systems for community reception, subject to agreement obtained under No. **9.21**. (WRC-03)

MOD

5.418 *Additional allocation:* in Korea (Rep.of), India, Japan, Pakistan and Thailand, the band 2535-2655 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 2630-2655 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:

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

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, the pfd value shall not exceed $-100 \text{ dB(W/(m}^2 \cdot \text{MHz))}$ anywhere on the territory of the Russian Federation.

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-03)

ADD

5.417A In applying provision No. **5.418**, in Korea (Rep.of) and Japan, *resolves* 3 of Resolution **528 (Rev.WRC-03)** is relaxed to allow the broadcasting-satellite service (sound) and the complementary terrestrial broadcasting service to additionally operate on a primary basis in the band 2 605-2 630 MHz. This use is limited to systems intended for national coverage. 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**. The provisions of No. **5.416** and Table **21-4** of Article **21** do not apply. Use of non-geostationary-satellite systems in the broadcasting-satellite service (sound) in the band 2 605-2 630 MHz is subject to the provisions of Resolution **539 (Rev.WRC-03)**. 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 2 605-2 630 MHz for which complete Appendix **4** coordination information, or notification information, has been received after 4 July 2003, for all conditions and for all methods of modulation, shall not exceed the following limits:

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

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. In the case of the broadcasting-satellite service (sound) networks of Korea (Rep. of), 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 1 000 km around the territory of the administration notifying the BSS (sound) system, for angles of arrival greater than 35° . (WRC-03)

ADD

5.417B In Korea (Rep. of) and Japan, use of the band 2 605-2 630 MHz by non-geostationary-satellite systems in the broadcasting-satellite service (sound), pursuant to No. 5.417A, for which complete Appendix 4 coordination information, or notification information, has been received after 4 July 2003, is subject to the application of the provisions of No. 9.12A, in respect of geostationary-satellite networks for which complete Appendix 4 coordination information, or notification information, is considered to have been received after 4 July 2003, and No. 22.2 does not apply. No. 22.2 shall continue to apply with respect to geostationary-satellite networks for which complete Appendix 4 coordination information, or notification information, is considered to have been received before 5 July 2003. (WRC-03)

ADD

5.417C Use of the band 2 605-2 630 MHz by non-geostationary-satellite systems in the broadcasting-satellite service (sound), pursuant to No. 5.417A, for which complete Appendix 4 coordination information, or notification information, has been received after 4 July 2003, is subject to the application of the provisions of No. 9.12. (WRC-03)

ADD

5.417D Use of the band 2 605-2 630 MHz by geostationary-satellite networks for which complete Appendix 4 coordination information, or notification information, has been received after 4 July 2003 is subject to the application of the provisions of No. 9.13 with respect to non-geostationary-satellite systems in the broadcasting-satellite service (sound), pursuant to No. 5.417A, and No. 22.2 does not apply. (WRC-03)

MOD

5.418A In certain Region 3 countries listed in No. 5.418, use of the band 2 630-2 655 MHz by non-geostationary-satellite systems in the broadcasting-satellite service (sound) for which complete Appendix 4 coordination information, or notification information, has been received after 2 June 2000, is subject to the application of the provisions of No. 9.12A, in respect of geostationary-satellite networks for which complete Appendix 4 coordination information, or notification information, is considered to have been received after 2 June 2000, and No. 22.2 does not apply. No. 22.2 shall continue to apply with respect to geostationary-satellite networks for which complete Appendix 4 coordination information, or notification information, is considered to have been received before 3 June 2000. (WRC-03)

MOD

5.418B Use of the band 2 630-2 655 MHz by non-geostationary-satellite systems in the broadcasting-satellite service (sound), pursuant to No. 5.418, for which complete Appendix 4 coordination information, or notification information, has been received after 2 June 2000, is subject to the application of the provisions of No. 9.12. (WRC-03)

MOD

5.418C Use of the band 2 630-2 655 MHz by geostationary-satellite networks for which complete Appendix 4 coordination information, or notification information, has been received after 2 June 2000 is subject to the application of the provisions of No. 9.13 with respect to non-geostationary-satellite systems in the broadcasting-satellite service (sound), pursuant to No. 5.418 and No. 22.2 does not apply. (WRC-03)

SUP

5.421

MOD

5.422 *Additional allocation:* in Saudi Arabia, Armenia, Azerbaijan, Bahrain, Belarus, Bosnia and Herzegovina, Brunei Darussalam, Congo (Rep. of the), Côte d'Ivoire, Cuba, Egypt, the United Arab Emirates, Eritrea, Ethiopia, the Russian Federation, Gabon, Georgia, Guinea, Guinea-Bissau, Iran (Islamic Republic of), Iraq, Israel, Jordan, Lebanon, Mauritania, Moldova, Mongolia, Nigeria, Oman, Uzbekistan, Pakistan, the Philippines, Qatar, Syrian Arab Republic, Kyrgyzstan, the Dem. Rep. of the Congo, Romania, Serbia and Montenegro, 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-03)

MOD

2 700-4 800 MHz

Allocation to services		
Region 1	Region 2	Region 3
2 900-3 100	RADIOLOCATION 5.424A RADIONAVIGATION 5.426 5.425 5.427	

ADD

5.424A In the band 2 900-3 100 MHz, stations in the radiolocation service shall not cause harmful interference to, nor claim protection from, radar systems in the radionavigation service. (WRC-03)

MOD

5.428 *Additional allocation:* in Azerbaijan, Cuba, Mongolia, Kyrgyzstan, Romania and Turkmenistan, the band 3 100-3 300 MHz is also allocated to the radionavigation service on a primary basis. (WRC-03)

MOD

5.429 *Additional allocation:* in Saudi Arabia, Bahrain, Bangladesh, Brunei Darussalam, China, Congo (Rep. of the), Korea (Rep. of), the United Arab Emirates, India, Indonesia, Iran (Islamic Republic of), Iraq, Israel, Japan, Jordan, Kenya, Kuwait, Lebanon, Libyan Arab Jamahiriya, Malaysia, Oman, Pakistan, Qatar, Syrian Arab Republic, 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-03)

MOD

5.430 *Additional allocation:* in Azerbaijan, Cuba, Mongolia, Kyrgyzstan, Romania and Turkmenistan, the band 3 300-3 400 MHz is also allocated to the radionavigation service on a primary basis. (WRC-03)

MOD

5.431 *Additional allocation:* in Germany, Israel and the United Kingdom, the band 3 400-3 475 MHz is also allocated to the amateur service on a secondary basis. (WRC-03)

MOD

4800-5830 MHz

Allocation to services		
Region 1	Region 2	Region 3
5 000-5 010	AERONAUTICAL RADIONAVIGATION RADIONAVIGATION-SATELLITE (Earth-to-space) 5.367	
5 010-5 030	AERONAUTICAL RADIONAVIGATION RADIONAVIGATION-SATELLITE (Earth-to-space) (space-space) 5.328B 5.443B 5.367	
5 030-5 150	AERONAUTICAL RADIONAVIGATION 5.367 5.444 5.444A	
5 150-5 250	AERONAUTICAL RADIONAVIGATION FIXED-SATELLITE (Earth-to-space) 5.447A MOBILE except aeronautical mobile 5.446A 5.446B 5.446 5.447 5.447B 5.447C	
5 250-5 255	EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION SPACE RESEARCH 5.447D MOBILE except aeronautical mobile 5.446A 5.447F 5.447E 5.448 5.448A	
5 255-5 350	EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION SPACE RESEARCH (active) MOBILE except aeronautical mobile 5.446A 5.447F 5.447E 5.448 5.448A	
5 350-5 460	EARTH EXPLORATION-SATELLITE (active) 5.448B SPACE RESEARCH (active) 5.448C AERONAUTICAL RADIONAVIGATION 5.449 RADIOLOCATION 5.448D	
5 460-5 470	RADIONAVIGATION 5.449 EARTH EXPLORATION-SATELLITE (active) SPACE RESEARCH (active) RADIOLOCATION 5.448D 5.448B	
5 470-5 570	MARITIME RADIONAVIGATION MOBILE except aeronautical mobile 5.446A 5.450A EARTH EXPLORATION-SATELLITE (active) SPACE RESEARCH (active) RADIOLOCATION 5.450B 5.448B 5.450 5.451 5.452	
5 570-5 650	MARITIME RADIONAVIGATION MOBILE except aeronautical mobile 5.446A 5.450A RADIOLOCATION 5.450B 5.450 5.451 5.452	
5 650-5 725	RADIOLOCATION MOBILE except aeronautical mobile 5.446A 5.450A Amateur Space research (deep space) 5.282 5.451 5.453 5.454 5.455	

SUP**5.443A****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 $-124.5 \text{ dB(W/m}^2\text{)}$ 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 (WRC-03)**. (WRC-03)

MOD

5.444 The 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. The requirements of this system shall take precedence over other uses of this band. For the use of this band, No. **5.444A** and Resolution **114 (Rev.WRC-03)** apply. (WRC-03)

MOD

5.444A *Additional allocation:* the band 5 091-5 150 MHz is also allocated to the fixed-satellite service (Earth-to-space) on a primary basis. This allocation is limited to feeder links of non-geostationary mobile-satellite systems in the mobile-satellite service and is subject to coordination under No. **9.11A**.

In the band 5 091-5 150 MHz, the following conditions also apply:

- prior to 1 January 2018, the use of the band 5 091-5 150 MHz by feeder links of non-geostationary-satellite systems in the mobile-satellite service shall be made in accordance with Resolution **114 (Rev.WRC-03)**;
- prior to 1 January 2018, the requirements of existing and planned international standard systems for the aeronautical radionavigation service which cannot be met in the 5 000-5 091 MHz band, shall take precedence over other uses of this band;
- after 1 January 2012, no new assignments shall be made to earth stations providing feeder links of non-geostationary mobile-satellite systems;
- after 1 January 2018, the fixed-satellite service will become secondary to the aeronautical radionavigation service. (WRC-03)

ADD

5.446A The use of the bands 5 150-5 350 MHz and 5 470-5 725 MHz by the stations in the mobile service shall be in accordance with Resolution **229 (WRC-03)**. (WRC-03)

ADD

5.446B In the band 5 150-5 250 MHz, stations in the mobile service shall not claim protection from earth stations in the fixed-satellite service. No. **5.43A** does not apply to the mobile service with respect to fixed-satellite service earth stations. (WRC-03)

MOD

5.447 *Additional allocation:* in Israel, Lebanon, Pakistan, 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 (WRC-03)** do not apply. (WRC-03)

ADD

5.447E *Additional allocation:* The band 5 250-5 350 MHz is also allocated to the fixed service on a primary basis in the following countries in Region 3: Australia, Korea (Rep. of), India, Indonesia, Iran (Islamic Republic of), Japan, Malaysia, Papua New Guinea, Philippines, Sri Lanka, Thailand and Viet Nam. The use of this band by the fixed service is intended for the implementation of fixed wireless access systems and shall comply with Recommendation ITU-R F.1613. In addition, the fixed service shall not claim protection from the radiodetermination, Earth exploration-satellite (active) and space research (active) services, but the provisions of No. 5.43A do not apply to the fixed service with respect to the Earth exploration-satellite (active) and space research (active) services. After implementation of fixed wireless access systems in the fixed service with protection for the existing radiodetermination systems, no more stringent constraints should be imposed on the fixed wireless access systems by future radiodetermination implementations. (WRC-03)

ADD

5.447F In the band 5 250-5 350 MHz, stations in the mobile service shall not claim protection from the radiolocation service, the Earth exploration-satellite service (active) and the space research service (active). These services shall not impose on the mobile service more stringent protection criteria, based on system characteristics and interference criteria, than those stated in Recommendations ITU-R M.1638 and ITU-R SA.1632. (WRC-03)

MOD

5.448 *Additional allocation:* in Azerbaijan, Libyan Arab Jamahiriya, Mongolia, Kyrgyzstan, Slovakia, Romania and Turkmenistan, the band 5 250-5 350 MHz is also allocated to the radionavigation service on a primary basis. (WRC-03)

MOD

5.448A The Earth exploration-satellite (active) and space research (active) services in the frequency band 5 250-5 350 MHz shall not claim protection from the radiolocation service. No. 5.43A does not apply. (WRC-03)

MOD

5.448B The Earth exploration-satellite service (active) operating in the band 5 350-5 570 MHz and space research service (active) operating in the band 5 460-5 570 MHz shall not cause harmful interference to the aeronautical radionavigation service in the band 5 350-5 460 MHz, the radionavigation service in the band 5 460-5 470 MHz and the maritime radionavigation service in the band 5 470-5 570 MHz. (WRC-03)

ADD

5.448C The space research service (active) operating in the band 5 350-5 460 MHz shall not cause harmful interference to nor claim protection from other services to which this band is allocated. (WRC-03)

ADD

5.448D In the frequency band 5 350-5 470 MHz, stations in the radiolocation service shall not cause harmful interference to, nor claim protection from, radar systems in the aeronautical radionavigation service operating in accordance with No. 5.449. (WRC-03)

MOD

5.450 *Additional allocation:* in Austria, Azerbaijan, Iran (Islamic Republic of), Mongolia, 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-03)

ADD

5.450A In the band 5 470-5 725 MHz, stations in the mobile service shall not claim protection from radiodetermination services. Radiodetermination services shall not impose on the mobile service more stringent protection criteria, based on system characteristics and interference criteria, than those stated in Recommendation ITU-R M.1638. (WRC-03)

ADD

5.450B In the frequency band 5 470-5 650 MHz, stations in the radiolocation service, except ground-based radars used for meteorological purposes in the band 5 600-5 650 MHz, shall not cause harmful interference to, nor claim protection from, radar systems in the maritime radionavigation service. (WRC-03)

MOD

5.453 *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, Gabon, Guinea, Equatorial Guinea, India, Indonesia, Iran (Islamic Republic of), Iraq, Israel, Japan, Jordan, Kenya, Kuwait, Lebanon, the Libyan Arab Jamahiriya, Madagascar, Malaysia, Nigeria, Oman, 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 (WRC-03)** do not apply. (WRC-03)

MOD

5.454 *Different category of service:* in Azerbaijan, the Russian Federation, Georgia, Mongolia, Uzbekistan, 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-03)

MOD

5.455 *Additional allocation:* in Armenia, Azerbaijan, Belarus, Cuba, the Russian Federation, Georgia, Hungary, Kazakhstan, Latvia, Moldova, Mongolia, Uzbekistan, Kyrgyzstan, Tajikistan, Turkmenistan and Ukraine, the band 5 670-5 850 MHz is also allocated to the fixed service on a primary basis. (WRC-03)

MOD

5.456 *Additional allocation:* in Cameroon, the band 5 755-5 850 MHz is also allocated to the fixed service on a primary basis. (WRC-03)

MOD

5 830-7 550 MHz

Allocation to services		
Region 1	Region 2	Region 3
5 925-6 700	FIXED	
	FIXED-SATELLITE (Earth-to-space)	5.457A 5.457B
	MOBILE	
	5.149 5.440 5.458	
...		
7 075-7 145	FIXED	
	MOBILE	
	5.458 5.459	
7 145-7 235	FIXED	
	MOBILE	
	SPACE RESEARCH (Earth-to-space)	5.460
	5.458 5.459	
7 235-7 250	FIXED	
	MOBILE	
	5.458	

ADD

5.457A In the bands 5 925-6 425 MHz and 14-14.5 GHz, earth stations located on board vessels may communicate with space stations of the fixed-satellite service. Such use shall be in accordance with Resolution **902 (WRC-03)**. (WRC-03)

ADD

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, Libyan Arab Jamahiriya, Morocco, Mauritania, Oman, Qatar, Syrian Arab Republic, 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-03)

MOD

5.460 The use of the band 7 145-7 190 MHz by the space research service (Earth-to-space) is restricted to deep space; no emissions to deep space shall be effected in the band 7 190-7 235 MHz. Geostationary satellites in the space research service operating in the band 7 190-7 235 MHz shall not claim protection from existing and future stations of the fixed and mobile services and No. **5.43A** does not apply. (WRC-03)

MOD**7 550-8 750 GHz**

Allocation to services		
Region 1	Region 2	Region 3
8 400-8 500	FIXED 5.486 MOBILE except aeronautical mobile SPACE RESEARCH (space-to-Earth) 5.465 5.466	

MOD

5.466 *Different category of service:* in Israel, 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-03)

SUP

5.467

MOD

5.468 *Additional allocation:* in Saudi Arabia, Bahrain, Bangladesh, Brunei Darussalam, Burundi, Cameroon, China, Congo (Rep. of the), Costa Rica, Egypt, the United Arab Emirates, Gabon, Guyana, Indonesia, Iran (Islamic Republic of), Iraq, Jamaica, Jordan, Kenya, Kuwait, Lebanon, Libyan Arab Jamahiriya, Malaysia, Mali, Morocco, Mauritania, Nepal, Nigeria, Oman, Pakistan, Qatar, Syrian Arab Republic, Dem. People's Rep. of Korea, Senegal, Singapore, Somalia, 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-03)

MOD

5.469 *Additional allocation:* in Armenia, Azerbaijan, Belarus, the Russian Federation, Georgia, Hungary, Lithuania, Moldova, 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-03)

MOD

5.473 *Additional allocation:* in Armenia, Austria, Azerbaijan, Belarus, Bulgaria, Cuba, the Russian Federation, Georgia, Hungary, Moldova, Mongolia, Uzbekistan, Poland, Kyrgyzstan, Romania, Tajikistan, Turkmenistan and Ukraine, the bands 8 850-9 000 MHz and 9 200-9 300 MHz are also allocated to the radionavigation service on a primary basis. (WRC-03)

MOD

5.477 *Different category of service:* in Algeria, Saudi Arabia, Bahrain, Bangladesh, Brunei Darussalam, Cameroon, 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, the Dem. People's Rep. of Korea, Singapore, Somalia, 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-03)

MOD

5.478 *Additional allocation:* in Azerbaijan, Bulgaria, Mongolia, Kyrgyzstan, Romania, Turkmenistan and Ukraine, the band 9 800-10 000 MHz is also allocated to the radionavigation service on a primary basis. (WRC-03)

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, Paraguay, Peru, the Dem. People's Rep. of Korea, 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-03)

MOD

5.482 In the band 10.6-10.68 GHz, stations of the fixed and mobile, except aeronautical mobile, services shall be limited to a maximum equivalent isotropically radiated power of 40 dBW and the power delivered to the antenna shall not exceed -3 dBW. These limits may be exceeded subject to agreement obtained under No. **9.21**. However, in Saudi Arabia, Armenia, Azerbaijan, Bahrain, Bangladesh, Belarus, China, the United Arab Emirates, Georgia, India, Indonesia, Iran (Islamic Republic of), Iraq, Japan, Kazakhstan, Kuwait, Latvia, Lebanon, Moldova, Nigeria, Pakistan, the Philippines, Qatar, Syrian Arab Republic, Tajikistan and Turkmenistan, the restrictions on the fixed and mobile, except aeronautical mobile, services are not applicable. (WRC-03)

MOD

5.483 *Additional allocation:* in Saudi Arabia, Armenia, Azerbaijan, Bahrain, Belarus, Bosnia and Herzegovina, China, Colombia, Korea (Rep. of), Costa Rica, Egypt, the United Arab Emirates, Georgia, Iran (Islamic Republic of), Iraq, Israel, Jordan, Kazakhstan, Kuwait, Lebanon, Mongolia, Uzbekistan, Qatar, Kyrgyzstan, the Dem. People's Rep. of Korea, Romania, Serbia and Montenegro, 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-03)

MOD

11.7-14.25 GHz

Allocation to services		
Region 1	Region 2	Region 3
11.7-12.5 FIXED BROADCASTING BROADCASTING-SATELLITE MOBILE except aeronautical mobile 5.487 5.487A 5.492	11.7-12.1 FIXED 5.486 FIXED-SATELLITE (space-to-Earth) 5.484A Mobile except aeronautical mobile 5.485 5.488	11.7-12.2 FIXED MOBILE except aeronautical mobile BROADCASTING BROADCASTING-SATELLITE 5.487 5.487A 5.492
	12.1-12.2 FIXED-SATELLITE (space-to-Earth) 5.484A 5.485 5.488 5.489	
	12.2-12.7 FIXED MOBILE except aeronautical mobile BROADCASTING BROADCASTING-SATELLITE	12.2-12.5 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile BROADCASTING 5.484A 5.487
12.5-12.75 FIXED-SATELLITE (space-to-Earth) 5.484A (Earth-to-space) 5.494 5.495 5.496	5.487A 5.488 5.490 5.492 12.7-12.75 FIXED FIXED-SATELLITE (Earth-to-space) MOBILE except aeronautical mobile	12.5-12.75 FIXED FIXED-SATELLITE (space-to-Earth) 5.484A MOBILE except aeronautical mobile BROADCASTING-SATELLITE 5.493
...		
13.75-14	FIXED-SATELLITE (Earth-to-space) 5.484A RADIOLOCATION Earth exploration-satellite Standard frequency and time signal-satellite (Earth-to-space) Space research 5.499 5.500 5.501 5.502 5.503	
14-14.25	FIXED-SATELLITE (Earth-to-space) 5.457A 5.457B 5.484A 5.506 5.506B RADIONAVIGATION 5.504 Mobile-satellite (Earth-to-space) 5.504C 5.506A Space research 5.504A 5.505	

MOD

5.487 In the band 11.7-12.5 GHz in Regions 1 and 3, the fixed, fixed-satellite, mobile, except aeronautical mobile, and broadcasting services, in accordance with their respective allocations, shall not cause harmful interference to, or claim protection from, broadcasting-satellite stations operating in accordance with the Regions 1 and 3 Plan in Appendix 30. (WRC-03)

MOD

5.487A *Additional allocation:* in Region 1, the band 11.7-12.5 GHz, in Region 2, the band 12.2-12.7 GHz and, in Region 3, the band 11.7-12.2 GHz, are also allocated to the fixed-satellite service (space-to-Earth) on a primary basis, limited to non-geostationary systems and subject to application of the provisions of No. 9.12 for coordination with other non-geostationary-satellite systems in the fixed-satellite service. Non-geostationary-satellite systems in the fixed-satellite service shall not claim protection from geostationary-satellite networks in the broadcasting-satellite service operating in accordance with the Radio Regulations, irrespective of the dates of receipt by the Bureau of the complete coordination or notification information, as appropriate, for the non-geostationary-satellite systems in the fixed-satellite service and of the complete coordination or notification information, as appropriate, for the geostationary-satellite networks, and No. 5.43A does not apply. Non-geostationary-satellite systems in the fixed-satellite service in the above bands shall be operated in such a way that any unacceptable interference that may occur during their operation shall be rapidly eliminated. (WRC-03)

MOD

5.488 The use of the band 11.7-12.2 GHz by geostationary-satellite networks in the fixed-satellite service in Region 2 is subject to application of the provisions of No. 9.14 for coordination with stations of terrestrial services in Regions 1, 2 and 3. For the use of the band 12.2-12.7 GHz by the broadcasting-satellite service in Region 2, see Appendix 30. (WRC-03)

SUP

5.491

MOD

5.494 *Additional allocation:* in Algeria, Angola, Saudi Arabia, Bahrain, Cameroon, the Central African Rep., Congo (Rep. of the), Côte d'Ivoire, Egypt, the United Arab Emirates, Eritrea, Ethiopia, Gabon, Ghana, Guinea, Iraq, Israel, Jordan, Kuwait, Lebanon, Libyan Arab Jamahiriya, Madagascar, Mali, Morocco, Mongolia, Nigeria, Qatar, Syrian Arab Republic, Dem. Rep. of the Congo, Somalia, 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-03)

MOD

5.495 *Additional allocation:* in Bosnia and Herzegovina, Croatia, France, Greece, Liechtenstein, Monaco, Uganda, Portugal, Romania, Serbia and Montenegro, Slovenia, Switzerland, 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-03)

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, Malta, Morocco, Mauritania, Nigeria, Pakistan, Qatar, Syrian Arab Republic, Singapore, Sudan, Chad and Tunisia, the band 13.4-14 GHz is also allocated to the fixed and mobile services on a primary basis. (WRC-03)

MOD

5.501 *Additional allocation:* in Azerbaijan, Hungary, Japan, Mongolia, Kyrgyzstan, Romania, the United Kingdom and Turkmenistan, the band 13.4-14 GHz is also allocated to the radionavigation service on a primary basis. (WRC-03)

MOD

5.502 In the band 13.75-14 GHz, an earth station of a geostationary fixed-satellite service network shall have a minimum antenna diameter of 1.2 m and an earth station of a non-geostationary fixed-satellite service system shall have a minimum antenna diameter of 4.5 m. In addition, the e.i.r.p., averaged over one second, radiated by a station in the radiolocation or radionavigation services shall not exceed 59 dBW for elevation angles above 2° and 65 dBW at lower angles. Before an administration brings into use an earth station in a geostationary-satellite network in the fixed-satellite service in this band with an antenna size smaller than 4.5 m, it shall ensure that the power flux-density produced by this earth station does not exceed:

- $-115 \text{ dB(W/(m}^2 \cdot 10 \text{ MHz))}$ for more than 1% of the time produced at 36 m above sea level at the low water mark, as officially recognized by the coastal state;
- $-115 \text{ dB(W/(m}^2 \cdot 10 \text{ MHz))}$ for more than 1% of the time produced 3 m above ground at the border of the territory of an administration deploying or planning to deploy land mobile radars in this band, unless prior agreement has been obtained.

For earth stations within the fixed-satellite service having an antenna diameter greater than or equal to 4.5 m, the e.i.r.p. of any emission should be at least 68 dBW and should not exceed 85 dBW. (WRC-03)

MOD

5.503 In the band 13.75-14 GHz, geostationary space stations in the space research service for which information for advance publication has been received by the Bureau prior to 31 January 1992 shall operate on an equal basis with stations in the fixed-satellite service; after that date, new geostationary space stations in the space research service will operate on a secondary basis. Until those geostationary space stations in the space research service for which information for advance publication has been received by the Bureau prior to 31 January 1992 cease to operate in this band:

- in the band 13.77-13.78 GHz, the e.i.r.p. density of emissions from any earth station in the fixed-satellite service operating with a space station in geostationary-satellite orbit shall not exceed:
 - i) $4.7D + 28 \text{ dB(W/40 kHz)}$, where D is the fixed-satellite service earth station antenna diameter (m) for antenna diameters equal to or greater than 1.2 m and less than 4.5 m;
 - ii) $49.2 + 20 \log(D/4.5) \text{ dB(W/40 kHz)}$, where D is the fixed-satellite service earth station antenna diameter (m) for antenna diameters equal to or greater than 4.5 m and less than 31.9 m;
 - iii) $66.2 \text{ dB(W/40 kHz)}$ for any fixed-satellite service earth station for antenna diameters (m) equal to or greater than 31.9 m;
 - iv) 56.2 dB(W/4 kHz) for narrow-band (less than 40 kHz of necessary bandwidth) fixed-satellite service earth station emissions from any fixed-satellite service earth station having an antenna diameter of 4.5 m or greater;
- the e.i.r.p. density of emissions from any earth station in the fixed-satellite service operating with a space station in non-geostationary-satellite orbit shall not exceed 51 dBW in the 6 MHz band from 13.772 to 13.778 GHz.

Automatic power control may be used to increase the e.i.r.p. density in these frequency ranges to compensate for rain attenuation, to the extent that the power flux-density at the fixed-satellite service space station does not exceed the value resulting from use by an earth station of an e.i.r.p. meeting the above limits in clear-sky conditions. (WRC-03)

SUP**5.503A**

ADD

5.504A In the band 14-14.5 GHz, aircraft earth stations in the secondary aeronautical mobile-satellite service may also communicate with space stations in the fixed-satellite service. The provisions of Nos. **5.29**, **5.30** and **5.31** apply. (WRC-03)

ADD

5.504B Aircraft earth stations operating in the aeronautical mobile-satellite service in the band 14-14.5 GHz shall comply with the provisions of Annex 1, Part C of Recommendation ITU-R M.1643, with respect to any radio astronomy station performing observations in the 14.47-14.5 GHz band located on the territory of Spain, France, India, Italy, the United Kingdom and South Africa. (WRC-03)

ADD

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, Lesotho, Nigeria, Oman, 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-03)

MOD

5.505 *Additional allocation:* in Algeria, Angola, Saudi Arabia, Bahrain, Bangladesh, Botswana, Brunei Darussalam, Cameroon, China, Congo (Rep. of the), Korea (Rep. of), Egypt, the United Arab Emirates, Gabon, Guatemala, Guinea, India, Indonesia, Iran (Islamic Republic of), Iraq, Israel, Japan, Jordan, Kuwait, Lesotho, Lebanon, Malaysia, Mali, Morocco, Mauritania, Oman, Pakistan, the Philippines, Qatar, Syrian Arab Republic, the Dem. People's Rep. of Korea, Singapore, Somalia, Sudan, Swaziland, Tanzania, Chad and Yemen, the band 14-14.3 GHz is also allocated to the fixed service on a primary basis. (WRC-03)

ADD

5.506A In the band 14-14.5 GHz, ship earth stations with an e.i.r.p. greater than 21 dBW shall operate under the same conditions as earth stations located on board vessels, as provided in Resolution **902 (WRC-03)**. This footnote shall not apply to ship earth stations for which the complete Appendix 4 information has been received by the Bureau prior to 5 July 2003. (WRC-03)

ADD

5.506B Earth stations located on board vessels communicating with space stations in the fixed-satellite service may operate in the frequency band 14-14.5 GHz without the need for prior agreement from Cyprus, Greece and Malta, within the minimum distance given in Resolution **902 (WRC-03)** from these countries. (WRC-03)

MOD**14.25-15.63 GHz**

Allocation to services		
Region 1	Region 2	Region 3
14.25-14.3	FIXED-SATELLITE (Earth-to-space) 5.457A 5.457B 5.484A 5.506 5.506B RADIONAVIGATION 5.504 Mobile-satellite (Earth-to-space) 5.506A 5.508A Space research 5.504A 5.505 5.508 5.509	
14.3-14.4 FIXED FIXED-SATELLITE (Earth-to-space) 5.457A 5.457B 5.484A 5.506 5.506B MOBILE except aeronautical mobile Mobile-satellite (Earth-to-space) 5.506A 5.509A Radionavigation-satellite 5.504A	14.3-14.4 FIXED-SATELLITE (Earth-to-space) 5.457A 5.484A 5.506 5.506B Mobile-satellite (Earth-to-space) 5.506A Radionavigation-satellite 5.504A	14.3-14.4 FIXED FIXED-SATELLITE (Earth-to-space) 5.457A 5.484A 5.506 5.506B MOBILE except aeronautical mobile Mobile-satellite (Earth-to-space) 5.506A 5.509A Radionavigation-satellite 5.504A
14.4-14.47	FIXED FIXED-SATELLITE (Earth-to-space) 5.457A 5.457B 5.484A 5.506 5.506B MOBILE except aeronautical mobile Mobile-satellite (Earth-to-space) 5.506A 5.509A Space research (space-to-Earth) 5.504A	
14.47-14.5	FIXED FIXED-SATELLITE (Earth-to-space) 5.457A 5.457B 5.484A 5.506 5.506B MOBILE except aeronautical mobile Mobile-satellite (Earth-to-space) 5.504B 5.506A 5.509A Radio astronomy 5.149 5.504A	

MOD

5.508 *Additional allocation:* in Germany, Bosnia and Herzegovina, France, Italy, The Former Yugoslav Rep. of Macedonia, Libyan Arab Jamahiriya, the United Kingdom, Serbia and Montenegro and Slovenia, the band 14.25-14.3 GHz is also allocated to the fixed service on a primary basis. (WRC-03)

ADD

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, Lesotho, Nigeria, Oman, 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-03)

ADD

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, Lesotho, Morocco, Nigeria, Oman, 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-03)

MOD**15.63-18.6 GHz**

Allocation to services		
Region 1	Region 2	Region 3
17.3-17.7 FIXED-SATELLITE (Earth-to-space) 5.516 (space-to-Earth) 5.516A 5.516B Radiolocation 5.514	17.3-17.7 FIXED-SATELLITE (Earth-to-space) 5.516 BROADCASTING-SATELLITE Radiolocation 5.514 5.515 5.517	17.3-17.7 FIXED-SATELLITE (Earth-to-space) 5.516 Radiolocation 5.514
...		
18.1-18.4	FIXED FIXED-SATELLITE (space-to-Earth) 5.484A 5.516B (Earth-to-space) 5.520 MOBILE 5.519 5.521	
18.4-18.6	FIXED FIXED-SATELLITE (space-to-Earth) 5.484A 5.516B MOBILE	

MOD

5.512 *Additional allocation:* in Algeria, Angola, Saudi Arabia, Austria, Bahrain, Bangladesh, Bosnia and Herzegovina, 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, Libyan Arab Jamahiriya, Malaysia, Mali, Morocco, Mauritania, Mozambique, Nepal, Nicaragua, Oman, Pakistan, Qatar, Serbia and Montenegro, Singapore, Slovenia, Somalia, Sudan, Swaziland, 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-03)

MOD

5.514 *Additional allocation:* in Algeria, Angola, Saudi Arabia, Austria, Bahrain, Bangladesh, Bosnia and Herzegovina, Cameroon, Costa Rica, El Salvador, the United Arab Emirates, Finland, Guatemala, India, Iran (Islamic Republic of), Iraq, Israel, Italy, Japan, Jordan, Kuwait, Libyan Arab Jamahiriya, Lithuania, Nepal, Nicaragua, Nigeria, Oman, Uzbekistan, Pakistan, Qatar, Kyrgyzstan, Serbia and Montenegro, Slovenia and 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-03)

ADD

5.516A In the band 17.3-17.7 GHz, earth stations of the fixed-satellite service (space-to-Earth) in Region 1 shall not claim protection from the broadcasting-satellite service feeder-link earth stations operating under Appendix **30A**, nor put any limitations or restrictions on the locations of the broadcasting-satellite service feeder-link earth stations anywhere within the service area of the feeder link. (WRC-03)

ADD

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

17.3-17.7 GHz	(space-to-Earth) in Region 1,
18.3-19.3 GHz	(space-to-Earth) in Region 2,
19.7-20.2 GHz	(space-to-Earth) in all Regions,
39.5-40 GHz	(space-to-Earth) in Region 1,
40-40.5 GHz	(space-to-Earth) in all Regions,
40.5-42 GHz	(space-to-Earth) in Region 2,
47.5-47.9 GHz	(space-to-Earth) in Region 1,
48.2-48.54 GHz	(space-to-Earth) in Region 1,
49.44-50.2 GHz	(space-to-Earth) in Region 1,
and	
27.5-27.82 GHz	(Earth-to-space) in Region 1,
28.35-28.45 GHz	(Earth-to-space) in Region 2,
28.45-28.94 GHz	(Earth-to-space) in all Regions,
28.94-29.1 GHz	(Earth-to-space) in Region 2 and 3,
29.25-29.46 GHz	(Earth-to-space) in Region 2,
29.46-30 GHz	(Earth-to-space) in all Regions,
48.2-50.2 GHz	(Earth-to-space) in Region 2.

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

MOD

5.521 *Alternative allocation:* in Germany, Denmark, the United Arab Emirates and Greece, the band 18.1-18.4 GHz is allocated to the fixed, fixed-satellite (space-to-Earth) and mobile services on a primary basis (see No. **5.33**). The provisions of No. **5.519** also apply. (WRC-03)

MOD

18.6-22.21 GHz

Allocation to services		
Region 1	Region 2	Region 3
18.6-18.8 EARTH EXPLORATION-SATELLITE (passive) FIXED FIXED-SATELLITE (space-to-Earth) 5.522B MOBILE except aeronautical mobile Space research (passive) 5.522A 5.522C	18.6-18.8 EARTH EXPLORATION-SATELLITE (passive) FIXED FIXED-SATELLITE (space-to-Earth) 5.516B 5.522B MOBILE except aeronautical mobile SPACE RESEARCH (passive) 5.522A	18.6-18.8 EARTH EXPLORATION-SATELLITE (passive) FIXED FIXED-SATELLITE (space-to-Earth) 5.522B MOBILE except aeronautical mobile Space research (passive) 5.522A
18.8-19.3	FIXED FIXED-SATELLITE (space-to-Earth) 5.516B 5.523A MOBILE	
...		
19.7-20.1 FIXED-SATELLITE (space-to-Earth) 5.484A 5.516B Mobile-satellite (space-to-Earth) 5.524	19.7-20.1 FIXED-SATELLITE (space-to-Earth) 5.484A 5.516B MOBILE-SATELLITE (space-to-Earth) 5.524 5.525 5.526 5.527 5.528 5.529	19.7-20.1 FIXED-SATELLITE (space-to-Earth) 5.484A 5.516B Mobile-satellite (space-to-Earth) 5.524
20.1-20.2	FIXED-SATELLITE (space-to-Earth) 5.484A 5.516B MOBILE-SATELLITE (space-to-Earth) 5.524 5.525 5.526 5.527 5.528	
...		
21.4-22 FIXED MOBILE BROADCASTING-SATELLITE 5.347A 5.530	21.4-22 FIXED MOBILE	21.4-22 FIXED MOBILE BROADCASTING-SATELLITE 5.347A 5.530 5.531

SUP

5.534

MOD**22.21-24.75 GHz**

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

MOD**24.75-29.9 GHz**

Allocation to services		
Region 1	Region 2	Region 3
24.75-25.25 FIXED	24.75-25.25 FIXED-SATELLITE (Earth-to-space) 5.535	24.75-25.25 FIXED FIXED-SATELLITE (Earth-to-space) 5.535 MOBILE
...		
25.5-27	EARTH EXPLORATION-SATELLITE (space-to Earth) 5.536A 5.536B FIXED INTER-SATELLITE 5.536 MOBILE SPACE RESEARCH (space-to-Earth) 5.536A 5.536C Standard frequency and time signal-satellite (Earth-to-space)	
...		
27.5-28.5	FIXED 5.537A FIXED-SATELLITE (Earth-to-space) 5.484A 5.516B 5.539 MOBILE 5.538 5.540	
28.5-29.1	FIXED FIXED-SATELLITE (Earth-to-space) 5.484A 5.516B 5.523A 5.539 MOBILE Earth exploration-satellite (Earth-to-space) 5.541 5.540	
29.1-29.5	FIXED FIXED-SATELLITE (Earth-to-space) 5.516B 5.523C 5.523E 5.535A 5.539 5.541A MOBILE Earth exploration-satellite (Earth-to-space) 5.541 5.540	
29.5-29.9 FIXED-SATELLITE (Earth-to-space) 5.484A 5.516B 5.539 Earth exploration-satellite (Earth-to-space) 5.541 Mobile-satellite (Earth-to-space) 5.540 5.542	29.5-29.9 FIXED-SATELLITE (Earth-to-space) 5.484A 5.516B 5.539 MOBILE-SATELLITE (Earth-to-space) Earth exploration-satellite (Earth-to-space) 5.541 5.525 5.526 5.527 5.529 5.540 5.542	29.5-29.9 FIXED-SATELLITE (Earth-to-space) 5.484A 5.516B 5.539 Earth exploration-satellite (Earth-to-space) 5.541 Mobile-satellite (Earth-to-space) 5.540 5.542

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 Recommendations ITU-R SA.1278 and ITU-R SA.1625, respectively. (WRC-03)

ADD

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, 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-03)

MOD

5.537A In Bhutan, Korea (Rep. of), the Russian Federation, Indonesia, Iran (Islamic Republic of), Japan, Kazakhstan, Lesotho, Malaysia, Maldives, Mongolia, Myanmar, Uzbekistan, Pakistan, Philippines, Kyrgyzstan, the Dem. People's Rep. of Korea, Sri Lanka, Thailand and Viet Nam, the allocation to the fixed service in the band 27.5-28.35 GHz may also be used by high altitude platform stations (HAPS). The use of HAPS within the band 27.5-28.35 GHz is limited, within the territory of the countries listed above, to a single 300 MHz sub-band. 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 (WRC-03)**. (WRC-03)

MOD

29.9-34.2 GHz

Allocation to services		
Region 1	Region 2	Region 3
29.9-30	FIXED-SATELLITE (Earth-to-space)	5.484A 5.516B 5.539
	MOBILE-SATELLITE (Earth-to-space)	
	Earth exploration-satellite (Earth-to-space)	5.541 5.543
	5.525 5.526 5.527 5.538 5.540 5.542	
...		
31.8-32	FIXED 5.547A	
	RADIONAVIGATION	
	SPACE RESEARCH (deep space) (space-to-Earth)	
	5.547 5.547B 5.548	
32-32.3	FIXED 5.547A	
	RADIONAVIGATION	
	SPACE RESEARCH (deep space) (space-to-Earth)	
	5.547 5.547C 5.548	

MOD

5.543A In Bhutan, Korea (Rep. of), the Russian Federation, Indonesia, Iran (Islamic Republic of), Japan, Kazakhstan, Lesotho, Malaysia, Maldives, Mongolia, Myanmar, Uzbekistan, Pakistan, Philippines, Kyrgyzstan, the Dem. People's Rep. of Korea, 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 take account of rain attenuation, provided the effective impact on the passive satellite does not exceed the impact under clear-sky conditions as given above. See Resolution **145 (WRC-03)**. (WRC-03)

MOD

5.545 *Different category of service:* in Armenia, Azerbaijan, Georgia, Mongolia, 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. **5.533**). (WRC-03)

MOD

5.546 *Different category of service:* in Saudi Arabia, Armenia, Azerbaijan, Belarus, Egypt, the United Arab Emirates, Spain, Estonia, the Russian Federation, Finland, Georgia, Hungary, Iran (Islamic Republic of), Israel, Jordan, Latvia, Lebanon, Moldova, Mongolia, Uzbekistan, Poland, 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. **5.533**). (WRC-03)

MOD

5.547 The bands 31.8-33.4 GHz, 37-40 GHz, 40.5-43.5 GHz, 51.4-52.6 GHz, 55.78-59 GHz and 64-66 GHz are available for high-density applications in the fixed service (see Resolutions **75 (WRC-2000)** and **79 (WRC-2000)**). Administrations should take this into account when considering regulatory provisions in relation to these bands. Because of the potential deployment of high-density applications in the fixed-satellite service in the bands 39.5-40 GHz and 40.5-42 GHz (see No. **5.516B**), administrations should further take into account potential constraints to high-density applications in the fixed service, as appropriate. (WRC-03)

MOD

5.547C *Alternative allocation:* in the United States, the band 32-32.3 GHz is allocated to the radionavigation and space research (deep space) (space-to-Earth) services on a primary basis. (WRC-03)

MOD

5.548 In designing systems for the inter-satellite service in the band 32.3-33 GHz, for the radionavigation service in the band 32-33 GHz, and for the space research service (deep space) in the band 31.8-32.3 GHz, administrations shall take all necessary measures to prevent harmful interference between these services, bearing in mind the safety aspects of the radionavigation service (see Recommendation **707**). (WRC-03)

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, Libyan Arab Jamahiriya, Malaysia, Mali, Malta, Morocco, Mauritania, Nepal, Nigeria, Oman, Pakistan, the Philippines, Qatar, Syrian Arab Republic, Dem. Rep. of the Congo, Singapore, Somalia, 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-03)

MOD

34.2-40 GHz

Allocation to services		
Region 1	Region 2	Region 3
35.5-36	METEOROLOGICAL AIDS EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION SPACE RESEARCH (active) 5.549 5.549A	
...		
37.5-38	FIXED FIXED-SATELLITE (space-to-Earth) MOBILE SPACE RESEARCH (space-to-Earth) Earth exploration-satellite (space-to-Earth) 5.547	
38-39.5	FIXED FIXED-SATELLITE (space-to-Earth) MOBILE Earth exploration-satellite (space-to-Earth) 5.547	
39.5-40	FIXED FIXED-SATELLITE (space-to-Earth) 5.516B MOBILE MOBILE-SATELLITE (space-to-Earth) Earth exploration-satellite (space-to-Earth) 5.547	

ADD

5.549A In the band 35.5-36.0 GHz, the mean power flux-density at the Earth’s surface, generated by any spaceborne sensor in the Earth exploration-satellite service (active) or space research service (active), for any angle greater than 0.8° from the beam centre shall not exceed –73.3 dB(W/m²) in this band. (WRC-03)

MOD**40-40.5 GHz**

Allocation to services		
Region 1	Region 2	Region 3
40-40.5	EARTH EXPLORATION-SATELLITE (Earth-to-space) FIXED FIXED-SATELLITE (space-to-Earth) 5.516B MOBILE MOBILE-SATELLITE (space-to-Earth) SPACE RESEARCH (Earth-to-space) Earth exploration-satellite (space-to-Earth)	

MOD

5.550 *Different category of service:* in Armenia, Azerbaijan, Belarus, the Russian Federation, Georgia, Mongolia, Uzbekistan, 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-03)

SUP**5.551A****SUP****5.551AA**

MOD

40.5-51.4 GHz

Allocation to services		
Region 1	Region 2	Region 3
40.5-41 FIXED FIXED-SATELLITE (space-to-Earth) BROADCASTING BROADCASTING-SATELLITE Mobile 5.547	40.5-41 FIXED FIXED-SATELLITE (space-to-Earth) 5.516B BROADCASTING BROADCASTING-SATELLITE Mobile Mobile-satellite (space-to-Earth) 5.547	40.5-41 FIXED FIXED-SATELLITE (space-to-Earth) BROADCASTING BROADCASTING-SATELLITE Mobile 5.547
41-42.5	FIXED FIXED-SATELLITE (space-to-Earth) 5.516B BROADCASTING BROADCASTING-SATELLITE Mobile 5.547 5.551F 5.551H 5.551I	
...		
47.2-47.5	FIXED FIXED-SATELLITE (Earth-to-space) 5.552 MOBILE 5.552A	
47.5-47.9 FIXED FIXED-SATELLITE (Earth-to-space) 5.552 (space-to-Earth) 5.516B 5.554A MOBILE	47.5-47.9 FIXED FIXED-SATELLITE (Earth-to-space) 5.552 MOBILE	
47.9-48.2	FIXED FIXED-SATELLITE (Earth-to-space) 5.552 MOBILE 5.552A	
48.2-48.54 FIXED FIXED-SATELLITE (Earth-to-space) 5.552 (space-to-Earth) 5.516B 5.554A 5.555A MOBILE	48.2-50.2 FIXED FIXED-SATELLITE (Earth-to-space) 5.516B 5.552 MOBILE 5.149 5.340 5.555	
48.54-49.44 FIXED FIXED-SATELLITE (Earth-to-space) 5.552 MOBILE 5.149 5.340 5.555		
49.44-50.2 FIXED FIXED-SATELLITE (Earth-to-space) 5.552 (space-to-Earth) 5.516B 5.554A 5.555A MOBILE		
50.2-50.4		
	EARTH EXPLORATION-SATELLITE (passive) SPACE RESEARCH (passive) 5.340	

SUP**5.551G****ADD**

5.551H The equivalent power flux-density (epfd) produced in the band 42.5-43.5 GHz by all space stations in any non-geostationary-satellite system in the fixed-satellite service (space-to-Earth), or in the broadcasting-satellite service (space-to-Earth) operating in the 42-42.5 GHz band, shall not exceed the following values at the site of any radio astronomy station for more than 2% of the time:

–230 dB(W/m²) in 1 GHz and –246 dB(W/m²) in any 500 kHz of the 42.5-43.5 GHz band at the site of any radio astronomy station registered as a single-dish telescope; and

–209 dB(W/m²) in any 500 kHz of the 42.5-43.5 GHz band at the site of any radio astronomy station registered as a very long baseline interferometry station.

These epfd values shall be evaluated using the methodology given in Recommendation ITU-R S.1586 and the reference antenna pattern and the maximum gain of an antenna in the radio astronomy service given in Recommendation ITU-R RA.1631 and shall apply over the whole sky and for elevation angles higher than the minimum operating angle θ_{min} of the radiotelescope (for which a default value of 5° should be adopted in the absence of notified information).

These values shall apply at any radio astronomy station that either:

- was in operation prior to 5 July 2003 and has been notified to the Bureau before 4 January 2004; or
- was notified before the date of receipt of the complete Appendix 4 information for coordination or notification, as appropriate, for the space station to which the limits apply.

Other radio astronomy stations notified after these dates may seek an agreement with administrations that have authorized the space stations. In Region 2, Resolution 743 (WRC-03) shall apply. The limits in this footnote may be exceeded at the site of a radio astronomy station of any country whose administration so agreed. (WRC-03)

ADD

5.551I The power flux-density in the band 42.5-43.5 GHz produced by any geostationary space station in the fixed-satellite service (space-to-Earth), or the broadcasting-satellite service (space-to-Earth) operating in the 42-42.5 GHz band, shall not exceed the following values at the site of any radio astronomy station:

–137 dB(W/m²) in 1 GHz and –153 dB(W/m²) in any 500 kHz of the 42.5-43.5 GHz band at the site of any radio astronomy station registered as a single-dish telescope; and

–116 dB(W/m²) in any 500 kHz of the 42.5-43.5 GHz band at the site of any radio astronomy station registered as a very long baseline interferometry station.

These values shall apply at the site of any radio astronomy station that either:

- was in operation prior to 5 July 2003 and has been notified to the Bureau before 4 January 2004; or
- was notified before the date of receipt of the complete Appendix 4 information for coordination or notification, as appropriate, for the space station to which the limits apply.

Other radio astronomy stations notified after these dates may seek an agreement with administrations that have authorized the space stations. In Region 2, Resolution 743 (WRC-03) shall apply. The limits in this footnote may be exceeded at the site of a radio astronomy station of any country whose administration so agreed. (WRC-03)

ADD

5.554A The use of the bands 47.5-47.9 GHz, 48.2-48.54 GHz and 49.44-50.2 GHz by the fixed-satellite service (space-to-Earth) is limited to geostationary satellites. (WRC-03)

SUP

5.555A

ADD

5.555B The power flux-density in the band 48.94-49.04 GHz produced by any geostationary space station in the fixed-satellite service (space-to-Earth) operating in the bands 48.2-48.54 GHz and 49.44-50.2 GHz shall not exceed $-151.8 \text{ dB(W/m}^2\text{)}$ in any 500 kHz band at the site of any radio astronomy station. (WRC-03)

MOD

158.5-202 GHz

Allocation to services		
Region 1	Region 2	Region 3
182-185	EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340	

SUP

5.563

ARTICLE 7

Application of the procedures**ADD**

7.4A Unless otherwise stated in an applicable regulatory provision of these Regulations or in a Resolution relating to the application of the provisions of Articles 9 or 11, the following shall be applied by the Bureau:

- when applying the provisions of No. 9.35 or 9.36, as appropriate, the Bureau shall apply the provisions in force at the date of receipt of the information submitted under No. 9.34;
- when applying the provisions of No. 11.31, the Bureau shall apply the provisions in force at the date of receipt of the complete notice submitted under No. 11.15;
- when applying the provisions of No. 11.32, the Bureau shall apply the provisions in force at the date of receipt of complete information submitted under No. 9.34. In the case where a new form of coordination exists on the date of receipt of notification under Article 11, where no such form existed at the coordination stage, the Bureau shall apply the forms of coordination in force on the date of receipt of complete Appendix 4 data under Article 11;
- in the case where a form of coordination or coordination requirements existed on the date of receipt of complete coordination data under Article 9 where no such form or coordination requirements exist on the date of receipt of complete notification data under Article 11, the Bureau shall not take into account these forms of coordination or coordination requirements. (WRC-03)

MOD**ARTICLE 9****Procedure for effecting coordination with or
obtaining agreement of other administrations**^{1, 2, 3, 4, 5, 6, 6A, 6B} (WRC-03)**ADD**

^{6A} **A.9.6A** For the purpose of this Article, a geostationary satellite is a geosynchronous satellite with an orbit the inclination of which is less than or equal to 15°. (WRC-03)

ADD

^{6B} **A.9.7** See also Resolution 33 (Rev.WRC-03). (WRC-03)

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

9.1 Before initiating any action under this Article or under Article 11 in respect of frequency assignments for a satellite network or a satellite system, an administration, or one⁷ acting on behalf of a group of named administrations, shall, prior to the coordination procedure described in Section II of Article 9 below, where applicable, send to the Bureau a general description of the network or system for advance publication in the International Frequency Information Circular (BR IFIC) not earlier than seven years and preferably not later than two years before the planned date of bringing into use of the network or system (see also No. 11.44). The characteristics to be provided for this purpose are listed in Appendix 4. The coordination or notification information may also be communicated to the Bureau at the same time; it shall be considered as having been received by the Bureau not earlier than six months after the date of receipt of the information for advance publication where coordination is required by Section II of Article 9. Where coordination is not required by Section II, notification shall be considered as having been received by the Bureau not earlier than six months after the date of publication of the advance publication information. (WRC-03)

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. (WRC-03)

MOD

⁸ **9.2B.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, 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 Council Decision 482 unless the payment has already been received. See also Resolution **87 (WRC-03)**. (WRC-03)

MOD

9.5D If the information under No. **9.30** has not been received by the Bureau within a period of 24 months after the date of receipt by the Bureau of the relevant complete information under No. **9.1** or **9.2**, as appropriate, the information published under No. **9.2B** and not covered by a coordination request under No. **9.30** shall be cancelled, after the administration concerned has been informed at least three months before the end of the 24-month period. The Bureau shall also publish the cancellation in its BR IFIC. (WRC-03)

Section II – Procedure for effecting coordination^{10, 11}

MOD

9.6 Before an administration^{12, 13, 13A} notifies to the Bureau or brings into use a frequency assignment in any of the cases listed below, it shall effect coordination, as required, with other administrations identified under No. **9.27**: (WRC-03)

ADD

^{13A} **9.6.3** Unless otherwise specified, coordination under any of the particular sharing situations defined in Nos. **9.7** to **9.21** is not applicable when limits for that sharing situation are specified elsewhere in these Regulations. (WRC-03)

MOD

9.14 *i)* for a space station of a satellite network for which the requirement to coordinate is included in a footnote to the Table of Frequency Allocations referring to this provision or to No. **9.11A** in respect of stations of terrestrial services where the threshold value is exceeded; (WRC-03)

MOD

- 9.17A** *m)* for any specific earth station, in respect of other earth stations operating in the opposite direction of transmission or for any typical mobile earth station in respect of specific earth stations operating in the opposite direction of transmission, in frequency bands allocated with equal rights to space radiocommunication services in both directions of transmission and where the coordination area of the earth station includes the territory of another country or the earth station is located within the coordination area of another earth station, with the exception of the coordination under No. **9.19**; (WRC-03)

MOD

¹⁹ **9.38.1** 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, 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 Council Decision 482 unless the payment has already been received. See also Resolution **87 (WRC-03)**. (WRC-03)

MOD

ARTICLE 11

Notification and recording of frequency assignments^{1, 2, 3, 4, 4A, 5A} (WRC-03)

ADD

^{4A} **A.11.4A** For the purpose of this Article, a geostationary satellite is a geosynchronous satellite with an orbit the inclination of which is less than or equal to 15°. (WRC-03)

ADD

^{5A} **A.11.5** See also Resolution 33 (Rev.WRC-03). (WRC-03)

Section I – Notification

ADD

11.3A *aa* if that assignment is subject to Resolution 221 (Rev.WRC-03); or (WRC-03)

ADD

11.21B *f* any terrestrial station in bands referred to in a footnote which includes a reference to No. 9.21, if it pertains to a service which is subject to the application of the procedure for seeking agreement under No. 9.21; (WRC-03)

(MOD)

11.22 *g* earth stations whose coordination area includes the territory of another administration, or where the earth station is located within the coordination area of an earth station operating in the opposite direction of transmission;^{6, 7} (WRC-03)

(MOD)

11.23 *h* earth stations whose interference potential is greater than that of a coordinated typical earth station.⁶ (WRC-03)

MOD

11.24 Notices relating to assignments to stations of terrestrial services, except for those referred to in Nos. 11.25, 11.26 or 11.26A, shall reach the Bureau not earlier than three months before the assignments are brought into use. (WRC-03)

ADD

11.26A Notices relating to assignments for high altitude platform stations operating as base stations to provide IMT-2000 in the bands identified in 5.388A shall reach the Bureau not earlier than three years before the assignments are brought into use. (WRC-03)

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

MOD

⁸ **11.31.1** Conformity with the Table of Frequency Allocations implies the successful application of No. **9.21**, when necessary. However, the recording of the assignment with respect to those objecting administration(s) whose agreement(s) have not been obtained will be with a favourable finding, subject to the condition that the assignment in question shall not cause harmful interference to nor claim protection from the service(s) of the objecting administration(s) from which the agreement was sought. With respect to the administration(s) which have not objected under No. **9.21**, the recording of the assignment shall also be made with a favourable finding. (WRC-03)

MOD

11.39 When the examination with respect to No. **11.34** leads to a favourable finding, the assignment shall be recorded in the Master Register. When the finding is unfavourable, the notice shall be returned to the notifying administration, with an indication of the appropriate action. However, notices under Appendices **25**, **26** or **27** which are in accordance with the technical principles of the relevant appendix but not with the associated allotment plan shall be treated as follows: (WRC-03)

ADD

11.39F A notice which is not in conformity with the technical principles of Appendices **25**, **26** or **27**, as applicable, shall be returned to the notifying administration, unless the administration undertakes that it will be operated in accordance with No. **4.4**; in such a case the assignment shall be recorded in the Master Register for information purposes and subject to application of No. **8.5**. (WRC-03)

MOD

11.44 The notified date¹⁷ of bringing into use of any 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-03)

SUP

11.44B

SUP

11.44C

SUP

11.44D

SUP

11.44E

SUP

11.44F

SUP

11.44G

SUP

11.44H

SUP

11.44I

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, 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 three months before the expiry date referred to in No. **11.44**. (WRC-03)

ADD

11.50 The Bureau shall review periodically the Master Register with the aim of maintaining or improving its accuracy, with particular emphasis on the review of the findings so as to adjust them to the changing allocation situation after each conference. (WRC-03)

ARTICLE 12

**Seasonal planning of the HF bands allocated to the
broadcasting service between 5900 kHz and 26100 kHz****Section III – The Procedure****MOD**

12.33 Upon receipt of the schedules, the Bureau shall, in accordance with the Rules of Procedure, validate the data where necessary, perform a compatibility analysis and prepare the tentative high frequency broadcasting schedules (the Tentative Schedules). These Schedules shall include all assignments where administrations gave no alternatives, the selections made by the Bureau from any alternatives given, and the frequencies selected by the Bureau in cases where the need for its assistance was indicated by their intentional omission from the individual schedules. (WRC-03)

MOD

12.34 The Tentative Schedules shall be published two months and one month before the start of each of the two schedule periods in Nos. **12.17** and **12.18**. (WRC-03)

MOD

12.38 Administrations shall notify the Bureau of changes to their schedules as quickly as possible and the Bureau shall update and make available the Schedule on a monthly basis. The Bureau shall perform new compatibility analyses and publish the updated Schedule and the results of these analyses at regular intervals during the season. (WRC-03)

ARTICLE 13

Instructions to the Bureau**ADD**

**Section 0 – Development of the Rules of Procedure and proposals
to resolve inconsistencies encountered in the application
of the Radio Regulations (WRC-03)**

ADD

13.0.1 The Board shall develop a new Rule of Procedure only when there is a clear need with proper justification for such a Rule. For all such Rules, the Board shall submit to the coming world radiocommunication conference the necessary modifications to the Radio Regulations, to alleviate such difficulties or inconsistencies and include its suggestions in the Report of the Director to the next world radiocommunication conference. (WRC-03)

ADD

13.0.2 If such a need is not identified under No. **13.0.1**, the Board shall submit also to the coming world radiocommunication conference the necessary modifications to the Radio Regulations to alleviate such difficulties or inconsistencies. (WRC-03)

Section III – Maintenance of the Rules of Procedure by the Bureau

ADD

13.12A In the preparation and development of the Rules of Procedure, the Board, the Bureau and administrations shall apply the following steps:

- a)* the Bureau shall also publish under No. **13.17**, on the ITU website, a list of future proposed Rules and the time-frame for their consideration by the Board and for comments by administrations on the list of future proposed Rules;
- b)* any practice used by the Bureau in the application of the provisions of the Radio Regulations shall be identified and proposed for inclusion in the Rules of Procedure in accordance with the procedures of this section;
- c)* all draft Rules prepared by the Bureau shall be available to administrations on the ITU website and by Circular Letter at least ten weeks prior to the start of the Board meeting;
- d)* any comments on these draft Rules of Procedure from administrations shall be submitted to the Bureau at least four weeks before the start of the Board meeting;

e) in submitting comments administrations should, if possible, suggest the actual text of their proposed Rules;

f) all comments from administrations shall be posted on the ITU website. However, those comments that do not meet the above time-limits shall not be considered by the Board;

g) any Rules of Procedure are to be in conformity with the spirit and principle of the Constitution, Convention and the Radio Regulations and shall avoid any relaxation to the application of the corresponding provisions of the Radio Regulation to which the Rules make reference. (WRC-03)

Section IV – Board documents

MOD

13.18 Within one week after a meeting of the Board, a summary of all decisions, including the reasons for each decision, taken in that meeting shall be made available on the ITU website. After each Board meeting the approved minutes of that meeting shall normally be circulated at least one month before the start of the following meeting to administrations by means of a circular letter and these approved minutes shall also be made available on the ITU website. (WRC-03)

ARTICLE 19

Identification of stations**Section II – Allocation of international series and assignment of call signs****ADD**

19.31A 4) Means shall be provided for uniquely identifying mobile stations operating in automated terrestrial or satellite communication systems for the purposes of answering distress calls, for avoiding interference and for billing. Identification of the mobile station by accessing a registration database is satisfactory, provided that the system can associate the mobile station calling number with the particular mobile station user. (WRC-03)

MOD

19.35 § 16 The Secretary-General shall be responsible for allocating additional maritime identification digits (MIDs) to administrations within the limits specified, provided that it is ascertained that the possibilities offered by the MIDs allocated to an administration will soon be exhausted despite judicious ship station identity assignment as outlined in Section VI. (WRC-03)

SUP

² **19.35.1**

MOD

19.36 § 17 Each administration has been allocated one or more maritime identification digit (MID) for its use. A second or subsequent MID should not be requested² unless the previously allocated MID is more than 80% exhausted in the basic category of three trailing zeros and the rate of assignments is such that 90% exhaustion is foreseen. (WRC-03)

ADD

² **19.36.1** In no circumstances may an administration claim more MIDs than the total number of its ship stations notified to ITU divided by 1 000, plus one. Administrations shall make every attempt to reuse the Maritime Mobile Service Identities (MMSI) assigned from earlier MID resources, which become redundant after ships leave their national ship registry. Such numbers should be considered for reassignment after being absent from at least two successive editions of List VIIA of the ITU service publications. Administrations seeking additional MID resources must meet the criteria of having notified all previous assignments, in accordance with No. **20.16**. This criteria applies only to MMSIs in the basic category and to all MIDs assigned to the administration. (WRC-03)

Section III – Formation of call signs

MOD

- 19.48** *b)* combinations in Recommendation ITU-R M.1172 that are reserved for the abbreviations to be used in the radiocommunication services. (WRC-03)

SUP

- 19.49** *c)*

MOD

⁴ **19.50.1** For call sign series beginning with B, F, G, I, K, M, N, R, W and 2, only the first character is required for nationality identification. In the cases of half series (i.e. when the first two characters are allocated to more than one Member State), the first three characters are required for nationality identification. (WRC-03)

MOD

- 19.68** § 30 1)
- one character (provided that it is the letter B, F, G, I, K, M, N, R or W) and a single digit (other than 0 or 1), followed by a group of not more than four characters, the last of which shall be a letter, *or*
 - two characters and a single digit (other than 0 or 1), followed by a group of not more than four characters, the last of which shall be a letter. (WRC-03)

ADD

19.68A 1A) On special occasions, for temporary use, administrations may authorize use of call signs with more than the four characters referred to in No. **19.68**. (WRC-03)

Section IV – Identification of stations using radiotelephony

MOD

19.72 § 32 Stations using radiotelephony shall be identified as indicated in Nos. **19.73** to **19.82A**. (WRC-03)

ADD

- 19.82A** § 35A *Amateur stations and experimental stations*
- a call sign (see No. **19.68**). (WRC-03)

Section V – Selective call numbers in the maritime mobile Service

MOD

19.96A 3) Five-digit ship station selective call numbers shall be assigned to sequential single frequency selective calling (SSFC) equipment (as described in Recommendation ITU-R M.257-3) for calling in radiotelephony and for the phasing in of narrow-band direct printing (NBDP) equipment (as described in Recommendation ITU-R M.476-5). Within one administration the same five-digit number may be used:

- for identification of ship stations fitted with both SSFC and NBDP equipment;
- for identification of ship stations of two different ships fitted with either SSFC or NBDP equipment only. (WRC-03)

Section VI – Maritime mobile service identities in the maritime mobile service and the maritime mobile-satellite service

MOD

19.101 2) These identities are formed in such a way that the identity or part thereof can be used by telephone and telex subscribers connected to the public telecommunications network principally to call ships automatically in the shore-to-ship direction. Access to public networks may also be achieved by means of free-form numbering plans, so long as the ship can be uniquely identified using the system's registration database (see No. **19.31A**) to obtain the ship station identity, call sign or ship name and nationality. (WRC-03)

ADD

19.108A § 41 The maritime identification digits $M_1I_2D_3$ are an integral part of the maritime mobile service identity and denote the geographical area of the administration responsible for the station so identified (see Nos. **19.102** to **19.106**). (WRC-03)

SUP

19.109

MOD

19.112 a) follow the guidelines contained in the most recent version of Recommendation ITU-R M.585 concerning the assignment and use of ship station identities; (WRC-03)

MOD

- 19.114** *c)* take particular care in assigning ship station identities with six significant digits (i.e. having three-trailing-zero identities), which should be assigned only to ship stations which can reasonably be expected to require such an identity for automatic access on a worldwide basis to public switched networks, in particular for mobile-satellite systems accepted for use in the GMDSS on or before 1 February 2002, as long as those systems maintain the MMSI as part of their numbering scheme. (WRC-03)

SUP**19.115****SUP****19.116**

ARTICLE 20

MOD

Service publications (WRC-03)

MOD

Section I – Titles and contents of service publications (WRC-03)

MOD

20.1 § 1 The following publications shall be issued by the Secretary-General. As circumstances warrant and in response to individual requests by administrations, the published information shall also be available in computer printed form, machine-readable form, film, microfiche or by other appropriate means. (WRC-03)

MOD

Section II – Preparation and amendment of service publications (WRC-03)

MOD

20.15 § 11 The form, the content and the periodicity of each publication shall be decided by the Bureau in consultation with administrations and the international organizations concerned. (WRC-03)

MOD

20.16 § 12 Administrations shall take all appropriate measures to notify the Bureau immediately of any changes in the operational information contained in Lists IV, V and VI, in view of the importance of this information, particularly with regard to safety. In the case of other publications, administrations shall communicate the changes in the information contained in them as soon as possible. (WRC-03)

MOD

20.17 § 13 For the purpose of the service publications, a “country” shall be understood to mean the territory within the limits of which the station is located; a territory which does not have full responsibility for its international relations shall also be considered as a country for this purpose. (WRC-03)

ARTICLE 21

Terrestrial and space services sharing frequency bands above 1 GHz**Section II – Power limits for terrestrial stations****MOD**

TABLE 21-2 (WRC-03)

Frequency band	Service	Limit as specified in Nos.
1 610-1 645.5 MHz (No. 5.359) 1 646.5-1 660 MHz (No. 5.359) 1 980-2 010 MHz 2 010-2 025 MHz (Region 2) 2 025-2 110 MHz 2 200-2 290 MHz 2 655-2 670 MHz ⁵ (Regions 2 and 3) 2 670-2 690 MHz 5 670-5 725 MHz (Nos. 5.453 and 5.455) 5 725-5 755 MHz ⁵ (Region 1 countries listed in Nos. 5.451 , 5.453 and 5.455) 5 755-5 850 MHz ⁵ (Region 1 countries listed in Nos. 5.451 , 5.453 , 5.455 and 5.456) 5 850-7 075 MHz 7 145-7 235 MHz* 7 900-8 400 MHz 8 400-8 500 MHz	Fixed-satellite Meteorological-satellite Space research Space operation Earth exploration-satellite Mobile-satellite	21.2, 21.3, 21.4 and 21.5
10.7-11.7 GHz ⁵ (Region 1) 12.5-12.75 GHz ⁵ (Nos. 5.494 and 5.496) 12.7-12.75 GHz ⁵ (Region 2) 12.75-13.25 GHz 13.75-14 GHz (Nos. 5.499 and 5.500) 14.0-14.25 GHz (No. 5.505) 14.25-14.3 GHz (Nos. 5.505 , 5.508 and 5.509) 14.3-14.4 GHz ⁵ (Regions 1 and 3) 14.4-14.5 GHz 14.5-14.8 GHz	Fixed-satellite	21.2, 21.3 and 21.5
17.7-18.4 GHz 18.6-18.8 GHz 19.3-19.7 GHz 22.55-23.55 GHz 24.45-24.75 GHz (Regions 1 and 3) 24.75-25.25 GHz (Region 3) 25.25-29.5 GHz	Fixed-satellite Earth exploration-satellite Space research Inter-satellite	21.2, 21.3, 21.5 and 21.5A

* For this frequency band only the limits of Nos. **21.3** and **21.5** apply.

Section III – Power limits for earth stations

MOD

TABLE 21-3 (WRC-03)

Frequency band	Services
...	Fixed-satellite
5 850-7 075 MHz	Earth-exploration-satellite
7 190-7 235 MHz	Meteorological-satellite
7 900-8 400 MHz	Mobile-satellite
...	Space operation
	Space research

ADD

21.13A 7) In the band 13.75-14 GHz, the level of off-axis e.i.r.p. emitted by an earth station of a geostationary fixed-satellite service network with an antenna diameter smaller than 4.5 m shall not exceed the following values:

<i>Angle off-axis (degrees)</i>	<i>Maximum e.i.r.p. in any 1 MHz band (dBW)</i>
$2 \leq \phi \leq 7$	$43 - 25 \log \phi$
$7 < \phi \leq 9.2$	22
$9.2 < \phi \leq 48$	$46 - 25 \log \phi$
$\phi > 48$	4

(WRC-03)

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

MOD

TABLE 21-4 (WRC-03)

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°		
1 670-1 700 MHz	Earth exploration-satellite Meteorological-satellite	−133 (value based on sharing with meteorological aids service)			1.5 MHz	
		0° ≤ δ ≤ 4°	4° < δ ≤ 20°	20° < δ ≤ 60°	60° < δ ≤ 90°	
1 518-1 525 MHz (Applicable to the territory of the United States in Region 2 between the longitudes 71° W and 125° W)	Mobile-satellite (space-to-Earth)	−181.0	−193.0 + 20 log δ	−213.3 + 35.6 log δ	−150.0	4 kHz

TABLE 21-4 (continued) (WRC-03)

Frequency band	Service*	Limit in dB(W/m ²) for angles of arrival (δ) above the horizontal plane			Reference bandwidth
		$0^\circ \leq \delta \leq 43.4^\circ$	$43.4^\circ < \delta \leq 60^\circ$	$60^\circ < \delta \leq 90^\circ$	
1 518-1 525 MHz (Applicable to all other territory of the United States in Region 2)	Mobile-satellite (space-to-Earth)	-155.0	$-213.3 + 35.6 \log \delta$	-150.0	4 kHz
		0°-5°	5°-25°	25°-90°	
1 525-1 530 MHz ⁷ (Region 1, Region 3) 1 670-1 690 MHz ¹¹ 1 690-1 700 MHz (Nos. 5.381 and 5.382) 1 700-1 710 MHz 2 025-2 110 MHz 2 200-2 300 MHz	Meteorological-satellite (space-to-Earth) Space research (space-to-Earth) (space-to-space) Space operation (space-to-Earth) (space-to-space) Earth exploration-satellite (space-to-Earth) (space-to-space)	-154 ⁹	$-154 + 0.5(\delta - 5)^9$	-144 ⁹	4 kHz
...					
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)	$-138 - Y_{aa, bb}$	$-138 - Y + (12 + Y)(\delta - 5)/20_{aa, bb}$	-126 ^{bb}	1 MHz
4 500-4 800 MHz 5 670-5 725 MHz (Nos. 5.453 and 5.455) 7 250-7 850 MHz	Fixed-satellite (space-to-Earth) Meteorological-satellite (space-to-Earth) Mobile-satellite Space research	-152	$-152 + 0.5(\delta - 5)$	-142	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) ^{dd}	-126	$-126 + 0.5(\delta - 5)$	-116	1 MHz

TABLE 21-4 (continued) (WRC-03)

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°	
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) ^{dd}	-124	-124 + 0.5(δ - 5)	-114	1 MHz
12.2-12.75 GHz ⁷ (Region 3) 12.5-12.75 GHz ⁷ (Region 1 countries listed in Nos. 5.494 and 5.496)	Fixed-satellite (space-to-Earth) (geostationary-satellite orbit)	-148	-148 + 0.5(δ - 5)	-138	4 kHz
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) ^{cc}	-129 ^{bb}	-129 + 0.75(δ - 5) ^{bb}	-114 ^{bb}	1 MHz
...					
19.3-19.7 GHz 22.55-23.55 GHz 24.45-24.75 GHz 25.25-27.5 GHz	Fixed-satellite (space-to-Earth) Earth exploration-satellite (space-to-Earth) Inter-satellite Space research (space-to-Earth)	-115	-115 + 0.5(δ - 5)	-105	1 MHz
...					
32.3-33 GHz	Inter-satellite	-135	-135 + (δ - 5)	-115	1 MHz
...					
37.5-40 GHz	Fixed-satellite (non-geostationary-satellite orbit) Mobile-satellite (non-geostationary-satellite orbit)	-120 ^{10, 19}	-120 + 0.75(δ - 5) ^{10, 19}	-105 ^{10, 19}	1 MHz

TABLE 21-4 (end) (WRC-03)

Frequency band	Service*	Limit in dB(W/m ²) for angles of arrival (δ) above the horizontal plane				Reference bandwidth
		0°-5°	5°-20°	20°-25°	25°-90°	
37.5-40 GHz	Fixed-satellite (non-geostationary-satellite orbit) Mobile-satellite (non-geostationary-satellite orbit)	-127 ¹⁹	-127 + (4/3)($\delta - 5$) ¹⁹	-107 + 0.4($\delta - 20$) ¹⁹	-105 ¹⁹	1 MHz
40-40.5 GHz	Fixed-satellite	-115	-115 + 0.5($\delta - 5$)		-105	1 MHz
40.5-42 GHz	Fixed-satellite (non-geostationary-satellite orbit) Broadcasting-satellite (non-geostationary-satellite orbit)	-115 ^{10, 19}	-115 + 0.5($\delta - 5$) ^{10, 19}		-105 ^{10, 19}	1 MHz
40.5-42 GHz	Fixed-satellite (geostationary-satellite orbit)	-120 ¹⁹	5°-15°	15°-25°	-105 ¹⁹	1 MHz
	Broadcasting-satellite (geostationary-satellite orbit)		-120 + ($\delta - 5$) ¹⁹	-110 + 0.5($\delta - 15$) ¹⁹		
42-42.5 GHz	Fixed-satellite (non-geostationary-satellite orbit)	-120 ^{10, 19}	5°-25°		-105 ^{10, 19}	1 MHz
	Broadcasting-satellite (non-geostationary-satellite orbit)		-120 + 0.75($\delta - 5$) ^{10, 19}			
42-42.5 GHz	Fixed-satellite (geostationary-satellite orbit)	-127 ¹⁹	5°-20°	20°-25°	-105 ¹⁹	1 MHz
	Broadcasting-satellite (geostationary-satellite orbit)		-127 + (4/3)($\delta - 5$) ¹⁹	-107 + 0.4($\delta - 20$) ¹⁹		
...						
In Region 1: 47.5-47.9 GHz 48.2-48.54 GHz 49.44-50.2 GHz	Fixed-satellite (geostationary-satellite orbit)	-115	5°-25°		-105	1 MHz
			-115 + 0.5($\delta - 5$)			

SUP

¹⁶ 21.16.11

SUP

¹⁷ 21.16.12

SUP

¹⁸ 21.16.13

ADD

¹⁹ **21.16.14** When addressing the sharing conditions between the fixed service and the fixed-satellite service in the bands 37.5–40 GHz and 40.5–42.5 GHz, the power flux-density at the Earth's surface from any FSS satellite should be no greater than the level(s) required to meet the FSS link availability and performance objectives of the subject applications, taking into account the technical and operational requirements of the overall design of the satellite network. In any case, the levels shall not exceed the applicable power flux-density limits in Table **21-4**. (WRC-03)

ADD

^{aa} **21.16.15** The value of Y is defined as $Y = 0$ for $\max(N_N, N_S) \leq 2$; $Y = 5 \log(\max(N_N, N_S))$ for $\max(N_N, N_S) > 2$, where N_N is the maximum number of space stations in a system simultaneously transmitting on a co-frequency basis in the fixed-satellite service in the Northern Hemisphere, and N_S is the maximum number of space stations in the same system simultaneously transmitting on a co-frequency basis in the fixed-satellite service in the Southern Hemisphere. In determining N_N and N_S , two space stations simultaneously transmitting during periods of short-duration handover shall be considered as one satellite. (WRC-03)

ADD

^{bb} **21.16.16** The applicability of these limits may need to be reviewed by a future competent conference if the number of co-frequency non-geostationary systems brought into use and simultaneously operating in the same hemisphere is greater than five. (WRC-03)

ADD

^{cc} **21.16.17** These limits apply to non-geostationary fixed-satellite service space stations employing an orbit with an inclination angle between 35° and 145° and apogee altitude greater than 18 000 km. (WRC-03)

ADD

^{dd} **21.16.18** These limits apply to non-geostationary fixed-satellite service space stations that are not covered by No. **21.16.17**. (WRC-03)

ADD

Section VI – Protection of aeronautical radionavigation service systems from aggregate emissions of space stations of radionavigation-satellite service systems in the 1164-1215 MHz band

21.18 § 7 Administrations operating or planning to operate radionavigation-satellite service systems or networks in the 1164-1215 MHz frequency band, for which complete coordination or notification information, as appropriate, was received by the Bureau after 2 June 2000, shall, in accordance with *resolves* 2 of Resolution **609 (WRC-03)**, take all necessary steps to ensure that the actual aggregate interference into aeronautical radionavigation service systems caused by such radionavigation-satellite service systems or networks operating co-frequency in these frequency bands does not exceed the equivalent power flux-density level shown in *resolves* 1 of Resolution **609 (WRC-03)**. (WRC-03)

ARTICLE 22

Space services¹**Section II – Control of interference to geostationary-satellite systems****MOD**

22.5C § 6 1) The equivalent power flux-density², epfd_{\downarrow} , at any point on the Earth's surface visible from the geostationary-satellite orbit, produced by emissions from all the space stations of a non-geostationary-satellite system in the fixed-satellite service in the frequency bands listed in Tables **22-1A** to **22-1E**, including emissions from a reflecting satellite, for all conditions and for all methods of modulation, shall not exceed the limits given in Tables **22-1A** to **22-1E** for the given percentages of time. These limits relate to the equivalent power flux-density which would be obtained under free-space propagation conditions, into a reference antenna and in the reference bandwidth specified in Tables **22-1A** to **22-1E**, for all pointing directions towards the geostationary-satellite orbit. (WRC-03)

MOD

22.5CA 2) The limits given in Tables **22-1A** to **22-1E** may be exceeded on the territory of any country whose administration has so agreed (see also Resolution **140 (WRC-03)**). (WRC-03)

MOD

TABLE 22-1A (WRC-03)

Limits to the epfd_{\downarrow} radiated by non-geostationary-satellite systems in the fixed-satellite service systems in certain frequency bands^{3, 4, 5, 6}

Frequency band (GHz)	epfd_{\downarrow} (dB(W/m ²))	Percentage of time during which epfd_{\downarrow} may not be exceeded	Reference bandwidth (kHz)	Reference antenna diameter and reference radiation pattern ⁷
10.7-11.7 in all Regions; 11.7-12.2 in Region 2; 12.2-12.5 in Region 3 and 12.5-12.75 in Regions 1 and 3	-175.4	0	40	60 cm Recommendation ITU-R S.1428-1
	-174	90		
	-170.8	99		
	-165.3	99.73		
	-160.4	99.991		
	-160	99.997		
	-160	100		
	-181.9	0	40	1.2 m Recommendation ITU-R S.1428-1
	-178.4	99.5		
	-173.4	99.74		
	-173	99.857		
	-164	99.954		
	-161.6	99.984		
	-161.4	99.991		
	-160.8	99.997		
	-160.5	99.997		
	-160	99.9993		
	-160	100		
	-190.45	0	40	3 m Recommendation ITU-R S.1428-1
	-189.45	90		
	-187.45	99.5		
	-182.4	99.7		
	-182	99.855		
	-168	99.971		
	-164	99.988		
	-162	99.995		
	-160	99.999		
	-160	100		
	-195.45	0	40	10 m Recommendation ITU-R S.1428-1
	-195.45	99		
	-190	99.65		
	-190	99.71		
	-172.5	99.99		
	-160	99.998		
	-160	100		

MOD

⁷ **22.5C.6** For this Table, reference patterns of Recommendation ITU-R S.1428-1 shall be used only for the calculation of interference from non-geostationary-satellite systems in the fixed-satellite service systems into geostationary-satellite systems in the fixed-satellite service. (WRC-03)

MOD

TABLE 22-1B (WRC-03)
Limits to the epfd_{\downarrow} radiated by non-geostationary-satellite systems
in the fixed-satellite service in certain frequency bands^{3, 6, 8}

Frequency band (GHz)	epfd_{\downarrow} (dB(W/m ²))	Percentage of time during which epfd_{\downarrow} may not be exceeded	Reference bandwidth (kHz)	Reference antenna diameter and reference radiation pattern ⁷
17.8-18.6	-175.4	0	40	1 m Recommendation ITU-R S.1428-1
	-175.4	90		
	-172.5	99	1 000	
	-167	99.714		
	-164	99.971	40	2 m Recommendation ITU-R S.1428-1
	-164	100		
	-161.4	0	1 000	
	-161.4	90		
	-158.5	99	40	2 m Recommendation ITU-R S.1428-1
	-153	99.714		
	-150	99.971	1 000	
	-150	100		
	-178.4	0	40	2 m Recommendation ITU-R S.1428-1
	-178.4	99.4		
	-171.4	99.9	1 000	
	-170.5	99.913		
	-166	99.971	40	5 m Recommendation ITU-R S.1428-1
	-164	99.977		
	-164	100	1 000	
	-164.4	0		
	-164.4	99.4	40	5 m Recommendation ITU-R S.1428-1
	-157.4	99.9		
	-156.5	99.913	1 000	
	-152	99.971		
	-150	99.977	40	5 m Recommendation ITU-R S.1428-1
	-150	100		
	-185.4	0	40	5 m Recommendation ITU-R S.1428-1
	-185.4	99.8		
	-180	99.8	1 000	
	-180	99.943		
	-172	99.943	40	5 m Recommendation ITU-R S.1428-1
	-164	99.998		
	-164	100	1 000	
	-171.4	0		
	-171.4	99.8	40	5 m Recommendation ITU-R S.1428-1
	-166	99.8		
	-166	99.943	1 000	
	-158	99.943		
	-150	99.998	40	5 m Recommendation ITU-R S.1428-1
	-150	100		

MOD

TABLE 22-1C (WRC-03)

Limits to the epfd_{\downarrow} radiated by non geostationary-satellite systems in the fixed-satellite service in certain frequency bands^{3, 6, 8}

Frequency band (GHz)	epfd_{\downarrow} (dB(W/m ²))	Percentage of time during which epfd_{\downarrow} may not be exceeded	Reference bandwidth (kHz)	Reference antenna diameter and reference radiation pattern ⁷
19.7-20.2	-187.4	0	40	70 cm Recommendation ITU-R S.1428-1
	-182	71.429		
	-172	97.143		
	-154	99.983		
	-154	100		
	-173.4	0	1 000	90 cm Recommendation ITU-R S.1428-1
	-168	71.429		
	-158	97.143		
	-140	99.983		
	-140	100		
	-190.4	0	40	90 cm Recommendation ITU-R S.1428-1
	-181.4	91		
	-170.4	99.8		
	-168.6	99.8		
	-165	99.943		2.5 m Recommendation ITU-R S.1428-1
	-160	99.943		
	-154	99.997		
	-154	100		
	-176.4	0	1 000	2.5 m Recommendation ITU-R S.1428-1
	-167.4	91		
	-156.4	99.8		
	-154.6	99.8		
	-151	99.943		5 m Recommendation ITU-R S.1428-1
	-146	99.943		
	-140	99.997		
	-140	100		
	-196.4	0	40	5 m Recommendation ITU-R S.1428-1
	-162	99.98		
	-154	99.99943		
	-154	100		
	-182.4	0	1 000	5 m Recommendation ITU-R S.1428-1
	-148	99.98		
	-140	99.99943		
	-140	100		
	-200.4	0	40	5 m Recommendation ITU-R S.1428-1
	-189.4	90		
	-187.8	94		
	-184	97.143		
	-175	99.886		1 000
	-164.2	99.99		
	-154.6	99.999		
	-154	99.9992		
	-154	100		
	-186.4	0	1 000	
	-175.4	90		
	-173.8	94		
	-170	97.143		
	-161	99.886		
	-150.2	99.99		
	-140.6	99.999		
	-140	99.9992		
	-140	100		
	-140	100		

MOD

TABLE 22-1D (WRC-03)

Limits to the epfd_{\downarrow} radiated by non-geostationary-satellite systems in the fixed-satellite service in certain frequency bands into 30 cm, 45 cm, 60 cm, 90 cm, 120 cm, 180 cm, 240 cm and 300 cm broadcasting-satellite service antennas^{6, 9, 10, 11}

Frequency band (GHz)	epfd_{\downarrow} (dB(W/m ²))	Percentage of time during which epfd_{\downarrow} may not be exceeded	Reference bandwidth (kHz)	Reference antenna diameter and reference radiation pattern ¹²
11.7-12.5 in Region 1; 11.7-12.2 and 12.5-12.75 in Region 3; 12.2-12.7 in Region 2	-165.841	0	40	30 cm Recommendation ITU-R BO.1443-1, Annex 1
	-165.541	25		
	-164.041	96		
	-158.6	98.857		
	-158.6	99.429		
	-158.33	99.429		
	-158.33	100		
	-175.441	0	40	45 cm Recommendation ITU-R BO.1443-1, Annex 1
	-172.441	66		
	-169.441	97.75		
	-164	99.357		
	-160.75	99.809		
	-160	99.986		
	-160	100		
	-176.441	0	40	60 cm Recommendation ITU-R BO.1443-1, Annex 1
	-173.191	97.8		
	-167.75	99.371		
	-162	99.886		
	-161	99.943		
	-160.2	99.971		
	-160	99.997		
	-160	100		
	-178.94	0	40	90 cm Recommendation ITU-R BO.1443-1, Annex 1
	-178.44	33		
	-176.44	98		
	-171	99.429		
	-165.5	99.714		
	-163	99.857		
	-161	99.943		
	-160	99.991		
	-160	100		
	-182.44	0	40	120 cm Recommendation ITU-R BO.1443-1, Annex 1
	-180.69	90		
	-179.19	98.9		
	-178.44	98.9		
	-174.94	99.5		
	-173.75	99.68		
	-173	99.68		
	-169.5	99.85		
	-167.8	99.915		
	-164	99.94		
	-161.9	99.97		
	-161	99.99		
	-160.4	99.998		
	-160	100		

TABLE 22-1D (*end*) (WRC-03)

Frequency band (GHz)	epfd_{\downarrow} (dB(W/m ²))	Percentage of time during which epfd_{\downarrow} may not be exceeded	Reference bandwidth (kHz)	Reference antenna diameter and reference radiation pattern ¹²
11.7-12.5 in Region 1; 11.7-12.2 and 12.5-12.75 in Region 3; 12.2-12.7 in Region 2	-184.941	0	40	180 cm Recommendation ITU-R BO.1443-1, Annex 1
	-184.101	33		
	-181.691	98.5		
	-176.25	99.571		
	-163.25	99.946		
	-161.5	99.974		
	-160.35	99.993		
	-160	99.999		
	-160	100		
	-187.441	0	40	240 cm Recommendation ITU-R BO.1443-1, Annex 1
	-186.341	33		
	-183.441	99.25		
	-178	99.786		
	-164.4	99.957		
	-161.9	99.983		
	-160.5	99.994		
	-160	99.999		
	-160	100		
	-191.941	0	40	300 cm Recommendation ITU-R BO.1443-1, Annex 1
	-189.441	33		
	-185.941	99.5		
	-180.5	99.857		
	-173	99.914		
	-167	99.951		
	-162	99.983		
	-160	99.991		
	-160	100		

MOD

¹² **22.5C.11** For this Table, reference patterns of Annex 1 to Recommendation ITU-R BO.1443-1 shall be used only for the calculation of interference from non-geostationary-satellite systems in the fixed-satellite service into geostationary-satellite systems in the broadcasting-satellite service. (WRC-03)

ADD

TABLE 22-1E (WRC-03)

Limits to the epfd_{\downarrow} radiated by non-geostationary-satellite systems in the fixed-satellite service in certain frequency bands

Frequency band (MHz)	epfd_{\downarrow} (dB(W/m ²))	Percentage of time during which epfd_{\downarrow} may not be exceeded	Reference bandwidth (kHz)	Reference antenna diameter and reference radiation pattern (m)
3 700-4 200	-195.4	100	4	1.8 ^{13A}
	-197.9	100	4	2.4 ^{13A}
	-201.6	100	4	3.7 ^{13A}
	-203.3	100	4	4.5 ^{13A}
	-204.5	100	4	5.5 ^{13A}
	-207.5	100	4	8 ^{13A}
	-208.5	100	4	10 ^{13A}
	-212.0	100	4	15 ^{13A}

ADD

^{13A} 22.5C.12 The associated reference radiation pattern is defined as follows:

a) for values of $\left(\frac{D}{\lambda}\right) \geq 100$:

$$G(\varphi) = G_{\max} - 2.5 \times 10^{-3} \left(\frac{D}{\lambda} \varphi\right)^2 \quad \text{for } 0 \leq \varphi < \varphi_m$$

$$G(\varphi) = G_1 \quad \text{for } \varphi_m \leq \varphi < \varphi_r$$

$$G(\varphi) = 29 - 25 \log \varphi \quad \text{for } \varphi_r \leq \varphi < 20^\circ$$

$$G(\varphi) = -3.5 \quad \text{for } 20^\circ \leq \varphi < 26.3^\circ$$

$$G(\varphi) = 32 - 25 \log \varphi \quad \text{for } 26.3^\circ \leq \varphi < 48^\circ$$

$$G(\varphi) = -10 \quad \text{for } 48^\circ \leq \varphi \leq 180^\circ$$

b) for values of $42 \leq \left(\frac{D}{\lambda}\right) < 100$:

$$G(\varphi) = G_{\max} - 2.5 \times 10^{-3} \left(\frac{D}{\lambda} \varphi\right)^2 \quad \text{for } 0 \leq \varphi < \varphi_m$$

$$G(\varphi) = G_1 \quad \text{for } \varphi_m \leq \varphi < 100 \left(\frac{\lambda}{D}\right)$$

$$G(\varphi) = 29 - 25 \log \varphi \quad \text{for } 100 \left(\frac{\lambda}{D}\right) \leq \varphi < 20^\circ$$

$$G(\varphi) = -3.5 \quad \text{for } 20^\circ \leq \varphi < 26.3^\circ$$

$$G(\varphi) = 32 - 25 \log \varphi \quad \text{for } 26.3^\circ \leq \varphi < 48^\circ$$

$$G(\varphi) = -10 \quad \text{for } 48^\circ \leq \varphi \leq 180^\circ$$

c) for values of $\left(\frac{D}{\lambda}\right) < 42$:

$$\begin{aligned}
 G(\varphi) &= G_{max} - 2,5 \times 10^{-3} \left(\frac{D}{\lambda} \varphi\right)^2 & \text{for } 0 \leq \varphi < \varphi_m \\
 G(\varphi) &= G_1 & \text{for } \varphi_m \leq \varphi < 100 \left(\frac{\lambda}{D}\right) \\
 G(\varphi) &= 32 - 25 \log \varphi & \text{for } 100 \left(\frac{\lambda}{D}\right) \leq \varphi < 48^\circ \\
 G(\varphi) &= -10 & \text{for } 48^\circ \leq \varphi \leq 180^\circ
 \end{aligned}$$

where:

D : antenna diameter
 λ : wavelength

} expressed in the same units

φ : off-axis angle of the antenna (degrees)

G_1 : gain of the first side lobe = $2 + 15 \log \left(\frac{D}{\lambda}\right)$ dBi

$\varphi_m = \frac{20\lambda}{D} \sqrt{G_{max} - G_1}$ degrees

$\varphi_r = 15.85 \left(\frac{D}{\lambda}\right)^{-0.6}$ degrees

$G_{max} = 7.7 + 20 \log \left(\frac{D}{\lambda}\right)$ dBi (WRC-03)

MOD

TABLE 22-2 (WRC-03)

Limits to the epfd_\uparrow radiated by non-geostationary-satellite systems in the fixed-satellite service in certain frequency bands¹⁴

Frequency band	epfd_\uparrow (dB(W/m ²))	Percentage of time epfd_\uparrow level may not be exceeded	Reference bandwidth (kHz)	Reference antenna beamwidth and reference radiation pattern ¹⁵
5 925-6 725 MHz	-183.0	100	4	1.5° Recommendation ITU-R S.672-4, $L_s = -20$
12.50-12.75 GHz 12.75-13.25 GHz 13.75-14.5 GHz	-160	100	40	4° Recommendation ITU-R S.672-4, $L_s = -20$
17.3-18.1 GHz (Regions 1 and 3) 17.8-18.1 GHz (Region 2) ¹⁶	-160	100	40	4° Recommendation ITU-R S.672-4, $L_s = -20$
27.5-28.6 GHz	-162	100	40	1.55° Recommendation ITU-R S.672-4, $L_s = -10$
29.5-30 GHz	-162	100	40	1.55° Recommendation ITU-R S.672-4, $L_s = -10$

MOD

22.5H 5) The limits specified in Nos. **22.5C** (except for Table **22-1E**) to **22.5D** (except for Table **22-2** for the frequency band 5925-6725 MHz) and **22.5F** apply to non-geostationary-satellite systems in the fixed-satellite service for which complete coordination or notification information, as appropriate, has been received by the Bureau after 22 November 1997. The limits specified in Table **22-1E** and those specified in Table **22-2** for the frequency band 5925-6725 MHz apply to non-geostationary-satellite systems in the fixed-satellite service for which complete notification information has been received by the Bureau after 5 July 2003. The limits in Tables **22-4A**, **22-4A1**, **22-4B** and **22-4C** do not apply to non-geostationary-satellite systems in the fixed-satellite service for which complete coordination or notification information, as appropriate, has been received by the Bureau before 22 November 1997. (WRC-03)

MOD

22.5I 6) An administration operating a non-geostationary-satellite system in the fixed-satellite service which is in compliance with the limits in Nos. **22.5C**, **22.5D** and **22.5F** shall be considered as having fulfilled its obligations under No. **22.2** with respect to any geostationary-satellite network, irrespective of the dates of receipt by the Bureau of the complete coordination or notification information, as appropriate, for the non-geostationary-satellite system and the geostationary-satellite network, provided that the epfd_{\downarrow} radiated by the non-geostationary-satellite system in the fixed-satellite service into any operating geostationary fixed-satellite service earth station does not exceed the operational and additional operational limits given in Tables **22-4A**, **22-4A1**, **22-4B** and **22-4C**, when the diameter of the earth station antenna is equal to the values given in Table **22-4A**, **22-4A1** or **22-4C**, or the gain of the earth station is equal to or greater than the values given in Table **22-4B** for the corresponding orbital inclination of the geostationary fixed-satellite service satellite. Except as otherwise agreed between concerned administrations, an administration operating a non-geostationary-satellite system in the fixed-satellite service that is subject to the limits in Nos. **22.5C**, **22.5D** and **22.5F** and which radiates epfd_{\downarrow} into any operating geostationary fixed-satellite service earth station at levels in excess of the operational or additional operational limits given in Tables **22-4A**, **22-4A1**, **22-4B** and **22-4C**, when the diameter of the earth station antenna is equal to the values given in Table **22-4A**, **22-4A1** or **22-4C**, or the gain of the earth station is equal to or greater than the values given in Table **22-4B** for the corresponding orbital inclination of the geostationary fixed-satellite service satellite, shall be considered to be in violation of its obligations under No. **22.2**, and the provisions of Article **15** (Section V) apply. In addition, administrations are encouraged to use the relevant ITU-R Recommendations to determine whether such a violation has occurred. (WRC-03)

ARTICLE 23

Broadcasting services**Section I – Broadcasting service****MOD**

23.11 *C – HF bands allocated to the broadcasting service except the bands as referred to in No. 23.6* (WRC-03)

MOD

23.12 § 3 Transmitting stations of the broadcasting service operating in the HF bands allocated to the broadcasting service, except the bands as referred to in No. 23.6, shall meet the system specifications contained in Appendix 11. (WRC-03)

ARTICLE 24

Fixed service

SUP

24.3

SUP

24.4

SUP

24.5

SUP

24.6

ARTICLE 25

Amateur services**Section I – Amateur service****MOD**

25.1 § 1 Radiocommunication between amateur stations of different countries shall be permitted unless the administration of one of the countries concerned has notified that it objects to such radiocommunications. (WRC-03)

MOD

25.2 § 2 1) Transmissions between amateur stations of different countries shall be limited to communications incidental to the purposes of the amateur service, as defined in No. **1.56** and to remarks of a personal character. (WRC-03)

ADD

25.2A 1A) Transmissions between amateur stations of different countries shall not be encoded for the purpose of obscuring their meaning, except for control signals exchanged between earth command stations and space stations in the amateur-satellite service. (WRC-03)

MOD

25.3 2) Amateur stations may be used for transmitting international communications on behalf of third parties only in case of emergencies or disaster relief. An administration may determine the applicability of this provision to amateur stations under its jurisdiction. (WRC-03)

SUP**25.4****MOD**

25.5 § 3 1) Administrations shall determine whether or not a person seeking a licence to operate an amateur station shall demonstrate the ability to send and receive texts in Morse code signals. (WRC-03)

MOD

25.6 2) Administrations shall verify the operational and technical qualifications of any person wishing to operate an amateur station. Guidance for standards of competence may be found in the most recent version of Recommendation ITU-R M.1544. (WRC-03)

MOD

25.7 § 4 The maximum power of amateur stations shall be fixed by the administrations concerned. (WRC-03)

MOD

25.8 § 5 1) All pertinent Articles and provisions of the Constitution, the Convention and of these Regulations shall apply to amateur stations. (WRC-03)

ADD

25.9A § 5A Administrations are encouraged to take the necessary steps to allow amateur stations to prepare for and meet communication needs in support of disaster relief. (WRC-03)

ADD

25.9B § 5B An administration may determine whether or not to permit a person who has been granted a licence to operate an amateur station by another administration to operate an amateur station while that person is temporarily in its territory, subject to such conditions or restrictions it may impose. (WRC-03)

Section II – Amateur-satellite service**MOD**

25.11 § 7 Administrations authorizing space stations in the amateur-satellite service shall ensure that sufficient earth command stations are established before launch to ensure that any harmful interference caused by emissions from a station in the amateur-satellite service can be terminated immediately (see No. **22.1**). (WRC-03)

ARTICLE 28

Radiodetermination services**Section III – Radio direction-finding stations****MOD**

28.13 2) Where a radio direction-finding service is provided in the authorized bands between 1 606.5 kHz and 2 850 kHz, the radio direction-finding stations should be able to take bearings on the radiotelephone distress and calling frequency 2 182 kHz. (WRC-03)

ARTICLE 29

Radio astronomy service**Section III – Protection of the radio astronomy service****MOD**

29.12 § 9 In applying the measures outlined in this Section, administrations should bear in mind that the radio astronomy service is extremely susceptible to interference from space and airborne transmitters (for further information, see the most recent version of Recommendation ITU-R RA.769). (WRC-03)

ARTICLE 31

Frequencies for the global maritime distress and safety system (GMDSS)**Section II – Survival craft stations****MOD**

- 31.9** *a)* in the bands between 1 606.5 kHz and 2 850 kHz, be able to transmit on 2 187.5 kHz; (WRC-03)

ARTICLE 32

Operational procedures for distress and safety communications in the global maritime distress and safety system (GMDSS)**Section I – General****MOD**

32.7 § 6 The phonetic alphabet and figure code in Appendix **14** and the abbreviations and signals in accordance with the most recent version of Recommendation ITU-R M.1172 should be used where applicable¹. (WRC-03)

ARTICLE 33

Operational procedures for urgency and safety communications in the global maritime distress and safety system (GMDSS)**Section IV – Safety communications****ADD**

33.31A Safety messages transmitted by coast stations in accordance with a predefined timetable should not be announced by digital selective calling techniques. (WRC-03)

Section V – Transmission of maritime safety information¹**MOD**

33.45 § 24 1) The frequency 490 kHz may be used for the transmission of maritime safety information by means of narrow-band direct-printing telegraphy with forward error correction (see Appendix 15). (WRC-03)

ARTICLE 47

Operator's certificates**Section I – General provisions**

SUP

47.1

SUP

47.3

MOD

Section IV – Qualifying service¹ (WRC-03)

ADD

¹ **47.IV.1** The categories of certificates referred to in this Section are described in Appendix 13, Part B, Section I. (CMR-03)

MOD

47.26 § 8 1) The holder of a radiocommunication general operator's certificate or a first- or second-class radiotelegraph operator's certificate shall be authorized to embark as chief operator of a ship station of the fourth category (which is described in Recommendation ITU-R M.1169). (WRC-03)

MOD

47.27 2) However, before becoming chief or sole operator of a ship station of the fourth category (in accordance with Recommendation ITU-R M.1169) which is required by international agreements to carry a radiotelegraph operator, the holder of a radiocommunication general operator's certificate or a first- or second-class radiotelegraph operator's certificate shall have had adequate experience as operator on board ship at sea. (WRC-03)

MOD

47.28 3) Before becoming chief operator of a ship station of the second or third category (in accordance with Recommendation ITU-R M.1169), the holder of a radiocommunication general operator's certificate or a first- or second-class radiotelegraph operator's certificate shall have had, as operator on board ship or in a coast station, at least six months' experience of which at least three months shall have been on board ship. (WRC-03)

MOD

47.29 4) Before becoming chief operator of a ship station of the first category (in accordance with Recommendation ITU-R M.1169), the holder of a radiocommunication general operator's certificate or a first-class radiotelegraph operator's certificate shall have had, as operator on board ship or in a coast station, at least one year's experience of which at least six months shall have been on board ship. (WRC-03)

ARTICLE 51

Conditions to be observed in the maritime services**Section I – Maritime mobile service****MOD**

51.17 B2 – Bands between 1 606.5 kHz and 2 850 kHz (WRC-03)

MOD

51.18 § 10 In Region 2, any Morse radiotelegraph station installed on board a ship which uses frequencies in the band 2 089.5-2 092.5 kHz for call and reply shall be provided with at least one other frequency in the authorized bands between 1 606.5 kHz and 2 850 kHz. (WRC-03)

MOD

51.28 C2 – Bands between 1 606.5 kHz and 4 000 kHz (WRC-03)

MOD

51.29 § 14 All ship stations equipped with digital selective calling apparatus to work in the authorized bands between 1 606.5 kHz and 4 000 kHz shall be able to: (WRC-03)

MOD

51.35 *b)* send and receive class F1B or J2B emissions on an international calling channel (identified in Recommendation ITU-R M.541-8) in each of the HF maritime mobile bands necessary for their service; (WRC-03)

MOD

51.46 CA2 – Bands between 1 606.5 kHz and 4 000 kHz (WRC-03)

MOD

51.47 § 19 All ship stations equipped with narrow-band direct-printing telegraphy apparatus to work in the authorized bands between 1 606.5 kHz and 4 000 kHz shall be able to send and receive class F1B or J2B emissions on working frequencies necessary to carry out their service. (WRC-03)

MOD

51.51 D1 – Bands between 1 606.5 kHz and 4 000 kHz (WRC-03)

MOD

51.52 § 21 All ship stations equipped with radiotelephony apparatus to work in the authorized bands between 1 606.5 kHz and 2 850 kHz shall be able to: (WRC-03)

**Section III – Stations on board aircraft communicating with stations of
the maritime mobile service and the maritime mobile-satellite service**

MOD

51.71 § 28 In the case of communication between stations on board aircraft and stations of the maritime mobile service, radiotelephone calling may be renewed as specified in Recommendation ITU-R M.1171 and radiotelegraph calling may be renewed after an interval of five minutes, notwithstanding the procedure contained in the most recent version of Recommendation ITU-R M.1170. (WRC-03)

ARTICLE 52

Special rules relating to the use of frequencies**Section I – General provisions****MOD**

52.7 2) In the maritime mobile service, the frequency 490 kHz is used exclusively for the transmission by coast stations of meteorological and navigational warnings and urgent information to ships by means of narrow-band direct-printing telegraphy. (WRC-03)

MOD

52.8 *C – Bands between 1 606.5 kHz and 4 000 kHz* (WRC-03)

Section II – Use of frequencies for Morse radiotelegraphy**MOD**

52.23 *b)* by coast stations to announce by means of Morse telegraphy the transmission of their traffic lists under the conditions provided for in the most recent version of Recommendation ITU-R M.1170. (WRC-03)

MOD

52.25 4) Before transmitting on 500 kHz, stations must listen on this frequency for a reasonable period to make sure that no distress traffic is being sent (see the most recent version of Recommendation ITU-R M.1170). (WRC-03)

MOD

52.31 § 13 1) The frequency for replying to a call sent on the general calling frequency (see No. **52.27**) shall be as follows:

- either 500 kHz,
- or the frequency specified by the calling station (see No. **52.29** and the most recent version of Recommendation ITU-R M.1170). (WRC-03)

MOD

52.32 2) In regions of heavy traffic, coast stations may answer calls made by ship stations of their own nationality in accordance with special arrangements made by the administration concerned (see the most recent version of Recommendation ITU-R M.1170). (WRC-03)

MOD

52.46 *C – Bands between 1 606.5 kHz and 4 000 kHz* (WRC-03)

MOD

52.47 § 18 1) The band 2 089.5-2 092.5 kHz is the calling and safety band for Morse radiotelegraphy in those parts of the band between 1 606.5 kHz and 2 850 kHz in which Morse radiotelegraphy is authorized. (WRC-03)

MOD

52.50 4) Coast stations which use frequencies in the band 2 089.5-2 092.5 kHz for calling shall be able to use at least one other frequency in those parts of the band between 1 606.5 kHz and 2 850 kHz in which Morse radiotelegraphy is authorized. (WRC-03)

MOD

52.63 2) So far as is practicable, a coast station shall transmit its calls at specified times in the form of traffic lists on the frequency or frequencies indicated in the List of Coast Stations (see the most recent version of Recommendation ITU-R M.1170). (WRC-03)

MOD

52.69 § 28 In order to reduce interference on Morse radiotelegraphy calling frequencies, a coast station shall take adequate steps to ensure, under normal conditions, the prompt receipt of Morse radiotelegraphy calls (see the most recent version of Recommendation ITU-R M.1170). (WRC-03)

Section III – Use of frequencies for narrow-band direct-printing telegraphy

SUP

52.98

MOD

52.99 *C – Bands between 1 606.5 kHz and 4 000 kHz* (WRC-03)

MOD

52.100 § 46 1) All ship stations equipped with narrow-band direct-printing telegraph apparatus to work in the authorized bands between 1 606.5 kHz and 4 000 kHz shall be able to send and receive class F1B or J2B emissions on at least two working frequencies. (WRC-03)

SUP

52.106

Section IV – Use of frequencies for digital selective-calling**MOD**

52.124 *C – Bands between 1 606.5 kHz and 4 000 kHz* (WRC-03)

MOD

52.125 § 60 1) The class of emission to be used for digital selective-calling and acknowledgement in the bands between 1 606.5 kHz and 4 000 kHz shall be F1B. (WRC-03)

MOD

52.126 2) Coast stations should, when transmitting digital selective calls and acknowledgements in the bands between 1 606.5 kHz and 4 000 kHz, use the minimum power necessary to cover their service area. (WRC-03)

MOD

52.136 2) The international digital selective-calling frequency 2 177 kHz may be assigned to any coast station. In order to reduce interference on this frequency, it may be used as a general rule by coast stations to call ships of another nationality, or in cases where it is not known on which digital selective-calling frequencies within the bands between 1 606.5 kHz and 4 000 kHz the ship station is maintaining watch. (WRC-03)

MOD

52.139 2) A coast station providing international public correspondence service using digital selective-calling techniques within the bands between 1 606.5 kHz and 4 000 kHz should, during its hours of service, maintain automatic digital selective-calling watch on appropriate national or international calling frequencies. The hours and frequencies shall be indicated in the List of Coast Stations. (WRC-03)

MOD

52.140 3) Ship stations equipped with apparatus for digital selective-calling to work in the authorized bands between 1 606.5 kHz and 4 000 kHz should, when within the coverage area of coast stations providing services using digital selective-calling techniques in these bands, maintain an automatic digital selective-calling watch on one or more appropriate digital selective-calling frequencies within these bands, taking into account the digital selective-calling frequencies operated by the coast stations. (WRC-03)

Section V – Use of frequencies for wide-band telegraphy, facsimile, special transmission systems and oceanographic data transmissions

MOD

52.164 A1 – Bands between 1 606.5 kHz and 4 000 kHz (WRC-03)

Section VI – Use of frequencies for radiotelephony

MOD

52.181 § 85 Single-sideband apparatus in radiotelephone stations of the maritime mobile service operating in the bands allocated to this service between 1 606.5 kHz and 4 000 kHz and in the bands allocated exclusively to this service between 4 000 kHz and 27 500 kHz shall satisfy the technical and operational conditions specified in Recommendation ITU-R M.1173. (WRC-03)

MOD

52.182 *B – Bands between 1 606.5 kHz and 4 000 kHz* (WRC-03)

MOD

52.183 § 86 1) Unless otherwise specified in the present Regulations (see Nos. **51.53**, **52.188**, **52.189**, **52.199** and Appendix 13), the class of emission to be used in the bands between 1 606.5 kHz and 4 000 kHz shall be J3E. (WRC-03)

MOD

52.184 2) The peak envelope power of coast radiotelephone stations operating in the authorized bands allocated between 1 606.5 kHz and 4 000 kHz shall not exceed: (WRC-03)

MOD

52.192 *b)* by coast stations to announce the transmission, on another frequency, of traffic lists as specified in Recommendation ITU-R M.1171. (WRC-03)

MOD

52.195 § 89 1) Before transmitting on the carrier frequency 2 182 kHz, a station shall, in accordance with Recommendation ITU-R M.1171, listen on this frequency for a reasonable period to make sure that no distress traffic is being sent. (WRC-03)

MOD

52.197 § 90 1) Coast stations which use 2 182 kHz for calling shall be able to use at least one other frequency in the authorized bands between 1 606.5 kHz and 2 850 kHz. (WRC-03)

MOD

52.198 2) Coast stations authorized to use radiotelephony on one or more frequencies other than 2 182 kHz in the authorized bands between 1 606.5 kHz and 2 850 kHz shall use class J3E emissions on those frequencies (see also No. **52.188**). (WRC-03)

MOD

52.199 3) Coast stations open to the public correspondence service on one or more frequencies between 1 606.5 kHz and 2 850 kHz shall also be capable of transmitting class H3E and J3E emissions with a carrier frequency of 2 182 kHz, and of receiving class A3E, H3E and J3E emissions with a carrier frequency of 2 182 kHz. (WRC-03)

MOD

52.202 § 91 The peak envelope power of ship radiotelephone stations operating in the authorized bands between 1 606.5 kHz and 2 850 kHz shall not exceed 400 W. (WRC-03)

MOD

52.213 2) In exceptional circumstances, if frequency usage according to Nos. **52.203** to **52.208** or No. **52.210** is not possible, a ship station may use one of its own assigned national ship-to-shore frequencies for communication with a coast station of another nationality, under the express condition that the coast station as well as the ship station shall take precautions, in accordance with Recommendation ITU-R M.1171, to ensure that the use of such a frequency will not cause harmful interference to the service for which the frequency in question is authorized. (WRC-03)

MOD

52.217 § 96 1) The class of emission to be used for analogue radiotelephony in the bands between 4 000 kHz and 26 175 kHz shall be J3E; for digital telecommunications in those bands, the class of emission shall be J2D. (WRC-03)

MOD

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

MOD

52.224 § 99 1) Before transmitting on the carrier frequencies 4 125 kHz, 6 215 kHz, 8 291 kHz, 12 290 kHz or 16 420 kHz a station shall, in accordance with Recommendation ITU-R M.1171, listen on the frequency for a reasonable period to make sure that no distress traffic is being sent (see No. **52.221A**). (WRC-03)

MOD

52.229 4) Transmitters used for radiotelephony in the bands between 4 000 kHz and 27 500 kHz shall comply with technical characteristics specified in Recommendation ITU-R M.1173. (WRC-03)

MOD

52.231 § 101 1) The frequency 156.8 MHz is the international frequency for distress traffic and for calling by radiotelephony when using frequencies in the authorized bands between 156 MHz and 174 MHz (see Appendix **13** for details of use). The class of emission to be used for radiotelephony on the frequency 156.8 MHz shall be G3E (as specified in Recommendation ITU-R M.489-2). (WRC-03)

MOD

52.234 *b)* by coast stations to announce the transmission on another frequency of traffic lists, in accordance with Recommendation ITU-R M.1171, and important maritime information. (WRC-03)

MOD

52.235 3) The frequency 156.8 MHz may be used by ship stations and coast stations for selective calling in accordance with Recommendation ITU-R M.257-3. (WRC-03)

MOD

52.240 8) Before transmitting on the frequency 156.8 MHz, a station shall, in accordance with Recommendation ITU-R M.1171, listen on this frequency for a reasonable period to make sure that no distress traffic is being sent. (WRC-03)

SUP

52.255

ARTICLE 55

Morse radiotelegraphy**MOD**

55.1 The recommended procedure for conducting radiotelegraph communications is detailed in the most recent version of Recommendation ITU-R M.1170. (WRC-03)

ARTICLE 57

Radiotelephony**MOD**

57.1 § 1 The procedure detailed in Recommendation ITU-R M.1171 shall be applicable to radiotelephone stations, except in cases of distress, urgency or safety, to which the provisions of Appendix **13** are applicable. (WRC-03)

ARTICLE 59

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

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 and WRC-03, shall be applied, pursuant to Article 54 of the Constitution, on the following basis. (WRC-03)

59.2 The provisions of these Regulations, as revised by WRC-95, concerning new or modified frequency allocations (including any new or modified conditions applying to existing allocations) and the related provisions of Articles **S21*** and **S22***, and Appendix **S4***, apply provisionally as of 1 January 1997.

59.3 The other provisions of these Regulations, as revised by WRC-95 and WRC-97, apply provisionally as of 1 January 1999, with the following exceptions: (WRC-2000)

59.4 – the revised provisions for which other effective dates of application are stipulated in Resolutions:
49 (WRC-97), 51 (WRC-97), 52 (WRC-97), 54 (WRC-97), 130 (WRC-97), 533 (WRC-97), 534 (WRC-97) and 538 (WRC-97).

59.5 The other provisions of these Regulations, as revised by WRC-2000, shall enter into force on 1 January 2002, with the following exceptions: (WRC-2000)

59.6 – the revised provisions for which other effective dates of application are stipulated in Resolutions:
49 (Rev.WRC-2000), 51 (Rev.WRC-2000), 53 (Rev.WRC-2000), 55 (WRC-2000), 56 (WRC-2000), 58 (WRC-2000), 59 (WRC-2000), 77 (WRC-2000), 84 (WRC-2000), 122 (Rev.WRC-2000), 128 (Rev.WRC-2000), 533 (Rev.WRC-2000), 539 (WRC-2000), 540 (WRC-2000), 541 (WRC-2000), 542 (WRC-2000), 604 (WRC-2000) and 605 (WRC-2000). (WRC-2000)

* *Note by the Secretariat:* In view of the changes in the numbering scheme used in this edition of the Radio Regulations, these references correspond now to Articles **21** and **22**, and to Appendix **4**, as appropriate.

ADD

59.7 The other provisions of these Regulations, as revised by WRC-03, shall enter into force on 1 January 2005, with the following exceptions: (WRC-03)

ADD

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-03)

APPENDICES

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APPENDIX 2 (Rev.WRC-03)

Table of transmitter frequency tolerances**MOD**

Frequency bands (lower limit exclusive, upper limit inclusive) and categories of stations	Tolerances applicable to transmitters
<i>Band: 9 kHz to 535 kHz</i> 1 <i>Fixed stations:</i> – 9 kHz to 50 kHz – 50 kHz to 535 kHz 2 <i>Land stations:</i> a) Coast stations b) Aeronautical stations 3 <i>Mobile stations:</i> a) Ship stations b) Ship's emergency transmitters c) Survival craft stations d) Aircraft stations 4 <i>Radiodetermination stations</i> 5 <i>Broadcasting stations</i>	100 50 100 ^{1, 2} 100 200 ^{3, 4} 500 ⁵ 500 100 100 10 Hz
<i>Band: 535 kHz to 1 606.5 kHz (1 605 kHz in Region 2)</i> <i>Broadcasting stations</i>	10 Hz (WRC-03)
<i>Band: 1 606.5 kHz (1 605 kHz in Region 2) to 4 000 kHz</i> 1 <i>Fixed stations:</i> – power 200 W or less – power above 200 W 2 <i>Land stations:</i> – power 200 W or less – power above 200 W	100 ^{7, 8} 50 ^{7, 8} 100 ^{1, 2, 7, 9, 10} 50 ^{1, 2, 7, 9, 10}

Notes in the table of transmitter frequency tolerances**MOD**

² For coast station transmitters used for digital selective calling, the tolerance is 10 Hz. (WRC-03)

MOD

⁴ For ship station transmitters used for digital selective calling, the tolerance is 10 Hz. (WRC-03)

⁶ (SUP – WRC-03).

MOD

- ¹⁹ For ship station transmitters in the band 26 175-27 500 kHz, on board small craft, with a carrier power not exceeding 5 W in or near coastal waters and utilizing F3E and G3E emissions, the frequency tolerance is 40×10^{-6} . (WRC-03)

MOD**APPENDIX 3 (Rev.WRC-03)****Tables of maximum permitted power levels for spurious
or spurious domain emissions¹**

(See Article 3)

MOD

1 The following sections indicate the maximum permitted levels of certain unwanted emissions, in terms of power as indicated in the tables, of components supplied by a transmitter to the antenna transmission line. Section I, which provides spurious emission limits, is applicable until 1 January 2012 to transmitters installed on or before 1 January 2003; Section II, which limits emissions in the spurious domain, is applicable to transmitters installed after 1 January 2003 and to all transmitters after 1 January 2012. The provisions of No. 4.5 apply to unwanted emissions not covered in Sections I and II.

2 Spurious and spurious domain emissions (covered by Sections I and II) from any part of the installation, other than the antenna and its transmission line, shall not have an effect greater than would occur if this antenna system were supplied with the maximum permitted power at the frequency of that emission.

3 These levels shall not, however, apply to emergency position-indicating radiobeacon (EPIRB) stations, emergency locator transmitters, ships' emergency transmitters, lifeboat transmitters, survival craft stations or maritime transmitters when used in emergency situations.

4 For technical or operational reasons, more stringent levels than those specified may be applied to protect specific services in certain frequency bands. The levels applied to protect these services, such as safety and passive services, shall be those agreed upon by the appropriate world radiocommunication conference. More stringent levels may also be fixed by specific agreement between the administrations concerned. Additionally, special consideration of transmitter spurious or spurious domain emissions may be required for the protection of safety services, radio astronomy and space services using passive sensors. Information on the levels of interference detrimental to radio astronomy, Earth exploration satellites and meteorological passive sensing is given in the most recent version of Recommendation ITU-R SM.329.

¹ Spurious domain emissions are unwanted emissions at frequencies within the spurious domain.

5 Spurious and spurious domain emission limits (covered by Sections I and II) for combined radiocommunication and information technology equipment are those for the radiocommunication transmitters. (WRC-03)

MOD

Section II – Spurious domain emission limits for transmitters installed after 1 January 2003 and for all transmitters after 1 January 2012 (WRC-03)

Application of these limits

7 The frequency range of the measurement of spurious domain emissions is from 9 kHz to 110 GHz or the second harmonic if higher. (WRC-03)

8 Except as provided in § 9 and 10 of this Appendix, the spurious domain emission levels are specified in the following reference bandwidths:

- 1 kHz between 9 kHz and 150 kHz
- 10 kHz between 150 kHz and 30 MHz
- 100 kHz between 30 MHz and 1 GHz
- 1 MHz above 1 GHz. (WRC-03)

9 The reference bandwidth of all space service spurious domain emissions should be 4 kHz. (WRC-03)

10 For radar systems, the reference bandwidths for specifying spurious domain emission levels should be calculated for each particular system. Thus, for the four general types of radar pulse modulation utilized for radionavigation, radiolocation, acquisition, tracking and other radiodetermination functions, the reference bandwidth values are determined using the following:

- for a fixed-frequency, non-pulse-coded radar, the reciprocal of the radar pulse length, in seconds (e.g. if the radar pulse length is 1 μ s, then the reference bandwidth is $1/(1 \mu\text{s}) = 1 \text{ MHz}$);
- for a fixed-frequency, phase-coded pulsed radar, the reciprocal of the phase chip length, in seconds (e.g. if the phase-coded chip is 2 μ s long, then the reference bandwidth is $1/(2 \mu\text{s}) = 500 \text{ kHz}$);
- for a frequency modulated (FM) or chirped radar, the square root of the quantity obtained by dividing the chirp bandwidth in MHz by the pulse length, in μ s (e.g. if the FM is from 1 250 MHz to 1 280 MHz, i.e. 30 MHz, during the pulse length of 10 μ s, then the reference bandwidth is $(30 \text{ MHz}/10 \mu\text{s})^{1/2} = 1.73 \text{ MHz}$);
- for radars operating with multiple waveforms, the reference bandwidth for specifying spurious domain emission levels is determined empirically from observations of the radar emission and is obtained following the guidance given in the most recent version of Recommendation ITU-R M.1177.

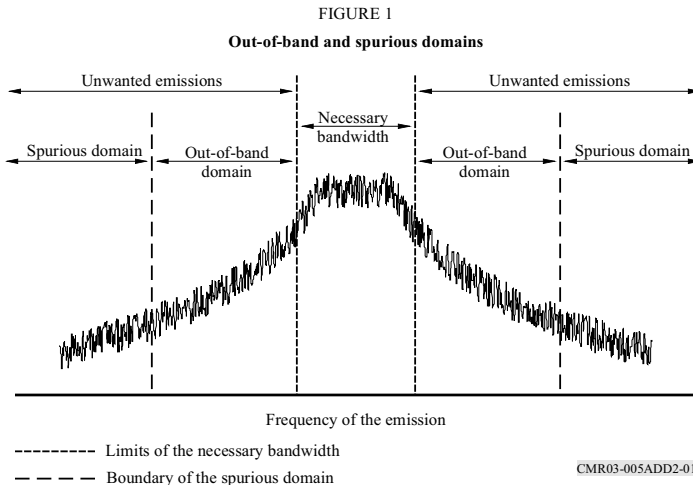
In the case of radars, for which the bandwidth, as determined using the method above, is greater than 1 MHz, a reference bandwidth of 1 MHz should be used. (WRC-03)

10bis Guidance regarding the methods of measuring spurious domain emissions is given in the most recent version of Recommendation ITU-R SM.329. The e.i.r.p. method specified in this Recommendation should be used when it is not possible to accurately measure the power supplied to the antenna transmission line, or for specific applications where the antenna is designed to provide significant attenuation in the spurious domain. Additionally, the e.i.r.p. method may need some modification for special cases. Specific guidance regarding the methods of measuring spurious domain emissions from radar systems is given in the most recent version of Recommendation ITU-R M.1177.

To improve measurement accuracy, sensitivity and efficiency, the resolution bandwidth in which spurious domain emissions are measured can be different from the reference bandwidth used for specifying spurious domain emission levels. (WRC-03)

11 The emission limits of this Section apply to all emissions, including harmonic emissions, intermodulation products, frequency conversion products and parasitic emissions, at frequencies in the spurious domain (see Fig. 1). The upper and lower parts of the spurious domain extend outward from a boundary determined using Annex 1. (WRC-03)

ADD



SUP

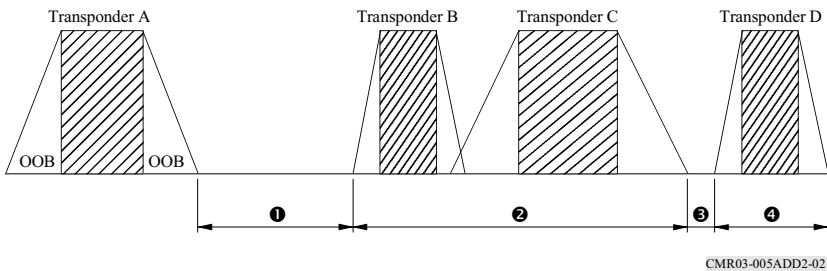
11bis

MOD

11ter For the case of a single satellite operating with more than one transponder in the same service area, and when considering the limits for spurious domain emissions as indicated in § 11 of this Appendix, spurious domain emissions from one transponder may fall on a frequency at which a second, companion transponder is transmitting. In these situations, the level of spurious domain emissions from the first transponder is well exceeded by the fundamental or out-of-band domain emissions of the second transponder. Therefore, the limits of this Appendix should not apply to those emissions of a satellite that fall within either the necessary bandwidth or the out-of-band domain of another transponder on the same satellite, in the same service area (see Fig. 2). (WRC-03)

MOD

FIGURE 2
Example of the applicability of spurious domain emission limits
to a satellite transponder



Transponders A, B, C and D are operating on the same satellite in the same service area. Transponder A is not required to meet spurious domain emission limits in frequency ranges 2 and 4, but is required to meet them in frequency ranges 1 and 3. (WRC-03)

12 Examples of applying $43 + 10 \log (P)$ to calculate attenuation requirements

Where specified in relation to mean power, spurious domain emissions are to be at least x dB below the total mean power P , i.e. $-x$ dBc. The power P (W) is to be measured in a bandwidth wide enough to include the total mean power. The spurious domain emissions are to be measured in the reference bandwidths given in the relevant ITU-R Recommendations. The measurement of the spurious domain emission power is independent of the value of necessary bandwidth. Because the absolute emission power limit, derived from $43 + 10 \log (P)$, can become too stringent for high-power transmitters, alternative relative powers are also provided in Table II.

Example 1

A land mobile transmitter, with any value of necessary bandwidth, must meet a spurious domain emission attenuation of $43 + 10 \log (P)$, or 70 dBc, whichever is less stringent. The reference bandwidths used for specifying spurious domain emission levels are provided in § 8 to 10 of this Appendix. Applying this in the frequency range between 30 MHz and 1 GHz gives a reference bandwidth of 100 kHz.

With a measured total mean power of 10 W:

- Attenuation relative to total mean power = $43 + 10 \log (10) = 53$ dBc.
- The 53 dBc value is less stringent than the 70 dBc, so the 53 dBc value is used.
- Therefore: Spurious domain emissions must not exceed 53 dBc in a 100 kHz bandwidth, or converting to an absolute level, they must not exceed $10 \text{ dBW} - 53 \text{ dBc} = -43 \text{ dBW}$ in a 100 kHz reference bandwidth.

With a measured total mean power of 1 000 W:

- Attenuation relative to total mean power = $43 + 10 \log (1\,000) = 73$ dBc.
- The 73 dBc value is more stringent than the 70 dBc limit, so the 70 dBc value is used.
- Therefore: Spurious domain emissions must not exceed 70 dBc in a 100 kHz bandwidth, or converting to an absolute level, they must not exceed $30 \text{ dBW} - 70 \text{ dBc} = -40 \text{ dBW}$ in a 100 kHz reference bandwidth. (WRC-03)

Example 2

A space service transmitter with any value of necessary bandwidth must meet a spurious domain emission attenuation of $43 + 10 \log (P)$, or 60 dBc, whichever is less stringent. To measure spurious domain emissions at any frequency, Note 10 to Table II indicates using a reference bandwidth of 4 kHz.

With a measured total mean power of 20 W:

- Attenuation relative to total mean power = $43 + 10 \log (20) = 56$ dBc.
- The 56 dBc value is less stringent than the 60 dBc limit, so the 56 dBc value is used.
- Therefore: Spurious domain emissions must not exceed 56 dBc in a 4 kHz reference bandwidth, or converting to an absolute level, they must not exceed $13 \text{ dBW} - 56 \text{ dBc} = -43 \text{ dBW}$ in a 4 kHz reference bandwidth. (WRC-03)

MOD

TABLE II (WRC-03)

**Attenuation values used to calculate maximum permitted
spurious domain emission power levels for
use with radio equipment**

Service category in accordance with Article 1, or equipment type ¹⁵	Attenuation (dB) below the power supplied to the antenna transmission line
All services except those services quoted below:	$43 + 10 \log (P)$, or 70 dBc, whichever is less stringent
Space services (earth stations) ^{10, 16}	$43 + 10 \log (P)$, or 60 dBc, whichever is less stringent
Space services (space stations) ^{10, 17}	$43 + 10 \log (P)$, or 60 dBc, whichever is less stringent
Radiodetermination ¹⁴	$43 + 10 \log (PEP)$, or 60 dB, whichever is less stringent
Broadcast television ¹¹	$46 + 10 \log (P)$, or 60 dBc, whichever is less stringent, without exceeding the absolute mean power level of 1 mW for VHF stations or 12 mW for UHF stations. However, greater attenuation may be necessary on a case by case basis
Broadcast FM	$46 + 10 \log (P)$, or 70 dBc, whichever is less stringent; the absolute mean power level of 1 mW should not be exceeded
Broadcasting at MF/HF	50 dBc; the absolute mean power level of 50 mW should not be exceeded
SSB from mobile stations ¹²	43 dB below PEP
Amateur services operating below 30 MHz (including those using SSB) ¹⁶	$43 + 10 \log (PEP)$, or 50 dB, whichever is less stringent
Services operating below 30 MHz, except space, radiodetermination, broadcast, those using SSB from mobile stations, and amateur ¹²	$43 + 10 \log (X)$, or 60 dBc, whichever is less stringent, where $X = PEP$ for SSB modulation, and $X = P$ for other modulation
Low-power device radio equipment ¹³	$56 + 10 \log (P)$, or 40 dBc, whichever is less stringent
Emergency transmitters ¹⁸	No limit

P : mean power in watts supplied to the antenna transmission line, in accordance with No. 1.158. When burst transmission is used, the mean power P and the mean power of any spurious domain emissions are measured using power averaging over the burst duration.

PEP : peak envelope power in watts supplied to the antenna transmission line, in accordance with No. 1.157.

dBc: decibels relative to the unmodulated carrier power of the emission. In the cases which do not have a carrier, for example in some digital modulation schemes where the carrier is not accessible for measurement, the reference level equivalent to dBc is decibels relative to the mean power P .

TABLE II (*end*)

- 10 Spurious domain emission limits for all space services are stated in a 4 kHz reference bandwidth.
- 11 For analogue television transmissions, the mean power level is defined with a specified video signal modulation. This video signal has to be chosen in such a way that the maximum mean power level (e.g. at the video signal blanking level for negatively modulated television systems) is supplied to the antenna transmission line.
- 12 All classes of emission using SSB are included in the category “SSB”.
- 13 Low-power radio devices having a maximum output power of less than 100 mW and intended for short-range communication or control purposes; such equipment is in general exempt from individual licensing.
- 14 For radiodetermination systems (radar as defined by No. **1.100**), spurious domain emission attenuation (dB) shall be determined for radiated emission levels, and not at the antenna transmission line. The measurement methods for determining the radiated spurious domain emission levels from radar systems should be guided by the most recent version of Recommendation ITU-R M.1177. (WRC-03)
- 15 In some cases of digital modulation (including digital broadcasting), broadband systems, pulsed modulation and narrow-band high-power transmitters for all categories of services, there may be difficulties in meeting limits close to $\pm 250\%$ of the necessary bandwidth.
- 16 Earth stations in the amateur-satellite service operating below 30 MHz are in the service category “Amateur services operating below 30 MHz (including those using SSB)”. (WRC-2000)
- 17 Space stations in the space research service intended for operation in deep space as defined by No. **1.177** are exempt from spurious domain emission limits. (WRC-03)
- 18 Emergency position-indicating radio beacon, emergency locator transmitters, personal location beacons, search and rescue transponders, ship emergency, lifeboat and survival craft transmitters and emergency land, aeronautical or maritime transmitters. (WRC-2000)

ADD

ANNEX 1

Determination of the boundary between the out-of-band and spurious domains (WRC-03)

1 Except as provided below, the boundary between the out-of-band and spurious domains occurs at frequencies that are separated from the centre frequency of the emission by the values shown in Table 1. In general, the boundary, on either side of the centre frequency, occurs at a separation of 250% of the necessary bandwidth, or at $2.5 B_N$, as shown in Table 1. For most systems, the centre frequency of the emission is the centre of the necessary bandwidth. For multichannel or multicarrier transmitters/transponders, where several carriers may be transmitted simultaneously from a final output amplifier or an active antenna, the centre frequency of the emission is taken to be the centre of the -3 dB bandwidth of the transmitter or transponder, and the transmitter or transponder bandwidth is used in place of the necessary bandwidth for determining the boundary. For multicarrier satellite systems, guidance on the boundary between

the out-of-band and spurious domains is provided in the most recent version of Recommendation ITU-R SM.1541. Some systems specify unwanted emissions relative to channel bandwidth, or channel spacing. These may be used as a substitute for the necessary bandwidth in Table 1, provided they are found in ITU-R Recommendations.

TABLE 1
Values for frequency separation between the centre frequency
and the boundary of the spurious domain

Frequency range	Narrow-band case		Normal separation	Wideband case	
	for $B_N <$	Separation		for $B_N >$	Separation
9 kHz $< f_c \leq$ 150 kHz	250 Hz	625 Hz	$2.5 B_N$	10 kHz	$1.5 B_N + 10$ kHz
150 kHz $< f_c \leq$ 30 MHz	4 kHz	10 kHz	$2.5 B_N$	100 kHz	$1.5 B_N + 100$ kHz
30 MHz $< f_c \leq$ 1 GHz	25 kHz	62.5 kHz	$2.5 B_N$	10 MHz	$1.5 B_N + 10$ MHz
1 GHz $< f_c \leq$ 3 GHz	100 kHz	250 kHz	$2.5 B_N$	50 MHz	$1.5 B_N + 50$ MHz
3 GHz $< f_c \leq$ 10 GHz	100 kHz	250 kHz	$2.5 B_N$	100 MHz	$1.5 B_N + 100$ MHz
10 GHz $< f_c \leq$ 15 GHz	300 kHz	750 kHz	$2.5 B_N$	250 MHz	$1.5 B_N + 250$ MHz
15 GHz $< f_c \leq$ 26 GHz	500 kHz	1.25 MHz	$2.5 B_N$	500 MHz	$1.5 B_N + 500$ MHz
$f_c > 26$ GHz	1 MHz	2.5 MHz	$2.5 B_N$	500 MHz	$1.5 B_N + 500$ MHz

NOTE – In Table 1, f_c is the centre frequency of the emission and B_N is the necessary bandwidth. If the assigned frequency band of the emissions extends across two frequency ranges, then the values corresponding to the higher frequency range shall be used for determining the boundary.

Example 1: The necessary bandwidth of an emission at 26 MHz is 1.8 kHz. Since B_N is less than 4 kHz, the minimum separation of 10 kHz applies. The spurious domain begins 10 kHz each side of the centre of the necessary bandwidth.

Example 2: The necessary bandwidth of an emission at 8 GHz is 200 MHz. Since the wideband case applies for $B_N > 100$ MHz at that frequency, the spurious domain begins 1.5×200 MHz + 100 MHz = 400 MHz each side of the centre of the necessary bandwidth. Using the general separation formula, the out-of-band domain would have extended to 2.5×200 MHz = 500 MHz either side of the centre frequency.

2 Tables 2 and 3 show exceptions to Table 1 for narrow-band and wideband cases, respectively, applicable to particular systems or services and frequency bands.

TABLE 2

Narrow-band variations for particular systems or services and frequency bands

System or service	Frequency range		Narrow-band case	
			for $B_N <$ (kHz)	Separation (kHz)
Fixed service	14 kHz-1.5 MHz		20	50 ⁽¹⁾
	1.5-30 MHz	$P_T \leq 50$ W	30	75 ⁽²⁾
		$P_T > 50$ W	80	200 ⁽²⁾

⁽¹⁾ The separation value is based on an assumption that the maximum value of the necessary bandwidth is about 3 kHz for the frequency range 14 kHz-1.5 MHz. The separation value of 50 kHz is extremely large as compared with the necessary bandwidth. This is because unwanted emissions of high power transmitters under modulated conditions have to be below the spurious limit (70 dBc) at the boundary between the out-of-band and spurious domains.

⁽²⁾ P_T is the transmitter power. The separation values are based on an assumption that the maximum value of the necessary bandwidth is about 12 kHz for the frequency range 1.5-30 MHz. The separation value of 200 kHz for $P_T > 50$ W is extremely large as compared with the necessary bandwidth. This is because unwanted emissions of high power transmitters under modulated conditions have to be below the spurious limit, 70 dBc, at the boundary between the out-of-band and spurious domains. Also, if future systems in the fixed service operating in this frequency range require a necessary bandwidth larger than 12 kHz, it may become necessary to review the 200 kHz separation.

TABLE 3

Wideband variations for particular systems or services and frequency bands

System or service	Frequency range	Wideband case	
		For $B_N >$	Separation
Fixed service	14-150 kHz	20 kHz	$1.5 B_N + 20$ kHz
Fixed-satellite service (FSS)	3.4-4.2 GHz	250 MHz	$1.5 B_N + 250$ MHz
FSS	5.725-6.725 GHz	500 MHz	$1.5 B_N + 500$ MHz
FSS	7.25-7.75 GHz and 7.9-8.4 GHz	250 MHz	$1.5 B_N + 250$ MHz
FSS	10.7-12.75 GHz	500 MHz	$1.5 B_N + 500$ MHz
Broadcasting-satellite service	11.7-12.75 GHz	500 MHz	$1.5 B_N + 500$ MHz
FSS	12.75-13.25 GHz	500 MHz	$1.5 B_N + 500$ MHz
FSS	13.75-14.8 GHz	500 MHz	$1.5 B_N + 500$ MHz

3 For primary radar, the boundary between the out-of-band and spurious domains is the frequency at which the out-of-band domain limits specified in the applicable ITU-R Recommendations are equal to the spurious domain limit defined in Table II of this Appendix. Further guidance on the boundary between the out-of-band and spurious domains for primary radar is provided in the most recent version of Recommendation ITU-R SM.1541.

APPENDIX 4 (Rev.WRC-03)

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

SUP

ANNEX 2A

**Characteristics of satellite networks' earth stations
or radio astronomy stations²** (WRC-2000)

MOD

ANNEX 2

**Characteristics of satellite networks, earth stations
or radio astronomy stations²** (WRC-03)

Information relating to the data listed in the following Tables

In many cases the data requirements involve the use of standard symbols in submissions to the Radiocommunication Bureau. These standard symbols may be found in the "Preface to the BR International Frequency Information Circular", (BR IFIC) (Space Services) and the Space Radiocommunication Stations on CD-ROM. (In the Table, this is referred to simply as "the Preface".) Information relating to the provision of data may also be found in ITU-R Recommendations, for example, information on the mask data can be found in Recommendation ITU-R S.1503 and Recommendation ITU-R SM.1413 provides general information related to submission of data.

Key to the symbols used in Tables A, B, C and D

X	Mandatory information
+	Mandatory under the conditions specified in column 2
O	Optional information
C	Mandatory if used as a basis to effect coordination with another administration

Reading the Appendix 4 Tables

The rules used to link the sign with the text are based on the Table column headings covering specific procedures and specific services.

- 1 If any data item has a condition attached to it, then it has a “+”.

A.6.c	if agreement has been reached, the related provision code (see the Preface)	+
-------	---	---

- 2 Data items grouped under a common subheading that limits the range of procedures, services or frequency bands have a “X” as the conditional nature is shown in the subheading title.

A.4.b.5	For space stations operating in a frequency band subject to the provisions of Nos. 9.11A, 9.12 or 9.12A, the data elements to characterize properly the orbital statistics of non-geostationary-satellite systems:	
A.4.b.5.a	the right ascension of the ascending node (Ω_j) for the j-th orbital plane, measured counter-clockwise in the equatorial plane from the direction of the vernal equinox to the point where the satellite makes its South-to-North crossing of the equatorial plane ($0^\circ \leq \Omega_j < 360^\circ$)	X

Footnotes to Tables A, B, C and D

- 1 Not required for coordination under No. 9.7A.

2 The most recent version of Recommendation ITU-R SF.675 should be used to the extent applicable in calculating the maximum power density per Hz. 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. In the case of assignments with a bandwidth less than the stated averaging bandwidth, the maximum density is calculated as if the assignment occupied the averaging bandwidth.

Table of characteristics to be submitted for space and radio astronomy services
(WRC-03)

Items in Appendix	A – GENERAL CHARACTERISTICS OF THE SATELLITE NETWORK, EARTH STATION OR RADIO ASTRONOMY STATION
A.1	IDENTITY OF THE SATELLITE NETWORK, EARTH STATION OR RADIOASTRONOMY STATION
A.1.a	the identity of the satellite network
A.1.b	the beam identification In the case of Appendix 30 or 30A, for modification, suppression or notification of Plan assignments In the case of Appendix 30B, for a network derived from the Allotment Plan
A.1.e	Identity of the earth station or radio astronomy station:
A.1.e.1	the type of earth station (specific or typical)
A.1.e.2	the name of the station
A.1.e.3	For a specific earth station or radio astronomy station:
A.1.e.3.a	the country or geographical area in which the station is located, using the symbols from the Preface
A.1.e.3.b	the geographical coordinates of each transmitting or receiving antenna site constituting the station (longitude and latitude in degrees and minutes) For a specific earth station, seconds are to be provided if the coordination area of the earth station overlaps the territory of another administration
A.1.f	Administration and intergovernmental organization symbol:
A.1.f.1	the symbol of the notifying administration (see the Preface)
A.1.f.2	if the notice is submitted on behalf of a group of administrations, the symbols of each of the administrations in the group, submitting the information on the satellite network (see the Preface)
A.1.f.3	if the notice is submitted on behalf of an intergovernmental satellite organization, the symbol of that organization (see the Preface)
A.1.g	Subregional systems:
A.1.g.1	an indicator showing whether the network is part of a subregional system
A.1.g.2	for each participating administration, if applicable, the part of its national allotment proposed to be used to form the subregional system

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)	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
									A.1	
X	X	X	X	X		X	X	X	A.1.a	
						+	+	+	A.1.b	
									A.1.e	
					X				A.1.e.1	
					X				A.1.e.2	X
									A.1.e.3	
					X				A.1.e.3.a	X
					X				A.1.e.3.b	X
									A.1.f	
X	X	X	X	X	X	X	X	X	A.1.f.1	X
+	+	+	+	+		+	+	+	A.1.f.2	
+	+	+	+	+		+	+	+	A.1.f.3	
									A.1.g	
								X	A.1.g.1	
								+	A.1.g.2	

Items in Appendix	<p align="center">A – GENERAL CHARACTERISTICS OF THE SATELLITE NETWORK, EARTH STATION OR RADIO ASTRONOMY STATION</p>
A.2	DATE OF BRINGING INTO USE
A.2.a	<p>the date (actual or foreseen, as appropriate) of bringing the frequency assignment (new or modified) into use</p> <p>The date of bringing into use denotes the date at which the frequency assignment is brought into regular operation* to provide the published radiocommunication service with the technical parameters within the technical characteristics notified to the Bureau</p> <p>Whenever the assignment is changed in any of its basic characteristics (except in the case of a change under A.1.a, the date to be given shall be that of the latest change (actual or foreseen, as appropriate)</p> <p>* Pending further studies by ITU-R on the applicability of the term "regular operation" to non-geostationary satellite networks, the condition of regular operation shall be limited to geostationary satellite networks</p>
A.2.b	for a space station, the period of validity of the frequency assignments (see Resolution 4 (Rev. WRC-03))
A.2.c	the date (actual or foreseen, as appropriate) on which reception of the frequency band begins or on which any of the basic characteristics are modified
A.3	OPERATING ADMINISTRATION OR AGENCY
A.3.a	<p>the symbol for the operating administration or agency (see the Preface) that is in operational control of the space station, earth station or radio astronomy station</p> <p>In the case of Appendix 30B, required only for notification under Article 8</p>
A.3.b	<p>the symbol for the address of the administration (see the Preface) to which communication should be sent on urgent matters regarding interference, quality of emissions and questions referring to the technical operation of the network or station (see Article 15)</p> <p>In the case of Appendix 30B, required only for notification under Article 8</p>
A.4	ORBITAL INFORMATION
A.4.a	For a space station onboard a geostationary-satellite:
A.4.a.1	the nominal geographical longitude on the geostationary-satellite orbit (GSO)
A.4.a.2.a	the planned longitudinal tolerance easterly limit
A.4.a.2.b	the planned longitudinal tolerance westerly limit
A.4.a.2.c	the planned inclination excursion

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)	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
									A.2	
									A.2.a	
X	X	X	X	X	X	X	X	X		
X	X	X	X	X					A.2.b	
									A.2.c	X
									A.3	
		X	X	X	X	X	X	+	A.3.a	X
		X	X	X	X	X	X	+	A.3.b	X
									A.4	
X			X			X	X	X	A.4.a	
			X			X	X	X	A.4.a.1	
			X			X	X	X	A.4.a.2.a	
			X			X	X	X	A.4.a.2.b	
			X					X	A.4.a.2.c	

Items in Appendix	A – GENERAL CHARACTERISTICS OF THE SATELLITE NETWORK, EARTH STATION OR RADIO ASTRONOMY STATION
A.4.a.4	For a space station on board a geostationary-satellite, not derived from the Appendix 30B allotment plan:
A.4.a.4.a	the service arc easterly limit (the arc of the geostationary-satellite orbit within which the space station could provide the required service to its associated earth stations or service areas)
A.4.a.4.b	the service arc westerly limit (the arc of the geostationary-satellite orbit within which the space station could provide the required service to its associated earth stations or service areas)
A.4.b	For space station(s) onboard non-geostationary satellite(s):
A.4.b.1	the number of orbital planes
A.4.b.2	the reference body code
A.4.b.3	For space stations of a non-geostationary fixed-satellite service system operating in the band 3 400–4 200 MHz:
A.4.b.3.a	the maximum number of space stations (N_N) in a non-geostationary-satellite system simultaneously transmitting on a co-frequency basis in the fixed-satellite service in the Northern Hemisphere
A.4.b.3.b	the maximum number of space stations (N_S) in a non-geostationary-satellite system simultaneously transmitting on a co-frequency basis in the fixed-satellite service in the Southern Hemisphere
A.4.b.4	For each orbital plane, where the Earth is the reference body:
A.4.b.4.a	the angle of inclination (i_j) of the orbital plane with respect to the Earth's equatorial plane ($0^\circ \leq i_j < 180^\circ$)
A.4.b.4.b	the number of satellites in the orbital plane
A.4.b.4.c	the period
A.4.b.4.d	the altitude, in kilometres, of the apogee of the space station
A.4.b.4.e	the altitude, in kilometres, of the perigee of the space station
A.4.b.5	For space stations operating in a frequency band subject to the provisions of Nos. 9.11A, 9.12 or 9.12A, the data elements to characterize properly the orbital statistics of the non-geostationary-satellite system:
A.4.b.5.a	the right ascension of the ascending node (Ω_j) for the j -th orbital plane, measured counter-clockwise in the equatorial plane from the direction of the vernal equinox to the point where the satellite makes its South-to-North crossing of the equatorial plane ($0^\circ \leq \Omega_j < 360^\circ$)
A.4.b.5.b	the initial phase angle (ω_i) of the i -th satellite in its orbital plane at reference time $t = 0$, measured from the point of the ascending node ($0^\circ \leq \omega_i < 360^\circ$)
A.4.b.5.c	the argument of perigee (ω_p), measured in the orbital plane, in the direction of motion, from the ascending node to the perigee ($0^\circ \leq \omega_p < 360^\circ$)

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)	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
									A.4.a.4	
								X	A.4.a.4.a	
								X	A.4.a.4.b	
									A.4.b	
	X	X		X					A.4.b.1	
				X					A.4.b.2	
									A.4.b.3	
		X		X					A.4.b.3.a	
		X		X					A.4.b.3.b	
									A.4.b.4	
		X		X					A.4.b.4.a	
		X		X					A.4.b.4.b	
		X		X					A.4.b.4.c	
		X		X					A.4.b.4.d	
		X		X					A.4.b.4.e	
									A.4.b.5	
				X					A.4.b.5.a	
				X					A.4.b.5.b	
				X					A.4.b.5.c	

Items in Appendix	<p align="center">A – GENERAL CHARACTERISTICS OF THE SATELLITE NETWORK, EARTH STATION OR RADIO ASTRONOMY STATION</p>
A.4.b.6	For space stations operating in a frequency band subject to Nos. 22.5C, 22.5D or 22.5F, the data elements to characterize properly the orbital operation of the non-geostationary-satellite system:
A.4.b.6.a	For each range of latitudes:
A.4.b.6.a.1	the maximum number of non-geostationary satellites transmitting with overlapping frequencies to a given location
A.4.b.6.a.2	the associated start of the latitude range
A.4.b.6.a.3	the associated end of the latitude range
A.4.b.6.b	the minimum altitude of the space station above the surface of the Earth at which any satellite transmits
A.4.b.6.c	an indicator showing whether the space station uses station-keeping to maintain a repeating ground track
A.4.b.6.d	if the space station uses station-keeping to maintain a repeating ground track, the time in seconds that it takes for the constellation to return to its starting position, i.e. such that all satellites are in the same location with respect to the Earth and each other
A.4.b.6.e	an indicator showing whether the space station should be modelled with a specific precession rate of the ascending node of the orbit instead of the J_2 term
A.4.b.6.f	if the space station is to be modelled with a specific precession rate of the ascending node of the orbit instead of the J_2 term, the precession rate in degrees/day, measured counter-clockwise in the equatorial plane
A.4.b.6.g	<p>the longitude of the ascending node (θ_j) for the j-th orbital plane, measured counter-clockwise in the equatorial plane from the Greenwich meridian to the point where the satellite orbit makes its South-to-North crossing of the equatorial plane ($0^\circ \leq \theta_j < 360^\circ$)</p> <p><i>Note</i> – For the evaluation of epfd a reference to a point on the Earth is used and hence the “longitude of the ascending node” is required. All satellites in the constellation must use the same reference time</p>
A.4.b.6.h	the date (day:month:year) at which the satellite is at the location defined by the longitude of the ascending node (θ_j), (see Note under A.4.b.6.g)
A.4.b.6.i	the time (hours:minutes) at which the satellite is at the location defined by the longitude of the ascending node (θ_j), (see Note under A.4.b.6.g)
A.4.b.6.j	the longitudinal tolerance of the longitude of the ascending node

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)	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
									A.4.b.6	
									A.4.b.6.a	
				X					A.4.b.6.a.1	
				X					A.4.b.6.a.2	
				X					A.4.b.6.a.3	
				X					A.4.b.6.b	
				X					A.4.b.6.c	
				+					A.4.b.6.d	
				X					A.4.b.6.e	
				+					A.4.b.6.f	
				X					A.4.b.6.g	
				X					A.4.b.6.h	
				X					A.4.b.6.i	
				X					A.4.b.6.j	

Items in Appendix	A – GENERAL CHARACTERISTICS OF THE SATELLITE NETWORK, EARTH STATION OR RADIO ASTRONOMY STATION
A.4.b.7	For space stations operating in a frequency band subject to Nos. 22.5C, 22.5D or 22.5F, the data elements to characterize properly the performance of the non-geostationary-satellite system:
A.4.b.7.a	the maximum number of non-geostationary satellites receiving simultaneously with overlapping frequencies from the associated earth stations within a given cell
A.4.b.7.b	the average number of associated earth stations with overlapping frequencies per square kilometre within a cell
A.4.b.7.c	the average distance, in kilometres, between co-frequency cells
A.4.b.7.d	For the exclusion zone about the geostationary-satellite orbit:
A.4.b.7.d.1	the type of zone (based on topocentric angle, satellite-based angle or other method for establishing the exclusion zone)
A.4.b.7.d.2	if the zone is based on a topocentric angle or a satellite-based angle, the width of the zone, in degrees
A.4.b.7.d.3	if an alternative method is used for establishing the exclusion zone, a detailed description of the avoidance mechanism
A.4.c	For an earth station:
A.4.c.1	the identity of the associated space station(s) with which communication is to be established
A.4.c.2	if communication is to be established with a geostationary space station, its orbital position
A.5	COORDINATIONS
A.5.a.1	the symbol of any administration (see the Preface) with which coordination has been successfully effected Required only in the case of notification
A.5.a.2	the symbol of any intergovernmental organization (see the Preface) with which coordination has been successfully effected Required only in the case of notification
A.5.b.1	the symbol of any administration (see the Preface) with which coordination has been sought but not completed
A.5.b.2	the symbol of any intergovernmental organization (see the Preface) with which coordination has been sought but not completed
A.5.c	the related provision code (see the Preface) under which coordination has been sought or completed if either A.5.a.1 (and A.5.a.2) or A.5.b.1 (and A.5.b.2) has been supplied

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)	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
									A.4.b.7	
				X					A.4.b.7.a	
				X					A.4.b.7.b	
				X					A.4.b.7.c	
									A.4.b.7.d	
				X					A.4.b.7.d.1	
				+					A.4.b.7.d.2	
				+					A.4.b.7.d.3	
									A.4.c	
					X				A.4.c.1	
					+				A.4.c.2	
									A.5	
			+	+	+ ¹				A.5.a.1	
			+	+	+ ¹				A.5.a.2	
			O	O	O				A.5.b.1	
			O	O					A.5.b.2	
			+	+	+ ¹				A.5.c	

Items in Appendix	<p align="center">A – GENERAL CHARACTERISTICS OF THE SATELLITE NETWORK, EARTH STATION OR RADIO ASTRONOMY STATION</p>
A.6	AGREEMENTS
A.6.a	if appropriate, the symbol of any administration or administration representing a group of administrations (see the Preface) with which agreement has been reached, including where the agreement is to exceed the limits prescribed in these Regulations
A.6.b	if appropriate, the symbol of any intergovernmental organization (see the Preface) with which agreement has been reached, including where the agreement is to exceed the limits prescribed in these Regulations
A.6.c	if agreement has been reached, the related provision code (see the Preface)
A.7	SPECIFIC EARTH STATION OR RADIO ASTRONOMY STATION SITE CHARACTERISTICS
A.7.a.1	the horizon elevation angle, in degrees, for each azimuth around the earth station
A.7.a.2	the distance, in kilometres, from the earth station to the horizon for each azimuth around the earth station
A.7.b.1	<p>the planned minimum angle of elevation of the antenna's main beam axis, in degrees, from the horizontal plane</p> <p>For an earth station the minimum elevation angle is only required for operation to geostationary satellites and should have due regard to possible inclined-orbit operation of the associated geostationary space station</p>
A.7.b.2	the planned maximum angle of elevation of the antenna's main beam axis, in degrees, from the horizontal plane
A.7.c.1	<p>the start azimuth for the planned range of operating azimuthal angles for the antenna's main beam axis, in degrees, clockwise from True North</p> <p>For an earth station the start azimuth is only required for operation to geostationary satellites and should have due regard to possible inclined-orbit operation of the associated geostationary space station</p>
A.7.c.2	<p>the end azimuth for the planned range of operating azimuthal angles for the antenna's main beam axis, in degrees, clockwise from True North</p> <p>For an earth station the end azimuth is only required for operation to geostationary satellites and should have due regard to possible inclined-orbit operation of the associated geostationary space station</p>
A.7.d	the altitude, in metres, of the antenna above mean sea level
A.7.e	the minimum angle of elevation of the antenna's main beam axis, in degrees, from the horizontal plane for each azimuth around the earth station that is operating to associated non-geostationary space stations
A.7.f	<p>the antenna diameter, in metres</p> <p>Required only for fixed-satellite service earth stations operating in the frequency band 13.75-14 GHz</p>

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)	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
			+	+	+ ¹	+	+	+	A.6	
									A.6.a	
			+	+	+ ¹	+	+	+	A.6.b	
			+	+	+ ¹	+	+	+	A.6.c	
									A.7	
					+ ¹				A.7.a.1	
					O				A.7.a.2	
					+ ¹				A.7.b.1	X
									A.7.b.2	X
					+ ¹				A.7.c.1	X
					+ ¹				A.7.c.2	X
					+ ¹				A.7.d	
					+				A.7.e	
					+ ¹				A.7.f	

Items in Appendix	A – GENERAL CHARACTERISTICS OF THE SATELLITE NETWORK, EARTH STATION OR RADIO ASTRONOMY STATION
A.8	Not used
A.9	Not used
A.10	EARTH STATION COORDINATION AREA DIAGRAMS
A.10.a	<p>the diagrams shall be drawn to an appropriate scale, indicating, for both transmission and reception, the location of the earth station and its associated coordination areas, or the coordination area related to the service area in which it is intended to operate the mobile earth station</p> <p>Earth station coordination area diagrams are required only for notification</p>
A.11	REGULAR HOURS OF OPERATION
A.11.a	the start time UTC
A.11.b	the stop time UTC
A.12	RANGE OF AUTOMATIC GAIN CONTROL, in dB
A.13	REFERENCES TO THE PUBLISHED SPECIAL SECTIONS OF THE BUREAU'S INTERNATIONAL FREQUENCY INFORMATION CIRCULAR (see the Preface)
A.13.a	the reference and number of the advance publication information in accordance with No. 9.1
A.13.b	<p>the reference and number of the coordination request in accordance with No. 9.6</p> <p>In the case of notification of an earth station, the reference to the Special Section of the associated satellite network has to be provided</p> <p>In the case of notification of an earth station coordinated under No. 9.7A, the coordination Special Section number of this earth station has to be provided</p>
A.13.c	the reference and number of the information in accordance with Article 4 of Appendix 30
A.13.d	the reference and number of the information in accordance with Article 4 of Appendix 30A
A.13.e	the reference and number of the information in accordance with Article 6 of Appendix 30B

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)	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
									A.8	
									A.9	
									A.10	
									A.10.a	
					+					
									A.11	
						X	X		A.11.a	
						X	X		A.11.b	
							X		A.12	
									A.13	
			X	X	X				A.13.a	
			X	X	X				A.13.b	
						X			A.13.c	
							X		A.13.d	
					X			X	A.13.e	

Items in Appendix	<p align="center">A – GENERAL CHARACTERISTICS OF THE SATELLITE NETWORK, EARTH STATION OR RADIO ASTRONOMY STATION</p>
A.14	FOR STATIONS OPERATING IN A FREQUENCY BAND SUBJECT TO Nos. 22.5C, 22.5D OR 22.5F: SPECTRUM MASKS
A.14.a	For each e.i.r.p. mask used by the non-geostationary space station:
A.14.a.1	the mask identification code
A.14.a.2	the lowest frequency for which the mask is valid
A.14.a.3	the highest frequency for which the mask is valid
A.14.a.4	the mask pattern defined in terms of the power in the reference bandwidth for a series of off-axis angles with respect to a specified reference point
A.14.b	For each associated earth station e.i.r.p. mask:
A.14.b.1	the mask identification code
A.14.b.2	the lowest frequency for which the mask is valid
A.14.b.3	the highest frequency for which the mask is valid
A.14.b.4	the minimum elevation angle at which any associated earth station can transmit to a non-geostationary satellite
A.14.b.5	the minimum separation angle between the geostationary-satellite orbit arc and the associated earth station main beam-axis at which the associated earth station can transmit towards a non-geostationary satellite
A.14.b.6	the mask pattern defined in terms of the power in the reference bandwidth for a series of off-axis angles with respect to a specified reference point
A.14.c	For each pfd mask used by the non-geostationary space station:
	<i>Note</i> – The space station pfd mask is defined by the maximum power flux-density generated by any space station in the interfering non-geostationary-satellite system as seen from any point on the surface of the Earth
A.14.c.1	the mask identification code
A.14.c.2	the lowest frequency for which the mask is valid
A.14.c.3	the highest frequency for which the mask is valid
A.14.c.4	the type of mask
A.14.c.5	the mask pattern of the power flux-density defined in three dimensions
A.15	COMMITMENT REGARDING COMPLIANCE WITH ADDITIONAL OPERATIONAL EQUIVALENT POWER FLUX DENSITY, epfd_{\downarrow}, LIMITS
A.15.a	<p>a commitment that the filed for system will meet the additional operational epfd_{\downarrow} limits that are specified in Table 22-4A1 under No. 22.5I</p> <p>Required only for non-geostationary-satellite systems operating in the fixed-satellite service in the bands 10.7-11.7 GHz (in all Regions), 11.7-12.2 GHz (Region 2), 12.2-12.5 GHz (Region 3), and 12.5-12.75 GHz (Regions 1 and 3)</p>

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)	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
									A.14	
									A.14.a	
				X					A.14.a.1	
				X					A.14.a.2	
				X					A.14.a.3	
				X					A.14.a.4	
									A.14.b	
				X					A.14.b.1	
				X					A.14.b.2	
				X					A.14.b.3	
				X					A.14.b.4	
				X					A.14.b.5	
				X					A.14.b.6	
									A.14.c	
				X					A.14.c.1	
				X					A.14.c.2	
				X					A.14.c.3	
				X					A.14.c.4	
				X					A.14.c.5	
									A.15	
				+					A.15.a	

Items in Appendix	<p align="center">A – GENERAL CHARACTERISTICS OF THE SATELLITE NETWORK, EARTH STATION OR RADIO ASTRONOMY STATION</p>
A.16	COMMITMENT REGARDING COMPLIANCE WITH OFF-AXIS POWER LIMITATIONS OR POWER FLUX-DENSITY, pfd, LIMITS
A.16.a	<p>a commitment that the associated earth stations operating with a geostationary-satellite network in the fixed-satellite service meet the off-axis power limitations given in Nos. 22.26 to 22.28 or 22.32 (as appropriate) under the conditions specified in Nos. 22.30, 22.31 and 22.34 to 22.39</p> <p>Required only where the earth stations are subject to those power limitations</p>
A.16.b	<p>a commitment by administrations that the filed system will meet the single entry power flux-density limits that are specified in No. 5.502</p> <p>Required only for specific earth station antennas less than 4.5 m in diameter operating with geostationary space stations in the fixed-satellite service in the band 13.75-14 GHz</p>
A.17	COMPLIANCE WITH POWER FLUX-DENSITY, pfd, LIMITS
A.17.a	<p>a commitment of compliance with per-satellite power-flux density level produced at the Earth's surface of $-129 \text{ dB(W/(m}^2 \cdot \text{MHz))}$ in any 1 MHz band under free space propagation conditions</p> <p>Required only for satellite systems operating in the radionavigation-satellite service in the band 1 164-1 215 MHz</p>
A.17.b.1	<p>the calculated aggregate power flux-density produced at the Earth's surface by any geostationary radionavigation-satellite system in the band 4 990-5 000 MHz in a 10 MHz bandwidth, as defined in <i>resolves</i> 1 of Resolution 741 (WRC-03)</p> <p>Required only for geostationary satellite systems operating in the radionavigation-satellite service in the band 5 010-5 030 MHz</p>
A.17.b.2	<p>the calculated aggregate power flux-density produced at the Earth's surface by all space stations within any radionavigation-satellite service system in the band 5 030-5 150 MHz in a 150 kHz bandwidth, as defined in No. 5.443B</p> <p>Required only for satellite systems operating in the radionavigation-satellite service in the band 5 010-5 030 MHz</p>
A.17.b.3	<p>the equivalent power flux-density produced at the Earth's surface by all space stations within any non-geostationary radionavigation-satellite service system in the band 4 990-5 000 MHz in a 10 MHz bandwidth, as defined in <i>resolves</i> 2 of Resolution 741 (WRC-03)</p> <p>Required only for non-geostationary satellite systems operating in the radionavigation-satellite service in the band 5 010-5 030 MHz</p>

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)	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
									A.16	
			+						A.16.a	
					+				A.16.b	
									A.17	
			+	+					A.17.a	
			+						A.17.b.1	
			+	+					A.17.b.2	
				+					A.17.b.3	

Items in Appendix	<p align="center">A – GENERAL CHARACTERISTICS OF THE SATELLITE NETWORK, EARTH STATION OR RADIO ASTRONOMY STATION</p>
A.17.c	<p>the aggregate power flux-density produced at the Earth's surface in the band 15.35-15.4 GHz, as defined in No. 5.511A</p> <p>Required only for non-geostationary-satellite systems operating in the fixed-satellite service (feeder links) in the band 15.43-15.63 GHz (space-to-Earth)</p>
A.17.d	<p>the mean power flux-density produced at the Earth's surface by any spaceborne sensor, as defined in No. 5.549A</p> <p>Required only for satellite systems operating in the Earth exploration-satellite service (active) or space research service (active) in the band 35.5-36 GHz</p>
A.17.e.1	<p>the calculated equivalent power flux-density produced at the site of a radio astronomy station in the band 42.5-43.5 GHz, as defined in No. 5.551H</p> <p>Required only for non-geostationary-satellite systems operating in the fixed-satellite service and broadcasting-satellite service in the band 42-42.5 GHz</p>
A.17.e.2	<p>the calculated power flux-density produced at the site of a radio astronomy station in the band 42.5-43.5 GHz, as defined in No. 5.551I</p> <p>Required only for geostationary-satellite systems operating in the fixed-satellite service and broadcasting-satellite service in the band 42-42.5 GHz</p>
A.18	COMPLIANCE WITH NOTIFICATION OF AIRCRAFT EARTH STATION(S)
A.18.a	<p>a commitment that the characteristics of the aircraft earth station (AES) in the aeronautical mobile-satellite service are within the characteristics of the specific and/or typical earth station published by the Bureau for the space station to which the AES is associated</p> <p>Required only for the band 14-14.5 GHz, when an aircraft earth station in the aeronautical mobile-satellite service communicates with a space station in the fixed-satellite service</p>

Items in Appendix	<p align="center"><i>B – CHARACTERISTICS TO BE PROVIDED FOR EACH SATELLITE ANTENNA BEAM OR EACH EARTH STATION OR RADIO ASTRONOMY ANTENNA</i></p>
B.1	IDENTIFICATION AND DIRECTION OF THE SATELLITE ANTENNA BEAM
B.1.a	<p>the designation of the satellite antenna beam</p> <p>For an earth station, the designation of the satellite antenna beam of the associated space station</p>
B.1.b	<p>an indicator showing whether the antenna beam, under B.1.a, is fixed or whether it is steerable and / or reconfigurable</p>
B.2	TRANSMISSION / RECEPTION INDICATOR FOR THE BEAM OF THE SPACE STATION OR THE ASSOCIATED SPACE STATION
B.3	SPACE STATION ANTENNA CHARACTERISTICS
B.3.a	For each space station antenna:
B.3.a.1	<p>the maximum co-polar isotropic gain, in dBi</p> <p>Where a steerable beam (see No. 1.191) is used, if the effective boresight area (see No. 1.175) is identical with the global service area, the maximum antenna gain, in dBi, is applicable to all points on the Earth's visible surface</p>
B.3.a.2	<p>if a non-elliptical beam, the maximum cross-polar isotropic antenna gain, in dBi</p>
B.3.b	Antenna gain contours:
B.3.b.1	<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>In the case of Appendix 30, 30A or 30B, only required for non-elliptical beams</p>
B.3.b.2	<p>if a non-elliptical beam, the cross-polar gain contours shall be provided as defined under B.3.b.1</p>

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)	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
		X	X	X	X	X	X	X	B.1	
									B.1.a	
		X	X	X		X	X	X	B.1.b	
X	X	X	X	X	+ ¹			X	B.2	
									B.3	
									B.3.a	
		X	X	X		X	X	X	B.3.a.1	
						+	+		B.3.a.2	
									B.3.b	
			X			+	+	+	B.3.b.1	
						+	+		B.3.b.2	

Items in Appendix	<p align="center">B – CHARACTERISTICS TO BE PROVIDED FOR EACH SATELLITE ANTENNA BEAM OR EACH EARTH STATION OR RADIO ASTRONOMY ANTENNA</p>
B.3.c	Antenna radiation patterns:
B.3.c.1	the co-polar antenna radiation pattern, in the case of: <ul style="list-style-type: none"> – non-geostationary space stations – geostationary or non-geostationary space stations where the antenna radiation beam is directed towards another satellite – elliptical antenna beams for Appendix 30, 30A or 30B
B.3.c.2	if an elliptical beam, the cross-polar antenna radiation pattern
B.3.d	the pointing accuracy of the antenna In the case of Appendix 30, 30A or 30B, required only for elliptical beams
B.3.e	if the space station is operating in a band allocated in the Earth-to-space direction and in the space-to-Earth direction, the gain of the antenna in the direction of those parts of the geostationary-satellite orbit which are not obstructed by the Earth
B.3.f	For a space station submitted in accordance with Appendix 30, 30A or 30B:
B.3.f.1	the boresight or aim point of the antenna beam (longitude and latitude)
B.3.f.2	For each elliptical beam:
B.3.f.2.a	the rotational accuracy, in degrees
B.3.f.2.b	the major axis orientation, in degrees, anticlockwise from the Equator
B.3.f.2.c	the major axis, in degrees, at the half-power beamwidth
B.3.f.2.d	the minor axis, in degrees, at the half-power beamwidth
B.4	ADDITIONAL CHARACTERISTICS FOR NON-GEOSTATIONARY SPACE STATION ANTENNA
B.4.a.1	the reference number of each orbital plane in which the space station antenna characteristics are used
B.4.a.2	if the antenna characteristics of a space station are not common to every satellite in the specified orbital plane, the reference number of each satellite in the specified orbital plane, on which the space station antenna characteristics are used
B.4.b	For a space station submitted in accordance with Nos. 9.11A, 9.12 or 9.12A:
B.4.b.1	For the orientation angles of the satellite transmitting and receiving antenna beams:
B.4.b.1.a	the orientation angle alpha, in degrees, (see most recent version of Recommendation ITU-R SM.1413)
B.4.b.1.b	the orientation angle beta, in degrees, (see most recent version of Recommendation ITU-R SM.1413)
B.4.b.2	the satellite antenna gain $G(\theta_e)$ as a function of elevation angle (θ_e) at a fixed point on the Earth
B.4.b.3	the spreading loss as a function of elevation angle (to be determined by equations or provided in graphical format)

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)	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
		X	+	X		+	+	+	B.3.c	
									B.3.c.1	
						+	+		B.3.c.2	
			X			+	+	+	B.3.d	
			+				+		B.3.e	
									B.3.f	
						X	X	X	B.3.f.1	
									B.3.f.2	
						X	X	X	B.3.f.2.a	
						X	X	X	B.3.f.2.b	
						X	X	X	B.3.f.2.c	
						X	X	X	B.3.f.2.d	
									B.4	
		X		X					B.4.a.1	
		+		+					B.4.a.2	
									B.4.b	
									B.4.b.1	
				X					B.4.b.1.a	
				X					B.4.b.1.b	
				X					B.4.b.2	
				X					B.4.b.3	

<p>Items in Appendix</p>	<p><i>B – CHARACTERISTICS TO BE PROVIDED FOR EACH SATELLITE ANTENNA BEAM OR EACH EARTH STATION OR RADIO ASTRONOMY ANTENNA</i></p>
<p>B.4.b.4</p>	<p>For each beam:</p>
<p>B.4.b.4.a</p>	<p>the maximum beam peak e.i.r.p./4 kHz</p>
<p>B.4.b.4.b</p>	<p>the average beam peak e.i.r.p./4 kHz</p>
<p>B.4.b.4.c</p>	<p>the maximum beam peak e.i.r.p./1 MHz</p>
<p>B.4.b.4.d</p>	<p>the average beam peak e.i.r.p./1 MHz</p>
<p>B.4.b.5</p>	<p>the calculated peak value of power flux-density produced within $\pm 5^\circ$ inclination of the geostationary-satellite orbit Required only for the fixed-satellite service (space-to-Earth) in the band 6 700-7 075 MHz</p>
<p>B.5</p>	<p>EARTH STATION ANTENNA CHARACTERISTICS</p>
<p>B.5.a</p>	<p>the isotropic gain, in dBi, of the antenna in the direction of maximum radiation (see No. 1.160)</p>
<p>B.5.b</p>	<p>the half-power beamwidth, in degrees</p>
<p>B.5.c</p>	<p>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</p>
<p>B.6</p>	<p>RADIO ASTRONOMY STATION ANTENNA CHARACTERISTICS</p>
<p>B.6.a</p>	<p>the antenna type (see the Preface)</p>
<p>B.6.b</p>	<p>the antenna dimensions (see the Preface)</p>
<p>B.6.c</p>	<p>the effective area of the antenna (see the Preface)</p>

Items in Appendix	<p align="center">C – CHARACTERISTICS TO BE PROVIDED FOR EACH GROUP OF FREQUENCY ASSIGNMENTS FOR A SATELLITE ANTENNA BEAM OR AN EARTH STATION OR RADIO ASTRONOMY ANTENNA</p>
C.1	FREQUENCY RANGE
C.1.a	the lower limit of the frequency range within which the carriers and the bandwidth of the emission will be located for each Earth-to-space or space-to-Earth service area, or for each space-to-space relay
C.1.b	the upper limit of the frequency range within which the carriers and the bandwidth of the emission will be located for each Earth-to-space or space-to-Earth service area, or for each space-to-space relay
C.2	ASSIGNED FREQUENCY (FREQUENCIES)
C.2.a.1	<p>the assigned frequency (frequencies), as defined in No. 1.148</p> <ul style="list-style-type: none"> - in kHz up to 28 000 kHz inclusive - in MHz above 28 000 kHz to 10 500 MHz inclusive - in GHz above 10 500 MHz <p>If the basic characteristics are identical, with the exception of the assigned frequency, a list of frequency assignments may be provided</p> <p>In the case of Appendix 30B, required only for notification under Article 8</p>
C.2.a.2	the channel number
C.2.b	<p>the centre of the frequency band observed</p> <ul style="list-style-type: none"> - in kHz up to 28 000 kHz inclusive - in MHz above 28 000 kHz to 10 500 MHz inclusive - in GHz above 10 500 MHz
C.2.c	if the frequency assignment is to be filed under No. 4.4 , an indication to that effect
C.3	ASSIGNED FREQUENCY BAND
C.3.a	<p>the bandwidth of the assigned frequency band, in kHz (see No. 1.147)</p> <p>In the case of Appendix 30B, required only for notification under Article 8</p>
C.3.b	the bandwidth of the frequency band, in kHz, observed by the station
C.4	CLASS OF STATION AND NATURE OF SERVICE
C.4.a	the class of station, using the symbols from the Preface
C.4.b	the nature of service performed, using the symbols from the Preface
C.5	RECEIVING SYSTEM NOISE TEMPERATURE
C.5.a	the lowest total receiving system noise temperature, in kelvins, referred to the output of the receiving antenna of the space station
C.5.b	<p>the lowest total receiving system noise temperature, in kelvins, referred to the output of the receiving antenna of the earth station under clear-sky conditions</p> <p>This value shall be indicated for the nominal value of the angle of elevation when the associated transmitting station is onboard a geostationary satellite and, in other cases, for the minimum value of the angle of elevation</p>
C.5.c	the overall receiving system noise temperature, in kelvins, referred to the output of the receiving antenna

Items in Appendix	<p align="center">C – CHARACTERISTICS TO BE PROVIDED FOR EACH GROUP OF FREQUENCY ASSIGNMENTS FOR A SATELLITE ANTENNA BEAM OR AN EARTH STATION OR RADIO ASTRONOMY ANTENNA</p>
C.6	POLARIZATION
C.6.a	<p>the type of polarization (see the Preface)</p> <p>In the case of circular polarization, this includes the sense of polarization (see Nos. 1.154 and 1.155)</p> <p>In the case of a space station submitted in accordance with Appendix 30 or 30A, see § 3.2 of Annex 5 to Appendix 30</p>
C.6.b	<p>if linear polarization is used, the angle, in degrees, measured counter-clockwise in a plane normal to the beam axis from the equatorial plane to the electric vector of the waves as seen from the satellite</p> <p>In the case of a space station submitted in accordance with Appendix 30 or 30A, see § 3.2 of Annex 5 to Appendix 30</p>
C.7	<p>NECESSARY BANDWIDTH AND CLASS OF EMISSION</p> <p>(in accordance with Article 2 and Appendix 1)</p>
C.7.a	<p>the necessary bandwidth and the class of emission: for each carrier</p> <p>In the case of Appendix 30B, required only for notification under Article 8</p>
C.7.b	<p>the carrier frequency or frequencies of the emission(s)</p>
C.8	POWER CHARACTERISTICS OF THE TRANSMISSION
C.8.a	For the case where individual carriers can be identified:
C.8.a.1	<p>the maximum value of the peak envelope power, in dBW, supplied to the input of the antenna for each carrier type</p> <p>Required if C.8.b.1 is not provided</p>
C.8.a.2	<p>the maximum power density, in dB(W/Hz), supplied to the input of the antenna for each carrier type²</p> <p>Required if C.8.b.2 is not provided</p>
C.8.b	For the case where it is not appropriate to identify individual carriers:
C.8.b.1	<p>the total peak envelope power, in dBW, supplied to the input of the antenna</p> <p>For coordination or notification of an Appendix 30A earth station the values shall include the maximum range of power control</p> <p>Required if C.8.a.1 is not provided</p>
C.8.b.2	<p>the maximum power density, in dB(W/Hz), supplied to the input of the antenna²</p> <p>For coordination or notification of an Appendix 30A earth station the values shall include the maximum range of power control</p> <p>Required if C.8.a.2 is not provided</p>
C.8.c.1	<p>the minimum value of the peak envelope power, in dBW, supplied to the input of the antenna for each carrier type</p> <p>If not provided, the reason for absence under C.8.c.2</p>
C.8.c.2	<p>if C.8.c.1 is not provided, the reason for absence of the minimum value of the peak envelope power</p>

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)	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.6	
									C.6.a	
		X	X	X	+ ¹	X	X			
									C.6.b	
		+	+	+	+ ¹	+	+			
									C.7	
		O	X	X	X	X	X	+	C.7.a	
		O	C	C	C				C.7.b	
									C.8	
									C.8.a	
									C.8.a.1	
		O	+	+	C					
		+	+	+	O				C.8.a.2	
									C.8.b	
									C.8.b.1	
		O	+	+	+ ¹	X	X			
		+	+	+	+ ¹	X	X	X	C.8.b.2	
		O	+	+	+ ¹				C.8.c.1	
			+	+	+ ¹				C.8.c.2	

Items in Appendix	<p align="center">C – CHARACTERISTICS TO BE PROVIDED FOR EACH GROUP OF FREQUENCY ASSIGNMENTS FOR A SATELLITE ANTENNA BEAM OR AN EARTH STATION OR RADIO ASTRONOMY ANTENNA</p>
C.8.c.3	<p>the minimum power density, in dB(W/Hz), supplied to the input of the antenna for each carrier type ²</p> <p>If not provided, the reason for absence under C.8.c.4</p>
C.8.c.4	<p>if C.8.c.3 is not provided, the reason for absence of the minimum power density</p>
C.8.d.1	<p>the maximum total peak envelope power, in dBW, supplied to the input of the antenna for each contiguous satellite bandwidth</p> <p>For a satellite transponder, this corresponds to the maximum saturated peak envelope power</p> <p>Required only for a space-to-Earth or space-to-space link</p>
C.8.d.2	<p>each contiguous satellite bandwidth</p> <p>For the maximum saturated peak envelope power of the satellite transponder, this corresponds to the bandwidth of each transponder</p> <p>Required only for a space-to-Earth or space-to-space link</p>
C.8.e.1	<p>for space-to-Earth, Earth-to-space or space-to-space links. for each carrier type, the greater of either the carrier-to-noise ratio, in dB, required to meet the performance of the link under clear-sky conditions or the carrier-to-noise ratio, in dB, required to meet the short-time objectives of the link inclusive of necessary margins</p> <p>If not provided, the reason for absence under C.8.e.2</p>
C.8.e.2	<p>if C.8.e.1 is not provided, the reason for absence of the carrier-to-noise ratio</p>
C.8.f.1	<p>the space station's nominal equivalent isotropically radiated power(s) (e.i.r.p.) on the beam axis</p> <p>Required only for a space-to-space link</p>
C.8.f.2	<p>the associated space station's nominal equivalent isotropically radiated power(s) (e.i.r.p.) on the beam axis</p> <p>Required only for a space-to-space link</p>
C.8.g.1	<p>the maximum aggregate power, in dBW, of all carriers (per transponder, if applicable) supplied to the input of the transmitting antenna of the earth station or the associated earth station</p> <p>Not required for coordination of a specific earth station under Nos. 9.15, 9.17 or 9.17A</p>
C.8.g.2	<p>the aggregate bandwidth of all carriers (per transponder, if applicable) supplied to the input of the transmitting antenna of the earth station or the associated earth station</p> <p>Not required for coordination of a specific earth station under Nos. 9.15, 9.17 or 9.17A</p>
C.8.g.3	<p>an indicator showing whether the bandwidth of the transponder corresponds to the aggregate bandwidth of all carriers (per transponder, if applicable) supplied to the input of the transmitting antenna of the earth station or the associated earth station</p> <p>Not required for coordination of a specific earth station under Nos. 9.15, 9.17 or 9.17A</p>

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)	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
		O	+	+	+ ¹				C.8.c.3	
			+	+	+ ¹				C.8.c.4	
			+	+					C.8.d.1	
			+	+					C.8.d.2	
		O	+	+	+ ¹				C.8.e.1	
			+	+	+ ¹				C.8.e.2	
		+							C.8.f.1	
		+							C.8.f.2	
			C	C	C				C.8.g.1	
			C	C	C				C.8.g.2	
			C	C	C				C.8.g.3	

Items in Appendix	<p align="center">C – CHARACTERISTICS TO BE PROVIDED FOR EACH GROUP OF FREQUENCY ASSIGNMENTS FOR A SATELLITE ANTENNA BEAM OR AN EARTH STATION OR RADIO ASTRONOMY ANTENNA</p>
C.8.h	the maximum power density per Hz supplied to the input of the antenna, in dB(W/Hz), averaged over the necessary bandwidth
	In the case of Appendix 30A, required only in the band 17.3-18.1 GHz
C.8.i	If power control is used, the range of power control, in dB, above the transmitting power indicated under C.8.b.1
C.8.j	the frequency below which signals whose peak-to-average ratio is less than 5 dB will be located
C.9	INFORMATION ON MODULATION CHARACTERISTICS
C.9.a	For each carrier, according to the nature of the signal modulating the carrier:
C.9.a.1	the type of modulation In the case of a non-geostationary space station required only for Nos. 9.11A, 9.12 or 9.12A
C.9.a.2	For a carrier frequency modulated by a frequency-division multichannel telephony baseband (FDM/FM) or by a signal that can be represented by a multichannel telephony baseband:
C.9.a.2.a	the lowest frequency of the baseband
C.9.a.2.b	the highest frequency of the baseband
C.9.a.2.c	the r.m.s. frequency deviation of the pre-emphasized signal for a test tone as a function of baseband frequency
C.9.a.3	For a carrier frequency modulated by a television signal:
C.9.a.3.a	the peak-to-peak frequency deviation of the pre-emphasized signal
C.9.a.3.b	the pre-emphasis characteristic
C.9.a.3.c	if applicable, the characteristics of the multiplexing of the video signal with the sound signal(s) or other signals
C.9.a.4	For a carrier phase-shift modulated by a digital signal:
C.9.a.4.a	the bit rate
C.9.a.4.b	the number of phases
C.9.a.5	For an amplitude modulated carrier (including single sideband):
C.9.a.5.a	the nature of the modulating signal, as precisely as possible
C.9.a.5.b	the kind of amplitude modulation used
C.9.a.6	For a frequency modulated carrier:
C.9.a.6.a	the peak-to-peak frequency deviation, in MHz, of the energy dispersal waveform
C.9.a.6.b	the sweep frequency, in kHz, of the energy dispersal waveform
C.9.a.6.c	the energy dispersal waveform
C.9.a.7	if other forms of modulation than frequency modulation, are being used, the type of energy dispersal
C.9.a.8	for all other types of modulation, such particulars as may be useful for an interference study
C.9.a.9	the TV standard

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)	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
						X	+	X	C.8.h	
							+		C.8.i	
								X	C.8.j	
									C.9	
									C.9.a	
		O	C	+		X	X		C.9.a.1	
									C.9.a.2	
		O	C	C					C.9.a.2.a	
		O	C	C					C.9.a.2.b	
		O	C	C					C.9.a.2.c	
									C.9.a.3	
		O	C	C		X	X		C.9.a.3.a	
		O	C	C		X	X		C.9.a.3.b	
		O	C	C		+	+		C.9.a.3.c	
									C.9.a.4	
		O	C	C					C.9.a.4.a	
		O	C	C					C.9.a.4.b	
									C.9.a.5	
		O	C	C					C.9.a.5.a	
		O	C	C					C.9.a.5.b	
									C.9.a.6	
		O	C	C		X	X		C.9.a.6.a	
		O	C	C		X	X		C.9.a.6.b	
		O	C	C		X	X		C.9.a.6.c	
						+	+		C.9.a.7	
		O	C	C					C.9.a.8	
		O	C	C		X	X		C.9.a.9	

Items in Appendix	<p align="center">C – CHARACTERISTICS TO BE PROVIDED FOR EACH GROUP OF FREQUENCY ASSIGNMENTS FOR A SATELLITE ANTENNA BEAM OR AN EARTH STATION OR RADIO ASTRONOMY ANTENNA</p>
C.9.b	For analogue carriers:
C.9.b.1	the sound-broadcasting characteristics
C.9.b.2	the composition of the baseband
C.9.c	For a non-geostationary space station submitted in accordance with Nos. 9.11A, 9.12 or 9.12A:
C.9.c.1	the type of multiple access
C.9.c.2	the spectrum mask
C.9.d	For stations operating in a frequency band subject to Nos. 22.5C, 22.5D or 22.5F:
C.9.d.1	the type of mask
C.9.d.2	the pfd mask identification code
C.9.d.3	the space station's e.i.r.p. mask identification code
C.9.d.4	the associated earth station's e.i.r.p. mask identification code
C.10	TYPE AND IDENTITY OF THE ASSOCIATED STATION(S) (the associated station may be another space station, a typical earth station of the network or a specific earth station)
C.10.a	For an associated space station:
C.10.a.1	the identity of the station
C.10.a.2	if the associated space station is in the geostationary orbit, its nominal longitude
C.10.b	For an associated earth station:
C.10.b.1	the name of the station
C.10.b.2	the type of station (specific or typical)
C.10.c	For a specific associated earth station:
C.10.c.1	the geographical coordinates of the antenna site
C.10.c.2	the country or geographical area in which the earth station is located, using the symbols from the Preface
C.10.d	For an associated earth station (whether specific or typical):
C.10.d.1	the class of station, using the symbols from the Preface
C.10.d.2	the nature of service performed, using the symbols from the Preface
C.10.d.3	the isotropic gain, in dBi, of the antenna in the direction of maximum radiation (see No. 1.160)
C.10.d.4	the beamwidth, in degrees, between the half-power points (described in detail if not symmetrical)
C.10.d.5.a	either the measured co-polar radiation pattern of the antenna or the co-polar reference radiation pattern
C.10.d.5.b	either the measured cross-polar radiation pattern of the antenna or the cross-polar reference radiation pattern

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)	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.9.b	
						X	X		C.9.b.1	
						X	X		C.9.b.2	
									C.9.c	
				X					C.9.c.1	
				X					C.9.c.2	
									C.9.d	
				X					C.9.d.1	
				X					C.9.d.2	
				X					C.9.d.3	
				X					C.9.d.4	
									C.10	
									C.10.a	
		X	X	X					C.10.a.1	
		+	+	+					C.10.a.2	
									C.10.b	
		X	X	X			X		C.10.b.1	
		X	X	X					C.10.b.2	
									C.10.c	
		X	X	X			X		C.10.c.1	
		X	X	X			X		C.10.c.2	
									C.10.d	
		X	X	X					C.10.d.1	
		X	X	X					C.10.d.2	
		X	X	X		X	X	X	C.10.d.3	
		O	X	X		X	X	X	C.10.d.4	
		X	X	X		X	X	X	C.10.d.5.a	
						X	X		C.10.d.5.b	

Items in Appendix	<p align="center">C – CHARACTERISTICS TO BE PROVIDED FOR EACH GROUP OF FREQUENCY ASSIGNMENTS FOR A SATELLITE ANTENNA BEAM OR AN EARTH STATION OR RADIO ASTRONOMY ANTENNA</p>
C.10.d.6	if the associated station is a receiving earth station, the lowest total receiving system noise temperature, in kelvins, referred to the output of the receiving antenna of the earth station under clear-sky conditions
C.10.d.7	<p>the antenna diameter, in metres</p> <p>In cases other than Appendix 30A, to be provided only for fixed-satellite service networks operating in the frequency band 13.75-14 GHz</p>
C.10.d.8	the equivalent antenna diameter (i.e. the diameter, in metres, of a parabolic antenna with the same off-axis performance as the receiving associated earth station antenna)
C.11	SERVICE AREA(S)
C.11.a	<p>the service area or areas of the satellite beam on the Earth, when the associated transmitting or receiving stations are earth stations</p> <p>For a space station submitted in accordance with Appendix 30, 30A or 30B, the service area identified by a set of a maximum of twenty test points and by a service area contour on the surface of the Earth or defined by a minimum elevation angle</p> <p>For advance publication of satellite networks subject to coordination, only a list of countries and geographical areas, using the symbols from the Preface, or a narrative description of the service area shall be supplied</p>
C.11.b	<p>the appropriate information required to calculate the affected region (as defined in Recommendation ITU-R M.1187)</p> <p>Required only for a non-geostationary space station in the mobile-satellite service submitted in accordance with No. 9.11A</p>
C.12	REQUIRED PROTECTION RATIO
C.12.a	<p>the minimum acceptable aggregate carrier-to-interference ratio, if less than 26 dB or 23 dB for submissions received by the Bureau as of 5 July 2003</p> <p>The carrier-to-interference ratio is to be expressed in terms of the power averaged over the necessary bandwidth of the modulated wanted and interfering signals, assuming both the desired carrier and interfering signals have equivalent bandwidths and modulation types</p>
C.13	CHARACTERISTICS OF OBSERVATIONS FOR RADIO ASTRONOMY STATIONS
C.13.a	<p>the class of observations to be taken on the frequency band shown under C.3.b</p> <ul style="list-style-type: none"> – Class A observations are those in which the sensitivity of the equipment is not a primary factor – Class B observations are those of such a nature that they can be made only with advanced low-noise receivers using the best techniques

[illegible]

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
C.13.b	the type of radio astronomy station in the frequency band shown under C.3.b <ul style="list-style-type: none">– Single-dish, "S", telescope used for spectral-line or continuum observations using single-dishes or closely connected arrays– Very long baseline interferometry (VLBI), "V", station used only for VLBI observations
C.13.c	the minimum elevation angle $_{min}$ at which the radio astronomy station conducts single-dish or VLBI observations in the frequency band
C.14	Not used
C.15	DESCRIPTION OF THE GROUP(S) REQUIRED IN THE CASE OF NON-SIMULTANEOUS EMISSIONS
C.15.a	if part of an exclusive operation group, the group identification code

Items in Appendix	D – OVERALL LINK CHARACTERISTICS
	For non-plan services, this data may be provided by administrations that so desire but only when simple frequency-changing transponders are used on the space station onboard a geostationary satellite
D.1	CONNECTION BETWEEN EARTH-TO-SPACE AND SPACE-TO-EARTH FREQUENCIES IN THE NETWORK
D.1.a	the connection between uplink and downlink frequency assignments in each transponder for each intended combination of receiving and transmitting beams In the case of Appendix 30 or 30A, required only in Region 2
D.2	TRANSMISSION GAINS AND ASSOCIATED EQUIVALENT SATELLITE LINK NOISE TEMPERATURES
D.2.a	For each entry under D.1.a:
D.2.a.1	the lowest equivalent satellite link noise temperature These values shall be indicated for the nominal value of the angle of elevation
D.2.a.2	the associated transmission gain of the lowest equivalent satellite link noise temperature These values shall be indicated for the nominal value of the angle of elevation The transmission gain is evaluated from the output of the receiving antenna of the space station to the output of the receiving antenna of the earth station
D.2.b.1	the values of associated equivalent satellite link noise temperature that correspond to the highest ratio of transmission gain to equivalent satellite link noise temperature
D.2.b.2	the values of transmission gain that correspond to the highest ratio of transmission gain to equivalent satellite link noise temperature

[illegible]

APPENDIX 5 (Rev.WRC-03)

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

ADD

1 *cbis*) recorded in the Master Register under No. **11.41**; or (WRC-03)

MOD

TABLE 5-1 (Rev.WRC-03)

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 radio-communication 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 $\pm 10^\circ$ 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 $\pm 9^\circ$ 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) and 5), 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)

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.)		3) 17.7-20.2 GHz, (Regions 2 and 3), 17.3-20.2 GHz (Region 1) and 27.5-30 GHz	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		
		4) Bands above 17.3 GHz, except those defined in § 3)	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 (WRC-03))		
		5) Bands above 17.3 GHz	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 (WRC-03))		

TABLE 5-1 (continued)

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.)		6) All frequency bands, other than those in § 1), 2), 3), 4) and 5), allocated to a space service, and the bands in § 1), 2), 3), 4) and 5) 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 band 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 band 4) applies.

MOD

TABLE 5-1 (continued)

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 1 452-1 492 MHz 2 310-2 360 MHz 2 535-2 655 MHz (Nos. 5.418 and 5.417A) 12.5-12.75 GHz (Region 3) 17.3-17.8 GHz (Region 2) 21.4-22 GHz (Regions 1 and 3) 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. 5.418 and 5.417A, and in Nos. 5.418 and 5.417A for GSO BSS (sound) networks pursuant to those provisions. Resolution 545 (WRC-03) applies in the 620-790 MHz band	Check by using the assigned frequencies and bandwidths	
...					
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; or 2) In the band 11.7-12.2 GHz (Region 2 GSO FSS): -124 dB(W/(m ² · MHz)) for 0° ≤ θ ≤ 5° -124 + 0.5 (θ - 5) dB(W/(m ² · MHz)) for 5° < θ ≤ 25° -114 dB(W/(m ² · MHz)) for θ > 25° where θ is the angle of arrival of the incident wave above the horizontal plane (degrees)	1) See § 1 of Annex 1 to this Appendix	
...					

TABLE 5-1 (continued)

Reference of Article 9	Case	Frequency bands (and Region) of the service for which coordination is sought	Threshold/condition	Calculation method	Remarks
No. 9.17A GSO, non-GSO/ GSO, non-GSO	A specific earth station in respect of other earth stations operating in the opposite direction of transmission or for any typical mobile earth station in respect of specific earth stations operating in the opposite direction of transmission in frequency bands allocated with equal rights to space radiocommunication services in both directions of transmission, where the coordination area of the earth station includes the territory of another country or the earth station is located within the coordination area of a coordinated earth station, with the exception of coordination under No. 9.19	Any frequency band allocated to a space service	The coordination area of the earth station covers the territory of another administration or the earth station is located within the coordination area of an earth station	Appendix 7	
...					

ANNEX 1

MOD

TABLE 5-2 (WRC-03)

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	
...						
1 518-1 525	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 (NOTE 4 and NOTE 8)	–128 dB(W/m ²) in 1 MHz	0.5	–128 dB(W/m ²) in 1 MHz	0.5	25
...						

MOD

NOTE 4 – Exceptions for the band 1 518-1 525 MHz are as follows:

4.1 For the land mobile service on the territory of Japan (No. **5.348A**): –150 dB(W/m²) in 4 kHz at all angles of arrival is applicable to all satellite space-to-Earth emissions.

4.2 For the aeronautical mobile service for telemetry on the territory of the administrations listed in No. **5.342**: –140 dB(W/m²) in 4 kHz at all angles of arrival.

4.3 For the point-to-multipoint systems operating in the fixed service in the territory of New Zealand: –138 dB(W/m²) in 1 MHz for angles of arrival less than or equal to 5° above the horizon and increasing linearly to –125 dB(W/m²) in 1 MHz for angles of arrival equal to 25° or greater above the horizon. (WRC-03)

ADD

NOTE 8 – In the band 1 518-1 520 MHz, for the point-to-multipoint systems operating in the fixed service on the territory of Australia: –138 dB(W/m²) in 1 MHz for angles of arrival less than or equal to 5° above the horizon and increasing linearly to –125 dB(W/m²) in 1 MHz for angles of arrival equal to 25° or greater above the horizon. (WRC-03)

APPENDIX 7 (Rev.WRC-03)

Methods for the determination of the coordination area around an earth station in frequency bands between 100 MHz and 105 GHz**MOD****1.4.4 Earth stations operating in bidirectionally allocated frequency bands**

For earth stations operating in some frequency bands there may be allocations with equal rights to space services operating in both the Earth-to-space and space-to-Earth directions. In this case, where two earth stations are operating in opposite directions of transmission it is only necessary to establish the coordination area for the transmitting earth station, as receiving earth stations will automatically be taken into consideration. Hence, a receiving earth station operating in a bidirectionally allocated frequency band will only be involved in coordination with a transmitting earth station if it is located within the transmitting earth station's coordination area.

For a transmitting earth station operating with either geostationary or non-geostationary satellites in a bidirectionally allocated frequency band, the coordination area is determined using the procedures described in § 3. (WRC-03)

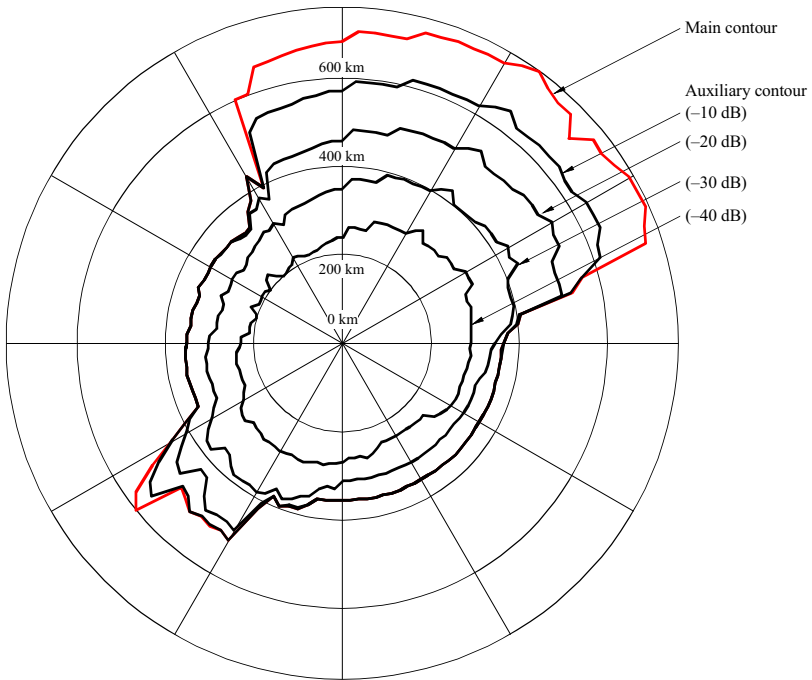
ANNEX 6

Supplementary and auxiliary contours

MOD

FIGURE 10 (WRC-03)

Propagation mode (1) main contour and auxiliary contours

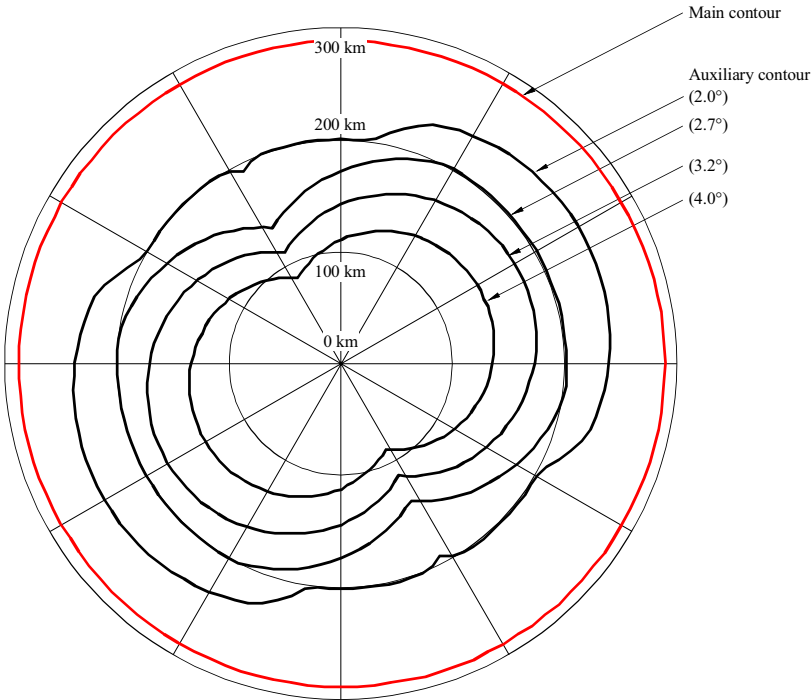


The propagation mode (1) auxiliary contours are shown for -10, -20, -30 and -40 dB adjustments in the minimum required loss.

CMR03-AP7A6-10

MOD

FIGURE 11 (WRC-03)
Propagation mode (2) main contour and auxiliary contours



The propagation mode (2) auxiliary contours are shown for terrestrial station main beam avoidance angles of 2.0°, 2.7°, 3.2° and 4.0°, respectively

ANNEX 7

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

MOD

TABLE 7a (WRC-03)

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

Transmitting space radiocommunication service designation	Mobile-satellite		Mobile-satellite, space operation	Earth exploration-satellite, meteorological satellite	Space operation	Space research, space operation	Mobile-satellite	Space operation	Mobile-satellite, radio-determination-satellite	Mobile-satellite	Space operation, space research	Mobile-satellite	Space research, space operation, Earth exploration-satellite
Frequency bands (MHz)	121.45-121.55		148.0-149.9	401-403	433.75-434.25	449.75-450.25	806-840	1 427-1 429	1 610-1 626.5	1 668.4-1 675	1 750-1 850	1 980-2 025	2 025-2 110 2 110-2 120 (Deep space)
Receiving terrestrial service designations	Aeronautical mobile		Fixed, mobile	Fixed, mobile, meteorological aids	Amateur, radio-location fixed, mobile	Fixed, mobile, radio-location	Fixed, mobile broadcasting, aeronautical radionavigation	Fixed, mobile	Aeronautical radionavigation	Fixed, mobile	Fixed, mobile	Fixed, mobile	Fixed, mobile
Method to be used	§ 1.4.7		§ 2.1, § 2.2	§ 2.1, § 2.2	§ 2.1, § 2.2	§ 2.1, § 2.2	§ 1.4.6	§ 2.1, § 2.2	§ 1.4.6	§ 1.4.6	§ 2.1, § 2.2	§ 1.4.6	§ 2.1, § 2.2
Modulation at terrestrial station ¹	A	N	A	A	N		A and N	A and N	A	N		A	N
Terrestrial station interference parameters and criteria	P_0 (%)		1.0				0.01	0.01	0.01	0.01		0.01	0.01
	n		1				2	2	2	2		2	2
	p (%)		1.0				0.005	0.005	0.005	0.005		0.005	0.005
	N_L (dB)		–				0	0	0	0		0	0
	M_s (dB)		–				20	20	33	33		33	26 ²
	W (dB)		–				0	0	0	0		0	0
Terrestrial station parameters	G_x (dBi) ³		8				16	16	33	33		35	49 ²
	T_e (K)		–				750	750	750	750		750	500 ²
Reference bandwidth	B (Hz)		4×10^3				12.5×10^3	12.5×10^3	4×10^3	10^6		4×10^3	4×10^3
Permissible interference power	$P_f(p)$ (dBW) in B		–153				–139	–139	–131	–107		–131	–140

¹ A: analogue modulation; N: digital modulation.

² The parameters for the terrestrial station associated with transhorizon systems have been used. Line-of-sight radio-relay parameters associated with the frequency band 1 668.4-1 675 MHz may also be used to determine a supplementary contour. (WRC-03)

³ Feeder losses are not included.

TABLE 7b (WRC-03)

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

Transmitting space radiocommunication service designation		Fixed-satellite, mobile-satellite	Fixed-satellite	Fixed-satellite	Fixed-satellite	Space operation, space research		Fixed-satellite, mobile-satellite, meteorological-satellite		Fixed-satellite		Fixed-satellite		Fixed-satellite	Fixed-satellite ³	Fixed-satellite	Fixed-satellite ³
Frequency bands (GHz)		2.655-2.690	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	Radio-location	Fixed, mobile	Fixed, mobile		Fixed, mobile		Fixed, mobile		Fixed, mobile		Radiolocation radionavigation (land only)	Aeronautical radionavigation	Fixed, mobile	Fixed, mobile
Method to be used		§ 2.1		§ 2.1	§ 2.1		§ 2.1, § 2.2		§ 2.1		§ 2.1		§ 2.1, § 2.2		§ 2.1	§ 2.1, § 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_0 (%)	0.01			0.01	0.005	0.01	0.005	0.01	0.005	0.01	0.005	0.01	0.005	0.01	0.005	0.005
	n	2			2	2	2	2	2	2	2	2	2	2	1	2	2
	p (%)	0.005			0.005	0.0025	0.005	0.0025	0.005	0.0025	0.005	0.0025	0.005	0.0025	0.01	0.0025	0.0025
	N_L (dB)	0			0	0	0	0	0	0	0	0	0	0	0	0	0
	M_s (dB)	26 ²			33	37	33	37	33	37	33	40	33	40	1	25	25
	W (dB)	0			0	0	0	0	0	0	0	0	0	0	0	0	0
Terrestrial station parameters	G_s (dBi) ⁴	49 ²	6		46	46	46	46	46	46	50	50	52	52	36	48	48
	T_e (K)	500 ²			750	750	750	750	750	750	1 500	1 100	1 500	1 100	2 636	1 100	1 100
Reference bandwidth	B (Hz)	4×10^3	150×10^3		4×10^3	10^6	4×10^3	10^6	4×10^3	10^6	4×10^3	10^6	4×10^3	10^6	10^7	10^6	10^6
Permissible interference power	$P_f(p)$ (dBW) in B	−140	−160		−131	−103	−131	−103	−131	−103	−128	−98	−128	−98	−131	−113	−113

¹ A: analogue modulation; N: digital modulation.² The parameters for the terrestrial station associated with transhorizon systems have been used. Line-of-sight radio-relay parameters associated with the frequency band 5 725-7 075 MHz may also be used to determine a supplementary contour with the exception that $G_s = 37$ dBi.³ Feeder links of non-geostationary-satellite systems in the mobile-satellite service.⁴ Feeder losses are not included.⁵ Actual frequency bands are 7 100-7 155 MHz and 7 190-7 235 MHz for space operation service and 7 145-7 235 MHz for the space research service.

TABLE 8a (WRC-03)

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

Receiving space radiocommunication service designation	Space operation, space research	Meteorological-satellite, mobile-satellite	Space research	Space research, space operation	Space operation	Mobile-satellite	Meteorological-satellite	Mobile-satellite	Space research, space operation	Space operation	Meteorological-satellite, Earth exploration-satellite	Space operation	Broadcasting-satellite	Mobile-satellite	Broadcasting-satellite (DAB)	Mobile-satellite, land-mobile satellite, maritime mobile-satellite
Frequency bands (MHz)	137-138	137-138	143.6-143.65	174-184	163-167 272-273 ⁵	335.4-399.9	400.15-401	400.15-401	400.15-401	401-402	460-470	549.75-550.25	620-790	856-890	1 452-1492	1 518-1 530 1 555-1 559 2 160-2 200 ¹
Transmitting terrestrial service designations	Fixed, mobile	Fixed, mobile	Fixed, mobile, radio-location	Fixed, mobile, broadcasting	Fixed, mobile	Fixed, mobile	Meteorological aids	Meteorological aids	Meteorological aids	Meteorological aids, fixed, mobile	Fixed, mobile	Fixed, mobile, broadcasting	Fixed, mobile, broadcasting	Fixed, mobile, broadcasting	Fixed, mobile, broadcasting	Fixed, mobile
Method to be used	§ 2.1	§ 2.1	§ 2.1	§ 2.1	§ 2.1	§ 1.4.6	§ 1.4.6	§ 1.4.6	–	§ 2.1	§ 2.1	§ 2.1	§ 1.4.5	§ 1.4.6	§ 1.4.5	§ 1.4.6
Modulation at earth station ²	N		N		N				N	N					N	N
Earth station interference parameters and criteria	p_0 (%)	0.1	0.1		1.0		0.012		0.1	0.1	0.012					10
	n	2	2		1		1		2	2	1					1
	p (%)	0.05	0.05		1.0		0.012		0.05	0.05	0.012					10
	N_L (dB)	0	0		0		0		0	0						0
	M_s (dB)	1	1		1		4.3		1	1						1
	W (dB)	0	0		0		0		0	0						0
Terrestrial station parameters	E (dBW) in B ³	A	–	–	15				–	–	5				38	37 ⁴
		N	–	–	15				–	–	5				38	37
	P_f (dBW) in B	A	–	–	–1				–	–	–11				3	0
		N	–	–	–1				–	–	–11				3	0
	G_x (dBi)	–	–		16				–	–	16				35	37
Reference bandwidth	B (Hz)	1	1		10^3		177.5×10^3		1	1	85				25×10^3	4×10^3
Permissible interference power	$P_{f(p)}$ (dBW) in B	–199	–199		–173		–148		–208	–208	–178					–176

¹ In the band 2 160-2 200 MHz, the terrestrial station parameters of line-of-sight radio-relay systems have been used. If an administration believes that, in this band transhorizon systems need to be considered, the parameters associated with the frequency band 2 500-2 690 MHz may be used to determine the coordination area.

² A: analogue modulation; N: digital modulation.

³ E is defined as the equivalent isotropically radiated power of the interfering terrestrial station in the reference bandwidth.

⁴ This value is reduced from the nominal value of 50 dBW for the purposes of determination of coordination area, recognizing the low probability of high power emissions falling fully within the relatively narrow bandwidth of the earth station.

⁵ The fixed-service parameters provided in the column for 163-167 MHz and 272-273 MHz are only applicable to the band 163-167 MHz.

MOD

TABLE 9a (WRC-03)

**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	Fixed-satellite ³		Fixed-satellite	Fixed-satellite, meteorological-satellite	Fixed-satellite
Frequency bands (GHz)	0.1499-0.15005	0.272-0.273	0.3999-0.40005	0.401-0.402	1.670-1.675		2.655-2.690	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		Fixed-satellite, broadcasting-satellite	Fixed-satellite	Radiodetermination-satellite	Fixed-satellite	Earth exploration-satellite	Earth exploration-satellite
Orbit ⁶		Non-GSO		Non-GSO	Non-GSO	GSO		Non-GSO		Non-GSO	Non-GSO	GSO
Modulation at receiving earth station ¹		N		N	N	N				N	N	N
Receiving earth station interference parameters and criteria	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
	N_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
Receiving earth station parameters	G_m (dBi) ²	0	20	0	20	30	45		48.5		50.7	
	G_r (dBi) ⁴	0	19	0	19	19 ⁹	8		10		10	8
	ϵ_{min} ⁵	3°	10°	3°	10°	5°	3°	3°	3°	3°	5°	3°
	T_e (K) ⁷	200	500	200	500	370	118	75	75	75	75	
Reference bandwidth	B (Hz)	4×10^3	10^3	4×10^3	1	10^6	4×10^3			10^6	10^6	10^6
Permissible interference power	$P_e(p)$ (dBW) in B	-172	-177	-172	-208	-145	-178			-151	-142	-154

Notes to Table 9a:

- ¹ A: analogue modulation; N: digital modulation.
- ² On-axis gain of the receive earth station antenna.
- ³ Feeder links of non-geostationary-satellite systems in the mobile-satellite service.
- ⁴ Horizon antenna gain for the receive earth station (refer to § 3 of the main body of this Appendix).
- ⁵ Minimum elevation angle of operation in degrees (non-geostationary or geostationary).
- ⁶ Orbit of the space service in which the receiving earth station operates (non-geostationary or geostationary).
- ⁷ The thermal noise temperature of the receiving system at the terminal of the receiving antenna (under clear-sky conditions). Refer to § 2.1 of this Annex for missing values.
- ⁸ Horizon antenna gain is calculated using the procedure of Annex 5. Where no value of G_m is specified, a value of 42 dBi is to be used.
- ⁹ Non-geostationary horizon antenna gain, $G_e = G_{min} + 20$ dB (see § 2.2), with $G_{min} = 10 - 10 \log (D/\lambda)$, $D/\lambda = 13$ (refer to Annex 3 for definition of symbols).
- ¹⁰ Unmanned space research is not a separate radiocommunication service and the system parameters are only to be used for the generation of supplementary contours.

MOD

TABLE 10 (WRC-03)
Predetermined coordination distances

Frequency sharing situation		Coordination distance (in sharing situations involving services allocated with equal rights) (km)
Type of earth station	Type of terrestrial station	
...		
Ground-based in the bands: 400.15-401 MHz 1 668.4-1 675 MHz	Station in the meteorological aids service (radiosonde)	580
Aircraft (mobile) in the bands: 400.15-401 MHz 1 668.4-1 675 MHz	Station in the meteorological aids service (radiosonde)	1 080
...		

APPENDIX 8 (Rev.WRC-03)

Method of calculation for determining if coordination is required between geostationary-satellite networks sharing the same frequency bands**MOD****2.2.1.2 Cases requiring independent treatment of the uplink and the downlink**

If there is a change of modulation in the satellite, if the transmission gain for the satellite network being considered has not been supplied, or if the transmission originates on board the satellite, then the apparent increase in the noise temperature must be related to the total receiving system noise temperature of the specific link being examined (the space station or the earth station, whichever is applicable). In this case, the equivalent noise temperature of the entire satellite link and the transmission gain are not used and equations (1) and (2) above are used separately as required (see § 3.2). (WRC-03)

MOD**3.2 Cases requiring independent treatment of the uplink and the downlink**

- a) In the case of interference into only one link, the uplink or the downlink, the value $\Delta T_e/T_e$ or $\Delta T_s/T_s$, expressed as a percentage, shall be compared with the threshold value of 6%³.
- b) In the case of interference into both the uplink and the downlink, between which there is a change of modulation on board the satellite, or in cases where the optional values for transmission gain and equivalent link noise temperature have not been supplied, the values of $\Delta T_e/T_e$ and $\Delta T_s/T_s$, expressed as a percentage, shall each be compared with the threshold value of 6%³. (WRC-03)

MOD**APPENDIX 11 (Rev.WRC-03)****System specifications for double-sideband (DSB), single-sideband (SSB) and digitally modulated emissions in the HF broadcasting service****PART B – Single-sideband (SSB) system****MOD****1.1 Channel spacing**

In a mixed DSB, SSB and digital environment (see Resolution **517 (Rev.WRC-03)**), the channel spacing shall be 10 kHz. In the interest of spectrum conservation, it is also permissible to interleave SSB emissions midway between two adjacent DSB channels, i.e., with 5 kHz separation between carrier frequencies, provided that the interleaved emission is not to the same geographical area as either of the emissions between which it is interleaved.

In an all inclusive SSB environment, the channel spacing and carrier frequency separation shall be 5 kHz. (WRC-03)

MOD**2.6 Carrier reduction (relative to peak envelope power)**

In a mixed DSB, SSB and digital environment, the carrier reduction shall be 6 dB to allow SSB emissions to be received by conventional DSB receivers with envelope detection without significant deterioration of the reception quality. (WRC-03)

MOD**3.2 Demodulator and carrier acquisition**

The reference receiver is equipped with a synchronous demodulator, using for the carrier acquisition a device which regenerates a carrier by means of a suitable control loop which locks the receiver to the incoming carrier. The reference receiver should work as well with DSB emissions as with SSB emissions having a carrier reduced to 6 dB below peak envelope power. (WRC-03)

ADD**PART C – Digital system** (WRC-03)**1 System parameters****1.1 Channel spacing**

The initial spacing for digitally modulated emissions shall be 10 kHz. However, interleaved channels with a separation of 5 kHz may be used in accordance with the appropriate protection criteria appearing in Resolution **543 (WRC-03)**, provided that the interleaved emission is not to the same geographical area as either of the emissions between which it is interleaved.

1.2 Channel utilization

Channels using digitally modulated emissions may share the same spectrum or be interleaved with analogue emissions in the same high frequency broadcasting (HFBC) band, provided the protection afforded to the analogue emissions is at least as great as that which is currently in force for analogue-to-analogue protection. Accomplishing this may require that the digital spectral power density (and total power) be lower by several dB than is currently used for either DSB or SSB emissions.

2 Emission characteristics**2.1 Bandwidth and centre frequency**

A full digitally modulated emission will have a 10 kHz bandwidth with its centre frequency at any of the 5 kHz centre frequency locations in the channel raster currently in use within the HFBC bands.

Among several possible “simulcast” modes are those having a combination of analogue and digital emissions of the same programme in the same channel, that may use a digital emission of 5 kHz or 10 kHz bandwidth, next to either a 5 kHz or 10 kHz analogue emission. In all cases of this type, the 5 kHz interleaved raster used in HFBC shall be adhered to in placing the emission within these bands.

2.2 Frequency tolerance

The frequency tolerance shall be 10 Hz¹.

2.3 Audio-frequency band

The quality of service, using digital source coding within a 10 kHz bandwidth, taking into account the need to adapt the emission coding for various levels of error avoidance, detection and correction, can range from the equivalent of monophonic FM (approximately 15 kHz) to the

¹ See Note 21 of Appendix 2.

low-level performance of a speech codec (of the order of 3 kHz). The choice of audio quality is connected to the needs of the broadcaster and listener, and includes the consideration of such characteristics as the propagation conditions expected. There is no single specification, only the upper and lower bounds noted in this paragraph.

2.4 Modulation

Quadrature amplitude modulation (QAM) with orthogonal frequency division multiplexing (OFDM) shall be used. 64-QAM is feasible under many propagation conditions; others such as 32-, 16- and 8-QAM are specified for use when needed.

2.5 RF protection ratio values

The protection ratio values for analogue and digital emissions for co-channel and adjacent channel conditions shall be in accordance with Resolution **543 (WRC-03)** as provisional RF protection ratio values subject to revision or confirmation by a future competent conference.

APPENDIX 13 (Rev.WRC-03)*

Distress and safety communications (non-GMDSS)**Part A2 – Frequencies for distress and safety****Section I – Availability of frequencies****MOD**

§ 8 1A) The aeronautical emergency frequency 121.5 MHz⁵ 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 in survival craft stations and emergency position-indicating radio-beacons. (WRC-03)

MOD**§ 12**

d) *in the bands between 117.975 MHz and 137 MHz*, be able to transmit on 121.5 MHz, using amplitude modulated emissions. If a receiver is provided for any of these bands, it shall be able to receive class A3E emissions on 121.5 MHz; (WRC-03)

Section II – Protection of Distress and Safety Frequencies**MOD**

§ 15 1) Apart from the transmissions authorized on 500 kHz, and taking account of No. **52.28**, all transmissions on the frequencies included between 495 kHz and 505 kHz are forbidden. (WRC-03)

Section III – Watch on distress frequencies**MOD****§ 19 2)**

a) transmissions shall cease in the band between 495 kHz and 505 kHz; (WRC-03)

APPENDIX 15 (Rev.WRC-03)

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

TABLE 15-1 (WRC-03)

Frequencies below 30 MHz

MOD

Frequency (kHz)	Description of usage	Notes
490	MSI	The frequency 490 kHz is used exclusively for maritime safety information (MSI)
...		

APPENDIX 17 (Rev.WRC-03)

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

(See Article 52)

MOD**PART A – Table of subdivided bands** (WRC-03)

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

- 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)</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

¹ Within the non-shaded boxes.

**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 and coast stations for telephony, simplex operation <i>a)</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 wide-band telegraphy, facsimile and special transmission systems	4 154 to 4 170 <i>5 f.</i> <i>4 kHz</i>	6 235 to 6 259 <i>7 f.</i> <i>4 kHz</i>	8 302 to 8 338 <i>10 f.</i> <i>4 kHz</i>	12 370 to 12 418 <i>13 f.</i> <i>4 kHz</i>	16 551 to 16 615 <i>17 f.</i> <i>4 kHz</i>	18 848 to 18 868 <i>6 f.</i> <i>4 kHz</i>	22 182 to 22 238 <i>15 f.</i> <i>4 kHz</i>	25 123 to 25 159 <i>10 f.</i> <i>4 kHz</i>
Limits (kHz)	4 172	6 261	8 340	12 420	16 617	18 870	22 240	25 161.25
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)	4 172	6 262.75	8 341.75	12 421.75	16 618.75	18 870	22 241.75	25 161.25
Frequencies (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>d) j) m) p)</i>	4 172.5 to 4 181.5 <i>18 f.</i> <i>0.5 kHz</i>	6 263 to 6 275.5 <i>25 f.</i> <i>0.5 kHz</i>						
Limits (kHz)	4 181.75	6 275.75	8 341.75	12 421.75	16 618.75	18 870	22 241.75	25 161.25
Calling frequencies assignable to ship stations for A1A or A1B Morse telegraphy <i>g) p)</i>								
Limits (kHz)	4 186.75	6 280.75	8 341.75	12 421.75	16 618.75	18 870	22 241.75	25 161.25
Frequencies (paired) assignable to ship stations for NBDP telegraphy and data transmission systems at speeds not exceeding 100 Bd for FSK and 200 Bd for PSK <i>d) m) p)</i>		6 281 to 6 284.5 <i>8 f.</i> <i>0.5 kHz</i>						
Limits (kHz)	4 186.75	6 284.75	8 341.75	12 421.75	16 618.75	18 870	22 241.75	25 161.25

**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)	4 186.75	6 284.75	8 341.75	12 421.75	16 618.75	18 870	22 241.75	25 161.25
Working frequencies assignable to ship stations for A1A or A1B Morse telegraphy <i>e) f) h) p)</i>	4 187 to 4 202 <i>31 f.</i> <i>0.5 kHz</i>	6 285 to 6 300 <i>31 f.</i> <i>0.5 kHz</i>	8 342 to 8 365.5 <i>48 f.</i> <i>0.5 kHz</i>	12 422 to 12 476.5 <i>110 f.</i> <i>0.5 kHz</i>	16 619 to 16 683 <i>129 f.</i> <i>0.5 kHz</i>		22 242 to 22 279 <i>75 f.</i> <i>0.5 kHz</i>	25 161.5 to 25 171 <i>20 f.</i> <i>0.5 kHz</i>
Limits (kHz)	4 202.25	6 300.25	8 365.75	12 476.75	16 683.25	18 870	22 279.25	25 171.25
Calling frequencies assignable to ship stations for A1A or A1B Morse telegraphy <i>g) p)</i>								
Limits (kHz)	4 202.25	6 300.25	8 370.75	12 476.75	16 683.25	18 870	22 284.25	25 172.75
Working frequencies assignable to ship stations for A1A or A1B Morse telegraphy <i>e) f) p)</i>			8 371 to 8 376 <i>11 f.</i> <i>0.5 kHz</i>					
Limits (kHz)	4 202.25	6 300.25	8 376.25	12 476.75	16 683.25	18 870	22 284.25	25 172.75
Frequencies (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>d) j) m) p)</i>			8 376.5 to 8 396 <i>40 f.</i> <i>0.5 kHz</i>	12 477 to 12 549.5 <i>146 f.</i> <i>0.5 kHz</i>	16 683.5 to 16 733.5 <i>101 f.</i> <i>0.5 kHz</i>	18 870.5 to 18 892.5 <i>45 f.</i> <i>0.5 kHz</i>	22 284.5 to 22 351.5 <i>135 f.</i> <i>0.5 kHz</i>	25 173 to 25 192.5 <i>40 f.</i> <i>0.5 kHz</i>
Limits (kHz)	4 202.25	6 300.25	8 396.25	12 549.75	16 733.75	18 892.75	22 351.75	25 192.75
Calling frequencies assignable to ship stations for A1A or A1B Morse telegraphy <i>g) p)</i>								
Limits (kHz)	4 202.25	6 300.25	8 396.25	12 554.75	16 738.75	18 892.75	22 351.75	25 192.75
Frequencies (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>d) m) p)</i>				12 555 to 12 559.5 <i>10 f.</i> <i>0.5 kHz</i>	16 739 to 16 784.5 <i>92 f.</i> <i>0.5 kHz</i>			
Limits (kHz)	4 202.25	6 300.25	8 396.25	12 559.75	16 784.75	18 892.75	22 351.75	25 192.75

**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)	4 202.25	6 300.25	8 396.25	12 559.75	16 784.75	18 892.75	22 351.75	25 192.75
Frequencies (non paired) assignable to ship stations for NBDP telegraphy and data transmission systems at speeds not exceeding 100 Bd for FSK and 200 Bd for PSK and for A1A or A1B Morse telegraphy (working) <i>b) p)</i>	4 202.5 to 4 207 <i>10 f.</i> <i>0.5 kHz</i>	6 300.5 to 6 311.5 <i>23 f.</i> <i>0.5 kHz</i>	8 396.5 to 8 414 <i>36 f.</i> <i>0.5 kHz</i>	12 560 to 12 576.5 <i>34 f.</i> <i>0.5 kHz</i>	16 785 to 16 804 <i>39 f.</i> <i>0.5 kHz</i>	18 893 to 18 898 <i>11 f.</i> <i>0.5 kHz</i>	22 352 to 22 374 <i>45 f.</i> <i>0.5 kHz</i>	25 193 to 25 208 <i>31 f.</i> <i>0.5 kHz</i>
Limits (kHz)	4 207.25	6 311.75	8 414.25	12 576.75	16 804.25	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) assignable to coast stations for NBDP and data transmission systems, at speeds not exceeding 100 Bd for FSK and 200 Bd for PSK <i>d) n) o) p)</i>	4 209.5 to 4 219 <i>20 f.</i> <i>0.5 kHz</i>	6 314 to 6 330.5 <i>34 f.</i> <i>0.5 kHz</i>	8 416.5 to 8 436 <i>40 f.</i> <i>0.5 kHz</i>	12 579 to 12 656.5 <i>156 f.</i> <i>0.5 kHz</i>	16 806.5 to 16 902.5 <i>193 f.</i> <i>0.5 kHz</i>	19 680.5 to 19 703 <i>46 f.</i> <i>0.5 kHz</i>	22 376 to 22 443.5 <i>136 f.</i> <i>0.5 kHz</i>	26 100.5 to 26 120.5 <i>41 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
Frequencies assignable to coast stations for wide-band and A1A or A1B Morse telegraphy, facsimile, special and data transmission systems and direct-printing telegraphy systems								
Limits (kHz)	4 351	6 501	8 707	13 077	17 242	19 755	22 696	26 145

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)	4 351	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)</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)* In the frequency bands to be used by ship stations for A1A Morse telegraphy working at speeds not exceeding 40 Bd, administrations may assign additional frequencies interleaved between the assignable frequencies. Any frequencies so assigned shall be multiples of 100 Hz. Administrations shall ensure a uniform distribution of such assignments within the bands.
- f)* See Part B, Section V.
- g)* See Part B, Section IV.
- h)* For the conditions of use of the frequency 8 364 kHz, see Appendix 13.
- 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 and Appendix 13.
- j)* For the use of the 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 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 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 (working) (see Part B, Section II).
- n)* The 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 *j)*, *n)* and *o)*, may be used for the initial testing and the possible future introduction within the maritime mobile service of new digital technologies. Stations using these sub-bands for this purpose shall not cause harmful interference to, and shall not claim protection from, other stations operating in accordance with Article 5.

PART B – Channelling arrangements**Section I – Radiotelephony****MOD**

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. (WRC-03)

MOD

6 *a)* Maritime radiotelephone stations using single-sideband emissions in the bands between 4000 kHz and 27500 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 4000-4063 kHz and ship and coast stations, when using frequencies for single-sideband emissions in the band 8100-8195 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. (WRC-03)

SUP

APPENDIX 25 (Rev.WRC-03)

**Provisions and associated frequency allotment Plan for coast radiotelephone
stations operating in the exclusive maritime mobile bands
between 4 000 kHz and 27 500 kHz**

MOD

25/2.4 (WRC-03)

Column 1	Column 2	Column 3
Assigned frequency (carrier frequency) (channel number)	Allotment area ²	Observations ³

SUP

4

1	2	3	1	2	3	1	2	3
4 358.4 (4 357) (401)	AFS AUS CHL CKH CUB D1 DNK E GEO GRC HRV INS J KOR LVA NIU PNR PRG RUS EO RUS NW S SCG* SMO SOM TKM TUR UKR URG USA CL USA E USA SO USA W YEM	ADD	4 364.4 (4 363) (403)	AFS ARG CAN CL CAN E CAN NO CAN W DNK E GRC HWA IND E IRQ MAC MCO NOR PNR PTR RUS EO S UKR USA CL USA E USA SO USA W	ADD	(405)	<< HWA IRN LTU LVA ROU RUS AS RUS EO RUS SW SNG URG USA CL USA E USA SO USA W	ADD
		ADD			ADD			
4 361.4 (4 360) (402)	ALB ALS ARG AZE CHN G GUM HWA I IRN J KAZ MDG PNG PNR POL PTR RUS AS RUS NW THA TKM TUN USA CL USA E USA SO USA W		4 367.4 (4 366) (404)	ALS AUS B CHL SO CHN COG F IRN ISR J MCO NCL OMA PAQ POL SEN THA USA CL USA E USA W	ADD	4 373.4 (4 372) (406)	ALB ALS ARG ARS CHN CLM COG CYP E FJI FIN G GUM HWA ISL MDG PNR POL PTR TUN USA CL USA E USA SO USA W	
					ADD			
4 370.4 (4 369) (405)	AFS ALS AUS E AZE B CHL CHN CME CNR D2 F GMB GRC HOL >>		4 376.4 (4 375) (407)	AFS ALS ARG AUS BRB CAN CL CME D2 E GUM HOL HWA I IND E IRN J NOR PTR RUS AN >>	ADD			ADD
					ADD			

* Note by the Secretariat: This designation replaces the former designation "YUG" which was used previously as a three-letter code for the Administration of Serbia and Montenegro.

[illegible]

1	2	3
(410)	<< << IRN ISR MLT MTN NZL ROU SEY USA E	
4 388.4 (4 387)	AMS ARG NO BEL	ADD
(411)	E EQA FLK HKG	ADD
	I INS IRN J	ADD
	KIR RUS NW TUR UKR USA CL USA E USA W	ADD
4 391.4 (4 390)	AUS D1 EST GEO I IND W IRQ J LTU LVA RUS EO RUS NW RUS SW RUS W UKR USA E USA SO USA W YEM	
4 394.4 (4 393)	AGL ALG ALS ARG AZR BHR CAN E CAN W CPV D1 FIN	
(413)	>> >>	

1	2	3
(413)	<< << GNB GRC GUM HWA J MCO MDR PNR POR PTR RUS EO TMP UKR USA CL USA E USA SO USA W	
4 397.4 (4 396) (414)	ALS CYP D1 E FIN INS ISL J KEN PTR RUS EO RUS SW RUS W SHN USA E USA SO	
4 400.4 (4 399) (415)	ALS ARG AUS CHN DNK EST F GRC GUM HWA IRN LTU LVA MDG MLA PNR PTR ROU RUS NW RUS SW RUS W USA E USA SO USA W	

1	2	3
4 430.4 (4 429) (425)	ALS B BEL CHL DNK E GRC GUM HNG HOL HWA J JOR LBY MLA NZL PNR PTR USA CL USA E USA SO USA W	ADD
4 433.4 (4 432) (426)	AGL ALG ALS ARG AZR BUL CHN CPV CYP DNK G GNB GUM HWA J MDR MOZ NOR PNR POR PTR THA TMP USA E USA SO USA W	
4 436.4 (4 435) (427)	ALS AUS BUL CHL CHN DGA E G HWA I >>>	>>

1	2	3
(427)	<< << J MDG PAQ POR RUS AN RUS EO RUS NW SCG UAE USA CL USA E USA SO USA W VIR VTN	
4 352.4 (4 351) (428)	ARG CL ARG SO AZE CHN GRC I J OMA RUS AN RUS AS RUS EO RUS NW RUS SW RUS W TKM UKR USA SO	
4 355.4 (4 354) (429)	ALS ARG SO AUS AZE B BLR CLM DGA E G GRC GUM HKG HWA I J KAZ MDG MDW PTR RUS AS RUS EO RUS NW RUS SW RUS W >>> >>	

[illegible]

1	2	3
(602)	<< << BEL BUL CAN E CAN W EQA EST FJI GEO GHA GUM HOL HRV HWA I INS IRN KAZ KOR LTU LVA MCO MDG POL POR PTR RUS AN RUS AS RUS EO RUS NW RUS SW RUS W SNG TKM TUN TUR USA CL USA E USA SO USA W	ADD ADD ADD
6 508.4 (6 507) (603)	ALB ALG ALS ARG ARS AUS CAN NO CAN W CYP DNK E GRC GUM HNG HWA IND E INS IRN >>> >>	ADD

1	2	3
(603)	<< << IRQ ISL ISR J LBY MLT MTN PTR ROU RUS EO RUS NW S SMO UKR USA CL USA E USA SO USA W	ADD
6 511.4 (6 510) (604)	ALS ATN AUS B BUL CAN W CHL CHN CME E GUM HKG HRV HWA I INS IRN ISR MDG MTN PNG POL PTR RUS NW TUN TUR TUV USA CL USA E USA SO USA W	ADD ADD
6 514.4 (6 513) (605)	ALG ALS B BUL CAN E CAN W CNR COG >>> >>	ADD

1	2	3
(605)	<< << DNK EGY F GUM HNG HOL HRV HWA IND W INS IRN IRQ J KOR LBY MDG NZL PTR RUS EO S SVN UKR URG USA CL USA E USA SO USA W	ADD ADD
6 520.4 (6 519) (607)	ARG AUS CHN CLM CUB DGA F GRC HKG J MDG OMA RUS AN RUS EO RUS NW UAE USA SO VTN	
6 523.4 (6 522) (608)	ALS ARG CL ARG SO AUS B BLR CHN DGA E EST G GRC >>> >>	

1	2	3
(608)	<< << GUM HWA J KOR LVA MDW MOZ PTR RUS AS RUS AN RUS EO RUS NW RUS SW RUS W UKR USA E USA SO USA W	
8 720.4 (8 719) (801)	AFS ALS BHR CHL DNK E GUM HWA ISR J MLA PNR PTR ROU RUS AN S USA E USA SO USA W	
8 723.4 (8 722) (802)	AGL ALG ALS ARG AUS AZR CHN CLN CPV D2 FIN G GNB GRC HOL HWA IND E IRQ MDR >>> >>	

1	2	3
(802)	<< << MOZ POR USA E USA SO	
8 726.4 (8 725) (803)	AFS ATN BEL CAN E CUB E KOR LTU LVA PNG RUS EO RUS NW RUS SW S SEN SUI TUR USA CL	ADD
8 729.4 (8 728) (804)	ARG E FIN GRC IRQ J JOR MCO POL QAT RUS AS RUS EO SNG USA E USA SO USA W	ADD ADD
8 732.4 (8 731) (805)	AFS ALB BEL E EQA FIN HOL IRN ISL ISR J LVA NCL PNG RUS EO RUS SW USA E USA SO USA W	ADD

1	2	3
8 735.4 (8 734) (806)	ALS ARG AUS BEL BHR E GRC GUM HOL HWA I J PNR POL PTR SMA UKR USA E USA W	ADD ADD
8 738.4 (8 737) (807)	AZE CAN W CHL COG CUB CYP CZE I ISL J MDG MTN NZL RUS AN RUS AS RUS SW RUS W SHN TKM USA CL	ADD
8 741.4 (8 740) (808)	AFS ALS ARG ARS DNK E GRC GUM HWA I J ROU S USA E USA W	ADD
8 744.4 (8 743) (809)	ALG AUS W CHL CNR >>> >>	

1	2	3
(809)	<< << CUB CZE D2 FIN GRC ISL J MCO NOR SVK THA USA E USA W	
8 747.4 (8 746) (810)	ARG BUL CAN E CHN E FJI HRV INS IRN J MOZ NOR POL TUR USA E USA SO USA W	
8 750.4 (8 749) (811)	ARG ARS AUS DNK F HKG HNG HRV J NOR S SCG TUR USA E USA SO USA W	
8 753.4 (8 752) (812)	ALS ARG SO BEL CAN NO CHN E GEO HWA I INS ISR >> >>	ADD

1	2	3
(812)	<< << J LTU LVA NZL POL RUS NW USA CL USA E USA SO USA W	
8 756.4 (8 755) (813)	AGL ALG ALS AUS AZR BEL CHL NO CHN CPV DNK GNB GRC GUM HNG HWA IND W MDR MOZ NOR PNR POR PTR USA CL USA E USA SO USA W	
8 759.4 (8 758) (814)	ALS ARG AZE CAN W CUB EST GEO GRC HWA I INS J KIR LTU LVA RUS AN RUS AS RUS EO RUS SW RUS W USA CL >> >>	ADD

1	2	3
(814)	<< << USA E USA SO USA W	
8 762.4 (8 761) (815)	AUS W BEL CHL CHN D1 EST GRC IRQ J JOR MRC RUS NW RUS SW SNG USA E USA SO USA W	ADD
8 765.4 (8 764) (816)	ALS ARG BRB CHN COG E G GRC GUM HWA INS LTU LVA PTR RUS NW RUS SW RUS W TUN USA E USA SO USA W	
8 768.4 (8 767) (817)	ALS AUS CAN E CHL D1 EGY F GUM HWA IRN PNR PTR ROU RUS EO RUS SW THA >> >>	ADD

1	2	3
(817)	<< << USA CL USA E USA SO USA W YEM	
8 771.4 (8 770) (818)	ALS ARG BUL CHN CME CYP DNK GUM HWA LBY MLA PNR PTR S SEY UKR USA E USA W	
8 774.4 (8 773) (819)	ALS AZE B CAN W EST G GEO GRC GUM HWA I INS J KAZ LVA PAQ PNR RUS AN RUS AS RUS NW RUS SW THA TKM USA CL USA E USA SO USA W YEM	ADD
8 777.4 (8 776) (820)	ALS ARG CYP D1 D2 GRC >> >>	ADD

1	2	3
(820)	<< << GUM HWA I IND E IRN J PNR PTR RUS NW SMO TZA USA E USA W	
8 783.4 (8 782) (822)	AUS B CHN G HNG HRV IRN KEN MRC SUI UKR USA E USA SO USA W	ADD
8 786.4 (8 785) (823)	ARG CAN E DNK GRC I IND W IRQ J ROU RUS EO RUS NW S TMP TZA USA W	
8 789.4 (8 788) (824)	B CHN D1 GRC IRN MRC OMA POL RUS NW SNG SUI TUN USA E USA SO USA W	ADD ADD

1	2	3
8 792.4 (8 791) (825)	ALG ALS AMS ARG BRB CAN CL CKH DNK F GHA HNG IND E IRN KAZ KGZ RUS EO S TKM UKR USA E USA SO USA W	ADD ADD
8 795.4 (8 794) (826)	CAN W CHN CLM CME D2 G GUM HOL I INS J QAT UKR USA CL USA E	ADD
8 798.4 (8 797) (827)	ALS ARG DJI DNK E GUM HRV HWA IRN ISR KOR MAC NIU PNR PTR S SCG SVN USA E USA W	

1	2	3
(837)	<< << RUS W TKM UKR USA SO	
13 078.4 (13 077) (1201)	ARG CAN NO CHN CYP E G INS QAT RUS EO RUS NW RUS SW UKR USA E USA SO USA W	ADD
13 081.4 (13 080) (1202)	ARS CHL D2 FJI G GRC HNG J MRC RUS AN SUI TUN USA CL USA E USA SO USA W	
13 084.4 (13 083) (1203)	AGL ALS AUS E AZR CHN CLM CPV DNK GNB GRC HWA IRQ LBY MDR MOZ POR RUS EO S TMP USA CL USA E USA SO USA W	

1	2	3
13 087.4 (13 086) (1204)	ALS D2 F GRC GUM HWA ISR J LVA MAC NOR PNR PTR RUS SW RUS W USA E USA SO USA W	
13 090.4 (13 089) (1205)	ALS ARG D1 E GEO GUM HWA I J LTU LVA MOZ NCL NOR PTR TMP UKR USA E USA SO USA W YEM	
13 093.4 (13 092) (1206)	ALB AUS W CHN D2 E FIN G I IRN ISL J MDG MRC TUR USA E USA SO USA W	

1	2	3
13 096.4 (13 095) (1207)	AGL ALG ATN AZR BEL CAN W CHN CPV EQA GRC HOL IRN ISR J MDR MOZ POR RUS NW SCG TMP	ADD
13 099.4 (13 098) (1208)	ARG CHN CYP D1 EST GRC HNG I ISL J LTU LVA RUS SW RUS W USA E USA SO	ADD
13 102.4 (13 101) (1209)	AFS ALS B BHR CAN W E EST FIN I INS J NZL POL RUS NW RUS SW TUR USA E USA SO USA W	

1	2	3
13 105.4 (13 104) (1210)	CHL DJI DNK E GRC GUM IND W INS ROU RUS AN RUS EO S SUI URG USA E USA SO USA W	ADD
13 108.4 (13 107) (1211)	ALS B CHN CUB DNK E I IRQ J KAZ MLA NOR PAQ RUS AN RUS AS S TKM USA CL USA E USA SO USA W	
13 111.4 (13 110) (1212)	ALS DI GRC HWA INS J MAU PTR RUS EO RUS SW RUS W USA E USA SO	
13 114.4 (13 113) (1213)	ARG BEL BRB CAN E CHN CNR FIN >>>	>>

1	2	3
(1213)	<< << GRC HOL I IND E IRN IRQ ISR KOR NOR RUS AN SMO USA W	ADD
13 117.4 (13 116) (1214)	ALS AUS B CAN W CUB DNK GRC GUM HNG IRN PTR RUS EO S USA CL USA E USA SO USA W	
13 120.4 (13 119) (1215)	ALG BEL CME DNK E GRC HOL IND W ISL ISR J PNR PTR ROU S SEY USA SO USA W	
13 123.4 (13 122) (1216)	ALB ALS ARG CHN EGY FIN GUM HWA IRN MRC >>>	>>

1	2	3
(1216)	<< << PNR POL PTR SNG TUR USA E USA SO USA W	
13 126.4 (13 125) (1217)	ALG AZE BUL CUB DNK GRC GUM IND E IRQ J KAZ NOR RUS AS RUS EO S SHN USA CL USA E USA SO USA W	
13 129.4 (13 128) (1218)	ALS BEL CHL CME CNR DI GUM HWA I IRN J NIU NOR PNR PTR RUS SW TUR USA E USA SO USA W	
13 132.4 (13 131) (1219)	ALS B BEL BUL DNK HOL J LTU LVA >>>	>>

1	2	3
(1219)	<< MRC RUS EO RUS NW RUS SW RUS W S SNG UKR USA E USA SO USA W	
13 135.4 (13 134)	ALS ARG D2 FJI GRC GUM HWA IRN ISL J JOR PNR POL PTR TUN USA E USA SO USA W	ADD
13 141.4 (13 140)	ALS ARG CAN E CKH F HWA IND W IRN J NOR ROU RUS EO TUR USA W	ADD
13 144.4 (13 143)	ARS B CZE DNK GRC GUM J MRC S SVK UKR USA E USA SO USA W	

1	2	3
13 147.4 (13 146) (1224)	AFS ALS CHL DI FIN G GHA GUM HRV HWA J MCO NZL PNR PTR USA E USA W	ADD
13 150.4 (13 149) (1225)	CHN E GRC IRN JOR MDG NOR PNG ROU RUS NW USA E USA SO	ADD
13 153.4 (13 152) (1226)	AUS CHL CZE DNK F IRN J MCO RUS NW S TUR USA E USA SO USA W	ADD ADD
13 156.4 (13 155) (1227)	ALS AUS E FIN GUM HRV HWA IND E PNR POL PTR RUS EO SUI TZA USA E USA W	ADD

1	2	3
13 159.4 (13 158) (1228)	B CHL CHN CUB EST G GEO HNG I LVA MLD NOR RUS SW RUS W UKR USA CL USA E USA W	 ADD ADD
13 162.4 (13 161) (1229)	ARG AUS AZE BUL CAN E F HRV J KAZ KGZ KOR LTU LVA POL QAT RUS AN RUS AS RUS NW RUS SW RUS W USA W	 ADD
13 165.4 (13 164) (1230)	ARG CYP FIN G HWA I J MTN SUI UKR USA E USA SO USA W	
13 168.4 (13 167) (1231)	ALS AUS F GRC GUM HKG >>> >>	

1	2	3
(1231)	<< << HWA IRN LBY NOR PNR POL PRG PTR USA E USA W	
13 171.4 (13 170) (1232)	ALG ALS ARG AZE D2 G GRC GUM HWA J KAZ MTN PNR SMA TKM USA E USA W	ADD ADD
13 174.4 (13 173) (1233)	AZE B CHN CLM E G GEO GRC J LVA MLT RUS AN RUS AS RUS EO RUS NW RUS SW RUS W TKM TUR UKR USA SO VTN	
13 177.4 (13 176) (1234)	ALS AUS CHN CLM E HWA KOR MDG >> >>	

1	2	3
(1234)	<< << OMA RUS EO USA SO USA W	
13 180.4 (13 179) (1235)	ARG CHN F G HOL J KOR LVA RUS AN RUS EO RUS NW RUS SW THA TUR UKR USA SO UZB	
13 183.4 (13 182) (1236)	BRM CHN I RUS EO UAE UKR USA SO	ADD
13 186.4 (13 185) (1237)	CHN F ISR J LVA PTR RUS AS RUS SW SUI TUR UAE UKR USA CL USA E USA SO VIR	
13 189.4 (13 188) (1238)	ALS B BLR CHL CHN EST GUM HWA KOR MCO PAQ PTR RUS AN >> >>	ADD

1	2	3
(1238)	<< << RUS AS RUS EO RUS NW RUS SW TKM TUR UKR USA E USA SO USA W	
13 192.4 (13 191) (1239)	ALS AZE B BUL CAN E CHN E F GUM HWA J KAZ MDG PTR QAT RUS AN RUS AS RUS EO RUS SW RUS W SCG TKM TUR UKR USA E USA SO USA W	
13 195.4 (13 194) (1240)	ARG CL ARG SO AUS CHN DGA GRC GUM HKG HWA KGZ MDW POR PTR RUS AN RUS EO RUS NW RUS SW RUS W USA E USA SO USA W	

1	2	3
13 198.4 (13 197) (1241)	ALS CHN D2 DGA GUM HWA IND E IND W J MDW PTR UKR USA E USA W	
17 243.4 (17 242) (1601)	ALS ARG DNK HWA J LTU NOR RUS NW RUS SW RUS W S SEY TUN UKR USA E USA SO	
17 246.4 (17 245) (1602)	ARS AUS E CME G GRC MRC RUS AN RUS EO RUS SW USA E USA SO USA W	
17 249.4 (17 248) (1603)	ALS ARG NO CHN CYP DNK HNG I MLT NOR S USA E USA SO USA W	ADD

1	2	3
17 252.4 (17 251) (1604)	AUS CAN E F GRC J NOR ROU	
17 255.4 (17 254) (1605)	DNK F IND W IRN J OCE RUS SW S UKR USA E USA W	
17 258.4 (17 257) (1606)	B CUB FIN G I ISL J NZL PTR RUS SW TUR USA SO USA W	
17 261.4 (17 260) (1607)	ALS ATN CAN E GRC IND E IRN MCO NOR POL RUS EO RUS NW USA E USA SO USA W	
17 264.4 (17 263) (1608)	AFS CAN W CHN CZE DNK EQA I MTN S SVK TUR	ADD

1	2	3
17 267.4 (17 266) (1609)	ARS BEL CKH E GRC IND E ISR J RUS NW USA E USA SO USA W	
17 270.4 (17 269) (1610)	AUS CHN DI EGY INS IRN MTN NOR RUS NW TUN UKR URG USA E USA SO USA W	
17 273.4 (17 272) (1611)	B FIN G HRV J LBY MLA SUI TUR USA E USA SO USA W	
17 276.4 (17 275) (1612)	ALS AUS CUB GEO GUM HWA JOR MRC PTR RUS EO RUS NW RUS SW UKR USA E USA SO USA W	ADD

1	2	3
17 279.4 (17 278) (1613)	ALS B BEL E GRC GUM HWA IRN ISR NOR PNR PTR ROU RUS EO SNG USA E USA SO USA W	
17 282.4 (17 281) (1614)	CAN W CHN DNK FIN I MLD NIU RUS AN S	ADD
17 285.4 (17 284) (1615)	AGL AZR CPV FIN G GNB IRN ISL MDR MOZ POR RUS EO SUI TMP	
17 288.4 (17 287) (1616)	ALS DI HWA I IRN J MRC RUS NW TUR USA E USA SO USA W	
17 291.4 (17 290) (1617)	B CNR DNK F GRC >>>	>>

1	2	3
(1617)	<< HNG IRN ISR RUS EO S	<<
17 294.4 (17 293) (1618)	ARG BHR DNK G HRV IND W J MRC S TUR	
17 297.4 (17 296) (1619)	ALS D2 F GRC GUM HWA MAU NOR PNR PTR RUS EO USA E USA W	
17 300.4 (17 299) (1620)	J LBY LTU LVA NOR RUS SW RUS W TUR UKR USA CL USA E	
17 306.4 (17 305) (1622)	ALS AUS DNK F GHA GRC HWA J PNR ROU S SUI	ADD ADD ADD ADD ADD
17 309.4 (17 308) (1623)	ALS CHN E FIN G GUM >>>	>>

1	2	3
(1623)	<< HOL HWA PNR PRG PTR UKR USA E USA SO USA W	<<
17 312.4 (17 311) (1624)	DI E I J LTU LVA RUS SW RUS W SMO USA E USA SO USA W	
17 315.4 (17 314) (1625)	ALS BEL GRC GUM HWA IRN ISL J POL PTR USA E USA SO USA W	
17 318.4 (17 317) (1626)	CAN W CUB GRC HOL IRQ J QAT RUS AN RUS EO RUS NW USA E	ADD
17 321.4 (17 320) (1627)	ALS BEL E EST GRC HNG HRV J LTU LVA NOR RUS SW RUS W	ADD

1	2	3
17 324.4 (17 323) (1628)	CUB EQA F GRC IRQ ISR MCO ROU RUS EO RUS NW	ADD ADD
17 327.4 (17 326) (1629)	ALG AUS BRM CAN E D2 GRC IRN J NOR SEN	ADD
17 330.4 (17 329) (1630)	ALS BEL E GEO GUM HWA IND W ISL J LTU LVA PNR PTR RUS SW USA E USA SO USA W	
17 333.4 (17 332) (1631)	ALG BUL CHL CHN GRC IRQ POL SUI USA E	
17 336.4 (17 335) (1632)	ALS ARG AZR CYP G HNG J MDG MDR POR USA E USA SO USA W	

1	2	3
17 339.4 (17 338) (1633)	AFS ALS AZE B CHN D2 F GRC GUM HWA KAZ KGZ PNR POL PTR RUS AS TKM USA E USA W	
17 342.4 17 341 (1634)	CAN NO CHN D1 E GRC J KOR ROU	
17 345.4 (17 344) (1635)	AGL AUS AZR BUL CPV DNK GNB I J MAC MDR MOZ PNR POR S TMP	ADD ADD
17 348.4 (17 347) (1636)	ALG ALS FIN GRC GUM HOL HWA IND E J PNR PTR USA E USA W	

1	2	3
17 351.4 (17 350) (1637)	AZE CHN E G HKG KAZ KOR MDG NZL RUS AS	
17 354.4 (17 353) (1638)	ALS BUL D2 FIN GUM HWA MRC POL SCG SMA USA E USA W	ADD ADD
17 357.4 (17 356) (1639)	ALB ALS CHN D1 E GUM HOL HWA PNR PTR USA E USA W	
17 360.4 (17 359) (1640)	BRB CHL D2 EST G GRC J LVA PNR	 ADD
17 363.4 (17 362) (1641)	ALG DNK IRQ J S SNG UKR USA E USA SO USA W	
17 366.4 (17 365) (1642)	ALS AUS CLM F HWA >>> >>	

1	2	3
(1642)	<< << J PTR RUS EO UAE USA CL USA E USA SO USA W VIR	
17 369.4 (17 368) (1643)	AZE CHN CLM F KAZ QAT RUS AN RUS EO RUS NW TKM UKR USA SO	
17 372.4 (17 371) (1644)	ALS B HWA I RUS EO RUS NW UAE USA CL USA E USA SO USA W	
(17 375.4) (17 374) (1645)	ARG CHN ISR KGZ KOR LVA OMA RUS AN RUS EO RUS NW RUS SW RUS W TUR UKR USA SO UZB	
17 378.4 (17 377) (1646)	CHN I RUS EO RUS SW RUS W USA W	

1	2	3
17 381.4 (17 380) (1647)	ALS CAN E CHN EST HWA KOR LTU RUS AS RUS EO RUS NW TUR UKR USA CL USA E USA SO USA W	
17 384.4 (17 383) (1648)	ALS BLR CHN HWA KOR PTR RUS AN RUS AS RUS EO RUS NW RUS SW UKR USA CL USA W VIR	
17 387.4 (17 386) (1649)	ALS B BUL GUM HWA J MDG PTR RUS AN USA E USA SO USA W	
17 390.4 (17 389) (1650)	ALS ARG CL ARG SO AZE CHN E GRC HKG HWA J PTR RUS AN RUS NW RUS SW UKR >> >>	

1	2	3
(1650)	<< << USA E USA SO USA W	
17 393.4 (17 392) (1651)	ALS BLR CHN DGA E GUM HWA J MDW PTR RUS AN RUS EO RUS SW UKR USA E USA SO USA W	
17 396.4 (17 395) (1652)	CHN GUM HOL J MDG MDW PTR RUS AN RUS EO RUS NW RUS SW SCG TKM UKR USA E USA SO	
17 399.4 (17 398) (1653)	B CHN E PTR RUS AS RUS EO RUS NW RUS SW RUS W UKR USA E USA SO USA W VTN	
17 402.4 (17 401) (1654)	CHN G HWA J PTR RUS SW UKR >> >>	

1	2	3
(1654)	<< << USA E USA SO USA W	
17 405.4 (17 404) (1655)	ALS CHL CHN DGA E G GRC GUM HWA KGZ MDW PTR RUS AN RUS NW RUS SW TUR UKR USA E USA SO USA W	
17 408.4 (17 407) (1656)	AUS CHN GUM HWA LVA MDW PTR RUS AN RUS NW RUS SW RUS W SUI UKR USA E USA SO USA W	
19 756.4 (19 755) (1801)	ALS AUS CHN E G HWA J JOR PTR RUS AN RUS EO RUS NW TUR UAE USA CL USA E USA SO USA W VIR	

1	2	3
19 759.4 (19 758) (1802)	CHN G HOL ISL J MOZ PTR RUS NW RUS SW RUS W UKR USA CL USA E USA SO VIR	
19 762.4 (19 761) (1803)	ALS AZE B CHN G HWA J JOR KOR LTU POR PTR RUS EO RUS NW RUS SW TKM UAE UKR USA CL USA E USA W VIR	
19 765.4 (19 764) (1804)	ALS CAN W CHN D2 HWA J RUS EO S TUR USA SO USA W	
19 768.4 (19 767) (1805)	ALS CHN HWA I J LVA RUS EO RUS SW RUS W TUR USA W	ADD

1	2	3
19 774.4 (19 773) (1807)	ARG CL ARG SO CHN D2 GEO ISL J LVA RUS AN RUS EO RUS NW RUS SW TKM TUR USA SO	
19 777.4 (19 776) (1808)	ALS BLR CHN CUB HWA ISR MCO MDG PTR RUS AN RUS AS RUS EO RUS NW TUR UKR USA CL USA E USA SO USA W VIR	ADD
19 780.4 (19 779) (1809)	ALS B CHN E GRC GUM HWA POL RUS NW RUS W SUI TUR UKR USA E USA SO USA W	ADD
19 783.4 (19 782) (1810)	ALS ARG BUL CHN EST HKG HWA >> >>	

1	2	3
(1810)	<< << J LTU PTR RUS AN RUS AS RUS SW UKR USA W	
19 786.4 (19 785) (1811)	ALS B CAN E CHN DGA GRC GUM HWA J KOR MDG MDW PTR RUS EO RUS NW TUR UKR USA E USA SO USA W	
19 789.4 (19 788) (1812)	ALS ARG AZE CAN E CHN HWA J PTR RUS EO RUS NW SCG TUR UKR USA E USA SO USA W	
19 792.4 (19 791) (1813)	ALS CHN E F HWA IND E IND W J PTR S TUR USA E USA SO USA W	ADD

1	2	3
19 795.4 (19 794) (1814)	ALS AUS AZE B CHN DGA E GUM HWA ISL MDW PTR RUS EO RUS NW SCG TUR USA E USA SO USA W	
19 798.4 (19 797) (1815)	ARG CL ARG SO AZE BLR CHN GUM J KAZ PTR RUS AN RUS AS RUS EO RUS NW RUS SW TKM UKR USA E USA SO USA W	
22 697.4 (22 696) (2201)	AUS CHN CME E GRC GUM HNG RUS NW USA E USA SO USA W	
22 700.4 (22 699) (2202)	ARG BRM CAN E HNG I IRN MTN NOR RUS EO UKR	ADD

1	2	3
22 703.4 (22 702) (2203)	AUS E BUL DNK IRN J MRC PNR S	ADD
22 706.4 (22 705) (2204)	AFS ARG CAN NO F FIN HRV ISR RUS EO RUS NW	
22 709.4 (22 708) (2205)	ALG AUS EST GRC HOL IRN LTU LVA RUS EO RUS NW RUS W USA E USA SO USA W	
22 712.4 (22 711) (2206)	AFS ALS BHR G GUM HRV HWA IND W J MRC POL PTR USA E USA SO USA W	ADD
22 715.4 (22 714) (2207)	AZR CHN CPV D1 ISR LVA MDR POR RUS SW TMP TUN	

1	2	3
22 718.4 (22 717) (2208)	ARG NO BUL DNK I IND E J MRC NOR PNR S	ADD ADD
22 721.4 (22 720) (2209)	ALS BEL CHN GRC GUM HWA KOR MRC PNR POL PTR RUS NW USA E USA W	
22 724.4 (22 723) (2210)	E FIN GRC HOL J UKR USA E	
22 727.4 (22 726) (2211)	CHN CUB DNK I J S UKR	
22 730.4 (22 729) (2212)	ALS AUS CYP G GUM HNG HWA MCO PNR PTR SNG USA E USA W	ADD
22 733.4 (22 732) (2213)	BUL CAN E DNK E GEO IRQ LBY >>>	>>

1	2	3
(2213)	<< << LTU NZL RUS EO RUS SW RUS W S TUR	
22 736.4 (22 735) (2214)	BEL CHN E FIN IRN RUS NW SUI TUR URG USA E USA SO USA W	
22 739.4 (22 738) (2215)	CHN F GHA GRC IRQ J NOR POL USA E USA SO USA W	ADD
22 742.4 (22 741) (2216)	CAN W DNK GRC GUM I J MTN USA E USA SO	
22 745.4 (22 744) (2217)	ALS D1 E GRC GUM HKG HWA IRN ISR PNR PTR USA E USA W	
22 748.4 (22 747) (2218)	ALS CHN CYP DNK F >>>	>>

1	2	3
(2218)	<< << GUM HWA PTR S UKR USA E USA SO USA W	
22 751.4 (22 750) (2219)	BEL CHN CUB GRC MCO POL SMO	
22 754.4 (22 753) (2220)	CAN W CHN CZE D2 G GRC SEN SUI SVK	ADD
22 760.4 (22 759) (2222)	ARS AZR CPV D1 FIN GRC KOR MDR MLD POR TMP USA E USA SO USA W	ADD
22 763.4 (22 762) (2223)	ALS AUS D1 HWA I J MLT PTR TUR USA E USA W	ADD
22 766.4 (22 765) (2224)	ALS D2 E GRC GUM HWA IRQ MAU >>>	>>

1	2	3
(2224)	<< PNR PTR USA E USA W <<	
22 769.4 (22 768) (2225)	ALG BEL CHL GRC IND W ISL J	
22 772.4 (22 771) (2226)	ALB ALS CHN D2 EGY F HWA ISL JOR ROU USA W	ADD ADD ADD
22 775.4 (22 774) (2227)	ALG G GRC IND E J UKR USA E USA SO USA W	
22 778.4 (22 777) (2228)	AUS DNK GRC MRC QAT RUS EO S USA E USA W	ADD
22 781.4 (22 780) (2229)	CAN E E G IND W J UKR	
22 784.4 (22 783) (2230)	ALS AUS AZE D2 E GUM HWA KAZ KGZ PNR PTR >> >>	

1	2	3
(2230)	<< RUS AS S TUR USA E USA W <<	
22 787.4 (22 786) (2231)	ALS ARS CAN W EST F FIN GRC J LVA MLA NIU RUS SW USA E USA SO USA W	
22 790.4 (22 789) (2232)	CUB GEO GRC HOL IRQ LTU LVA POL RUS EO RUS SW RUS W SUI	
22 793.4 (22 792) (2233)	ALS CKH GRC GUM HWA IRN NOR PNR PTR ROU USA E USA SO USA W	ADD
22 796.4 (22 795) (2234)	ARG DNK INS J LBY NOR ROU S	
22 799.4 (22 798) (2235)	ALS F GRC GUM >> >>	

1	2	3
(2235)	<< HWA IRN J PTR QAT RUS NW USA E USA SO USA W <<	ADD
22 802.4 (22 801) (2236)	DNK E GRC IRQ J NZL UKR USA E USA W	
22 805.4 (22 804) (2237)	AZR CHN I IRN J MDR NOR POR ROU USA E USA SO USA W	
22 808.4 (22 807) (2238)	ALG AUS B D1 GRC HNG IRQ J LTU LVA RUS SW RUS W	
22 811.4 (22 810) (2239)	ALS BEL CHN E GUM HRV HWA IND E IRN NOR PNR PTR USA E USA W	

1	2	3
22 814.4 (22 813) (2240)	CHL GRC J MDG NOR TUN	
22 817.4 (22 816) (2241)	ALS AZE CHN CLM GEO HKG HWA J PTR RUS EO RUS NW RUS SW TUR UKR USA CL USA E USA SO USA W VIR VTN	
22 820.4 (22 819) (2242)	BLR CLM RUS AN RUS AS RUS EO RUS NW RUS SW RUS W UKR USA SO	
22 823.4 (22 822) (2243)	ALS AUS B BUL HWA J KOR PTR RUS EO RUS W UAE USA CL USA E USA SO USA W VIR	
22 826.4 (22 825) (2244)	ALS HWA I J RUS AN >> >>	

1	2	3
(2244)	<< << RUS EO UKR USA W	
22 829.4 (22 828) (2245)	ALS ARG CL ARG SO CHN E HWA J RUS EO UAE USA SO USA W	
22 832.4 (22 831) (2246)	B J KGZ KOR LVA RUS EO RUS SW RUS W SUI TUR USA SO	
22 835.4 (22 834) (2247)	ALS CAN E HWA J RUS AN RUS AS RUS EO RUS NW RUS SW UKR USA CL USA E USA SO USA W VIR	
22 838.4 (22 837) (2248)	ALS CHN E HWA PTR USA E USA SO USA W	
22 841.4 (22 840) (2249)	ALS CHN HWA I J PTR RUS EO RUS NW RUS W >> >>	

1	2	3
(2249)	<< << UKR USA E USA SO USA W	
22 844.4 (22 843) (2250)	ALS AZE B DGA E GRC GUM HWA KAZ KOR MDW PTR RUS EO RUS NW RUS SW SCG TKM TUR UKR USA E USA SO USA W	
22 847.4 (22 846) (2251)	ALS B BLR CHN GUM HWA J MCO MDW PTR RUS AN RUS NW RUS SW TUR UKR USA E USA SO USA W	ADD
22 850.4 (22 849) (2252)	ALS G GUM HWA J LVA PTR RUS NW RUS SW TKM UAE UKR >> >>	

1	2	3
(2252)	<< << USA E USA SO USA W	
22 853.4 (22 852) (2253)	ALS AUS AZE CHN DGA E G GEO GRC GUM HWA J KAZ MDW PTR RUS NW RUS W TKM UKR USA E USA SO USA W	
26 146.4 (26 145) (2501)	ALS AZE B CAN E CHN DI HNG HWA JOR RUS EO SCG TUR UKR USA CL USA E USA SO USA W	
26 149.4 (26 148) (2502)	ALS AUS BLR CHN G HWA J MOZ PTR RUS EO RUS SW UKR USA CL USA E USA SO USA W VIR	

1	2	3
26 152.4 (26 151) (2503)	ARG CL BUL CHN J RUS EO SUI UAE USA SO	
26 155.4 (26 154) (2504)	ALS ARG SO B BLR CHN HWA J PTR RUS AN RUS AS RUS EO RUS NW RUS SW TKM UKR USA CL USA E USA SO USA W VIR	
26 158.4 (26 157) (2505)	ALS B CHN E GUM HWA IND E IND W ISR PTR RUS EO RUS NW RUS SW RUS W TUR UKR USA E USA SO USA W	
26 161.4 (26 160) (2506)	ALS ARG CHN HWA I J S TUR USA SO USA W	ADD

1	2	3
26 164.4 (26 163) (2507)	ALS ARG AZE CAN E CHN DGA E GRC GUM HKG HWA J KAZ MDW PTR RUS EO TKM TUR UKR USA E USA SO USA W	
26 167.4 (26 166) (2508)	ALS AUS B CAN W CHN DGA GRC GUM HNG JOR MDW POR PTR RUS EO RUS SW TUR UKR USA E USA SO USA W	
26 170.4 (26 169) (2509)	ALS ARG CL ARG SO CHN D2 GUM HWA J MDW PTR RUS EO S TUR USA E USA SO USA W	ADD

MOD

10 Special section No./Weekly Circular or BR IFIC No./Date (e.g. MAR/10/1305/280278). (WRC-03)

1	2	3		4	5	6	7				8	9		10
		3.1	3.2				7.1	7.2 a)	7.2 b)	7.2 c)		9a)	9b)	
401	AUS	12	800	CV	J3E	20.0	ND				2200-1000	2200-1000	30	MAR/54/1640/021084
401	PNR	9, 18	500	CP	J3E	30.0	ND				0000-1200		25	AR16/84/1838/160888
403	CAN CL	2, 16	1000	CV	J3E	30.0	ND				0000-2359	0800-2000	360	AR16/120/2318/100398
403	PNR	9, 18	500	CP	J3E	30.0	ND				0800-1200		25	AR16/84/1838/160888
404	MCO	17	300	CP	J3E	40.0	ND				0700-2200	0800-1000 1500-1700	50	AP25/125/2379/250599
405	USA CL	16	800	CP	J3E	30.0	ND				1100-2300	1200-1800	180	MAR/50/1609/280284
407	AUS	11, 12	800	CO/CP	J3E	15.0	ND				2300-1100			
407	I	17	1200	CO	J3E	37.0	ND				0000-2400			MAR/48/1602/100184
408	B	18, 20	800	CV	J3E	21.8	ND				0000-2400		120	MAR/69/1712/040386
408	CHN	5	200	OT	J3E	26.0	D	340	60	3	1100-1900	1200-1300	190	
408	MLD	6	—	CO	J3E	30.0	D	300	120	5	0000-2400			AR16/79/1816/150388
408	SMA	8, 12, 13	1000	CP	J3E	30.0	ND				1800-0400		30	MAR/10/1305/280278
409	GHA	19	500	CP	J3E	30.0	ND				0000-2359			AR16/114/2237/230796
409	QAT	6	2500	CP	J3E	30.0	ND	110	30	10				
411	AMS	10	—	CP	J3E	24.8	ND	330	30	10	0000-2400			AR16/89/1886/250789
411	EQA	9	800	CP	J3E	24.0	ND				0430-0445		25	MAR/15/1347/191278
411	I	17	—	CO	J3E	31.8	ND				0830-0845			
411	KIR	7, 8	500	CP	J3E	27.0	ND				1230-1245			
416	ARG CL	14, 20	1000	CP	J3E	30.0	D	90	60	2	0000-2400	1100-1700	490	
417	TZA	6, 10, 19, 21	3200	CO/CP	J3E	37.0	ND				0700-1800	0800-1000 1500-1700	240	MAR/66/1707/280186
418	B	18, 20	800	CV	J3E	21.8	ND				0000-2400	0700-1100	240	MAR/69/1712/040386
418	I	17	—	CO	J3E	31.8	ND				0500-2200	0700-1100	60	AR16/75/1747/041186
419	TZA	6, 10, 19, 21	3200	CO/CP	J3E	37.0	ND				0700-1800	0800-1000 1500-1700	240	MAR/57/1680/160785
422	SUI	15, 17	4000	CP	J3E	37.0	D	ROT	30	8	1900-0200	2000-2200	20	MAR/62/1694/221085
423	B	18, 20	800	CV	J3E	27.0	ND				0000-2400			MAR/16/1350/160179
423	MLT	6, 15, 17	3000	CP	J3E	31.8	ND				1700-0500	2000-2100	60	MAR/41/1565/190483
423	QAT	6	800	CP	J3E	37.0	ND				0000-2400		200	MAR/23/1412/010480
		6	1500	CP	J3E	37.0	D	130	60	9	0000-2400		200	
		6	1500	CP	J3E	37.0	D	200	60	9	0000-2400		200	
		6	1500	CP	J3E	37.0	D	310	60	9	0000-2400		200	
424	AUS E	12	800	CO/CP	J3E	30.0	ND				0000-2400			MAR/48/1602/100184
424	PNR	9, 18	500	CP	J3E	30.0	ND				0800-1200		25	AR16/73/1742/300986
425	B	18, 20	800	CV	J3E	27.0	ND				1000-2300	1900-2200	100	MAR/16/1350/160179
425	JOR	6, 15, 17	5000	CP	J3E	37.0	ND				1700-0500			MAR/49/1604/240184
601	I	17	—	CO	J3E	31.8	ND				0400-2200	0600-1400	60	AR16/75/1747/041186
601	MLD	6	—	CO	J3E	30.0	D	300	120	5	0000-2400			AR16/79/1816/150388
601	NCL	7, 8, 12	2500	CP	J3E	27.0	ND				0000-2400			AR16/71/1737/260886
602	AUS E	12	1000	CV	J3E	26.0	ND				0000-2359	1900-0700		AP25/128/2406/301199

1	2	3		4	5	6	7				8	9		10
		3.1	3.2				7.1	7.2 a)	7.2 b)	7.2 c)		9a)	9b)	
602	B	18, 20	800	CP	J3E	30.0	ND				0000-2400			MAR/69/1712/040386
602	EQA	9	800	CP	J3E	24.0	ND				0630-1000		30	AR16/90/1895/260989
602	FJI	12	1 000	CP	J3E	30.0	ND				1800-0600	2000-0500	120	MAR/37/1519/180582
602	GHA	19	500	CP	J3E	30.0	ND				0000-2359			AR16/114/2237/230796
							D	110	30	10				
							D	330	30	10				
603	AUS	11, 12	4 000	CP	J3E	30.0	ND				0000-2400	2100-0900	30	MAR/55/1651/181284
603	MLT	6, 15, 17	3 000	CP	J3E	31.8	ND				0500-1700	0900-1100	60	MAR/41/1565/190483
604	ATN	18	1 500	CP	J3E	30.0	ND				0000-0200		120	MAR/35/1495/171181
											0600-1000			
604	B	18, 20	800	CP	J3E	30.0	ND				1000-1300			MAR/69/1712/040386
											1700-2000			
604	TUV	8, 12	450	CP	J3E	30.0	ND				1800-1200	2000-0400	30	AR16/91/1897/101089
605	B	18, 20	800	CP	J3E	30.0	ND				1000-1300			MAR/69/1712/040386
											1700-2000			
605	F	15, 17	2 500	CP	J3E	40.0	ND				0600-0900	1800-2200	300	MAR/56/1679/090785
											1700-2200			
605	NZL	7, 8, 11, 12, 13	6 000	CP	J3E	37.0	ND				0000-2400	0400-0900	90	MAR/63/1695/291085
803	SUI	15, 16, 17, 18, 19	6 000	CP	J3E	40.0	D	ROT	30	8	0600-0200	0600-1000	50	MAR/62/1694/221085
											1700-2200			
804	JOR	6, 15, 17	5 000	CP	J3E	37.0	ND				0500-1700			MAR/49/1604/240184
804	QAT	6	1 500	CP	J3E	37.0	ND				0000-2400		200	MAR/23/1412/010480
		6	2 500	CP	J3E	37.0	D	130	60	10	0000-2400		200	
		6	2 500	CP	J3E	37.0	D	200	60	10	0000-2400		200	
		6, 17	2 500	CP	J3E	37.0	D	310	60	10	0000-2400		200	
805	EQA	9	800	CP	J3E	24.0	ND				1130-1730		30	AR16/90/1895/260989
806	AUS	11	2 000	CP	J3E	30.0	ND				2100-0500	2100-0500	90	MAR/52/1631/310784
806	SMA	8, 12, 13	3 000	CP	J3E	30.0	ND				1800-0400		30	MAR/11/1310/040478
807	I	15, 17	–	CO	J3E	31.8	ND				0000-2400	0500-1300	60	AR16/75/1747/041186
808	I	15, 17	–	CO	J3E	31.8	ND				0000-2400	1300-2100	60	AR16/75/1747/041186
812	I	15, 17	–	CO	J3E	31.8	ND				0000-2400	2100-0500	60	AR16/75/1747/041186
814	KIR	7, 8	500	CP	J3E	27.0	ND				1800-0800			MAR/65/1702/171285
815	JOR	6, 17	3 000	CP	J3E	37.0	ND				0700-2000	0800-1200	60	AR16/100/2084/060793
817	PNR	9, 18	2 000	CP	J3E	30.0	ND				1200-2300		25	AR16/84/1838/160888
819	PNR	9, 18	2 000	CP	J3E	30.0	ND				1200-2300		25	AR16/84/1838/160888
820	D2	6, 15, 16, 17, 18, 19	6 000	CP	J3E	40.0	ND				0400-2000		30	AR16/82/1827/310588
820	TZA	6, 10, 19, 21	3 200	CO/CP	J3E	37.0	ND				0700-1800	0800-1000	240	MAR/66/1707/280186
											1500-1700			
822	AUS	11, 12	3 000	CP	J3E	30.0	ND				2100-0900	2100-0900	90	MAR/64/1696/051185
823	TZA	6, 10, 19, 21	3 200	CO/CP	J3E	30.0	ND				0700-1800	0800-1000	240	MAR/66/1707/280186
											1500-1700			
823	USA W	9	1 200	CO	J3E	30.0	ND				1600-0400	1600-1800	180	AR16/92/1910/230190
											0000-0200			
825	AMS	10	–	CP	J3E	24.8	ND				0445-0500		25	MAR/15/1347/191278
											0845-0900			
825	GHA	19	500	CP	J3E	30.0	ND				1245-1300			AR16/114/2237/230796
							D	110	30	10	0000-2359			
							D	330	30	10				

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		3.1	3.2				7.1	7.2 a)	7.2 b)	7.2 c)			9a)	9b)	
825	S	5, 15 5, 15 6, 10, 17 6, 10, 17, 19, 21 15, 16, 17, 18, 19, 21 15, 16, 18, 19 15, 16	—	CP	J3E	40.0 D 40.0 D 40.0 D 40.0 D 40.0 D 40.0 D 40.0 D	D D D D D D D	10 50 130 170 210 250 310	60 60 60 60 60 60 60	11 11 11 11 11 11 11	0000-2400 0000-2400 0000-2400 0000-2400 0000-2400 0000-2400 0000-2400	0800-1000 0800-1000 0800-1000 0800-1000 0800-1000 0800-1000 0800-1000	90 90 90 90 90 90 90		AR16/70/1730/080786
826	QAT	6	2500	CP	J3E	30.0	ND				0000-2400				AR16/89/1886/250789
829	BRM	5, 6, 7	3300	CP	J3E	24.0	ND				2330-1130	0330-0430	30		AR16/112/2223/160496
829	MLD	6	—	CO	J3E	30.0	D	300	120	5	0000-2400				AR16/79/1816/150388
830	CHN	5, 6, 7, 8	8000	CP	J3E	38.5	ND				0000-2400	0000-0800	400		AP25/125/2379/250599
830	MCO	15, 17	800	CP	J3E	40.0	ND				0700-2200	0800-1000 1500-1700	50		
1201	QAT	6	2500	CP	J3E	30.0	ND				0400-0600 1400-1600				AR16/89/1886/250789
1207	EQA	9	800	CP	J3E	24.0	ND				1830-2330		30		AR16/90/1895/260989
1208	I	6, 15, 16, 17, 18	—	CO	J3E	31.8	ND				0300-2200	0600-1100	30		AR16/75/1747/041186
1210	SUI	6, 10, 15, 16, 17, 18, 19, 20, 21	9000	CP	J3E	40.0	D	ROT	30	8	0600-0200	0800-1200 1600-2100	60		MAR/62/1694/221085
1213	USA W	9	1600	CO	J3E	30.0	ND				1800-2300	2100-2200	180		AR16/95/1996/011091
1220	D2	6, 15, 16, 17, 18, 19	6000	CP	J3E	40.0	ND				0400-2000		30		AR16/82/1827/310588
1220	JOR	6, 15, 17	5000	CP	J3E	37.0	ND				0500-1700				MAR/49/1604/240184
1222	ALS	4	1600	CO	J3E	30.0	ND				2000-0100	2300-2400	180		AR16/95/1996/011091
1222	USA W	9	1600	CO	J3E	30.0	ND				1800-2300	2100-2200	180		AR16/95/1996/011091
1224	GHA	19	500	CP	J3E	30.0	ND				0000-2359				AR16/114/2237/230796
							D	110	30	10					
							D	330	30	10					
1225	JOR	6, 10	5000	CP	J3E	37.0	D	144	60	9	0900-1700	1300-1500	30		AR16/100/2084/060793
1226	MCO	01, 02, 06, 15, 16, 17, 18, 19	6000	CP	J3E	40.0	ND				0700-2200	0800-1000 1500-1700	50		AP25/125/2379/250599
1226	S	5, 15 5, 15 6, 10, 17 6, 10, 17, 19, 21 15, 16, 17, 18, 19, 21 15, 16, 18, 19 15, 16	—	CP	J3E	40.0 D 40.0 D 40.0 D 40.0 D 40.0 D 40.0 D 40.0 D 40.0 D	D D D D D D D D	10 50 130 170 210 250 310	60 60 60 60 60 60 60 60	11 11 11 11 11 11 11 11	0000-2400 0000-2400 0000-2400 0000-2400 0000-2400 0000-2400 0000-2400 0000-2400	0800-1000 0800-1000 0800-1000 0800-1000 0800-1000 0800-1000 0800-1000 0800-1000	90 90 90 90 90 90 90 90		AR16/70/1730/080786
1227	TZA	6, 10, 19, 21	3200	CO/CP	J3E	37.0	ND				0700-1800	0800-1000 1500-1700	240		MAR/66/1707/280186
1228	I	6, 15, 16, 17, 18	—	CO	J3E	31.8	ND				2200-0500	2300-0200	30		AR16/75/1747/041186
1228	MLD	6	—	CO	J3E	30.0	D	300	120	5	0000-2400				AR16/79/1816/150388
1229	QAT	6, 17	2000	CP	J3E	37.0	ND				0400-0600 1400-1600		200		MAR/23/1412/010480
		6	3000	CP	J3E	37.0	D	130	60	11	0400-0600 1400-1600				
		6, 17	3000	CP	J3E	37.0	D	200	60	11	0400-0600 1400-1600				
		6, 17	3000	CP	J3E	37.0	D	310	60	11	0400-0600 1400-1600				
1232	PNR	9, 14, 16, 18	4000	CP	J3E	30.0	ND				1200-2400		25		AR16/84/1838/160888
1232	SMA	8, 12, 13	3000	CP	J3E	30.0	ND				1800-0400		30		MAR/11/1310/040478
1236	BRM	5, 6, 7	3300	CP	J3E	24.0	ND				2330-1130	0330-0430	30		AR16/112/2223/160496
1238	MCO	15, 16, 17	5000	CP	J3E	40.0	ND				0700-2200	0800-1600	120		AP25/129/2445/290501
1603	MLT	15, 17	3000	CP	J3E	31.8	ND				0000-1159				MAR/21/1379/070879

1	2	3		4	5	6	7				8	9		10
		3.1	3.2				7.1	7.2 a)	7.2 b)	7.2 c)		9a)	9b)	
1608	EQA	9, 14	800	CP	J3E	27.0	ND				1800-2300	2000-2300	40	AR16/111/2221/020496
1612	JOR	6, 10	6000	CP	J3E	37.0	D	144	60	9	1000-1600	1300-1500	20	AR16/100/2084/060793
1614	MLD	6	—	CO	J3E	30.0	D	300	120	5	0000-2400			AR16/79/1816/150388
1622	ALS	4	2400	CO	J3E	30.0	ND				2000-0600	0200-0300	180	AR16/95/1996/011091
1622	GHA	19	500	CP	J3E	30.0	ND				0000-2359			AR16/114/2237/230796
1622	HWA	8	2400	CO	J3E	30.0	ND				2000-0600	0200-0300	180	AR16/95/1996/011091
1622	PNR	9, 14, 16, 18	4000	CP	J3E	30.0	ND				1200-2400		25	AR16/84/1838/160888
1622	SUI	3,4,5,6,7,9,10,15,16,17,18,19,20,21	10000	CP	J3E	40.0	D	ROT	30	8	0600-0200	0800-1700	60	MAR/62/1694/221085
1626	J	3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14	—	CR	J3E	37.0	ND				0000-2400	0800-1000	500	
1626	QAT	6, 17	4000	CP	J3E	40.0	ND				0600-0800		200	MAR/23/1412/010480
		6	6000	CP	J3E	40.0	D	130	60	11	1200-1400			
		6, 10, 17	6000	CP	J3E	40.0	D	200	60	11	0600-0800			
		6, 15, 17	6000	CP	J3E	40.0	D	310	60	11	1200-1400			
1627	ALS	4	2400	CO	J3E	30.0	ND				2000-0600	0200-0300	180	AR16/95/1996/011091
1628	EQA	9, 14	800	CP	J3E	27.0	ND				1800-2300	2000-2300	40	AR16/111/2221/020496
1628	MCO	01, 02, 06, 15, 16, 17, 18, 19	6000	CP	J3E	40.0	ND				0700-2200	0800-1000	50	AP25/125/2379/250599
1629	BRM	5, 6, 7	3300	CP	J3E	24.0	ND				2330-1130	0330-0430	30	AR16/112/2223/160496
1630	J	3,4,5,6,7,8,9,10,11,12,13,14	—	CR	J3E	37.0	ND				0000-2400	0300-0700	650	
1634	CHN	8, 9, 10, 11, 12, 13, 14, 15, 17, 19, 20, 21	19 000	CP	J3E	40.0	ND				0000-1000	0200-0600	200	
1635	I	5, 6, 7, 9, 10, 14, 15, 16, 18, 20, 21	—	CO	J3E	31.8	ND				0400-2400	0600-1600	30	AR16/75/1747/041186
1635	PNR	9, 14, 16, 18	4000	CP	J3E	30.0	ND				1500-2400		25	AR16/84/1838/160888
1637	CHN	8, 9, 10, 11, 12, 13, 14, 15, 17, 19, 20, 21	19000	CP	J3E	40.0	ND				0000-1000	0200-0600	200	
1638	SMA	8, 12, 13	4000	CP	J3E	30.0	ND				1800-0400		30	MAR/10/1305/280278
1638	D2	6, 15, 16, 17, 18, 19	6000	CP	J3E	40.0	ND				0400-2000		30	AR16/82/1827/310588
1639	CHN	5	800	OT	J3E	31.8	D	90	60	3	0000-1200	0100-0230	300	
1640	PNR	9, 14, 16, 18	4000	CP	J3E	30.0	ND				1500-2400		25	AR16/84/1838/160888
1804	S	06, 15, 16, 17, 18, 19	7000	CP	J3E	38.5	ND				0000-2359	0600-1900	120	AP25/126/2388/270799
1808	MCO	15, 16, 17	5000	CP	J3E	40.0	ND				0700-2200	0800-1600	120	AP25/129/2445/290501
1809	POL	5, 11, 21	20000	CP	J3E	40.0	ND				0000-2230	1730-2230	90	AR16/119/2310/130198
1813	S	06, 15, 16, 17, 18, 19	7000	CP	J3E	38.5	ND				0000-2359	0600-1900	120	AP25/130/2445/290501
2202	BRM	5, 6, 7	3300	CP	J3E	24.0	ND				2330-1130	0330-0430	30	AR16/112/2223/160496
2203	PNR	9, 14, 16, 18	4000	CP	J3E	30.0	ND				1500-2400		25	AR16/84/1838/160888
2206	BHR	6, 10, 15, 17, 19, 21	—	CP	J3E	34.8	ND				0000-2359			AR16/100/2084/060793
2208	I	5, 6, 7, 9, 10, 14, 15, 16, 18, 20, 21	—	CO	J3E	31.8	ND				0500-2400	0700-2200	30	AR16/75/1747/041186

1	2	3		4	5	6	7				8	9		10
		3.1	3.2				7.1	7.2 a)	7.2 b)	7.2 c)		9a)	9b)	
2208	PNR	9, 14, 16, 18	4000	CP	J3E	30.0	ND				1200-2400		25	AR16/84/1838/160888
2209	CHN	4, 9, 10, 11, 12, 13, 14, 15, 17, 19, 20, 21	19000	CP	J3E	40.0	ND				0000-1000	0200-0600	200	
2211	CHN	4, 9, 10, 11, 12, 13, 14, 15, 17, 19, 20, 21	18000	CP	J3E	40.0	ND				0000-1000	0200-0600	240	
2212	MCO	01, 02, 06, 10, 15, 16, 17, 18, 19, 20, 21	8000	CP	J3E	40.0	ND				0700-2200	0800-1000 1400-1600	50	AP25/125/2379/250599
2215	CHN	4, 9, 10, 11, 12, 13, 14, 15, 17, 19, 20, 21	19000	CP	J3E	40.0	ND				0000-1000	0200-0600	200	
2215	GHA	19	500	CP	J3E	30.0	ND D D	110 330	30 30	10 10	0000-2359			AR16/114/2237/230796
2218	CHN	4, 9, 10, 11, 12, 13, 14, 15, 17, 19, 20, 21	19000	CP	J3E	40.0	ND				0000-1000	0200-0600	200	
2220	CHN	4, 9, 10, 11, 12, 13, 14, 15, 17, 19, 20, 21	19000	CP	J3E	40.0	ND				0000-1000	0200-0600	240	
2220	SUI	6, 10, 18, 20, 21	14000	CP	J3E	40.0	D	ROT	70	8,5	0600-1800	0900-1600	60	MAR/27/1431/120880
2222	MLD	6	—	CO	J3E	30.0	D	300	120	5	0000-2400			AR16/79/1816/150388
2223	MLT	15, 17	3000	CP	J3E	31.8	ND				0000-1159			MAR/20/1372/190679
2226	ALS	4	2400	CO	J3E	30.0	ND				2000-0400	0100-0200	180	AR16/95/1996/011091
2226	HWA	8	2400	CO	J3E	30.0	ND				2000-0400	0100-0200	180	AR16/95/1996/011091
2226	JOR	6, 10, 11	8000	CP	J3E	37.0	D	144	60	9	1100-1400			AR16/100/2084/060793
2226	USA W	9	2400	CO	J3E	30.0	ND				1800-0200	2300-2400	180	AR16/95/1996/011091
2228	QAT	6, 10, 11	2500	CP	J3E	33.0	D	140	60	10	0000-1800	0400-1100		AR16/96/1997/081091
2233	GRC	17	2600	CO	J3E	30.0	ND				0500-2200	0600, 1000, 2200	30	MAR/51/1621/220584
2235	QAT	6, 17 6, 10, 11 6, 10, 17, 21 17, 15	5000 8000 8000 8000	CP CP CP CP	J3E J3E J3E J3E	40.0 40.0 40.0 40.0	ND D D D	130 200 310	60 60 60	11 11 11	0800-1200 0800-1200 0800-1200		200 200 200 200	MAR/23/1412/010480
2237	CHN	4, 9, 10, 11, 12, 13, 14, 15, 17, 19, 20, 21	19000	CP	J3E	40.0	ND				0000-1000	0200-0600	200	
2239	CHN	7	2700	CP	J3E	20.0	ND				0100-0930	0200-0400	280	
2251	MCO	15, 16, 17	5000	CP	J3E	40.0	ND				0700-2200	0800-1600	120	AP25/129/2445/290501
2506	S	06, 15, 16, 17, 18, 19	7000	CP	J3E	38.5	ND				0000-2359	0600-1900	120	AP25/130/2445/290501
2509	S	06, 15, 16, 17, 18, 19	7000	CP	J3E	38.5	ND				0000-2359	0600-1900	120	AP25/126/2388/270799

APPENDIX 27 (Rev.WRC-03)*

**Frequency allotment Plan for the aeronautical mobile (R)
service and related information****MOD**

27/17 1.6 The arrangements contemplated in Nos. **27/15** and **27/16** should be made under the Articles of the Constitution and Convention of the International Telecommunication Union and the Radio Regulations entitled “Special agreements”*. (WRC-03)

SUP

27/29

MOD

* *Note by the Secretariat:* This edition of Appendix **27** incorporates editorial amendments to the Appendix **27** Aer2 as adopted by the WARC-Aer2.

The references in Appendix **27** now conform to the new numbering scheme of the Radio Regulations. In addition, the text of Appendix **27** contains updated definitions of the relevant aeronautical areas conforming with the new geographical situation reflecting the political changes since 1979. It also contains updated references to the classes of emissions in accordance with Article 2.

MOD

APPENDIX 30 (Rev.WRC-03)*

Provisions for all services and associated Plans and List 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)

(See Articles 9 and 11 of the Radio Regulations) (WRC-03)

ADD

** The Regions 1 and 3 List of additional uses is annexed to the Master International Frequency Register (see Resolution 542 (WRC-2000)). (WRC-03)

ARTICLE 1 (WRC-2000)

General definitions

MOD

1.8 *Regions 1 and 3 List of additional uses (hereafter called in short the “List”):* The List of assignments for additional uses in Regions 1 and 3 as established by WRC-2000 (see Resolution 542 (WRC-2000)), as updated following the successful application of the procedure of § 4.1 of Article 4. (WRC-03)

ADD

1.9 *Frequency assignment in conformity with the List:* Any frequency assignment which appears in the List as updated following successful application of § 4.1 of Article 4. (WRC-03)

ADD

1.10 *The broadcasting-satellite service subject to one of the Plans:* The broadcasting-satellite service subject to one of the Plans referred to in this Appendix is the broadcasting-satellite service in the bands 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. (WRC-03)

ARTICLE 2

Frequency bands

SUP

2.2

ADD

ARTICLE 2A (WRC-03)

Use of the guardbands

2A.1 The use of the guardbands defined in § 3.9 of Annex 5 of this Appendix to provide space operation functions in accordance with No. **1.23** in support of the operation of geostationary-satellite networks in the broadcasting-satellite service (BSS) shall be coordinated with assignments of the BSS subject to a Plan using the provisions of Article 7 of this Appendix.

2A.2 Coordination among assignments intended to provide the space operation functions and services not subject to a Plan shall be effected using the provisions of Nos. **9.7, 9.17, 9.18** and the associated provisions of Section II of Article **9**, or § 4.1.1 *d*) or 4.2.3 *d*) of Article 4 of this Appendix, as appropriate. Advance publication information is not required. Coordination of modifications to the Region 2 Plan or assignments to be included in the Regions 1 and 3 List with assignments intended to provide these functions shall be effected using § 4.1.1 *e*) or 4.2.3 *e*), as appropriate, of Article 4 of this Appendix.

2A.3 Any assignment intended to provide these functions in support of a geostationary-satellite network in the BSS whose assignments are submitted under Article 4 of this Appendix shall be brought into use within the regulatory time-limit applicable to the corresponding BSS assignments submitted under Article 4 of this Appendix.

2A.4 Any assignment intended to provide these functions for the initial Plans (Region 2 Plans incorporated in the Radio Regulations at WARC Orb-85 and the Regions 1 and 3 Plan adopted at WRC-2000), shall be brought into use within the regulatory time-limit referred to in § 4.1.3 or § 4.2.6 of this Appendix from the date of receipt by the Bureau of the complete Appendix **4** data.

2A.5 Assignments intended to provide these functions shall be notified under Article **11**.

2A.6 Section II of Article **23** does not apply to assignments in the guardbands intended to provide the above-mentioned functions.

ARTICLE 4 (Rev.WRC-03)

**Procedures for modifications to the Region 2 Plan or
for additional uses in Regions 1 and 3²**

MOD

² The provisions of Resolution **49 (Rev.WRC-03)** apply. (WRC-03)

MOD

4.1.3 An administration, or one^{2A} acting on behalf of a group of named administrations, intending to include a new or modified assignment in the List shall send to the Bureau, not earlier than eight years but preferably not later than two years before the date on which the assignment is to be brought into use, the relevant information listed in Appendix 4. An assignment in the List shall lapse if it is not brought into use by that date³. A proposed new or modified assignment not included in the List by that date shall also lapse³. (WRC-03)

ADD

^{2A} Whenever, under this provision, an administration acts on behalf of a group of named administrations, all members of that group retain the right to respond in respect of their own networks or systems. (WRC-03)

MOD

³ The provisions of Resolution 533 (Rev.WRC-2000) apply. (WRC-03)

ADD

4.1.3*bis* The regulatory time-limit for bringing into use of an assignment in the List 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.

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^{3A}. In order to take advantage of this extension, the administration shall have, within one month of the launch failure or one month after 5 July 2003, 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 § 4.1.3:

- date of launch failure;
- due diligence information as required in Resolution 49 (Rev.WRC-03) for the assignment with respect to the satellite that suffered the launch failure, if that information has not already been provided.

If, within one year of the request for extension, the administration has not provided to the Bureau updated Resolution 49 (Rev.WRC-03) information for the new satellite under procurement, the related frequency assignments shall lapse. (WRC-03)

ADD

^{3A} For a launch failure which occurred before 5 July 2003, the maximum extension of three years shall apply as from 5 July 2003. (WRC-03)

MOD

⁴ 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 Council Decision 482 unless the payment has already been received (see also Resolution **87 (WRC-03)**). (WRC-03)

ADD

4.1.7bis Except as provided under § 4.1.18 to 4.1.20, any inclusion of a new or modified frequency assignment in the Regions 1 and 3 List which would have the effect of exceeding the limits specified in Annex 1 shall be subject to the agreement of all administrations whose services are considered to be affected. (WRC-03)

ADD

4.1.10bis Thirty days prior to the expiry of the same four-month period, the Bureau shall dispatch a reminder telegram or fax to an administration which has not made its comments under § 4.1.10, bringing the matter to its attention. (WRC-03)

ADD

4.1.10ter After expiry of the deadline for comments in respect of the proposed assignment, the Bureau shall, according to its records, publish a Special Section indicating the list of administrations whose agreements are required for completion of the Article 4 procedure. (WRC-03)

ADD

4.1.12bis In application of § 4.1.12, an administration may indicate the changes to the information communicated to the Bureau under § 4.1.3 and published under § 4.1.5. (WRC-03)

MOD

4.1.13 The agreement of the administrations affected may also be obtained in accordance with this Article, for a specified period. When this specific period of agreement expires for an assignment in the List, the assignment in question shall be maintained in the List until the end of the period referred to in § 4.1.3 above. After that date this assignment shall lapse unless the agreement of the administrations affected is renewed. (WRC-03)

MOD

4.1.15 The Bureau shall publish^{4A} in a Special Section of its BR IFIC the information received under § 4.1.12, together with the names of any administrations with which the provisions of this Article have been successfully applied. The frequency assignment concerned shall be included in the List. (WRC-03)

ADD

^{4A} 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 Council Decision 482 unless the payment has already been received (see also Resolution **87 (WRC-03)**). (WRC-03)

MOD

4.1.18 If, in spite of the application of § 4.1.16 and 4.1.17, there is still continuing disagreement and the assignment which was the basis of the disagreement is not an assignment in the Regions 1 and 3 Plan, or in the Region 2 Plan or for which the procedure of § 4.2 of this Appendix has been initiated, and if the notifying administration insists that the proposed assignment be included in the Regions 1 and 3 List, the Bureau shall provisionally enter the assignment in the Regions 1 and 3 List with an indication of those administrations whose assignments were the basis of the disagreement; however, the entry shall be changed from provisional to definitive recording in the List only if the Bureau is informed that the new assignment in the Regions 1 and 3 List has been in use, together with the assignment which was the basis for the disagreement, for at least four months without any complaint of harmful interference being made. (WRC-03)

MOD

4.1.18*bis* When requesting the application of § 4.1.18, the notifying administration shall undertake to meet the requirements of § 4.1.20 and provide to the administration in respect of which § 4.1.18 is applied, with a copy to the Bureau, a description of the steps by which it undertakes to meet these requirements. Once an assignment is entered in the List provisionally under the provisions of § 4.1.18, the calculation of the equivalent protection margin (EPM)^{4B} of an assignment in the Regions 1 and 3 List or for which the procedure of Article 4 of this Appendix has been initiated and which was the basis for the disagreement shall not take into account the interference produced by the assignment for which the provisions of § 4.1.18 have been applied. (WRC-03)

ADD

^{4B} For the definition of EPM, see § 3.4 of Annex 5. (WRC-03)

MOD

4.1.26 The procedure of this Article may be applied by the administration of a new ITU Member State in order to include new assignments in the List. Upon completion of the procedure, the next World Radiocommunication Conference may be requested to consider, among the assignments included in the List after the successful completion of this procedure, the inclusion in the Plan of up to 10 channels (for Region 1) and up to 12 channels (for Region 3), over the national territory of the new Member State. (WRC-03)

ADD

4.1.27*bis* Should the assignments mentioned in § 4.1.26 and 4.1.27 over the national territory of the administration not be brought into use within the regulatory time-limit mentioned in § 4.1.3, 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 § 4.1.26 and 4.1.27 respectively, and thereafter they shall be removed from the List. (WRC-03)

MOD

4.2.6 An administration, or one^{7A} acting on behalf of a group of named administrations, intending to make a modification to the Region 2 Plan shall send to the Bureau, not earlier than eight years but preferably not later than two years before the date on which the assignment is to be brought into use, the relevant information listed in Appendix 4. Modifications to that Plan shall lapse if the assignment is not brought into use by that date^{7B}. A request for a modification that has not been included in that Plan by that date shall also lapse^{7B}. (WRC-03)

ADD

^{7A} Whenever, under this provision, an administration acts on behalf of a group of named administrations, all members of that group retain the right to respond in respect of their own networks or systems. (WRC-03)

ADD

^{7B} The provisions of Resolution 533 (Rev.WRC-2000) apply. (WRC-03)

ADD

4.2.6*bis* The regulatory time-limit for bringing into use of an assignment in the Region 2 Plan obtained through application of § 4.2 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.

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^{7C}. In order to take advantage of this extension, the administration shall have, within one month of the launch failure or one month after 5 July 2003, 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 § 4.2.6:

- date of launch failure;
- due diligence information as required in Resolution 49 (Rev.WRC-03) for the assignment with respect to the satellite that suffered the launch failure, if that information has not already been provided.

If, within one year of the request for extension, the administration has not provided to the Bureau updated Resolution 49 (Rev.WRC-03) information for the new satellite under procurement, the related frequency assignments shall lapse. (WRC-03)

ADD

^{7C} For a launch failure which occurred before 5 July 2003, the maximum extension of three years shall apply as from 5 July 2003. (WRC-03)

MOD

⁸ 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 Council Decision 482 unless the payment has already been received (see also Resolution **87 (WRC-03)**). (WRC-03)

MOD

4.2.11 Except as provided under § 4.2.21A to 4.2.21D, any modification to a frequency assignment which is in conformity with the Region 2 Plan or any inclusion in that Plan of a new frequency assignment which would have the effect of exceeding the limits specified in Annex 1 shall be subject to the agreement of all administrations whose services are considered to be affected. (WRC-03)

ADD

4.2.14*bis* Thirty days prior to the expiry of the same four-month period the Bureau shall dispatch a reminder telegram or fax to an administration which has not made its comments under § 4.2.14, bringing the matter to its attention. (WRC-03)

ADD

4.2.14*ter* After expiry of the deadline for comments in respect of the proposed assignment, the Bureau shall, according to its records, publish a Special Section, indicating the list of administrations whose agreements are required for completion of the Article 4 procedure. (WRC-03)

ADD

4.2.16*bis* In application of § 4.2.16, an administration may indicate the changes to the information communicated to the Bureau under § 4.2.6 and published under § 4.2.8. (WRC-03)

MOD

4.2.17 The agreement of the administrations affected may also be obtained in accordance with this Article, for a specified period. When this specific period of agreement expires for an assignment in the Plan, the assignment in question shall be maintained in the Plan until the end of the period referred to in § 4.2.6 above. After that date this assignment in the Plan shall lapse unless the agreement of the administrations affected is renewed. (WRC-03)

MOD

4.2.19 The Bureau shall publish^{8A} in a Special Section of its BR IFIC the information received under § 4.2.16 together with the names of any administrations with which the provisions of this Article have been successfully applied. The frequency assignment concerned shall enjoy the same status as those appearing in the Region 2 Plan and will be considered as a frequency assignment in conformity with the Plan. (WRC-03)

ADD

^{8A} 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 Council Decision 482 unless the payment has already been received (see also Resolution **87 (WRC-03)**). (WRC-03)

ADD

4.2.21A If, in spite of the application of § 4.2.20 and 4.2.21, there is still continuing disagreement and the assignment which was the basis of the disagreement is not an assignment in the Region 2 Plan, or in the Regions 1 and 3 Plan or List, or for which the procedure of § 4.1 or 4.2 of this Appendix has been initiated, and if the notifying administration insists that the proposed assignment be included in the Region 2 Plan, the Bureau shall provisionally enter the assignment in the Region 2 Plan with an indication of those administrations whose assignments were the basis of the disagreement; however, the entry shall be changed from provisional to definitive recording in the Region 2 Plan only if the Bureau is informed that the new assignment in the Region 2 Plan has been in use, together with the assignment which was the basis for the disagreement, for at least four months without any complaint of harmful interference being made. (WRC-03)

ADD

4.2.21B When requesting the application of § 4.2.21A, the notifying administration shall undertake to meet the requirements of § 4.2.21D and provide to the administration in respect of which § 4.2.21A has been applied, with a copy to the Bureau, a description of the steps by which it undertakes to meet these requirements. (WRC-03)

ADD

4.2.21C Should the assignments that were the basis of the disagreement not be brought into use within the period specified in No. **11.44**, the status of the assignment in the Region 2 Plan shall be reviewed accordingly. (WRC-03)

ADD

4.2.21D Should harmful interference be caused by an assignment included in the Region 2 Plan under § 4.2.21A to any recorded assignment in the Master Register which was the basis of the disagreement, the administration using the frequency assignment included in the Region 2 Plan under § 4.2.21A shall, upon receipt of advice thereof, immediately eliminate this harmful interference. (WRC-03)

ARTICLE 5

**Notification, examination and recording in the Master International
Frequency Register of frequency assignments to space stations
in the broadcasting-satellite service**

MOD

5.1.1 Whenever an administration^{8B} intends to bring into use a frequency assignment to a space station in the broadcasting-satellite service, it shall notify this frequency assignment to the Bureau. For this purpose, the notifying administration shall apply the following provisions.
(WRC-03)

ADD

^{8B} A frequency assignment may be notified by one administration acting on behalf of a group of named administrations. Any further notice (modification or deletion) relating to that assignment shall, in the absence of information to the contrary, be regarded as having been submitted on behalf of the entire group. (WRC-03)

ADD

5.1.2*bis* In application of § 5.1.2, an administration may identify the characteristics of assignments in the Plans or the List as notification and send to the Bureau the changes thereto.
(WRC-03)

MOD

⁹ Where appropriate, the notifying administration shall initiate the procedure for modifying the Plan concerned or for including assignments in the Regions 1 and 3 List in sufficient time to ensure that this limit is observed. For Region 2, see also Resolution 42 (Rev.WRC-03) and § B of Annex 7. (WRC-03)

MOD**5.2.1 The Bureau shall examine each notice:**

- a)* with respect to its conformity with the Constitution, the Convention and the relevant provisions of the Radio Regulations (with the exception of those relating to § *b*), *c*), *d*) and *e*) below);
- b)* with respect to its conformity with the appropriate Regional Plan or the Regions 1 and 3 List, as appropriate; *or*
- c)* with respect to the coordination requirements specified in the Remarks column of Article 10 or Article 11; *or*

- d) with respect to its conformity with the appropriate Regional Plan or the Regions 1 and 3 List, however, having characteristics differing from those in the appropriate Regional Plan or in the Regions 1 and 3 List, in one or more of the following aspects:
- use of a reduced e.i.r.p.,
 - use of a reduced coverage area entirely situated within the coverage area appearing in the appropriate Regional Plan or in the Regions 1 and 3 List,
 - use of other modulating signals in accordance with the provisions of § 3.1.3 of Annex 5,
 - use of the assignment for transmission in the fixed-satellite service in accordance with No. **5.492**,
 - in the case of Region 2, use of an orbital position under the conditions specified in § B of Annex 7,
 - in the case of the notification of Plan assignments, use of an e.i.r.p. which produces a pfd that exceeds the limit of $-103.6 \text{ dB(W/(m}^2 \cdot 27 \text{ MHz))}$ given in Section 1 of Annex 1 to Appendix **30** on the territory of the notifying administration under the condition that the calculated pfd at test points of any Plan assignment, List assignment or proposed assignment submitted under Article 4 are equal to or below that of the original Plan assignments in the same channel of the administration applying this section; *or*
- e) with respect to its conformity with the provisions of Resolution **42 (Rev.WRC-03)**. (WRC-03)

MOD

5.2.2.2 In the case of Region 2, where the Bureau reaches a favourable finding with respect to § 5.2.1 a) and 5.2.1 c), but an unfavourable finding with respect to § 5.2.1 b) and 5.2.1 d), it shall examine the notice with respect to the successful application of the provisions of Resolution **42 (Rev.WRC-03)**. A frequency assignment for which the provisions of Resolution **42 (Rev.WRC-03)** have been successfully applied shall be recorded in the Master Register with an appropriate symbol to indicate its interim status. The date of receipt of the notice by the Bureau shall be entered in Column 2d. In relations between administrations all frequency assignments brought into use following the successful application of the provisions of Resolution **42 (Rev.WRC-03)** and recorded in the Master Register shall be considered to have the same status irrespective of the dates entered in Column 2d for such frequency assignments. (WRC-03)

MOD

5.3.1 If an administration has not confirmed the bringing into use of a frequency assignment under § 5.2.8, the Bureau will make inquiries of the administration not earlier than six months after the expiry of the period specified in § 5.1.3. On receipt of the relevant information, the Bureau will either modify^{9A} the date of coming into use or cancel the entry. (WRC-03)

ADD

^{9A} See also § 4.1.3 or 4.2.6 of Article 4 of this Appendix. (WRC-03)

ARTICLE 7 (WRC-2000)

Coordination, notification and recording in the Master International Frequency Register of frequency assignments to stations in the fixed-satellite service (space-to-Earth) in the bands 11.7-12.2 GHz (in Region 2), 12.2-12.7 GHz (in Region 3) and 12.5-12.7 GHz (in Region 1), and to stations in the broadcasting-satellite service in the band 12.5-12.7 GHz (in Region 3) when frequency assignments to broadcasting-satellite stations in the bands 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 are involved¹¹

MOD

¹¹ These provisions do not replace the procedures prescribed in Articles 9 and 11 when stations other than those in the broadcasting-satellite service subject to a Plan are involved. (WRC-03)

MOD

7.2.1 The frequency assignments to be taken into account are:

- a) the assignments in conformity with the appropriate Regional Plan in Appendix 30;
- b) the assignments included in the Regions 1 and 3 List;
- c) the assignments for which the procedure of Article 4 has been initiated, as from the date of receipt of the complete Appendix 4 information under § 4.1.3 or 4.2.6. (WRC-03)

SUP

ARTICLE 9

Power flux-density limits between 12.2 GHz and 12.7 GHz to protect terrestrial services in Regions 1 and 3 from interference from Region 2 broadcasting-satellite space stations

ARTICLE 10

**The Plan for the broadcasting-satellite service in
the frequency band 12.2-12.7 GHz in Region 2**

MOD

- a) The overall equivalent protection margin to be used for the application of Article 4 and Resolution 42 (Rev.WRC-03) shall be calculated on the following basis:
- for the calculation of interference to assignments that are part of a group, only the interference contributions from assignments that are not part of the same group are to be included; and
 - for the calculation of interference from assignments belonging to a group to assignments that are not part of that same group, only the worst interference contribution from that group shall be used on a test point to test point basis. (WRC-03)

ARTICLE 11 (Rev.WRC-03)

**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

11.2 TEXT FOR NOTES IN THE REMARKS COLUMN OF THE PLAN

SUP

11.3 TABLE SHOWING CORRESPONDENCE BETWEEN CHANNEL NUMBERS
AND ASSIGNED FREQUENCIES

ADD

11.2 TEXT FOR NOTES IN THE REMARKS COLUMN OF THE PLAN (WRC-03)

1 To be dedicated to the Islamic programme envisaged in WARC SAT-77 documents.

2 Not used.

3 Provisional beam. These assignments have been included in the Plan by WRC-97. These assignments are for exclusive use by Palestine, subject to the Israeli-Palestinian Interim Agreement of 28 September 1995, Resolution 741 of the Council notwithstanding and Resolution 99 (Minneapolis, 1998) of the Plenipotentiary Conference.

4 Assignment intended to ensure coverage of Algeria, Libyan Arab Jamahiriya, Morocco, Mauritania and Tunisia, with the agreement of the countries concerned. If required, it may be used with the characteristics of the beam TUN15000.

5 This assignment shall be brought into use only when the limits referred to in Table 1 are not exceeded or with the agreement of the administrations identified in Table 2, whose networks/beams listed in this Table may be affected, with respect to (see also the Note to § 11.2):

a) assignments in the Region 2 Plan on 12 May 2000; or

b) assignments in the terrestrial services which are recorded in the Master Register with a favourable finding or received by the Bureau prior to 12 May 2000 for recording in the Master Register and which subsequently receive a favourable finding based on the Plan as it existed on 12 May 2000; or

c) assignments in the fixed-satellite service which:

- are recorded in the Master Register prior to 12 May 2000 with a favourable finding; or*
- have been coordinated under the provisions of No. 9.7 (or No. 1060) or § 7.2.1 of Article 7 prior to 12 May 2000; or*
- are in process of coordination under the provisions of No. 9.7 (or No. 1060) or § 7.2.1 of Article 7 prior to 31 July 2000 for which complete Appendix 4 data (or Appendix 3 data, as appropriate) have been received by the Bureau under the relevant provisions of Article 9 (or Article 11, as appropriate):*
 - filings received by the Bureau prior to 12 May 2000 at 1700 h (Istanbul time) shall be taken into account in the pertinent compatibility analysis by applying the pfd criteria referred to in Table 1; or*
 - filings received by the Bureau after 12 May 2000 at 1700 h (Istanbul time), but before 31 July 2000, shall be taken into account by applying the sharing criteria of $-138 \text{ dB(W/(m}^2 \cdot 27 \text{ MHz))}$ or the pfd criteria referred to in Table 1, whichever is higher.*

6 This assignment shall not claim protection from interference caused by the assignments which pertain to networks/beams identified in Table 3 which are in conformity with the Region 2 Plan on 12 May 2000 (see also the Note to § 11.2).

7 This assignment shall not claim protection from interference caused by assignments in the fixed-satellite service which pertain to networks/beams identified in Table 3 (see also the Note to § 11.2) and:

- a) either are recorded in the Master Register with a favourable finding prior to 12 May 2000;
- b) or for which complete Appendix 4 data (or Appendix 3 data, as appropriate) under the relevant provisions of Article 9 (or No. 1060, or § 7.2.1 of Article 7, as appropriate) have been received prior to 12 May 2000, which have been brought into use prior to 12 May 2000 and for which the complete due diligence information, in accordance with Annex 2 to Resolution 49 (WRC-97), has been received prior to 12 May 2000.

8 This assignment shall not claim protection from the assignments of the administrations for terrestrial services identified in Table 4 which are recorded in the Master Register with a favourable finding, or received by the Bureau prior to 12 May 2000 for recording in the Master Register and which subsequently receive a favourable finding based on the Plan as it existed on 12 May 2000 (see also the Note to § 11.2).

9 Provisional beam. These assignments have been included in the Plan by WRC-2000. These assignments are for exclusive use by East Timor.

TABLE 1

Symbol	Criteria
a	§ 3 of Annex 1 ¹
b	§ 4 of Annex 1 ¹
c	§ 6 of Annex 1 ¹

¹ These paragraphs and this Annex are contained in this Appendix as adopted by WRC-03.

NOTE – In cases where assignments from the WRC-97 Plan without remarks were included in the WRC-2000 Regions 1 and 3 Plan without change, or with conversion of modulation from analogue to digital, or a change from normal roll-off to fast roll-off antenna characteristics, the coordination status afforded by the WRC-97 Plan shall be preserved.

In cases where assignments from the WRC-97 Plan with remarks were included in the WRC-2000 Regions 1 and 3 Plan without change, or with conversion of modulation from analogue to digital, or a change from normal roll-off to fast roll-off antenna pattern, the compatibility will be reassessed using the revised criteria and methodology of WRC-2000 and the remarks of the WRC-97 Plan assignment will either be maintained or reduced on the basis of the results of this analysis.

In other cases the methodology described in Notes 5 to 8 shall be applied.

TABLE 2

Affected administrations and corresponding networks/beams identified based on Note 5 in § 11.2 of Article 11 of this Appendix

Beam name	Channels	Ref. Table 1	Affected administrations*	Affected networks/beams/terrestrial stations*
AFS02100	23	c	F, F/EUT, MLA	MEASAT-SA1, VIDEOSAT-8-KU-C, EUTELSAT 3-4E
AGL29500	1, 3, 5, 7, 9, 11, 13	c	USA	INTELSAT7 335.5E, INTELSAT8 335.5E
ARM06400	26	c	BLR/IK, CHN, D, F/EUT, G, HOL, J, PAK, TON, UAE, USA	ASIASAT-AKX, ASIASAT-BKX, ASIASAT-CK1, ASIASAT-CKX, ASIASAT-DKX, ASIASAT-EK1, ASIASAT-EKX, EMARSAT-1B, EMARSAT-1F, EMARSAT-1G, EUROPE*STAR-2G-1, EUROPE*STAR-2G-2, EUROPE*STAR-2G-3, EUTELSAT 3-25.5E, EUTELSAT 3-33E, EUTELSAT 3-36E, EUTELSAT 3-44E, EUTELSAT 3-48E, EUTELSAT 3-70.5E, EUTELSAT 3-73.5E, EUTELSAT 3-76E, EUTELSAT 3-80.5E, EUTELSAT 3-83.5E, EUTELSAT 3-86E, EUTELSAT 3-88.5E, INTELSAT KFOS 85E, INTELSAT7 66E, INTERSPUTNIK-27E-Q, N-SAT-102.5E, N-SAT-103.5E, N-SAT-106.5, N-SAT-110E, N-SAT-117, N-SAT-120E, N-SAT-122.5E, N-SAT-65.5, N-SAT-73E, N-SAT-74.5E, N-SAT-76.5E, N-SAT-79.5E, N-SAT-82.5E, N-SAT-84E, N-SAT-86E, N-SAT-94E, NSS-21, NSS-22, NSS-23, NSS-24, NSS-8, NSS-9, PAKSAT-1, PAKSAT-2, PAKSAT-C, PAKSAT-D, SKYSAT-A1, SKYSAT-A2, SKYSAT-B2, SKYSAT-C1, SKYSAT-C2, SKYSAT-C3, SKYSAT-C4, TONGASAT AP-KU-4
ARM06400	30, 34, 38	c	BLR/IK, CHN, D, F/EUT, G, HOL, J, LAO, MLA, PAK, PNG, THA, TON, UAE, USA	APSTAR-3, APSTAR-4, ASIASAT-AKX, ASIASAT-BKX, ASIASAT-CK1, ASIASAT-CKX, ASIASAT-DKX, ASIASAT-EK1, ASIASAT-EKX, EMARSAT-1B, EMARSAT-1F, EMARSAT-1G, EUROPE*STAR-2G-1, EUROPE*STAR-2G-2, EUROPE*STAR-2G-3, EUTELSAT 3-25.5E, EUTELSAT 3-33E, EUTELSAT 3-36E, EUTELSAT 3-44E, EUTELSAT 3-48E, EUTELSAT 3-70.5E, EUTELSAT 3-73.5E, EUTELSAT 3-76E, EUTELSAT 3-80.5E, EUTELSAT 3-83.5E, EUTELSAT 3-86E, EUTELSAT 3-88.5E, INTELSAT KFOS 85E, INTELSAT7 66E, INTERSPUTNIK-27E-Q, L-STAR-1, L-STAR-2, L-STAR-3, L-STAR-5, L-STAR-6, MEASAT-1, MEASAT-3, MEASAT-91.5E, MEASAT-95E, MEASAT-SA3, MEASAT-SA4, N-SAT-102.5E, N-SAT-103.5E, N-SAT-106.5, N-SAT-110, N-SAT-110E, N-SAT-117, N-SAT-120E, N-SAT-122.5E, N-SAT-65.5, N-SAT-73E, N-SAT-74.5E, N-SAT-76.5E, N-SAT-79.5E, N-SAT-82.5E, N-SAT-84E, N-SAT-86E, N-SAT-94E, NSS-21, NSS-22, NSS-23, NSS-24, NSS-8, NSS-9, PACSTAR-L1, PACSTAR-L2, PAKSAT-1, PAKSAT-2, PAKSAT-C, PAKSAT-D, SKYSAT-A1, SKYSAT-A2, SKYSAT-B2, SKYSAT-C1, SKYSAT-C2, SKYSAT-C3, SKYSAT-C4, THAICOM-A2B, THAICOM-A3B, THAICOM-A5B, THAICOM-C1, THAICOM-G1K, TONGASAT AP-KU-4
ARS34000	40	c	BLR/IK, CHN, D, F/EUT, G, HOL, INS, J, KOR, LAO, MLA, PAK, PNG, SNG, THA, TON, UAE, USA	AM-SAT A1, AM-SAT A4, APSTAR-3, APSTAR-4, ASIASAT-AK1, ASIASAT-AKX, ASIASAT-BKX, ASIASAT-CK1, ASIASAT-CKX, ASIASAT-DKX, ASIASAT-EK1, ASIASAT-EKX, EMARSAT-1B, EMARSAT-1F, EMARSAT-1G, EUROPE*STAR-2G-1, EUROPE*STAR-2G-2, EUROPE*STAR-2G-3, EUTELSAT 3-25.5E, EUTELSAT 3-33E, EUTELSAT 3-36E, EUTELSAT 3-44E, EUTELSAT 3-48E, EUTELSAT 3-70.5E, EUTELSAT 3-73.5E, EUTELSAT 3-76E, EUTELSAT 3-80.5E, EUTELSAT 3-83.5E, EUTELSAT 3-86E, EUTELSAT 3-88.5E, INTELSAT7 66E, INTERSPUTNIK-27E-Q, JCSAT-3A, JCSAT-3B, KOREASAT-1, KOREASAT-2, L-STAR-1, L-STAR-2, L-STAR-3, L-STAR-4, L-STAR-5, L-STAR-6, MEASAT-1, MEASAT-3, MEASAT-91.5E, MEASAT-95E, MEASAT-SA3, MEASAT-SA4, N-SAT-102.5E, N-SAT-103.5E, N-SAT-106.5, N-SAT-110, N-SAT-110E, N-SAT-117, N-SAT-120E, N-SAT-122.5E, N-SAT-125.5E, N-SAT-128, N-SAT-129.5E, N-SAT-65.5, N-SAT-73E, N-SAT-74.5E, N-SAT-76.5E, N-SAT-79.5E, N-SAT-82.5E, N-SAT-84E, N-SAT-86E, N-SAT-94E, N-SAT-94E, N-STAR-A2, N-STAR-B2, NSS-21, NSS-22, NSS-23, NSS-24, NSS-8, NSS-9, PACSTAR-L1, PACSTAR-L2, PACSTAR-L3, PAKSAT-1, PAKSAT-2, PAKSAT-C, PAKSAT-D, PAKSAT-E, PALAPA-C5, PALAPA-C6, PALAPA-C7, SB-SAT-135, SJC-1, SKYSAT-A1, SKYSAT-A2, SKYSAT-A3, SKYSAT-B1, SKYSAT-B2, SKYSAT-B3, SKYSAT-C1, SKYSAT-C2, SKYSAT-C3, SKYSAT-C4, ST-1C, THAICOM-A2B, THAICOM-A3B, THAICOM-A5B, THAICOM-C1, THAICOM-G1K, THAICOM-G2K, TONGASAT AP-KU-4, TONGASAT C/KU-1, TONGASAT C/KU-2, TONGASAT C/KU-3

Beam name	Channels	Ref. Table 1	Affected administrations*	Affected networks/beams/terrestrial stations*
ARS__100	22, 24	c	F/EUT	EUTELSAT 3-16E
ARS__100	26	c	BLR/IK, CHN, D, F/EUT, G, HOL, J, PAK, SNG, THA, TON, UAE, USA	ASIASAT-AK1, ASIASAT-AKX, ASIASAT-BKX, ASIASAT-CK1, ASIASAT-CKX, ASIASAT-DKX, ASIASAT-EK1, ASIASAT-EKX, EMARSAT-1B, EMARSAT-1F, EMARSAT-1G, EUROPE*STAR-2G-1, EUROPE*STAR-2G-2, EUROPE*STAR-2G-3, EUTELSAT 3-16E, EUTELSAT 3-25.5E, EUTELSAT 3-33E, EUTELSAT 3-36E, EUTELSAT 3-44E, EUTELSAT 3-48E, EUTELSAT 3-70.5E, EUTELSAT 3-73.5E, EUTELSAT 3-76E, EUTELSAT 3-80.5E, EUTELSAT 3-83.5E, EUTELSAT 3-86E, EUTELSAT 3-88.5E, INTELSAT KFOS 85E, INTELSAT7 66E, INTERSPUTNIK-27E-Q, JCSAT-3A, JCSAT-3B, N-SAT-102.5E, N-SAT-103.5E, N-SAT-106.5, N-SAT-110E, N-SAT-117, N-SAT-120E, N-SAT-122.5E, N-SAT-125.5E, N-SAT-129.5E, N-SAT-65.5, N-SAT-73E, N-SAT-74.5E, N-SAT-76.5E, N-SAT-79.5E, N-SAT-82.5E, N-SAT-84E, N-SAT-86E, N-SAT-94E, NSS-21, NSS-22, NSS-23, NSS-24, NSS-8, NSS-9, PAKSAT-1, PAKSAT-2, PAKSAT-C, PAKSAT-D, PAKSAT-E, SKYSAT-A1, SKYSAT-A2, SKYSAT-A3, SKYSAT-B2, SKYSAT-C1, SKYSAT-C2, SKYSAT-C3, SKYSAT-C4, ST-1C, THAICOM-C2, TONGASAT AP-KU-4, TONGASAT C/KU-1
ARS__100	28	c	BLR/IK, CHN, D, F/EUT, G, HOL, INS, J, KOR, LAO, MLA, PAK, PNG, SNG, THA, TON, UAE, USA	AM-SAT A1, AM-SAT A4, APSTAR-3, APSTAR-4, ASIASAT-AK1, ASIASAT-AKX, ASIASAT-BKX, ASIASAT-CK1, ASIASAT-CKX, ASIASAT-DKX, ASIASAT-EK1, ASIASAT-EKX, EMARSAT-1B, EMARSAT-1F, EMARSAT-1G, EUROPE*STAR-2G-1, EUROPE*STAR-2G-2, EUROPE*STAR-2G-3, EUTELSAT 3-25.5E, EUTELSAT 3-33E, EUTELSAT 3-36E, EUTELSAT 3-44E, EUTELSAT 3-48E, EUTELSAT 3-70.5E, EUTELSAT 3-73.5E, EUTELSAT 3-76E, EUTELSAT 3-80.5E, EUTELSAT 3-83.5E, EUTELSAT 3-86E, EUTELSAT 3-88.5E, INTELSAT KFOS 85E, INTERSPUTNIK-27E-Q, JCSAT-3A, JCSAT-3B, KOREASAT-103KU, KOREASAT-123.7KU, L-STAR-1, L-STAR-2, L-STAR-3, L-STAR-4, L-STAR-5, L-STAR-6, MEASAT-1, MEASAT-3, MEASAT-91.5E, MEASAT-95E, MEASAT-SA3, MEASAT-SA4, N-SAT-102.5E, N-SAT-103.5E, N-SAT-106.5, N-SAT-110, N-SAT-110E, N-SAT-117, N-SAT-120E, N-SAT-122.5E, N-SAT-125.5E, N-SAT-128, N-SAT-129.5E, N-SAT-65.5, N-SAT-73E, N-SAT-74.5E, N-SAT-76.5E, N-SAT-79.5E, N-SAT-82.5E, N-SAT-84E, N-SAT-86E, N-SAT-94E, NSS-21, NSS-22, NSS-23, NSS-24, NSS-8, NSS-9, PACSTAR-L1, PACSTAR-L2, PACSTAR-L3, PAKSAT-1, PAKSAT-2, PAKSAT-C, PAKSAT-D, PAKSAT-E, PALAPA-C5, PALAPA-C6, PALAPA-C7, SJC-1, SKYSAT-A1, SKYSAT-A2, SKYSAT-A3, SKYSAT-B2, SKYSAT-C1, SKYSAT-C2, SKYSAT-C3, SKYSAT-C4, ST-1C, THAICOM-A2B, THAICOM-A3B, THAICOM-A5B, THAICOM-C1, THAICOM-C2, THAICOM-G1K, THAICOM-G2K, TONGASAT AP-KU-4, TONGASAT C/KU-1
ARS__100	30, 32, 34, 36, 38	c	BLR/IK, CHN, D, F/EUT, G, HOL, INS, J, LAO, MLA, PAK, PNG, SNG, THA, TON, UAE, USA	AM-SAT A1, AM-SAT A4, APSTAR-3, APSTAR-4, ASIASAT-AK1, ASIASAT-AKX, ASIASAT-BKX, ASIASAT-CK1, ASIASAT-CKX, ASIASAT-DKX, ASIASAT-EK1, ASIASAT-EKX, EMARSAT-1B, EMARSAT-1F, EMARSAT-1G, EUROPE*STAR-2G-1, EUROPE*STAR-2G-2, EUROPE*STAR-2G-3, EUTELSAT 3-25.5E, EUTELSAT 3-33E, EUTELSAT 3-36E, EUTELSAT 3-44E, EUTELSAT 3-48E, EUTELSAT 3-70.5E, EUTELSAT 3-73.5E, EUTELSAT 3-76E, EUTELSAT 3-80.5E, EUTELSAT 3-83.5E, EUTELSAT 3-86E, EUTELSAT 3-88.5E, INTELSAT KFOS 85E, INTERSPUTNIK-27E-Q, JCSAT-3A, JCSAT-3B, L-STAR-1, L-STAR-2, L-STAR-3, L-STAR-4, L-STAR-5, L-STAR-6, MEASAT-1, MEASAT-3, MEASAT-91.5E, MEASAT-95E, MEASAT-SA3, MEASAT-SA4, N-SAT-102.5E, N-SAT-103.5E, N-SAT-106.5, N-SAT-110, N-SAT-110E, N-SAT-117, N-SAT-120E, N-SAT-122.5E, N-SAT-125.5E, N-SAT-128, N-SAT-129.5E, N-SAT-65.5, N-SAT-73E, N-SAT-74.5E, N-SAT-76.5E, N-SAT-79.5E, N-SAT-82.5E, N-SAT-84E, N-SAT-86E, N-SAT-94E, NSS-21, NSS-22, NSS-23, NSS-24, NSS-8, NSS-9, PACSTAR-L1, PACSTAR-L2, PACSTAR-L3, PAKSAT-1, PAKSAT-2, PAKSAT-C, PAKSAT-D, PAKSAT-E, PALAPA-C5, PALAPA-C6, PALAPA-C7, SJC-1, SKYSAT-A1, SKYSAT-A2, SKYSAT-A3, SKYSAT-B2, SKYSAT-C1, SKYSAT-C2, SKYSAT-C3, SKYSAT-C4, ST-1C, THAICOM-A2B, THAICOM-A3B, THAICOM-A5B, THAICOM-C1, THAICOM-C2, THAICOM-G1K, THAICOM-G2K, TONGASAT AP-KU-4, TONGASAT C/KU-1

Beam name	Channels	Ref. Table 1	Affected administrations*	Affected networks/beams/terrestrial stations*
ARS__100	40	c	BLR/IK, CHN, D, F/EUT, G, HOL, INS, J, LAO, MLA, PAK, PNG, SNG, THA, TON, UAE, USA	AM-SAT A1, AM-SAT A4, APSTAR-3, APSTAR-4, ASIASEAT-AK1, ASIASEAT-AKX, ASIASEAT-BKX, ASIASEAT-CK1, ASIASEAT-CKX, ASIASEAT-DKX, ASIASEAT-EK1, ASIASEAT-EKX, EMARSAT-1B, EMARSAT-1F, EMARSAT-1G, EUROPE*STAR-2G-1, EUROPE*STAR-2G-2, EUROPE*STAR-2G-3, EUTELSAT 3-25.5E, EUTELSAT 3-33E, EUTELSAT 3-36E, EUTELSAT 3-44E, EUTELSAT 3-48E, EUTELSAT 3-70.5E, EUTELSAT 3-73.5E, EUTELSAT 3-76E, EUTELSAT 3-80.5E, EUTELSAT 3-83.5E, EUTELSAT 3-86E, EUTELSAT 3-88.5E, INTELSAT 7 66E, INTERSPUTNIK-27E-Q, JCSAT-3A, JCSAT-3B, L-STAR-1, L-STAR-2, L-STAR-3, L-STAR-4, L-STAR-5, L-STAR-6, MEASAT-1, MEASAT-3, MEASAT-91.5E, MEASAT-95E, MEASAT-SA3, MEASAT-SA4, N-SAT-102.5E, N-SAT-103.5E, N-SAT-106.5, N-SAT-110E, N-SAT-110E, N-SAT-117, N-SAT-120E, N-SAT-122.5E, N-SAT-125.5E, N-SAT-128, N-SAT-129.5E, N-SAT-65.5, N-SAT-73E, N-SAT-74.5E, N-SAT-79.5E, N-SAT-76.5E, N-SAT-82.5E, N-SAT-84E, N-SAT-86E, N-SAT-94E, NSS-21, NSS-22, NSS-23, NSS-24, NSS-8, NSS-9, PACSTAR-L1, PACSTAR-L2, PACSTAR-L3, PAKSAT-1, PAKSAT-2, PAKSAT-C, PAKSAT-D, PAKSAT-E, PALAPA-C5, PALAPA-C6, PALAPA-C7, SJC-1, SKYSAT-A1, SKYSAT-A2, SKYSAT-A3, SKYSAT-B2, SKYSAT-C1, SKYSAT-C2, SKYSAT-C3, SKYSAT-C4, ST-1C, THAICOM-A2B, THAICOM-A3B, THAICOM-A5B, THAICOM-C1, THAICOM-G1K, THAICOM-G2K, TONGASAT AP-KU-4, TONGASAT C/KU-1
AUSA_100	1, 5, 9	c	BLR/IK	INTERSPUTNIK-153.5EQ
AZE06400	25	c	BLR/IK, CHN, D, F/EUT, G, HOL, J, PAK, TON, USA	ASIASEAT-AK1, ASIASEAT-CK1, ASIASEAT-EK1, EUROPE*STAR-2G-1, EUROPE*STAR-2G-2, EUROPE*STAR-2G-3, EUTELSAT 3-25.5E, EUTELSAT 3-33E, EUTELSAT 3-36E, EUTELSAT 3-44E, EUTELSAT 3-48E, EUTELSAT 3-70.5E, EUTELSAT 3-76E, EUTELSAT 3-80.5E, EUTELSAT 3-83.5E, EUTELSAT 3-88.5E, INTELSAT KFOS 85E, INTELSAT 7 66E, INTERSPUTNIK-27E-Q, JCSAT-3B, N-SAT-102.5E, N-SAT-103.5E, N-SAT-106.5, N-SAT-110E, N-SAT-117, N-SAT-120E, N-SAT-122.5E, N-SAT-65.5, N-SAT-73E, N-SAT-74.5E, N-SAT-76.5E, N-SAT-79.5E, N-SAT-82.5E, N-SAT-84E, N-SAT-86E, N-SAT-94E, NSS-21, NSS-22, NSS-23, NSS-24, NSS-8, NSS-9, PAKSAT-1, PAKSAT-2, PAKSAT-C, PAKSAT-D, SKYSAT-A1, SKYSAT-A2, SKYSAT-A3, SKYSAT-B2, SKYSAT-C1, SKYSAT-C2, SKYSAT-C3, SKYSAT-C4, TONGASAT AP-KU-4
AZE06400	27	c	BLR/IK, CHN, D, F/EUT, G, HOL, J, MLA, PAK, TON, UAE, USA	ASIASEAT-AK1, ASIASEAT-AKX, ASIASEAT-BKX, ASIASEAT-CK1, ASIASEAT-CKX, ASIASEAT-DKX, ASIASEAT-EK1, ASIASEAT-EKX, EMARSAT-1B, EMARSAT-1F, EMARSAT-1G, EUROPE*STAR-2G-1, EUROPE*STAR-2G-2, EUROPE*STAR-2G-3, EUTELSAT 3-25.5E, EUTELSAT 3-33E, EUTELSAT 3-36E, EUTELSAT 3-44E, EUTELSAT 3-48E, EUTELSAT 3-70.5E, EUTELSAT 3-73.5E, EUTELSAT 3-76E, EUTELSAT 3-80.5E, EUTELSAT 3-83.5E, EUTELSAT 3-86E, EUTELSAT 3-88.5E, INTELSAT KFOS 85E, INTELSAT 7 66E, INTERSPUTNIK-27E-Q, JCSAT-3B, MEASAT-SA3, MEASAT-SA4, N-SAT-102.5E, N-SAT-103.5E, N-SAT-106.5, N-SAT-110E, N-SAT-117, N-SAT-120E, N-SAT-122.5E, N-SAT-65.5, N-SAT-73E, N-SAT-74.5E, N-SAT-76.5E, N-SAT-79.5E, N-SAT-82.5E, N-SAT-84E, N-SAT-86E, N-SAT-94E, NSS-21, NSS-22, NSS-23, NSS-24, NSS-8, NSS-9, PAKSAT-1, PAKSAT-2, PAKSAT-C, PAKSAT-D, SKYSAT-A1, SKYSAT-A2, SKYSAT-B2, SKYSAT-C1, SKYSAT-C2, SKYSAT-C3, SKYSAT-C4, TONGASAT AP-KU-4
AZE06400	29	c	BLR/IK, CHN, D, F/EUT, G, HOL, J, KOR, LAO, MLA, PAK, PNG, THA, TON, UAE, USA	APSTAR-3, APSTAR-4, ASIASEAT-AK1, ASIASEAT-AKX, ASIASEAT-BKX, ASIASEAT-CK1, ASIASEAT-CKX, ASIASEAT-DKX, ASIASEAT-EK1, ASIASEAT-EKX, EMARSAT-1B, EMARSAT-1F, EMARSAT-1G, EUROPE*STAR-2G-1, EUROPE*STAR-2G-2, EUROPE*STAR-2G-3, EUTELSAT 3-25.5E, EUTELSAT 3-33E, EUTELSAT 3-36E, EUTELSAT 3-44E, EUTELSAT 3-48E, EUTELSAT 3-70.5E, EUTELSAT 3-73.5E, EUTELSAT 3-76E, EUTELSAT 3-80.5E, EUTELSAT 3-83.5E, EUTELSAT 3-86E, EUTELSAT 3-88.5E, INTELSAT KFOS 85E, INTELSAT 7 66E, INTERSPUTNIK-27E-Q, JCSAT-3B, KOREASAT-103KU, KOREASAT-123.7KU, L-STAR-1, L-STAR-2, L-STAR-3, L-STAR-5, L-STAR-6, MEASAT-1, MEASAT-3, MEASAT-91.5E, MEASAT-95E, MEASAT-SA3, MEASAT-SA4, N-SAT-102.5E, N-SAT-103.5E, N-SAT-106.5, N-SAT-110, N-SAT-110E, N-SAT-117, N-SAT-120E, N-SAT-122.5E, N-SAT-65.5, N-SAT-73E, N-SAT-74.5E, N-SAT-76.5E, N-SAT-79.5E, N-SAT-82.5E, N-SAT-84E, N-SAT-86E, N-SAT-94E, NSS-21, NSS-22, NSS-23, NSS-24, NSS-8, NSS-9, PACSTAR-L1, PACSTAR-L2, PAKSAT-1, PAKSAT-2, PAKSAT-C, PAKSAT-D, SJC-1, SKYSAT-A1, SKYSAT-A2, SKYSAT-A3, SKYSAT-B2, SKYSAT-C1, SKYSAT-C2, SKYSAT-C3, SKYSAT-C4, THAICOM-A2B, THAICOM-A3B, THAICOM-A5B, THAICOM-C1, THAICOM-G1K, TONGASAT AP-KU-4

Beam name	Channels	Ref. Table 1	Affected administrations*	Affected networks/beams/terrestrial stations*
AZE06400	31, 33, 35, 37, 39	c	BLR/IK, CHN, D, F/EUT, G, HOL, J, LAO, MLA, PAK, PNG, THA, TON, UAE, USA	APSTAR-3, APSTAR-4, ASIASAT-AKI, ASIASAT-AKX, ASIASAT-BKX, ASIASAT-CK1, ASIASAT-CKX, ASIASAT-DKX, ASIASAT-EK1, ASIASAT-EKX, EMARSAT-1B, EMARSAT-1F, EMARSAT-1G, EUROPE*STAR-2G-1, EUROPE*STAR-2G-2, EUROPE*STAR-2G-3, EUTELSAT 3-25.5E, EUTELSAT 3-33E, EUTELSAT 3-36E, EUTELSAT 3-44E, EUTELSAT 3-48E, EUTELSAT 3-70.5E, EUTELSAT 3-73.5E, EUTELSAT 3-76E, EUTELSAT 3-80.5E, EUTELSAT 3-83.5E, EUTELSAT 3-86E, EUTELSAT 3-88.5E, INTELSAT KFOS 85E, INTELSAT 7 66E, INTERSPUTNIK-27E-Q, JCSAT-3B, L-STAR-1, L-STAR-2, L-STAR-3, L-STAR-5, L-STAR-6, MEASAT-1, MEASAT-3, MEASAT-91.5E, MEASAT-95E, MEASAT-SA3, MEASAT-SA4, N-SAT-102.5E, N-SAT-103.5E, N-SAT-106.5, N-SAT-110, N-SAT-110E, N-SAT-117, N-SAT-120E, N-SAT-122.5E, N-SAT-65.5, N-SAT-73E, N-SAT-74.5E, N-SAT-76.5E, N-SAT-79.5E, N-SAT-82.5E, N-SAT-84E, N-SAT-86E, N-SAT-94E, NSS-21, NSS-22, NSS-23, NSS-24, NSS-8, NSS-9, PACSTAR-L1, PACSTAR-L2, PAKSAT-1, PAKSAT-2, PAKSAT-C, PAKSAT-D, SJC-1, SKYSAT-A1, SKYSAT-A2, SKYSAT-A3, SKYSAT-B2, SKYSAT-C1, SKYSAT-C2, SKYSAT-C3, SKYSAT-C4, THAICOM-A2B, THAICOM-A3B, THAICOM-A5B, THAICOM-C1, THAICOM-G1K, TONGASAT AP-KU-4
BEL01800	22, 24	c	ARG, B, F, F/EUT, HOL, NOR, URG, USA	B-SAT 1, BIFROST-14, EUTELSAT 3-10E, EUTELSAT 3-12.5W, EUTELSAT 3-13E, EUTELSAT 3-14.8W, EUTELSAT 3-16E, EUTELSAT 3-4E, EUTELSAT 3-64W, EUTELSAT 3-7E, F-SAT-KU-E-5W, INTELSAT8 304.5E, INTELSAT8 304E, INTELSAT8 310E, NAHUEL-D, NAHUEL-E, NSS-10, NSS-15, NSS-17, NSS-18, URUSAT-1, URUSAT-2, URUSAT-3, URUSAT-4, URUSAT-5, URUSAT-6, URUSAT-7, URUSAT-8, USASAT-14L, USASAT-26G, USASAT-26L, USASAT-350, USASAT-41L, USASAT-41S, VIDEOSAT-5, VIDEOSAT-5-KA, VIDEOSAT-6, VIDEOSAT-6-KA, VIDEOSAT-7, VIDEOSAT-7-KA, VIDEOSAT-8-KU-C
BEL01800	26	c	ARG, B, F, F/EUT, HOL, NOR, PAK, URG, USA	B-SAT 1, BIFROST-14, EUTELSAT 3-10E, EUTELSAT 3-12.5W, EUTELSAT 3-13E, EUTELSAT 3-14.8W, EUTELSAT 3-16E, EUTELSAT 3-4E, EUTELSAT 3-64W, EUTELSAT 3-7E, F-SAT-KU-E-5W, INTELSAT8 304.5E, INTELSAT8 304E, INTELSAT8 310E, NAHUEL-D, NAHUEL-E, NSS-10, NSS-15, NSS-17, NSS-18, PAKSAT-1, URUSAT-1, URUSAT-2, URUSAT-3, URUSAT-4, URUSAT-5, URUSAT-6, URUSAT-7, URUSAT-8, USASAT-14L, USASAT-26G, USASAT-26L, USASAT-350, USASAT-41L, USASAT-41S, VIDEOSAT-5, VIDEOSAT-5-KA, VIDEOSAT-6, VIDEOSAT-6-KA, VIDEOSAT-7, VIDEOSAT-7-KA, VIDEOSAT-8-KU-C
BEL01800	28, 30, 32, 34, 36, 38, 40	c	PAK	PAKSAT-1
BEN23300	1, 5, 9, 13	c	USA	INTELSAT7 340E, INTELSAT8 340E
BFA10700	22, 24	c	E	HISPASAT-1, HISPASAT-2C3 KU
BHR25500	25	c	BLR/IK, D, F/EUT, HOL, PAK	EUROPE*STAR-2G-1, EUROPE*STAR-2G-2, EUROPE*STAR-2G-3, EUTELSAT 3-25.5E, EUTELSAT 3-33E, EUTELSAT 3-36E, EUTELSAT 3-44E, EUTELSAT 3-48E, INTERSPUTNIK-27E-Q, NSS-21, NSS-22, NSS-23, PAKSAT-1, PAKSAT-2, PAKSAT-C
BHR25500	27	c	F/EUT, MLA, PAK	EUTELSAT 3-33E, EUTELSAT 3-36E, MEASAT-SA3, PAKSAT-C
BHR25500	29, 33, 37	c	BLR/IK, D, F/EUT, HOL, MLA, PAK, THA, UAE	EMARSAT-1B, EMARSAT-1F, EMARSAT-1G, EUROPE*STAR-2G-1, EUROPE*STAR-2G-2, EUROPE*STAR-2G-3, EUTELSAT 3-25.5E, EUTELSAT 3-33E, EUTELSAT 3-36E, EUTELSAT 3-44E, EUTELSAT 3-48E, INTERSPUTNIK-27E-Q, MEASAT-SA3, MEASAT-SA4, NSS-21, NSS-22, NSS-23, PAKSAT-1, PAKSAT-2, PAKSAT-C, THAICOM-C1
BHR25500	31, 35, 39	c	F/EUT	EUTELSAT 3-33E, EUTELSAT 3-36E
BOT29700	22, 24, 26	c	NOR	BIFROST-14
BUL02000	22, 24, 26	c	NOR	BIFROST-14
CAF25800	22, 26	c	F/EUT, USA	USASAT-14L, EUTELSAT 3-12.5W, EUTELSAT 3-14.8W

Beam name	Channels	Ref. Table 1	Affected administrations*	Affected networks/beams/terrestrial stations*
CHNF_100	2, 4, 6, 8, 10, 12	c	BLR/IK, HOL., J, MHL, PNG, TON, USA	INTELSAT IBS 183E, INTELSAT7 157E, INTELSAT7 174E, INTELSAT7 177E, INTELSAT7 180E, INTELSAT7 183E, INTELSAT8 174E, INTELSAT8 176E, INTELSAT8 177E, INTELSAT8 178E, INTELSAT8 180E, INTELSAT8 183E, INTERSPUTNIK-153.5EQ, JCSAT-1R, JCSAT-2R, N-SAT-123W, N-SAT-127W, N-SAT-131W, N-SAT-133W, N-SAT-141E, N-SAT-141W, N-SAT-143W, N-SAT-145W, N-SAT-147.5E, N-SAT-148W, N-SAT-150W, N-SAT-152W, N-SAT-159W, N-SAT-161W, N-SAT-163W, N-SAT-165W, N-SAT-166E, N-SAT-167W, N-SAT-168E, N-SAT-169W, N-SAT-172W, N-SAT-173W, N-SAT-174.5W, N-SAT-175.5E, N-SAT-175.5W, N-SAT-175W, N-SAT-176W, N-SAT-178.5E, N-SAT-178.5W, NSS-11, NSS-14, NSS-19, NSS-27, NSS-6, NSS-7, ORION-AP-1, ORION-AP-2, PACSTAR-L3, SUPERBIRD-A2, SUPERBIRD-B2, SUPERBIRD-C, TONGASAT C1/C1-R, USASAT-14E, USASAT-14K, USASAT-14M, USASAT-42L, USASAT-42Q
CHNF_100	14, 16, 18, 20, 24	c	BLR/IK, HOL., J, MHL, PNG, TON, USA	INTERSPUTNIK-153.5EQ, JCSAT-1R, JCSAT-2R, N-SAT-123W, N-SAT-127W, N-SAT-131W, N-SAT-133W, N-SAT-141E, N-SAT-141W, N-SAT-143W, N-SAT-145W, N-SAT-147.5E, N-SAT-148W, N-SAT-150W, N-SAT-152W, N-SAT-159W, N-SAT-161W, N-SAT-163W, N-SAT-165W, N-SAT-166E, N-SAT-167W, N-SAT-168E, N-SAT-169W, N-SAT-172W, N-SAT-173W, N-SAT-174.5W, N-SAT-175.5E, N-SAT-175.5W, N-SAT-175W, N-SAT-176W, N-SAT-178.5E, N-SAT-178.5W, NSS-11, NSS-14, NSS-19, NSS-27, NSS-6, NSS-7, ORION-AP-1, ORION-AP-2, PACSTAR-L3, SUPERBIRD-A2, SUPERBIRD-B2, SUPERBIRD-C, TONGASAT C1/C1-R, USASAT-14E, USASAT-14K, USASAT-14M, USASAT-42L, USASAT-42Q
CHNF_100	22	c	BLR/IK, USA	INTERSPUTNIK-153.5EQ, USASAT-14M
CME30000	22, 24, 26	c	F/EUT	EUTELSAT 3-12.5W
COD_100	2, 4, 6, 8, 10, 12	c	USA	INTELSAT IBS 342E, INTELSAT7 342E, INTELSAT7 340E, INTELSAT8 342E, INTELSAT8 340E
COG23500	1, 3, 5, 7, 9, 11, 13, 15, 17, 19	c	F/EUT	EUTELSAT 3-12.5W
CPV30100	2, 4, 6, 8, 10, 12	c	USA	INTELSAT7 325.5E, INTELSAT8 325.5E
CTI23700	1, 3, 5, 7, 9, 11, 13	c	USA	INTELSAT7 335.5E, INTELSAT8 335.5E
CVA08300	1, 3, 5, 7, 9, 11	c	NOR, USA	INTELSAT7 359E, INTELSAT8 359E, BIFROST-14, INTELSAT10 359E
CVA08500	22	c	NOR	BIFROST-14
CYP08600	1, 3, 5, 7, 9, 11, 13	c	NOR, USA	INTELSAT7 359E, INTELSAT8 359E, BIFROST-14
CYP08600	15, 17, 19	c	NOR	BIFROST-14
CZE14401	1, 9, 17, 25	c	F/EUT	EUTELSAT 3-12.5W
CZE14402	14	c	F/EUT	EUTELSAT 3-12.5W
CZE14403	2, 22, 24	c	F/EUT	EUTELSAT 3-12.5W

Beam name	Channels	Ref. Table 1	Affected administrations*	Affected networks/beams/terrestrial stations*
DNK__100	1, 3, 5, 7, 9, 11	c	HOL, USA	INTELSAT7 335.5E, INTELSAT K 338.5E, INTELSAT8 338.5E, INTELSAT8 330.5E, INTELSAT7 330.5E, INTELSAT8 335.5E, INTELSAT8 332.5E, INTELSAT7 332.5E, NSS-15
DNK__100	13	c	HOL, USA	INTELSAT7 335.5E, INTELSAT8 338.5E, INTELSAT8 330.5E, INTELSAT7 330.5E, INTELSAT8 335.5E, INTELSAT8 332.5E, INTELSAT7 332.5E, NSS-15
DNK__100	15, 17, 19	c	HOL	NSS-15
EGY02600	2, 6, 10, 14, 18	c	BLR/IK, F	INTERSPUTNIK-6W-Q, VIDEOSAT-5, VIDEOSAT-6, VIDEOSAT-5-KA, VIDEOSAT-6-KA
EST06100	1, 3, 5, 7, 9, 11	c	F, F/EUT, HOL, NOR, URG, USA	BIFROST-14, EUTELSAT 3-10E, EUTELSAT 3-12.5W, EUTELSAT 3-13E, EUTELSAT 3-14.8W, EUTELSAT 3-16E, EUTELSAT 3-4E, EUTELSAT 3-7E, F-SAT-KU-E-5W, INTELSAT IBS 307E, INTELSAT IBS 310E, INTELSAT IBS 342E, INTELSAT10 359E, INTELSAT7 304.5E, INTELSAT7 307E, INTELSAT7 310E, INTELSAT7 330.5E, INTELSAT7 340E, INTELSAT7 342E, INTELSAT7 359E, INTELSAT8 304.5E, INTELSAT8 307E, INTELSAT8 310E, INTELSAT8 319.5E, INTELSAT8 325.5E, INTELSAT8 328.5E, INTELSAT8 330.5E, INTELSAT8 332.5E, INTELSAT8 335.5E, INTELSAT8 340E, INTELSAT8 342E, INTELSAT8 359E, NSS-15, NSS-18, URUSAT-6, URUSAT-7, USASAT-14L, USASAT-26L, USASAT-41L, USASAT-41S, VIDEOSAT-5, VIDEOSAT-5-KA, VIDEOSAT-6, VIDEOSAT-6-KA, VIDEOSAT-7, VIDEOSAT-7-KA, VIDEOSAT-8-KU-C
EST06100	13	c	F, F/EUT, HOL, NOR, URG, USA	BIFROST-14, EUTELSAT 3-10E, EUTELSAT 3-12.5W, EUTELSAT 3-13E, EUTELSAT 3-14.8W, EUTELSAT 3-16E, EUTELSAT 3-4E, EUTELSAT 3-7E, F-SAT-KU-E-5W, INTELSAT IBS 307E, INTELSAT IBS 310E, INTELSAT IBS 342E, INTELSAT10 359E, INTELSAT7 304.5E, INTELSAT7 307E, INTELSAT7 310E, INTELSAT7 330.5E, INTELSAT7 340E, INTELSAT7 342E, INTELSAT7 359E, INTELSAT8 304.5E, INTELSAT8 307E, INTELSAT8 310E, INTELSAT8 319.5E, INTELSAT8 325.5E, INTELSAT8 328.5E, INTELSAT8 330.5E, INTELSAT8 332.5E, INTELSAT8 335.5E, INTELSAT8 340E, INTELSAT8 342E, INTELSAT8 359E, NSS-15, NSS-18, URUSAT-6, URUSAT-7, USASAT-14L, USASAT-26A, USASAT-26L, USASAT-41L, USASAT-41S, VIDEOSAT-5, VIDEOSAT-5-KA, VIDEOSAT-6, VIDEOSAT-6-KA, VIDEOSAT-7, VIDEOSAT-7-KA, VIDEOSAT-8-KU-C
EST06100	15, 17, 19	c	F, F/EUT, HOL, NOR, URG, USA	BIFROST-14, EUTELSAT 3-10E, EUTELSAT 3-12.5W, EUTELSAT 3-13E, EUTELSAT 3-14.8W, EUTELSAT 3-16E, EUTELSAT 3-4E, EUTELSAT 3-7E, F-SAT-KU-E-5W, INTELSAT8 304.5E, INTELSAT8 310E, NSS-15, NSS-18, URUSAT-6, URUSAT-7, USASAT-14L, USASAT-26L, USASAT-41L, USASAT-41S, VIDEOSAT-5, VIDEOSAT-5-KA, VIDEOSAT-6, VIDEOSAT-6-KA, VIDEOSAT-7, VIDEOSAT-7-KA, VIDEOSAT-8-KU-C
F 09300	22, 24, 26	c	BLR/IK, F/EUT	INTERSPUTNIK-6W-Q, EUTELSAT 3-12.5W
FJI19300	1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23	c	J	N-SAT-178.5W
FSM00000	1, 3, 5, 7, 9, 11, 13	c	J, USA	INTELSAT7 157E, SUPERBIRD-A2
FSM00000	15, 17, 19, 21, 23	c	J	SUPERBIRD-A2

Beam name	Channels	Ref. Table 1	Affected administrations*	Affected networks/beams/terrestrial stations*
F___100	25	c	BLR/IK, CHN, D, F/EUT, G, HOL, J, MHL, TON, USA	ASIASAT-AK1, ASIASAT-CK1, ASIASAT-EK1, EUROPE*STAR-2G-1, EUROPE*STAR-2G-2, EUROPE*STAR-2G-3, EUTELSAT 3-25.5E, EUTELSAT 3-33E, EUTELSAT 3-36E, EUTELSAT 3-44E, EUTELSAT 3-48E, EUTELSAT 3-70.5E, EUTELSAT 3-76E, EUTELSAT 3-80.5E, EUTELSAT 3-83.5E, EUTELSAT 3-88.5E, INTELSAT KFOS 85E, INTERSPUTNIK-27E-Q, JCSAT-3A, JCSAT-3B, N-SAT-102.5E, N-SAT-103.5E, N-SAT-106.5, N-SAT-110E, N-SAT-117, N-SAT-120E, N-SAT-122.5E, N-SAT-125.5E, N-SAT-129.5E, N-SAT-141E, N-SAT-141E, N-SAT-65.5, N-SAT-73E, N-SAT-74.5E, N-SAT-76.5E, N-SAT-79.5E, N-SAT-82.5E, N-SAT-84E, N-SAT-86E, N-SAT-94E, N-STAR-A2, N-STAR-B2, NSS-21, NSS-22, NSS-23, NSS-24, NSS-8, NSS-9, ORION-AP-1, SB-SAT-135, SKYSAT-A1, SKYSAT-A2, SKYSAT-A3, SKYSAT-B1, SKYSAT-B2, SKYSAT-B3, SKYSAT-B4, SKYSAT-C1, SKYSAT-C2, SKYSAT-C3, SKYSAT-C4, TONGASAT AP-KU-4, TONGASAT C/KU-1, TONGASAT C/KU-2, TONGASAT C/KU-3, TONGASAT C/KU-4
F___100	27	c	BLR/IK, CHN, D, F/EUT, G, HOL, J, THA, TON, USA	ASIASAT-AK1, ASIASAT-AKX, ASIASAT-BKX, ASIASAT-CK1, ASIASAT-CKX, ASIASAT-DKX, ASIASAT-EK1, ASIASAT-EKX, EUROPE*STAR-2G-1, EUROPE*STAR-2G-2, EUROPE*STAR-2G-3, EUTELSAT 3-25.5E, EUTELSAT 3-33E, EUTELSAT 3-36E, EUTELSAT 3-44E, EUTELSAT 3-48E, EUTELSAT 3-70.5E, EUTELSAT 3-73.5E, EUTELSAT 3-76E, EUTELSAT 3-80.5E, EUTELSAT 3-83.5E, EUTELSAT 3-86E, EUTELSAT 3-88.5E, INTELSAT KFOS 85E, INTELSAT 7 66E, INTERSPUTNIK-27E-Q, JCSAT-3A, JCSAT-3B, N-SAT-102.5E, N-SAT-103.5E, N-SAT-106.5, N-SAT-110E, N-SAT-117, N-SAT-120E, N-SAT-122.5E, N-SAT-125.5E, N-SAT-129.5E, N-SAT-141E, N-SAT-65.5, N-SAT-73E, N-SAT-74.5E, N-SAT-76.5E, N-SAT-79.5E, N-SAT-82.5E, N-SAT-84E, N-SAT-86E, N-SAT-94E, N-STAR-A2, N-STAR-B2, NSS-21, NSS-22, NSS-23, NSS-24, NSS-8, NSS-9, SB-SAT-135, SKYSAT-A1, SKYSAT-A2, SKYSAT-A3, SKYSAT-B1, SKYSAT-B2, SKYSAT-B3, SKYSAT-B4, SKYSAT-C1, SKYSAT-C2, SKYSAT-C3, SKYSAT-C4, THAICOM-C2, TONGASAT AP-KU-4, TONGASAT C/KU-1, TONGASAT C/KU-2, TONGASAT C/KU-3, TONGASAT C/KU-4
F___100	29	c	BLR/IK, CHN, D, F/EUT, G, HOL, J, KOR, LAO, MLA, PNG, THA, TON, USA	ASIASAT-AK1, ASIASAT-AKX, ASIASAT-BKX, ASIASAT-CK1, ASIASAT-CKX, ASIASAT-DKX, ASIASAT-EK1, ASIASAT-EKX, EUROPE*STAR-2G-1, EUROPE*STAR-2G-2, EUROPE*STAR-2G-3, EUTELSAT 3-25.5E, EUTELSAT 3-33E, EUTELSAT 3-36E, EUTELSAT 3-44E, EUTELSAT 3-48E, EUTELSAT 3-70.5E, EUTELSAT 3-73.5E, EUTELSAT 3-76E, EUTELSAT 3-80.5E, EUTELSAT 3-83.5E, EUTELSAT 3-86E, EUTELSAT 3-88.5E, INTELSAT KFOS 85E, INTELSAT 7 66E, INTERSPUTNIK-27E-Q, JCSAT-3A, JCSAT-3B, KOREASAT-1, KOREASAT-103KU, KOREASAT-123.7KU, KOREASAT-2, L-STAR-1, L-STAR-2, L-STAR-3, L-STAR-4, L-STAR-5, L-STAR-6, MEASAT-1, MEASAT-3, MEASAT-91.5E, MEASAT-95E, N-SAT-102.5E, N-SAT-103.5E, N-SAT-106.5, N-SAT-110, N-SAT-110E, N-SAT-117, N-SAT-120E, N-SAT-122.5E, N-SAT-125.5E, N-SAT-128, N-SAT-129.5E, N-SAT-141E, N-SAT-65.5, N-SAT-73E, N-SAT-74.5E, N-SAT-76.5E, N-SAT-79.5E, N-SAT-82.5E, N-SAT-84E, N-SAT-86E, N-SAT-94E, N-STAR-A2, N-STAR-B2, NSS-21, NSS-22, NSS-23, NSS-24, NSS-8, NSS-9, PACSTAR-L1, PACSTAR-L2, PACSTAR-L3, SB-SAT-135, SKYSAT-A1, SKYSAT-A2, SKYSAT-A3, SKYSAT-B1, SKYSAT-B2, SKYSAT-B3, SKYSAT-B4, SKYSAT-C1, SKYSAT-C2, SKYSAT-C3, SKYSAT-C4, THAICOM-A2B, THAICOM-A3B, THAICOM-A4B, THAICOM-A5B, THAICOM-C1, THAICOM-C2, THAICOM-G1K, THAICOM-G2K, THAICOM-G3K, TONGASAT AP-KU-4, TONGASAT C/KU-1, TONGASAT C/KU-2, TONGASAT C/KU-3, TONGASAT C/KU-4
F___100	31, 33, 35, 37, 39	c	BLR/IK, CHN, D, F/EUT, G, HOL, J, KOR, LAO, MLA, PNG, THA, TON, USA	ASIASAT-AK1, ASIASAT-AKX, ASIASAT-BKX, ASIASAT-CK1, ASIASAT-CKX, ASIASAT-DKX, ASIASAT-EK1, ASIASAT-EKX, EUROPE*STAR-2G-1, EUROPE*STAR-2G-2, EUROPE*STAR-2G-3, EUTELSAT 3-25.5E, EUTELSAT 3-33E, EUTELSAT 3-36E, EUTELSAT 3-44E, EUTELSAT 3-48E, EUTELSAT 3-70.5E, EUTELSAT 3-73.5E, EUTELSAT 3-76E, EUTELSAT 3-80.5E, EUTELSAT 3-83.5E, EUTELSAT 3-86E, EUTELSAT 3-88.5E, INTELSAT KFOS 85E, INTELSAT 7 66E, INTERSPUTNIK-27E-Q, JCSAT-3A, JCSAT-3B, KOREASAT-1, KOREASAT-2, L-STAR-1, L-STAR-2, L-STAR-3, L-STAR-4, L-STAR-5, L-STAR-6, MEASAT-1, MEASAT-3, MEASAT-91.5E, MEASAT-95E, N-SAT-102.5E, N-SAT-103.5E, N-SAT-106.5, N-SAT-110, N-SAT-110E, N-SAT-117, N-SAT-120E, N-SAT-122.5E, N-SAT-125.5E, N-SAT-128, N-SAT-129.5E, N-SAT-141E, N-SAT-65.5, N-SAT-73E, N-SAT-74.5E, N-SAT-76.5E, N-SAT-79.5E, N-SAT-82.5E, N-SAT-84E, N-SAT-86E, N-SAT-94E, N-STAR-A2, N-STAR-B2, NSS-21, NSS-22, NSS-23, NSS-24, NSS-8, NSS-9, PACSTAR-L1, PACSTAR-L2, PACSTAR-L3, SB-SAT-135, SKYSAT-A1, SKYSAT-A2, SKYSAT-A3, SKYSAT-B1, SKYSAT-B2, SKYSAT-B3, SKYSAT-B4, SKYSAT-C1, SKYSAT-C2, SKYSAT-C3, SKYSAT-C4, THAICOM-A2B, THAICOM-A3B, THAICOM-A4B, THAICOM-A5B, THAICOM-C1, THAICOM-C2, THAICOM-G1K, THAICOM-G2K, THAICOM-G3K, TONGASAT AP-KU-4, TONGASAT C/KU-1, TONGASAT C/KU-2, TONGASAT C/KU-3, TONGASAT C/KU-4

Beam name	Channels	Ref. Table 1	Affected administrations*	Affected networks/beams/terrestrial stations*
G 02700	2, 6, 10	c	HOL, URG	INTELSAT IBS 319.5E, INTELSAT7 319.5E, INTELSAT8 319.5E, NSS-18, URUSAT-7
G 02700	14, 18	c	HOL, URG	NSS-18, URUSAT-7
GAB26000	1, 5, 9, 13, 17	c	F/EUT	EUTELSAT 3-12.5W
GMB30200	1, 5, 9, 13, 17	c	URG, USA	USASAT-26A, URUSAT-7
GNB30400	22, 24	c	E	HISPASAT-1, HISPASAT-2C3 KU
GRC10500	2, 4, 6, 8, 10, 12	c	NOR, USA	INTELSAT7 359E, INTELSAT8 359E, BIFROST-14, INTELSAT10 359E
GRC10500	14, 16, 18, 20	c	NOR	BIFROST-14
GUI19200	2, 4, 6, 8, 10, 12, 14, 16, 18, 20	c	E, URG, USA	USASAT-26A, HISPASAT 36W KU, URUSAT-7
HNG10601	3, 11, 19	c	F/EUT	EUTELSAT 3-12.5W
HNG10602	6	c	F/EUT	EUTELSAT 3-12.5W
HNG10603	2, 22, 24	c	F/EUT	EUTELSAT 3-12.5W
HOL21300	2, 4, 6, 8, 10	c	ARG, B, F, F/EUT, NOR, URG, USA	B-SAT I, BIFROST-14, EUTELSAT 3-10E, EUTELSAT 3-12.5W, EUTELSAT 3-13E, EUTELSAT 3-14.8W, EUTELSAT 3-16E, EUTELSAT 3-4E, EUTELSAT 3-64W, EUTELSAT 3-7E, F-SAT-KU-E-5W, INTELSAT IBS 307E, INTELSAT IBS 310E, INTELSAT IBS 342E, INTELSAT10 310E, INTELSAT10 359E, INTELSAT7 304.5E, INTELSAT7 304E, INTELSAT7 307E, INTELSAT7 310E, INTELSAT7 325.5E, INTELSAT7 328.5E, INTELSAT7 330.5E, INTELSAT7 332.5E, INTELSAT7 335.5E, INTELSAT7 340E, INTELSAT7 342E, INTELSAT7 359E, INTELSAT8 304.5E, INTELSAT8 304E, INTELSAT8 307E, INTELSAT8 310E, INTELSAT8 325.5E, INTELSAT8 328.5E, INTELSAT8 330.5E, INTELSAT8 332.5E, INTELSAT8 335.5E, INTELSAT8 340E, INTELSAT8 342E, INTELSAT8 359E, NAHUEL-D, NAHUEL-E, URUSAT-1, URUSAT-2, URUSAT-3, URUSAT-4, URUSAT-5, URUSAT-6, URUSAT-7, URUSAT-8, USASAT-14L, USASAT-26G, USASAT-26L, USASAT-35O, USASAT-41L, USASAT-41S, VIDEOSAT-5, VIDEOSAT-5-KA, VIDEOSAT-6, VIDEOSAT-6-KA, VIDEOSAT-7, VIDEOSAT-7-KA, VIDEOSAT-8-KU-C
HOL21300	12	c	ARG, B, F, F/EUT, NOR, URG, USA	B-SAT I, BIFROST-14, EUTELSAT 3-10E, EUTELSAT 3-12.5W, EUTELSAT 3-13E, EUTELSAT 3-14.8W, EUTELSAT 3-16E, EUTELSAT 3-4E, EUTELSAT 3-64W, EUTELSAT 3-7E, F-SAT-KU-E-5W, INTELSAT IBS 307E, INTELSAT IBS 310E, INTELSAT IBS 342E, INTELSAT10 310E, INTELSAT10 359E, INTELSAT7 304.5E, INTELSAT7 304E, INTELSAT7 307E, INTELSAT7 310E, INTELSAT7 325.5E, INTELSAT7 328.5E, INTELSAT7 330.5E, INTELSAT7 332.5E, INTELSAT7 335.5E, INTELSAT7 340E, INTELSAT7 342E, INTELSAT7 359E, INTELSAT8 304.5E, INTELSAT8 304E, INTELSAT8 307E, INTELSAT8 310E, INTELSAT8 325.5E, INTELSAT8 328.5E, INTELSAT8 330.5E, INTELSAT8 332.5E, INTELSAT8 335.5E, INTELSAT8 340E, INTELSAT8 342E, INTELSAT8 359E, NAHUEL-D, NAHUEL-E, URUSAT-1, URUSAT-2, URUSAT-3, URUSAT-4, URUSAT-5, URUSAT-6, URUSAT-7, URUSAT-8, USASAT-14L, USASAT-26A, USASAT-26G, USASAT-26L, USASAT-35O, USASAT-41L, USASAT-41S, VIDEOSAT-5, VIDEOSAT-5-KA, VIDEOSAT-6, VIDEOSAT-6-KA, VIDEOSAT-7, VIDEOSAT-7-KA, VIDEOSAT-8-KU-C

Beam name	Channels	Ref. Table 1	Affected administrations*	Affected networks/beams/terrestrial stations*
HOL21300	14, 16, 18, 20	c	ARG, B, F, F/EUT, NOR, URG, USA	B-SAT I, BIFROST-14, EUTELSAT 3-10E, EUTELSAT 3-12.5W, EUTELSAT 3-13E, EUTELSAT 3-14.8W, EUTELSAT 3-16E, EUTELSAT 3-4E, EUTELSAT 3-64W, EUTELSAT 3-7E, F-SAT-KU-E-5W, INTELSAT8 304.5E, INTELSAT8 304E, INTELSAT8 310E, NAHUEL-D, NAHUEL-E, URUSAT-1, URUSAT-2, URUSAT-3, URUSAT-4, URUSAT-5, URUSAT-6, URUSAT-7, URUSAT-8, USASAT-14L, USASAT-26G, USASAT-26L, USASAT-35Q, USASAT-41L, USASAT-41S, VIDEOSAT-5, VIDEOSAT-5-KA, VIDEOSAT-6, VIDEOSAT-6-KA, VIDEOSAT-7, VIDEOSAT-7-KA, VIDEOSAT-8-KU-C
HRV14801	5, 13, 21	c	F/EUT	EUTELSAT 3-12.5W
HRV14802	10	c	F/EUT	EUTELSAT 3-12.5W
HRV14803	2, 22, 24	c	F/EUT	EUTELSAT 3-12.5W
I 08200	22	c	F/EUT, MLA, USA	MEASAT-SA2, USASAT-41S, EUTELSAT 3-7E, EUTELSAT 3-10E
I 08200	24, 26	c	F/EUT, USA	USASAT-41S, EUTELSAT 3-7E, EUTELSAT 3-10E
IRL21100	1, 3, 5, 7, 9, 11, 13, 15, 17, 19	c	URG, USA	USASAT-26A, URUSAT-7
ISL04900	27	a	GUY	GUY00302
ISL04900	29	a	DNK, JMC	GRLDNK01, JMC00005
ISL04900	31, 35, 37	a	DNK, GUY, JMC	GRLDNK01, GUY00302, JMC00005
ISL04900	33	a	GUY, JMC	GUY00302, JMC00005
ISL04900	39	a	JMC	JMC00005
ISL04900	23	c	ARG, B, F, F/EUT, HOL, NOR, URG, USA, VEN/ASA	B-SAT I, BIFROST-14, EUTELSAT 3-10E, EUTELSAT 3-12.5W, EUTELSAT 3-13E, EUTELSAT 3-14.8W, EUTELSAT 3-16E, EUTELSAT 3-4E, EUTELSAT 3-64W, EUTELSAT 3-7E, F-SAT-KU-E-5W, INTELSAT8 304.5E, INTELSAT8 304E, INTELSAT8 310E, NAHUEL-D, NAHUEL-E, NSS-10, NSS-15, NSS-17, NSS-18, SIMON BOLIVAR 2, SIMON BOLIVAR 4, URUSAT-1, URUSAT-2, URUSAT-3, URUSAT-4, URUSAT-5, URUSAT-6, URUSAT-7, URUSAT-8, USASAT-14L, USASAT-26G, USASAT-26L, USASAT-35K, USASAT-35M, USASAT-35Q, USASAT-35Q, USASAT-41L, USASAT-41S, VIDEOSAT-5, VIDEOSAT-5-KA, VIDEOSAT-6, VIDEOSAT-6-KA, VIDEOSAT-7, VIDEOSAT-7-KA, VIDEOSAT-8-KU-C
ISL05000	22, 24	c	ARG, B, F, F/EUT, HOL, NOR, URG, USA, VEN/ASA	B-SAT I, BIFROST-14, EUTELSAT 3-10E, EUTELSAT 3-12.5W, EUTELSAT 3-13E, EUTELSAT 3-14.8W, EUTELSAT 3-16E, EUTELSAT 3-4E, EUTELSAT 3-64W, EUTELSAT 3-7E, F-SAT-KU-E-5W, INTELSAT8 304.5E, INTELSAT8 304E, INTELSAT8 310E, NAHUEL-D, NAHUEL-E, NSS-10, NSS-15, NSS-17, NSS-18, SIMON BOLIVAR 2, SIMON BOLIVAR 4, URUSAT-1, URUSAT-2, URUSAT-3, URUSAT-4, URUSAT-5, URUSAT-6, URUSAT-7, URUSAT-8, USASAT-14L, USASAT-26G, USASAT-26L, USASAT-35K, USASAT-35M, USASAT-35Q, USASAT-35Q, USASAT-41L, USASAT-41S, VIDEOSAT-5, VIDEOSAT-5-KA, VIDEOSAT-6, VIDEOSAT-6-KA, VIDEOSAT-7, VIDEOSAT-7-KA, VIDEOSAT-8-KU-C
ISL05000	26	c	ARG, B, F, F/EUT, HOL, NOR, URG, USA, VEN/ASA	B-SAT I, BIFROST-14, EUTELSAT 3-10E, EUTELSAT 3-12.5W, EUTELSAT 3-13E, EUTELSAT 3-14.8W, EUTELSAT 3-16E, EUTELSAT 3-4E, EUTELSAT 3-64W, EUTELSAT 3-7E, F-SAT-KU-E-5W, INTELSAT8 304.5E, INTELSAT8 304E, INTELSAT8 310E, NAHUEL-D, NAHUEL-E, NSS-10, NSS-15, NSS-17, NSS-18, SIMON BOLIVAR 2, SIMON BOLIVAR 4, URUSAT-1, URUSAT-2, URUSAT-3, URUSAT-4, URUSAT-5, URUSAT-6, URUSAT-7, URUSAT-8, USASAT-14L, USASAT-26G, USASAT-26L, USASAT-35K, USASAT-35L, USASAT-35M, USASAT-35Q, USASAT-35Q, USASAT-41L, USASAT-41S, VIDEOSAT-5, VIDEOSAT-5-KA, VIDEOSAT-6, VIDEOSAT-6-KA, VIDEOSAT-7, VIDEOSAT-7-KA, VIDEOSAT-8-KU-C

Beam name	Channels	Ref. Table 1	Affected administrations*	Affected networks/beams/terrestrial stations*
J 10985	1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23	c	HOL, MHL, PNG, USA	NSS-11, NSS-12, NSS-14, NSS-27, NSS-6, NSS-7, ORION-AP-1, ORION-AP-2, PACSTAR-L3, USASAT-14E, USASAT-14K, USASAT-23J, USASAT-35C, USASAT-35D, USASAT-35E, USASAT-40M, USASAT-42L, USASAT-42Q
J 11100	1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23	c	HOL, MHL, PNG, USA	NSS-11, NSS-12, NSS-14, NSS-27, NSS-6, NSS-7, ORION-AP-1, ORION-AP-2, PACSTAR-L3, USASAT-14E, USASAT-14K, USASAT-23J, USASAT-35C, USASAT-35D, USASAT-35E, USASAT-40M, USASAT-42L, USASAT-42Q
KEN24900	22, 24, 26	c	NOR	BIFROST-14
KIR__100	1, 3, 5, 7, 9, 11, 13	c	BLR/IK, HOL, J, MHL, PNG, TON, URG, USA	INTELSAT IBS 183E, INTELSAT7 157E, INTELSAT7 174E, INTELSAT7 176E, INTELSAT7 177E, INTELSAT7 178E, INTELSAT7 180E, INTELSAT7 183E, INTELSAT8 174E, INTELSAT8 176E, INTELSAT8 177E, INTELSAT8 178E, INTELSAT8 180E, INTELSAT8 183E, INTERSPUTNIK-153.5EQ, JCSAT-1R, JCSAT-2R, N-SAT-123W, N-SAT-127W, N-SAT-131W, N-SAT-133W, N-SAT-141E, N-SAT-141W, N-SAT-143W, N-SAT-145W, N-SAT-147.5E, N-SAT-148W, N-SAT-150W, N-SAT-152W, N-SAT-159W, N-SAT-161W, N-SAT-163W, N-SAT-165W, N-SAT-166E, N-SAT-167W, N-SAT-168E, N-SAT-169W, N-SAT-172W, N-SAT-173W, N-SAT-174.5W, N-SAT-175.5E, N-SAT-175.5W, N-SAT-175W, N-SAT-176W, N-SAT-178.5E, N-SAT-178.5W, NSS-10, NSS-11, NSS-12, NSS-14, NSS-19, NSS-27, NSS-6, NSS-7, ORION-AP-1, ORION-AP-2, PACSTAR-L3, SUPERBIRD-A2, SUPERBIRD-B2, SUPERBIRD-C, TONGASAT C1/C1-R, URUSAT-1, URUSAT-2, USASAT-14E, USASAT-14K, USASAT-14M, USASAT-35K, USASAT-35M, USASAT-35O, USASAT-40M, USASAT-42L, USASAT-42Q
KIR__100	15, 19, 23	c	J	N-SAT-175.5E
KIR__100	17, 21	c	BLR/IK, HOL, J, MHL, PNG, TON, URG, USA	INTERSPUTNIK-153.5EQ, JCSAT-1R, JCSAT-2R, N-SAT-123W, N-SAT-127W, N-SAT-131W, N-SAT-133W, N-SAT-141E, N-SAT-141W, N-SAT-143W, N-SAT-145W, N-SAT-147.5E, N-SAT-148W, N-SAT-150W, N-SAT-152W, N-SAT-159W, N-SAT-161W, N-SAT-163W, N-SAT-165W, N-SAT-166E, N-SAT-167W, N-SAT-168E, N-SAT-169W, N-SAT-172W, N-SAT-173W, N-SAT-174.5W, N-SAT-175.5E, N-SAT-175.5W, N-SAT-175W, N-SAT-176W, N-SAT-178.5E, N-SAT-178.5W, NSS-10, NSS-11, NSS-12, NSS-14, NSS-19, NSS-27, NSS-6, NSS-7, ORION-AP-1, ORION-AP-2, PACSTAR-L3, SUPERBIRD-A2, SUPERBIRD-B2, SUPERBIRD-C, TONGASAT C1/C1-R, URUSAT-1, URUSAT-2, USASAT-14E, USASAT-14K, USASAT-14M, USASAT-35K, USASAT-35M, USASAT-35O, USASAT-40M, USASAT-42L, USASAT-42Q
KRE28600	1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23	c	J, MHL	ORION-AP-1, N-SAT-141E
KWT11300	26	c	BLR/IK, CHN, D, F/EUT, J, PAK, SNG, THA, TON, UAE	ASIASAT-AK1, EMARSAT-1B, EUROPE*STAR-2G-2, EUTELSAT 3-25.5E, EUTELSAT 3-33E, INTERSPUTNIK-27E-Q, N-SAT-125.5E, PAKSAT-1, PAKSAT-2, PAKSAT-C, PAKSAT-D, ST-1C, THAICOM-C2, TONGASAT AP-KU-4

Beam name	Channels	Ref. Table 1	Affected administrations*	Affected networks/beams/terrestrial stations*
KWT11300	28	c	BLR/IK, CHN, D, F/EUT, G, HOL, INS, J, KOR, LAO, MLA, PAK, PNG, SNG, THA, TON, UAE, USA	AM-SAT A4, APSTAR-3, APSTAR-4, ASIASEAT-AK1, ASIASEAT-AKX, ASIASEAT-BKX, ASIASEAT-CK1, ASIASEAT-CKX, ASIASEAT-DKX, ASIASEAT-EK1, ASIASEAT-EKX, EMARSAT-1B, EMARSAT-1F, EMARSAT-1G, EUROPE*STAR-2G-1, EUROPE*STAR-2G-2, EUROPE*STAR-2G-3, EUTELSAT 3-25.5E, EUTELSAT 3-33E, EUTELSAT 3-36E, EUTELSAT 3-44E, EUTELSAT 3-48E, EUTELSAT 3-70.5E, EUTELSAT 3-73.5E, EUTELSAT 3-76E, EUTELSAT 3-80.5E, EUTELSAT 3-83.5E, EUTELSAT 3-86E, EUTELSAT 3-88.5E, INTELSAT KFOS 85E, INTELSAT 7 66E, INTERSPUTNIK-27E-Q, JCSAT-3B, KOREASAT-103KU, KOREASAT-123.7KU, L-STAR-1, L-STAR-2, L-STAR-3, L-STAR-4, L-STAR-5, L-STAR-6, MEASAT-1, MEASAT-3, MEASAT-91.5E, MEASAT-95E, MEASAT-SA3, MEASAT-SA4, N-SAT-102.5E, N-SAT-103.5E, N-SAT-106.5, N-SAT-110, N-SAT-110E, N-SAT-117, N-SAT-120E, N-SAT-122.5E, N-SAT-125.5E, N-SAT-125.5E, N-SAT-13E, N-SAT-73E, N-SAT-74.5E, N-SAT-76.5E, N-SAT-79.5E, N-SAT-82.5E, N-SAT-84E, N-SAT-86E, N-SAT-94E, NSS-21, NSS-22, NSS-23, NSS-24, NSS-8, NSS-9, PACSTAR-L1, PACSTAR-L2, PAKSAT-1, PAKSAT-2, PAKSAT-C, PAKSAT-D, PALAPA-C6, SJC-1, SKYSAT-A1, SKYSAT-A2, SKYSAT-A3, SKYSAT-B2, SKYSAT-C1, SKYSAT-C2, SKYSAT-C3, SKYSAT-C4, ST-1C, THAICOM-A2B, THAICOM-A3B, THAICOM-A5B, THAICOM-C1, THAICOM-C2, THAICOM-G1K, THAICOM-G2K, TONGASAT AP-KU-4
KWT11300	30, 34	c	BLR/IK, CHN, D, F/EUT, G, INS, J, LAO, MLA, PAK, SNG, THA, TON, UAE	AM-SAT A4, APSTAR-3, APSTAR-4, ASIASEAT-AK1, EMARSAT-1B, EUROPE*STAR-2G-2, EUTELSAT 3-25.5E, EUTELSAT 3-33E, INTERSPUTNIK-27E-Q, L-STAR-4, MEASAT-SA3, MEASAT-SA4, N-SAT-125.5E, PAKSAT-1, PAKSAT-2, PAKSAT-C, PAKSAT-D, PALAPA-C6, SJC-1, ST-1C, THAICOM-C2, THAICOM-G1K, THAICOM-G2K, TONGASAT AP-KU-4
KWT11300	32, 36	c	BLR/IK, CHN, D, F/EUT, G, HOL, INS, J, LAO, MLA, PAK, PNG, SNG, THA, TON, UAE, USA	AM-SAT A4, APSTAR-3, APSTAR-4, ASIASEAT-AK1, ASIASEAT-AKX, ASIASEAT-BKX, ASIASEAT-CK1, ASIASEAT-CKX, ASIASEAT-DKX, ASIASEAT-EK1, ASIASEAT-EKX, EMARSAT-1B, EMARSAT-1F, EMARSAT-1G, EUROPE*STAR-2G-1, EUROPE*STAR-2G-2, EUROPE*STAR-2G-3, EUTELSAT 3-25.5E, EUTELSAT 3-33E, EUTELSAT 3-36E, EUTELSAT 3-44E, EUTELSAT 3-48E, EUTELSAT 3-70.5E, EUTELSAT 3-73.5E, EUTELSAT 3-76E, EUTELSAT 3-80.5E, EUTELSAT 3-83.5E, EUTELSAT 3-86E, EUTELSAT 3-88.5E, INTELSAT KFOS 85E, INTELSAT 7 66E, INTERSPUTNIK-27E-Q, JCSAT-3B, L-STAR-1, L-STAR-2, L-STAR-3, L-STAR-4, L-STAR-5, L-STAR-6, MEASAT-1, MEASAT-3, MEASAT-91.5E, MEASAT-95E, MEASAT-SA3, MEASAT-SA4, N-SAT-102.5E, N-SAT-103.5E, N-SAT-106.5, N-SAT-110, N-SAT-110E, N-SAT-117, N-SAT-120E, N-SAT-122.5E, N-SAT-125.5E, N-SAT-65.5, N-SAT-73E, N-SAT-74.5E, N-SAT-76.5E, N-SAT-79.5E, N-SAT-82.5E, N-SAT-84E, N-SAT-86E, N-SAT-94E, NSS-21, NSS-22, NSS-23, NSS-24, NSS-8, NSS-9, PACSTAR-L1, PACSTAR-L2, PAKSAT-1, PAKSAT-2, PAKSAT-C, PAKSAT-D, PALAPA-C6, SJC-1, SKYSAT-A1, SKYSAT-A2, SKYSAT-A3, SKYSAT-B2, SKYSAT-C1, SKYSAT-C2, SKYSAT-C3, SKYSAT-C4, ST-1C, THAICOM-A2B, THAICOM-A3B, THAICOM-A5B, THAICOM-C1, THAICOM-C2, THAICOM-G1K, THAICOM-G2K, TONGASAT AP-KU-4
KWT11300	38	c	BLR/IK, F/EUT, J, PAK, THA	EUTELSAT 3-25.5E, EUTELSAT 3-33E, INTERSPUTNIK-27E-Q, N-SAT-125.5E, PAKSAT-C, PAKSAT-D, THAICOM-G2K
KWT11300	40	c	BLR/IK, CHN, D, F/EUT, G, HOL, INS, J, LAO, MLA, PAK, PNG, SNG, THA, TON, UAE, USA	AM-SAT A4, APSTAR-3, APSTAR-4, ASIASEAT-AK1, ASIASEAT-AKX, ASIASEAT-BKX, ASIASEAT-CK1, ASIASEAT-CKX, ASIASEAT-DKX, ASIASEAT-EK1, ASIASEAT-EKX, EMARSAT-1B, EMARSAT-1F, EMARSAT-1G, EUROPE*STAR-2G-1, EUROPE*STAR-2G-2, EUROPE*STAR-2G-3, EUTELSAT 3-25.5E, EUTELSAT 3-33E, EUTELSAT 3-36E, EUTELSAT 3-44E, EUTELSAT 3-48E, EUTELSAT 3-70.5E, EUTELSAT 3-73.5E, EUTELSAT 3-76E, EUTELSAT 3-80.5E, EUTELSAT 3-83.5E, EUTELSAT 3-86E, EUTELSAT 3-88.5E, INTELSAT 7 66E, INTERSPUTNIK-27E-Q, JCSAT-3B, L-STAR-1, L-STAR-2, L-STAR-3, L-STAR-4, L-STAR-5, L-STAR-6, MEASAT-1, MEASAT-3, MEASAT-91.5E, MEASAT-95E, MEASAT-SA3, MEASAT-SA4, N-SAT-102.5E, N-SAT-103.5E, N-SAT-106.5, N-SAT-110, N-SAT-110E, N-SAT-117, N-SAT-120E, N-SAT-122.5E, N-SAT-125.5E, N-SAT-65.5, N-SAT-73E, N-SAT-74.5E, N-SAT-76.5E, N-SAT-79.5E, N-SAT-82.5E, N-SAT-84E, N-SAT-86E, N-SAT-94E, NSS-21, NSS-22, NSS-23, NSS-24, NSS-8, NSS-9, PACSTAR-L1, PACSTAR-L2, PAKSAT-1, PAKSAT-2, PAKSAT-C, PAKSAT-D, PALAPA-C6, SJC-1, SKYSAT-A1, SKYSAT-A2, SKYSAT-A3, SKYSAT-B2, SKYSAT-C1, SKYSAT-C2, SKYSAT-C3, SKYSAT-C4, ST-1C, THAICOM-A2B, THAICOM-A3B, THAICOM-A5B, THAICOM-C1, THAICOM-C2, THAICOM-G1K, THAICOM-G2K, TONGASAT AP-KU-4

Beam name	Channels	Ref. Table 1	Affected administrations*	Affected networks/beams/terrestrial stations*
LBR24400	1, 5, 9, 13	c	USA	INTELSAT7 325.5E, INTELSAT8 325.5E
LBV__100	2, 4, 6, 8, 10, 12	c	USA	INTELSAT7 335.5E, INTELSAT8 335.5E
MAU__100	26	c	BLR/IK, CHN, D, F/EUT, G, HOL, J, MHL, PAK, THA, TON, USA	ASIASAT-AK1, ASIASAT-AKX, ASIASAT-BKX, ASIASAT-CK1, ASIASAT-CKX, ASIASAT-DKX, ASIASAT-EK1, ASIASAT-EKX, EUROPE*STAR-2G-1, EUROPE*STAR-2G-2, EUROPE*STAR-2G-3, EUTELSAT 3-25.5E, EUTELSAT 3-33E, EUTELSAT 3-36E, EUTELSAT 3-44E, EUTELSAT 3-48E, EUTELSAT 3-70.5E, EUTELSAT 3-73.5E, EUTELSAT 3-76E, EUTELSAT 3-80.5E, EUTELSAT 3-83.5E, EUTELSAT 3-86E, EUTELSAT 3-88.5E, INTELSAT KFOS 85E, INTELSAT7 66E, INTERSPUTNIK-27E-Q, JCSAT-3A, JCSAT-3B, N-SAT-102.5E, N-SAT-103.5E, N-SAT-106.5, N-SAT-110E, N-SAT-117, N-SAT-120E, N-SAT-122.5E, N-SAT-125.5E, N-SAT-129.5E, N-SAT-141E, N-SAT-65.5, N-SAT-73E, N-SAT-74.5E, N-SAT-76.5E, N-SAT-79.5E, N-SAT-82.5E, N-SAT-84E, N-SAT-86E, N-SAT-94E, N-STAR-A2, N-STAR-B2, NSS-21, NSS-22, NSS-23, NSS-24, NSS-8, NSS-9, ORION-AP-1, PAKSAT-C, SB-SAT-135, SKYSAT-A1, SKYSAT-A2, SKYSAT-A3, SKYSAT-B1, SKYSAT-B2, SKYSAT-B3, SKYSAT-B4, SKYSAT-C1, SKYSAT-C2, SKYSAT-C3, SKYSAT-C4, THAICOM-C2, TONGASAT AP-KU-4, TONGASAT C/KU-1, TONGASAT C/KU-2, TONGASAT C/KU-3, TONGASAT C/KU-4
MAU__100	28	c	BLR/IK, CHN, D, F/EUT, G, HOL, J, KOR, LAO, MLA, PAK, PNG, THA, TON, USA	ASIASAT-AK1, ASIASAT-AKX, ASIASAT-BKX, ASIASAT-CK1, ASIASAT-CKX, ASIASAT-DKX, ASIASAT-EK1, ASIASAT-EKX, EUROPE*STAR-2G-1, EUROPE*STAR-2G-2, EUROPE*STAR-2G-3, EUTELSAT 3-25.5E, EUTELSAT 3-33E, EUTELSAT 3-36E, EUTELSAT 3-44E, EUTELSAT 3-48E, EUTELSAT 3-70.5E, EUTELSAT 3-73.5E, EUTELSAT 3-76E, EUTELSAT 3-80.5E, EUTELSAT 3-83.5E, EUTELSAT 3-86E, EUTELSAT 3-88.5E, INTELSAT KFOS 85E, INTELSAT7 66E, INTERSPUTNIK-27E-Q, JCSAT-3A, JCSAT-3B, KOREASAT-103KU, KOREASAT-123.7KU, KOREASAT-2, L-STAR-1, L-STAR-2, L-STAR-3, L-STAR-4, L-STAR-5, L-STAR-6, MEASAT-1, MEASAT-3, MEASAT-91.5E, MEASAT-95E, N-SAT-102.5E, N-SAT-103.5E, N-SAT-106.5, N-SAT-110, N-SAT-110E, N-SAT-117, N-SAT-120E, N-SAT-122.5E, N-SAT-125.5E, N-SAT-128, N-SAT-129.5E, N-SAT-141E, N-SAT-65.5, N-SAT-73E, N-SAT-74.5E, N-SAT-76.5E, N-SAT-79.5E, N-SAT-82.5E, N-SAT-84E, N-SAT-86E, N-SAT-94E, N-STAR-A2, N-STAR-B2, NSS-21, NSS-22, NSS-23, NSS-24, NSS-8, NSS-9, PACSTAR-L1, PACSTAR-L2, PACSTAR-L3, PAKSAT-C, SB-SAT-135, SIC-1, SKYSAT-A1, SKYSAT-A2, SKYSAT-A3, SKYSAT-B1, SKYSAT-B2, SKYSAT-B3, SKYSAT-B4, SKYSAT-C1, SKYSAT-C2, SKYSAT-C3, SKYSAT-C4, THAICOM-A2B, THAICOM-A3B, THAICOM-A4B, THAICOM-A5B, THAICOM-C1, THAICOM-C2, THAICOM-G1K, THAICOM-G2K, THAICOM-G3K, TONGASAT AP-KU-4, TONGASAT C/KU-1, TONGASAT C/KU-2, TONGASAT C/KU-3, TONGASAT C/KU-4
MAU__100	30, 32, 34, 36, 38	c	BLR/IK, CHN, D, F/EUT, G, HOL, J, KOR, LAO, MLA, PAK, PNG, THA, TON, USA	ASIASAT-AK1, ASIASAT-AKX, ASIASAT-BKX, ASIASAT-CK1, ASIASAT-CKX, ASIASAT-DKX, ASIASAT-EK1, ASIASAT-EKX, EUROPE*STAR-2G-1, EUROPE*STAR-2G-2, EUROPE*STAR-2G-3, EUTELSAT 3-25.5E, EUTELSAT 3-33E, EUTELSAT 3-36E, EUTELSAT 3-44E, EUTELSAT 3-48E, EUTELSAT 3-70.5E, EUTELSAT 3-73.5E, EUTELSAT 3-76E, EUTELSAT 3-80.5E, EUTELSAT 3-83.5E, EUTELSAT 3-86E, EUTELSAT 3-88.5E, INTELSAT KFOS 85E, INTELSAT7 66E, INTERSPUTNIK-27E-Q, JCSAT-3A, JCSAT-3B, KOREASAT-1, KOREASAT-2, L-STAR-1, L-STAR-2, L-STAR-3, L-STAR-4, L-STAR-5, L-STAR-6, MEASAT-1, MEASAT-3, MEASAT-91.5E, MEASAT-95E, N-SAT-102.5E, N-SAT-103.5E, N-SAT-106.5, N-SAT-110, N-SAT-110E, N-SAT-117, N-SAT-120E, N-SAT-122.5E, N-SAT-125.5E, N-SAT-128, N-SAT-129.5E, N-SAT-141E, N-SAT-65.5, N-SAT-73E, N-SAT-74.5E, N-SAT-76.5E, N-SAT-79.5E, N-SAT-82.5E, N-SAT-84E, N-SAT-86E, N-SAT-94E, N-STAR-A2, N-STAR-B2, NSS-21, NSS-22, NSS-23, NSS-24, NSS-8, NSS-9, PACSTAR-L1, PACSTAR-L2, PACSTAR-L3, PAKSAT-C, SB-SAT-135, SIC-1, SKYSAT-A1, SKYSAT-A2, SKYSAT-A3, SKYSAT-B1, SKYSAT-B2, SKYSAT-B3, SKYSAT-B4, SKYSAT-C1, SKYSAT-C2, SKYSAT-C3, SKYSAT-C4, THAICOM-A2B, THAICOM-A3B, THAICOM-A4B, THAICOM-A5B, THAICOM-C1, THAICOM-C2, THAICOM-G1K, THAICOM-G2K, THAICOM-G3K, TONGASAT AP-KU-4, TONGASAT C/KU-1, TONGASAT C/KU-2, TONGASAT C/KU-3, TONGASAT C/KU-4

Beam name	Channels	Ref. Table 1	Affected administrations*	Affected networks/beams/terrestrial stations*
MAU__100	40	c	BLR/IK, CHN, D, F/EUT, G, HOL, J, KOR, LAO, MLA, PAK, PNG, THA, TON, USA	ASIASAT-AK1, ASIASAT-AKX, ASIASAT-BKX, ASIASAT-CK1, ASIASAT-CKX, ASIASAT-DKX, ASIASAT-EK1, ASIASAT-EKX, EUROPE*STAR-2G-1, EUROPE*STAR-2G-2, EUROPE*STAR-2G-3, EUTELSAT 3-25.5E, EUTELSAT 3-33E, EUTELSAT 3-36E, EUTELSAT 3-44E, EUTELSAT 3-48E, EUTELSAT 3-70.5E, EUTELSAT 3-73.5E, EUTELSAT 3-76E, EUTELSAT 3-80.5E, EUTELSAT 3-83.5E, EUTELSAT 3-86E, EUTELSAT 3-88.5E, INTELSAT7 66E, INTERSPUTNIK-27E-Q, JCSAT-3A, JCSAT-3B, KOREASAT-1, KOREASAT-2, L-STAR-1, L-STAR-2, L-STAR-3, L-STAR-4, L-STAR-5, L-STAR-6, MEASAT-1, MEASAT-3, MEASAT-91.5E, MEASAT-95E, N-SAT-102.5E, N-SAT-103.5E, N-SAT-106.5, N-SAT-110, N-SAT-110E, N-SAT-117, N-SAT-120E, N-SAT-122.5E, N-SAT-125.5E, N-SAT-128, N-SAT-129.5E, N-SAT-141E, N-SAT-65.5, N-SAT-73E, N-SAT-74.5E, N-SAT-76.5E, N-SAT-79.5E, N-SAT-82.5E, N-SAT-84E, N-SAT-86E, N-SAT-94E, N-STAR-A2, N-STAR-B2, NSS-21, NSS-22, NSS-23, NSS-24, NSS-8, NSS-9, PACSTAR-L1, PACSTAR-L2, PACSTAR-L3, PAKSAT-C, SB-SAT-135, SJC-1, SKYSAT-A1, SKYSAT-A2, SKYSAT-A3, SKYSAT-B1, SKYSAT-B2, SKYSAT-B3, SKYSAT-B4, SKYSAT-C1, SKYSAT-C2, SKYSAT-C3, SKYSAT-C4, THAICOM-A2B, THAICOM-A3B, THAICOM-A4B, THAICOM-A5B, THAICOM-C1, THAICOM-G1K, THAICOM-G2K, THAICOM-G3K, TONGASAT AP-KU-4, TONGASAT C/KU-1, TONGASAT C/KU-2, TONGASAT C/KU-3, TONGASAT C/KU-4
MDA06300	26	c	HOL	NSS-23
MDA06300	28, 30, 32, 34, 36, 38, 40	c	HOL, THA	NSS-23, THAICOM-C1
MHL00000	4, 8, 12, 16, 20, 22, 24	c	J	N-SAT-147.5E
MLI__100	1, 3, 5, 7, 9, 11, 13	c	USA	INTELSAT IBS 342E, INTELSAT7 342E, INTELSAT7 340E, INTELSAT8 342E INTELSAT8 340E
MNG24800	27	c	BLR/IK, CHN, D, F/EUT, G, HOL, IND, INS, J, MLA, PNG, SNG, THA, TON, UAE, USA	ASIASAT-AK1, ASIASAT-AKX, ASIASAT-BKX, ASIASAT-CK1, ASIASAT-CKX, ASIASAT-DKX, ASIASAT-EK1, ASIASAT-EKX, EMARSAT-1B, EUROPE*STAR-2G-1, EUROPE*STAR-2G-2, EUROPE*STAR-2G-3, EUTELSAT 3-25.5E, EUTELSAT 3-33E, EUTELSAT 3-36E, EUTELSAT 3-44E, EUTELSAT 3-48E, EUTELSAT 3-70.5E, EUTELSAT 3-73.5E, EUTELSAT 3-76E, EUTELSAT 3-80.5E, EUTELSAT 3-83.5E, EUTELSAT 3-86E, EUTELSAT 3-88.5E, INSAT-EK74, INTELSAT KFOS 85E, INTELSAT7 66E, INTERSPUTNIK-153.5E, INTERSPUTNIK-75E-Q, JCSAT-1R, JCSAT-2R, JCSAT-3A, JCSAT-3B, MEASAT-SA3, MEASAT-SA4, MTSAT-135E, MTSAT-140E, MTSAT-145E, N-SAT-102.5E, N-SAT-103.5E, N-SAT-106.5, N-SAT-110E, N-SAT-117, N-SAT-120E, N-SAT-122.5E, N-SAT-125.5E, N-SAT-129.5E, N-SAT-141E, N-SAT-147.5E, N-SAT-163W, N-SAT-165W, N-SAT-166E, N-SAT-167W, N-SAT-168E, N-SAT-169W, N-SAT-172W, N-SAT-173W, N-SAT-174.5W, N-SAT-175.5E, N-SAT-175.5W, N-SAT-175W, N-SAT-176W, N-SAT-178.5E, N-SAT-178.5W, N-SAT-65.5, N-SAT-73E, N-SAT-74.5E, N-SAT-76.5E, N-SAT-79.5E, N-SAT-82.5E, N-SAT-84E, N-SAT-86E, N-SAT-94E, N-STAR-A2, N-STAR-B2, NSS-19, NSS-21, NSS-22, NSS-23, NSS-24, NSS-8, NSS-9, PACSTAR-3, PALAPA PAC-1 CKU, PALAPA PAC-2 CKU, PALAPA PAC-KU 146E, SB-SAT-135, SB-SAT-144, SB-SAT-154, SKYSAT-A1, SKYSAT-A2, SKYSAT-A3, SKYSAT-B1, SKYSAT-B2, SKYSAT-B3, SKYSAT-B4, SKYSAT-C1, SKYSAT-C2, SKYSAT-C3, SKYSAT-C4, SKYSAT-C5, ST-1C, SUPERBIRD-A2, SUPERBIRD-B2, SUPERBIRD-C, THAICOM-C2, TONGASAT AP-KU-4, TONGASAT C/KU-1, TONGASAT C/KU-2, TONGASAT C/KU-3, TONGASAT C/KU-4, TONGASAT C1/C1-R, USASAT-14E

Beam name	Channels	Ref. Table 1	Affected administrations*	Affected networks/beams/terrestrial stations*
MNG24800	31, 35	c	AUS, BLR/IK, CHN, D, F/EUT, G, HOL, IND, INS, J, KOR, LAO, MLA, PNG, SNG, THA, TON, UAE, USA	AM-SAT A1, AM-SAT A4, APSTAR-2, APSTAR-2 F1, APSTAR-2 F2, APSTAR-3, APSTAR-4, ASIASAT-AK1, ASIASAT-AKX, ASIASAT-BKX, ASIASAT-CK1, ASIASAT-CKX, ASIASAT-DKX, ASIASAT-EK1, ASIASAT-EKX, AUSSAT C 156E FSS, CHINASAT-13, CHINASAT-6, DFH-3-OC, DFH-3A-OA, DFH-3A-OB, DFH-3A-OC, DFH-3A-OD, DFH-4-OA, DFH-4-OB, DFH-4-OC, DFH-4-OD, DFH-4-OE, DFH-4-OF, EASTSAT, EMARSAT-1B, EUROPE*STAR-2G-1, EUROPE*STAR-2G-2, EUROPE*STAR-2G-3, EUTELSAT 3-25.5E, EUTELSAT 3-33E, EUTELSAT 3-36E, EUTELSAT 3-44E, EUTELSAT 3-48E, EUTELSAT 3-70.5E, EUTELSAT 3-73.5E, EUTELSAT 3-76E, EUTELSAT 3-80.5E, EUTELSAT 3-83.5E, EUTELSAT 3-86E, EUTELSAT 3-88.5E, INSAT-EK74, INTELSAT KFOS 85E, INTELSAT 7 66E, INTERSPUTNIK-153.5EQ, INTERSPUTNIK-75E-Q, JCSAT-1, JCSAT-1R, JCSAT-2, JCSAT-2R, JCSAT-3A, JCSAT-3B, KOREASAT-1, KOREASAT-2, L-STAR-1, L-STAR-2, L-STAR-3, L-STAR-4, L-STAR-5, L-STAR-6, MEASAT-1, MEASAT-148E, MEASAT-2, MEASAT-3, MEASAT-91.5E, MEASAT-95E, MEASAT-SA3, MEASAT-SA4, MTSAT-135E, MTSAT-140E, MTSAT-145E, N-SAT-102.5E, N-SAT-103.5E, N-SAT-106.5, N-SAT-110, N-SAT-110E, N-SAT-117, N-SAT-120E, N-SAT-122.5E, N-SAT-125.5E, N-SAT-128, N-SAT-129.5E, N-SAT-141E, N-SAT-147.5E, N-SAT-163W, N-SAT-165W, N-SAT-166E, N-SAT-167W, N-SAT-168E, N-SAT-169W, N-SAT-172W, N-SAT-173W, N-SAT-174.5W, N-SAT-175.5E, N-SAT-175.5W, N-SAT-175W, N-SAT-176W, N-SAT-178.5E, N-SAT-178.5W, N-SAT-65.5, N-SAT-73E, N-SAT-74.5E, N-SAT-76.5E, N-SAT-79.5E, N-SAT-82.5E, N-SAT-84E, N-SAT-86E, N-SAT-94E, N-STAR-A2, N-STAR-B2, NSS-19, NSS-21, NSS-22, NSS-23, NSS-24, NSS-8, NSS-9, PACSTAR-3, PACSTAR-L1, PACSTAR-L2, PACSTAR-L3, PALAPA PAC-1 CKU, PALAPA PAC-2 CKU, PALAPA PAC-KU 146E, PALAPA-C5, PALAPA-C6, PALAPA-C7, SB-SAT-135, SB-SAT-144, SB-SAT-154, SJC-1, SKYSAT-A1, SKYSAT-A2, SKYSAT-A3, SKYSAT-B1, SKYSAT-B2, SKYSAT-B3, SKYSAT-B4, SKYSAT-C1, SKYSAT-C2, SKYSAT-C3, SKYSAT-C4, SKYSAT-C5, ST-1C, SUPERBIRD-A2, SUPERBIRD-B2, SUPERBIRD-C, THAICOM-A2B, THAICOM-A3B, THAICOM-A4B, THAICOM-A5B, THAICOM-C1, THAICOM-C2, THAICOM-G1K, THAICOM-G2K, THAICOM-G3K, TONGASAT AP-KU-4, TONGASAT C/KU-1, TONGASAT C/KU-2, TONGASAT C/KU-3, TONGASAT C/KU-4, TONGASAT C1/C1-R, USASAT-14E, USASAT-14G, USASAT-14H
MOZ30700	2, 6, 10	c	NOR, USA	INTELSAT7 359E, INTELSAT8 359E, BIFROST-14, INTELSAT10 359E
MOZ30700	14, 18	c	NOR	BIFROST-14
MRC20900	1, 3, 5, 7, 9, 11	c	HOL, USA	INTELSAT K 338.5E, INTELSAT7 332.5E, INTELSAT7 335.5E, INTELSAT7 338.5E, INTELSAT8 332.5E, INTELSAT8 335.5E, INTELSAT8 338.5E, NSS-15
MRC20900	13	c	HOL, USA	INTELSAT7 332.5E, INTELSAT7 335.5E, INTELSAT7 338.5E, INTELSAT8 332.5E, INTELSAT8 335.5E, INTELSAT8 338.5E, NSS-15
MRC20900	15, 17, 19	c	HOL	NSS-15
MTN__100	24	c	E, URG, USA	USASAT-26A, URUSAT-7, HISPASAT 36W KU
NGR11500	2, 4, 6, 8, 10, 12, 14, 16, 18, 20	c	E, URG, USA	USASAT-26A, HISPASAT 36W KU, URUSAT-7
NOR12000	1, 3, 5, 7, 9, 11, 13	c	USA	INTELSAT7 359E, INTELSAT8 359E, INTELSAT10 359E
NZL__100	2, 4, 6, 8, 10, 12	c	J, USA	INTELSAT7 157E, SUPERBIRD-A2
NZL__100	14, 16, 18, 20, 22, 24	c	J	SUPERBIRD-A2

[illegible]

Beam name	Channels	Ref. Table 1	Affected administrations*	Affected networks/beams/terrestrial stations*
PLM33200	2, 4, 6, 8, 10, 12	c	BLR/IK, HOL, J, MHL, PNG, TON, URG	INTELSAT8 183E, INTERSPUTNIK-153.5EQ, JCSAT-1R, JCSAT-2R, N-SAT-123W, N-SAT-127W, N-SAT-131W, N-SAT-133W, N-SAT-141E, N-SAT-141W, N-SAT-143W, N-SAT-145W, N-SAT-147.5E, N-SAT-148W, N-SAT-150W, N-SAT-152W, N-SAT-159W, N-SAT-161W, N-SAT-163W, N-SAT-165W, N-SAT-166E, N-SAT-167W, N-SAT-168E, N-SAT-169W, N-SAT-172W, N-SAT-173W, N-SAT-174.5W, N-SAT-175.5E, N-SAT-175.5W, N-SAT-175W, N-SAT-176W, N-SAT-178.5E, N-SAT-178.5W, NSS-10, NSS-11, NSS-12, NSS-14, NSS-19, NSS-27, NSS-6, NSS-7, ORION-AP-1, ORION-AP-2, PACSTAR-L3, SUPERBIRD-A2, SUPERBIRD-B2, SUPERBIRD-C, TONGASAT C1/C1-R, URUSAT-1, URUSAT-2
PLM33200	14, 16, 18, 20, 22, 24	c	BLR/IK, HOL, J, MHL, PNG, TON, URG	INTERSPUTNIK-153.5EQ, JCSAT-1R, JCSAT-2R, N-SAT-123W, N-SAT-127W, N-SAT-131W, N-SAT-133W, N-SAT-141E, N-SAT-141W, N-SAT-143W, N-SAT-145W, N-SAT-147.5E, N-SAT-148W, N-SAT-150W, N-SAT-152W, N-SAT-159W, N-SAT-161W, N-SAT-163W, N-SAT-165W, N-SAT-166E, N-SAT-167W, N-SAT-168E, N-SAT-169W, N-SAT-172W, N-SAT-173W, N-SAT-174.5W, N-SAT-175.5E, N-SAT-175.5W, N-SAT-175W, N-SAT-176W, N-SAT-178.5E, N-SAT-178.5W, NSS-10, NSS-11, NSS-12, NSS-14, NSS-19, NSS-27, NSS-6, NSS-7, ORION-AP-1, ORION-AP-2, PACSTAR-L3, SUPERBIRD-A2, SUPERBIRD-B2, SUPERBIRD-C, TONGASAT C1/C1-R, URUSAT-1, URUSAT-2
POL13200	26	c	HOL	NSS-23
POL13200	28, 30, 32, 34, 36, 38, 40	c	HOL, THA	NSS-23, THAICOM-C1
POR__100	1, 3, 5, 7, 9, 11, 13	c	E, HOL, URG, USA	INTELSAT IBS 319.5E, INTELSAT7 319.5E, INTELSAT7 325.5E, INTELSAT8 319.5E, USASAT-26A, HISPASAT 36W KU, INTELSAT8 325.5E, NSS-18, URUSAT-7
POR__100	15, 17, 19	c	E, HOL, URG, USA	USASAT-26A, HISPASAT 36W KU, NSS-18, URUSAT-7
RUS-4	25	c	BLR/IK, CHN, F/EUT, G, HOL, J, MHL, PNG, SNG, TON, USA	ASIASAT-AK1, ASIASAT-CK1, ASIASAT-EK1, EUTELSAT 3-44E, EUTELSAT 3-48E, EUTELSAT 3-70.5E, EUTELSAT 3-76E, EUTELSAT 3-80.5E, EUTELSAT 3-83.5E, EUTELSAT 3-88.5E, INTELSAT KFOS 85E, INTELSAT7 66E, INTERSPUTNIK-153.5EQ, JCSAT-1R, JCSAT-2R, JCSAT-3A, JCSAT-3B, N-SAT-102.5E, N-SAT-103.5E, N-SAT-106.5E, N-SAT-110, N-SAT-110E, N-SAT-117, N-SAT-120E, N-SAT-122.5E, N-SAT-123W, N-SAT-125.5E, N-SAT-127W, N-SAT-128, N-SAT-129.5E, N-SAT-131W, N-SAT-133W, N-SAT-141E, N-SAT-141W, N-SAT-143W, N-SAT-145W, N-SAT-146, N-SAT-147.5E, N-SAT-148W, N-SAT-150W, N-SAT-152W, N-SAT-159W, N-SAT-161W, N-SAT-163W, N-SAT-165W, N-SAT-166E, N-SAT-167W, N-SAT-168E, N-SAT-169W, N-SAT-172W, N-SAT-173W, N-SAT-174.5W, N-SAT-175.5E, N-SAT-175.5W, N-SAT-175W, N-SAT-176W, N-SAT-178.5E, N-SAT-178.5W, N-SAT-178.5W, N-SAT-65.5, N-SAT-73E, N-SAT-74.5E, N-SAT-76.5E, N-SAT-79.5E, N-SAT-82.5E, N-SAT-84E, N-SAT-86E, N-SAT-94E, N-STAR-A2, N-STAR-B2, NSS-11, NSS-12, NSS-14, NSS-19, NSS-23, NSS-24, NSS-27, NSS-6, NSS-7, NSS-8, NSS-9, ORION-AP-1, ORION-AP-2, PACSTAR-L3, SB-SAT-135, SB-SAT-144, SB-SAT-154, SKYSAT-A1, SKYSAT-A2, SKYSAT-A3, SKYSAT-B1, SKYSAT-B2, SKYSAT-B3, SKYSAT-B4, SKYSAT-C1, SKYSAT-C2, SKYSAT-C3, SKYSAT-C4, SKYSAT-C5, ST-IC, SUPERBIRD-A2, SUPERBIRD-B2, SUPERBIRD-C, TONGASAT AP-KU-4, TONGASAT C/KU-1, TONGASAT C/KU-2, TONGASAT C/KU-3, TONGASAT C/KU-4, TONGASAT C1/C1-R, USASAT-14E, USASAT-14K, USASAT-14M, USASAT-23J, USASAT-35C, USASAT-35D, USASAT-35E, USASAT-40M, USASAT-42L, USASAT-42Q

Beam name	Channels	Ref. Table 1	Affected administrations*	Affected networks/beams/terrestrial stations*
RUS-4	26	c	BLR/IK, CHN, F/EUT, G, HOL, IND, INS, J, MHL, PNG, SNG, THA, TON, USA	ASIASAT-AK1, ASIASAT-AKX, ASIASAT-BKX, ASIASAT-CK1, ASIASAT-CKX, ASIASAT-DKX, ASIASAT-EK1, ASIASAT-EKX, EUTELSAT 3-44E, EUTELSAT 3-48E, EUTELSAT 3-70.5E, EUTELSAT 3-73.5E, EUTELSAT 3-76E, EUTELSAT 3-80.5E, EUTELSAT 3-83.5E, EUTELSAT 3-86E, EUTELSAT 3-88.5E, INSAT-EK111.5, INTELSAT KFOS 85E, INTELSAT7 66E, INTERSPUTNIK-153.5EQ, JCSAT-1R, JCSAT-2R, JCSAT-3A, JCSAT-3B, N-SAT-102.5E, N-SAT-103.5E, N-SAT-106.5, N-SAT-110, N-SAT-110E, N-SAT-117, N-SAT-120E, N-SAT-122.5E, N-SAT-123W, N-SAT-125.5E, N-SAT-127W, N-SAT-128, N-SAT-129.5E, N-SAT-131W, N-SAT-133W, N-SAT-141E, N-SAT-141W, N-SAT-143W, N-SAT-145W, N-SAT-146, N-SAT-147.5E, N-SAT-148W, N-SAT-150W, N-SAT-152W, N-SAT-159W, N-SAT-161W, N-SAT-163W, N-SAT-165W, N-SAT-166E, N-SAT-167W, N-SAT-168E, N-SAT-169W, N-SAT-172W, N-SAT-173W, N-SAT-174.5W, N-SAT-175.5E, N-SAT-175.5W, N-SAT-175W, N-SAT-176W, N-SAT-178.5E, N-SAT-178.5W, N-SAT-65.5, N-SAT-73E, N-SAT-74.5E, N-SAT-76.5E, N-SAT-79.5E, N-SAT-82.5E, N-SAT-84E, N-SAT-86E, N-SAT-94E, N-STAR-A2, N-STAR-B2, NSS-11, NSS-12, NSS-14, NSS-19, NSS-23, NSS-24, NSS-27, NSS-6, NSS-7, NSS-8, NSS-9, ORION-AP-1, ORION-AP-2, PACSTAR-L3, PALAPA PAC-1 CKU, PALAPA PAC-2 CKU, SB-SAT-135, SB-SAT-144, SB-SAT-154, SKYSAT-A1, SKYSAT-A2, SKYSAT-A3, SKYSAT-B1, SKYSAT-B2, SKYSAT-B3, SKYSAT-B4, SKYSAT-C1, SKYSAT-C2, SKYSAT-C3, SKYSAT-C4, SKYSAT-C5, ST-1C, SUPERBIRD-A2, SUPERBIRD-B2, SUPERBIRD-C, THAICOM-C2, TONGASAT AP-KU-4, TONGASAT C/KU-1, TONGASAT C/KU-2, TONGASAT C/KU-3, TONGASAT C/KU-4, TONGASAT C1/C1-R, USASAT-14E, USASAT-14K, USASAT-14M, USASAT-23J, USASAT-35C, USASAT-35D, USASAT-35E, USASAT-40M, USASAT-42L, USASAT-42Q
RUS-4	27	c	BLR/IK, CHN, F/EUT, G, HOL, IND, INS, J, MLA, SNG, THA, TON, USA	ASIASAT-AK1, ASIASAT-AKX, ASIASAT-BKX, ASIASAT-CK1, ASIASAT-CKX, ASIASAT-DKX, ASIASAT-EK1, ASIASAT-EKX, EUTELSAT 3-44E, EUTELSAT 3-48E, EUTELSAT 3-70.5E, EUTELSAT 3-73.5E, EUTELSAT 3-76E, EUTELSAT 3-80.5E, EUTELSAT 3-83.5E, EUTELSAT 3-86E, EUTELSAT 3-88.5E, INSAT-EK111.5, INTELSAT KFOS 85E, INTELSAT7 66E, INTERSPUTNIK-153.5EQ, JCSAT-1R, JCSAT-2R, JCSAT-3A, JCSAT-3B, MEASAT-SA4, N-SAT-102.5E, N-SAT-103.5E, N-SAT-106.5, N-SAT-110, N-SAT-110E, N-SAT-117, N-SAT-120E, N-SAT-122.5E, N-SAT-125.5E, N-SAT-128, N-SAT-129.5E, N-SAT-141E, N-SAT-143W, N-SAT-145W, N-SAT-146, N-SAT-147.5E, N-SAT-148W, N-SAT-150W, N-SAT-152W, N-SAT-159W, N-SAT-161W, N-SAT-163W, N-SAT-165W, N-SAT-166E, N-SAT-167W, N-SAT-168E, N-SAT-169W, N-SAT-172W, N-SAT-173W, N-SAT-174.5W, N-SAT-175.5E, N-SAT-175.5W, N-SAT-175W, N-SAT-176W, N-SAT-178.5E, N-SAT-178.5W, N-SAT-65.5, N-SAT-73E, N-SAT-74.5E, N-SAT-76.5E, N-SAT-79.5E, N-SAT-82.5E, N-SAT-84E, N-SAT-86E, N-SAT-94E, N-STAR-A2, N-STAR-B2, NSS-19, NSS-23, NSS-24, NSS-8, NSS-9, PALAPA PAC-1 CKU, PALAPA PAC-2 CKU, SB-SAT-135, SB-SAT-144, SB-SAT-154, SKYSAT-A1, SKYSAT-A2, SKYSAT-A3, SKYSAT-B1, SKYSAT-B2, SKYSAT-B3, SKYSAT-B4, SKYSAT-C1, SKYSAT-C2, SKYSAT-C3, SKYSAT-C4, SKYSAT-C5, ST-1C, SUPERBIRD-A2, SUPERBIRD-B2, SUPERBIRD-C, THAICOM-C2, TONGASAT AP-KU-4, TONGASAT C/KU-1, TONGASAT C/KU-2, TONGASAT C/KU-3, TONGASAT C/KU-4, TONGASAT C1/C1-R, USASAT-14E

Beam name	Channels	Ref. Table 1	Affected administrations*	Affected networks/beams/terrestrial stations*
RUS-4	28	c	BLR/IK, CHN, F/EUT, G, HOL, IND, INS, J, KOR, LAO, MLA, PNG, SNG, THA, TON, USA	AM-SAT A1, AM-SAT A4, APSTAR-2, APSTAR-2 F1, APSTAR-2 F2, APSTAR-3, ASIASEAT-AK1, ASIASEAT-AKX, ASIASEAT-BKX, ASIASEAT-CK1, ASIASEAT-CKX, ASIASEAT-DKX, ASIASEAT-EK1, ASIASEAT-EKX, DFH-3-OC, DFH-4-OA, DFH-4-OB, DFH-4-OC, DFH-4-OD, DFH-4-OE, DFH-4-OF, EASTSAT, EUTELSAT 3-44E, EUTELSAT 3-48E, EUTELSAT 3-70.5E, EUTELSAT 3-73.5E, EUTELSAT 3-76E, EUTELSAT 3-80.5E, EUTELSAT 3-83.5E, EUTELSAT 3-86E, EUTELSAT 3-88.5E, INSAT-EK111.5, INTELSAT KFOS 85E, INTELSAT 7 66E, INTERSPUTNIK-153.5EQ, JCSAT-1, JCSAT-1R, JCSAT-1R, JCSAT-2, JCSAT-3A, JCSAT-3B, KOREASAT-1, KOREASAT-103KU, KOREASAT-123.7KU, KOREASAT-2, L-STAR-1, L-STAR-2, L-STAR-3, L-STAR-4, L-STAR-5, L-STAR-6, MEASAT-1, MEASAT-148E, MEASAT-2, MEASAT-3, MEASAT-91.5E, MEASAT-95E, MEASAT-SA4, N-SAT-102.5E, N-SAT-103.5E, N-SAT-106.5, N-SAT-110, N-SAT-110E, N-SAT-117, N-SAT-120E, N-SAT-122.5E, N-SAT-125.5E, N-SAT-128, N-SAT-129.5E, N-SAT-141E, N-SAT-143W, N-SAT-145W, N-SAT-146, N-SAT-147.5E, N-SAT-148W, N-SAT-150W, N-SAT-152W, N-SAT-159W, N-SAT-161W, N-SAT-163W, N-SAT-165W, N-SAT-166E, N-SAT-167W, N-SAT-168E, N-SAT-169W, N-SAT-172W, N-SAT-173W, N-SAT-174.5W, N-SAT-175.5E, N-SAT-175.5W, N-SAT-175W, N-SAT-176W, N-SAT-178.5E, N-SAT-178.5W, N-SAT-65.5, N-SAT-73E, N-SAT-74.5E, N-SAT-76.5E, N-SAT-79.5E, N-SAT-82.5E, N-SAT-84E, N-SAT-86E, N-SAT-94E, N-SAT-94E, N-SAT-A, N-SAT-A2, N-SAT-B, N-SAT-B2, NSS-19, NSS-23, NSS-24, NSS-8, NSS-9, PACSTAR-L1, PACSTAR-L2, PACSTAR-L3, PALAPA PAC-1 CKU, PALAPA PAC-2 CKU, PALAPA-C5, PALAPA-C6, PALAPA-C7, SB-SAT-135, SB-SAT-144, SB-SAT-154, SJC-1, SKYSAT-A1, SKYSAT-A2, SKYSAT-A3, SKYSAT-B1, SKYSAT-B2, SKYSAT-B3, SKYSAT-B4, SKYSAT-C1, SKYSAT-C2, SKYSAT-C3, SKYSAT-C4, SKYSAT-C5, ST-1C, SUPERBIRD-A, SUPERBIRD-A2, SUPERBIRD-B, SUPERBIRD-B2, SUPERBIRD-C, THAICOM-A2B, THAICOM-A3B, THAICOM-A4B, THAICOM-A5B, THAICOM-C1, THAICOM-C2, THAICOM-G1K, THAICOM-G2K, THAICOM-G3K, TONGASAT AP-KU-4, TONGASAT C/KU-1, TONGASAT C/KU-2, TONGASAT C/KU-3, TONGASAT C/KU-4, TONGASAT C1/C1-R, USASAT-14E, USASAT-14G, USASAT-14H
RUS-4	29	c	BLR/IK, CHN, F/EUT, G, HOL, IND, INS, J, KOR, LAO, MLA, PNG, SNG, THA, TON, USA	AM-SAT A1, AM-SAT A4, APSTAR-2, APSTAR-2 F1, APSTAR-2 F2, APSTAR-3, ASIASEAT-AK1, ASIASEAT-AKX, ASIASEAT-BKX, ASIASEAT-CK1, ASIASEAT-CKX, ASIASEAT-DKX, ASIASEAT-EK1, ASIASEAT-EKX, CHINASAT-6, D-STAR-1, D-STAR-2, DFH-3-OC, DFH-3A-OA, DFH-3A-OB, DFH-3A-OC, DFH-3A-OD, DFH-4-OA, DFH-4-OB, DFH-4-OC, DFH-4-OD, DFH-4-OE, DFH-4-OF, EASTSAT, EUTELSAT 3-44E, EUTELSAT 3-48E, EUTELSAT 3-70.5E, EUTELSAT 3-73.5E, EUTELSAT 3-76E, EUTELSAT 3-80.5E, EUTELSAT 3-83.5E, EUTELSAT 3-86E, EUTELSAT 3-88.5E, INSAT-EK111.5, INTELSAT KFOS 85E, INTELSAT 7 66E, INTERSPUTNIK-153.5EQ, JCSAT-1, JCSAT-1R, JCSAT-2, JCSAT-2R, JCSAT-3A, JCSAT-3B, KOREASAT-1, KOREASAT-103KU, KOREASAT-123.7KU, KOREASAT-2, L-STAR-1, L-STAR-2, L-STAR-3, L-STAR-4, L-STAR-5, L-STAR-6, MEASAT-1, MEASAT-148E, MEASAT-2, MEASAT-3, MEASAT-91.5E, MEASAT-95E, MEASAT-SA4, N-SAT-102.5E, N-SAT-103.5E, N-SAT-106.5, N-SAT-110, N-SAT-110E, N-SAT-117, N-SAT-120E, N-SAT-122.5E, N-SAT-125.5E, N-SAT-128, N-SAT-145W, N-SAT-146, N-SAT-147.5E, N-SAT-148W, N-SAT-150W, N-SAT-152W, N-SAT-159W, N-SAT-161W, N-SAT-163W, N-SAT-165W, N-SAT-166E, N-SAT-167W, N-SAT-168E, N-SAT-169W, N-SAT-172W, N-SAT-173W, N-SAT-175.5E, N-SAT-175W, N-SAT-176W, N-SAT-178.5E, N-SAT-178.5W, N-SAT-65.5, N-SAT-73E, N-SAT-74.5E, N-SAT-76.5E, N-SAT-79.5E, N-SAT-82.5E, N-SAT-84E, N-SAT-86E, N-SAT-94E, N-SAT-94E, N-SAT-A, N-SAT-A2, N-SAT-B, N-SAT-B2, NSS-19, NSS-23, NSS-24, NSS-8, NSS-9, PACSTAR-L1, PACSTAR-L2, PACSTAR-L3, PALAPA PAC-1 CKU, PALAPA PAC-2 CKU, PALAPA-C5, PALAPA-C6, PALAPA-C7, SB-SAT-135, SB-SAT-144, SB-SAT-154, SJC-1, SKYSAT-A1, SKYSAT-A2, SKYSAT-A3, SKYSAT-B1, SKYSAT-B2, SKYSAT-B3, SKYSAT-B4, SKYSAT-C1, SKYSAT-C2, SKYSAT-C3, SKYSAT-C4, SKYSAT-C5, ST-1C, SUPERBIRD-A, SUPERBIRD-A2, SUPERBIRD-B, SUPERBIRD-B2, SUPERBIRD-C, THAICOM-A2B, THAICOM-A3B, THAICOM-A4B, THAICOM-A5B, THAICOM-C1, THAICOM-C2, THAICOM-G1K, THAICOM-G2K, THAICOM-G3K, TONGASAT AP-KU-4, TONGASAT C/KU-1, TONGASAT C/KU-2, TONGASAT C/KU-3, TONGASAT C/KU-4, TONGASAT C1/C1-R, USASAT-14E, USASAT-14G, USASAT-14H

Beam name	Channels	Ref. Table 1	Affected administrations*	Affected networks/beams/terrestrial stations*
RUS-4	31, 35, 37	c	BLR/IK, CHN, F/EUT, G, HOL, IND, INS, J, KOR, LAO, MLA, PNG, SNG, THA, TON, USA	AM-SAT A1, AM-SAT A4, APSTAR-2, APSTAR-2 F1, APSTAR-2 F2, APSTAR-3, ASIASEAT-AK1, ASIASEAT-AKX, ASIASEAT-BKX, ASIASEAT-CK1, ASIASEAT-CKX, ASIASEAT-DKX, ASIASEAT-EK1, ASIASEAT-EKX, CHINASAT-13, CHINASAT-6, D-STAR-1, D-STAR-2, DFH-3-OC, DFH-3A-OB, DFH-3A-OC, DFH-3A-OD, DFH-4-OB, DFH-4-OC, DFH-4-OD, DFH-4-OD, DFH-4-OF, EASTSAT, EUTELSAT 3-44E, EUTELSAT 3-48E, EUTELSAT 3-70.5E, EUTELSAT 3-73.5E, EUTELSAT 3-76E, EUTELSAT 3-80.5E, EUTELSAT 3-83.5E, EUTELSAT 3-86E, EUTELSAT 3-88.5E, INSAT-EK111.5, INTELSAT KFOS 85E, INTELSAT 7 66E, INTERSPUTNIK-153.5EQ, JCSAT-1, JCSAT-1R, JCSAT-2, JCSAT-2R, JCSAT-3A, JCSAT-3B, KOREASAT-1, KOREASAT-103KU, KOREASAT-123.7KU, KOREASAT-2, L-STAR-1, L-STAR-2, L-STAR-3, L-STAR-4, L-STAR-5, L-STAR-6, MEASAT-1, MEASAT-148E, MEASAT-2, MEASAT-3, MEASAT-91.5E, MEASAT-95E, MEASAT-SA4, N-SAT-102.5E, N-SAT-103.5E, N-SAT-106.5, N-SAT-110, N-SAT-110E, N-SAT-117, N-SAT-120E, N-SAT-122.5E, N-SAT-125.5E, N-SAT-128, N-SAT-129.5E, N-SAT-141E, N-SAT-143W, N-SAT-145W, N-SAT-146, N-SAT-147.5E, N-SAT-148W, N-SAT-150W, N-SAT-152W, N-SAT-159W, N-SAT-161W, N-SAT-163W, N-SAT-165W, N-SAT-166E, N-SAT-167W, N-SAT-168E, N-SAT-169W, N-SAT-172W, N-SAT-173W, N-SAT-174.5W, N-SAT-175.5E, N-SAT-175.5W, N-SAT-175W, N-SAT-176W, N-SAT-176W, N-SAT-178.5E, N-SAT-178.5W, N-SAT-65.5, N-SAT-73E, N-SAT-74.5E, N-SAT-76.5E, N-SAT-79.5E, N-SAT-82.5E, N-SAT-84E, N-SAT-86E, N-SAT-94E, N-STAR-A, N-STAR-A2, N-STAR-B, N-STAR-B2, NSS-19, NSS-23, NSS-24, NSS-8, NSS-9, PACSTAR-L1, PACSTAR-L2, PACSTAR-L3, PALAPA PAC-1 CKU, PALAPA PAC-2 CKU, PALAPA-C5, PALAPA-C6, PALAPA-C7, SB-SAT-135, SB-SAT-144, SB-SAT-154, SJC-1, SKYSAT-A1, SKYSAT-A2, SKYSAT-A3, SKYSAT-B1, SKYSAT-B2, SKYSAT-B3, SKYSAT-B4, SKYSAT-C1, SKYSAT-C2, SKYSAT-C3, SKYSAT-C4, SKYSAT-C5, ST-1C, SUPERBIRD-A, SUPERBIRD-A2, SUPERBIRD-B, SUPERBIRD-B2, SUPERBIRD-C, THAICOM-A2B, THAICOM-A3B, THAICOM-A4B, THAICOM-A5B, THAICOM-C1, THAICOM-C2, THAICOM-G1K, THAICOM-G2K, THAICOM-G3K, TONGASAT AP-KU-4, TONGASAT C/KU-1, TONGASAT C/KU-2, TONGASAT C/KU-3, TONGASAT C/KU-4, TONGASAT C1/C1-R, USASAT-14E, USASAT-14G, USASAT-14H
RUS-4	33, 39	c	BLR/IK, CHN, F/EUT, G, HOL, IND, INS, J, KOR, LAO, MLA, PNG, SNG, THA, TON, USA	AM-SAT A1, AM-SAT A4, APSTAR-2, APSTAR-2 F1, APSTAR-2 F2, APSTAR-3, ASIASEAT-AK1, ASIASEAT-AKX, ASIASEAT-BKX, ASIASEAT-CK1, ASIASEAT-CKX, ASIASEAT-DKX, ASIASEAT-EK1, ASIASEAT-EKX, CHINASAT-13, CHINASAT-6, D-STAR-1, D-STAR-2, DFH-3-OC, DFH-3A-OB, DFH-3A-OC, DFH-3A-OD, DFH-4-OB, DFH-4-OC, DFH-4-OD, DFH-4-OD, DFH-4-OF, EASTSAT, EUTELSAT 3-44E, EUTELSAT 3-48E, EUTELSAT 3-70.5E, EUTELSAT 3-73.5E, EUTELSAT 3-76E, EUTELSAT 3-80.5E, EUTELSAT 3-83.5E, EUTELSAT 3-86E, EUTELSAT 3-88.5E, INSAT-EK111.5, INTELSAT KFOS 85E, INTELSAT 7 66E, INTERSPUTNIK-153.5EQ, JCSAT-1, JCSAT-1R, JCSAT-2, JCSAT-2R, JCSAT-3A, JCSAT-3B, KOREASAT-1, KOREASAT-103KU, KOREASAT-123.7KU, KOREASAT-2, L-STAR-1, L-STAR-2, L-STAR-3, L-STAR-4, L-STAR-5, L-STAR-6, MEASAT-1, MEASAT-148E, MEASAT-2, MEASAT-3, MEASAT-91.5E, MEASAT-95E, MEASAT-SA4, N-SAT-102.5E, N-SAT-103.5E, N-SAT-106.5, N-SAT-110, N-SAT-110E, N-SAT-117, N-SAT-120E, N-SAT-122.5E, N-SAT-125.5E, N-SAT-128, N-SAT-129.5E, N-SAT-141E, N-SAT-143W, N-SAT-145W, N-SAT-146, N-SAT-147.5E, N-SAT-148W, N-SAT-150W, N-SAT-152W, N-SAT-159W, N-SAT-161W, N-SAT-163W, N-SAT-165W, N-SAT-166E, N-SAT-167W, N-SAT-168E, N-SAT-169W, N-SAT-172W, N-SAT-173W, N-SAT-174.5W, N-SAT-175.5E, N-SAT-175.5W, N-SAT-175W, N-SAT-176W, N-SAT-176W, N-SAT-178.5E, N-SAT-178.5W, N-SAT-65.5, N-SAT-73E, N-SAT-74.5E, N-SAT-76.5E, N-SAT-79.5E, N-SAT-82.5E, N-SAT-84E, N-SAT-86E, N-SAT-94E, N-STAR-A, N-STAR-A2, N-STAR-B, N-STAR-B2, NSS-19, NSS-23, NSS-24, NSS-8, NSS-9, PACSTAR-L1, PACSTAR-L2, PACSTAR-L3, PALAPA PAC-1 CKU, PALAPA PAC-2 CKU, PALAPA-C5, PALAPA-C6, PALAPA-C7, SB-SAT-135, SB-SAT-144, SB-SAT-154, SJC-1, SKYSAT-A1, SKYSAT-A2, SKYSAT-A3, SKYSAT-B1, SKYSAT-B2, SKYSAT-B3, SKYSAT-B4, SKYSAT-C1, SKYSAT-C2, SKYSAT-C3, SKYSAT-C4, SKYSAT-C5, ST-1C, SUPERBIRD-A, SUPERBIRD-A2, SUPERBIRD-B, SUPERBIRD-B2, SUPERBIRD-C, THAICOM-A2B, THAICOM-A3B, THAICOM-A4B, THAICOM-A5B, THAICOM-C1, THAICOM-C2, THAICOM-G1K, THAICOM-G2K, THAICOM-G3K, TONGASAT AP-KU-4, TONGASAT C/KU-1, TONGASAT C/KU-2, TONGASAT C/KU-3, TONGASAT C/KU-4, TONGASAT C1/C1-R, USASAT-14E, USASAT-14G, USASAT-14H

Beam name	Channels	Ref. Table 1	Affected administrations*	Affected networks/beams/terrestrial stations*
S 13800	21, 23, 25	c	F, F/EUT	VIDEOSAT-8-KU-C, EUTELSAT 3-4E, EUTELSAT 3-7E
SCG14800**	22, 24, 26	c	F	VIDEOSAT-5, VIDEOSAT-6, VIDEOSAT-5-KA, VIDEOSAT-6-KA
SDN__100	21, 23, 25	c	BLR/IK F	INTERSPUTNIK-6W-Q, VIDEOSAT-5, VIDEOSAT-6, VIDEOSAT-5-KA, VIDEOSAT-6-KA
SEN22200	23	c	E, URG, USA	USASAT-26A, HISPASAT 36W KU, URUSAT-7
SEY00000	26	c	BLR/IK, D, F/EUT, HOL, J, PAK, UAE, USA	EMARSAT-1F, EUROPE*STAR-2G-1, EUROPE*STAR-2G-2, EUROPE*STAR-2G-3, EUTELSAT 3-25.5E, EUTELSAT 3-33E, EUTELSAT 3-36E, EUTELSAT 3-44E, EUTELSAT 3-48E, INTELSAT7 66E, INTERSPUTNIK-27E-Q, N-SAT-65.5, NSS-21, NSS-22, NSS-23, NSS-8, PAKSAT-2
SEY00000	28, 30, 32, 34, 36, 38, 40	c	BLR/IK, D, F/EUT, HOL, J, PAK, THA, UAE, USA	EMARSAT-1F, EUROPE*STAR-2G-1, EUROPE*STAR-2G-2, EUROPE*STAR-2G-3, EUTELSAT 3-25.5E, EUTELSAT 3-33E, EUTELSAT 3-36E, EUTELSAT 3-44E, EUTELSAT 3-48E, INTELSAT7 66E, INTERSPUTNIK-27E-Q, N-SAT-65.5, NSS-21, NSS-22, NSS-23, NSS-8, PAKSAT-2, THAICOM-C1
SMO05700	1, 5, 9, 13, 17, 19, 21, 23	c	J	N-SAT-178.5W
SOM31200	26	c	D, F/EUT, HOL, PAK, UAE	EMARSAT-1F, EUROPE*STAR-2G-1, EUROPE*STAR-2G-2, EUROPE*STAR-2G-3, EUTELSAT 3-33E, EUTELSAT 3-36E, EUTELSAT 3-44E, EUTELSAT 3-48E, NSS-21, NSS-22, PAKSAT-1, PAKSAT-2, PAKSAT-C
SOM31200	28, 30, 32, 34, 36, 38, 40	c	D, F/EUT, HOL, MLA, PAK, UAE	EMARSAT-1F, EUROPE*STAR-2G-1, EUROPE*STAR-2G-2, EUROPE*STAR-2G-3, EUTELSAT 3-33E, EUTELSAT 3-36E, EUTELSAT 3-44E, EUTELSAT 3-48E, MEASAT-SA3, MEASAT-SA4, NSS-21, NSS-22, PAKSAT-1, PAKSAT-2, PAKSAT-C
STP24100	2, 4, 6, 8, 10, 12, 14, 16, 18, 20	c	F	VIDEOSAT-5, VIDEOSAT-5-KA
SVK14401	7, 15, 23	c	F/EUT	EUTELSAT 3-12.5W
SVK14402	18, 26	c	F/EUT	EUTELSAT 3-12.5W
SVK14403	2, 22, 24	c	F/EUT	EUTELSAT 3-12.5W
SYR22900	28, 32, 36, 40	c	F/EUT	EUTELSAT 3-25.5E
SYR33900	40	c	F/EUT	EUTELSAT 3-25.5E
TCD14300	1, 3, 5, 7, 9, 11, 13, 15, 17, 19	c	F/EUT	EUTELSAT 3-16E
TGO22600	1, 3, 5, 7, 9, 11	c	USA	INTELSAT7 330.5E, INTELSAT8 330.5E
TGO22600	13	c	E, USA	HISPASAT-1, INTELSAT7 330.5E, HISPASAT-2C3 KU, INTELSAT8 330.5E
TGO22600	15, 17, 19	c	E	HISPASAT-1, HISPASAT-2C3 KU

Beam name	Channels	Ref. Table 1	Affected administrations*	Affected networks/beams/terrestrial stations*
TJK06900	26	c	BLR/IK, CHN, D, F/EUT, G, HOL, IND, J, MHL, PAK, SNG, THA, TON, UAE, USA	ASIASAT-AK1, ASIASAT-AKX, ASIASAT-BKX, ASIASAT-CK1, ASIASAT-CKX, ASIASAT-DKX, ASIASAT-EK1, ASIASAT-EKX, EMARSAT-1B, EMARSAT-1F, EMARSAT-1G, EUROPE*STAR-2G-1, EUROPE*STAR-2G-2, EUROPE*STAR-2G-3, EUTELSAT 3-25.5E, EUTELSAT 3-33E, EUTELSAT 3-36E, EUTELSAT 3-44E, EUTELSAT 3-48E, EUTELSAT 3-70.5E, EUTELSAT 3-73.5E, EUTELSAT 3-76E, EUTELSAT 3-80.5E, EUTELSAT 3-83.5E, EUTELSAT 3-86E, EUTELSAT 3-88.5E, INSAT-EK48, INSAT-EK55, INTELSAT KFOS 85E, INTELSAT 7 66E, INTERSPUTNIK-27E-Q, JCSAT-1R, JCSAT-3A, JCSAT-3B, MTSAT-135E, MTSAT-140E, MTSAT-145E, N-SAT-102.5E, N-SAT-103.5E, N-SAT-106.5E, N-SAT-110E, N-SAT-117, N-SAT-120E, N-SAT-122.5E, N-SAT-125.5E, N-SAT-129.5E, N-SAT-141E, N-SAT-147.5E, N-SAT-65.5, N-SAT-73E, N-SAT-74.5E, N-SAT-76.5E, N-SAT-79.5E, N-SAT-82.5E, N-SAT-84E, N-SAT-86E, N-SAT-94E, N-STAR-A2, N-STAR-B2, NSS-21, NSS-22, NSS-23, NSS-24, NSS-8, NSS-9, ORION-AP-1, ORION-AP-2, PAKSAT-1, PAKSAT-2, PAKSAT-C, PAKSAT-D, PAKSAT-E, SB-SAT-135, SB-SAT-144, SKYSAT-A1, SKYSAT-A2, SKYSAT-A3, SKYSAT-B1, SKYSAT-B2, SKYSAT-B3, SKYSAT-B4, SKYSAT-C1, SKYSAT-C2, SKYSAT-C3, SKYSAT-C4, ST-1C, SUPERBIRD-C, THAICOM-C2, TONGASAT AP-KU-4, TONGASAT C/KU-1, TONGASAT C/KU-2, TONGASAT C/KU-3, TONGASAT C/KU-4
TJK06900	28	c	BLR/IK, CHN, D, F/EUT, G, HOL, IND, INS, J, KOR, LAO, MLA, PAK, PNG, SNG, THA, TON, UAE, USA	AM-SAT A1, AM-SAT A4, APSTAR-2 F1, APSTAR-2 F2, APSTAR-3, APSTAR-4, ASIASAT-AK1, ASIASAT-AKX, ASIASAT-BKX, ASIASAT-CK1, ASIASAT-CKX, ASIASAT-DKX, ASIASAT-EK1, ASIASAT-EKX, DFH-3-OC, DFH-4-OA, DFH-4-OB, DFH-4-OC, DFH-4-OD, DFH-4-OE, DFH-4-OF, EMARSAT-1B, EMARSAT-1F, EMARSAT-1G, EUROPE*STAR-2G-1, EUROPE*STAR-2G-2, EUROPE*STAR-2G-3, EUTELSAT 3-25.5E, EUTELSAT 3-33E, EUTELSAT 3-36E, EUTELSAT 3-44E, EUTELSAT 3-48E, EUTELSAT 3-70.5E, EUTELSAT 3-73.5E, EUTELSAT 3-76E, EUTELSAT 3-80.5E, EUTELSAT 3-83.5E, EUTELSAT 3-86E, EUTELSAT 3-88.5E, INSAT-EK48, INSAT-EK55, INTELSAT KFOS 85E, INTELSAT 7 66E, INTERSPUTNIK-27E-Q, JCSAT-1R, JCSAT-3A, JCSAT-3B, KOREASAT-103KU, KOREASAT-123.7KU, KOREASAT-2, L-STAR-1, L-STAR-2, L-STAR-3, L-STAR-4, L-STAR-5, L-STAR-6, MEASAT-1, MEASAT-148E, MEASAT-2, MEASAT-3, MEASAT-91.5E, MEASAT-95E, MEASAT-SA3, MEASAT-SA4, MTSAT-135E, MTSAT-140E, MTSAT-145E, N-SAT-102.5E, N-SAT-103.5E, N-SAT-106.5E, N-SAT-110, N-SAT-110E, N-SAT-117, N-SAT-120E, N-SAT-122.5E, N-SAT-125.5E, N-SAT-128, N-SAT-129.5E, N-SAT-141E, N-SAT-147.5E, N-SAT-65.5, N-SAT-73E, N-SAT-74.5E, N-SAT-76.5E, N-SAT-79.5E, N-SAT-82.5E, N-SAT-84E, N-SAT-86E, N-SAT-94E, N-STAR-A2, N-STAR-B2, NSS-21, NSS-22, NSS-23, NSS-24, NSS-8, NSS-9, PACSTAR-L1, PACSTAR-L2, PACSTAR-L3, PAKSAT-1, PAKSAT-2, PAKSAT-C, PAKSAT-D, PAKSAT-E, PALAPA-C6, PALAPA-C7, SB-SAT-135, SB-SAT-144, SJC-1, SKYSAT-A1, SKYSAT-A2, SKYSAT-A3, SKYSAT-B1, SKYSAT-B2, SKYSAT-B3, SKYSAT-B4, SKYSAT-C1, SKYSAT-C2, SKYSAT-C3, SKYSAT-C4, ST-1C, SUPERBIRD-C, THAICOM-A2B, THAICOM-A3B, THAICOM-A4B, THAICOM-A5B, THAICOM-AK3, THAICOM-C1, THAICOM-C2, THAICOM-G1K, THAICOM-G2K, THAICOM-G3K, TONGASAT AP-KU-4, TONGASAT C/KU-1, TONGASAT C/KU-2, TONGASAT C/KU-3, TONGASAT C/KU-4
TJK06900	30, 32, 34, 36, 38	c	BLR/IK, CHN, D, F/EUT, G, HOL, IND, INS, J, KOR, LAO, MLA, PAK, PNG, SNG, THA, TON, UAE, USA	AM-SAT A1, AM-SAT A4, APSTAR-2 F1, APSTAR-2 F2, APSTAR-3, APSTAR-4, ASIASAT-AK1, ASIASAT-AKX, ASIASAT-BKX, ASIASAT-CK1, ASIASAT-CKX, ASIASAT-DKX, ASIASAT-EK1, ASIASAT-EKX, CHINASAT-6, DFH-3-OC, DFH-3A-OA, DFH-3A-OB, DFH-3A-OC, DFH-3A-OD, DFH-4-OA, DFH-4-OB, DFH-4-OC, DFH-4-OD, DFH-4-OE, DFH-4-OF, EMARSAT-1B, EMARSAT-1F, EMARSAT-1G, EUROPE*STAR-2G-1, EUROPE*STAR-2G-2, EUROPE*STAR-2G-3, EUTELSAT 3-25.5E, EUTELSAT 3-33E, EUTELSAT 3-36E, EUTELSAT 3-44E, EUTELSAT 3-48E, EUTELSAT 3-70.5E, EUTELSAT 3-73.5E, EUTELSAT 3-76E, EUTELSAT 3-80.5E, EUTELSAT 3-83.5E, EUTELSAT 3-86E, EUTELSAT 3-88.5E, INSAT-EK48, INSAT-EK55, INTELSAT KFOS 85E, INTELSAT 7 66E, INTERSPUTNIK-27E-Q, JCSAT-1R, JCSAT-3A, JCSAT-3B, KOREASAT-1, KOREASAT-2, L-STAR-1, L-STAR-2, L-STAR-3, L-STAR-4, L-STAR-5, L-STAR-6, MEASAT-1, MEASAT-148E, MEASAT-2, MEASAT-3, MEASAT-91.5E, MEASAT-95E, MEASAT-SA3, MEASAT-SA4, MTSAT-135E, MTSAT-140E, MTSAT-145E, N-SAT-102.5E, N-SAT-103.5E, N-SAT-106.5E, N-SAT-110, N-SAT-110E, N-SAT-117, N-SAT-120E, N-SAT-122.5E, N-SAT-125.5E, N-SAT-128, N-SAT-129.5E, N-SAT-141E, N-SAT-147.5E, N-SAT-65.5, N-SAT-73E, N-SAT-74.5E, N-SAT-76.5E, N-SAT-79.5E, N-SAT-82.5E, N-SAT-84E, N-SAT-86E, N-SAT-94E, N-STAR-A2, N-STAR-B2, NSS-21, NSS-22, NSS-23, NSS-24, NSS-8, NSS-9, PACSTAR-L1, PACSTAR-L2, PACSTAR-L3, PAKSAT-1, PAKSAT-2, PAKSAT-C, PAKSAT-D, PAKSAT-E, PALAPA-C6, PALAPA-C7, SB-SAT-135, SB-SAT-144, SJC-1, SKYSAT-A1, SKYSAT-A2, SKYSAT-A3, SKYSAT-B1, SKYSAT-B2, SKYSAT-B3, SKYSAT-B4, SKYSAT-C1, SKYSAT-C2, SKYSAT-C3, SKYSAT-C4, ST-1C, SUPERBIRD-C, THAICOM-A2B, THAICOM-A3B, THAICOM-A4B, THAICOM-A5B, THAICOM-AK3, THAICOM-C1, THAICOM-C2, THAICOM-G1K, THAICOM-G2K, THAICOM-G3K, TONGASAT AP-KU-4, TONGASAT C/KU-1, TONGASAT C/KU-2, TONGASAT C/KU-3, TONGASAT C/KU-4

Beam name	Channels	Ref. Table 1	Affected administrations*	Affected networks/beams/terrestrial stations*
TJK06900	40	c	BLR/IK, CHN, D, F/EUT, G, HOL, IND, INS, J, KOR, LAO, MLA, PAK, PNG, SNG, THA, TON, UAE, USA	AM-SAT A1, AM-SAT A4, APSTAR-2 F1, APSTAR-2 F2, APSTAR-3, APSTAR-4, ASIANSAT-AK1, ASIANSAT-AKX, ASIANSAT-BKX, ASIANSAT-CK1, ASIANSAT-CKX, ASIANSAT-DKX, ASIANSAT-EK1, ASIANSAT-EKX, ASIANSAT-6, DFH-3-OC, DFH-3A-OA, DFH-3A-OB, DFH-3A-OC, DFH-3A-OD, DFH-4-OA, DFH-4-OB, DFH-4-OC, DFH-4-OD, DFH-4-OE, DFH-4-OF, EMARSAT-1B, EMARSAT-1F, EMARSAT-1G, EUROPE*STAR-2G-1, EUROPE*STAR-2G-2, EUROPE*STAR-2G-3, EUTELSAT 3-25.5E, EUTELSAT 3-33E, EUTELSAT 3-36E, EUTELSAT 3-44E, EUTELSAT 3-48E, EUTELSAT 3-70.5E, EUTELSAT 3-73.5E, EUTELSAT 3-76E, EUTELSAT 3-80.5E, EUTELSAT 3-83.5E, EUTELSAT 3-86E, EUTELSAT 3-88.5E, INSAT-EK48, INSAT-EK55, INTELSAT 7 66E, INTERSPUTNIK-27E-Q, JCSAT-1R, JCSAT-3A, JCSAT-3B, KOREASAT-1, KOREASAT-2, L-STAR-1, L-STAR-2, L-STAR-3, L-STAR-4, L-STAR-5, L-STAR-6, MEASAT-1, MEASAT-148E, MEASAT-2, MEASAT-3, MEASAT-91.5E, MEASAT-95E, MEASAT-SA3, MEASAT-SA4, MTSAT-135E, MTSAT-140E, MTSAT-145E, N-SAT-102.5E, N-SAT-103.5E, N-SAT-106.5E, N-SAT-110, N-SAT-110E, N-SAT-117, N-SAT-120E, N-SAT-122.5E, N-SAT-125.5E, N-SAT-128, N-SAT-129.5E, N-SAT-141E, N-SAT-147.5E, N-SAT-65.5, N-SAT-73E, N-SAT-74.5E, N-SAT-76.5E, N-SAT-79.5E, N-SAT-82.5E, N-SAT-84E, N-SAT-86E, N-SAT-94E, N-STAR-A2, N-STAR-B2, NSS-21, NSS-22, NSS-23, NSS-24, NSS-8, NSS-9, PACSTAR-L1, PACSTAR-L2, PACSTAR-L3, PAKSAT-1, PAKSAT-2, PAKSAT-C, PAKSAT-D, PAKSAT-E, PALAPA-C6, PALAPA-C7, SB-SAT-135, SB-SAT-144, SJC-1, SKYSAT-A1, SKYSAT-A2, SKYSAT-A3, SKYSAT-B1, SKYSAT-B2, SKYSAT-B3, SKYSAT-B4, SKYSAT-C1, SKYSAT-C2, SKYSAT-C3, SKYSAT-C4, ST-1C, SUPERBIRD-C, THAICOM-A2B, THAICOM-A3B, THAICOM-A4B, THAICOM-A5B, THAICOM-A6B, THAICOM-C1, THAICOM-C2, THAICOM-G1K, THAICOM-G2K, THAICOM-G3K, TONGASAT AP-KU-4, TONGASAT C/KU-1, TONGASAT C/KU-2, TONGASAT C/KU-3, TONGASAT C/KU-4
TKM06800	26	c	BLR/IK, CHN, D, F/EUT, G, HOL, IND, J, MHL, PAK, SNG, THA, TON, UAE, USA	ASIANSAT-AK1, ASIANSAT-AKX, ASIANSAT-BKX, ASIANSAT-CK1, ASIANSAT-CKX, ASIANSAT-DKX, ASIANSAT-EK1, ASIANSAT-EKX, EMARSAT-1B, EMARSAT-1F, EMARSAT-1G, EUROPE*STAR-2G-1, EUROPE*STAR-2G-2, EUROPE*STAR-2G-3, EUTELSAT 3-25.5E, EUTELSAT 3-33E, EUTELSAT 3-36E, EUTELSAT 3-44E, EUTELSAT 3-48E, EUTELSAT 3-70.5E, EUTELSAT 3-73.5E, EUTELSAT 3-76E, EUTELSAT 3-80.5E, EUTELSAT 3-83.5E, EUTELSAT 3-86E, EUTELSAT 3-88.5E, INSAT-EK48, INSAT-EK55, INTELSAT KFOS 85E, INTELSAT 7 66E, INTERSPUTNIK-27E-Q, JCSAT-3A, JCSAT-3B, N-SAT-102.5E, N-SAT-103.5E, N-SAT-106.5, N-SAT-110E, N-SAT-117, N-SAT-120E, N-SAT-122.5E, N-SAT-125.5E, N-SAT-129.5E, N-SAT-141E, N-SAT-65.5, N-SAT-73E, N-SAT-74.5E, N-SAT-76.5E, N-SAT-79.5E, N-SAT-82.5E, N-SAT-84E, N-SAT-86E, N-SAT-94E, N-STAR-A2, N-STAR-B2, NSS-21, NSS-22, NSS-23, NSS-24, NSS-8, NSS-9, ORION-AP-1, PAKSAT-1, PAKSAT-2, PAKSAT-3, PAKSAT-C, PAKSAT-D, PAKSAT-E, SB-SAT-135, SKYSAT-A1, SKYSAT-A2, SKYSAT-A3, SKYSAT-B1, SKYSAT-B2, SKYSAT-B3, SKYSAT-B4, SKYSAT-C1, SKYSAT-C2, SKYSAT-C3, SKYSAT-C4, ST-1C, THAICOM-C2, TONGASAT AP-KU-4, TONGASAT C/KU-1, TONGASAT C/KU-2, TONGASAT C/KU-3, TONGASAT C/KU-4
TKM06800	28	c	BLR/IK, CHN, D, F/EUT, G, HOL, IND, INS, J, KOR, LAO, MLA, PAK, PNG, SNG, THA, TON, UAE, USA	AM-SAT A1, AM-SAT A4, APSTAR-3, APSTAR-4, ASIANSAT-AK1, ASIANSAT-AKX, ASIANSAT-BKX, ASIANSAT-CK1, ASIANSAT-CKX, ASIANSAT-DKX, ASIANSAT-EK1, ASIANSAT-EKX, DFH-3-OC, EMARSAT-1B, EMARSAT-1F, EMARSAT-1G, EUROPE*STAR-2G-1, EUROPE*STAR-2G-2, EUROPE*STAR-2G-3, EUTELSAT 3-25.5E, EUTELSAT 3-33E, EUTELSAT 3-36E, EUTELSAT 3-44E, EUTELSAT 3-48E, EUTELSAT 3-70.5E, EUTELSAT 3-73.5E, EUTELSAT 3-76E, EUTELSAT 3-80.5E, EUTELSAT 3-83.5E, EUTELSAT 3-86E, EUTELSAT 3-88.5E, INSAT-EK48, INSAT-EK55, INTELSAT KFOS 85E, INTELSAT 7 66E, INTERSPUTNIK-27E-Q, JCSAT-3A, JCSAT-3B, KOREASAT-1, KOREASAT-2, L-STAR-1, L-STAR-2, L-STAR-3, L-STAR-4, L-STAR-5, L-STAR-6, MEASAT-1, MEASAT-3, MEASAT-91.5E, MEASAT-95E, MEASAT-SA3, MEASAT-SA4, MTSAT-135E, MTSAT-140E, MTSAT-145E, N-SAT-102.5E, N-SAT-103.5E, N-SAT-106.5, N-SAT-110, N-SAT-117, N-SAT-120E, N-SAT-122.5E, N-SAT-125.5E, N-SAT-128, N-SAT-129.5E, N-SAT-141E, N-SAT-65.5, N-SAT-73E, N-SAT-74.5E, N-SAT-76.5E, N-SAT-79.5E, N-SAT-82.5E, N-SAT-84E, N-SAT-86E, N-SAT-94E, N-STAR-A2, N-STAR-B2, NSS-21, NSS-22, NSS-23, NSS-24, NSS-8, NSS-9, PACSTAR-L1, PACSTAR-L2, PACSTAR-L3, PAKSAT-1, PAKSAT-2, PAKSAT-3, PAKSAT-C, PAKSAT-D, PAKSAT-E, PALAPA-C5, PALAPA-C6, PALAPA-C7, SB-SAT-135, SJC-1, SKYSAT-A1, SKYSAT-A2, SKYSAT-A3, SKYSAT-B1, SKYSAT-B2, SKYSAT-B3, SKYSAT-B4, SKYSAT-C1, SKYSAT-C2, SKYSAT-C3, SKYSAT-C4, ST-1C, THAICOM-A2B, THAICOM-A3B, THAICOM-A4B, THAICOM-A5B, THAICOM-C1, THAICOM-C2, THAICOM-G1K, THAICOM-G2K, THAICOM-G3K, TONGASAT AP-KU-4, TONGASAT C/KU-1, TONGASAT C/KU-2, TONGASAT C/KU-3, TONGASAT C/KU-4

Beam name	Channels	Ref. Table 1	Affected administrations*	Affected networks/beams/terrestrial stations*
TKM06800	30, 32, 34, 36, 38	c	BLR/IK, CHN, D, F/EUT, G, HOL, IND, INS, J, KOR, LAO, MLA, PAK, PNG, SNG, THA, TON, UAE, USA	AM-SAT A1, AM-SAT A4, APSTAR-3, APSTAR-4, ASIASEAT-AK1, ASIASEAT-AKX, ASIASEAT-BKX, ASIASEAT-CK1, ASIASEAT-CKX, ASIASEAT-DKX, ASIASEAT-EK1, ASIASEAT-EKX, DFH-3-OC, EMARSAT-IB, EMARSAT-IF, EMARSAT-IG, EUROPE*STAR-2G-1, EUROPE*STAR-2G-2, EUROPE*STAR-2G-3, EUTELSAT 3-25.5E, EUTELSAT 3-33E, EUTELSAT 3-36E, EUTELSAT 3-44E, EUTELSAT 3-48E, EUTELSAT 3-70.5E, EUTELSAT 3-73.5E, EUTELSAT 3-76E, EUTELSAT 3-80.5E, EUTELSAT 3-83.5E, EUTELSAT 3-86E, EUTELSAT 3-88.5E, INSAT-EK48, INSAT-EK55, INTELSAT KFOS 85E, INTELSAT7 66E, INTERSPUTNIK-27E-Q, JCSAT-3A, JCSAT-3B, KOREASAT-1, KOREASAT-2, L-STAR-1, L-STAR-2, L-STAR-3, L-STAR-4, L-STAR-5, L-STAR-6, MEASAT-1, MEASAT-3, MEASAT-91.5E, MEASAT-95E, MEASAT-SA3, MEASAT-SA4, N-SAT-102.5E, N-SAT-103.5E, N-SAT-106.5, N-SAT-110, N-SAT-110E, N-SAT-117, N-SAT-120E, N-SAT-122.5E, N-SAT-125.5E, N-SAT-128, N-SAT-129.5E, N-SAT-141E, N-SAT-65.5, N-SAT-73E, N-SAT-74.5E, N-SAT-76.5E, N-SAT-79.5E, N-SAT-82.5E, N-SAT-84E, N-SAT-86E, N-SAT-94E, N-STAR-A2, N-STAR-B2, NSS-21, NSS-22, NSS-23, NSS-24, NSS-8, NSS-9, PACSTAR-L1, PACSTAR-L2, PACSTAR-L3, PAKSAT-1, PAKSAT-2, PAKSAT-C, PAKSAT-D, PAKSAT-E, PALAPA-C5, PALAPA-C6, PALAPA-C7, SB-SAT-135, SJC-1, SKYSAT-A1, SKYSAT-A2, SKYSAT-A3, SKYSAT-B1, SKYSAT-B2, SKYSAT-B3, SKYSAT-B4, SKYSAT-C1, SKYSAT-C2, SKYSAT-C3, SKYSAT-C4, ST-1C, THAICOM-A2B, THAICOM-A3B, THAICOM-A4B, THAICOM-A5B, THAICOM-C1, THAICOM-C2, THAICOM-G1K, THAICOM-G2K, THAICOM-G3K, TONGASAT AP-KU-4, TONGASAT C/KU-1, TONGASAT C/KU-2, TONGASAT C/KU-3, TONGASAT C/KU-4
TKM06800	40	c	BLR/IK, CHN, D, F/EUT, G, HOL, IND, INS, J, KOR, LAO, MLA, PAK, PNG, SNG, THA, TON, UAE, USA	AM-SAT A1, AM-SAT A4, APSTAR-3, APSTAR-4, ASIASEAT-AK1, ASIASEAT-AKX, ASIASEAT-BKX, ASIASEAT-CK1, ASIASEAT-CKX, ASIASEAT-DKX, ASIASEAT-EK1, ASIASEAT-EKX, DFH-3-OC, EMARSAT-IB, EMARSAT-IF, EMARSAT-IG, EUROPE*STAR-2G-1, EUROPE*STAR-2G-2, EUROPE*STAR-2G-3, EUTELSAT 3-25.5E, EUTELSAT 3-33E, EUTELSAT 3-36E, EUTELSAT 3-44E, EUTELSAT 3-48E, EUTELSAT 3-70.5E, EUTELSAT 3-73.5E, EUTELSAT 3-76E, EUTELSAT 3-80.5E, EUTELSAT 3-83.5E, EUTELSAT 3-86E, EUTELSAT 3-88.5E, INSAT-EK48, INSAT-EK55, INTELSAT7 66E, INTERSPUTNIK-27E-Q, JCSAT-3A, JCSAT-3B, KOREASAT-1, KOREASAT-2, L-STAR-1, L-STAR-2, L-STAR-3, L-STAR-4, L-STAR-5, L-STAR-6, MEASAT-1, MEASAT-3, MEASAT-91.5E, MEASAT-95E, MEASAT-SA3, MEASAT-SA4, L-SAT-102.5E, N-SAT-103.5E, N-SAT-106.5, N-SAT-110, N-SAT-110E, N-SAT-117, N-SAT-120E, N-SAT-122.5E, N-SAT-125.5E, N-SAT-128, N-SAT-129.5E, N-SAT-141E, N-SAT-65.5, N-SAT-73E, N-SAT-74.5E, N-SAT-76.5E, N-SAT-79.5E, N-SAT-82.5E, N-SAT-84E, N-SAT-86E, N-SAT-94E, N-STAR-A2, N-STAR-B2, NSS-21, NSS-22, NSS-23, NSS-24, NSS-8, NSS-9, PACSTAR-L1, PACSTAR-L2, PACSTAR-L3, PAKSAT-1, PAKSAT-2, PAKSAT-C, PAKSAT-D, PALAPA-C5, PALAPA-C6, PALAPA-C7, SB-SAT-135, SJC-1, SKYSAT-A1, SKYSAT-A2, SKYSAT-A3, SKYSAT-B1, SKYSAT-B2, SKYSAT-B3, SKYSAT-B4, SKYSAT-C1, SKYSAT-C2, SKYSAT-C3, SKYSAT-C4, ST-1C, THAICOM-A2B, THAICOM-A3B, THAICOM-A4B, THAICOM-A5B, THAICOM-C1, THAICOM-G1K, THAICOM-G2K, THAICOM-G3K, TONGASAT AP-KU-4, TONGASAT C/KU-1, TONGASAT C/KU-2, TONGASAT C/KU-3, TONGASAT C/KU-4
TON21500	2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24	c	USA	USASAT-14K
TUV00000	4, 8, 12	c	J, USA	INTELSAT7 176E, INTELSAT8 176E, N-SAT-175.5E
TUV00000	16, 18, 20, 22, 24	c	J	N-SAT-175.5E
TZA22500	21, 25	c	F/EUT	EUTELSAT 3-10E

Beam name	Channels	Ref. Table 1	Affected administrations*	Affected networks/beams/terrestrial stations*
UAE27400	25	c	BLR/IK, CHN, D, F/EUT, G, HOL, J, PAK, SNG, TON, USA	ASIASAT-AK1, ASIASAT-CK1, ASIASAT-EK1, EUROPE*STAR-2G-1, EUROPE*STAR-2G-2, EUROPE*STAR-2G-3, EUTELSAT 3-25.5E, EUTELSAT 3-33E, EUTELSAT 3-36E, EUTELSAT 3-44E, EUTELSAT 3-48E, EUTELSAT 3-70.5E, EUTELSAT 3-76E, EUTELSAT 3-80.5E, EUTELSAT 3-83.5E, EUTELSAT 3-88.5E, INTELSAT KFOS 85E, INTELSAT7 66E, INTERSPUTNIK-27E-Q, JCSAT-3A, JCSAT-3B, N-SAT-102.5E, N-SAT-103.5E, N-SAT-106.5, N-SAT-110E, N-SAT-117, N-SAT-120E, N-SAT-122.5E, N-SAT-125.5E, N-SAT-129.5E, N-SAT-65.5, N-SAT-73E, N-SAT-74.5E, N-SAT-79.5E, N-SAT-82.5E, N-SAT-84E, N-SAT-86E, N-SAT-94E, NSS-21, NSS-22, NSS-23, NSS-24, NSS-8, NSS-9, PAKSAT-1, PAKSAT-2, PAKSAT-C, PAKSAT-D, PAKSAT-E, SKYSAT-A1, SKYSAT-A2, SKYSAT-A3, SKYSAT-B2, SKYSAT-C1, SKYSAT-C2, SKYSAT-C3, SKYSAT-C4, ST-1C, TONGASAT AP-KU-4, TONGASAT C/KU-1
UAE27400	27	c	BLR/IK, CHN, D, F/EUT, G, HOL, J, MLA, PAK, SNG, THA, TON, USA	ASIASAT-AK1, ASIASAT-AKX, ASIASAT-BKX, ASIASAT-CK1, ASIASAT-CKX, ASIASAT-DKX, ASIASAT-EK1, ASIASAT-EKX, EUROPE*STAR-2G-1, EUROPE*STAR-2G-2, EUROPE*STAR-2G-3, EUTELSAT 3-25.5E, EUTELSAT 3-33E, EUTELSAT 3-36E, EUTELSAT 3-44E, EUTELSAT 3-48E, EUTELSAT 3-70.5E, EUTELSAT 3-73.5E, EUTELSAT 3-76E, EUTELSAT 3-80.5E, EUTELSAT 3-83.5E, EUTELSAT 3-86E, EUTELSAT 3-88.5E, INTELSAT KFOS 85E, INTELSAT7 66E, INTERSPUTNIK-27E-Q, JCSAT-3A, JCSAT-3B, MEASAT-SA3, MEASAT-SA4, N-SAT-102.5E, N-SAT-103.5E, N-SAT-106.5, N-SAT-110E, N-SAT-117, N-SAT-120E, N-SAT-122.5E, N-SAT-125.5E, N-SAT-129.5E, N-SAT-65.5, N-SAT-73E, N-SAT-74.5E, N-SAT-76.5E, N-SAT-79.5E, N-SAT-82.5E, N-SAT-84E, N-SAT-86E, N-SAT-94E, N-SAT-A2, NSS-21, NSS-22, NSS-23, NSS-24, NSS-8, NSS-9, PAKSAT-1, PAKSAT-2, PAKSAT-C, PAKSAT-D, PAKSAT-E, SKYSAT-A1, SKYSAT-A2, SKYSAT-A3, SKYSAT-B1, SKYSAT-B2, SKYSAT-C1, SKYSAT-C2, SKYSAT-C3, SKYSAT-C4, ST-1C, THAICOM-C2, TONGASAT AP-KU-4, TONGASAT C/KU-1, TONGASAT C/KU-2
UAE27400	29	c	BLR/IK, CHN, D, F/EUT, G, HOL, INS, J, KOR, LAO, MLA, PAK, PNG, SNG, THA, TON, USA	AM-SAT A1, AM-SAT A4, APSTAR-3, APSTAR-4, ASIASAT-AK1, ASIASAT-AKX, ASIASAT-BKX, ASIASAT-CK1, ASIASAT-CKX, ASIASAT-DKX, ASIASAT-EK1, ASIASAT-EKX, EUROPE*STAR-2G-1, EUROPE*STAR-2G-2, EUROPE*STAR-2G-3, EUTELSAT 3-25.5E, EUTELSAT 3-33E, EUTELSAT 3-36E, EUTELSAT 3-44E, EUTELSAT 3-48E, EUTELSAT 3-70.5E, EUTELSAT 3-73.5E, EUTELSAT 3-76E, EUTELSAT 3-80.5E, EUTELSAT 3-83.5E, EUTELSAT 3-86E, EUTELSAT 3-88.5E, INTELSAT KFOS 85E, INTELSAT7 66E, INTERSPUTNIK-27E-Q, JCSAT-3A, JCSAT-3B, KOREASAT-1, KOREASAT-103KU, KOREASAT-123.7KU, L-STAR-1, L-STAR-2, L-STAR-3, L-STAR-4, L-STAR-5, L-STAR-6, MEASAT-1, MEASAT-3, MEASAT-91.5E, MEASAT-95E, MEASAT-SA3, MEASAT-SA4, N-SAT-102.5E, N-SAT-103.5E, N-SAT-106.5, N-SAT-110, N-SAT-110E, N-SAT-117, N-SAT-120E, N-SAT-122.5E, N-SAT-125.5E, N-SAT-128, N-SAT-129.5E, N-SAT-65.5, N-SAT-73E, N-SAT-74.5E, N-SAT-76.5E, N-SAT-79.5E, N-SAT-82.5E, N-SAT-84E, N-SAT-86E, N-SAT-94E, NSS-21, NSS-22, NSS-23, NSS-24, NSS-8, NSS-9, PACSTAR-L1, PACSTAR-L2, PACSTAR-L3, PAKSAT-1, PAKSAT-2, PAKSAT-C, PAKSAT-D, PAKSAT-E, PALAPA-C5, PALAPA-C6, PALAPA-C7, SIC-1, SKYSAT-A1, SKYSAT-A2, SKYSAT-A3, SKYSAT-B2, SKYSAT-C1, SKYSAT-C2, SKYSAT-C3, SKYSAT-C4, ST-1C, THAICOM-A2B, THAICOM-A5B, THAICOM-C1, THAICOM-C2, THAICOM-G1K, THAICOM-G2K, TONGASAT AP-KU-4, TONGASAT C/KU-1
UAE27400	31, 35, 39	c	BLR/IK, CHN, D, F/EUT, G, HOL, INS, J, KOR, LAO, MLA, PAK, PNG, SNG, THA, TON, USA	AM-SAT A1, AM-SAT A4, APSTAR-3, APSTAR-4, ASIASAT-AK1, ASIASAT-AKX, ASIASAT-BKX, ASIASAT-CK1, ASIASAT-CKX, ASIASAT-DKX, ASIASAT-EK1, ASIASAT-EKX, EUROPE*STAR-2G-1, EUROPE*STAR-2G-2, EUROPE*STAR-2G-3, EUTELSAT 3-25.5E, EUTELSAT 3-33E, EUTELSAT 3-36E, EUTELSAT 3-44E, EUTELSAT 3-48E, EUTELSAT 3-70.5E, EUTELSAT 3-73.5E, EUTELSAT 3-76E, EUTELSAT 3-80.5E, EUTELSAT 3-83.5E, EUTELSAT 3-86E, EUTELSAT 3-88.5E, INTELSAT KFOS 85E, INTELSAT7 66E, INTERSPUTNIK-27E-Q, JCSAT-3A, JCSAT-3B, KOREASAT-1, KOREASAT-2, L-STAR-1, L-STAR-2, L-STAR-3, L-STAR-4, L-STAR-5, L-STAR-6, MEASAT-1, MEASAT-3, MEASAT-91.5E, MEASAT-95E, MEASAT-SA3, MEASAT-SA4, N-SAT-102.5E, N-SAT-103.5E, N-SAT-106.5, N-SAT-110, N-SAT-110E, N-SAT-117, N-SAT-120E, N-SAT-122.5E, N-SAT-125.5E, N-SAT-128, N-SAT-129.5E, N-SAT-65.5, N-SAT-73E, N-SAT-74.5E, N-SAT-76.5E, N-SAT-79.5E, N-SAT-82.5E, N-SAT-84E, N-SAT-86E, N-SAT-94E, N-SAT-A2, NSS-21, NSS-22, NSS-23, NSS-24, NSS-8, NSS-9, PACSTAR-L1, PACSTAR-L2, PACSTAR-L3, PAKSAT-1, PAKSAT-2, PAKSAT-C, PAKSAT-D, PAKSAT-E, PALAPA-C6, PALAPA-C7, SIC-1, SKYSAT-A1, SKYSAT-A2, SKYSAT-A3, SKYSAT-B1, SKYSAT-B2, SKYSAT-C1, SKYSAT-C2, SKYSAT-C3, SKYSAT-C4, ST-1C, THAICOM-A2B, THAICOM-A3B, THAICOM-A5B, THAICOM-C1, THAICOM-C2, THAICOM-G1K, THAICOM-G2K, TONGASAT AP-KU-4, TONGASAT C/KU-1, TONGASAT C/KU-2

Beam name	Channels	Ref. Table 1	Affected administrations*	Affected networks/beams/terrestrial stations*
UAE27400	33, 37	c	BLR/IK, CHN, D, F/EUT, G, HOL, INS, J, KOR, LAO, MLA, PAK, PNG, SNG, THA, TON, USA	AM-SAT A1, AM-SAT A4, APSTAR-3, APSTAR-4, ASIASEAT-AK1, ASIASEAT-AKX, ASIASEAT-BKX, ASIASEAT-CK1, ASIASEAT-CKX, ASIASEAT-DKX, ASIASEAT-EK1, ASIASEAT-EKX, EUROPE*STAR-2G-1, EUROPE*STAR-2G-2, EUROPE*STAR-2G-3, EUTELSAT 3-25.5E, EUTELSAT 3-33E, EUTELSAT 3-36E, EUTELSAT 3-44E, EUTELSAT 3-48E, EUTELSAT 3-70.5E, EUTELSAT 3-73.5E, EUTELSAT 3-76E, EUTELSAT 3-80.5E, EUTELSAT 3-83.5E, EUTELSAT 3-86E, EUTELSAT 3-88.5E, INTELSAT KFOS 85E, INTELSAT 7 66E, INTERSPUTNIK-27E-Q, JCSAT-3A, JCSAT-3B, KOREASAT-1, L-STAR-1, L-STAR-2, L-STAR-3, L-STAR-4, L-STAR-5, L-STAR-6, MEASAT-1, MEASAT-3, MEASAT-91.5E, MEASAT-95E, MEASAT-SA3, MEASAT-SA4, N-SAT-102.5E, N-SAT-103.5E, N-SAT-106.5, N-SAT-110, N-SAT-110E, N-SAT-117, N-SAT-120E, N-SAT-122.5E, N-SAT-125.5E, N-SAT-128, N-SAT-129.5E, N-SAT-65.5, N-SAT-73E, N-SAT-74.5E, N-SAT-76.5E, N-SAT-79.5E, N-SAT-82.5E, N-SAT-84E, N-SAT-86E, N-SAT-94E, NSS-21, NSS-22, NSS-23, NSS-24, NSS-8, NSS-9, PACSTAR-L1, PACSTAR-L2, PACSTAR-L3, PAKSAT-1, PAKSAT-2, PAKSAT-C, PAKSAT-D, PAKSAT-E, PALAPA-C5, PALAPA-C6, PALAPA-C7, SJC-1, SKYSAT-A1, SKYSAT-A2, SKYSAT-A3, SKYSAT-B2, SKYSAT-C1, SKYSAT-C2, SKYSAT-C3, SKYSAT-C4, ST-1C, THAICOM-A2B, THAICOM-A5B, THAICOM-C1, THAICOM-C2, THAICOM-G1K, THAICOM-G2K, TONGASAT AP-KU-4, TONGASAT C/KU-1
VUT12800	1, 5, 9, 13, 17, 19, 21, 23	c	J, MHL	ORION-AP-1, N-SAT-141E
WAK33400	3, 7, 11, 15, 19, 21, 23	c	J, MHL	ORION-AP-1, N-SAT-141E
ZMB31400	21, 23, 25	c	NOR	BIFROST-14
ZWE13500	1, 3, 5, 7, 9, 11, 13	c	NOR, USA	INTELSAT7 359E, INTELSAT8 359E, BIFROST-14
ZWE13500	15, 17, 19	c	NOR	BIFROST-14

* Administrations and corresponding networks/beams/terrestrial stations whose assignment(s) may receive interference from the beam shown in the left-hand column.

** *Note by the Secretariat:* This designation replaces the former designation "YUG" which was used previously as a three-letter code for the Administration of Serbia and Montenegro.

TABLE 3

Affecting administrations and corresponding networks/beams identified based on Notes 6 and 7 in § 11.2 of Article 11 of this Appendix

Beam name	Channels	Note	Affecting administrations*	Affecting networks/beams*
AFG_100	1, 3, 5, 7, 9, 11, 13	7	USA	INTELSAT7 342E, INTELSAT7 359E
AGL29500	1, 3, 5, 7, 9, 11, 13	7	HOL, USA	INTELSAT7 307E, INTELSAT7 310E, INTELSAT7 328.5E, INTELSAT7 338.5E, INTELSAT7 342E, INTELSAT7 359E, INTELSAT8 338.5E, INTELSAT8 328.5E
AND34100	2, 6, 10, 12	7	HOL, USA	INTELSAT7 307E, INTELSAT7 310E, INTELSAT7 319.5E, INTELSAT7 328.5E, INTELSAT7 342E, INTELSAT7 359E, INTELSAT IBS 319.5E, INTELSAT8 319.5E, USASAT-26A INTELSAT8 328.5E
AND34100	14, 16, 18, 20	7	USA	USASAT-26A
ARM06400	26	7	J	JCSAT-3B
ARM06400	28, 30, 32, 34, 36, 38, 40	7	J, KOR	JCSAT-3B, KOREASAT-2
ARS34000	40	7	J, KOR	JCSAT-3A, JCSAT-3B, KOREASAT-2
ARS_100	26	7	J	JCSAT-3A, JCSAT-3B
ARS_100	28, 30, 32, 34, 36, 38, 40	7	J, KOR	JCSAT-3A, JCSAT-3B, KOREASAT-2
AUSA_100	1, 5, 9	7	USA	INTELSAT7 174E, INTELSAT7 177E, INTELSAT7 180E
AUSB_100	4, 8, 12	7	USA	INTELSAT7 174E, INTELSAT7 177E, INTELSAT7 180E, INTELSAT8 174E
AZE06400	25, 27	7	J	JCSAT-3A, JCSAT-3B
AZE06400	29, 31, 33, 35, 37, 39	7	J, KOR	JCSAT-3A, JCSAT-3B, KOREASAT-2
BEN23300	1, 3, 5, 7, 9, 11, 13	7	HOL, USA	INTELSAT7 307E, INTELSAT7 310E, INTELSAT7 328.5E, INTELSAT7 338.5E, INTELSAT7 342E, INTELSAT7 359E, INTELSAT IBS 342E, INTELSAT8 338.5E, INTELSAT8 328.5E
BFA10700	22, 24	7	E	HISPASAT-1, HISPASAT-2C3 KU
BHR25500	25, 27	7	J	JCSAT-3A, JCSAT-3B
BHR25500	29, 31, 33, 35, 37, 39	7	J, KOR	JCSAT-3A, JCSAT-3B, KOREASAT-2
BIH14800	1, 3, 5, 7, 9, 11, 13	7	USA	INTELSAT7 307E, INTELSAT7 310E, INTELSAT7 328.5E, INTELSAT7 342E, INTELSAT7 359E
BLR06200	1, 3, 5, 7, 9, 11, 13	7	USA	INTELSAT7 310E, INTELSAT7 328.5E, INTELSAT7 342E, INTELSAT7 359E
BRM29800	1, 3, 5, 7, 9, 11, 13	7	USA	INTELSAT7 174E, INTELSAT7 177E, INTELSAT7 180E
BRU33000	2, 4, 6, 8, 10	7	USA	INTELSAT7 174E, INTELSAT7 177E, INTELSAT7 180E
CBG29900	2, 4, 6, 8, 10, 12	7	USA	INTELSAT7 174E, INTELSAT7 177E, INTELSAT7 180E
CHN15500	1, 3, 5, 7, 9, 11, 13	7	USA	INTELSAT7 174E, INTELSAT7 177E, INTELSAT7 359E
CHN15800	2, 4, 6, 8, 10, 12	7	USA	INTELSAT7 174E, INTELSAT7 177E, INTELSAT7 180E
CHN19000	3, 7, 11	7	USA	INTELSAT7 174E, INTELSAT7 177E, INTELSAT7 180E
CHN20000	2, 4, 6, 8, 10, 12	7	USA	INTELSAT7 174E, INTELSAT7 177E, INTELSAT7 180E
CHNA_100	2, 4, 6, 8, 10, 12	7	USA	INTELSAT7 174E, INTELSAT7 177E, INTELSAT7 180E, INTELSAT7 359E

Beam name	Channels	Note	Affecting administrations*	Affecting networks/beams*
CHNC_100	1, 3, 5, 7, 9, 11, 13	7	USA	INTELSAT7 174E, INTELSAT7 177E, INTELSAT7 180E
CHNE_100	1, 3, 5, 7, 9, 11, 13	7	USA	INTELSAT7 174E, INTELSAT7 177E, INTELSAT7 180E
CHNF_100	2, 4, 6, 8, 10, 12	7	USA	INTELSAT7 174E, INTELSAT7 177E, INTELSAT7 180E
CLN21900	1, 3, 5, 7, 9, 11, 13	7	USA	INTELSAT7 359E
COD__100	2, 4, 6, 8, 10, 12	7	HOL, USA	INTELSAT7 307E, INTELSAT7 310E, INTELSAT7 328.5E, INTELSAT7 338.5E, INTELSAT7 342E, INTELSAT7 359E, INTELSAT IBS 342E, INTELSAT8 338.5E, INTELSAT8 328.5E
COG23500	1, 3, 5, 7, 9, 11, 13	7	HOL, USA	INTELSAT7 307E, INTELSAT7 310E, INTELSAT7 328.5E, INTELSAT7 338.5E, INTELSAT7 342E, INTELSAT7 359E, INTELSAT IBS 342E, INTELSAT8 338.5E
COM20700	25, 27	7	J	JCSAT-3B
COM20700	29, 31, 33, 35, 37, 39	7	J, KOR	JCSAT-3B, KOREASAT-2
CPV30100	2, 4, 6, 8, 10, 12	7	HOL, USA	INTELSAT7 307E, INTELSAT7 310E, INTELSAT7 319.5E, INTELSAT7 328.5E, INTELSAT7 338.5E, INTELSAT7 342E, INTELSAT7 359E, INTELSAT8 319.5E, INTELSAT8 338.5E, INTELSAT8 328.5E
CTI23700	1, 3, 5, 7, 9, 11, 13	7	HOL, USA	INTELSAT7 307E, INTELSAT7 310E, INTELSAT7 328.5E, INTELSAT7 338.5E, INTELSAT7 342E, INTELSAT7 359E, INTELSAT8 338.5E, INTELSAT8 328.5E
CVA08300	1, 3, 5, 7, 9, 11	7	USA	INTELSAT7 307E, INTELSAT7 310E, INTELSAT7 328.5E, INTELSAT7 342E, INTELSAT7 359E
CYP08600	1, 3, 5, 7, 9, 11, 13	7	USA	INTELSAT7 328.5E, INTELSAT7 342E, INTELSAT7 359E
CZE14401	1, 9	7	HOL, USA	INTELSAT7 307E, INTELSAT7 310E, INTELSAT7 328.5E, INTELSAT7 338.5E, INTELSAT7 342E, INTELSAT7 359E, INTELSAT8 338.5E
CZE14403	2	7	HOL, USA	INTELSAT7 307E, INTELSAT7 310E, INTELSAT7 328.5E, INTELSAT7 338.5E, INTELSAT7 342E, INTELSAT7 359E, INTELSAT8 338.5E
D 08700	1, 3, 5, 7, 9, 11, 13	7	HOL, USA	INTELSAT7 307E, INTELSAT7 310E, INTELSAT7 328.5E, INTELSAT7 338.5E, INTELSAT7 342E, INTELSAT7 359E, INTELSAT IBS 342E, INTELSAT8 338.5E
DJI09900	2, 4, 6, 8, 10, 12	7	USA	INTELSAT7 328.5E, INTELSAT7 342E, INTELSAT7 359E
DNK090XR	29	6	JMC	JMC00005
DNK090XR	33	6	GUY, JMC	GUY00302, JMC00005
DNK091XR	31, 35	6	GUY, JMC	GUY00302, JMC00005
DNK__100	1, 3, 5, 7, 9, 11, 13	7	HOL, USA	INTELSAT7 307E, INTELSAT7 310E, INTELSAT7 328.5E, INTELSAT7 338.5E, INTELSAT7 342E, INTELSAT7 359E, INTELSAT8 338.5E, INTELSAT8 328.5E
EGY02600	2, 6, 8, 10, 12	7	USA	INTELSAT7 307E, INTELSAT7 310E, INTELSAT7 328.5E, INTELSAT7 342E, INTELSAT7 359E
ERI09200	25, 27	7	J	JCSAT-3B
ERI09200	29, 31, 33, 35, 37, 39	7	J, KOR	JCSAT-3B, KOREASAT-2
EST06100	1, 3, 5, 7, 9, 11, 13	7	USA	INTELSAT7 310E, INTELSAT7 328.5E, INTELSAT7 342E, INTELSAT7 359E
ETH09200	2, 4, 6, 8, 10, 12	7	USA	INTELSAT7 328.5E, INTELSAT7 342E, INTELSAT7 359E
FJI19300	1, 3, 5, 7, 9, 11, 13	7	HOL, USA	INTELSAT7 174E, INTELSAT7 177E, INTELSAT7 180E, INTELSAT7 183E, INTELSAT IBS 183E, INTELSAT8 174E

Beam name	Channels	Note	Affecting administrations*	Affecting networks/beams*
FSM00000	1, 3, 5, 7, 9, 11, 13	7	USA	INTELSAT7 174E, INTELSAT7 177E, INTELSAT7 180E
F____100	25, 27	7	J	JCSAT-3A, JCSAT-3B
F____100	29, 31, 33, 35, 37, 39	7	J, KOR	JCSAT-3A, JCSAT-3B, KOREASAT-2
G 02700	2, 4, 6, 8, 10, 12	7	HOL, USA	INTELSAT7 307E, INTELSAT7 310E, INTELSAT7 319.5E, INTELSAT7 328.5E, INTELSAT7 338.5E, INTELSAT7 342E, INTELSAT7 359E, INTELSAT8 319.5E, INTELSAT8 328.5E
GAB26000	1, 3, 5, 7, 9, 11, 13	7	HOL, USA	INTELSAT7 307E, INTELSAT7 310E, INTELSAT7 328.5E, INTELSAT7 338.5E, INTELSAT7 342E, INTELSAT7 359E, INTELSAT IBS 342E, INTELSAT8 338.5E
GEO06400	1, 3, 5, 7, 9, 11, 13	7	USA	INTELSAT7 328.5E, INTELSAT7 342E, INTELSAT7 359E
GMB30200	1, 3, 5, 7, 9, 11, 13	7	HOL, USA	INTELSAT7 307E, INTELSAT7 310E, INTELSAT7 319.5E, INTELSAT7 328.5E, INTELSAT7 342E, INTELSAT7 359E, INTELSAT IBS 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 307E, INTELSAT7 310E, INTELSAT7 328.5E, INTELSAT7 342E, INTELSAT7 359E
GUI19200	2, 4, 6, 8, 10, 12	7	HOL, USA	INTELSAT7 307E, INTELSAT7 310E, INTELSAT7 319.5E, INTELSAT7 328.5E, INTELSAT7 342E, INTELSAT7 359E, INTELSAT IBS 319.5E, INTELSAT8 319.5E, USASAT-26A, INTELSAT8 328.5E
GUI19200	14, 16, 18, 20	7	USA	USASAT-26A
HNG10601	3, 11	7	HOL, USA	INTELSAT7 307E, INTELSAT7 310E, INTELSAT7 328.5E, INTELSAT7 338.5E, INTELSAT7 342E, INTELSAT7 359E, INTELSAT8 338.5E
HNG10602	6	7	HOL, USA	INTELSAT7 307E, INTELSAT7 310E, INTELSAT7 328.5E, INTELSAT7 338.5E, INTELSAT7 342E, INTELSAT7 359E, INTELSAT8 338.5E
HNG10603	2	7	HOL, USA	INTELSAT7 307E, INTELSAT7 310E, INTELSAT7 328.5E, INTELSAT7 338.5E, INTELSAT7 342E, INTELSAT7 359E, INTELSAT8 338.5E
HOL21300	2, 4, 6, 8, 10, 12	7	USA	INTELSAT7 307E, INTELSAT7 310E, INTELSAT7 328.5E, INTELSAT7 342E, INTELSAT7 359E
HRV14801	5, 13	7	HOL, USA	INTELSAT7 307E, INTELSAT7 310E, INTELSAT7 328.5E, INTELSAT7 338.5E, INTELSAT7 342E, INTELSAT7 359E, INTELSAT8 338.5E
HRV14802	10	7	HOL, USA	INTELSAT7 307E, INTELSAT7 310E, INTELSAT7 328.5E, INTELSAT7 338.5E, INTELSAT7 342E, INTELSAT7 359E, INTELSAT8 338.5E
HRV14803	2	7	HOL, USA	INTELSAT7 307E, INTELSAT7 310E, INTELSAT7 328.5E, INTELSAT7 338.5E, INTELSAT7 342E, INTELSAT7 359E, INTELSAT8 338.5E
IND03700	4, 6, 8, 10, 12	7	USA	INTELSAT7 174E, INTELSAT7 177E
IND04700	1, 5, 7, 9, 11, 13	7	USA	INTELSAT7 174E
INDA_100	2, 4, 6, 8, 10, 12	7	USA	INTELSAT7 359E
INDB_100	1, 3, 5, 7, 9, 11, 13	7	USA	INTELSAT7 359E
INDD_100	1, 3, 5, 7, 9, 11, 13	7	USA	INTELSAT7 359E

Beam name	Channels	Note	Affecting administrations*	Affecting networks/beams*
INSA_100	1, 3, 5, 7, 9, 11, 13	7	USA	INTELSAT7 174E, INTELSAT7 177E, INTELSAT7 180E
INSB_100	2, 4, 6, 8, 10, 12	7	USA	INTELSAT7 174E, INTELSAT7 177E, INTELSAT7 180E
IRL21100	1, 3, 5, 7, 9, 11, 13	7	HOL, USA	INTELSAT7 307E, INTELSAT7 310E, INTELSAT7 319.5E, INTELSAT7 328.5E, INTELSAT7 342E, INTELSAT7 359E, INTELSAT IBS 319.5E, INTELSAT8 319.5E, USASAT-26A, INTELSAT8 328.5E
IRL21100	15, 17, 19	7	USA	USASAT-26A
IRN10900	1, 5, 9, 11, 13	7	USA	INTELSAT7 328.5E, INTELSAT7 342E, INTELSAT7 359E
IRQ25600	1, 3, 5, 7, 9, 11, 13	7	USA	INTELSAT7 328.5E, INTELSAT7 342E, INTELSAT7 359E
ISL04900	27	6	GUY	GUY00302
ISL04900	29	6	DNK, JMC	GRLDNK01, JMC00005
ISL04900	31, 35, 37	6	DNK, GUY, JMC	GRLDNK01, GUY00302, JMC00005
ISL04900	33	6	GUY, JMC	GUY00302, JMC00005
ISL04900	39	6	JMC	JMC00005
ISR11000	28, 30, 32, 34, 36, 38, 40	7	KOR	KOREASAT-2
J 10985	1, 3, 5, 7, 9, 11, 13	7	USA	INTELSAT7 174E, INTELSAT7 177E, INTELSAT7 180E
J 11100	1, 3, 5, 7, 9, 11, 13	7	USA	INTELSAT7 174E, INTELSAT7 177E, INTELSAT7 180E
JOR22400	2, 4, 6, 8, 10, 12	7	USA	INTELSAT7 328.5E, INTELSAT7 342E, INTELSAT7 359E
KAZ06600	1, 3, 5, 7, 9, 11, 13	7	USA	INTELSAT7 342E, INTELSAT7 359E
KEN24900	28, 30, 32, 34, 36, 38, 40	7	KOR	KOREASAT-2
KGZ07000	2, 4, 6, 8, 10, 12	7	USA	INTELSAT7 359E
KIR__100	1, 3, 5, 7, 9, 11, 13	7	HOL, USA	INTELSAT7 174E, INTELSAT7 177E, INTELSAT7 180E, INTELSAT7 183E, INTELSAT IBS 183E, INTELSAT8 174E
KOR11200	2, 4, 6, 8, 10, 12	7	USA	INTELSAT7 174E, INTELSAT7 177E, INTELSAT7 180E
KRE28600	1, 3, 5, 7, 9, 11, 13	7	USA	INTELSAT7 174E, INTELSAT7 177E, INTELSAT7 180E
KWT11300	26	7	J	JCSAT-3A, JCSAT-3B
KWT11300	28, 30, 32, 34, 36, 38, 40	7	J, KOR	JCSAT-3A, JCSAT-3B, KOREASAT-2
LAO28400	2, 4, 6, 8, 10, 12	7	USA	INTELSAT7 174E, INTELSAT7 177E, INTELSAT7 180E
LBN27900	1, 3, 5, 7, 9, 11, 13	7	USA	INTELSAT7 328.5E, INTELSAT7 342E, INTELSAT7 359E
LBR24400	1, 5, 7, 9, 11, 13	7	HOL, USA	INTELSAT7 307E, INTELSAT7 310E, INTELSAT7 319.5E, INTELSAT7 328.5E, INTELSAT7 338.5E, INTELSAT7 342E, INTELSAT7 359E, INTELSAT8 319.5E, INTELSAT8 338.5E, INTELSAT8 328.5E
LBY__100	2, 4, 6, 8, 10, 12	7	HOL, USA	INTELSAT7 307E, INTELSAT7 310E, INTELSAT7 328.5E, INTELSAT7 338.5E, INTELSAT7 342E, INTELSAT7 359E, INTELSAT8 338.5E, INTELSAT8 328.5E
LSO30500	1, 3, 5, 7, 9, 11, 13	7	USA	INTELSAT7 310E, INTELSAT7 328.5E, INTELSAT7 342E, INTELSAT7 359E
LTU06100	1, 3, 5, 7, 9, 11, 13	7	USA	INTELSAT7 307E, INTELSAT7 310E, INTELSAT7 328.5E, INTELSAT7 342E, INTELSAT7 359E

Beam name	Channels	Note	Affecting administrations*	Affecting networks/beams*
LUX11400	1, 3, 5, 7, 9, 11, 13	7	USA	INTELSAT7 307E, INTELSAT7 310E, INTELSAT7 328.5E, INTELSAT7 342E, INTELSAT7 359E
LVA06100	2, 4, 6, 8, 10, 12	7	USA	INTELSAT7 307E, INTELSAT7 310E, INTELSAT7 328.5E, INTELSAT7 342E, INTELSAT7 359E
MAU__100	26	7	J	JCSAT-3A, JCSAT-3B
MAU__100	28, 30, 32, 34, 36, 38, 40	7	J, KOR	JCSAT-3A, JCSAT-3B, KOREASAT-2
MCO11600	1, 3, 5, 7, 9, 11, 13	7	USA	INTELSAT7 307E, INTELSAT7 310E, INTELSAT7 328.5E, INTELSAT7 342E, INTELSAT7 359E
MDG23600	3, 5, 7, 9, 11, 13	7	USA	INTELSAT7 328.5E, INTELSAT7 342E, INTELSAT7 359E
MHL00000	4, 8, 12	7	USA	INTELSAT7 174E, INTELSAT7 177E, INTELSAT7 180E
MLA__100	2, 4, 6, 8, 10, 12	7	USA	INTELSAT7 174E, INTELSAT7 177E, INTELSAT7 180E
MLD30600	1, 3, 5, 7, 9, 11, 13	7	USA	INTELSAT7 359E
MLI__100	1, 3, 5, 7, 9, 11, 13	7	HOL, USA	INTELSAT7 307E, INTELSAT7 310E, INTELSAT7 328.5E, INTELSAT7 338.5E, INTELSAT7 342E, INTELSAT7 359E, INTELSAT IBS 342E, INTELSAT8 338.5E, INTELSAT8 328.5E
MNG24800	27	7	J	JCSAT-3A, JCSAT-3B, JCSAT-1R, SUPERBIRD-C
MNG24800	29, 31, 33, 35, 37, 39	7	CHN, J, KOR, MLA, THA	MEASAT-2, JCSAT-3A, JCSAT-3B, APSTAR-4, JCSAT-1R, THAICOM-A2B, SUPERBIRD-C, KOREASAT-2
MOZ30700	2, 6, 10, 12	7	USA	INTELSAT7 310E, INTELSAT7 328.5E, INTELSAT7 342E, INTELSAT7 359E
MRC20900	1, 3, 5, 7, 9, 11, 13	7	HOL, USA	INTELSAT7 307E, INTELSAT7 310E, INTELSAT7 328.5E, INTELSAT7 338.5E, INTELSAT7 342E, INTELSAT7 359E, INTELSAT8 338.5E, INTELSAT8 328.5E
MTN__100	22, 24, 26	7	USA	USASAT-26A
MW130800	2, 4, 6, 8, 10, 12	7	USA	INTELSAT7 328.5E, INTELSAT7 342E, INTELSAT7 359E
NCL10000	4, 6, 8, 10, 12	7	USA	INTELSAT7 174E, INTELSAT7 177E, INTELSAT7 180E
NGR11500	2, 4, 6, 8, 10, 12	7	HOL, USA	INTELSAT7 307E, INTELSAT7 310E, INTELSAT7 319.5E, INTELSAT7 328.5E, INTELSAT7 342E, INTELSAT7 359E, INTELSAT IBS 319.5E, INTELSAT8 319.5E, USASAT-26A, INTELSAT8 328.5E
NGR11500	14, 16, 18, 20	7	USA	USASAT-26A
NOR12000	1, 3, 5, 7, 9, 11, 13	7	USA	INTELSAT7 307E, INTELSAT7 310E, INTELSAT7 328.5E, INTELSAT7 342E, INTELSAT7 359E
NRU30900	1, 5, 7, 9, 11, 13	7	USA	INTELSAT7 174E, INTELSAT7 177E, INTELSAT7 180E
NZL__100	2, 4, 6, 8, 10, 12	7	USA	INTELSAT7 174E, INTELSAT7 177E, INTELSAT7 180E
OCE10100	2, 6, 8, 10, 12	7	USA	INTELSAT7 174E, INTELSAT7 177E, INTELSAT7 180E
OMA12300	26	7	J	JCSAT-3A, JCSAT-3B
OMA12300	28, 30, 32, 34, 36, 38, 40	7	J, KOR	JCSAT-3A, JCSAT-3B, KOREASAT-2
PAK12700	2, 4, 6, 8, 10, 12	7	USA	INTELSAT7 359E
PHL28500	2, 4, 6, 8, 10, 12	7	USA	INTELSAT7 174E, INTELSAT7 177E, INTELSAT7 180E
PLM33200	2, 4, 6, 8, 10, 12	7	HOL	INTELSAT7 183E

Beam name	Channels	Note	Affecting administrations*	Affecting networks/beams*
PLW00000	2, 4, 6, 8, 10, 12	7	USA	INTELSAT7 174E, INTELSAT7 177E, INTELSAT7 180E
PNG13100	2, 4, 6, 8, 10, 12	7	USA	INTELSAT7 174E, INTELSAT7 177E, INTELSAT7 180E
POR__100	1, 3, 5, 7, 9, 11, 13	7	HOL, USA	INTELSAT7 307E, INTELSAT7 310E, INTELSAT7 319.5E, INTELSAT7 328.5E, INTELSAT7 342E, INTELSAT7 359E, INTELSAT IBS 319.5E, INTELSAT8 319.5E, USASAT-26A, INTELSAT8 328.5E
POR__100	15, 17, 19	7	USA	USASAT-26A
QAT24700	2, 4, 6, 8, 10, 12	7	USA	INTELSAT7 342E, INTELSAT7 359E
ROU13600	1, 3, 5, 7, 9, 11, 13	7	USA	INTELSAT7 307E, INTELSAT7 310E, INTELSAT7 328.5E, INTELSAT7 342E, INTELSAT7 359E
RRW31000	2, 6, 8, 10, 12	7	USA	INTELSAT7 310E, INTELSAT7 328.5E, INTELSAT7 342E, INTELSAT7 359E
RUS-4	25	7	J	JCSAT-3A, JCSAT-3B, JCSAT-1R, SUPERBIRD-C
RUS-4	26, 27	7	CHN, J	ASIASAT-AK1, ASIASAT-CK1, ASIASAT-EK1, JCSAT-3A, JCSAT-3B, JCSAT-1R, SUPERBIRD-C
RUS-4	28	7	CHN, J, KOR, MLA	ASIASAT-AK1, ASIASAT-CK1, ASIASAT-EK1, JCSAT-3A, JCSAT-3B, JCSAT-1R, SUPERBIRD-C, ASIASAT-CKX, MEASAT-2, KOREASAT-1, KOREASAT-2
RUS-4	29	7	CHN, J, KOR, MLA	ASIASAT-AK1, ASIASAT-CK1, ASIASAT-EK1, SJC-1, JCSAT-3A, JCSAT-3B, JCSAT-1R, SUPERBIRD-C, ASIASAT-CKX, MEASAT-2, KOREASAT-1, KOREASAT-2
RUS-4	31, 33, 35, 37, 39	7	CHN, J, KOR, MLA	ASIASAT-AK1, ASIASAT-CK1, ASIASAT-EK1, SJC-1, JCSAT-3A, JCSAT-3B, JCSAT-1R, SUPERBIRD-C, CHINASAT-6, ASIASAT-CKX, MEASAT-2, KOREASAT-1, KOREASAT-2
SDN__100	29, 31, 33, 35, 37, 39	7	KOR	KOREASAT-2
SEN22200	23, 25	7	USA	USASAT-26A
SEY00000	26	7	J	JCSAT-3A, JCSAT-3B
SEY00000	28, 30, 32, 34, 36, 38, 40	7	J, KOR	JCSAT-3A, JCSAT-3B, KOREASAT-2
SLM00000	1, 3, 5, 7, 9, 11, 13	7	USA	INTELSAT7 174E, INTELSAT7 177E, INTELSAT7 180E
SMO05700	1, 3, 5, 7, 9, 11, 13	7	HOL, USA	INTELSAT7 174E, INTELSAT7 177E, INTELSAT7 180E, INTELSAT7 183E, INTELSAT IBS 183E, INTELSAT8 174E
SMR31100	1, 3, 5, 7, 9, 11, 13	7	HOL, USA	INTELSAT7 307E, INTELSAT7 310E, INTELSAT7 319.5E, INTELSAT7 328.5E, INTELSAT7 342E, INTELSAT7 359E, INTELSAT IBS 319.5E, INTELSAT8 319.5E, USASAT-26A, INTELSAT8 328.5E
SMR31100	15, 17, 19	7	USA	USASAT-26A
SNG15100	1, 3, 5, 7, 9, 11, 13	7	USA	INTELSAT7 174E, INTELSAT7 177E, INTELSAT7 180E
SOM31200	26	7	J	JCSAT-3A, JCSAT-3B
SOM31200	28, 30, 32, 34, 36, 38, 40	7	J, KOR	JCSAT-3A, JCSAT-3B, KOREASAT-2
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 307E, INTELSAT7 310E, INTELSAT7 328.5E, INTELSAT7 342E, INTELSAT7 359E, INTELSAT7 359E

Beam name	Channels	Note	Affecting administrations*	Affecting networks/beams*
SUI14000	2, 4, 6, 8, 10, 12	7	HOL, USA	INTELSAT7 307E, INTELSAT7 310E, INTELSAT7 328.5E, INTELSAT7 338.5E, INTELSAT7 342E, INTELSAT7 359E, INTELSAT IBS 342E, INTELSAT8 338.5E, INTELSAT7 342E
SVK14401	7	7	HOL, USA	INTELSAT7 307E, INTELSAT7 310E, INTELSAT7 328.5E, INTELSAT7 338.5E, INTELSAT7 342E, INTELSAT7 359E, INTELSAT8 338.5E
SVK14403	2	7	HOL, USA	INTELSAT7 307E, INTELSAT7 310E, INTELSAT7 328.5E, INTELSAT7 338.5E, INTELSAT7 342E, INTELSAT7 359E, INTELSAT8 338.5E
SVN14800	2, 4, 6, 8, 10, 12	7	USA	INTELSAT7 307E, INTELSAT7 310E, INTELSAT7 328.5E, INTELSAT7 342E, INTELSAT7 359E
SWZ31300	1, 3, 5, 7, 9, 11, 13	7	USA	INTELSAT7 328.5E, INTELSAT7 342E, INTELSAT7 359E
SYR22900	28, 30, 32, 34, 36, 38, 40	7	KOR	KOREASAT-2
SYR33900	40	7	KOR	KOREASAT-2
TCI14300	1, 3, 5, 7, 9, 11, 13	7	USA	INTELSAT7 307E, INTELSAT7 310E, INTELSAT7 328.5E, INTELSAT7 342E, INTELSAT7 359E
TGO22600	1, 3, 5, 7, 9, 11	7	HOL, USA	INTELSAT7 307E, INTELSAT7 310E, INTELSAT7 319.5E, INTELSAT7 328.5E, INTELSAT7 338.5E, INTELSAT7 342E, INTELSAT7 359E, INTELSAT8 319.5E, INTELSAT8 338.5E, INTELSAT8 328.5E
TGO22600	13	7	E, HOL, USA	INTELSAT7 307E, INTELSAT7 310E, INTELSAT7 319.5E, INTELSAT7 328.5E, INTELSAT7 338.5E, INTELSAT7 342E, INTELSAT7 359E, INTELSAT8 319.5E, INTELSAT8 338.5E, INTELSAT8 328.5E, HISPASAT-2C3 KU
TGO22600	15, 17, 19	7	E	HISPASAT-1, HISPASAT-2C3 KU
THA14200	1, 3, 5, 7, 9, 11, 13	7	USA	INTELSAT7 174E, INTELSAT7 177E, INTELSAT7 180E
TJK06900	26	7	J	JCSAT-3A, JCSAT-3B, JCSAT-1R
TJK06900	28, 30, 32, 34, 36, 38, 40	7	J, KOR, MLA	JCSAT-3A, JCSAT-3B, JCSAT-1R, MEASAT-2, KOREASAT-2
TKM06800	26	7	J	JCSAT-3A, JCSAT-3B
TKM06800	28, 30, 32, 34, 36, 38, 40	7	J, KOR	JCSAT-3A, JCSAT-3B, KOREASAT-2
TMP00000	2, 4, 6, 8, 10, 12	7	USA	INTELSAT7 174E, INTELSAT7 177E, INTELSAT7 180E
TON21500	2, 4, 6, 8, 10, 12	7	HOL, USA	INTELSAT7 174E, INTELSAT7 177E, INTELSAT7 180E, INTELSAT7 183E, INTELSAT8 174E
TUR14500	2, 4, 6, 8, 10, 12	7	USA	INTELSAT7 310E, INTELSAT7 328.5E, INTELSAT7 342E, INTELSAT7 359E
TUV00000	2, 4, 6, 8, 10, 12	7	HOL, USA	INTELSAT7 174E, INTELSAT7 177E, INTELSAT7 180E, INTELSAT7 183E, INTELSAT IBS 183E, INTELSAT8 174E
TZA22500	29, 31, 33, 35, 37, 39	7	KOR	KOREASAT-2
UAE27400	25, 27	7	J	JCSAT-3A, JCSAT-3B
UAE27400	29, 31, 33, 35, 37, 39	7	J, KOR	JCSAT-3A, JCSAT-3B, KOREASAT-2
UGA05100	29, 31, 33, 35, 37, 39	7	KOR	KOREASAT-2
UKR06300	2, 4, 6, 8, 10, 12	7	USA	INTELSAT7 307E, INTELSAT7 310E, INTELSAT7 328.5E, INTELSAT7 342E, INTELSAT7 359E
USAA_100	1, 3, 5, 7, 9, 11, 13	7	HOL	INTELSAT7 183E
UZB07100	1, 3, 5, 7, 9, 11, 13	7	USA	INTELSAT7 342E, INTELSAT7 359E

Beam name	Channels	Note	Affecting administrations*	Affecting networks/beams*
VTN32500	2, 4, 6, 8, 10, 12	7	USA	INTELSAT7 174E, INTELSAT7 177E, INTELSAT7 180E
VUT12800	1, 5, 7, 9, 11, 13	7	USA	INTELSAT7 174E, INTELSAT7 177E, INTELSAT7 180E
WAL10200	4, 8, 10, 12	7	USA	INTELSAT7 174E, INTELSAT7 177E, INTELSAT7 180E
YEM__100	1, 3, 5, 7, 9, 11, 13	7	USA	INTELSAT7 328.5E, INTELSAT7 342E, INTELSAT7 359E
YYY00000	29, 31, 33, 35, 37, 39	7	KOR	KOREASAT-2
ZMB31400	29, 31, 33, 35, 37, 39	7	KOR	KOREASAT-2
ZWE13500	1, 3, 5, 7, 9, 11, 13	7	USA	INTELSAT7 307E, INTELSAT7 310E, INTELSAT7 328.5E, INTELSAT7 342E, INTELSAT7 359E

* Administrations and corresponding networks/beams whose assignment(s) may cause interference to the beam shown in the left-hand column.

TABLE 4
Affecting administrations and corresponding terrestrial stations identified based on Note 8 in Section 11.2 of Article 11 of this Appendix

Beam name	Channels	Affecting administrations*	Affecting terrestrial stations*
EGY02600	2	ISR	HERZILIYA
F 09300	24, 26	SUI	GENEVE STUDIO C VOGT
F 09300	38, 40	AUT	EHRWALD
I 08200	38, 40	AUT	EHRWALD
JOR22400	2	ISR	HERZILIYA, JERUSALEM
RUS-4	25, 26, 27, 28, 29, 31, 33, 35, 37, 39	J ¹	

* Administrations and corresponding terrestrial stations whose assignment(s) may cause interference to the beam shown in the left-hand column.

¹ The identification of this administration is based on its typical terrestrial station assignments as recorded in the Master Register.

TABLE 5

Table showing correspondence between channel numbers and assigned frequencies

Channel No.	Assigned frequency (MHz)	Channel No.	Assigned frequency (MHz)
1	11 727.48	21	12 111.08
2	11 746.66	22	12 130.26
3	11 765.84	23	12 149.44
4	11 785.02	24	12 168.62
5	11 804.20	25	12 187.80
6	11 823.38	26	12 206.98
7	11 842.56	27	12 226.16
8	11 861.74	28	12 245.34
9	11 880.92	29	12 264.52
10	11 900.10	30	12 283.70
11	11 919.28	31	12 302.88
12	11 938.46	32	12 322.06
13	11 957.64	33	12 341.24
14	11 976.82	34	12 360.42
15	11 996.00	35	12 379.60
16	12 015.18	36	12 398.78
17	12 034.36	37	12 417.96
18	12 053.54	38	12 437.14
19	12 072.72	39	12 456.32
20	12 091.90	40	12 475.50

Note – Assigned frequency = $11\,708.30 + 19.18\,n$, where n is the channel number.

TABLE 6A

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	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	Orien- tation			Co-polar	Cross- polar	Code	Gain	Type	Angle						
AFG	AFG_100	50.00	65.88	33.86				CB_TSS_AFGA		42.71		MODRES	35.50	CL		58.4	27M0G7W		P	7	
AFS	AFS02100	4.80	24.50	-28.00	3.13	1.68	27.00	R13TSS		37.24		MODRES	35.50	CL		59.1	27M0G7W		P	5	
AGL	AGL29500	-24.80	16.06	-12.45	2.42	1.88	77.88	R13TSS		37.87		MODRES	35.50	CL		59.1	27M0G7W		P	5, 7	
ALB	ALB29600	62.00	20.04	41.23	0.60	0.60	61.32	R13TSS		48.88		MODRES	35.50	CL		58.9	27M0G7W		P		
ALG	ALG_100	-24.80	1.86	27.60				CB_TSS_ALGA		39.59		MODRES	35.50	CL		54.5	27M0G7W		P		
AND	AND34100	-37.00	1.60	42.50	0.60	0.60	0.00	R13TSS		48.88		MODRES	35.50	CL		56.5	27M0G7W		P	7	
ARM	ARM06400	22.80	44.99	39.95	0.73	0.60	148.17	R13TSS		48.02		MODRES	35.50	CR		58.9	27M0G7W		P	5, 7	
ARS	ARS_100	17.00	44.72	23.76				CB_TSS_ARSA		37.81		MODRES	35.50	CL		57.7	27M0G7W	54	P	5, 7	
ARS	ARS34000	17.00	52.30	24.80	2.68	0.70	143.00	R13TSS		41.71		MODRES	35.50	CL		59.2	27M0G7W	54	P	5, 7	
AUS	AUS00400	152.00	123.00	-24.20	3.06	2.17	102.00	R13TSS		36.22		MODRES	35.50	CR		58.2	27M0G7W	30	P		
AUS	AUS0040A	152.00	96.83	-12.19	0.60	0.60	0.00	R13TSS		48.88		MODRES	35.50	CR		58.9	27M0G7W	30	P		
AUS	AUS0040B	152.00	105.69	-10.45	0.60	0.60	0.00	R13TSS		48.88		MODRES	35.50	CR		58.9	27M0G7W	30	P		
AUS	AUS0040C	152.00	110.52	-66.28	0.60	0.60	0.00	R13TSS		48.88		MODRES	35.50	CR		58.9	27M0G7W	30	P		
AUS	AUS00500	152.00	133.90	-18.40	2.82	1.74	105.00	R13TSS		37.53		MODRES	35.50	CL		59.4	27M0G7W		P		
AUS	AUS00600	152.00	136.60	-30.90	2.41	1.52	161.00	R13TSS		38.80		MODRES	35.50	CL		58.4	27M0G7W		P		
AUS	AUS00700	164.00	145.20	-38.10	2.12	1.02	147.00	R13TSS		41.09		MODRES	35.50	CR		58.5	27M0G7W	31	P		
AUS	AUS0070A	164.00	158.94	-54.50	0.60	0.60	0.00	R13TSS		48.88		MODRES	35.50	CR		58.9	27M0G7W	31	P		
AUS	AUS00800	164.00	145.90	-21.70	3.62	1.63	136.00	R13TSS		36.73		MODRES	35.50	CL		58.8	27M0G7W		P		
AUS	AUS00900	164.00	147.50	-32.10	2.31	1.43	187.00	R13TSS		39.25		MODRES	35.50	CR		59.3	27M0G7W	32	P		
AUS	AUS0090A	164.00	159.06	-31.52	0.60	0.60	0.00	R13TSS		48.88		MODRES	35.50	CR		58.9	27M0G7W	32	P		
AUS	AUS0090B	164.00	167.93	-29.02	0.60	0.60	0.00	R13TSS		48.88		MODRES	35.50	CR		58.9	27M0G7W	32	P		
AUS	AUSA_100	152.00	132.38	-38.37				CB_TSS_AUSA		48.88		MODRES	35.50	CR		58.9	27M0G7W		P	5, 7	
AUS	AUSB_100	164.00	132.38	-38.37				CB_TSS_AUSB		48.88		MODRES	35.50	CL		58.9	27M0G7W		P	7	
AUT	AUT01600	-18.80	10.31	49.47	1.82	0.92	151.78	MOD13FRTSS		42.19		MODRES	35.50	CR		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	5, 7	
BDI	BDI27000	11.00	29.90	-3.10	0.71	0.60	80.00	R13TSS		48.15		MODRES	35.50	CL		58.4	27M0G7W		P		
BEL	BEL01800	38.20	5.12	51.96	1.00	1.00	24.53	MOD13FRTSS		44.45		MODRES	35.50	CL		55.5	27M0G7W		P	5	
BEN	BEN23300	-19.20	2.20	9.50	1.44	0.68	97.00	R13TSS		44.54		MODRES	35.50	CL		58.3	27M0G7W		P	5, 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	BGD22000	74.00	90.30	23.60	1.46	0.84	135.00	R13TSS		43.56		MODRES	35.50	CR		58.7	27M0G7W		P		
BHR	BHR25500	34.00	50.50	26.10	0.60	0.60	0.00	MOD13FRTSS		48.88		MODRES	35.50	CR		54.5	27M0G7W		P	5, 7	
BIH	BIH14800	56.00	18.22	43.97	0.60	0.60	90.00	R13TSS		48.88		MODRES	35.50	CL		58.9	27M0G7W		P	7	
BLR	BLR06200	37.80	27.91	53.06	1.21	0.60	11.47	R13TSS		45.83		MODRES	35.50	CL		58.9	27M0G7W		P	7	

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.i.r.p.	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						
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	5	
BRM	BRM29800	104.00	96.97	18.67	3.33	1.66	91.58	R13TSS		37.04		MODRES	35.50	CL		58.9	27M0G7W		P	7	
BRU	BRU33000	74.00	114.70	4.40	0.60	0.60	0.00	R13TSS		48.88		MODRES	35.50	CR		57.5	27M0G7W		P	7	
BTN	BTN03100	86.00	90.44	27.05	0.72	0.60	175.47	R13TSS		48.11		MODRES	35.50	CR		58.9	27M0G7W		P		
BUL	BUL02000	-1.20	25.00	43.00	1.04	0.60	165.00	R13TSS		46.50		MODRES	35.50	CL		58.6	27M0G7W		P	5	
CAF	CAF25800	-13.20	21.00	6.30	2.25	1.68	31.00	R13TSS		38.67		MODRES	35.50	CL		59.3	27M0G7W		P	5	
CBG	CBG29900	86.00	104.82	12.34	1.04	0.86	9.45	R13TSS		44.91		MODRES	35.50	CR		59.3	27M0G7W		P	7	
CHN	CHN15500	62.00	88.18	31.20	3.03	1.24	163.23	R13TSS		38.69		MODRES	35.50	CL		57.9	27M0G7W		P	7	
CHN	CHN15800	134.00	113.29	39.70	2.80	1.55	35.44	R13TSS		38.07		MODRES	35.50	CR		57.0	27M0G7W		P	7	
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	7	
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	7	
CHN	CHNA_100	62.00	90.56	39.22				CB_TSS_CHNA		40.01		MODRES	35.50	CR		58.5	27M0G7W		P	7	
CHN	CHNC_100	134.00	105.77	27.56				CB_TSS_CHNC		39.51		MODRES	35.50	CL		57.1	27M0G7W		P	7	
CHN	CHNE_100	92.20	114.96	20.16				CB_TSS_CHNE		44.74		MODRES	35.50	CL		59.4	27M0G7W		P	7	
CHN	CHNF_100	92.20	123.54	45.78				CB_TSS_CHNF		43.71		MODRES	35.50	CR		60.4	27M0G7W		P	5, 7	
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	7	
CME	CME30000	-13.00	12.70	6.20	2.54	1.68	87.00	R13TSS		38.15		MODRES	35.50	CR		58.5	27M0G7W		P	5	
COD	COD_100	-19.20	21.85	-3.40				CB_TSS_CODA		38.36		MODRES	35.50	CR		59.7	27M0G7W		P	5, 7	
COG	COG23500	-13.20	14.60	-0.70	2.02	1.18	59.00	R13TSS		40.67		MODRES	35.50	CL		58.8	27M0G7W		P	5, 7	
COM	COM20700	29.00	44.10	-12.10	0.76	0.60	149.00	R13TSS		47.86		MODRES	35.50	CR		58.1	27M0G7W		P	7	
CPV	CPV30100	-33.50	-24.12	16.09	0.77	0.63	94.46	R13TSS		47.56		MODRES	35.50	CL		57.2	27M0G7W		P	5, 7	
CTI	CTI23700	-24.80	-5.78	7.19	1.50	1.26	111.74	R13TSS		41.67		MODRES	35.50	CL		58.8	27M0G7W		P	5, 7	
CVA	CVA08300	-1.20	13.02	42.09	0.75	0.66	20.53	R13TSS		47.50		MODRES	35.50	CR		60.2	27M0G7W		P	5, 7	
CVA	CVA08500	-1.20	12.59	41.09	1.72	1.31	144.13	MOD13FRTSS		40.92		MODRES	35.50	CR		56.5	27M0G7W		P	5	
CYP	CYP08600	-1.20	33.45	35.12	0.60	0.60	0.00	MOD13FRTSS		48.88		MODRES	35.50	CR		56.1	27M0G7W		P	5, 7	
CZE	CZE14401	-12.80	16.77	46.78	1.71	0.89	149.15	MOD13FRTSS		42.64		MODRES	35.50	CL		58.8	27M0G7W		P	5, 7	
CZE	CZE14402	-12.80	16.77	46.78	1.71	0.89	149.15	MOD13FRTSS		42.64		MODRES	35.50	CR		58.8	27M0G7W		P	5	
CZE	CZE14403	-12.80	16.77	46.78	1.71	0.89	149.15	MOD13FRTSS		42.64		MODRES	35.50	CR		58.8	27M0G7W	37	P	5, 7	
D	D 08700	-18.80	10.31	49.47	1.82	0.92	151.78	MOD13FRTSS		42.19		MODRES	35.50	CR		59.1	27M0G7W		P	7	
DJI	DJI09900	16.80	42.68	11.68	0.60	0.60	90.00	R13TSS		48.88		MODRES	35.50	CL		57.5	27M0G7W		P	7	
DNK	DNK_100	-25.20	2.92	59.62				CB_TSS_DNKA		48.88		MODRES	35.50	CL		58.3	27M0G7W		P	5, 7	
DNK	DNK090XR	-33.50	13.27	60.86	1.99	0.63	151.38	MOD13FRTSS		43.48		MODRES	35.50	CR		54.5	27M0G7W		P	6	
DNK	DNK091XR	-33.50	-15.16	63.67	1.56	0.60	170.63	MOD13FRTSS		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	P	
E	HISP33D1	-30.00	-4.00	39.00					COP	39.80	5.50	MODRES	35.50	CL		57.6	33M0G7W--	HISPASAT-1	01	PE	
E	HISP33D2	-30.00	-4.00	39.00					COP	39.80	5.50	MODRES	32.50	CL		57.6	33M0G7W--	HISPASAT-1	01	PE	

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.i.r.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	Angle						
E	HISPA27D	-30.00	-4.00	39.00					COP	39.80	5.50	MODRES	38.43	CL		57.6	27MOG7W-	HISPASAT-1	01	PE	
E	HISPAS44	-30.00	-4.00	39.00					COP	39.80	5.50	MODRES	38.43	CL		57.6	27MOF8W	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	27MOG7W		12	P	5, 7, 8
ERI	ERI09200	22.80	39.41	14.98	1.67	0.95	145.48	R13TSS		42.44		MODRES	35.50	CR		58.9	27MOG7W			P	7
EST	EST06100	44.50	25.06	58.60	0.77	0.60	12.27	R13TSS		47.81		MODRES	35.50	CR		58.7	27MOG7W			P	5, 7
ETH	ETH09200	36.00	40.29	8.95	2.87	2.16	174.06	R13TSS		36.52		MODRES	35.50	CL		58.7	27MOG7W			P	7
F	F 09300	-7.00	3.52	45.41	2.22	1.15	159.34	R13TSS		40.39		MODRES	35.50	CL		58.8	27MOG7W		21	P	5, 8
F	F_100	-7.00	50.00	-15.65				CB_TSS_F_A		48.88		MODRES	35.50	CR		58.9	27MOG7W			P	5, 7
F	NCL10000	140.00	166.00	-21.00	1.14	0.72	146.00	R13TSS		45.30		MODRES	35.50	CR		58.7	27MOG7W			P	7
F	OCE10100	-160.00	-145.00	-16.30	4.34	3.54	4.00	R13TSS		32.58		MODRES	35.50	CL		58.5	27MOG7W			P	5, 7
F	WAL10200	140.00	-176.80	-14.00	0.74	0.60	29.00	R13TSS		47.97		MODRES	35.50	CR		59.4	27MOG7W			P	7
FIN	FIN10300	22.80	22.50	64.50	1.38	0.76	171.00	MOD13FRTSS		44.24		MODRES	35.50	CL		54.5	27MOG7W		52	P	
FIN	FIN10400	22.80	15.87	61.15	2.24	0.91	16.70	MOD13FRTSS		41.37		MODRES	35.50	CL		54.5	27MOG7W		52	P	
FJI	FJI19300	-178.00	179.62	-17.87	1.16	0.92	155.22	R13TSS		44.16		MODRES	35.50	CR		58.7	27MOG7W			P	5, 7
FSM	FSM00000	158.00	151.90	5.48	5.15	1.57	167.00	R13TSS		35.38		MODRES	35.50	CR		58.9	27MOG7W			P	5, 7
G	G 02700	-33.50	-3.50	53.80	1.84	0.72	142.00	R13TSS		43.23		MODRES	35.50	CR		58.0	27MOG7W			P	5, 7
GAB	GAB26000	-13.20	11.80	-0.60	1.43	1.12	64.00	R13TSS		42.40		MODRES	35.50	CR		58.3	27MOG7W			P	5, 7
GEO	GEO06400	23.20	43.35	42.27	1.11	0.60	161.21	R13TSS		46.23		MODRES	35.50	CR		58.9	27MOG7W			P	7
GHA	GHA10800	-25.00	-1.20	7.90	1.48	1.06	102.00	R13TSS		42.49		MODRES	35.50	CR		58.6	27MOG7W			P	
GMB	GMB30200	-37.20	-15.10	13.40	0.79	0.60	4.00	R13TSS		47.69		MODRES	35.50	CL		58.3	27MOG7W			P	5, 7
GNB	GNB30400	-30.00	-15.00	12.00	0.90	0.60	172.00	R13TSS		47.12		MODRES	35.50	CL		58.1	27MOG7W			P	5, 7
GNE	GNE30300	-18.80	10.30	1.50	0.68	0.60	10.00	R13TSS		48.34		MODRES	35.50	CL		58.8	27MOG7W			P	
GRC	GRC10500	-1.20	24.51	38.08	1.70	0.95	152.97	MOD13FRTSS		42.40		MODRES	35.50	CL		56.3	27MOG7W			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	27MOG7W			P	5, 7
HNG	HNG10601	-12.80	16.77	46.78	1.71	0.89	149.15	MOD13FRTSS		42.64		MODRES	35.50	CL		59.3	27MOG7W			P	5, 7
HNG	HNG10602	-12.80	16.77	46.78	1.71	0.89	149.15	MOD13FRTSS		42.64		MODRES	35.50	CR		59.3	27MOG7W			P	5, 7
HNG	HNG10603	-12.80	16.77	46.78	1.71	0.89	149.15	MOD13FRTSS		42.64		MODRES	35.50	CR		59.3	27MOG7W		37	P	5, 7
HOL	HOL21300	38.20	5.12	51.96	1.00	1.00	24.53	MOD13FRTSS		44.45		MODRES	35.50	CL		58.5	27MOG7W			P	5, 7
HRV	HRV14801	-12.80	16.77	46.78	1.71	0.89	149.15	MOD13FRTSS		42.64		MODRES	35.50	CL		58.8	27MOG7W			P	5, 7
HRV	HRV14802	-12.80	16.77	46.78	1.71	0.89	149.15	MOD13FRTSS		42.64		MODRES	35.50	CR		58.8	27MOG7W			P	5, 7
HRV	HRV14803	-12.80	16.77	46.78	1.71	0.89	149.15	MOD13FRTSS		42.64		MODRES	35.50	CR		58.8	27MOG7W		37	P	5, 7
I	I 08200	9.00	12.67	40.74	1.99	1.35	144.20	R13TSS		40.14		MODRES	35.50	CR		54.5	27MOG7W			P	5, 8
IND	IND03700	68.00	93.00	25.50	1.46	1.13	40.00	R13TSS		42.27		MODRES	35.50	CL		58.9	27MOG7W			P	7
IND	IND04700	68.00	93.30	11.10	1.92	0.60	96.00	R13TSS		43.83		MODRES	35.50	CR		58.4	27MOG7W			P	7
IND	INDA_100	55.80	76.16	14.72				CB_TSS_INDA		45.66		MODRES	35.50	CR		58.8	27MOG7W			P	7
IND	INDB_100	55.80	83.43	24.22				CB_TSS_INDB		43.15		MODRES	35.50	CL		58.9	27MOG7W			P	7

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.i.r.p.	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						
IND	INDD_100	68.00	74.37	29.16				CB_TSS_INDD		41.80		MODRES	35.50	CR		59.3	27M0G7W		P	7	
INS	INSA_100	80.20	108.82	-0.73				CB_TSS_INSA		38.88		MODRES	35.50	CR		59.2	27M0G7W		P	7	
INS	INSB_100	104.00	129.75	-3.50				CB_TSS_INSB		37.53		MODRES	35.50	CL		58.8	27M0G7W		P	7	
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		36.03		MODRES	35.50	CL		57.8	27M0G7W		P	7	
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	7	
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	7	
J	000BS-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	5, 7
J	J 11100	110.00	134.50	31.50	3.52	3.30	68.00	R13TSS		33.80		MODRES	35.50	GR		*	34M5G7W		02	P	5, 7
J	J 1110E	110.00	134.50	31.50	3.52	3.30	68.00	R13TSS		33.80		MODRES	35.50	CR		*	27M0F8W	BS-3M	02	PE	
JOR	JOR22400	11.00	37.55	34.02	1.47	0.91	73.16	MOD13FRTSS		43.19		MODRES	35.50	CL		55.5	27M0G7W		P	7, 8	
KAZ	KAZ06600	56.40	65.73	46.40	4.58	1.76	177.45	R13TSS		35.38		MODRES	35.50	CR		58.9	27M0G7W		P	7	
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	5, 7	
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	7	
KIR	KIR_100	176.00	-170.31	-0.56				CB_TSS_KIRA		42.58		MODRES	35.50	CL		58.9	27M0G7W		P	5, 7	
KOR	KO11201D	116.00	127.50	36.00	1.24	1.02	168.00	R13TSS		43.40		MODRES	38.43	CL		**	27M0G7W	KOREASAT-1	03	PE	
KOR	KOR11200	116.00	127.50	36.00	1.24	1.02	168.00	R13TSS		43.80		MODRES	35.50	CL		***	27M0G7W		03	P	7
KOR	KOR11201	116.00	127.50	36.00	1.24	1.02	168.00	R13TSS		43.40		MODRES	38.43	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	5, 7	
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	5, 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	7	
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	7	
LBR	LBR24400	-33.50	-9.30	6.60	1.22	0.70	133.00	R13TSS		45.13		MODRES	35.50	CR		58.2	27M0G7W		P	5, 7	
LBY	LBY_100	-24.80	17.62	26.55				CB_TSS_LBYA		40.30		MODRES	35.50	CL		58.0	27M0G7W		P	5, 7	
LIE	LIE25300	-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	7	
LUX	LUX11400	28.20	5.21	49.20	0.60	0.60	90.00	R13TSS		48.88		MODRES	35.50	CL		57.9	27M0G7W		09	P	7
LVA	LVA06100	23.20	24.51	56.09				CB_TSS_LVAA		48.21		MODRES	35.50	CR		56.9	27M0G7W		P	7	

* 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	Boresight		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	Orien- tation			Co-polar	Cross- polar	Code	Gain	Type	Angle						
MAU	MAU_100	29.00	58.61	-15.88				CB_TSS_MAUa		41.42		MODRES	35.50	CL		59.0	27MOG7W		P	5, 7	
MCO	MCO11600	34.20	7.93	43.59	1.28	0.60	21.73	MOD13FRTSS		45.58		MODRES	35.50	CL		58.6	27MOG7W		P	7	
MDA	MDA06300	50.00	28.45	46.99	0.60	0.60	90.00	R13TSS		48.88		MODRES	35.50	CR		58.9	27MOG7W		P	5	
MDG	MDG23600	29.00	46.60	-18.80	2.72	1.14	65.00	R13TSS		39.53		MODRES	35.50	CL		58.3	27MOG7W		P	7	
MHL	MHL00000	146.00	167.64	9.83	2.07	0.90	157.42	R13TSS		41.75		MODRES	35.50	CR		59.0	27MOG7W		P	5, 7	
MKD	MKD14800	22.80	21.61	41.56	0.60	0.60	90.00	R13TSS		48.88		MODRES	35.50	CR		58.9	27MOG7W		P		
MLA	MLA_100	91.50	108.05	4.00				CB_TSS_MLAA		43.00		MODRES	35.50	CR		58.4	27MOG7W		P	7	
MLD	MLD30600	50.00	72.95	5.78	1.19	0.91	104.53	R13TSS		44.09		MODRES	35.50	CR		58.7	27MOG7W		P	7	
MLI	MLI_100	-19.20	-5.35	17.11				CB_TSS_MLIb		41.21		MODRES	35.50	CR		58.7	27MOG7W		P	5, 7	
MLT	MLT14700	22.80	14.40	35.90	0.60	0.60	0.00	R13TSS		48.88		MODRES	35.50	CR		56.0	27MOG7W		P		
MNG	MNG24800	74.00	102.20	46.60	3.60	1.13	169.00	R13TSS		38.35		MODRES	35.50	CR		59.0	27MOG7W		P	5, 7	
MOZ	MOZ30700	-1.00	34.00	-18.00	3.57	1.38	55.00	R13TSS		37.52		MODRES	35.50	CL		59.2	27MOG7W		P	5, 7	
MRC	MRC20900	-25.20	-8.95	28.98	3.56	1.23	49.23	R13TSS		38.02		MODRES	35.50	CR		54.9	27MOG7W		P	5, 7	
MTN	MTN_100	-36.80	-10.52	19.66				CB_TSS_MTNA		41.91		MODRES	35.50	CR		55.5	27MOG7W		P	5, 7	
MWI	MWI30800	4.80	33.79	-13.25	1.56	0.70	92.69	R13TSS		44.10		MODRES	35.50	CR		59.2	27MOG7W		P	7	
NGR	NGR11500	-37.20	7.63	17.01	2.20	1.80	102.40	R13TSS		38.48		MODRES	35.50	CL		59.5	27MOG7W		P	5, 7	
NIG	NIG11900	-19.20	7.80	9.40	2.16	2.02	45.00	R13TSS		38.05		MODRES	35.50	CR		58.9	27MOG7W		P		
NMB	NMB02500	-18.80	17.50	-21.60	2.66	1.90	48.00	R13TSS		37.41		MODRES	35.50	CL		59.7	27MOG7W		P		
NOR	NOR12000	-0.80	13.42	62.76	1.43	0.60	19.61	MOD13FRTSS		45.10		MODRES	35.50	CL		56.2	27MOG7W	06	P	5, 7	
NOR	NOR12100	-0.80	18.00	60.23	1.67	0.83	23.85	R13TSS		43.02		MODRES	35.50	CL		57.8	27MOG7W	06	P		
NPL	NPL12200	50.00	83.70	28.30	1.72	0.60	163.00	R13TSS		44.31		MODRES	35.50	CR		59.6	27MOG7W		P		
NRU	NRU30900	134.00	167.00	-0.50	0.60	0.60	0.00	R13TSS		48.88		MODRES	35.50	CL		57.5	27MOG7W		P	7	
NZL	NZL_100	158.00	-170.68	-19.72				CB_TSS_NZLA		48.88		MODRES	35.50	CL		59.6	27MOG7W		P	5, 7	
OMA	OMA12300	17.20	55.60	21.00	1.88	1.02	100.00	R13TSS		41.62		MODRES	35.50	CR		58.3	27MOG7W		P	5, 7	
PAK	PAK12700	38.20	69.60	29.50	2.30	2.16	14.00	R13TSS		37.49		MODRES	35.50	CR		58.9	27MOG7W		P	7	
PHL	PHL28500	98.00	121.30	11.10	3.46	1.76	99.00	R13TSS		36.60		MODRES	35.50	CL		58.7	27MOG7W		P	7	
PLW	PLW00000	140.00	132.98	5.51	1.30	0.60	55.41	R13TSS		45.53		MODRES	35.50	CR		58.8	27MOG7W		P	7	
PNG	PNG13100	134.00	148.07	-6.65	3.13	2.30	168.32	MOD13FRTSS		35.87		MODRES	35.50	CR		54.5	27MOG7W		P	7	
POL	POL13200	50.00	20.07	51.86	1.20	0.69	17.76	R13TSS		45.26		MODRES	35.50	CL		59.2	27MOG7W		P	5	
POR	POR_100	-37.00	-15.92	37.65				CB_TSS_PORA		47.17		MODRES	35.50	CR		58.4	27MOG7W		P	5, 7	
PSE	YYY00000	-13.20	34.99	31.86	0.60	0.60	90.00	R13TSS		48.88		MODRES	35.50	CL		58.9	27MOG7W		P	3, 7	
QAT	QAT24700	20.00	51.38	25.26	0.60	0.60	90.00	R13TSS		48.88		MODRES	35.50	CL		54.5	27MOG7W		P	7	
ROU	ROU13600	50.00	25.12	45.75	1.17	0.73	9.52	R13TSS		45.15		MODRES	35.50	CR		58.9	27MOG7W		P	7	
RRW	RRW31000	11.00	30.00	-2.10	0.66	0.60	42.00	R13TSS		48.47		MODRES	35.50	CL		59.8	27MOG7W		P	7	
RUS	RSTREA11	36.00	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	35.50	CL		53.0	27MOF8W	RST-1	05	PE	
RUS	RSTREA12	36.00	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	35.50	CR		53.0	27MOF8W	RST-1	05	PE	

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.i.r.p.	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						
RUS	RSTRED11	36.00	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	35.50	CL		53.0	27M0G7W	RST-1	05	PE	
RUS	RSTRED12	36.00	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	35.50	CR		53.0	27M0G7W	RST-1	05	PE	
RUS	RSTRSD11	36.00	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	35.50	CL		53.0	27M0G7W	RST-1	05	P	
RUS	RSTRSD12	36.00	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	35.50	CR		53.0	27M0G7W	RST-1	05	P	
RUS	RSTRSD13	36.00	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	39.02	CL		53.0	27M0G7W	RST-1	05	P	
RUS	RSTRSD14	36.00	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	39.02	CR		53.0	27M0G7W	RST-1	05	P	
RUS	RSTRSD21	56.00	65.00	63.00	2.20	2.20	0.00	R123FR		37.70		MODRES	35.50	CL		55.0	27M0G7W	RST-2	14	P	
RUS	RSTRSD22	56.00	65.00	63.00	2.20	2.20	0.00	R123FR		37.70		MODRES	35.50	CR		55.0	27M0G7W	RST-2	14	P	
RUS	RSTRSD31	86.00	97.00	62.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	35.50	CL		55.0	27M0G7W	RST-3	33	P	
RUS	RSTRSD32	86.00	97.00	62.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	35.50	CR		55.0	27M0G7W	RST-3	33	P	
RUS	RSTRSD51	140.00	158.00	56.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	35.50	CL		55.0	27M0G7W	RST-5	35	P	
RUS	RSTRSD52	140.00	158.00	56.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	35.50	CR		55.0	27M0G7W	RST-5	35	P	
RUS	RUS00401	110.00	128.73	54.30	4.25	2.02	156.81	R13TSS		35.11		MODRES	35.50	CL		58.9	27M0G7W	RUS-4	34	P	5, 7, 8
RUS	RUS00402	110.00	128.73	54.30	4.25	2.02	156.81	R13TSS		35.11		MODRES	35.50	CR		58.9	27M0G7W	RUS-4	34	P	5, 7, 8
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	5
S	S 13900	5.00	17.00	61.50	2.00	1.00	10.00	R13TSS		41.44		MODRES	35.50	CL		61.1	27M0G7W		04	P	
SCG*	SCG14800	-7.00	20.50	43.98	0.91	0.60	145.16	R13TSS		47.07		MODRES	35.50	CR		58.9	27M0G7W			P	5
SDN	SDN_100	-7.00	30.24	13.53				CB_TSS_SDNA		40.26		MODRES	35.50	CR		59.4	27M0G7W			P	5, 7
SEN	SEN22200	-37.00	-14.40	13.80	1.46		139.00	R13TSS		42.63		MODRES	35.50	CL		58.6	27M0G7W			P	5, 7
SEY	SEY00000	42.50	51.86	-7.23	2.43	1.04	27.51	R13TSS		40.44		MODRES	35.50	CR		58.9	27M0G7W			P	5, 7
SLM	SLM00000	128.00	159.27	-8.40	1.35	1.08	118.59	R13TSS		42.81		MODRES	35.50	CL		58.9	27M0G7W			P	7
SMO	SMO05700	-178.00	-171.70	-13.87	0.60	0.60	90.00	R13TSS		48.88		MODRES	35.50	CR		58.6	27M0G7W			P	5, 7
SMR	SMR31100	-36.80	12.60	43.70	0.60	0.60	0.00	R13TSS		48.88		MODRES	35.50	CR		57.4	27M0G7W			P	7
SNG	SNG15100	88.00	103.86	1.42	0.92	0.72	175.12	R13TSS		46.25		MODRES	35.50	CL		58.5	27M0G7W			P	7
SOM	SOM31200	37.80	45.16	7.11	3.31	1.51	65.48	R13TSS		37.46		MODRES	35.50	CR		57.4	27M0G7W			P	5, 7
SRL	SRL25900	-33.50	-11.80	8.60	0.78	0.68	114.00	R13TSS		47.20		MODRES	35.50	CR		58.4	27M0G7W			P	6
STP	STP24100	-7.00	6.17	1.45	0.65	0.60	153.51	R13TSS		48.56		MODRES	35.50	CR		56.4	27M0G7W			P	5, 7
SUI	SUI14000	-18.80	10.31	49.47	1.82	0.92	151.78	MOD13FRTSS		42.19		MODRES	35.50	CL		59.1	27M0G7W			P	7
SVK	SVK14401	-12.80	16.77	46.78	1.71	0.89	149.15	MOD13FRTSS		42.64		MODRES	35.50	CL		59.3	27M0G7W			P	5, 7
SVK	SVK14402	-12.80	16.77	46.78	1.71	0.89	149.15	MOD13FRTSS		42.64		MODRES	35.50	CR		59.3	27M0G7W			P	5
SVK	SVK14403	-12.80	16.77	46.78	1.71	0.89	149.15	MOD13FRTSS		42.64		MODRES	35.50	CR		59.3	27M0G7W		37	P	5, 7
SVN	SVN14800	33.80	15.01	46.18	0.60	0.60	90.00	R13TSS		48.88		MODRES	35.50	CR		58.9	27M0G7W			P	7
SWZ	SWZ31300	4.80	31.39	-26.44	0.60	0.60	90.00	R13TSS		48.88		MODRES	35.50	CL		57.9	27M0G7W			P	7
SYR	SYR22900	11.00	37.55	34.02	1.47	0.91	73.16	MOD13FRTSS		43.19		MODRES	35.50	CL		55.5	27M0G7W		53	P	5, 7
SYR	SYR33900	11.00	37.60	34.20	1.32	0.88	74.00	MOD13FRTSS		43.80		MODRES	35.50	CL		56.4	27M0G7W		53	P	5, 7
TCD	TCD14300	17.00	18.36	15.47	3.23	2.05	82.89	R13TSS		36.23		MODRES	35.50	CR		58.9	27M0G7W			P	5, 7

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.i.r.p.	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						
TGO	TGO22600	-30.00	0.72	8.61	1.12	0.60	109.54	R13TSS		46.19		MODRES	35.50	CR		58.5	27M0G7W		P	5, 7	
THA	THA14200	98.00	100.75	12.88	2.80	1.82	93.77	R13TSS		37.37		MODRES	35.50	CL		58.6	27M0G7W		P	7	
TJK	TJK06900	38.00	71.14	38.41	1.21	0.73	155.31	R13TSS		45.00		MODRES	35.50	CL		58.8	27M0G7W		P	5, 7	
TKM	TKM06800	50.00	59.24	38.83	2.26	1.02	166.64	R13TSS		40.81		MODRES	35.50	CR		58.9	27M0G7W		P	5, 7	
TMP	TMP00000	128.00	126.03	-8.72	0.66	0.60	13.92	R13TSS		48.50		MODRES	35.50	CR		58.9	27M0G7W		P	7, 9	
TON	TON21500	170.75	-175.23	-18.19	1.59	0.60	71.33	R13TSS		44.64		MODRES	35.50	CR		58.3	27M0G7W		P	5, 7	
TUN	TUN15000	-25.20	9.50	33.50	1.88	0.72	135.00	MOD13FRTSS		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	MOD13FRTSS		36.54		MODRES	35.50	CR		55.5	27M0G7W	55	P	4	
TUR	TUR14500	42.00	34.95	39.09	3.18	0.99	0.79	R13TSS		39.47		MODRES	35.50	CL		58.8	27M0G7W	36	P	7	
TUV	TUV00000	176.00	177.61	-7.11	0.94	0.60	137.58	R13TSS		46.93		MODRES	35.50	CR		58.9	27M0G7W		P	5, 7	
TZA	TZA22500	11.00	34.60	-6.20	2.41	1.72	129.00	R13TSS		38.27		MODRES	35.50	CR		58.7	27M0G7W		P	5, 7	
UAE	UAE27400	52.50	53.85	24.34	1.19	0.85	3.72	R13TSS		44.39		MODRES	35.50	CR		58.2	27M0G7W		P	5, 7	
UGA	UGA05100	17.00	32.20	1.04	1.50	1.02	68.73	R13TSS		42.62		MODRES	35.50	CL		58.2	27M0G7W		P	7	
UKR	UKR06300	38.20	31.74	48.22	2.29	0.96	177.78	R13TSS		41.01		MODRES	35.50	CR		58.9	27M0G7W		P	7	
USA	GUM33100	122.00	144.50	13.10	0.60	0.60	0.00	R13TSS		48.88		MODRES	35.50	CL		58.3	27M0G7W		P		
USA	MRA33200	121.80	145.90	16.90	1.20	0.60	76.00	R13TSS		45.87		MODRES	35.50	CR		58.5	27M0G7W		P		
USA	PLM33200	170.00	-161.40	7.00	0.60	0.60	0.00	R13TSS		48.88		MODRES	35.50	CL		57.4	27M0G7W		P	5, 7	
USA	USAA_100	170.00	-170.51	-12.72				CB_TSS_USAA		48.88		MODRES	35.50	CL		56.1	27M0G7W		P	7	
USA	WAK33400	140.00	166.50	19.20	0.60	0.60	0.00	R13TSS		48.88		MODRES	35.50	CR		58.6	27M0G7W		P	5	
UZB	UZB07100	33.80	63.80	41.21	2.56	0.89	159.91	R13TSS		40.84		MODRES	35.50	CR		58.8	27M0G7W		P	7	
VTN	VTN32500	107.00	106.84	14.21	3.43	1.76	109.43	R13TSS		36.65		MODRES	35.50	CR		58.4	27M0G7W		P	7	
VUT	VUT12800	140.00	168.00	-16.40	1.52	0.68	87.00	R13TSS		44.30		MODRES	35.50	CL		57.8	27M0G7W		P	5, 7	
YEM	YEM_100	11.00	48.05	14.64				CB_TSS_YEMA		47.63		MODRES	35.50	CL		54.9	27M0G7W		P	7	
ZMB	ZMB31400	-0.80	27.50	-13.10	2.38	1.48	39.00	R13TSS		38.98		MODRES	35.50	CR		58.7	27M0G7W		P	5, 7	
ZWE	ZWE13500	-0.80	29.60	-18.80	1.46	1.36	37.00	R13TSS		41.47		MODRES	35.50	CR		59.2	27M0G7W		P	5, 7	

* Note by the Secretariat: This designation replaces the former designation "YUG" which was used previously as a three-letter code for the Administration of Serbia and Montenegro.

COLUMN HEADINGS IN TABLE 6B

- Col. 1 *Nominal orbital position*, in degrees and hundredths of a degree from the Greenwich meridian (negative values indicate longitudes which are west of the Greenwich meridian; positive values indicate longitudes which are east of the Greenwich meridian).
- Col. 2 *Notifying administration symbol*.
- Col. 3 *Beam identification* (Column 2, normally, contains the symbol designating the administration or the geographical area taken from Table B1 of the Preface to the International Frequency List, followed by the symbol designating the service area).
- Col. 4 *Polarization* (CL – circular left, CR – circular right).
- Col. 5 *Channel number/Indication of minimum equivalent protection margin (EPM) for a given assignment derived from the set of values for all test points belonging to the given beam* (dB).

AP30

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[illegible]

** See Note 1 of § 11.2 of Article 11.

[illegible]

ANNEX 1 (WRC-2000)

Limits for determining whether a service of an administration is affected by a proposed modification to the Region 2 Plan or by a proposed new or modified assignment in the Regions 1 and 3 List or when it is necessary under this Appendix to seek the agreement of any other administration¹⁴

(See Article 4)

MOD

1 Limits for the interference into frequency assignments in conformity with the Regions 1 and 3 Plan or with the Regions 1 and 3 List or into new or modified assignments in the Regions 1 and 3 List

Under assumed free-space propagation conditions, the power flux-density of a proposed new or modified assignment in the List shall not exceed the value of $-103.6 \text{ dB(W/(m}^2 \cdot 27 \text{ MHz))}$.

With respect to § 4.1.1 *a)* or *b)* of Article 4, an administration in Region 1 or 3 is considered by the Bureau as being affected if the minimum orbital spacing between the wanted and interfering space stations, under worst-case station-keeping conditions, is less than 9° .

However, an administration in Region 1 or 3 is considered as not being affected if either of the following two conditions is met:

- a)* under assumed free-space propagation conditions, the power flux-density at any test point within the service area associated with any of its frequency assignments in the Plan or in the List or for which the procedure of Article 4 has been initiated, does not exceed the following values:¹⁵

$$-147 \text{ dB(W/(m}^2 \cdot 27 \text{ MHz))} \quad \text{for } 0^\circ \leq \theta < 0.23^\circ$$

$$-135.7 + 17.74 \log \theta \text{ dB(W/(m}^2 \cdot 27 \text{ MHz))} \quad \text{for } 0.23^\circ \leq \theta < 2.0^\circ$$

$$-136.7 + 1.66 \theta^2 \text{ dB(W/(m}^2 \cdot 27 \text{ MHz))} \quad \text{for } 2.0^\circ \leq \theta < 3.59^\circ$$

$$-129.2 + 25 \log \theta \text{ dB(W/(m}^2 \cdot 27 \text{ MHz))} \quad \text{for } 3.59^\circ \leq \theta < 9^\circ$$

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

- b)* the effect of the proposed new or modified assignments in the List is that the equivalent downlink protection margin¹⁶ corresponding to a test point of its assignment in the Regions 1 and 3 Plan or List, or for which the procedure of Article 4 has been initiated, including cumulative effect of any previous modification to the List or any previous agreement, does

not fall more than 0.45 dB below 0 dB or, if already negative, more than 0.45 dB below the value resulting from:

- the Regions 1 and 3 Plan and List as established by WRC-2000; *or*
- a proposed new or modified assignment to the List in accordance with this Appendix; *or*
- a new entry in the Regions 1 and 3 List as a result of successful application of Article 4 procedures.

NOTE – In performing the calculation, the effect at the receiver input of all the co-channel and adjacent-channel signals is expressed in terms of one equivalent co-channel interfering signal. This value is usually expressed in decibels. (WRC-03)

(MOD)

2 Limits to the change in the overall equivalent protection margin for frequency assignments in conformity with the Region 2 Plan

With respect to § 4.2.3 *c*) of Article 4, an administration in Region 2 is considered as being affected if the overall equivalent protection margin¹⁷ corresponding to a test point of its entry in the Region 2 Plan, including the cumulative effect of any previous modification to that Plan or any previous agreement, falls more than 0.25 dB below 0 dB, or, if already negative, more than 0.25 dB below the value resulting from:

- the Region 2 Plan as established by the 1983 Conference; *or*
- a modification of the assignment in accordance with this Appendix; *or*
- a new entry in the Region 2 Plan under Article 4; *or*
- any agreement reached in accordance with this Appendix. (WRC-03)

MOD

3 Limits to the change in the power flux-density to protect the broadcasting-satellite service in Regions 1 and 2 in the band 12.2-12.5 GHz and in Region 3 in the band 12.5-12.7 GHz

With respect to § 4.1.1 *c*) of Article 4, an administration in Region 2 is considered as being affected if the proposed new or modified assignment in the Regions 1 and 3 List would result in exceeding the following power flux-density values, at any test point in the service area of its overlapping frequency assignments:

$$-147 \text{ dB(W/(m}^2 \cdot 27 \text{ MHz))} \quad \text{for } 0^\circ \leq \theta < 0.23^\circ$$

$$-135.7 + 17.74 \log \theta \text{ dB(W/(m}^2 \cdot 27 \text{ MHz))} \quad \text{for } 0.23^\circ \leq \theta < 1.8^\circ$$

$$\begin{aligned}
 & -134.0 + 0.89 \theta^2 \quad \text{dB(W/(m}^2 \cdot 27 \text{ MHz))} && \text{for } 1.8^\circ \leq \theta < 5.0^\circ \\
 & -129.2 + 25 \log \theta \quad \text{dB(W/(m}^2 \cdot 27 \text{ MHz))} && \text{for } 5.0^\circ \leq \theta < 10.57^\circ \\
 & -103.6 \quad \text{dB(W/(m}^2 \cdot 27 \text{ MHz))} && \text{for } 10.57^\circ \leq \theta
 \end{aligned}$$

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

With respect to § 4.2.3 *a)*, 4.2.3 *b)* or 4.2.3 *f)* of Article 4, as appropriate, an administration in Region 1 or 3 is considered as being affected if the proposed modification to the Region 2 Plan would result in exceeding the following power flux-density values, at any test point in the service area of its overlapping frequency assignments:

$$\begin{aligned}
 & -147 \quad \text{dB(W/(m}^2 \cdot 27 \text{ MHz))} && \text{for } 0^\circ \leq \theta < 0.23^\circ \\
 & -135.7 + 17.74 \log \theta \quad \text{dB(W/(m}^2 \cdot 27 \text{ MHz))} && \text{for } 0.23^\circ \leq \theta < 2.0^\circ \\
 & -136.7 + 1.66 \theta^2 \quad \text{dB(W/(m}^2 \cdot 27 \text{ MHz))} && \text{for } 2.0^\circ \leq \theta < 3.59^\circ \\
 & -129.2 + 25 \log \theta \quad \text{dB(W/(m}^2 \cdot 27 \text{ MHz))} && \text{for } 3.59^\circ \leq \theta < 10.57^\circ \\
 & -103.6 \quad \text{dB(W/(m}^2 \cdot 27 \text{ MHz))} && \text{for } 10.57^\circ \leq \theta
 \end{aligned}$$

where θ is the minimum geocentric orbital separation in degrees between the wanted and interfering space stations, taking into account the respective East-West station-keeping accuracies. (WRC-03)

(MOD)

4 Limits to the power flux-density to protect the terrestrial services of other administrations^{18, 19, 20}

With respect to § 4.1.1 *d)* of Article 4, an administration in Region 1, 2 or 3 is considered as being affected if the consequence of the proposed modified assignment in the Regions 1 and 3 List is to increase the power flux-density arriving on any part of the territory of that administration by more than 0.25 dB over that resulting from that frequency assignment in the Plan or List for Regions 1 and 3 as established by WRC-2000. The same administration is considered as not being affected if the value of the power flux-density anywhere in its territory does not exceed the limits expressed below.

With respect to § 4.2.3 *d)* of Article 4, an administration in Region 1, 2 or 3 is considered as being affected if the consequence of the proposed modification to an existing assignment in the Region 2 Plan is to increase the power flux-density arriving on any part of the territory of that administration by more than 0.25 dB over that resulting from that frequency assignment in the Region 2 Plan at the time of entry into force of the Final Acts of the 1985 Conference. The same administration is considered as not being affected if the value of the power flux-density anywhere in its territory does not exceed the limits expressed below.

With respect to § 4.1.1 *d*) or § 4.2.3 *d*) of Article 4, an administration in Region 1, 2 or 3 is considered as being affected if the proposed new assignment in the Regions 1 and 3 List, or if the proposed new frequency assignment in the Region 2 Plan, would result in exceeding a power flux-density, for any angle of arrival, at any point on its territory, of:

$$-148 \text{ dB(W/(m}^2 \cdot 4 \text{ kHz))} \quad \text{for} \quad \theta \leq 5^\circ$$

$$-148 + 0.5 (\theta - 5) \text{ dB(W/(m}^2 \cdot 4 \text{ kHz))} \quad \text{for} \quad 5^\circ < \theta \leq 25^\circ$$

$$-138 \text{ dB(W/(m}^2 \cdot 4 \text{ kHz))} \quad \text{for} \quad 25^\circ < \theta \leq 90^\circ$$

where θ represents the angle of arrival. (WRC-03)

MOD

6 **Limits to the change in the power flux-density of assignments in the Regions 1 and 3 Plan or List to protect the fixed-satellite service (space-to-Earth) in the band 11.7-12.2 GHz²¹ in Region 2 or in the band 12.2-12.5 GHz in Region 3, and of assignments in the Region 2 Plan to protect the fixed-satellite service (space-to-Earth) in the band 12.5-12.7 GHz in Region 1 and in the band 12.2-12.7 GHz in Region 3**

With respect to § 4.1.1 *e*) of Article 4, an administration is considered as being affected if the proposed new or modified assignment in the Regions 1 and 3 List would result in an increase in the power flux-density over any portion of the service area of its overlapping frequency assignments in the fixed-satellite service in Region 2 or Region 3 of 0.25 dB or more above that resulting from the frequency assignments in the Plan or List for Regions 1 and 3 as established by WRC-2000.

With respect to § 4.2.3 *e*), an administration is considered as being affected if the proposed modification to the Region 2 Plan would result in an increase in the power flux-density over any portion of the service area of its overlapping frequency assignments in the fixed-satellite service in Region 1 or 3 of 0.25 dB or more above that resulting from the frequency assignments in the Region 2 Plan at the time of entry into force of the Final Acts of the 1985 Conference.

With respect to § 4.1.1 *e*) or 4.2.3 *e*) of Article 4, with the exception of cases covered by Note 1 below, an administration is considered as not being affected if the proposed new or modified assignment in the Regions 1 and 3 List, or if a proposed modification to the Region 2 Plan, gives

²¹ Including assignments operating under No. 5.485 of the Radio Regulations.

a power flux-density anywhere over any portion of the service area of its overlapping frequency assignments in the fixed-satellite service in Region 1, 2 or 3 of less than:

$$\begin{aligned}
 & -186.5 \text{ dB(W/(m}^2 \cdot 40 \text{ kHz))} && \text{for } 0^\circ \leq \theta < 0.054^\circ \\
 & -164.0 + 17.74 \log \theta \text{ dB(W/(m}^2 \cdot 40 \text{ kHz))} && \text{for } 0.054^\circ \leq \theta < 2.0^\circ \\
 & -165.0 + 1.66 \theta^2 \text{ dB(W/(m}^2 \cdot 40 \text{ kHz))} && \text{for } 2.0^\circ \leq \theta < 3.59^\circ \\
 & -157.5 + 25 \log \theta \text{ dB(W/(m}^2 \cdot 40 \text{ kHz))} && \text{for } 3.59^\circ \leq \theta < 10.57^\circ \\
 & -131.9 \text{ dB(W/(m}^2 \cdot 40 \text{ kHz))} && \text{for } 10.57^\circ \leq \theta
 \end{aligned}$$

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

NOTE 1 – With respect to § 4.1.1 e) of Article 4, an administration in Region 3 is considered as not being affected if the proposed new or modified assignment in the Regions 1 and 3 List in the orbital arc 105° E-129° E gives a power flux-density anywhere over any portion of the territory of the notifying administration within the service area of its overlapping frequency assignments in the fixed-satellite service in the orbital arc 110° E-124° E of less than:

$$\begin{aligned}
 & -186.5 \text{ dB(W/(m}^2 \cdot 40 \text{ kHz))} && \text{for } 0^\circ \leq \theta < 0.054^\circ \\
 & -164.0 + 17.74 \log \theta \text{ dB(W/(m}^2 \cdot 40 \text{ kHz))} && \text{for } 0.054^\circ \leq \theta < 1.8^\circ \\
 & -162.3 + 0.89 \theta^2 \text{ dB(W/(m}^2 \cdot 40 \text{ kHz))} && \text{for } 1.8^\circ \leq \theta < 5.0^\circ \\
 & -157.5 + 25 \log \theta \text{ dB(W/(m}^2 \cdot 40 \text{ kHz))} && \text{for } 5.0^\circ \leq \theta < 10.57^\circ \\
 & -131.9 \text{ dB(W/(m}^2 \cdot 40 \text{ kHz))} && \text{for } 10.57^\circ \leq \theta
 \end{aligned}$$

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

The above set of formulas is only applied to networks:

- for which Appendix 4 information for coordination had been received by the Bureau prior to 30 March 2002; *and*
- which had been brought into use prior to 30 March 2002 and for which the date of bringing into use had been confirmed to the Bureau; *and*
- for which the complete due diligence information, in accordance with Annex 2 to Resolution 49 (Rev.WRC-2000), had been received by the Bureau prior to 30 March 2002. (WRC-03)

MOD**7 Limits to the change in equivalent noise temperature to protect the fixed-satellite service (Earth-to-space) in Region 1 from modifications to the Region 2 Plan in the band 12.5-12.7 GHz**

With respect to § 4.2.3 *e*) of Article 4, an administration of Region 1 is considered as being affected if the proposed modification to the Region 2 Plan would result in:

- the value of $\Delta T/T$ resulting from the proposed modification is greater than the value of $\Delta T/T$ resulting from the assignment in the Region 2 Plan as of the date of entry into force of the Final Acts of the 1985 Conference; *and*
- the value of $\Delta T/T$ resulting from the proposed modification exceeds 6%,

using the method of Appendix 8 (Case II). (WRC-03)

MOD**ANNEX 2** (Rev.WRC-03)**Basic characteristics to be furnished in notices relating to space stations in the broadcasting-satellite service**

These data items are listed in Appendix 4.

MOD**ANNEX 3** (WRC-03)

Method for determining the limiting interfering power flux-density at the edge of a broadcasting-satellite service area 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), and for calculating the power flux-density produced in these bands by a terrestrial station, or by a transmitting earth station in the fixed-satellite service in the band 12.5-12.7 GHz

1 General

1.1 This Annex describes a method of calculating the interference potential from terrestrial transmitters or transmitting earth stations in the fixed-satellite service (FSS) to receiving earth stations in the broadcasting-satellite service (BSS).

1.2 The method is in two parts:

- a) the calculation of the maximum permissible interfering power flux-density at the edge of the BSS area concerned;
- b) the calculation of the likely power flux-density produced at any point on the edge of the service area by the terrestrial transmitter or transmitting earth stations in the FSS of another administration.

1.3 The interference potential of the terrestrial transmitters or the transmitting earth stations in the FSS must be considered case by case; the power flux-density produced by each terrestrial transmitter or each transmitting earth station F_p is compared to the limiting power flux-density F at any point on the edge of the service area of a broadcasting-satellite station of another administration. If, for a given transmitter, the value of the power flux-density produced F_p is lower than the value of the limiting power flux-density F at any point on the edge of the service area, the interference caused to the BSS by this transmitter is considered to be lower than the permissible value and no coordination is required between administrations before the terrestrial service station or the transmitting earth station is brought into use. Where this is not the case, coordination and more precise calculations derived from a mutually agreed basis are necessary.

Section 2 calculates the limit of power flux-density F at the edge of the service area.

Section 3 calculates the power flux-density produced by a terrestrial station or a transmitting earth station, F_p .

1.4 It is emphasized that, should the calculation described in this Annex indicate that the maximum permissible power flux-density is exceeded, it does not necessarily preclude the introduction of the terrestrial or the FSS since the calculations are necessarily based on worst-case assumptions for:

- a) the nature of the terrain of the interference path;
- b) the off-beam discrimination on the broadcasting-satellite receiving installations;
- c) the necessary protection ratios for the BSS;
- d) the type of reception in the BSS, i.e., assuming individual reception, this being more critical than community reception for the angles of elevation concerned;
- e) the value of power flux-density to be protected in the BSS;
- f) the propagation conditions between the terrestrial station or the transmitting earth station in the FSS operating in the opposite direction of transmission, and the BSS area.

2 Limit of power flux-density

2.1 General

The limiting power flux-density not to be exceeded at the edge of the service area in order to protect the BSS of an administration is given by the formula:

$$F = F_0 - R + D + P \quad (1)$$

where:

- F : the maximum permissible interfering power flux-density (dB(W/m²)) within the necessary bandwidth of the broadcasting-satellite;
- F_0 : the wanted power flux-density (dB(W/m²)) at the edge of the service area;
- R : the protection ratio (dB) between the wanted and interfering signals;
- D : angular antenna discrimination (dB) provided by the radiation pattern of the broadcasting-satellite receiver antenna;
- P : polarization discrimination (dB) between the wanted and interfering signals.

2.2 Wanted power flux-density (F_0)

The value of F_0 is equal to:

For the Regions 1 and 3 Plan and List, Region 2 Plan and Article 4 submissions under § 4.1.3 and 4.2.6:

- a) $-108 \text{ dB(W/(m}^2 \cdot 27 \text{ MHz))}$ for service areas in Regions 1 and 3, *and*
- b) $-115 \text{ dB(W/(m}^2 \cdot 24 \text{ MHz))}$, as well as in $\text{dB(W/(m}^2 \cdot 27 \text{ MHz))}$ with respect to the cases mentioned in the footnote to § 3.8 of Annex 5 concerning necessary bandwidths in Region 2.

For the analogue BSS assignments in the Region 2 Plan:

$-107 \text{ dB(W/(m}^2 \cdot 24 \text{ MHz))}$, as well as in $\text{dB(W/(m}^2 \cdot 27 \text{ MHz))}$ with respect to the cases mentioned in the footnote to § 3.8 of Annex 5 concerning necessary bandwidths in Region 2.

2.3 Protection ratio (R)

2.3.1 For digital BSS assignments, the single entry protection ratio is equal to 30 dB.

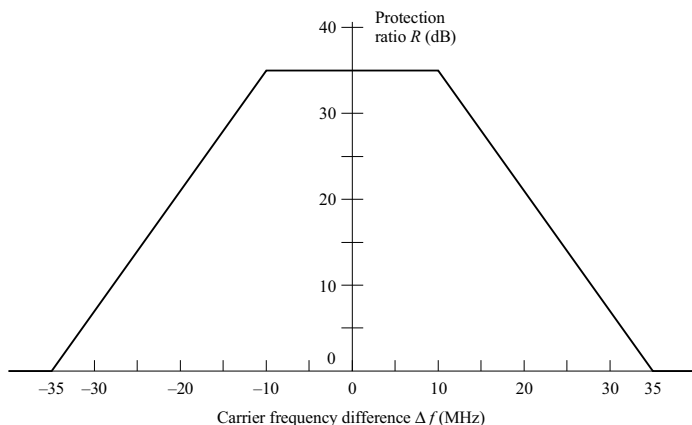
2.3.2 For the analogue BSS assignments in the Region 2 Plan and for notified BSS assignments in Regions 1 and 3 Plan and List which are in conformity with the Plans and List of Appendix 30 and which have been brought into use and for which the date of bringing into use has been confirmed to the Bureau before 9 June 2003, the single entry protection ratio against all

types of terrestrial transmissions, with the exception of amplitude-modulation multichannel television systems, is 35 dB for carrier frequency differences between the wanted and interfering signals of up to ± 10 MHz, decreasing linearly from 35 dB to 0 dB for carrier frequency differences between 10 MHz and 35 MHz, and is 0 dB for frequency differences in excess of 35 MHz (see Fig. 1). For amplitude-modulation multichannel television systems which produce high peaks of power flux-density spread over a wide range of their necessary bandwidth, the protection ratio R is 35 dB and is independent of the carrier frequency difference.

2.3.3 The carrier frequency difference should be determined by reference to the frequency assignments in the broadcasting-satellite Plan or, in the case of assignments not contained within a plan, by reference to the characteristics of the proposed or operational system.

2.3.4 A signal from a terrestrial station or a transmitting earth station in the FSS should be considered only if its necessary bandwidth overlaps the necessary bandwidth of the BSS assignment.

FIGURE 1
Protection ratio (R) (dB) for a broadcasting-satellite signal
against a single entry of interference from a terrestrial service
(except for AM multichannel TV system)



AP30A3-01

2.4 Angular antenna discrimination (D)

2.4.1 For all Regions (digital)

The value of D to be assumed in equation (1) is derived from the following equations, which are based on Recommendation ITU-R BO.1213 (also found in Annex 5 to this Appendix):

$$\begin{aligned}
 D &= 0.0025((d/\lambda) \varphi)^2 & \text{dB} & \quad \text{for } 0^\circ \leq \varphi < \varphi_m \\
 D &= G_{\max} - (29 - 25 \log(\varphi_r)) & \text{dB} & \quad \text{for } \varphi_m \leq \varphi < \varphi_r \\
 D &= G_{\max} - (29 - 25 \log(\varphi)) & \text{dB} & \quad \text{for } \varphi_r \leq \varphi \leq 14.45^\circ \\
 D &= G_{\max} & \text{dB} & \quad \text{for } \varphi > 14.45^\circ
 \end{aligned}$$

where:

φ : elevation angle (degrees) for the proposed or operational broadcasting-satellite system for the BSS area concerned

φ_m : $(\lambda/d)((G_{\max} - G_1)/(0.0025))^{0.5}$ (degrees)

G_1 : $29 - 25 \log(\varphi_r)$ (dB)

φ_r : $95(\lambda/d)$ (degrees)

G_{\max} : maximum gain of the antenna (dBi)

d : diameter of the antenna (m)

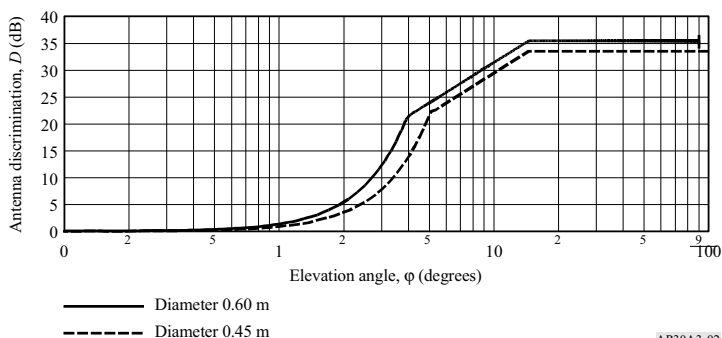
λ : the wavelength (m).

NOTE 1 – If more than one value of φ is specified for a particular service area, the appropriate value of φ should be used for each section of the edge of the service area under consideration.

For Regions 1 and 3, $G_{\max} = 35.5$ dBi corresponding to a 0.6 m diameter antenna at 11.7 GHz and 65% efficiency. For Region 2, $G_{\max} = 33.3$ dBi corresponding to a 0.45 m diameter antenna at 12.2 GHz and 65% efficiency. For a graphical depiction of this antenna discrimination see Fig. 2.

FIGURE 2

Discrimination D of a broadcasting-satellite receiving antenna
as a function of elevation angle



2.4.2 For the analogue BSS assignments in the Region 2 Plan

The discrimination D should be derived from the expression (3) below where φ is the elevation angle for the proposed or operational broadcasting-satellite system for the BSS area concerned.

NOTE 1 – If more than one value of φ is specified for a particular service area, the appropriate value of φ should be used for each section of the edge of the service area under consideration.

$$D = 0$$
$$D = 4.15 \varphi^2$$
$$D = 8.24 + 25 \log \varphi$$
$$D = 43.2$$

dB

dB

dB

dB

for $0^\circ \leq \varphi \leq 0.43^\circ$

for $0.43^\circ < \varphi \leq 1.92^\circ$

for $1.92^\circ < \varphi \leq 25^\circ$

for $\varphi > 25^\circ$

(3)

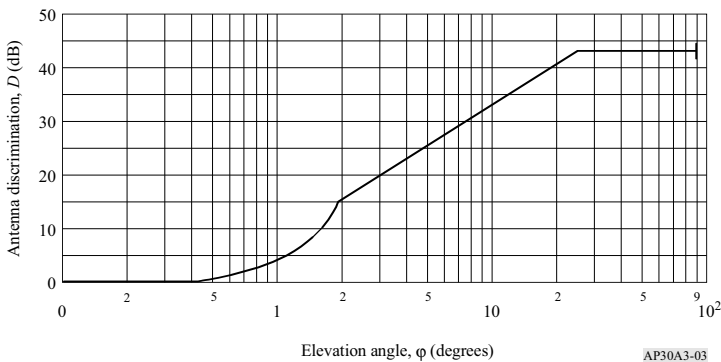
NOTE 2 – For the graphical determination of D see Fig. 3. The unit for φ is degrees.

2.5 Polarization discrimination (P)

The value of P is equal to:

- a) 3 dB when the interfering service uses linear polarization and the BSS uses circular polarization or vice versa;
- b) 0 dB when the interfering service and the BSS both use circular or both use linear polarization.

FIGURE 3
Discrimination D of broadcasting-satellite receiving antenna
as a function of elevation angle



3 Power flux-density produced by a terrestrial station or a transmitting earth station (F_p)

The power flux-density F_p (dB(W/m²)) produced at any point on the edge of the service area by the terrestrial station or the transmitting earth station is determined from the following formula:

$$F_p = E - A + 10 \log (4\pi/\lambda^2) \quad (4)$$

where:

- E : equivalent isotropically radiated power (dBW) of the terrestrial station or the transmitting earth station in the direction of the point concerned on the edge of the service area
- A : total path loss (dB)
- λ : wavelength (m).

3.1 Evaluation of path loss A for a terrestrial station or a transmitting earth station at the edge of the service area of the broadcasting satellite

The following propagation model is to be used for determining the minimum path loss between the interfering terrestrial transmitter or transmitting earth station and the edge of the BSS service area.

3.2 Propagation model

3.2.1 Distance limits

3.2.1.1 Minimum distance limit

The minimum coordination distance is given as:

$$d_{min}(f) = 100 + \frac{(\beta_p - f)}{2} \quad (5)$$

where:

- f : frequency (GHz)
- β_p : radiometeorological parameter, which reflects the relative incidence of clear-sky anomalous propagation conditions.

The value of β_p is latitude dependent. The latitude to be used in determining the correct value for β_p is given by:

$$\zeta_r = \begin{cases} |\zeta| - 1.8 & \text{for } |\zeta| > 1.8^\circ \\ 0 & \text{for } |\zeta| \leq 1.8^\circ \end{cases} \quad (6)$$

where ζ is the earth station latitude (degrees).

β_p is then determined using:

$$\beta_p = \begin{cases} 10^{(1.67-0.015\zeta_r)} & \text{for } \zeta_r \leq 70^\circ \\ 4.17 & \text{for } \zeta_r > 70^\circ \end{cases} \quad (7)$$

3.2.1.2 Maximum distance limit

The maximum distance, d_{max} , for paths comprising a single climatic zone must not exceed the value for that climatic zone given in the Table below. For mixed paths comprising multiple zones the overall maximum distance must not exceed the value in the Table below corresponding to the climatic zone in the mixed path having the largest value (e.g. for a mixed path comprising zones A1 and A2, d_{max} is 500 km).

Climatic Zone ¹	Maximum distance (d_{max}) ²
A1	500
A2	375
B	900
C	1 200

¹ For the definition see Appendix 7, § 1.5.1 and 1.5.3.2.

² As computed in § 2 of Appendix 7.

3.2.2 Ducting model

3.2.2.1 Distance-independent part of the loss (dB) for ducting

For BSS earth stations, no additional protection due to the earth station horizon elevation angle can be assumed, i.e. A_h , the total terrain shielding attenuation, is 0 dB. However, if the detailed information for the transmitting station is known, including any site-shielding-based mitigation techniques that are used, all these factors need to be included in the determination of the coordination distance.

Reduction in attenuation arising from direct coupling into over-sea ducts (dB):

$$A_c = \frac{-6}{1 + d_c} \quad (8)$$

where d_c (km) is the distance from a land-based transmitting station to the coast in the direction being considered. d_c is zero in other circumstances.

Distance-independent part of the loss (dB) for ducting:

$$A_1 = 122.43 + 16.5 \log f + A_c \quad (9)$$

3.2.2.2 Distance-dependent part of the loss (dB) for ducting

3.2.2.2a The specific attenuation (dB/km) due to dry air is given as:

$$\gamma_0 = \left(7.19 \times 10^{-3} + \frac{6.09}{f^2 + 0.227} + \frac{4.81}{(f - 57)^2 + 1.50} \right) f^2 \times 10^{-3} \quad (10)$$

3.2.2.2b The specific attenuation due to water vapour is given as a function of ρ , the water vapour density in units of g/m^3 , by the following equation:

$$\gamma_w(\rho) = \left(0.050 + 0.0021\rho + \frac{3.6}{(f - 22.2)^2 + 8.5} \right) f^2 \rho \times 10^{-4} \quad (11)$$

3.2.2.2c The specific attenuation (dB/km) due to water vapour for the ducting propagation model using a water vapour density of 7.5 g/m^3 for paths over land in Zones A1 and A2 is given as:

$$\gamma_{wdl} = \gamma_w(7.5) \quad (12)$$

3.2.2.2d The specific attenuation (dB/km) due to water vapour for the ducting propagation model using a water vapour density of 10.0 g/m^3 for paths over sea in Zones B and C is given as:

$$\gamma_{wds} = \gamma_w(10.0) \quad (13)$$

Note that the value of 10.0 g/m^3 is used for both Zones B and C in view of the lack of data on the variability of water vapour density on a global basis, particularly the minimum values.

3.2.2.2e Specific attenuation due to gaseous absorption (dB/km):

$$\gamma_g = \gamma_0 + \gamma_{wdl} \left(\frac{d_l}{d_i} \right) + \gamma_{wds} \left(1 - \frac{d_l}{d_i} \right) \quad (14)$$

where:

d_l (km): aggregate land distance (Zone A1 + Zone A2) along the path;

d_i (km): path length considered, which lies within the range between a minimum calculation distance and a maximum calculation distance.

3.2.2.2f Values for zone-dependent parameters:

$$\tau = 1 - \exp \left(- \left(4.12 \times 10^{-4} (d_{lm})^{2.41} \right) \right) \quad (15)$$

where:

d_{lm} (km): longest continuous inland distance (Zone A2) along the path considered.

$$\mu_1 = \left(10^{\frac{-d_{lm}}{16 - 6.6\tau}} + \left(10^{-(0.496 + 0.354\tau)} \right)^5 \right)^{0.2} \quad (16)$$

where:

d_{lm} (km): longest continuous land (i.e. inland + coastal) distance (Zone A1 + Zone A2) along the path considered.

μ_1 is limited to $\mu_1 \leq 1$.

$$\sigma = -0.6 - 8.5 \times 10^{-9} d_i^{3.1} \tau \quad (17)$$

σ is limited to $\sigma \geq -3.4$.

$$\mu_2 = \left(2.48 \times 10^{-4} d_i^2 \right)^\sigma \quad (18)$$

μ_2 is limited to $\mu_2 \leq 1$.

$$\mu_4 = \begin{cases} 10^{(-0.935 + 0.0176\zeta_r) \log \mu_1} & \text{for } \zeta \leq 70^\circ \\ 10^{0.3 \log \mu_1} & \text{for } \zeta > 70^\circ \end{cases} \quad (19)$$

3.2.2.2g Path-dependent incidence of ducting, β , and the related parameter, Γ_1 , that are used to calculate time dependency of the path loss are given as:

$$\beta = \beta_e \cdot \mu_1 \cdot \mu_2 \cdot \mu_4 \quad (20)$$

$$\Gamma_1 = \frac{1.076}{(2.0058 - \log \beta)^{1.012}} \exp \left(- \left(9.51 - 4.8 \log \beta + 0.198 (\log \beta)^2 \right) \times 10^{-6} d_i^{1.13} \right) \quad (21)$$

NOTE 1 – For coordination of terrestrial mobile transmitting stations, fixed stations and transmitting earth stations, the mitigation factor C_{2i} was set equal to zero.

3.2.2.2h Distance-dependent part of the loss (dB) for ducting:

$$L_5(p) = (\gamma_d + \gamma_g) d_i + (1.2 + 3.7 \times 10^{-3} d_i) \log \left(\frac{p}{\beta} \right) + 12 \left(\frac{p}{\beta} \right)^{\Gamma_1} + C_{2i} \quad (22)$$

where:

p : the maximum percentage of time for which the permissible interference power may be exceeded; $p = 0.3\%$

γ_d : the frequency-dependent ducting specific attenuation (dB/km).

$$\gamma_d = 0.05 f^{1/3} \quad (23)$$

3.2.2.2i Attenuation due to ducting:

$$A_{duct} = A_1 + L_5(p) \quad (24)$$

3.2.3 For the tropospheric scatter model

3.2.3.1 Distance-independent part of the loss (dB) for tropospheric scatter

$$A_2 = 187.36 + 10\epsilon_h + L_f - 0.15N_0 - 10.1 \left(-\log \left(\frac{p}{50} \right) \right)^{0.7} \quad (25)$$

where:

ϵ_h : earth station horizon elevation angle (degrees)

N_0 : path centre sea level surface refractivity given as:

$$N_0 = 330 + 62.6 e^{-\left(\frac{\zeta - 2}{32.7} \right)^2} \quad (26)$$

L_f : the frequency-dependent part of the loss (dB), given as:

$$L_f = 25 \log(f) - 2.5 \left(\log \left(\frac{f}{2} \right) \right)^2 \quad (27)$$

3.2.3.2 Distance-dependent part of the loss (dB) for tropospheric scatter

$$L_6(p) = 20 \log(d_i) + 5.73 \times 10^{-4} (112 - 15 \cos(2\zeta)) d_i + (\gamma_0 + \gamma_{wt}) d_i + C_{2i} \quad (28)$$

Total attenuation due to tropospheric scatter:

$$A_{trop} = A_2 + L_6(p) \quad (29)$$

3.2.3.3 Minimum path loss

The minimum path loss, A_{min} , between the site of the interfering transmitter and the edge of the BSS service area is given by:

$$A_{min} = \min(A_{duct}, A_{trop}) \quad (30)$$

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ANNEX 4 (Rev.WRC-03)

Need for coordination of a transmitting space station in the fixed-satellite service or in the broadcasting-satellite service where this service is not subject to a Plan: in Region 2 (11.7-12.2 GHz) with respect to the Plan, the List or proposed new or modified assignments in the List for Regions 1 and 3; in Region 1 (12.5-12.7 GHz) and in Region 3 (12.2-12.7 GHz) with respect to the Plan or proposed modifications to the Plan in Region 2; in Region 3 (12.2-12.5 GHz) with respect to the Plan, List or proposed new or modified assignments in the List for Region 1

(See Article 7)

With respect to § 7.1 and 7.2 of Article 7, coordination of a transmitting space station in the fixed-satellite service (FSS) (space-to-Earth) of Region 2 or Region 3 or in the broadcasting-satellite service (BSS) not subject to a Plan in Region 3 is required when, under assumed free-space propagation conditions, the power flux-density over any portion of the service area of the overlapping frequency assignments in the BSS of an administration in Region 1 or Region 3 exceeds the following values:

$$-147 \text{ dB(W/(m}^2 \cdot 27 \text{ MHz))} \quad \text{for } 0^\circ \leq \theta < 0.23^\circ$$

$$-135.7 + 17.74 \log \theta \text{ dB(W/(m}^2 \cdot 27 \text{ MHz))} \quad \text{for } 0.23^\circ \leq \theta < 2.0^\circ$$

$$-136.7 + 1.66 \theta^2 \text{ dB(W/(m}^2 \cdot 27 \text{ MHz))} \quad \text{for } 2.0^\circ \leq \theta < 3.59^\circ$$

$$-129.2 + 25 \log \theta \text{ dB(W/(m}^2 \cdot 27 \text{ MHz))} \quad \text{for } 3.59^\circ \leq \theta < 10.57^\circ$$

$$-103.6 \text{ dB(W/(m}^2 \cdot 27 \text{ MHz))} \quad \text{for } 10.57^\circ \leq \theta$$

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

In the case of an administration in Region 3 that has notified and brought into use its BSS Plan assignments before 9 June 2003, and whose notified assignments have been recorded in the Master Register with a favourable finding and for which the date of bringing into use has been

confirmed to the Bureau, with respect to § 7.2.1 a) of Article 7, the conditions contained above are replaced by the following conditions:

- under assumed free-space propagation conditions, the power flux-density at any test point within the service area of the overlapping frequency assignments in the Plan does not exceed the following values^{21A}:

$$-147 \text{ dB(W/(m}^2 \cdot 27 \text{ MHz))} \quad \text{for } 0^\circ \leq \theta < 0.23^\circ$$

$$-135.7 + 17.74 \log \theta \text{ dB(W/(m}^2 \cdot 27 \text{ MHz))} \quad \text{for } 0.23^\circ \leq \theta < 1.8^\circ$$

$$-134.0 + 0.89 \theta^2 \text{ dB(W/(m}^2 \cdot 27 \text{ MHz))} \quad \text{for } 1.8^\circ \leq \theta < 5.0^\circ$$

$$-129.2 + 25 \log \theta \text{ dB(W/(m}^2 \cdot 27 \text{ MHz))} \quad \text{for } 5.0^\circ \leq \theta < 10.57^\circ$$

$$-103.6 \text{ dB(W/(m}^2 \cdot 27 \text{ MHz))} \quad \text{for } 10.57^\circ \leq \theta$$

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

With respect to § 7.1 and 7.2 of Article 7, coordination of a transmitting space station in the FSS (space-to-Earth) in Region 1 or 3 or BSS not subject to a Plan in Region 3 is required when, under assumed free-space propagation conditions, the power flux-density over any portion of the service area of the overlapping frequency assignments in the BSS of an administration in Region 2 exceeds the following values:

$$-147 \text{ dB(W/(m}^2 \cdot 27 \text{ MHz))} \quad \text{for } 0^\circ \leq \theta < 0.23^\circ$$

$$-135.7 + 17.74 \log \theta \text{ dB(W/(m}^2 \cdot 27 \text{ MHz))} \quad \text{for } 0.23^\circ \leq \theta < 1.8^\circ$$

$$-134.0 + 0.89 \theta^2 \text{ dB(W/(m}^2 \cdot 27 \text{ MHz))} \quad \text{for } 1.8^\circ \leq \theta < 5.0^\circ$$

$$-129.2 + 25 \log \theta \text{ dB(W/(m}^2 \cdot 27 \text{ MHz))} \quad \text{for } 5.0^\circ \leq \theta < 10.57^\circ$$

$$-103.6 \text{ dB(W/(m}^2 \cdot 27 \text{ MHz))} \quad \text{for } 10.57^\circ \leq \theta$$

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

^{21A} For the protection of analogue assignments brought into service before 17 October 1997, the following values shall be used until 1 January 2015:

$$-147 \text{ dB(W/(m}^2 \cdot 27 \text{ MHz))} \quad \text{for } 0^\circ \leq \theta < 0.44^\circ$$

$$-138 + 25 \log \theta \text{ dB(W/(m}^2 \cdot 27 \text{ MHz))} \quad \text{for } 0.44^\circ \leq \theta < 9^\circ$$

ANNEX 5

**Technical data used in establishing the provisions and associated Plans
and the Regions 1 and 3 List, which should be used
for their application²² (WRC-2000)**

MOD**3.4 Protection ratio between television signals**

For developing the original 1977 broadcasting-satellite service Plan for Regions 1 and 3, the following protection ratios were used^{27, 28}:

- 31 dB for co-channel signals;
- 15 dB for adjacent channel signals.

For revising this Plan at WRC-97, the following aggregate downlink protection ratios were specified in Recommendation ITU-R BO.1297 for the purpose of calculating downlink equivalent protection margins^{28, 29, 30}:

- 24 dB for co-channel signals;
- 16 dB for adjacent channel signals.

In revising the Regions 1 and 3 Plan at WRC-97, the following aggregate overall protection ratio values were used for calculating the overall co-channel and adjacent-channel protection margins as defined in § 1.8 and 1.9:

- 23 dB for co-channel signals;
- 15 dB for adjacent channel signals.

It was also specified that for the revision of the Regions 1 and 3 Plan, no overall co-channel single entry C/I should be lower than 28 dB.

However, for the assignments notified, which are in conformity with this Appendix, brought into use, and for which the date of bringing into use has been confirmed to the Bureau before 27 October 1997, the overall equivalent protection margins were calculated using a co-channel overall protection ratio of 30 dB and lower and upper overall adjacent channel protection ratios of 14 dB³¹.

WRC-2000 adopted, for the protection of digital assignments from digital emissions, the following protection ratio values to be applied for calculation of downlink equivalent protection margins of the WRC-2000 Regions 1 and 3 Plan:

- 21 dB for co-channel signals;
- 16 dB for adjacent channel signals.

During planning at WRC-2000, these values were used for all assignments of the Regions 1 and 3 Plan and List except those for which WRC-2000 adopted different values used in the planning process³².

Revision of the Regions 1 and 3 Plan at WRC-97 and planning at WRC-2000 were generally based on a set of reference parameters such as the average e.i.r.p., the reference earth station receiving antenna, all test points placed within the -3 dB contour, a bandwidth of 27 MHz and the predetermined value of C/N . The Regions 1 and 3 Plan as established by WRC-2000 is generally based on the use of digital modulation.

Protection masks and associated calculation methods for interference into broadcasting satellite systems involving digital emissions shall be in accordance with Recommendation ITU-R BO.1293-2 (Annexes 1 and 2^{32A}).

In Region 2, the following protection ratios have been adopted for the purpose of calculating the overall equivalent protection margin^{32B}:

- 28 dB for co-channel signals;
- 13.6 dB for adjacent-channel signals;
- -9.9 dB for second adjacent-channel signals.

In Region 2, as a guide for planning, the reduction in the overall C/I ratio due to co-channel interference in the feeder link is taken as equivalent to a degradation in the downlink co-channel C/I ratio of approximately 0.5 dB not exceeded for 99% of the worst month; however, the feeder-link and downlink Plans are evaluated on the basis of the overall equivalent protection margin, which includes the combined downlink and feeder-link contributions.

In Region 2, an overall equivalent protection margin of 0 dB, or greater, indicates that the individual protection ratios have been met for the co-channel, the adjacent channels and the second adjacent channels. (WRC-03)

ADD

^{32A} Annex 3 of this Recommendation may be applied only in compatibility analysis for bilateral coordination between administrations. (WRC-03)

ADD

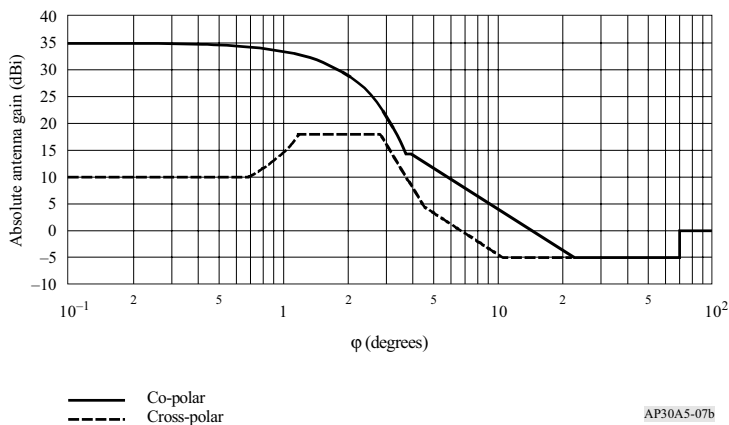
^{32B} The definitions in § 1.7, 1.8, 1.9, 1.10 and 1.11 of this Annex apply to these calculations. (WRC-03)

3.7.2 Receiving antenna reference patterns

MOD

FIGURE 7bis

Reference receiving earth station antenna patterns used at WRC-97 for revising the Regions 1 and 3 broadcasting-satellite service Plan



Co-polar pattern:

$$G_{co}(\phi) = G_{max} - 2.5 \times 10^{-3} \left(\frac{D}{\lambda} \phi \right)^2 \quad \text{for } 0 \leq \phi < \phi_m$$

where:

$$\phi_m = \frac{\lambda}{D} \sqrt{\frac{G_{max} - G_1}{0.0025}}$$

$$G_{co}(\phi) = G_1 = 29 - 25 \log \phi_r \quad \text{for } \phi_m \leq \phi < \phi_r$$

where:

$$\phi_r = 95 \frac{\lambda}{D}$$

$$G_{co}(\phi) = 29 - 25 \log \phi \quad \text{for } \phi_r \leq \phi < \phi_b$$

where:

$$\phi_b = 10^{(34/25)}$$

$$G_{co}(\varphi) = -5 \text{ dBi}$$

$$\text{for } \varphi_b \leq \varphi < 70^\circ$$

$$G_{co}(\varphi) = 0 \text{ dBi}$$

$$\text{for } 70^\circ \leq \varphi < 180^\circ$$

Cross-polar pattern:

$$G_{cross}(\varphi) = G_{max} - 25$$

$$\text{for } 0 \leq \varphi < 0.25 \varphi_0$$

where:

$$\varphi_0 = 2 \frac{\lambda}{D} \sqrt{\frac{3}{0.0025}} = 3 \text{ dB beamwidth}$$

$$G_{cross}(\varphi) = G_{max} - 25 + 8 \left(\frac{\varphi - 0.25 \varphi_0}{0.19 \varphi_0} \right)$$

$$\text{for } 0.25 \varphi_0 \leq \varphi < 0.44 \varphi_0$$

$$G_{cross}(\varphi) = G_{max} - 17$$

$$\text{for } 0.44 \varphi_0 \leq \varphi < \varphi_0$$

$$G_{cross}(\varphi) = G_{max} - 17 - C \left| \frac{\varphi - \varphi_0}{\varphi_1 - \varphi_0} \right|$$

$$\text{for } \varphi_0 \leq \varphi < \varphi_1$$

where:

λ : wavelength corresponding to 12.1 GHz (m)

$$C = 21 - 25 \log \varphi_1 - (G_{max} - 17)$$

$$\varphi_1 = \frac{\varphi_0}{2} \sqrt{10.1875}$$

$$G_{cross}(\varphi) = 21 - 25 \log \varphi$$

$$\text{for } \varphi_1 \leq \varphi < \varphi_2$$

where:

$$\varphi_2 = 10^{(26/25)}$$

$$G_{cross}(\varphi) = -5 \text{ dBi}$$

$$\text{for } \varphi_2 \leq \varphi < 70^\circ$$

$$G_{cross}(\varphi) = 0 \text{ dBi}$$

$$\text{for } 70^\circ \leq \varphi < 180^\circ$$

The reference frequency used in calculations for this antenna pattern = 12.1 GHz.

For the 0.60 m antenna pattern, which was used as a reference receiving antenna in replanning the absolute gain of 35.5 dBi was applied. (WRC-03)

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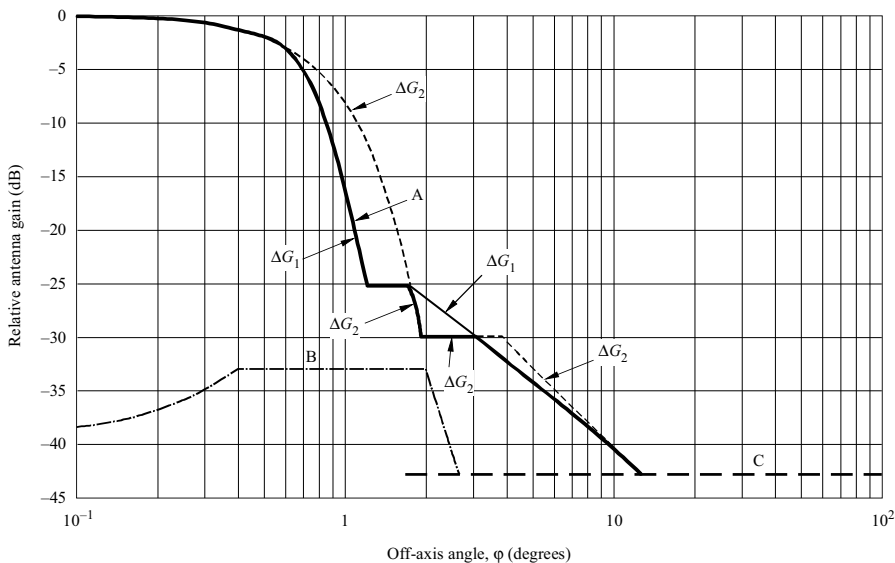
3.9.4 The guardbands at both the lower and upper edges may be used to provide space operation functions in accordance with No. 1.23 in support of the operation of geostationary-satellite networks in the broadcasting-satellite service. (WRC-03)

3.13.3 Transmitting antenna reference patterns

MOD

FIGURE 13 (WRC-2000)

Improved fast roll-off satellite transmitting antenna pattern for Regions 1 and 3



- Regions 1 and 3 transmitting fast roll-off co-polar (Curve ΔG_1)
- Improved fast roll-off co-polar (Curve A defined as ΔG below)
- Regions 1 and 3 transmitting co-polar (Curve ΔG_2)
- · - · - Improved fast roll-off cross-polar (Regions 1 and 3 transmitting cross-polar) (Curve B)
- — — Curve C (minus the on-axis gain)

Note 1 – The diagram gives the example curves in the case of a satellite antenna beamwidth of $\phi_0 = 1.2^\circ$ (circular).

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Curve A: co-polar relative gain (dB relative to main beam gain):

$$\Delta G = \min(\Delta G_1, \Delta G_2)$$

where:

$$\Delta G_1 = -12(\phi/\phi_0)^2 \quad \text{for } 0 \leq (\phi/\phi_0) \leq 0.5$$

$$\Delta G_1 = -12 \left(\frac{\frac{\varphi}{\varphi_0} - x}{\frac{B_{min}}{\varphi_0}} \right)^2 \quad \text{for } 0.5 < (\varphi/\varphi_0) \leq \left(\frac{1.45}{\varphi_0} B_{min} + x \right)$$

$$\Delta G_1 = -25.23 \quad \text{for } \left(\frac{1.45}{\varphi_0} B_{min} + x \right) < (\varphi/\varphi_0) \leq 1.45 \quad (\text{WRC-03})$$

$$\Delta G_1 = -(22 + 20 \log(\varphi/\varphi_0)) \quad \text{for } (\varphi/\varphi_0) > 1.45$$

$$\Delta G_1 = -(G_{on-axis}) \quad \text{after intersection with Curve C}$$

$$\Delta G_2 = -12(\varphi/\varphi_0)^2 \quad \text{for } 0 \leq \varphi \leq 1.58 \varphi_0$$

$$\Delta G_2 = -30 \quad \text{for } 1.58 \varphi_0 < \varphi \leq 3.16 \varphi_0$$

$$\Delta G_2 = -(17.5 + 25 \log(\varphi/\varphi_0)) \quad \text{for } \varphi > 3.16 \varphi_0$$

$$\Delta G_2 = -(G_{on-axis}) \quad \text{after intersection with Curve C}$$

Curve B: cross-polar relative gain (dB):

$$-\left(40 + 40 \log \left| \frac{\varphi}{\varphi_0} - 1 \right| \right) \quad \text{for } 0 \leq \varphi \leq 0.33 \varphi_0$$

$$-33 \quad \text{for } 0.33 \varphi_0 < \varphi \leq 1.67 \varphi_0$$

$$-\left(40 + 40 \log \left| \frac{\varphi}{\varphi_0} - 1 \right| \right) \quad \text{for } \varphi > 1.67 \varphi_0$$

$$-(G_{on-axis}) \quad \text{after intersection with Curve C}$$

Curve C: minus the on-axis gain (Curve C in this Figure illustrates the particular case of an antenna with an on-axis gain of 42.8 dBi)

where:

φ : off-axis angle (degrees)

φ_0 : cross-sectional half-power beamwidth in the direction of interest (degrees)

B_{min} : 0.6° for Regions 1 and 3

$$x = 0.5 \left(1 - \frac{B_{min}}{\varphi_0} \right)$$

ANNEX 6³⁹**Criteria for sharing between services****ADD****Part A – Technical bases for the criteria for interregional sharing between space services in Annexes 1 and 4 of this Appendix (WRC-03)**

The revised interregional sharing criteria in the bands governed by Appendix 30 are based nominally on the following assumptions.

1 Reference assumptions regarding earth station antenna patterns

1.1 For earth station antennas with diameters between 0.45 m and 2.40 m, the gain of the side lobes given by Recommendation ITU-R BO.1213 were used.

For the patterns of earth station antennas with diameters greater than 2.40 m, the gain of the side lobes given by Recommendation ITU-R S.580-5, with a $(29 - 25 \log \theta)$ side-lobe envelope, complemented by the main-lobe given in Annex 3 to Appendix 8, were used. θ is the off-axis angle in degrees.

1.2 For the broadcasting-satellite service and fixed-satellite service earth stations, an antenna efficiency of 65% was used at a frequency of 11.7 GHz.

2 Antenna diameters and noise temperatures

The range of antenna diameters and associated noise temperatures considered for the protection of the fixed-satellite service and the broadcasting-satellite service on an interregional basis are given in the following Table:

Receive earth station antenna diameter (m)	0.45 ⁽¹⁾	0.60	0.80	1.20	2.40	5 ⁽²⁾	8 ⁽²⁾	11 ⁽²⁾
Receive earth station noise temperature (K)	110	110	125	150	150	200	250	250
Total link noise temperature (K)	174	174	198	238	238	317	396	396

⁽¹⁾ This antenna diameter applies in certain cases (see Annexes 1, 3 and 4 of this Appendix).

⁽²⁾ This antenna diameter does not apply for broadcasting-satellite service.

The total link noise temperature was calculated from the receive earth station noise temperature (which includes the antenna temperature, the receive amplifier temperature and the noise increase resulting from feeder losses), and adding 2 dB to take account of all other sources of noise (uplink noise, geostationary-satellite orbit interference, cross polarization isolation and frequency reuse interference).

3 Protection criteria

The power flux-density masks developed in Sections 1, 3 and 6 of Annex 1 and in Annex 4 to this Appendix have been determined by setting at 6% the allowable relative noise increase ($\Delta T/T$), for the earth station antenna characteristics given in the above Table.

The allowable interfering power flux-density was calculated by the following expression:

$$PFD_{at}(\theta) = 10 \log (\Delta T/T) + 10 \log (k T b_{rf}) + G_m - G_a(\varphi)$$

where:

$PFD_{at}(\theta)$: allowable level of interfering power flux-density for an orbital separation of θ°

$\Delta T/T$: allowable relative increase in receive link noise = 6%

k : Boltzmann's constant (1.38×10^{-23} J/K)

T : receive link noise temperature (K) (see Table in Section 2 above)

b_{rf} : reference bandwidth (27 MHz in Regions 1 and 3; 24 MHz in Region 2)

G_m : gain for a 1 m² effective aperture (dBi/m²)

$G_a(\varphi)$: receive antenna gain for topocentric angle of φ (dBi)

φ : topocentric angle (degrees) between the interfering and the wanted satellite, as defined in Annex 1 of Appendix 8.

4 Power flux-density levels for fixed-satellite service and broadcasting-satellite service with specific antenna diameters

The Table below contains power flux-density levels derived for fixed-satellite service and broadcasting-satellite service earth stations with specific antenna diameters for the characteristics defined in § 1, 2 and 3 above. These levels were used to develop the power flux-density masks in Sections 1, 3 and 6 of Annex 1 and in Annex 4 of this Appendix by taking the envelope of the individual pfd masks for the relevant antenna diameters.

Orbital separation between wanted and interfering space stations (degrees)	power flux-density level in dB(W/(m ² · 27 MHz)) corresponding to different antenna diameters							
	0,45 m ⁽¹⁾	0,60 m	0,80 m	1,20 m	2,40 cm	5 m ⁽²⁾	8 m ⁽²⁾	11 m ⁽²⁾
0°	−134.2	−136.7	−138.7	−141.4	−147.4	−152.5	−155.7	−158.4
θ > 0°	For any value of the orbital separation θ between the wanted and interfering space stations, the applicable power flux-density should be relaxed from the value corresponding to 0° orbital separation by adding the off-axis antenna discrimination, as calculated under the assumptions in § 1 above							

⁽¹⁾ This antenna diameter applies to certain cases (see Annexes 1, 3 and 4 of this Appendix).

⁽²⁾ This antenna diameter does not apply for broadcasting satellite service.

ADD

Part B – Sharing criteria used in establishing the WARC SAT-77 Plan (WRC-03)

MOD

ANNEX 7 (Rev.WRC-03)

Orbital position limitations

A In applying the procedure of Article 4 for proposed modifications to the Region 2 Plan or for proposed new or modified assignments in the Regions 1 and 3 List, administrations should observe the following criteria:

- 1) No broadcasting satellite serving an area in Region 1 and using a frequency in the band 11.7-12.2 GHz shall occupy a nominal orbital position further west than 37.2° W or further east than 146° E.
- 2) No broadcasting satellite serving an area in Region 2 that involves an orbital position different from that contained in the Region 2 Plan shall occupy a nominal orbital position:
 - a) further east than 54° W in the band 12.5-12.7 GHz; *or*
 - b) further east than 44° W in the band 12.2-12.5 GHz; *or*
 - c) further west than 175.2° W in the band 12.2-12.7 GHz.

However, modifications necessary to resolve possible incompatibilities during the incorporation of the Regions 1 and 3 feeder-link Plan into the Radio Regulations shall be permitted.

- 3) The purpose of the following orbital position and e.i.r.p. limitations is to preserve access to the geostationary-satellite orbit by the Region 2 fixed-satellite service in the band 11.7-12.2 GHz. Within the orbital arc of the geostationary-satellite orbit between 37.2° W and 10° E, the orbital position associated with any proposed new or modified assignment in the Regions 1 and 3 List of additional uses shall lie within one of the portions of the orbital arc listed in Table 1. The e.i.r.p. of such assignments shall not exceed 56 dBW, except at the positions listed in Table 2.

TABLE 1

Allowable portions of the orbital arc between 37.2° W and 10° E for new or modified assignments in the Regions 1 and 3 Plan and List

Orbital position	37.2° W to 36° W	33.5° W to 32.5° W	30° W to 29° W	26° W to 24° W	20° W to 18° W	14° W to 12° W	8° W to 6° W	4° W ¹	2° W to 0°	4° E to 6° E	9° E ¹
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¹ Proposed new or modified assignments in the List which involve this orbital position shall not exceed the power flux-density limit $-138 \text{ dB(W/(m}^2 \cdot 27 \text{ MHz))}$ at any point in Region 2.

TABLE 2

Nominal positions in the orbital arc between 37.2° W and 10° E at which the e.i.r.p. may exceed the limit of 56 dBW

Orbital position	37° W $\pm 0.2^\circ$	33.5° W	30° W	25° W $\pm 0.2^\circ$	19° W $\pm 0.2^\circ$	13° W $\pm 0.2^\circ$	7° W $\pm 0.2^\circ$	4° W ¹	1° W $\pm 0.2^\circ$	5° E $\pm 0.2^\circ$	9° E ¹
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¹ Proposed new or modified assignments in the List which involve this orbital position shall not exceed the power flux-density limit $-138 \text{ dB(W/(m}^2 \cdot 27 \text{ MHz))}$ at any point in Region 2.

B The Region 2 Plan is based on the grouping of the space stations in nominal orbital positions of $\pm 0.2^\circ$ from the centre of the cluster of satellites. Administrations may locate those satellites within a cluster at any orbital position within that cluster, provided they obtain the agreement of administrations having assignments to space stations in the same cluster. (See § 4.13.1 of Annex 3 to Appendix 30A.)

MOD

APPENDIX 30A (Rev.WRC-03)*

**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 of the Radio Regulations) (WRC-03)

ADD

* The expression “frequency assignment to a space station”, wherever it appears in this Appendix, shall be understood to refer to a frequency assignment associated with a given orbital position. (WRC-03)

MOD

¹ The Regions 1 and 3 feeder-link List of additional uses is annexed to the Master International Frequency Register (see Resolution 542 (WRC-2000)). (WRC-03)

ARTICLE 1 (WRC-2000)

General definitions

MOD

1.10 *Regions 1 and 3 feeder-link List of additional uses (hereafter called in short the “feeder-link List”):* The list of assignments for additional uses in Regions 1 and 3 as established by WRC-2000 (see Resolution 542 (WRC-2000)), as updated following the successful application of the procedure of § 4.1 of Article 4. (WRC-03)

ADD

1.11 *Frequency assignment in conformity with the feeder-link List:* Any frequency assignment which appears in the feeder-link List as updated following successful application of § 4.1 of Article 4. (WRC-03)

ADD

1.12 *Broadcasting-satellite service (BSS) feeder link subject to one of the Plans:* The BSS feeder-link subject to one of the Plans referred to in this Appendix is the BSS feeder link in the frequency bands 14.5-14.8 GHz and 17.3-18.1 GHz in Regions 1 and 3 and 17.3-17.8 GHz in Region 2. (WRC-03)

ARTICLE 2

Frequency bands

SUP

2.2

ADD

ARTICLE 2A (WRC-03)

Use of the guardbands

2A.1 The use of the guardbands defined in § 3.1 and 4.1 of Annex 3 of this Appendix to provide space operation functions in accordance with No. **1.23** in support of the operation of geostationary-satellite networks for the broadcasting-satellite service (BSS) feeder link shall be coordinated with assignments of the BSS feeder link subject to a Plan using the provisions of Article 7 of this Appendix.

2A.2 Coordination among assignments intended to provide the space operation functions and services not subject to a Plan shall be effected using the provisions of Nos. **9.7, 9.17, 9.17A, 9.18**, and the associated provisions of Section II of Article **9**, as appropriate. Advance publication information is not required. Coordination of modifications to the Region 2 feeder-link Plan or assignments to be included in the Regions 1 and 3 feeder-link List, with assignments intended to provide these functions shall be effected using § 4.1.1 *d*) of Article 4 of this Appendix.

2A.3 Any assignments intended to provide these functions in support of a geostationary-satellite network for the BSS feeder link whose assignments are submitted under Article 4 of this Appendix shall be brought into use within the regulatory time-limit of the corresponding BSS feeder-link assignments submitted under Article 4 of this Appendix.

2A.4 Any assignments intended to provide these functions for the initial Plans (Region 2 Plans incorporated in the Radio Regulations at WARC Orb-85 and Regions 1 and 3 Plan adopted at WRC-2000), shall be brought into use within the regulatory time-limit referred to in § 4.1.3 or 4.2.6 of this Appendix from the date of receipt by the Bureau of the complete Appendix **4** data.

2A.5 Assignments intended to provide the above-mentioned functions shall be notified under Article **11**.

ARTICLE 3 (WRC-2000)

Execution of the provisions and associated Plans**MOD**

3.3 The procedures for the use of interim systems in Region 2 for feeder links in the fixed-satellite service for the bands covered by this Appendix are given in Resolution **42 (Rev.WRC-03)**. (WRC-03)

ARTICLE 4 (WRC-2000)

**Procedures for modifications to the Region 2 feeder-link Plan
or for additional uses in Regions 1 and 3****MOD**

4.1.1 An administration proposing to include a new or modified assignment in the feeder-link List shall seek the agreement of those administrations whose services are considered to be affected, i.e. administrations^{4, 4A}:

- a) of Regions 1 and 3 having a feeder-link frequency assignment in the fixed-satellite service (Earth-to-space) to a space station in the broadcasting-satellite service which is included in the Regions 1 and 3 feeder-link Plan with a necessary bandwidth, any portion of which falls within the necessary bandwidth of the proposed assignment; *or*
- b) of Regions 1 and 3 having a feeder-link frequency assignment included in the feeder-link List or for which complete Appendix 4 information has been received by the Radiocommunication Bureau in accordance with the provisions of § 4.1.3, and any portion of which falls within the necessary bandwidth of the proposed assignment; *or*
- c) of Region 2 having a feeder-link frequency assignment in the fixed-satellite service (Earth-to-space) to a space station in the broadcasting-satellite service which is in conformity with the Region 2 feeder-link Plan, or in respect of which proposed modifications to that Plan have already been received by the Bureau in accordance with the provisions of § 4.2.6 with a necessary bandwidth, any portion of which falls within the necessary bandwidth of the proposed assignment; *or*
- d) having a feeder-link frequency assignment in the band 17.8-18.1 GHz in Region 2 in the fixed-satellite service (Earth-to-space) to a space station in the broadcasting-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 § 7.1 of Article 7, with a necessary bandwidth, any portion of which falls within the necessary bandwidth of the proposed assignment. (WRC-03)

ADD

^{4A} Coordination under Nos. **9.17** or **9.17A** is not required for an earth station of an administration on the territory of which this earth station is located and for which the procedures of former § 4.2.1.2 and 4.2.1.3 of Appendix **30A (WRC-97)** have been successfully applied by that administration before 3 June 2000 in respect of terrestrial stations or earth stations operating in the opposite direction of transmission. (WRC-03)

MOD

4.1.3 An administration, or one^{4B} acting on behalf of a group of named administrations, intending to include a new or modified assignment in the feeder-link List shall send to the Bureau, not earlier than eight years but preferably not later than two years before the date on which the assignment is to be brought into use, the relevant information listed in Appendix **4**. An assignment in the feeder-link List shall lapse if it is not brought into use by that date.⁵ A proposed new or modified assignment not included in the List by that date⁵ shall also lapse. (WRC-03)

ADD

^{4B} Whenever, under this provision, an administration acts on behalf of a group of named administrations, all members of that group retain the right to respond in respect of their own networks or systems. (WRC-03)

MOD

⁵ The provisions of Resolution **533 (Rev.WRC-2000)** apply. (WRC-03)

ADD

4.1.3*bis* The regulatory time-limit for bringing into use an assignment in the List 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; *or*
- 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.

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^{5A}. In order to take advantage of this extension, the administration shall have, within one month of the launch failure or one month after 5 July 2003, 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 § 4.1.3:

- date of launch failure;

- due diligence information as required in Resolution **49 (Rev.WRC-03)** for the assignment with respect to the satellite that suffered the launch failure, if that information has not already been provided.

If, within one year of the request for extension, the administration has not provided to the Bureau updated Resolution **49 (Rev.WRC-03)** information for the new satellite under procurement, the related frequency assignments shall lapse. (WRC-03)

ADD

^{5A} For a launch failure which occurred before 5 July 2003, the maximum extension of three years shall apply as from 5 July 2003. (WRC-03)

MOD

⁶ 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 Council Decision 482 unless the payment has already been received (see also Resolution **87 (WRC-03)**). (WRC-03)

ADD

4.1.7bis Except as provided under § 4.1.18 to 4.1.20, any inclusion of a new or modified frequency assignment in the Regions 1 and 3 List which would have the effect of exceeding the limits specified in Annex 1 shall be subject to the agreement of all administrations whose services are considered to be affected. (WRC-03)

ADD

4.1.10bis Thirty days prior to the expiry of the same four-month period, the Bureau shall dispatch a reminder telegram or fax to an administration which has not made its comments under § 4.1.10, bringing the matter to its attention. (WRC-03)

ADD

4.1.10ter After expiry of the deadline for comments in respect of the proposed assignment, the Bureau shall, according to its records, publish a Special Section, indicating the list of administrations whose agreements are required for completion of the procedure of Article 4 of this Appendix. (WRC-03)

ADD

4.1.12bis In application of § 4.1.12, an administration may indicate the changes to the information communicated to the Bureau under § 4.1.3 and published under § 4.1.5. (WRC-03)

MOD

4.1.13 The agreement of the administrations affected may also be obtained in accordance with this Article, for a specified period. When this specific period of agreement expires for an assignment in the List, the assignment in question shall be maintained in the List until the end of the period referred to in § 4.1.3 above. After that date this assignment shall lapse unless the agreement of the administrations affected is renewed. (WRC-03)

MOD

4.1.15 The Bureau shall publish^{6A} in a Special Section of its BR IFIC the information received under § 4.1.12, together with the names of any administrations with which the provisions of this Article have been successfully applied. The frequency assignment concerned shall be included in the feeder-link List. (WRC-03)

ADD

^{6A} 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 Council Decision 482 unless the payment has already been received (see also Resolution **87 (WRC-03)**). (WRC-03)

MOD

4.1.18 If, in spite of the application of § 4.1.16 and 4.1.17, there is still continuing disagreement and the assignment which was the basis of the disagreement is not an assignment in the Regions 1 and 3 Plan, or in the Region 2 Plan or for which the procedure of § 4.2 of this Appendix has been initiated, and if the notifying administration insists that the proposed assignment be included in the Regions 1 and 3 feeder-link List, the Bureau shall provisionally enter the assignment in the Regions 1 and 3 feeder-link List with an indication of those administrations whose assignments were the basis of the disagreement; however, the entry shall be changed from provisional to definitive recording in the feeder-link List only if the Bureau is informed that the new assignment in the Regions 1 and 3 feeder-link List has been in use, together with the assignment which was the basis for the disagreement, for at least four months without any complaint of harmful interference being made. (WRC-03)

MOD

4.1.18*bis* When requesting the application of § 4.1.18, the notifying administration shall undertake to meet the requirements of § 4.1.20 and provide to the administration in respect of which § 4.1.18 is applied, with a copy to the Bureau, a description of the steps by which it undertakes to meet these requirements. Once an assignment is entered in the feeder-link List provisionally under the provisions of § 4.1.18, the calculation of the equivalent protection margin (EPM)^{6B} of an assignment in the Regions 1 and 3 feeder-link List or for which the procedure of Article 4 has been initiated and which was the basis for the disagreement shall not take into account interference produced by the assignment for which the provisions of § 4.1.18 have been applied. (WRC-03)

ADD

^{6B} For the definition of the EPM, see § 1.7 of Annex 3. (WRC-03)

MOD

4.1.19 Should the assignments that were the basis of the disagreement not be brought into use within the period specified in No. **11.44** (for non-planned services), or in § 4.1 (for assignments in the feeder-link List or having initiated the procedure under § 4.1), as appropriate, then the status of the assignment in the feeder-link List shall be reviewed accordingly. (WRC-03)

MOD

4.1.20 Should harmful interference be caused by an assignment included in the feeder-link List under § 4.1.18 to any recorded assignment in the Master Register which was the basis of the disagreement, the administration using the frequency assignment included in the feeder-link List under § 4.1.18 shall, upon receipt of advice thereof, immediately eliminate this harmful interference. (WRC-03)

MOD

4.1.23 When a frequency assignment included in the feeder-link List is no longer required, the administration concerned shall immediately so inform the Bureau. The Bureau shall publish this information in a Special Section of its BR IFIC and delete the assignment from the feeder-link List. (WRC-03)

MOD

4.1.24 No assignment in the feeder-link List shall have a period of operation exceeding 15 years, counted from the date of bringing into use, or 2 June 2000, whichever is later. Upon request by the responsible administration received by the Bureau at the latest three years before the expiry of this period, this period may be extended by up to 15 years, on condition that all the characteristics of the assignment remain unchanged. (WRC-03)

MOD

4.1.25 Where an administration already having included in the feeder-link List two assignments (not including those systems notified on behalf of a group of named administrations and included in the feeder-link List by WRC-2000) in the same channel and covering the same service area, proposes to include in the feeder-link List a new assignment in the same channel over this same service area, it shall apply the following in respect of another administration which has no assignment in the feeder-link List in the same channel and which proposes to include in the feeder-link List a new assignment:

- a) if the agreement of the former administration is required following the application of § 4.1 by the latter administration, in order to protect the new assignment proposed by the former administration from interference caused by the assignment proposed by the latter administration, both administrations shall make every possible effort to resolve the difficulties by means of mutually acceptable adjustments to their networks;

- b) in case of continuing disagreement, and if the former administration has not communicated to the Bureau the information specified in Annex 2 to Resolution 49 (Rev.WRC-03), this administration shall be deemed to have given its agreement to inclusion in the feeder-link List of the assignment of the latter administration. (WRC-03)

MOD

4.1.26 The procedure of this Article may be applied by the administration of a new ITU Member State in order to include new assignments in the feeder-link List. Upon completion of the procedure, the next world radiocommunication conference may be requested to consider, among the assignments included in the feeder-link List after the successful completion of this procedure, the inclusion in the Regions 1 and 3 feeder-link Plan of up to 10 channels (for Region 1) and up to 12 channels (for Region 3), over the national territory of the new Member State. (WRC-03)

MOD

4.1.27 When an administration has successfully applied this procedure and received all the agreements⁷ required to include in the feeder-link List assignments over its national territory, at an orbital location and/or in channels different from those appearing in the Regions 1 and 3 feeder-link Plan for its country, it may request the next world radiocommunication conference to consider the inclusion in this Plan of up to 10 (for Region 1) and up to 12 (for Region 3) of these assignments, in replacement of its assignments appearing in this Plan. (WRC-03)

ADD

4.1.27bis Should the assignments mentioned in § 4.1.26 and 4.1.27 over the national territory of the administration not be brought into use within the regulatory time-limit mentioned in § 4.1.3, they would be retained in the List until the end of the World Radiocommunication Conference following immediately after the successful completion of procedure referred to in § 4.1.26 and 4.1.27, respectively and thereafter they shall be removed from the List. (WRC-03)

MOD

4.1.28 The feeder-link List, as updated, shall be published periodically by the Bureau. (WRC-03)

MOD

4.1.29 New or modified assignments in the feeder-link List shall be limited to digital modulation. (WRC-03)

MOD

4.2.1 When an administration intends to make a modification to the Region 2 feeder-link Plan, i.e.:

- a) to modify the characteristics of any of its frequency assignments in the fixed-satellite service which are shown in the Region 2 feeder-link Plan, or for which the procedure in this Article has been successfully applied, whether or not the station has been brought into use;
or

- b) to include in the Region 2 feeder-link Plan a new frequency assignment in the fixed-satellite service; *or*
- c) to cancel a frequency assignment in the fixed-satellite service,

the following procedure shall be applied before any notification of the frequency assignment is made to the Bureau (see Article 5 and Resolution **42 (Rev.WRC-03)**). (WRC-03)

MOD

4.2.2 An administration proposing a modification to the characteristics of a frequency assignment in conformity with the Region 2 feeder-link Plan, or the inclusion of a new frequency assignment in that Plan, shall seek the agreement of those administrations^{8, 8A, 9}:

- a) having an assignment for feeder-links in the fixed-satellite service (Earth-to-space) which is in conformity with the Regions 1 and 3 feeder-link Plan with the necessary bandwidth, any portion of which falls within the necessary bandwidth of the proposed assignment; *or*
- b) of Regions 1 and 3 having a feeder-link frequency assignment included in the feeder-link List or for which complete Appendix 4 information has been received by the Bureau in accordance with the provisions of § 4.1.3, and any portion of which falls within the necessary bandwidth of the proposed assignment; *or*
- c) of Region 2 having a feeder-link frequency assignment in the fixed-satellite service (Earth-to-space) in the same channel or an adjacent channel, which appears in the Region 2 feeder-link Plan or in respect of which proposed modifications to this Plan have been received by the Bureau in accordance with the provisions of § 4.2.6;
- d) which are considered affected. (WRC-03)

ADD

^{8A} Coordination under No. **9.17** or **9.17A** is not required for an earth station of an administration on the territory of which this earth station is located and for which the procedures of former § 4.2.3.2 and 4.2.3.3 of Appendix **30A (WRC-97)** have been successfully applied by that administration before 3 June 2000 in respect of terrestrial stations or earth stations operating in the opposite direction of transmission. (WRC-03)

MOD

4.2.6 An administration, or one^{9A} acting on behalf of a group of named administrations, intending to make a modification to the Region 2 feeder-link Plan shall send to the Bureau, not earlier than eight years but preferably not later than two years before the date on which the assignment is to be brought into use, the relevant information listed in Appendix 4. Modifications to that Plan shall lapse if the assignment is not brought into use by that date^{9B}. A request for a modification that has not been included in that Plan by that date^{9B} shall also lapse. (WRC-03)

ADD

^{9A} Whenever, under this provision, an administration acts on behalf of a group of named administrations, all members of that group retain the right to respond in respect of their own networks or systems. (WRC-03)

ADD

^{9B} The provisions of Resolution **533 (Rev.WRC-2000)** apply. (WRC-03)

ADD

4.2.6bis The regulatory time-limit for bringing into use of an assignment in the Region 2 Plan obtained through application of § 4.2 may be extended once by no more than three years due to launch failure in the following cases:

- the destruction of the satellite intended to bring the assignment into use; *or*
- 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.

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^{9C}. In order to take advantage of this extension, the administration shall have, within one month of the launch failure or one month after 5 July 2003, 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 § 4.2.6:

- date of launch failure;
- due diligence information as required in Resolution **49 (Rev.WRC-03)** for the assignment with respect to the satellite that suffered the launch failure, if that information has not already been provided.

If, within one year of the request for extension, the administration has not provided to the Bureau updated Resolution **49 (Rev.WRC-03)** information for the new satellite under procurement, the related frequency assignments shall lapse. (WRC-03)

ADD

^{9C} For a launch failure which occurred before 5 July 2003, the maximum extension of three years shall apply as from 5 July 2003. (WRC-03)

MOD

¹⁰ 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 Council Decision 482 unless the payment has already been received (see also Resolution **87 (WRC-03)**). (WRC-03)

MOD

4.2.11 Except as provided under § 4.2.21A to 4.2.21D, any modification to a frequency assignment which is in conformity with the Region 2 feeder-link Plan or any inclusion in that Plan of a new frequency assignment which would have the effect of exceeding the limits specified in Annex 1 shall be subject to the agreement of all affected administrations. (WRC-03)

ADD

4.2.14*bis* Thirty days prior to the expiry of the same four-month period the Bureau shall dispatch a reminder telegram or fax to an administration which has not made its comments under § 4.2.14, bringing the matter to its attention. (WRC-03)

ADD

4.2.14*ter* After expiry of the deadline for comments in respect of the proposed assignment, the Bureau shall, according to its records, publish a Special Section, indicating the list of administrations whose agreements are required for completion of the procedure of Article 4 of this Appendix. (WRC-03)

ADD

4.2.16*bis* In application of § 4.1.16, an administration may indicate the changes to the information communicated to the Bureau under § 4.2.6 and published under § 4.2.8. (WRC-03)

MOD

4.2.17 The agreement of the administrations affected may also be obtained in accordance with this Article, for a specified period. When this specific period of agreement expires for an assignment in the Plan, the assignment in question shall be maintained in the Plan until the end of the period referred to in § 4.2.6 above. After that date this assignment in the Plan shall lapse unless the agreement of the administrations affected is renewed. (WRC-03)

MOD

4.2.19 The Bureau shall publish^{10A} in a Special Section of its BR IFIC the information received under § 4.2.16 together with the names of any administrations with which the provisions of this Article have been successfully applied. The frequency assignment concerned shall enjoy the same status as those appearing in the Region 2 feeder-link Plan and will be considered as a frequency assignment in conformity with that Plan. (WRC-03)

ADD

^{10A} 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 Council Decision 482 unless the payment has already been received (see also Resolution **87 (WRC-03)**). (WRC-03)

ADD

4.2.21A If, in spite of the application of § 4.2.20 and 4.2.21, there is still continuing disagreement and the assignment which was the basis of the disagreement is not an assignment in the Region 2 feeder-link Plan, or in the Regions 1 and 3 feeder-link Plan or List, or for which the procedure of § 4.1 or 4.2 of this Appendix has been initiated, and if the notifying administration insists that the proposed assignment be included in the Region 2 feeder-link Plan, the Bureau shall provisionally enter the assignment in the Region 2 feeder-link Plan with an indication of those administrations whose assignments were the basis of the disagreement; however, the entry shall be changed from provisional to definitive recording in the Region 2 feeder-link Plan only if the Bureau is informed that the new or modified assignment in the Region 2 feeder-link Plan has been in use, together with the assignment which was the basis for the disagreement, for at least four months without any complaint of harmful interference being made. (WRC-03)

ADD

4.2.21B When requesting the application of § 4.2.21A, the notifying administration shall undertake to meet the requirements of § 4.2.21D and provide to the administration in respect of which § 4.2.21A has been applied, with a copy to the Bureau, a description of the steps by which it undertakes to meet these requirements. (WRC-03)

ADD

4.2.21C Should the assignments that were the basis of the disagreement not be brought into use within the period specified in No. **11.44**, the status of the assignment in the Region 2 feeder-link Plan shall be reviewed accordingly. (WRC-03)

ADD

4.2.21D Should harmful interference be caused by an assignment included in the Region 2 feeder-link Plan under § 4.2.21A to any recorded assignment in the Master Register which was the basis of the disagreement, the administration using the frequency assignment included in the Region 2 feeder-link Plan under § 4.2.21A shall, upon receipt of advice thereof, immediately eliminate this harmful interference. (WRC-03)

ARTICLE 5 (Rev.WRC-03)

**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 service¹¹**

MOD

¹¹ 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 of this Appendix, shall be effected applying the provisions of Article 11 following completion of the procedure of Article 9. (WRC-03)

MOD

5.1.2 Whenever an administration^{11A} intends to bring into use a frequency assignment to a transmitting earth station or receiving space station in the fixed-satellite service in the bands between 14.5 GHz and 14.8 GHz and between 17.3 GHz and 18.1 GHz in Regions 1 and 3, and between 17.3 GHz and 17.8 GHz in Region 2, it shall notify this frequency assignment to the Bureau. For this purpose, the notifying administration shall apply the following provisions. (WRC-03)

ADD

^{11A} A frequency assignment to a space station or typical earth station in the satellite network may be notified by one administration acting on behalf of a group of named administrations. Any further notice (modification or deletion) relating to that assignment shall, in the absence of information to the contrary, be regarded as having been submitted on behalf of the entire group. (WRC-03)

ADD

5.1.2*bis* Frequency assignments relating to a number of earth stations may be notified in the form of the characteristics of a typical earth station and the intended geographical area of operation. Individual notices of frequency assignments are however necessary in the case of earth stations whose coordination area includes all or part of the territory of another administration. (WRC-03)

MOD

5.1.3 Before an administration in Region 1 or 3 notifies to the Bureau or brings into use any frequency assignment to a specific transmitting feeder-link earth station in the bands 14.5-14.8 GHz and 17.7-18.1 GHz with an e.i.r.p. greater than the sum of the values specified in columns 11 and 12 of the Regions 1 and 3 feeder-link Plan, it shall effect coordination of this assignment with each administration whose territory lies wholly or partly within the coordination area of the planned earth station using the method detailed in Appendix 7. (WRC-03)

MOD

5.1.4 Before an administration in Region 1 or 3 notifies to the Bureau or brings into use any frequency assignment to a specific transmitting feeder-link earth station in the bands 14.5-14.8 GHz and 17.7-18.1 GHz, it shall effect coordination of this assignment with each administration whose territory lies wholly or partly within the coordination area of the planned earth station, using the method detailed in Appendix 7, in respect of notices concerning stations of the mobile and fixed services in the bands 14.5-14.8 GHz and 17.7-18.1 GHz and of the fixed-satellite service (space-to-Earth) in the band 17.7-18.1 GHz received by the Bureau prior to 3 June 2000 for recording in the International Master Frequency Register (Master Register) and subsequently recorded with a favourable finding^{11B}. (WRC-03)

ADD

^{11B} In cases where assignments from the WRC-97 Plans without Remarks were included in the WRC-2000 Regions 1 and 3 feeder-link Plan without change, or with conversion of modulation from analogue to digital, or a change from normal roll-off to fast roll-off antenna pattern, the coordination status afforded by the WRC-97 Plans shall be preserved.

In cases where assignments from the WRC-97 Plans with Remarks were included in the WRC-2000 Regions 1 and 3 feeder-link Plan without change, or with conversion of modulation from analogue to digital, or a change from normal roll-off to fast roll-off antenna pattern, the compatibility shall be reassessed using the revised criteria and methodology in force and the Remarks of the WRC-97 Plans assignment shall either be maintained or reduced on the basis of the results of this analysis. (WRC-03)

ADD

5.1.6*bis* In application of § 5.1.2, an administration may identify the characteristics of assignments in the Plans or the List as notification and send to the Bureau the changes thereto. (WRC-03)

MOD

- b)* with respect to its conformity with the appropriate Regional feeder-link Plan or the Regions 1 and 3 feeder-link List, as appropriate; *or* (WRC-03)

MOD

- d)* with respect to its conformity with the appropriate Regional feeder-link Plan or the Regions 1 and 3 feeder-link List, however, having characteristics differing from those in this Plan or in the Regions 1 and 3 feeder-link List in one or more of the following aspects:

- use of a reduced e.i.r.p.,
- use of a reduced coverage area entirely situated within the coverage area appearing in the Plan or in the Regions 1 and 3 feeder-link List,

- use of other modulating signals in accordance with the provisions of § 3.1.3 to Annex 5 of Appendix 30,
 - in the case of Region 2, use of an orbital position under the conditions specified in § B of Annex 7 to Appendix 30,
 - in the case of Regions 1 and 3, use of the assignment for transmissions in the fixed-satellite service (Earth-to-space) other than for feeder links to the broadcasting-satellite service provided that such transmissions do not cause more interference, or require more protection from interference, than the feeder-link transmissions operating in conformity with the Plan or the List, as appropriate;
- e) for Region 2, with respect to its conformity with the provisions of Resolution 42 (Rev.WRC-03); (WRC-03)

SUP

12

MOD

5.2.2.2 In the case of Region 2, when the Bureau reaches a favourable finding with respect to § 5.2.1 a) and 5.2.1 c) but an unfavourable finding with respect to § 5.2.1 b) and 5.2.1 d), it shall examine the notice with respect to the successful application of the provisions of Resolution 42 (Rev.WRC-03). A frequency assignment for which the provisions of Resolution 42 (Rev.WRC-03) have been successfully applied shall be recorded in the Master Register with an appropriate symbol to indicate its interim status. The date of receipt of the notice by the Bureau shall be entered in Column 2d. In relations between administrations all frequency assignments brought into use following the successful application of the provisions of Resolution 42 (Rev.WRC-03) and recorded in the Master Register shall be considered to have the same status irrespective of the dates entered in Column 2d for such frequency assignments. If the finding with respect to § 5.2.1 e), where applicable, is unfavourable, the notice shall be returned immediately by airmail to the notifying administration. (WRC-03)

MOD

5.3.1 If an administration has not confirmed the bringing into use of a frequency assignment under § 5.2.8, the Bureau will make inquiries of the administration not earlier than six months after the expiry of the period specified in § 5.1.3. On receipt of the relevant information, the Bureau will either modify^{12A} the date of coming into use or cancel the entry. (WRC-03)

ADD

^{12A} See also § 4.1.3 or 4.2.6 of Article 4. (WRC-03)

MOD

ARTICLE 6 (Rev.WRC-03)

Coordination, notification and recording in the Master International Frequency Register of frequency assignments to receiving terrestrial stations in Regions 1 and 3 in the bands 14.5-14.8 GHz and 17.7-18.1 GHz, and in Region 2 in the band 17.7-17.8 GHz, when frequency assignments to feeder-link transmitting earth stations for the broadcasting-satellite service in conformity with the Regions 1 and 3 feeder-link Plan or the Region 2 feeder-link Plan^{12B} are involved^{12C}

ADD

^{12B} Only assignments included in the Region 2 feeder-link Plan before 3 June 2000 shall be taken into account. (WRC-03)

^{12C} These procedures do not replace the procedures prescribed for terrestrial stations in Articles 9 and 11. (WRC-03)

MOD

ARTICLE 7 (Rev.WRC-03)

Coordination, notification and recording in the Master International Frequency Register of frequency assignments to stations in the fixed-satellite service (space-to-Earth) in Region 1 in the band 17.3-18.1 GHz and in Regions 2 and 3 in the band 17.7-18.1 GHz to stations in the fixed-satellite service (Earth-to-space) in Region 2 in the band 17.8-18.1 GHz and to stations in the broadcasting-satellite service in Region 2 in the band 17.3-17.8 GHz when frequency assignments to feeder links for broadcasting-satellite stations in the 17.3-18.1 GHz band in Regions 1 and 3 or in the band 17.3-17.8 GHz in Region 2 are involved^{13A}

ADD

^{13A} These provisions do not replace the procedures prescribed in Articles 9 and 11 when stations other than those for feeder links in the broadcasting-satellite service subject to a Plan are involved. (WRC-03)

Section I – Coordination of transmitting space or earth stations in the fixed-satellite service or transmitting space stations in the broadcasting-satellite service with assignments to broadcasting-satellite service feeder links

MOD

7.1 The provisions of No. **9.7**¹⁴ and the associated provisions under Articles **9** and **11** are applicable to transmitting space stations in the fixed-satellite service in Region 1 in the band 17.3-18.1 GHz, to transmitting space stations in the fixed-satellite service in Regions 2 and 3 in the band 17.7-18.1 GHz, to transmitting earth stations in the fixed-satellite service in Region 2 in the band 17.8-18.1 GHz and to transmitting space stations in the broadcasting-satellite service in Region 2 in the band 17.3-17.8 GHz. (WRC-03)

MOD

7.2.1 The frequency assignments to be taken into account are:

- a) the assignments in conformity with the appropriate Regional feeder-link Plan in Appendix **30A**;
- b) the assignments included in the Regions 1 and 3 feeder-link List;
- c) the assignments for which the procedure of Article 4 has been initiated as from the date of receipt of the complete Appendix **4** information under § 4.1.3 or 4.2.6. (WRC-03)

Section III – Coordination with assignments in the Regions 1 and 3 feeder-link Lists, or for which the procedure of Article 4 has been initiated

MOD

7.9 The provisions of No. **9.17A** and the associated provisions under Articles **9** and **11** and Appendix **5** are applicable to fixed-satellite service and broadcasting-satellite service receiving earth stations, in respect of frequency assignments to transmitting broadcasting-satellite service feeder-link earth stations, in the fixed-satellite service in the bands 17.3-18.1 GHz in Regions 1 and 3 and 17.3-17.8 GHz in Region 2 which correspond to assignments to receiving broadcasting-satellite service feeder-link space stations already included in the Regions 1 and 3 feeder-link List, or for which the procedure of Article 4 has been initiated, as from the date of receipt of the complete Appendix **4** information. (WRC-03)

ARTICLE 9

**Plan for feeder links for the broadcasting-satellite service in
the fixed-satellite service in the frequency band
17.3-17.8 GHz in Region 2**

9.2 TEXT FOR NOTES IN REMARKS COLUMN OF THE PLAN

MOD

- a) The overall equivalent protection margin to be used for the application of Article 4 and Resolution 42 (Rev.WRC-03) shall be calculated on the following basis:
- for the calculation of interference to assignments that are part of a group, only the interference contributions from assignments that are not part of the same group are to be included; *and*
 - for the calculation of interference from assignments belonging to a group of assignments that are not part of that same group, only the worst interference contribution from that group shall be used on a test point to test point basis. (WRC-03)

ARTICLE 9A (Rev.WRC-03)

**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

9A.2 TEXT FOR NOTES IN THE REMARKS COLUMN OF THE
REGIONS 1 AND 3 FEEDER-LINK PLAN

ADD

9A.2 TEXT FOR NOTES IN THE REMARKS COLUMN OF THE
REGIONS 1 AND 3 FEEDER-LINK PLAN (WRC-03)

1 (Not used.)

2 (Not used.)

3 (Not used.)

4 (Not used.)

5 This assignment shall be brought into use only when the limits given in § 5 of Annex 1 are not exceeded, or with the agreement of the administrations identified in Table 1A, whose networks or beams listed in this Table may be affected with respect to assignments which are in conformity with the Region 2 feeder-link Plan on 12 May 2000 (see also Note to § 9A.2).

6 This assignment shall not claim protection from interference caused by the assignments which pertain to networks or beams identified in Table 1B which are in conformity with the Region 2 feeder-link Plan on 12 May 2000 (see also Note to § 9A.2).

7 This assignment shall not claim protection from interference caused by the assignments which pertain to networks or beams identified in Table 1B which are recorded in the Master Register with a favourable finding prior to 12 May 2000 (see also Note to § 9A.2).

The methodology and criteria for this analysis shall be those contained in § 1 of Annex 4, modified to take into consideration the system noise temperature of the received space station to be 600 K and to apply a $\Delta T/T$ criterion of 6%.

8 Provisional beam. These assignments have been included in the Regions 1 and 3 feeder-link Plan by WRC-97. These assignments are for exclusive use by Palestine, subject to the Israeli-Palestinian Interim Agreement of 28 September 1995, Resolution 741 of the Council notwithstanding and Resolution 99 (Minneapolis, 1998) of the Plenipotentiary Conference.

9 (Not used.)

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.

NOTE – In cases where assignments from the WRC-97 Plans without Remarks were included in the WRC-2000 Regions 1 and 3 feeder-link Plan without change, or with conversion of modulation from analogue to digital, or a change from normal roll-off to fast roll-off antenna characteristics, the coordination status afforded by the WRC-97 Plans shall be preserved.

In cases where assignments from the WRC-97 Plans with Remarks were included in the WRC-2000 Regions 1 and 3 feeder-link Plan without change, or with conversion of modulation from analogue to digital, or a change from normal roll-off to fast roll-off antenna pattern, the compatibility will be reassessed using the revised criteria and methodology of WRC-2000 and the Remarks of the WRC-97 Plans assignment will either be maintained or reduced on the basis of the results of this analysis.

In other cases, the methodology described in Notes 5 to 7 shall be applied.

TABLE 1A

Affected administrations and corresponding networks or beams identified based on Note 5 in § 9A.2 of Article 9A of this Appendix

Beam name	Channels	Affected administrations ¹	Affected networks or beams ¹
CPV30100	2, 4, 8, 10, 12	GUY JMC	GUY00302, JMC00005
CPV30100	6	JMC	JMC00005
G 02700	2, 4, 8, 10, 12	GUY JMC	GUY00302, JMC00005
G 02700	6	JMC	JMC00005
LBR24400	1	GUY	GUY00302
LBR24400	3, 9, 13	JMC	JMC00005
LBR24400	5, 7, 11	GUY JMC	GUY00302, JMC00005

¹ Administrations and corresponding networks or beams whose assignment(s) may receive interference from the beam shown in the left-hand column.

TABLE 1B

Affecting administrations and corresponding networks or beams identified based on Notes 6 and 7 in § 9A.2 of Article 9A of this Appendix

Beam name	Channels	Note	Affecting administrations ¹	Affecting networks or beams ¹
CPV30100	2, 4, 8, 10, 12	6	GUY JMC	GUY00302, JMC00005
CPV30100	6	6	JMC	JMC00005
E__100	1, 3, 5, 7, 9, 11, 13	6	G	BERBER02
G 02700	2, 4, 8, 10, 12	6	GUY JMC	GUY00302, JMC00005
G 02700	6	6	JMC	JMC00005
LBR24400	1	6	GUY	GUY00302
LBR24400	3, 9, 13	6	JMC	JMC00005
LBR24400	5, 7, 11	6	GUY JMC	GUY00302, JMC00005
NZL__100	24	7	J	SUPERBIRD-A

¹ Administrations and corresponding networks or beams whose assignment(s) may cause interference to the beam shown in the left-hand column.

TABLE 2A

Table showing correspondence between channel numbers and assigned frequencies¹ for the feeder links in the frequency band 14.5-14.8 GHz

Channel No.	Assigned feeder-link frequency (MHz)
1	14 525.30
2	14 544.48
3	14 563.66
4	14 582.84
5	14 602.02
6	14 621.20
7	14 640.38
8	14 659.56
9	14 678.74
10	14 697.92
11	14 717.10
12	14 736.28
13	14 755.46
14	14 774.64

¹ Assigned frequency = 14 506.12 + 19.18 *n*, where *n* is the channel number.

TABLE 2B

Table showing correspondence between channel numbers and assigned frequencies¹ for the feeder links in the frequency band 17.3-18.1 GHz

Channel No.	Assigned feeder-link frequency (MHz)	Channel No.	Assigned feeder-link frequency (MHz)
1	17 327.48	21	17 711.08
2	17 346.66	22	17 730.26
3	17 365.84	23	17 749.44
4	17 385.02	24	17 768.62
5	17 404.20	25	17 787.80
6	17 423.38	26	17 806.98
7	17 442.56	27	17 826.16
8	17 461.74	28	17 845.34
9	17 480.92	29	17 864.52
10	17 500.10	30	17 883.70
11	17 519.28	31	17 902.88
12	17 538.46	32	17 922.06
13	17 557.64	33	17 941.24
14	17 576.82	34	17 960.42
15	17 596.00	35	17 979.60
16	17 615.18	36	17 998.78
17	17 634.36	37	18 017.96
18	17 653.54	38	18 037.14
19	17 672.72	39	18 056.32
20	17 691.90	40	18 075.50

¹ Assigned frequency = 17 308.3 + 19.18 *n*, where *n* is the channel number.

TABLE 3A1

Basic characteristics of the Regions 1 and 3 feeder-link Plan in the frequency band 14.5-14.8 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.r.p.	Power control	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	Angle							
AFS	AFS02101	4.80	24.50	-28.00	3.13	1.68	27.00	MODRSS		37.24		MODTES	57.00	CL		82.0		27MOG7W		4L	P	
AFS	AFS02102	4.80	24.50	-28.00	3.13	1.68	27.00	MODRSS		37.24		MODTES	57.00	CR		82.0		27MOG7W		4L	P	
CHN	CHN19001	122.00	114.17	23.32	0.91	0.60	2.88	MODRSS		47.08		MODTES	57.00	CL		84.0		27MOG7W		4C	P	
CHN	CHN19002	122.00	114.17	23.32	0.91	0.60	2.88	MODRSS		47.08		MODTES	57.00	CR		84.0		27MOG7W		4C	P	
CME	CME30001	-13.00	12.70	6.20	2.54	1.68	87.00	MODRSS		38.15		MODTES	57.00	CL		84.0		27MOG7W		4I	P	
CME	CME30002	-13.00	12.70	6.20	2.54	1.68	87.00	MODRSS		38.15		MODTES	57.00	CR		84.0		27MOG7W		4I	P	
ETH	ETH09201	36.00	40.49	9.20	2.83	2.26	174.44	MODRSS		36.40		MODTES	57.00	CL		82.0		27MOG7W		4P	P	
ETH	ETH09202	36.00	40.49	9.20	2.83	2.26	174.44	MODRSS		36.40		MODTES	57.00	CR		82.0		27MOG7W		4P	P	
GHA	GHA10801	-25.00	-1.20	7.90	1.48	1.06	102.00	MODRSS		42.49		MODTES	57.00	CR		83.0		27MOG7W		4F	P	
GHA	GHA10802	-25.00	-1.20	7.90	1.48	1.06	102.00	MODRSS		42.49		MODTES	57.00	CL		83.0		27MOG7W		4F	P	
IND	INDA_101	55.80	76.16	14.72				CB_RSS_IND		45.66		MODTES	57.00	CR		82.0		27MOG7W		4U	P	
IND	INDA_102	55.80	76.16	14.72				CB_RSS_IND		45.66		MODTES	57.00	CL		82.0		27MOG7W		4U	P	
IRN	IRN10901	34.00	54.20	32.40	3.82	1.82	149.00	MODRSS		36.03		MODTES	57.00	CR		82.0		27MOG7W		4S	P	
IRN	IRN10902	34.00	54.20	32.40	3.82	1.82	149.00	MODRSS		36.03		MODTES	57.00	CL		82.0		27MOG7W		4S	P	
IRQ	IRQ25601	50.00	43.86	32.86	1.82	1.34	162.65	MODRSS		40.58		MODTES	57.00	CL		82.0		27MOG7W		4M	P	
IRQ	IRQ25602	50.00	43.86	32.86	1.82	1.34	162.65	MODRSS		40.58		MODTES	57.00	CR		82.0		27MOG7W		4M	P	
KOR	KO11201D	116.00	127.50	36.00	1.24	1.02	168.00	R13RSS		43.40		R13TES	57.30	CL		82.0		27MOG7W	KOREASAT-1	03	PE	
KOR	KOR11201	116.00	127.50	36.00	1.24	1.02	168.00	R13RSS		43.40		R13TES	57.30	CL		82.0		27MOF8W	KOREASAT-1	03	PE	
MOZ	MOZ30701	-1.00	34.00	-18.00	3.57	1.38	55.00	MODRSS		37.52		MODTES	57.00	CL		82.0		27MOG7W		4K	P	
MOZ	MOZ30702	-1.00	34.00	-18.00	3.57	1.38	55.00	MODRSS		37.52		MODTES	57.00	CR		82.0		27MOG7W		4K	P	
NIG	NIG11901	-19.20	7.80	9.40	2.16	2.02	45.00	MODRSS		38.05		MODTES	57.00	CR		82.0		27MOG7W		4G	P	
NIG	NIG11902	-19.20	7.80	9.40	2.16	2.02	45.00	MODRSS		38.05		MODTES	57.00	CL		82.0		27MOG7W		4G	P	
NMB	NMB02501	-18.80	17.50	-21.60	2.66	1.90	48.00	MODRSS		37.41		MODTES	57.00	CL		82.0		27MOG7W		4H	P	
NMB	NMB02502	-18.80	17.50	-21.60	2.66	1.90	48.00	MODRSS		37.41		MODTES	57.00	CR		82.0		27MOG7W		4H	P	
NPL	NPL12201	50.00	83.70	28.30	1.72	0.60	163.00	MODRSS		44.31		MODTES	57.00	CR		82.0		27MOG7W		4N	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		c.i.r.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							
NPL	NPL12202	50.00	83.70	28.30	1.72	0.60	163.00	MODRSS		44.31		MODTES	57.00	CL		82.0		27M0G7W		4N	P	
PAK	PAK12701	38.20	69.60	29.50	2.30	2.16	14.00	MODRSS		37.49		MODTES	57.00	CR		82.0		27M0G7W		4R	P	
PAK	PAK12702	38.20	69.60	29.50	2.30	2.16	14.00	MODRSS		37.49		MODTES	57.00	CL		82.0		27M0G7W		4R	P	
PNG	PNG13101	134.00	148.07	-6.65	3.13	2.30	168.32	MODRSS		38.87		MODTES	57.00	CR		89.0		27M0G7W		4B	P	
PNG	PNG13102	134.00	148.07	-6.65	3.13	2.30	168.32	MODRSS		38.87		MODTES	57.00	CL		89.0		27M0G7W		4B	P	
SDN	SDN_101	-7.00	30.13	13.52				CB_RSS_SDNA		37.20		MODTES	57.00	CL		86.0		27M0G7W		4J	P	
SDN	SDN_102	-7.00	30.13	13.52				CB_RSS_SDNA		37.20		MODTES	57.00	CR		86.0		27M0G7W		4J	P	
SEN	SEN22201	-37.00	-14.40	13.80	1.46	1.04	139.00	MODRSS		42.63		MODTES	57.00	CL		82.0		27M0G7W		4D	P	
SEN	SEN22202	-37.00	-14.40	13.80	1.46	1.04	139.00	MODRSS		42.63		MODTES	57.00	CR		82.0		27M0G7W		4D	P	
SEY	SEY00001	42.50	51.86	-7.23	2.43	1.04	27.51	MODRSS		40.44		MODTES	57.00	CL		84.0		27M0G7W		4T	P	
SEY	SEY00002	42.50	51.86	-7.23	2.43	1.04	27.51	MODRSS		40.44		MODTES	57.00	CR		84.0		27M0G7W		4T	P	
SOM	SOM31201	37.80	45.17	6.61	3.37	1.68	62.04	MODRSS		36.92		MODTES	57.00	CL		83.0		27M0G7W		4Q	P	
SOM	SOM31202	37.80	45.17	6.61	3.37	1.68	62.04	MODRSS		36.92		MODTES	57.00	CR		83.0		27M0G7W		4Q	P	
TGO	TGO22601	-30.00	0.68	8.57	1.13	0.60	108.43	MODRSS		46.14		MODTES	57.00	CL		82.0		27M0G7W		4E	P	
TGO	TGO22602	-30.00	0.68	8.57	1.13	0.60	108.43	MODRSS		46.14		MODTES	57.00	CR		82.0		27M0G7W		4E	P	
USA	USAC_101	140.00	177.50	16.35				CB_RSS_USAC		44.06		MODTES	57.00	CL		87.0		27M0G7W		4A	P	
USA	USAC_102	140.00	177.50	16.35				CB_RSS_USAC		44.06		MODTES	57.00	CR		87.0		27M0G7W		4A	P	
YEM	YEM_101	11.00	48.29	14.53				CB_RSS_YEMA		47.78		MODTES	57.00	CR		82.0		27M0G7W		4O	P	
YEM	YEM_102	11.00	48.29	14.53				CB_RSS_YEMA		47.78		MODTES	57.00	CL		82.0		27M0G7W		4O	P	

TABLE 3A2

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		c.l.r.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	AFG24501	50.00	67.00	34.30	1.89	1.19	18.00	MODRSS		40.93		MODTES	57.00	CL		84.0		27M0G7W		71	P	
AFG	AFG24502	50.00	67.00	34.30	1.89	1.19	18.00	MODRSS		40.93		MODTES	57.00	CR		84.0		27M0G7W		71	P	
AGL	AGL29500	-24.80	16.43	-12.37	2.66	1.75	77.43	MODRSS		37.77		MODTES	57.00	CR		84.0		27M0G7W			P	
ALB	ALB29600	62.00	19.50	41.37	0.60	0.60	69.35	MODRSS		48.88		MODTES	57.00	CL		82.6		27M0G7W			P	
ALG	ALG25152	-24.80	1.50	27.60	3.65	2.94	135.00	MODRSS		34.14		MODTES	57.00	CL		84.0		27M0G7W			P	
AND	AND34100	-37.00	1.60	42.50	0.60	0.60	0.00	MODRSS		48.88		MODTES	57.00	CL		83.0		27M0G7W			P	
ARM	ARM06400	22.80	44.99	39.95	0.73	0.60	148.17	MODRSS		48.02		MODTES	57.00	CR		84.0		27M0G7W			P	
ARS	ARS00375	17.00	44.60	23.40	4.21	2.48	145.00	MODRSS		34.26		MODTES	57.00	CL		84.0		27M0G7W		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		27M0G7W		54	P	
AUS	AUS00400	152.00	135.00	-24.20	7.19	5.20	140.00	MODRSS		28.71		MODTES	57.00	CL		87.0		27M0G7W		30	P	
AUS	AUS00401	152.00	96.83	-12.19	0.60	0.60	0.00	MODRSS		48.88		MODTES	57.00	CL		87.0		27M0G7W		30	P	
AUS	AUS00402	152.00	105.69	-10.45	0.60	0.60	0.00	MODRSS		48.88		MODTES	57.00	CL		87.0		27M0G7W		30	P	
AUS	AUS00403	152.00	110.52	-66.28	0.60	0.60	0.00	MODRSS		48.88		MODTES	57.00	CL		87.0		27M0G7W		30	P	
AUS	AUS00404	152.00	158.94	-54.50	0.60	0.60	0.00	MODRSS		48.88		MODTES	57.00	CL		87.0		27M0G7W		30	P	
AUS	AUS00405	152.00	159.06	-31.52	0.60	0.60	0.00	MODRSS		48.88		MODTES	57.00	CL		87.0		27M0G7W		30	P	
AUS	AUS00406	152.00	167.93	-29.02	0.60	0.60	0.00	MODRSS		48.88		MODTES	57.00	CL		87.0		27M0G7W		30	P	
AUS	AUS0040A	152.00	135.36	-23.95	6.89	4.83	141.15	R123FR		29.23		MODTES	57.00	CL		87.0		27M0G7W		30	P	
AUS	AUS00500	152.00	135.00	-24.20	7.19	5.20	140.00	MODRSS		28.71		MODTES	57.00	CR		87.0		27M0G7W		41	P	
AUS	AUS00501	152.00	96.83	-12.19	0.60	0.60	0.00	MODRSS		48.88		MODTES	57.00	CR		87.0		27M0G7W		41	P	
AUS	AUS00502	152.00	105.69	-10.45	0.60	0.60	0.00	MODRSS		48.88		MODTES	57.00	CR		87.0		27M0G7W		41	P	
AUS	AUS00503	152.00	110.52	-66.28	0.60	0.60	0.00	MODRSS		48.88		MODTES	57.00	CR		87.0		27M0G7W		41	P	
AUS	AUS00504	152.00	158.94	-54.50	0.60	0.60	0.00	MODRSS		48.88		MODTES	57.00	CR		87.0		27M0G7W		41	P	
AUS	AUS00505	152.00	159.06	-31.52	0.60	0.60	0.00	MODRSS		48.88		MODTES	57.00	CR		87.0		27M0G7W		41	P	
AUS	AUS00506	152.00	167.93	-29.02	0.60	0.60	0.00	MODRSS		48.88		MODTES	57.00	CR		87.0		27M0G7W		41	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.l.r.p.	Power control	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	Angle							
AUS	AUS00600	152.00	135.50	-24.20	7.19	5.20	140.00	MODRSS		28.71		MODTES	57.00	CR		87.0		27MOG7W		42	P	
AUS	AUS00601	152.00	96.83	-12.19	0.60	0.60	0.00	MODRSS		48.88		MODTES	57.00	CR		87.0		27MOG7W		42	P	
AUS	AUS00602	152.00	105.69	-10.45	0.60	0.60	0.00	MODRSS		48.88		MODTES	57.00	CR		87.0		27MOG7W		42	P	
AUS	AUS00603	152.00	110.52	-66.28	0.60	0.60	0.00	MODRSS		48.88		MODTES	57.00	CR		87.0		27MOG7W		42	P	
AUS	AUS00604	152.00	158.94	-54.50	0.60	0.60	0.00	MODRSS		48.88		MODTES	57.00	CR		87.0		27MOG7W		42	P	
AUS	AUS00605	152.00	159.06	-31.52	0.60	0.60	0.00	MODRSS		48.88		MODTES	57.00	CR		87.0		27MOG7W		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		27MOG7W		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		27MOG7W		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		27MOG7W		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		27MOG7W		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		27MOG7W		31	P	
AUS	AUS00704	164.00	158.94	-54.50	0.60	0.60	0.00	MODRSS		48.88		MODTES	57.00	CR		87.0		27MOG7W		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		27MOG7W		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		27MOG7W		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		27MOG7W		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		27MOG7W		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		27MOG7W		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		27MOG7W		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		27MOG7W		44	P	
AUS	AUS00804	164.00	158.94	-54.50	0.60	0.60	0.00	MODRSS		48.88		MODTES	57.00	CL		87.0		27MOG7W		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		27MOG7W		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		27MOG7W		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		27MOG7W		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		27MOG7W		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		27MOG7W		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		27MOG7W		32	P	
AUS	AUS00904	164.00	158.94	-54.50	0.60	0.60	0.00	MODRSS		48.88		MODTES	57.00	CR		87.0		27MOG7W		32	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.l.r.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							
AUS	AUS00905	164.00	159.06	-31.52	0.60	0.60	0.00	MODRSS		48.88		MODTES	57.00	CR		87.0		27MOG7W		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		27MOG7W		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		27MOG7W		32	P	
AUS	AUSA0000	152.00	135.36	-23.95	6.89	4.83	141.15	R123FR		29.23		MODTES	57.00	CL		87.0		27MOG7W		40	P	
AUS	AUSA0001	152.00	96.83	-12.19	0.60	0.60	0.00	MODRSS		48.88		MODTES	57.00	CL		87.0		27MOG7W		40	P	
AUS	AUSA0002	152.00	105.69	-10.45	0.60	0.60	0.00	MODRSS		48.88		MODTES	57.00	CL		87.0		27MOG7W		40	P	
AUS	AUSA0003	152.00	110.52	-66.28	0.60	0.60	0.00	MODRSS		48.88		MODTES	57.00	CL		87.0		27MOG7W		40	P	
AUS	AUSA0004	152.00	158.94	-54.50	0.60	0.60	0.00	MODRSS		48.88		MODTES	57.00	CL		87.0		27MOG7W		40	P	
AUS	AUSA0005	152.00	159.06	-31.52	0.60	0.60	0.00	MODRSS		48.88		MODTES	57.00	CL		87.0		27MOG7W		40	P	
AUS	AUSA0006	152.00	167.93	-29.02	0.60	0.60	0.00	MODRSS		48.88		MODTES	57.00	CL		87.0		27MOG7W		40	P	
AUS	AUSB0000	164.00	136.62	-24.16	6.82	4.20	134.19	R123FR		29.87		MODTES	57.00	CL		87.0		27MOG7W		43	P	
AUS	AUSB0001	164.00	96.83	-12.19	0.60	0.60	0.00	MODRSS		48.88		MODTES	57.00	CL		87.0		27MOG7W		43	P	
AUS	AUSB0002	164.00	105.69	-10.45	0.60	0.60	0.00	MODRSS		48.88		MODTES	57.00	CL		87.0		27MOG7W		43	P	
AUS	AUSB0003	164.00	110.52	-66.28	0.60	0.60	0.00	MODRSS		48.88		MODTES	57.00	CL		87.0		27MOG7W		43	P	
AUS	AUSB0004	164.00	158.94	-54.50	0.60	0.60	0.00	MODRSS		48.88		MODTES	57.00	CL		87.0		27MOG7W		43	P	
AUS	AUSB0005	164.00	159.06	-31.52	0.60	0.60	0.00	MODRSS		48.88		MODTES	57.00	CL		87.0		27MOG7W		43	P	
AUS	AUSB0006	164.00	167.93	-29.02	0.60	0.60	0.00	MODRSS		48.88		MODTES	57.00	CL		87.0		27MOG7W		43	P	
AUT	AUT01600	-18.80	10.31	49.47	1.82	0.92	151.78	MODRSS		42.19		MODTES	57.00	CR		84.0		27MOG7W			P	
AZE	AZE06400	23.20	47.47	40.14	0.93	0.60	158.14	MODRSS		46.98		MODTES	57.00	CL		84.0		27MOG7W			P	
BDI	BDI27000	11.00	29.90	-3.10	0.71	0.60	80.00	MODRSS		48.15		MODTES	57.00	CL		81.0		27MOG7W			P	
BEL	BEL01800	38.20	5.12	51.96	1.00	1.00	0.00	MODRSS		44.44		MODTES	57.00	CR		85.5		27MOG7W			P	
BEN	BEN23300	-19.20	2.20	9.50	1.44	0.68	97.00	MODRSS		44.54		MODTES	57.00	CL		84.0		27MOG7W			P	
BFA	BFA10700	-30.00	-1.50	12.20	1.45	1.14	29.00	MODRSS		42.26		MODTES	57.00	CL		84.0		27MOG7W			P	
BGD	BGD22000	74.00	90.30	23.60	1.46	0.84	135.00	MODRSS		43.56		MODTES	57.00	CR		84.0		27MOG7W			P	
BHR	BHR25500	34.00	50.50	26.10	0.60	0.60	0.00	MODRSS		48.88		MODTES	57.00	CR		83.0		27MOG7W			P	
BIH	BIH14800	56.00	18.22	43.97	0.60	0.60	90.00	MODRSS		48.88		MODTES	57.00	CR		84.0		27MOG7W			P	
BLR	BLR06200	37.80	28.04	53.18	1.17	0.60	9.68	MODRSS		45.96		MODTES	57.00	CL		84.0		27MOG7W			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	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							
BOT	BOT29700	-0.80	23.30	-22.20	2.13	1.50	36.00	MODRSS		39.40		MODTES	57.00	CL		84.0		27M0G7W		P		
BRM	BRM29800	104.00	96.97	18.68	3.33	1.66	91.63	MODRSS		37.02		MODTES	57.00	CR		84.0		27M0G7W		P		
BRU	BRU3300A	74.00	114.70	4.40	0.60	0.60	0.00	MODRSS		48.88		MODTES	57.00	CR		84.0		27M0G7W		P		
BTN	BTN03100	86.00	90.44	27.05	0.72	0.60	175.47	MODRSS		48.11		MODTES	57.00	CR		84.0		27M0G7W		P		
BUL	BUL02000	-1.20	25.00	43.00	1.04	0.60	165.00	MODRSS		46.50		MODTES	57.00	CL		83.0		27M0G7W		P		
CAF	CAF25800	-13.20	21.00	6.30	2.25	1.68	31.00	MODRSS		38.67		MODTES	57.00	CR		84.0		27M0G7W		P		
CBG	CBG29900	86.00	104.89	12.79	1.12	0.94	32.89	MODRSS		44.22		MODTES	57.00	CR		84.0		27M0G7W		P		
CHN	CHN15400	62.00	101.90	33.50	5.10	2.80	143.00	MODRSS		32.90		MODTES	57.00	CR		84.0		27M0G7W		45	P	
CHN	CHN15500	62.00	101.90	33.50	5.10	2.80	143.00	MODRSS		32.90		MODTES	57.00	CL		84.0		27M0G7W		45	P	
CHN	CHN15800	134.00	113.21	34.27	6.40	3.16	10.74	MODRSS		31.39		MODTES	57.00	CL		84.0		27M0G7W		46	P	
CHN	CHN15900	134.00	113.21	34.27	6.40	3.16	10.74	MODRSS		31.39		MODTES	57.00	CR		84.0		27M0G7W		46	P	
CHN	CHN16000	92.20	108.10	33.70	5.00	4.00	148.00	MODRSS		31.44		MODTES	57.00	CR		84.0		27M0G7W		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		27M0G7W		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		27M0G7W		P		
CLN	CLN21900	50.00	80.60	7.70	1.18	0.60	106.00	MODRSS		45.95		MODTES	57.00	CL		84.0		27M0G7W		P		
COD	COD_100	-19.20	21.85	-3.40				CB_RSS_CODA		38.36		MODTES	57.00	CL		84.0		27M0G7W		P		
COG	COG23500	-13.20	14.60	-0.70	2.02	1.18	59.00	MODRSS		40.67		MODTES	57.00	CR		84.0		27M0G7W		P		
COM	COM20700	29.00	44.10	-12.10	0.76	0.60	149.00	MODRSS		47.86		MODTES	57.00	CR		84.0		27M0G7W		P		
CPV	CPV30100	-33.50	-24.12	16.09	0.77	0.63	94.46	MODRSS		47.56		MODTES	57.00	CL		84.0		27M0G7W		P	5, 6	
CTI	CTI23700	-24.80	-5.66	7.39	1.45	1.29	126.59	MODRSS		41.73		MODTES	57.00	CR		84.0		27M0G7W		P		
CVA	CVA08300	-1.20	13.02	42.09	0.75	0.66	20.53	MODRSS		47.48		MODTES	57.00	CR		84.0		27M0G7W		P		
CVA	CVA08500	-1.20	13.02	42.09	0.75	0.66	20.53	MODRSS		47.48		MODTES	57.00	CR		84.0		27M0G7W		P		
CYP	CYP08600	-1.20	33.45	35.12	0.60	0.60	90.00	MODRSS		48.88		MODTES	57.00	CL		84.0		27M0G7W		P		
CZE	CZE14401	-12.80	16.77	46.78	1.71	0.89	149.15	MODRSS		42.64		MODTES	57.00	CR		84.0		27M0G7W		P		
CZE	CZE14402	-12.80	16.77	46.78	1.71	0.89	149.15	MODRSS		42.64		MODTES	57.00	CL		84.0		27M0G7W		P		
CZE	CZE14403	-12.80	16.77	46.78	1.71	0.89	149.15	MODRSS		42.64		MODTES	57.00	CL		84.0		27M0G7W		37	P	
D	D 08700	-18.80	10.31	49.47	1.82	0.92	151.78	MODRSS		42.19		MODTES	57.00	CR		84.0		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.l.r.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							
DJI	DJI09900	16.80	42.68	11.68	0.60	0.60	90.00	MODRSS		48.88		MODTES	57.00	CL		84.0		27M0G7W		P		
DNK	DNK__100	-25.20	5.28	61.83				CB_RSS_DNKA		48.88		MODTES	57.00	CL		79.5		27M0G7W		P		
DNK	DNK09000	-33.50	14.34	61.72	1.83	0.60	151.50	MODRSS		44.05		MODTES	57.00	CR		84.0		27M0G7W		P		
DNK	DNK09100	-33.50	-14.94	63.79	1.52	0.60	168.57	MODRSS		44.86		MODTES	57.00	CR		84.0		27M0G7W		P		
E	E___100	-30.00	-9.40	34.15				CB_RSS_E__A		44.79		MODTES	57.00	CR		84.0		27M0G7W		01	P	6
E	HISP27D4	-30.00	-3.10	39.90					ECO	43.00	18.70	R13TES	55.00	CR		82.5		27M0G7W--	HISPASAT-1	01	PE	
E	HISP27D6	-30.00	-3.10	39.90					ECO	43.00	18.70	R13TES	58.50	CR		83.5		27M0G7W--	HISPASAT-1	01	PE	
E	HISP33D4	-30.00	-3.10	39.90					ECO	43.00	18.70	MODTES	55.00	CR		82.5		33M0G7W--	HISPASAT-1	01	PE	
E	HISP33D6	-30.00	-3.10	39.90					ECO	43.00	18.70	MODTES	58.50	CR		83.5		33M0G7W--	HISPASAT-1	01	PE	
E	HISPASA4	-30.00	-3.10	39.90					ECO	43.00	18.70	R13TES	55.00	CR		82.5		27M0F8W	HISPASAT-1	01	PE	
E	HISPASA6	-30.00	-3.10	39.90					ECO	43.00	18.70	R13TES	58.50	CR		83.5		27M0F8W	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		27M0G7W		12	P	
ERI	ERI09200	22.80	39.41	14.98	1.67	0.95	145.49	MODRSS		42.44		MODTES	57.00	CL		84.0		27M0G7W			P	
EST	EST06100	44.50	25.40	59.18	0.67	0.60	5.99	MODRSS		48.42		MODTES	57.00	CR		84.0		27M0G7W			P	
F	F 09300	-7.00	3.30	45.37	2.18	1.20	156.36	MODRSS		40.27		MODTES	57.00	CR		84.0		27M0G7W		21	P	
F	F___100	-7.00	29.16	13.43				CB_RSS_F__A		48.88		MODTES	57.00	CL		84.0		27M0G7W		12	P	
F	F___200	140.00	174.50	-17.30				CB_RSS_F__B		45.80		MODTES	57.00	CL		84.0		27M0G7W		7F	P	
F	F___300	140.00	174.65	-17.65				CB_RSS_F__C		47.97		MODTES	57.00	CR		84.0		27M0G7W		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		27M0G7W			P	
FIN	FIN10300	22.80	17.61	61.54	2.18	0.90	11.59	MODRSS		41.53		MODTES	57.00	CL		84.0		27M0G7W		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		27M0G7W		52	P	
FJI	FJI19300	-178.00	179.62	-17.87	1.16	0.92	155.22	MODRSS		44.16		MODTES	57.00	CR		84.0		27M0G7W			P	
FSM	FSM00000	158.00	151.90	5.48	5.15	1.57	167.00	MODRSS		35.38		MODTES	57.00	CR		84.0		27M0G7W			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		27M0G7W			P	5, 6
GAB	GAB26000	-13.20	11.80	-0.60	1.43	1.12	64.00	MODRSS		42.40		MODTES	57.00	CL		84.0		27M0G7W			P	
GEO	GEO06400	23.20	43.35	42.27	1.11	0.60	161.21	MODRSS		46.23		MODTES	57.00	CL		84.0		27M0G7W			P	
GMB	GMB30200	-37.20	-15.10	13.40	0.79	0.60	4.00	MODRSS		47.69		MODTES	57.00	CL		83.0		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.l.r.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							
GNB	GNB30400	-30.00	-15.00	12.00	0.90	0.60	172.00	MODRSS		47.12		MODTES	57.00	CL		84.0		27MOG7W			P	
GNE	GNE30300	-18.80	10.30	1.50	0.68	0.60	10.00	MODRSS		48.34		MODTES	57.00	CR		84.0		27MOG7W			P	
GRC	GRC10500	-1.20	24.52	38.11	1.70	0.95	152.55	MODRSS		42.37		MODTES	57.00	CR		84.0		27MOG7W			P	
GUI	GUI19200	-37.00	-11.00	10.20	1.58	1.04	147.00	MODRSS		42.29		MODTES	57.00	CR		85.0		27MOG7W			P	
HNG	HNG10601	-12.80	16.77	46.78	1.71	0.89	149.15	MODRSS		42.64		MODTES	57.00	CR		84.0		27MOG7W			P	
HNG	HNG10602	-12.80	16.77	46.78	1.71	0.89	149.15	MODRSS		42.64		MODTES	57.00	CL		84.0		27MOG7W			P	
HNG	HNG10603	-12.80	16.77	46.78	1.71	0.89	149.15	MODRSS		42.64		MODTES	57.00	CL		84.0		27MOG7W		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		27MOG7W			P	
HRV	HRV14801	-12.80	16.77	46.78	1.71	0.89	149.15	MODRSS		42.64		MODTES	57.00	CR		84.0		27MOG7W			P	
HRV	HRV14802	-12.80	16.77	46.78	1.71	0.89	149.15	MODRSS		42.64		MODTES	57.00	CL		84.0		27MOG7W			P	
HRV	HRV14803	-12.80	16.77	46.78	1.71	0.89	149.15	MODRSS		42.64		MODTES	57.00	CL		84.0		27MOG7W		37	P	
I	I 08200	9.00	12.67	40.74	1.99	1.35	144.20	MODRSS		40.14		MODTES	57.00	CR		84.0		27MOG7W			P	
IND	IND03700	68.00	93.00	25.50	1.46	1.13	40.00	MODRSS		42.27		MODTES	57.00	CL		84.0		27MOG7W			P	
IND	IND04701	68.00	93.30	11.10	1.92	0.60	96.00	MODRSS		43.83		MODTES	57.00	CR		84.0		27MOG7W		7E	P	
IND	IND04702	68.00	93.30	11.10	1.92	0.60	96.00	MODRSS		43.83		MODTES	57.00	CL		84.0		27MOG7W		7E	P	
IND	INDA_101	55.80	76.16	14.72				CB_RSS_IND A		45.66		MODTES	57.00	CR		84.0		27MOG7W		7G	P	
IND	INDA_102	55.80	76.16	14.72				CB_RSS_IND A		45.66		MODTES	57.00	CL		84.0		27MOG7W		7G	P	
IND	INDB_101	55.80	83.67	23.73				CB_RSS_INDB		43.13		MODTES	57.00	CR		84.0		27MOG7W		7H	P	
IND	INDB_102	55.80	83.67	23.73				CB_RSS_INDB		43.13		MODTES	57.00	CL		84.0		27MOG7W		7H	P	
IND	INDD_100	68.00	74.37	29.16				CB_RSS_INDD		41.79		MODTES	57.00	CR		84.0		27MOG7W			P	
INS	INS02800	80.20	113.60	-1.40	6.73	3.33	160.00	MODRSS		30.94		MODTES	57.00	CR		84.0		27MOG7W			P	
INS	INS03501	104.00	115.20	-1.70	9.14	3.43	170.00	MODRSS		29.48		MODTES	57.00	CL		84.0		27MOG7W		7D	P	
INS	INS03502	104.00	115.20	-1.70	9.14	3.43	170.00	MODRSS		29.48		MODTES	57.00	CR		84.0		27MOG7W		7D	P	
IRL	IRL21100	-37.20	-8.25	53.22	0.72	0.60	157.56	MODRSS		48.08		MODTES	57.00	CR		84.0		27MOG7W			P	
IRN	IRN10900	34.00	54.20	32.40	3.82	1.82	149.00	MODRSS		36.03		MODTES	57.00	CL		83.0		27MOG7W			P	
ISL	ISL04900	-33.50	-19.00	64.90	1.00	0.60	177.00	MODRSS		46.67		MODTES	57.00	CL		83.0		27MOG7W			P	
ISL	ISL05000	-33.50	-14.94	63.79	1.52	0.60	168.57	MODRSS		44.86		MODTES	57.00	CR		84.0		27MOG7W			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.l.r.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							
ISR	ISR11000	-4.00	34.95	31.32	0.73	0.60	110.02	MODRSS		48.03		MODTES	57.00	CR		84.0		27M0G7W			P	
J	000BS-3N	109.85	134.50	31.50	3.52	3.30	68.00	MODRSS		33.80		MODTES	57.00	CR		87.0		27M0F8W	BS-3N	02	PE	
J	J 10985	109.85	134.50	31.50	3.52	3.30	68.00	MODRSS		33.80		MODTES	57.00	CR		87.0		34M5G7W		02	P	
J	J 11100	110.00	134.50	31.50	3.52	3.30	68.00	MODRSS		33.80		MODTES	57.00	CR		87.0		34M5G7W		02	P	
J	J 1110E	110.00	134.50	31.50	3.52	3.30	68.00	MODRSS		33.80		MODTES	57.00	CR		87.0		27M0F8W	BS-3M	02	PE	
JOR	JOR22400	11.00	37.55	34.02	1.47	0.91	73.16	MODRSS		43.19		MODTES	57.00	CL		85.0		27M0G7W			P	
KAZ	KAZ06600	56.40	65.73	46.40	4.58	1.76	177.45	MODRSS		35.38		MODTES	57.00	CL		84.0		27M0G7W			P	
KEN	KEN24900	-0.80	37.99	0.88	2.06	1.30	99.68	MODRSS		40.17		MODTES	57.00	CR		84.0		27M0G7W			P	
KGZ	KGZ07000	50.00	73.91	41.32	1.47	0.64	5.05	MODRSS		44.75		MODTES	57.00	CR		84.0		27M0G7W			P	
KIR	KIR_100	176.00	-170.31	-0.56				CB_RSS_KIRA		42.60		MODTES	57.00	CL		84.0		27M0G7W			P	
KOR	KOR11201	116.00	127.50	36.00	1.24	1.02	168.00	MODRSS		43.43		MODTES	57.00	CL		89.0		27M0G7W		03	P	
KOR	KOR11202	116.00	127.50	36.00	1.24	1.02	168.00	MODRSS		43.43		MODTES	57.00	CR		89.0		27M0G7W		03	P	
KRE	KRE28600	140.00	128.45	40.32	1.63	0.68	18.89	MODRSS		44.00		MODTES	57.00	CL		87.0		27M0G7W			P	
KWT	KWT11300	11.00	47.48	29.12	0.60	0.60	90.00	MODRSS		48.88		MODTES	57.00	CR		83.0		27M0G7W			P	
LAO	LAO28400	122.20	103.71	18.17	1.87	1.03	123.99	MODRSS		42.18		MODTES	57.00	CR		84.0		33M0G7W			P	
LBN	LBN27900	11.00	37.55	34.02	1.47	0.91	73.16	MODRSS		43.19		MODTES	57.00	CR		84.0		27M0G7W			P	
LBR	LBR24400	-33.50	-9.30	6.60	1.22	0.70	133.00	MODRSS		45.13		MODTES	57.00	CR		84.0		27M0G7W			P	5, 6
LBY	LBY28021	-24.80	17.50	26.30	3.68	1.84	130.00	MODRSS		36.14		MODTES	57.00	CL		84.0		27M0G7W			P	
LIE	LIE25300	-18.80	10.31	49.47	1.82	0.92	151.78	MODRSS		42.19		MODTES	57.00	CL		84.0		27M0G7W			P	
LSO	LSO30500	4.80	27.80	-29.80	0.66	0.60	36.00	MODRSS		48.47		MODTES	57.00	CL		84.0		27M0G7W			P	
LTU	LTU06100	23.20	24.52	56.11				CB_RSS_LTUA		47.92		MODTES	57.00	CR		84.0		27M0G7W			P	
LUX	LUX11400	28.20	5.21	49.20	0.60	0.60	90.00	MODRSS		48.88		MODTES	57.00	CL		84.0		27M0G7W		09	P	
LVA	LVA06100	23.20	24.52	56.11				CB_RSS_LVAA		47.92		MODTES	57.00	CR		84.0		27M0G7W			P	
MAU	MAU_100	29.00	58.61	-15.88				CB_RSS_MAUA		41.42		MODTES	57.00	CL		84.0		27M0G7W			P	
MCO	MCO11600	34.20	7.40	43.70	0.60	0.60	0.00	MODRSS		48.88		MODTES	57.00	CR		81.0		27M0G7W			P	
MDA	MDA06300	50.00	28.45	46.99	0.60	0.60	90.00	MODRSS		48.88		MODTES	57.00	CR		84.0		27M0G7W			P	
MDG	MDG23600	29.00	46.20	-18.60	2.57	0.80	67.00	MODRSS		41.32		MODTES	57.00	CL		84.0		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.l.r.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							
MHL	MHL00000	146.00	167.64	9.83	2.07	0.90	157.42	MODRSS		41.75		MODTES	57.00	CR		84.0		27M0G7W			P	
MKD	MKD14800	22.80	21.53	41.50	0.60	0.60	90.00	MODRSS		48.88		MODTES	57.00	CL		84.0		27M0G7W			P	
MLA	MLA_100	91.50	108.07	3.92				CB_RSS_MLAA		41.75		MODTES	57.00	CR		84.0		27M0G7W			P	
MLD	MLD30600	50.00	73.10	6.00	0.60	0.60	0.00	MODRSS		48.88		MODTES	57.00	CR		84.0		27M0G7W			P	
MLI	MLI_100	-19.20	-4.80	16.10				CB_RSS_MLIA		41.11		MODTES	57.00	CR		87.0		27M0G7W			P	
MLT	MLT14700	22.80	14.40	35.90	0.60	0.60	0.00	MODRSS		48.88		MODTES	57.00	CR		84.0		27M0G7W			P	
MNG	MNG24800	74.00	101.95	46.79	3.32	1.04	169.27	MODRSS		39.07		MODTES	59.92	CL		86.9		27M0G7W			P	
MRC	MRC20900	-25.20	-8.90	28.90	3.96	1.55	50.00	MODRSS		36.57		MODTES	57.00	CR		80.0		27M0G7W			P	
MTN	MTN_100	-36.80	-11.24	20.91				CB_RSS_MTNA		37.55		MODTES	57.00	CR		86.0		27M0G7W			P	
MWI	MWI30800	4.80	33.79	-13.25	1.56	0.70	92.69	MODRSS		44.10		MODTES	57.00	CR		84.0		27M0G7W			P	
NGR	NGR11500	-37.20	7.63	16.97	2.20	1.80	100.58	MODRSS		38.47		MODTES	57.00	CL		84.0		27M0G7W			P	
NOR	NOR12000	-0.80	16.70	61.58	1.84	0.95	177.31	MODRSS		42.02		MODTES	57.00	CR		84.0		27M0G7W		06	P	
NOR	NOR12100	-0.80	16.70	61.58	1.84	0.95	177.31	MODRSS		42.02		MODTES	57.00	CL		84.0		27M0G7W		06	P	
NRU	NRU30900	134.00	167.00	-0.50	0.60	0.60	0.00	MODRSS		48.88		MODTES	57.00	CL		84.0		27M0G7W			P	
NZL	NZL_100	158.00	-174.35	-24.30				CB_RSS_NZLA		48.88		MODTES	57.00	CL		84.0		27M0G7W			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		27M0G7W			P	
PHL	PHL28500	98.00	121.30	11.10	3.46	1.76	99.00	MODRSS		36.60		MODTES	57.00	CL		84.0		27M0G7W			P	
PLW	PLW00000	140.00	132.98	5.51	1.30	0.60	55.41	MODRSS		45.53		MODTES	57.00	CR		84.0		27M0G7W			P	
POL	POL13200	50.00	19.71	52.18	1.22	0.63	16.12	MODRSS		45.59		MODTES	57.00	CR		84.0		27M0G7W			P	
POR	POR_100	-37.00	-15.92	37.65				CB_RSS_PORA		47.17		MODTES	57.00	CR		84.0		27M0G7W			P	
PSE	YYY00001	-13.20	34.99	31.86	0.60	0.60	90.00	MODRSS		48.88		MODTES	57.00	CL		80.5		27M0G7W			P	8
QAT	QAT24700	20.00	51.59	25.35	0.60	0.60	90.00	MODRSS		48.88		MODTES	57.00	CL		84.0		27M0G7W			P	
ROU	ROU13600	50.00	25.12	45.75	1.17	0.73	9.52	MODRSS		45.15		MODTES	57.00	CL		84.0		27M0G7W			P	
RRW	RRW31000	11.00	30.00	-2.10	0.66	0.60	42.00	MODRSS		48.47		MODTES	57.00	CR		81.0		27M0G7W			P	
RUS	RSTREA11	36.00	38.00	53.00					COP	38.40	8.40	MODTES	57.00	CR		84.0		27M0F8W	RST-1	05	PE	
RUS	RSTREA12	36.00	38.00	53.00					COP	38.40	8.40	MODTES	57.00	CL		84.0		27M0F8W	RST-1	05	PE	
RUS	RSTRED11	36.00	38.00	53.00					COP	38.40	8.40	MODTES	57.00	CR		84.0		27M0G7W	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.l.r.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							
RUS	RSTRED12	36.00	38.00	53.00					COP	38.40	8.40	MODTES	57.00	CL		84.0		27M0G7W	RST-1	05	PE	
RUS	RSTRSD11	36.00	38.00	53.00					COP	38.40	8.40	MODTES	57.00	CR		84.0		27M0G7W	RST-1	05	P	
RUS	RSTRSD12	36.00	38.00	53.00					COP	38.40	8.40	MODTES	57.00	CL		84.0		27M0G7W	RST-1	05	P	
RUS	RSTRSD21	56.00	65.00	63.00					COP	38.40	8.40	MODTES	57.00	CR		84.0		27M0G7W	RST-2	14	P	
RUS	RSTRSD22	56.00	65.00	63.00					COP	38.40	8.40	MODTES	57.00	CL		84.0		27M0G7W	RST-2	14	P	
RUS	RSTRSD31	86.00	97.00	62.00					COP	38.40	8.40	MODTES	57.00	CR		84.0		27M0G7W	RST-3	33	P	
RUS	RSTRSD32	86.00	97.00	62.00					COP	38.40	8.40	MODTES	57.00	CL		84.0		27M0G7W	RST-3	33	P	
RUS	RSTRSD51	140.00	158.00	56.00					COP	38.40	8.40	MODTES	57.00	CR		84.0		27M0G7W	RST-5	35	P	
RUS	RSTRSD52	140.00	158.00	56.00					COP	38.40	8.40	MODTES	57.00	CL		84.0		27M0G7W	RST-5	35	P	
RUS	RUS00401	110.00	118.22	51.52					COP	38.40	8.40	MODTES	57.00	CR		84.0		27M0G7W	RUS-4	34	P	
RUS	RUS00402	110.00	118.22	51.52					COP	38.40	8.40	MODTES	57.00	CL		84.0		27M0G7W	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		27M0G7W		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		27M0G7W		04	P	
SCG*	SCG14800	-7.00	20.50	43.98	0.91	0.60	145.16	MODRSS		47.07		MODTES	57.00	CL		84.0		27M0G7W			P	
SEY	SEY00000	42.50	51.86	-7.23	2.43	1.04	27.51	MODRSS		40.44		MODTES	57.00	CR		84.0		27M0G7W			P	
SLM	SLM00000	128.00	159.27	-8.40	1.35	1.08	118.59	MODRSS		42.81		MODTES	57.00	CL		84.0		27M0G7W			P	
SMO	SMO05700	-178.00	-171.70	-13.87	0.60	0.60	90.00	MODRSS		48.88		MODTES	57.00	CL		84.0		27M0G7W			P	
SMR	SMR31100	-36.80	12.50	43.90	0.60	0.60	0.00	MODRSS		48.88		MODTES	57.00	CL		83.0		27M0G7W			P	
SNQ	SNQ15100	88.00	103.86	1.42	0.92	0.72	175.12	MODRSS		46.25		MODTES	57.00	CL		84.0		27M0G7W			P	
SRL	SRL25900	-33.50	-11.80	8.60	0.78	0.68	114.00	MODRSS		47.20		MODTES	57.00	CR		84.0		27M0G7W			P	
STP	STP24100	-7.00	7.00	0.80	0.60	0.60	0.00	MODRSS		48.88		MODTES	57.00	CL		84.0		27M0G7W			P	
SUI	SUI14000	-18.80	10.31	49.47	1.82	0.92	151.78	MODRSS		42.19		MODTES	57.00	CL		84.0		27M0G7W			P	
SVK	SVK14401	-12.80	16.77	46.78	1.71	0.89	149.15	MODRSS		42.64		MODTES	57.00	CR		84.0		27M0G7W			P	
SVK	SVK14402	-12.80	16.77	46.78	1.71	0.89	149.15	MODRSS		42.64		MODTES	57.00	CL		84.0		27M0G7W			P	
SVK	SVK14403	-12.80	16.77	46.78	1.71	0.89	149.15	MODRSS		42.64		MODTES	57.00	CL		84.0		27M0G7W		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		27M0G7W			P	
SWZ	SWZ31300	4.80	31.39	-26.44	0.60	0.60	90.00	MODRSS		48.88		MODTES	57.00	CR		82.0		27M0G7W			P	
SYR	SYR22900	11.00	37.55	34.02	1.47	0.91	73.16	MODRSS		43.19		MODTES	57.00	CL		84.0		27M0G7W		53	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	Identity of the space station	Group code	Status	Remarks
			Long.	Lat.	Major axis	Minor axis	Orientation			Co-polar	Cross-polar	Code	Gain	Type	Angle							
SYR	SYR33900	11.00	37.60	34.20	1.32	0.88	74.00	MODRSS		43.80		MODTES	57.00	CL		84.0		27M0G7W		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		27M0G7W			P	
THA	THA14200	98.00	100.75	12.88	2.80	1.82	93.77	MODRSS		37.38		MODTES	57.00	CR		84.0		27M0G7W			P	
TJK	TJK06900	38.00	71.14	38.41	1.21	0.73	155.31	MODRSS		45.00		MODTES	57.00	CL		82.0		27M0G7W			P	
TKM	TKM06800	50.00	59.24	38.83	2.26	1.02	166.64	MODRSS		40.81		MODTES	57.00	CL		85.7		27M0G7W			P	
TMP	TMP00000	128.00	126.03	-8.72	0.66	0.60	13.92	MODRSS		48.50		MODTES	57.00	CR		84.0		27M0G7W			P	10
TON	TON21500	170.75	-175.23	-18.19	1.59	0.60	71.33	MODRSS		44.64		MODTES	57.00	CR		84.0		27M0G7W			P	
TUN	TUN15000	-25.20	9.50	33.50	1.88	0.72	135.00	MODRSS		43.13		MODTES	57.00	CR		84.0		27M0G7W		55	P	
TUN	TUN27200	-25.20	2.50	32.00	3.59	1.75	175.00	MODRSS		36.47		MODTES	57.00	CR		84.0		27M0G7W		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		27M0G7W		36	P	
TUV	TUV00000	176.00	177.61	-7.11	0.94	0.60	137.58	MODRSS		46.93		MODTES	57.00	CR		84.0		27M0G7W			P	
TZA	TZA22500	11.00	34.60	-6.20	2.41	1.72	129.00	MODRSS		38.27		MODTES	57.00	CR		84.0		27M0G7W			P	
UAE	UAE27400	52.50	53.98	24.37	1.23	0.84	6.62	MODRSS		44.31		MODTES	57.00	CR		84.0		27M0G7W			P	
UGA	UGA05100	17.00	32.20	1.04	1.50	1.02	68.73	MODRSS		42.62		MODTES	57.00	CR		84.0		27M0G7W			P	
UKR	UKR06300	38.20	31.82	48.19	2.32	0.95	177.32	MODRSS		41.01		MODTES	57.00	CR		84.0		27M0G7W			P	
USA	GUM33101	122.00	155.56	13.21				CB_RSS_GUMA		43.61		MODTES	57.00	CR		87.0		27M0G7W		7C	P	
USA	GUM33102	122.00	155.56	13.21				CB_RSS_GUMA		43.61		MODTES	57.00	CL		87.0		27M0G7W		7C	P	
USA	MRA33200	121.80	155.56	13.21				CB_RSS_MRAA		43.61		MODTES	57.00	CR		91.0		27M0G7W			P	
USA	PLM33200	170.00	-145.55	19.50				CB_RSS_PLMA		39.35		MODTES	57.00	CL		87.0		27M0G7W			P	
USA	USAA_101	170.00	-145.55	19.50				CB_RSS_USAA		39.35		MODTES	57.00	CR		87.0		27M0G7W		7A	P	
USA	USAA_102	170.00	-145.55	19.50				CB_RSS_USAA		39.35		MODTES	57.00	CL		87.0		27M0G7W		7A	P	
UZB	UZB07100	33.80	63.80	41.21	2.56	0.89	159.91	MODRSS		40.84		MODTES	57.00	CR		82.0		27M0G7W			P	
VTN	VTN32500	107.00	106.84	14.21	3.43	1.76	109.43	MODRSS		36.64		MODTES	57.00	CR		84.0		27M0G7W			P	
VUT	VUT12801	140.00	168.00	-16.40	1.52	0.68	87.00	MODRSS		44.30		MODTES	57.00	CL		84.0		27M0G7W		7B	P	
VUT	VUT12802	140.00	168.00	-16.40	1.52	0.68	87.00	MODRSS		44.30		MODTES	57.00	CR		84.0		27M0G7W		7B	P	
ZMB	ZMB31400	-0.80	27.50	-13.10	2.38	1.48	39.00	MODRSS		38.98		MODTES	57.00	CR		84.0		27M0G7W			P	
ZWE	ZWE13500	-0.80	29.60	-18.80	1.46	1.36	37.00	MODRSS		41.47		MODTES	57.00	CL		85.0		27M0G7W			P	

* Note by the Secretariat: This designation replaces the former designation "YUG" which was used previously as a three-letter code for the Administration of Serbia and Montenegro.

COLUMN HEADINGS OF TABLES 3B1 AND 3B2

- Col. 1 *Nominal orbital position*, in degrees and hundredths of a degree from the Greenwich meridian (negative values indicate longitudes which are west of the Greenwich meridian; positive values indicate longitudes which are east of the Greenwich meridian).
- Col. 2 *Notifying administration symbol*.
- Col. 3 *Beam identification* (Column 2, normally, contains the symbol designating the administration or the geographical area taken from Table B1 of the Preface to the International Frequency List, followed by the symbol designating the service area).
- Col. 4 Polarization (CL – circular left, CR – circular right).
- Col. 5 *Channel number/indication of minimum equivalent protection margin (EPM) for a given assignment derived from the set of values for all test points belonging to the given beam*.

TABLE 3B1

Minimum equivalent protection margin in the Regions 1 and 3 feeder-link Plan in the frequency band 14.5-14.8 GHz (sorted by orbital position)

1	2	3	4	5													
Orbital position	Admin. symbol	Beam Identification	Polarization type	Channel number													
				2	3	4	5	6	7	8	9	10	11	12	13	14	
				Minimum equivalent protection margin													
−37.00	SEN	SEN22201	CL				40.8		39.6		39.6		39.6		39.6		
−37.00	SEN	SEN22202	CR					39.6		39.6		39.6		39.6		40.7	
−30.00	TGO	TGO22601	CL				15.0		14.1		14.1		14.1		14.1		
−30.00	TGO	TGO22602	CR					14.1		14.1		14.1		14.1		15.0	
−25.00	GHA	GHA10801	CR				14.9		14.1		14.1		14.1		14.1		
−25.00	GHA	GHA10802	CL					14.1		14.1		14.1		14.1		14.9	
−19.20	NIG	NIG11901	CR				6.4		4.2		4.2		4.2		4.2		
−19.20	NIG	NIG11902	CL					4.2		4.2		4.2		4.2		6.4	
−18.80	NMB	NMB02501	CL				6.9		4.5		4.5		4.5		4.5		
−18.80	NMB	NMB02502	CR					4.5		4.5		4.5		4.5		6.9	
−13.00	CME	CME30001	CL				17.2		16.3		16.3		16.3		16.3		
−13.00	CME	CME30002	CR					16.3		16.3		16.3		16.3		17.2	
−7.00	SDN	SDN__101	CL				27.1		26.1		26.1		26.1		26.1		
−7.00	SDN	SDN__102	CR					26.1		26.1		26.1		26.1		27.1	
−1.00	MOZ	MOZ30701	CL				16.6		15.7		15.7		15.7		15.7		
−1.00	MOZ	MOZ30702	CR					15.7		15.7		15.7		15.7		16.6	
4.80	AFS	AFS02101	CL				11.9		11.0		11.0		11.0		11.0		
4.80	AFS	AFS02102	CR					11.0		11.0		11.0		11.0		11.9	
11.00	YEM	YEM__101	CR				47.8		47.3		47.3		47.3		47.3		
11.00	YEM	YEM__102	CL					47.3		47.3		47.3		47.3		47.8	
34.00	IRN	IRN10901	CR		15.2		13.9		13.9		13.9		13.9		13.9		
34.00	IRN	IRN10902	CL			14.3		13.9		13.9		13.9		13.9		14.8	
36.00	ETH	ETH09201	CL				2.3		1.4		1.4		1.4		1.4		
36.00	ETH	ETH09202	CR					1.4		1.4		1.4		1.4		2.3	
37.80	SOM	SOM31201	CL				0.0		−0.3		−0.3		−0.3		−0.3		
37.80	SOM	SOM31202	CR					−0.3		−0.3		−0.3		−0.3		1.6	
38.20	PAK	PAK12701	CR		14.2		3.2		0.9		0.9		0.9		0.9		
38.20	PAK	PAK12702	CL			4.2		0.9		0.9		0.9		0.9		3.3	
42.50	SEY	SEY00001	CL				36.3		35.3		35.3		35.3		35.3		
42.50	SEY	SEY00002	CR					35.3		35.3		35.3		35.3		36.4	
50.00	IRQ	IRQ25601	CL				−0.1		−0.1		−0.1		−0.1		−0.1		
50.00	IRQ	IRQ25602	CR					−0.1		−0.1		−0.1		−0.1		2.4	
50.00	NPL	NPL12201	CR		38.2		3.9		1.2		1.2		1.2		1.2		
50.00	NPL	NPL12202	CL			4.6		1.2		1.2		1.2		1.2		3.9	
55.80	IND	INDA_101	CR		25.7		24.7		24.7		24.7		24.7		24.7		
55.80	IND	INDA_102	CL			24.7		24.7		24.7		24.7		24.7		25.6	

1	2	3	4	5													
Orbital position	Admin. symbol	Beam Identification	Polarization type	Channel number													
				2	3	4	5	6	7	8	9	10	11	12	13	14	
				Minimum equivalent protection margin													
55.80	IND	INDA_102	CL			24.7		24.7		24.7		24.7		24.7		25.6	
116.00	KOR	KO11201D	CL	7.5		7.5		7.5		7.5		7.5		7.5			
116.00	KOR	KOR11201	CL	7.5		7.5		7.5		7.5		7.5		7.5			
122.00	CHN	CHN19001	CL		47.7		47.7		47.7		47.7		47.7		50.7		
122.00	CHN	CHN19002	CR			42.0		42.0		42.0		42.0		42.0		999.9	
134.00	PNG	PNG13101	CR		26.1		25.2		25.2		25.2		25.2		25.2		
134.00	PNG	PNG13102	CL			25.2		25.2		25.2		25.2		25.2		26.1	
140.00	USA	USAC_101	CL		19.4		18.6		18.6		18.6		18.6		18.6		
140.00	USA	USAC_102	CR			18.6		18.6		18.6		18.6		18.6		19.4	

1	2	3	4	5																																								
Orbital Position	Admin. symbol	Beam Identification	Polarization type	Channel number																																								
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	
				Minimum equivalent protection margin																																								
-12.80	HRV	HRV14802	CL										0.1																														2.1	
-12.80	HRV	HRV14803	CL		0.1*																				-0.7*	-0.7*																		
-12.80	SVK	SVK14401	CR						0.8							0.8										0.0							0.0									0.0		
-12.80	SVK	SVK14402	CL																0.1										-0.7							-0.7								
-12.80	SVK	SVK14403	CL		0.1*																				-0.7*	-0.7*																		
-7.00	EGY	EGY02600	CR		27.4		28.1		27.4		28.1		27.4		28.1		27.4		28.7		27.8		9.2																					
-7.00	F	F 09300	CR																						-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	
-7.00	F	F____100	CL	17.3		16.4		16.4		16.4		16.4		16.4		16.4		17.1		17.9		17.9																						
-7.00	SCG**	SCG14800	CL																						1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	2.0		
-7.00	STP	STP24100	CL																						14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.1		
-4.00	ISR	ISR11000	CR																						18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2	20.9		
-1.20	BUL	BUL02000	CL	3.5		1.6		1.6		1.6		1.6		1.6		1.6		3.2		5.6		5.5																						
-1.20	CVA	CVA08300	CR		1.7		2.3		1.7		2.3		1.7		2.3																													
-1.20	CVA	CVA08500	CR													1.7																												
-1.20	CYP	CYP08600	CL																					7.7	4.6	4.7	4.6	4.7	4.6	4.7	4.6	4.7	4.6	4.7	4.6	4.7	4.6	4.7	4.6	4.7	4.6	4.7		
-1.20	GRC	GRC10500	CR																						0.2	-0.6	0.2	-0.6	0.2	-0.6	0.2	-0.6	0.2	-0.6	0.2	-0.6	0.2	-0.6	0.2	-0.6	0.2	0.6		
-0.80	BOT	BOT29700	CL																					3.2	-0.4	0.8	-0.4	0.8	-0.4	0.8	-0.4	0.8	-0.4	0.8	-0.4	0.8	-0.4	0.8	-0.4	0.8	-0.4			
-0.80	KEN	KEN24900	CR		1.4		2.4		1.4		2.5		1.4		2.5		1.4		3.3		1.9		5.3																					
-0.80	NOR	NOR12000	CR	1.7		-0.7		-0.7		-0.7		-0.7		-0.7		-0.9		0.9		4.2		4.6																						
-0.80	NOR	NOR12100	CL																																									
-0.80	ZMB	ZMB31400	CR																																									
-0.80	ZWE	ZWE13500	CL	8.6		7.6		7.6		7.6		7.6		7.6		7.6		7.8		7.9		7.9																						
4.80	LSO	LSO30500	CL		6.3		6.2		6.3		6.2		6.3		6.2		6.1		6.1		5.8		8.0																					
4.80	MWI	MWI30800	CR																					10.6	11.1	11.1	11.1	11.1	6.9		6.9		6.9		6.9		6.9		6.9		5.4			
4.80	SWZ	SWZ31300	CR	6.9		3.9		3.9		3.9		3.9		3.9		3.8		3.8		3.8		3.4																						
5.00	S	S 13800	CL																					7.5	7.2	8.2	7.2	8.2		8.2		7.2		8.2		7.2		8.2		7.2				
5.00	S	S 13900	CL																																									

* This assignment shall only be used by the administrations of Croatia, Hungary, Slovakia and the Czech Rep. on the basis of equal access subject to mutual agreement between them.

** Note by the Secretariat: This designation replaces the former designation "YUG" which was used previously as a three-letter code for the Administration of Serbia and Montenegro.

1	2	3	4	5																																												
Orbital Position	Admin. symbol	Beam Identification	Polarization type	Channel number																																												
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40					
				Minimum equivalent protection margin																																												
9.00	I	I 08200	CR																																													
11.00	BDI	BDI27000	CL	3.2		0.4		0.4		0.4		0.4		0.4		0.4		0.4		0.4					12.2		12.0		12.2		11.6		11.1		11.2		11.2		11.2		11.2						11.4	
11.00	JOR	JOR22400	CL																						5.8		5.8		5.8		5.8		5.8		5.8		5.8		5.8		5.8		5.8				7.6	
11.00	KWT	KWT11300	CR																					8.0		7.1		7.1		7.1		7.1		7.1		7.1		7.1		7.1		7.1				7.1		
11.00	LBN	LBN27900	CR	2.0		-0.8		-0.8		-0.8		-0.8		-0.8		-0.8		-0.8		-0.8		-0.8																										
11.00	RRW	RRW31000	CR		0.2		0.2		0.2		0.2		0.2		0.2		0.2		0.2		0.2		2.6																									
11.00	SYR	SYR22900	CL		-0.7		-0.7		-0.7		-0.7		-0.7		-0.7		-0.7		-0.7		-0.7		1.4																									
11.00	SYR	SYR33900	CL		-0.7																																											
11.00	TZA	TZA22500	CR																						0.1		0.1		0.1		0.1		0.1		0.1		0.1		0.1		0.1				2.0			
16.80	DJI	DJI09900	CL	8.7		6.0		6.0		6.0		6.0		6.0		6.0		6.0		6.0		6.0																										
17.00	ARS	ARS00375	CL																						4.3		4.3		4.3		4.3		4.3		4.3		4.3		4.3		4.3		4.3				6.8	
17.00	ARS	ARS34000	CL																																												6.8	
17.00	TCO	TCO14300	CR	4.3		4.0		4.0		4.0		4.0		4.0		4.0		4.0		4.1																												
17.00	UGA	UGA05100	CR																					11.5		10.7		10.7		10.7		10.7		10.7		10.7		10.7		10.7		10.7		10.7				
17.20	OMA	OMA12300	CL		2.0		2.0		2.0		2.0		2.0		2.0		2.0		2.0		2.0		4.4																									
20.00	QAT	QAT24700	CL		13.7		13.7		13.7		13.7		13.7		13.7		13.7		13.7		13.7		15.5																									
22.80	ARM	ARM06400	CR																						2.4		2.4		2.4		2.4		2.4		2.4		2.4		2.4		2.4		2.4				5.1	
22.80	ERI	ERI09200	CL																						1.3		1.3		1.3		1.3		1.3		1.3		1.3		1.3		1.3		1.3				1.7	
22.80	FIN	FIN10300	CL																						0.2		0.2		0.2		0.2		0.2		0.2		0.2		0.2		0.2		0.2				1.7	
22.80	FIN	FIN10400	CL																																												1.7	
22.80	MKD	MKD14800	CL		8.7		8.7		8.7		8.7		8.7		8.7		8.7		8.7		8.7		10.6																									
22.80	MLT	MLT14700	CR	9.1		7.7		7.7		7.7		7.7		7.7		7.7		7.7		7.7		7.8																										
23.20	AZE	AZE06400	CL																					4.7		2.5		2.5		2.5		2.5		2.5		2.5		2.5		2.5		2.5		2.5				
23.20	GEO	GEO06400	CL	8.1		6.0		6.0		6.0		6.0		6.0		6.0		6.0		6.0		6.0																										
23.20	LTU	LTU06100	CR																					5.6		3.0		3.0		3.0		3.0		3.0		3.0		3.0		3.0		3.0		3.0				
23.20	LVA	LVA06100	CR	6.4		6.3		6.2		6.2		6.2		6.2		6.2		6.2		6.2		6.4																										
28.20	LUX	LUX11400	CL	18.5		18.2		17.7		18.2		17.7		18.2		17.7		18.2		18.2		18.3																										
29.00	COM	COM20700	CR																					12.9		9.9		9.9		9.9		9.9		9.9		9.9		9.9		9.9		9.9		9.9				
29.00	MAU	MAU__100	CL																																													
29.00	MDG	MDG23600	CL	28.0		27.5		27.5		27.5		27.5		27.5		27.5		27.5		27.5		27.9				2.6		2.6		2.6		2.6		2.6		2.6		2.6		2.6		2.6		2.6				5.6

1	2	3	4	5																																									
Orbital Position	Admin. symbol	Beam Identification	Polarization type	Channel number																																									
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40		
				Minimum equivalent protection margin																																									
33.80	SVN	SVN14800	CR		5.9		5.9		5.9		5.9		5.9		5.9		6.0		6.0		6.1				0.3		2.5		5.8		4.7		5.8		4.7		5.8		4.7		5.8		5.0		
33.80	UZB	UZB07100	CR																																										
34.00	BHR	BHR25500	CR		6.6		6.6		6.6		6.6		6.6		6.6		6.6		6.6		6.7																								
34.00	IRN	IRN10900	CL	2.4	-0.2		-0.2		-0.2		-0.3		-0.2		-0.3		-0.2		-0.2		-0.2		0.6		1.9																				
34.20	MCO	MCO11600	CR																					2.3		8.7		17.2		17.2		17.2		17.2		17.2		17.2		17.2		17.7			
36.00	RUS	RSTREA11	CR																																										
36.00	RUS	RSTREA12	CL																																										
36.00	RUS	RSTRED11	CR																																										
36.00	RUS	RSTRED12	CL																																										
36.00	RUS	RSTRSD11	CR																																										
36.00	RUS	RSTRSD12	CL																																										
37.80	BLR	BLR06200	CL	2.1		0.4		0.2		0.4		0.2		0.4		0.2		0.4		0.4		0.4																							
38.00	TJK	TJK06900	CL		1.9		1.9		1.9		1.9		1.9		1.9		1.9		1.9		1.9		4.4																						
38.20	BEL	BEL01800	CR																																										
38.20	HOL	HOL21300	CL																																										
38.20	UKR	UKR06300	CR		0.5		0.5		0.5		0.5		0.5		0.5		0.5		0.6		0.6		0.3																						
42.00	TUR	TUR14500	CL		7.9		7.9		7.9		7.9		7.9		7.9		7.9		7.9		7.9		7.9																						
42.50	SEY	SEY00000	CR																																										
44.50	EST	EST06100	CR	14.4		13.8		13.8		13.8		13.8		13.8		13.8		13.8		13.8		13.8																							
50.00	AFG	AFG24501	CL																																										
50.00	AFG	AFG24502	CR																																										
50.00	CLN	CLN21900	CL	1.0		0.9		0.9		0.9		0.9		0.9		0.8		0.8		0.8		0.8		4.9		4.9																			
50.00	KGZ	KGZ07000	CR		-1.0		-1.0		-1.0		-1.0		-1.0		-1.0		-1.0		-1.0		-1.0		0.4																						
50.00	MDA	MDA06300	CR																																										
50.00	MLD	MLD30600	CR	5.5		5.3		5.3		5.3		5.3		5.2		5.2		5.2		5.2		5.6		5.8																					
50.00	POL	POL13200	CR	5.9		4.5		4.5		4.5		4.5		4.5		4.5		4.5		4.5		4.5		4.5																					
50.00	ROU	ROU13600	CL																																										
50.00	TKM	TKM06800	CL	-0.2		-1.0		-1.0		-1.0		-1.0		-1.0		-1.0		-1.0		-1.0		-1.0																							
52.50	UAE	UAE27400	CR																																										
55.80	IND	INDA_101	CR																																										

1	2	3	4	5																																												
Orbital Position	Admin. symbol	Beam Identification	Polarization type	Channel number																																												
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40					
				Minimum equivalent protection margin																																												
55.80	IND	INDA_102	CL											9.3	9.3	9.3	11.7	17.4	14.2																													
55.80	IND	INDB_101	CR	5.3		5.3		5.3		5.3		5.3																																				
55.80	IND	INDB_102	CL		7.3		7.3		7.3		7.3		7.3	-0.2																																		
56.00	BIH	BIH14800	CR	13.0		12.6		12.6		12.6		12.6		12.3		12.3		12.3		12.3																												
56.00	RUS	RSTRSD21	CR																							11.0		17.6		17.2		17.1		17.1		17.1		17.1		17.1		17.1		17.1				
56.00	RUS	RSTRSD22	CL																									17.7		17.6		17.2		17.2		17.2		17.2		17.2		17.2		17.2		18.2		
56.40	KAZ	KAZ06600	CL	3.2		1.2		1.2		1.2		1.2		3.1		6.0		6.0		6.0																												
62.00	ALB	ALB29600	CL																																												47.4	
62.00	CHN	CHN15400	CR		13.5		13.5		13.5		13.5		13.7		15.1		15.1		15.1		15.5		2.6		2.6																							
62.00	CHN	CHN15500	CL	14.5		13.6		13.6		13.6		13.6		15.0		15.4		15.4		15.4		2.5		-0.5																								
68.00	IND	IND03700	CL		5.2		5.2		5.2		5.2		5.2		5.2		5.2		5.2		5.2		5.2		8.2																							
68.00	IND	IND04701	CR																																													
68.00	IND	IND04702	CL																																													
68.00	IND	IND0_100	CR	6.0		3.0		3.0		3.0		3.0		3.0		3.0		3.0		3.0		3.0		3.0		3.0																					47.1	
74.00	BGD	BGD22000	CR	4.7		1.7		1.7		1.7		1.7		1.7		1.7		1.7		1.7		0.9		0.9																								
74.00	BRU	BRU3300A	CR		12.1		12.1		12.1		12.1		12.1		12.1		12.1		12.1		11.7		11.3		13.6																							
74.00	MNG	MNG24800	CL																																													
80.20	INS	INS02800	CR	16.0		14.6		14.6		14.6		14.6		14.6		14.6		14.6		14.6		14.5		14.5																								
86.00	BTN	BTN03100	CR	8.6		5.6		5.6		5.6		5.6		5.6		5.6		5.6		5.6		5.6		5.6																								
86.00	CBG	CBG29900	CR		2.1		2.1		2.1		2.1		2.1		2.1		2.1		2.1		2.1		2.1		4.0																							
86.00	RUS	RSTRSD31	CR																																													
86.00	RUS	RSTRSD32	CL																																													
88.00	SNG	SNG15100	CL	15.4		13.0		13.0		13.0		13.0		13.0		13.0		13.0		13.0		13.0		13.0		13.0																						
91.50	MLA	MLA_100	CR		11.4		11.4		11.4		11.4		11.4		11.4		11.4		11.4		11.4		11.4		13.7																							
92.20	CHN	CHN16000	CR	7.7		4.9		4.9		4.9		4.9		4.9		4.9		4.9		4.9		4.9		4.9		4.9																						
92.20	CHN	CHN16100	CL		11.1		11.1		11.1		11.1		11.1		11.1		11.1		11.1		11.1		11.1		11.2																							
98.00	PHL	PHL28500	CL		5.1		5.1		5.1		5.1		5.1		5.1		5.1		5.1		5.1		5.1		7.9																							
98.00	THA	THA14200	CR	8.1		5.3		5.3		5.3		5.3		5.3		5.3		5.3		5.3		5.3		5.3		5.3																						
104.00	BRM	BRM29800	CR	15.4		13.8		13.8		13.8		13.8		13.8		13.8		13.8		13.8		13.8		13.8		13.8																						
104.00	INS	INS03501	CL																																													

1	2	3	4	5																																										
Orbital Position	Admin. symbol	Beam Identification	Polarization type	Channel number																																										
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40			
				Minimum equivalent protection margin																																										
152.00	AUS	AUS00401	CL		6.0			6.0			6.0				6.0			6.0			6.0			6.0			6.0																			
152.00	AUS	AUS00402	CL		6.0			6.0			6.0				6.0			6.0					6.0			6.0																				
152.00	AUS	AUS00403	CL		6.0			6.0			6.0				6.0			6.0			6.0			6.0			6.0																			
152.00	AUS	AUS00404	CL		6.0			6.0			6.0				6.0			6.0			6.0			6.0			6.0																			
152.00	AUS	AUS00405	CL		6.0			6.0			6.0				6.0			6.0			6.0			6.0			6.0																			
152.00	AUS	AUS00406	CL		6.0			6.0			6.0				6.0			6.0			6.0			6.0			6.0																			
152.00	AUS	AUS0040A	CL		-0.4			-0.4			-0.4				-0.4			-0.4			-0.4			-0.4			-0.4																			
152.00	AUS	AUS00500	CR			-3.3			-3.3			-0.3				-0.3			-0.3			-0.3				-0.3																				
152.00	AUS	AUS00501	CR			3.0			3.0			6.0			6.0			6.0			6.0			6.0			6.0																			
152.00	AUS	AUS00502	CR			3.0			3.0			6.0			6.0			6.0			6.0			6.0			6.0																			
152.00	AUS	AUS00503	CR			3.0			3.0			6.0			6.0			6.0			6.0			6.0			6.0																			
152.00	AUS	AUS00504	CR			3.0			3.0			6.0			6.0			6.0			6.0			6.0			6.0																			
152.00	AUS	AUS00505	CR			3.0			3.0			6.0			6.0			6.0			6.0			6.0			6.0																			
152.00	AUS	AUS00506	CR			3.0			3.0			6.0			6.0			6.0			6.0			6.0			6.0																			
152.00	AUS	AUS00600	CR																																											
152.00	AUS	AUS00601	CR																																											
152.00	AUS	AUS00602	CR																																											
152.00	AUS	AUS00603	CR																																											
152.00	AUS	AUS00604	CR																																											
152.00	AUS	AUS00605	CR																																											
152.00	AUS	AUS00606	CR																																											
152.00	AUS	AUSA0000	CL	39.7			-0.4				-0.4																																			
152.00	AUS	AUSA0001	CL	61.2			6.0				6.0																																			
152.00	AUS	AUSA0002	CL	60.5			6.0				6.0																																			
152.00	AUS	AUSA0003	CL	61.5			6.0				6.0																																			

[illegible]

MOD

ANNEX 1

Limits for determining whether a service of an administration is considered to be affected by a proposed modification to the Region 2 feeder-link Plan or by a proposed new or modified assignment in the Regions 1 and 3 feeder-link List or when it is necessary under this Appendix to seek the agreement of any other administration (WRC-03)

MOD

3 Limits to the change in the overall equivalent protection margin with respect to frequency assignments in conformity with the Region 2 feeder-link Plan¹⁸ (WRC-2000)

With respect to the modification to the Region 2 feeder-link Plan and when it is necessary under this Appendix to seek the agreement of any other administration of Region 2, except in cases covered by Resolution 42 (Rev.WRC-03), an administration is considered as being affected if the overall equivalent protection margin¹⁹ corresponding to a test point of its entry in that Plan, including the cumulative effect of any previous modification to that Plan or any previous agreement, falls more than 0.25 dB below 0 dB, or, if already negative, more than 0.25 dB below the value resulting from:

- the feeder-link Plan as established by the 1983 Conference; *or*
- a modification of the assignment in accordance with this Appendix; *or*
- a new entry in the feeder-link Plan under Article 4; *or*
- any agreement reached in accordance with this Appendix except for Resolution 42 (Rev.WRC-03). (WRC-03)

MOD

4 Limits to the interference into frequency assignments in conformity with the Regions 1 and 3 feeder-link Plan or with the Regions 1 and 3 feeder-link List or proposed new or modified assignments in the Regions 1 and 3 feeder-link List (WRC-03)

Under assumed free-space propagation conditions, the power flux-density of a proposed new or modified assignment in the feeder-link List shall not exceed the value of $-76 \text{ dB(W/(m}^2 \cdot 27 \text{ MHz))}$ at any point in the geostationary-satellite orbit, and the relative off-axis e.i.r.p. of the associated feeder-link antenna shall be in compliance with Fig. A (WRC-97 curves) of Annex 3. (WRC-03)

With respect to § 4.1.1 *a)* or *b)* of Article 4, an administration in Region 1 or 3 is considered by the Bureau as being affected if the minimum orbital spacing between the wanted and interfering space stations, under worst-case station-keeping conditions, is less than 9°. (WRC-03)

However, an administration is not considered as being affected if, under assumed free-space propagation conditions, the effect of the proposed new or modified assignments in the feeder-link List is that the feeder-link equivalent protection margin²⁰ corresponding to a test point of its assignment in the feeder-link Plan or the feeder-link List or for which the procedure of Article 4 has been initiated, including the cumulative effect of any previous modification to the feeder-link List or any previous agreement, does not fall more than 0.45 dB below 0 dB, or, if already negative, more than 0.45 dB below the value resulting from:

- the Regions 1 and 3 feeder-link Plan and List as established by WRC-2000; *or*
- a proposed new or modified assignment to the feeder-link List in accordance with this Appendix; *or*
- a new entry in the Regions 1 and 3 feeder-link List as a result of the successful application of Article 4 procedures. (WRC-03)

For a proposed new or modified assignment to the feeder-link List, in the interference analysis, for each test point, the antenna characteristics described in § 3.5 of Annex 3 shall apply. (WRC-03)

MOD

5 Limits applicable to protect a frequency assignment in the bands 17.3-18.1 GHz (Regions 1 and 3) and 17.3-17.8 GHz (Region 2) to a receiving space station in the fixed-satellite service (Earth-to-space)

An administration in Region 1 or 3 is considered as being affected by a proposed modification in Region 2, with respect to § 4.2.2 *a)* or 4.2.2 *b)* of Article 4, or an administration in Region 2 is considered as being affected by a proposed new or modified assignment in the Regions 1 and 3 feeder-link List, with respect to § 4.1.1 *c)* of Article 4, when the power flux-density arriving at the receiving space station of a broadcasting-satellite feeder-link would cause an increase in the noise temperature of the feeder-link space station which exceeds the threshold value of $\Delta T/T$ corresponding to 6%, where $\Delta T/T$ is calculated in accordance with the method given in Appendix 8, except that the maximum power densities per hertz averaged over the worst 1 MHz are replaced by power densities per hertz averaged over the necessary bandwidth of the feeder-link carriers. (WRC-03)

Interim systems of Region 2 in accordance with Resolution 42 (Rev.WRC-03) shall not be taken into consideration when applying the above paragraph to proposed new or modified assignments in the Regions 1 and 3 feeder-link List. However, the above paragraph shall be applied to Region 2 interim systems with respect to Regions 1 and 3 administrations, referred to in § 5.2 *b)* of Resolution 42 (Rev.WRC-03). (WRC-03)

MOD

6 Limits applicable to protect a frequency assignment in the band 17.8-18.1 GHz (Region 2) to a receiving feeder-link space station in the fixed-satellite service (Earth-to-space) (WRC-03)

With respect to § 4.1.1 *d*) of Article 4, an administration is considered affected by a proposed new or modified assignment in the Regions 1 and 3 feeder-link List when the power flux-density arriving at the receiving space station of a broadcasting-satellite feeder-link in Region 2 of that administration would cause an increase in the noise temperature of the receiving feeder-link space station which exceeds the threshold value of $\Delta T/T$ corresponding to 6%, where $\Delta T/T$ is calculated in accordance with the method given in Appendix 8, except that the maximum power densities per hertz averaged over the worst 1 MHz are replaced by power densities per hertz averaged over the necessary bandwidth of the feeder-link carriers. (WRC-03)

MOD

ANNEX 2 (Rev.WRC-03)

Basic characteristics to be furnished in notices relating to feeder-link stations in the fixed-satellite service operating in the frequency bands 14.5-14.8 GHz and 17.3-18.1 GHz

These data are listed in Appendix 4.

MOD

ANNEX 3

Technical data used in establishing the provisions and associated Plans and Regions 1 and 3 feeder-link List, which should be used for their application²¹ (WRC-03)

2.2 Rain attenuation

MOD

Step 6 remains the same except the frequency dependent coefficients k and α shall be obtained from Recommendation ITU-R P.838-2. (WRC-03)

3 Basic technical characteristics for Regions 1 and 3

MOD

3.1 Translation frequency and guardbands

a) 17 GHz feeder-links

The feeder-link Plan generally uses a frequency translation of 5.6 GHz between the 17 GHz feeder-link channels and the 12 GHz downlink channels. Other values of the translation frequency may be used, provided that the corresponding channels have been assigned to the space station of the administration concerned.

With the value of frequency translation between the feeder-link frequency band (17.3-18.1 GHz in Regions 1 and 3) and the downlink frequency band (11.7-12.5 GHz in Region 1 and 11.7-12.2 GHz in Region 3), the guardbands specified in § 3.9 of Annex 5 to Appendix 30 for the downlink Plan result in corresponding guardband bandwidths of 11 MHz at the upper and 14 MHz at the lower feeder-link band edges. These feeder-link guardbands may be used to provide space operation functions in accordance with No. 1.23 in support of the operation of geostationary-satellite networks in the broadcasting-satellite service. (WRC-03)

(MOD) (Spanish version only)

c) Frequency translation rules

MOD

3.3 Protection ratios

For planning in Regions 1 and 3 at the 1988 Conference (WARC Orb-88), the following protection ratios were applied for the purpose of calculating the feeder-link equivalent protection margins²⁶:

- co-channel protection ratio = 40 dB;
- adjacent channel protection ratio = 21 dB.

The method for the calculation of the feeder-link equivalent protection margin is given in § 1.7.

For revising the Regions 1 and 3 feeder-link Plan at WRC-97, the corresponding values of aggregate protection ratio that were used to calculate the feeder-link equivalent protection margins which appear in the alternative formula for overall equivalent protection margin given in § 1.12 are specified in Recommendation ITU-R BO.1297, as follows^{27, 28}:

- co-channel protection ratio = 30 dB;
- adjacent channel protection ratio = 22 dB. (WRC-2000)

However, it should be noted that the revision of the Regions 1 and 3 feeder-link Plan by WRC-97 was based on “simultaneous planning of feeder links and downlinks with calculation of overall equivalent protection margins” (as defined in § 1.11 of Annex 5 to Appendix 30 and in § 1.12) using the following values of aggregate protection ratio:

- co-channel = 23 dB;
- adjacent channel = 15 dB. (WRC-03)

It was also specified that, for the revision of the Regions 1 and 3 feeder-link Plan, no overall co-channel single entry C/I ratio should be lower than 28 dB. (WRC-03)

Nevertheless, for assignments notified, which are in conformity with this Appendix, brought into use, and for which the date of bringing into use has been confirmed to the Bureau before 27 October 1997, the overall equivalent protection margins were calculated using a co-channel overall protection ratio of 30 dB and lower and upper overall adjacent channel protection ratios of 14 dB.

Revision of the Regions 1 and 3 feeder-link Plan at WRC-97 and planning at WRC-2000 were generally based on a set of reference parameters such as the average e.i.r.p., the reference earth station transmitting antenna, all test points placed within the –3 dB contour, a bandwidth of 27 MHz and the predetermined value of C/N . The Regions 1 and 3 feeder-link Plan as established by WRC-2000 is generally based on the use of digital modulation. (WRC-2000)

WRC-2000 adopted for the protection of digital assignments from digital emissions the following protection ratio values to be applied for calculation of feeder-link equivalent protection margins of the WRC-2000 Regions 1 and 3 feeder-link Plan:

- 27 dB for co-channel signals;
- 22 dB for adjacent channel signals. (WRC-2000)

During planning at WRC-2000, these values were used for all assignments of the Regions 1 and 3 feeder-link Plan and List, except those for which WRC-2000 adopted different values to be used in the planning process²⁹. (WRC-03)

Protection masks and associated calculation methods for interference into broadcasting-satellite systems involving digital emissions shall be in accordance with Recommendation ITU-R BO.1293-2 (Annexes 1 and 2^{29A}). (WRC-03)

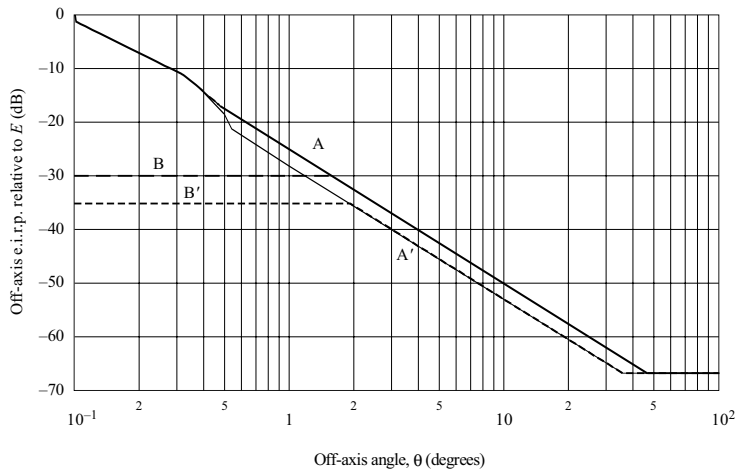
ADD

^{29A} Annex 3 of this Recommendation may be applied only in compatibility analysis for bilateral coordination between administrations. (WRC-03)

3.7.1 Cross-section of receiving antenna beam

MOD

FIGURE A
Earth station e.i.r.p. at off-axis antenna angles



Curves A: WARC Orb-88 Regions 1 and 3 co-polar
A': WRC-97 co-polar
B: WARC Orb-88 Regions 1 and 3 cross-polar
B': WRC-97 cross-polar

AP30AA3-A

Co-polar component (dBW):

Curve A (WARC Orb-88)

E	for	$0^\circ \leq \theta \leq 0.1^\circ$
$E - 21 - 20 \log \theta$	for	$0.1^\circ < \theta \leq 0.32^\circ$
$E - 5.7 - 53.2 \theta^2$	for	$0.32^\circ < \theta \leq 0.44^\circ$
$E - 25 - 25 \log \theta$	for	$0.44^\circ < \theta \leq 48^\circ$
$E - 67$	for	$48^\circ < \theta$

Curve A' (WRC-97)

E	for	$0^\circ \leq \theta \leq 0.1^\circ$
$E - 21 - 20 \log \theta$	for	$0.1^\circ < \theta \leq 0.32^\circ$
$E - 5.7 - 53.2 \theta^2$	for	$0.32^\circ < \theta \leq 0.54^\circ$
$E - 28 - 25 \log \theta$	for	$0.54^\circ < \theta \leq 36.31^\circ$
$E - 67$	for	$36.31^\circ < \theta$

Cross-polar component (dBW): (WRC-03)

Curve B (WARC Orb-88)

$E - 30$	for	$0^\circ \leq \theta \leq 1.6^\circ$
$E - 25 - 25 \log \theta$	for	$1.6^\circ < \theta \leq 48^\circ$
$E - 67$	for	$48^\circ < \theta$

Curve B' (WRC-97)

$E - 35$	for	$0^\circ \leq \theta \leq 1.91^\circ$
$E - 28 - 25 \log \theta$	for	$1.91^\circ < \theta \leq 36.31^\circ$
$E - 67$	for	$36.31^\circ < \theta$

where:

E : earth station e.i.r.p. on the antenna axis (dBW);
 θ : off-axis angle referred to the main lobe axis (degrees).

MOD

3.8 System noise temperature

The satellite system noise temperature values generally used in the Plan at the 1988 Conference (WARC Orb-88) are 1 800 K for 17 GHz and 1 500 K for 14 GHz³². For revising the Regions 1 and 3 Plan at WRC-97 these values are 900 K for 17 GHz and 750 K for 14 GHz. A value of 600 K was used for the 17 GHz band in the revision of the Regions 1 and 3 Plan at WRC-2000. WRC-2000 did not change the value for the 14 GHz band. (WRC-03)

MOD

3.15 Orbit positions

The Plan is generally based on the use of a regular spacing of 6°. The orbital positions are those given in the Plan. (WRC-03)

MOD

4.1 Translation frequency and guard bands

The feeder-link Plan is based on the use of a single frequency translation of 5.1 GHz between the 17 GHz feeder-link channels and the 12 GHz downlink channels. Other values of the translation frequency may be used, provided that the corresponding channels have been assigned to the space station of the administration concerned.

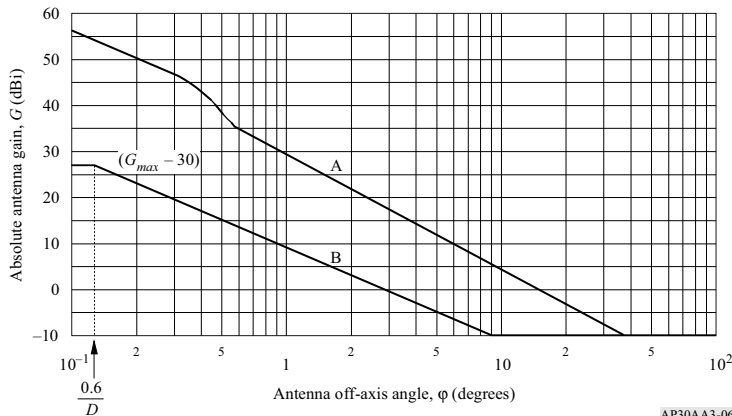
With a single value frequency translation between the feeder-link frequency band (17.3-17.8 GHz) and the downlink frequency band (12.2-12.7 GHz), the guard bands present in the downlink Plan result in corresponding bandwidths of 12 MHz at the upper and lower feeder-link band edges. These feeder-link guard bands may be used to provide space operation functions in accordance with No. 1.23 in support of the operation of geostationary-satellite networks in the broadcasting-satellite service. (WRC-03)

MOD

4.4.2 Transmitting antenna reference patterns (WRC-03)

MOD

FIGURE 6
Reference patterns for co-polar and cross-polar components
for transmitting antennas for Region 2



Curve A: co-polar component (dBi)

$$\begin{aligned}
 G_{co} &= G_{max} & \text{for } 0^\circ \leq \varphi < 0.1^\circ \\
 G_{co} &= 36 - 20 \log \varphi & \text{for } 0.1^\circ \leq \varphi < 0.32^\circ \\
 G_{co} &= 51.3 - 53.2 \varphi^2 & \text{for } 0.32^\circ \leq \varphi < 0.54^\circ \\
 G_{co} &= \max(29 - 25 \log \varphi, -10) & \text{for } 0.54^\circ \leq \varphi \leq 180^\circ \\
 \text{If } G_{co} > G_{max}: G_{co} &= G_{max} & (\text{WRC-03})
 \end{aligned}$$

Curve B: cross-polar component (dBi)

$$\begin{aligned}
 G_{cross} &= G_{max} - 30 & \text{for } 0^\circ \leq \varphi < (0.6/D)^\circ \\
 G_{cross} &= \max(9 - 20 \log \varphi, -10) & \text{for } (0.6/D)^\circ \leq \varphi \leq 180^\circ \\
 \text{If } G_{cross} > G_{max} - 30: G_{cross} &= G_{max} - 30 & (\text{WRC-03})
 \end{aligned}$$

where:

- φ : off-axis angle referred to the main-lobe axis (degrees)
- G_{max} : on-axis co-polar gain of the antenna (dBi)
- D : diameter of the antenna (m) ($D \geq 2.5$).

NOTE 1 – In the angular range between 0.1° and 0.54° , the co-polar gain must not exceed the reference pattern.

NOTE 2 – In the angular range between 0° and $(0.6/D)^\circ$, the cross polar gain must not exceed the reference pattern.

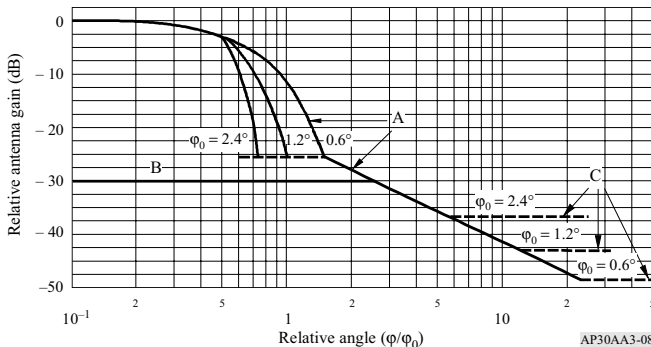
NOTE 3 – At the larger off-axis angles and for 90% of all side-lobe peaks in each of the reference angular windows, the gain must not exceed the reference pattern. The reference angular windows are 0.54° to 1° , 1° to 2° , 2° to 4° , 4° to 7° , 7° to 10° , 10° to 20° , 20° to 40° , 40° to 70° , 70° to 100° and 100° to 180° . The first reference angular window for evaluating the cross-polar component should be $(0.6/D)^\circ$ to 1° .

MOD

4.6.3 Receiving antenna reference patterns (WRC-03)

MOD

FIGURE 8
Reference patterns for co-polar and cross-polar components for satellite receiving antennas with fast roll-off in the main beam for Region 2



AP30AA3-08

Curve A: co-polar component (dB relative to main beam gain)

$$\begin{aligned}
 & -12 (\varphi/\varphi_0)^2 & \text{for } 0 & \leq \varphi/\varphi_0 \leq 0.5 \\
 & -33.33 \varphi_0^2 (\varphi/\varphi_0 - x)^2 & \text{for } 0.5 & < \varphi/\varphi_0 \leq \frac{0.87}{\varphi_0} + x \\
 & -25.23 & \text{for } \frac{0.87}{\varphi_0} + x & < \varphi/\varphi_0 \leq 1.45 \\
 & -(22 + 20 \log (\varphi/\varphi_0)) & \text{for } \varphi/\varphi_0 & > 1.45
 \end{aligned}$$

after intersection with Curve C, as Curve C. (WRC-03)

Curve B: cross-polar component (dB relative to main beam gain)

$$-30 \quad \text{for } 0 \leq (\varphi/\varphi_0) \leq 2.51$$

after intersection with Curve A, as Curve A.

Curve C: minus the on-axis gain (Curves A and C represent examples for three antennas having different values of φ_0 as labelled in Fig. 8. The on-axis gains of these antennas are 37, 43 and 49 dBi, respectively).

where:

φ : off-axis angle (degrees)

φ_0 : dimension of the minimum ellipse fitted around the feeder-link service area in the direction of interest (degrees)

$$x = 0.5 \left(1 - \frac{0.6}{\varphi_0} \right)$$

MOD

4.7 System noise temperature

The Plan is based on a value of 1 500 K for the satellite system noise temperature. WRC-03 decided that for feeder-link assignments in the Plan which have not been subsequently modified through successful application of Article 4 of this Appendix, a value of 600 K (instead of 1 500 K) is used in application of § 5 of Annex 1 and § 1 of Annex 4 of this Appendix. For those assignments which have been subsequently modified, the noise temperature value provided in that modification is used. (WRC-03)

ANNEX 4 (WRC-2000)

Criteria for sharing between services**MOD**

- 1 Threshold values for determining when coordination is required between, on one hand, transmitting space stations in the fixed-satellite service or the broadcasting-satellite service and, on the other hand, a receiving space station in the feeder-link Plan or List or a proposed new or modified receiving space station in the List, in the frequency bands 17.3-18.1 GHz (Regions 1 and 3) and in the feeder-link Plan or a proposed modification to the Plan in the frequency band 17.3-17.8 GHz (Region 2)** (WRC-03)

With respect to § 7.1, Article 7, coordination of a transmitting space station in the fixed-satellite service or in the broadcasting-satellite service with a receiving space station in a broadcasting-satellite service feeder link in the Regions 1 and 3 feeder-link Plan or List, or a proposed new or modified receiving space station in the List, or in the Region 2 feeder-link Plan or proposed modification to the Plan is required when the power flux-density arriving at the receiving space station of a broadcasting-satellite service feeder link of another administration would cause an increase in the noise temperature of the feeder-link space station which exceeds a threshold value of $\Delta T_s/T_s$ corresponding to 6%. $\Delta T_s/T_s$ is calculated in accordance with Case II of the method given in Appendix 8. (WRC-03)

MOD

- 2 Threshold values for determining when coordination is required between transmitting feeder-link earth stations in the fixed-satellite service in Region 2 and a receiving space station in the Regions 1 and 3 feeder-link Plan or List or a proposed new or modified receiving space station in the List, in the frequency band 17.8-18.1 GHz** (WRC-03)

With respect to § 7.1, Article 7, coordination of a transmitting feeder-link earth station in the fixed-satellite service with a receiving space station in a broadcasting-satellite feeder link in the Regions 1 and 3 feeder-link Plan or List, or a proposed new or modified receiving space station in the List, is required when the power flux density arriving at the receiving space station of a broadcasting-satellite service feeder link of another administration would cause an increase in the noise temperature of the feeder-link space station which exceeds a threshold value of $\Delta T/T$ corresponding to 6%, where $\Delta T/T$ is calculated in accordance with the method given in Appendix 8, except that the maximum power densities per hertz averaged over the worst 1 MHz are replaced by power densities per hertz averaged over the necessary bandwidth of the feeder-link carriers. (WRC-03)

APPENDIX 30B (Rev.WRC-03)

**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, 11.20-11.45 GHz and 12.75-13.25 GHz**

ARTICLE 5

The Plan and the associated List of assignments

MOD

5.3 The predetermined arc (PDA) is a segment of the geostationary-satellite orbit (GSO) about a nominal orbital position intended to provide flexibility in the Plan.

- a) The size of the PDA depends on the stage of development of the satellite system:
 - for a system in the *pre-design stage*, the PDA is the fixed portion of the GSO defined by the intersection between a segment of $\pm 10^\circ$ about the nominal orbital position established at the Conference and the corresponding service arc. After twenty years from the date of entry into force of this Appendix, the PDA for a system in the pre-design stage is the fixed portion of the GSO defined by the intersection between a segment of $\pm 20^\circ$ about the nominal orbital position established at the Conference and the corresponding service arc, provided that the minimum elevation angle after the application of this procedure is not less than 20° or than the value indicated for each climatic zone in Annex 1 to this Appendix, whichever is larger, for all allotments affected;
 - for a system in the *design stage*, the PDA is the fixed portion of the GSO defined by the intersection between a segment of $\pm 5^\circ$ about the nominal orbital position as may be modified by the application of this Appendix and the PDA defined for the pre-design stage;
 - for a system in the *operational stage*, the PDA will be considered as being zero.
- b) The stage of development to be associated with allotments in Part A and assignments in the List derived from allotments in Part A, with existing systems in Part B, with subregional systems or additional uses, is given in Table 1.
- c) An administration will not be considered to be affected if the nominal orbital position associated with its allotment in the Plan or with its assignments in the List is moved within the corresponding PDA while keeping an aggregate $C/I \geq 26$ dB. WRC-03 decided that for submissions received as from 5 July 2003 the value $C/I \geq 23$ dB shall be applied. (WRC-03)

ARTICLE 6

Procedures for implementation of the Plan and regulation of the fixed-satellite service in the planned bands¹ (WRC-03)**MOD**

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 § 6.26, 6.33 and 6.49 and the corresponding entries in the List under § 6.26, 6.34, 6.50, as appropriate, or cancel entries in the List under § 6.44, as appropriate, 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 specified in the above-mentioned Decision 482, unless the payment has already been received (see also Resolution 87 (WRC-03)). (WRC-03)

Section I – Procedure for conversion of an allotment into an assignment**MOD**

6.1 When an administration intends to convert an allotment into an assignment employing all or part of its allotment in Part A of the Plan, it shall, not earlier than eight years and not later than two years before the planned date of bringing the network into use, send to the Bureau the information specified in Appendix 4. If the assignment is not brought into use by that date, the assignments recorded in the Appendix 30B List shall be transferred to allotment(s) in Part A of the Appendix 30B Plan with the predetermined arc (PDA) defined for a system in the pre-design stage in accordance with § 5.3 of Article 5 of Appendix 30B, without any changes to other technical parameters of allotments, of existing systems or of assignments recorded in the List. (WRC-03)

Section IB – Procedure for recording in the List of the existing systems contained in Part B of the Plan**MOD**

6.29 For existing systems in Part B of the Plan, as well as those entered in the List, the provisions of Resolution 51 (Rev.WRC-2000) shall be applied. If the assignment is not brought into use in accordance with those provisions, the assignments recorded in the Appendix 30B List or existing systems in Part B of the Appendix 30B Plan, as appropriate, shall be cancelled and the Bureau shall also update the reference situation of all allotments, existing systems and assignments recorded in the List, without any changes to their technical parameters. (WRC-03)

MOD

6.34 If, within forty-five days of the BR IFIC mentioned in § 6.33 the Bureau receives no comments, it shall be deemed that there are no objections to the proposed relocations and the Bureau shall record the assignment in the List. The administration shall then notify the assignment in accordance with Article 8. (WRC-03)

Section II – Procedure for the introduction of a subregional system

MOD

6.38 When a group of administrations intends to bring into use a subregional system it shall select one or more orbital positions for the system, preferably from the national allotments concerned, and send details of the assignment of the proposed network to the Bureau, not earlier than eight years and not later than two years before the planned date of bringing into use. For this purpose, the administrations shall designate one among them to act on their behalf in the application of the provisions of this Appendix. The selected administration shall be known as the notifying administration. If the assignment is not brought into use by the planned date, the Bureau shall:

- a) cancel the related special sections and/or circular telegrams, as appropriate, and the assignments recorded in the Appendix **30B** List;
- b) reactivate any relevant suspended allotments; *and*
- c) update the reference situation of all allotments, existing systems and assignments recorded in the List, without any changes to their technical parameters. (WRC-03)

MOD

6.43 Upon receipt of a complete (Appendix 4) notice relating to the proposed assignment, the Bureau shall use the method of Annex 4 to determine whether the proposed assignment affects: (WRC-03)

- a) the allotments in the Plan;
- b) the assignments which appear in the List;
- c) the assignments for which the Bureau has previously received complete information in accordance with this Article.

ADD

6.43*bis* In the case where multiple consecutive complete notices belonging to the same notifying administration have to be examined under § 6.43 without any notice from other administrations having been received in the meantime, the Bureau shall implement, whenever feasible, the following measures, where applicable, in order to accelerate, to the maximum extent possible, the processing of the notices:

- simultaneous processing of the information relating to the 6/4 and 13/10-11 GHz frequency bands in the same network having the same or different date of receipt;
- sequential examination of networks having the same or different date of receipt. The Bureau's finding for all these networks shall be given at the same time and the publication of all related special sections under § 6.49 shall be included in a single set of publications with one single deadline for comments and published in the same BR IFIC. (WRC-03)

MOD

6.50 If, within forty-five days from the date of the BR IFIC mentioned in § 6.49, the Bureau receives no comments, it shall be deemed that there are no objections to the proposed solution and the proposed assignment shall be recorded in the List. The administration shall then notify the assignment in accordance with Article 8. Comments, if any, shall be limited to the case of an administration believing that the agreed protection criteria have not been met. If it receives such comments, the Bureau shall initiate the appropriate action to resolve the matter. (WRC-03)

**Section III – Supplementary provisions applicable to additional uses
in the planned bands**

ADD

6.56*bis* In the case where multiple consecutive complete notices belonging to the same notifying administration have to be examined under § 6.56 without any notice from other administrations having been received in the meantime, the Bureau shall implement, whenever feasible, the following measures, where applicable, in order to accelerate, to the maximum extent possible, the processing of the notices:

- simultaneous processing of the information relating to the 6/4 and 13/10-11 GHz frequency bands in the same network having the same or different date of receipt;
- sequential examination of networks having the same or different date of receipt. The Bureau's finding for all these networks shall be given at the same time. (WRC-03)

MOD

6.57 For this purpose it shall, not earlier than eight years and not later than two years before the planned date of bringing the related assignment into use, send the information specified in Appendix 4 to the Bureau. If the assignment is not brought into use by that date, the Bureau shall:

- a) cancel the related special sections and/or circular telegrams, as appropriate, and the assignments recorded in the Appendix **30B** List;
- b) reactivate any relevant suspended allotments; *and*
- c) update the reference situation of all allotments, existing systems and assignments recorded in the List, without any changes to their technical parameters. (WRC-03)

ARTICLE 8

Procedure for notification and recording in the Master Register of assignments in the planned bands for the fixed-satellite service**MOD**

8.1 Any assignment for which the relevant procedure of Article 6 has been successfully applied shall be notified to the Bureau using the relevant characteristics listed in Appendix 4, not earlier than three years before the assignments are brought into use. (WRC-03)

SUP

8.2

ADD

8.2 If the first notice referred to in § 8.1 has not been received by the Bureau within the eight-year period mentioned in § 6.1, 6.38 or 6.57 of Article 6, as appropriate, the assignments in the List shall no longer be taken into account by the Bureau and administrations. The Bureau shall then act as if the assignment in the List has not been brought into use in conformity with § 6.1, 6.38 or 6.57 of Article 6, as appropriate. The Bureau shall inform the notifying administration, three months in advance of the end of the eight-year period, of the actions it intends to take. (WRC-03)

SUP

8.3

ADD

8.3 Notices not containing those characteristics specified in Appendix 4 as mandatory or required shall be returned with comments to help the notifying administration to complete and resubmit them, unless the information not provided is immediately forthcoming in response to an inquiry by the Bureau. (WRC-03)

SUP

8.4

ADD

8.4 Upon reception by the Bureau of a complete notice under § 8.1, a PDA of zero degrees (operational stage) shall be associated with this assignment. (WRC-03)

ADD

8.5 Complete notices shall be marked by the Bureau with their date of receipt and shall be examined in the date order of their receipt. Following receipt of a complete notice the Bureau shall, within not 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. 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-03)

ADD

8.6 The Bureau shall not postpone the formulation of a finding on a complete notice unless it lacks sufficient data to reach a conclusion thereon. (WRC-03)

ADD

8.7 Each notice shall be examined: (WRC-03)

ADD

8.8 *a)* with respect to its conformity with the Table of Frequency Allocations and the other provisions^{4A} of these Regulations, except those provisions relating to conformity with the fixed-satellite service Plan which are the subject of the following subparagraph; (WRC-03)

^{4A} The “other provisions” shall be identified and included in the Rules of Procedure. (WRC-03)

ADD

8.9 *b)* with respect to its conformity with the fixed-satellite service Plan and the associated provisions. (WRC-03)

ADD

8.10 When the examination with respect to § 8.8 leads to a favourable finding, the assignment shall be examined further with respect to § 8.9; otherwise the notice shall be returned with an indication of the appropriate action. (WRC-03)

ADD

8.11 When the examination with respect to § 8.9 leads to a favourable finding, the assignment shall be recorded in the Master Register. When the finding is unfavourable, the notice shall be returned to the notifying administration, with an indication of the appropriate action. (WRC-03)

ADD

8.12 In every case when a new assignment is recorded in the Master Register it shall, in accordance with the provisions of Article 8, include an indication of the finding reflecting the status of the assignment. This information shall also be published in the BR IFIC. (WRC-03)

ADD

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, 6.29, 6.38 or 6.57 of Article 6, as appropriate. (WRC-03)

ADD

8.14 In the case of a change in the characteristics of an assignment which is in conformity with § 8.8, should the Bureau reach a favourable finding with respect to § 8.9, the amended assignment shall retain the original date of entry in the Master Register. The date of receipt by the Bureau of the notice relating to the change shall be entered in the Master Register. (WRC-03)

ADD

8.15 In applying the provisions of this Article, any resubmitted notice which is received by the Bureau more than six months after the date on which the original notice was returned by the Bureau shall be considered to be a new notice. (WRC-03)

ADD

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 by the date specified in the notice. Within thirty days of such an assignment being brought into use, the notifying administration shall so inform the Bureau. If the Bureau does not receive that confirmation within the above period, after sending a reminder, it shall cancel the entry. The Bureau shall, however, inform the administration concerned before taking such action. (WRC-03)

ADD

8.17 Where the use of a recorded assignment to a space station is suspended for a period not exceeding eighteen months, the notifying administration shall, as soon as possible, inform the Bureau of the date on which such use was suspended and the date on which the assignment is to be brought back into regular use. This latter date shall not exceed two years from the date of suspension. (WRC-03)

ADD

8.18 No provision of this Appendix shall be considered as modifying the requirements of Article 9 relating to coordination between earth stations in the fixed-satellite service and stations of terrestrial services sharing the planned bands on an equal primary basis. (WRC-03)

ADD

8.19 Notification of assignments to a specific earth station using assignments included in the List shall be effected applying the provisions of Article 11. (WRC-03)

MOD**ANNEX 1** (WRC-03)**Parameters used in characterizing the fixed-satellite service Plan****Section A – Technical data used in establishing the Allotment Plan
and the associated provisions****MOD****1.4 Interference criteria**

The Plan has been prepared with a view to assuring for each allotment an aggregate carrier-to-interference ratio under free-space conditions of 26 dB or higher. WRC-03 decided to apply an aggregate carrier-to-interference ratio under free-space conditions of 23 dB for submissions received by the Bureau as from 5 July 2003. (WRC-03)

MOD**1.6 Earth station characteristics**

1.6.4 The earth station antenna reference pattern applicable to all Part A allotments is shown in Table 1 below. If so desired by an administration, the improved side-lobe pattern shown in Table 2 below may be used. (WRC-03)

MOD

1.6.5 In cases where the aggregate C/I ratio of 26 dB cannot be obtained (WRC-03 decided that for the examination of submissions received as from 5 July 2003 the value 23 dB (instead of the of 26 dB) shall be applied), it would be appropriate for the countries concerned to agree on the use of antennas with an improved side-lobe pattern or on other suitable means so as to obtain the above ratio (see Table 2 below). (WRC-03)

TABLE 1 (Rev.WRC-03)

$G_{max} = 10 \log (\eta(\pi D/\lambda)^2)$	
$G(\varphi) = G_{max} - 2.5 \times 10^{-3} \left(\frac{D}{\lambda} \varphi \right)^2$	for $0 < \varphi < \varphi_m$
$G(\varphi) = \min (G_1, 29 - 25 \log \varphi)$	for $\varphi_m \leq \varphi \leq 19.95^\circ$
$G(\varphi) = \max (\min (-3.5, 32 - 25 \log \varphi), -10)$	for $\varphi > 19.95^\circ$
where: <div style="border: 1px solid black; padding: 5px; display: inline-block;"> D: antenna diameter λ: wavelength </div> } expressed in the same unit φ : off-axis angle of the antenna (degrees) <div style="border: 1px solid black; padding: 5px; display: inline-block;"> G_1: gain of the first side lobe $= -1 + 15 \log \frac{D}{\lambda}$ </div> $\varphi_m = \frac{20\lambda}{D} - \sqrt{G_{max} - G_1} \quad \text{degrees}$ η : antenna efficiency	

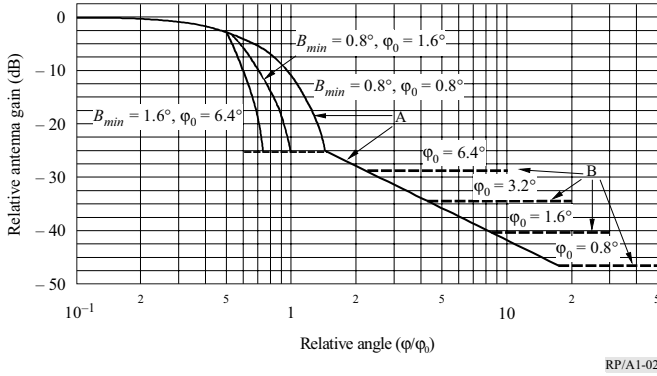
TABLE 2 (WRC-03)

$G_{max} = 10 \log (\eta(\pi D/\lambda)^2)$	
$G(\varphi) = G_{max} - 2.5 \times 10^{-3} \left(\frac{D}{\lambda} \varphi \right)^2$	for $0 < \varphi < \varphi_m$
$G(\varphi) = G_1$	for $\varphi_m \leq \varphi < \varphi_r$
$G(\varphi) = 29 - 25 \log \varphi$	for $\varphi_r \leq \varphi < 36.3^\circ$
$G(\varphi) = -10$	for $36.3^\circ \leq \varphi < 180^\circ$
where: <div style="border: 1px solid black; padding: 5px; display: inline-block;"> D: antenna diameter λ: wavelength </div> } expressed in the same unit φ : off-axis angle of the antenna (degrees) <div style="border: 1px solid black; padding: 5px; display: inline-block;"> G_1: gain of the first side lobe $= -1 + 15 \log \frac{D}{\lambda}$ </div> $\varphi_m = \frac{20\lambda}{D} - \sqrt{G_{max} - G_1} \quad \text{degrees}$ $\varphi_r = 15.85 \left(\frac{D}{\lambda} \right)^{-0.6} \quad \text{degrees}$ η : antenna efficiency	

1.7 Space station characteristics

MOD

FIGURE 2* (WRC-03)
Reference patterns for satellite antennas
with fast roll-off in the main beam



Curve A: dB relative to main beam gain

$$-12 (\phi/\phi_0)^2 \quad \text{for } 0 \leq (\phi/\phi_0) \leq 0.5$$

$$-12 \left[\frac{(\phi/\phi_0) - x}{B_{min}/\phi_0} \right]^2 \quad \text{for } 0.5 < (\phi/\phi_0) \leq \left(\frac{1.45 B_{min}}{\phi_0} + x \right)$$

$$-25.23 \quad \text{for } \left(\frac{1.45 B_{min}}{\phi_0} + x \right) < (\phi/\phi_0) \leq 1.45$$

$$-(22 + 20 \log (\phi/\phi_0)) \quad \text{for } (\phi/\phi_0) > 1.45$$

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. 2. The on-axis gains of these antennas are approximately 28.3, 34.3, 40.4 and 46.4 dBi, respectively)

where:

ϕ : off-axis angle (degrees)

ϕ_0 : cross-sectional half-power beamwidth in the direction of interest (degrees)

$$x = 0.5 \left(1 - \frac{B_{min}}{\phi_0} \right)$$

where:

$$B_{min} = \begin{cases} 0.8^\circ & \text{for 13/10-11 GHz} \\ 1.6^\circ & \text{for 6/4 GHz} \end{cases}$$

* Figure 2 represents patterns for same combinations of B_{min} and ϕ_0 .

SUP

ANNEX 2

**Basic data to be furnished in notices relating to stations
in the fixed-satellite service entering the design stage
using frequency bands of the Plan**

ADD

ANNEX 2 (WRC-03)

**Basic data to be furnished in notices relating to stations
in the fixed-satellite service entering the design stage
using frequency bands of the Plan**

These data are listed in Appendix 4.

ANNEX 4 (WRC-03)

**Limits for determining whether an allotment or an assignment
made in accordance with the provisions of Appendix 30B is
considered to be affected**

MOD

An allotment shall be considered as being affected by another administration if, at its nominal orbital position within the predetermined arc, the calculated single-entry carrier-to-interference ratio is less than or equal to 30 dB (WRC-03 decided that for the examination of submissions received as from 5 July 2003 the value 27 dB (instead of 30 dB) shall be applied), or the calculated value, based on the Plan, due to that other administration (whichever is the lower), at any test point within the service area of the interfered-with satellite network. The single-entry carrier-to-interference ratio is calculated using the method in Appendix 1 to this Annex.

An assignment shall be considered affected by a signal whose peak-to-average ratio (k) exceeds 5 dB in that portion of the spectrum which has been defined for low-density carrier usage, as identified in Annex 3B, if the single-entry carrier-to-interference ratio, calculated on the basis of power density averaged over the necessary bandwidth of the desired carrier, falls below:

$$25 + k \quad \text{dB}$$

(WRC-03 decided that for the examination of submissions received as from 5 July 2003 the value $22 + k$ dB (instead of $25 + k$ dB) shall be applied.)

Even if the single-entry carrier-to-interference ratio is above 30 dB (WRC-03 decided that for the examination of submissions received as from 5 July 2003 the value 27 dB (instead of 30 dB) shall be applied) (or the calculated value based on the Plan due to that other administration, whichever value is lower), an allotment or an assignment shall be considered affected if the

overall aggregate C/I , as calculated using Appendix 1 to this Annex, falls below 26 dB (WRC-03 decided that for the examination of submissions received as from 5 July 2003 the value 23 dB (instead of 26 dB) shall be applied) or the calculated value for the assignment, based on the Plan, whichever is lower.

ANNEX 5

Application of the PDA (predetermined arc) concept

MOD

1.1 For the purposes of this Annex, an administration will be considered as being affected by another administration if, at its nominal orbital position within the predetermined arc, the calculated single-entry carrier-to-interference ratio is less than or equal to 30 dB (WRC-03 decided that for the examination of submissions received as from 5 July 2003 the value 27 dB (instead of 30 dB) shall be applied), or the calculated value, based on the Plan, due to that other administration (whichever is lower), at any test point within the service area of the interfered-with satellite network. The single-entry C/I ratio is calculated by the method in Appendix 1, Annex 4.

Even if the single-entry C/I ratio is above 30 dB (WRC-03 decided that for the examination of submissions received as from 5 July 2003 the value 27 dB (instead of 30 dB) shall be applied), or the calculated value, based on the Plan, due to that other administration (whichever is lower), an administration shall be considered as being affected if the overall aggregate C/I ratio, calculated by the method in Appendix 1, falls below 26 dB⁹ (WRC-03 decided that for the examination of submissions received as from 5 July 2003 the value 23 dB (instead of 26 dB) shall be applied), or the value for the assignment (whichever is lower). (WRC-03)

MOD

⁹ For allotments with an aggregate C/I ratio less than 26 dB (WRC-03 decided that for the examination of submissions received as from 5 July 2003 the value 23 dB (instead of 26 dB) shall be applied), the calculated C/I ratio based on the Plan will be used. However, if through the use of the PDA Concept, this value is improved in the latter application of this procedure, the improved value will be used until it reaches 26 dB (WRC-03 decided that for the examination of submissions received as from 5 July 2003 the value 23 dB (instead of 26 dB) shall be applied). (WRC-03)

ANNEX 6

Technical means which may be used to avoid incompatibilities between systems in the fixed-satellite service at their implementation stage

MOD

5 Transmission (modulation) and reception techniques allowing for the C/I ratios less than 26 dB (WRC-03 decided that for the examination of submissions received as from 5 July 2003 the value 23 dB (instead of 26 dB) shall be applied). (WRC-03)

APPENDIX 42 (Rev.WRC-03)

Table of allocation of international call sign series

MOD

Call sign series	Allocated to
4WA-4WZ	Democratic Republic of Timor-Leste

(WRC-03)

RESOLUTIONS
AND
RECOMMENDATIONS

List of Resolutions and Recommendations approved for deletion by WRC-03

RESOLUTIONS	
29 (WRC-97)	Information on the occupancy by fixed and mobile services in the additional HF bands allocated by WARC-92 to the broadcasting service
44 (Mob-87)	Compatibility of equipment used in the mobile-satellite service
46 (Rev.WRC-97)	Interim procedures for the coordination and notification of frequency assignments of satellite networks in certain space services and the other services to which certain bands are allocated
53 (Rev.WRC-2000)	Updating of the “Remarks” columns in the Tables of Article 9A of Appendix 30A and Article 11 of Appendix 30 to the Radio Regulations
59 (WRC-2000)	Transitional and implementation arrangements in certain frequency bands for the use of geostationary networks in the fixed-satellite service and the broadcasting-satellite service, and non-geostationary systems in the fixed-satellite service as well as for the use of networks in the radionavigation-satellite service and terrestrial services
77 (WRC-2000)	Protection of terrestrial services in all Regions from geostationary-satellite networks in the fixed-satellite service in Region 2 using the frequency band 11.7-12.2 GHz
78 (WRC-2000)	Development of procedures in case the operational or additional operational limits in Article 22 are exceeded
82 (WRC-2000)	Provisions relating to earth stations located on board vessels which operate in fixed-satellite service networks in the bands 3 700-4 200 MHz and 5 925-6 425 MHz
83 (WRC-2000)	Administrative procedures for cost recovery for satellite network filings
84 (WRC-2000)	Power flux-density limits in the bands 37.5-42.5 GHz for the fixed-satellite service, broadcasting-satellite service and mobile-satellite service
127 (Rev.WRC-2000)	Studies relating to consideration of allocations in bands around 1.4 GHz for feeder links of the non-geostationary-satellite systems in the mobile-satellite service with service links operating below 1 GHz
128 (Rev.WRC-2000)	Protection of the radio astronomy service in the 42.5-43.5 GHz band

RESOLUTIONS <i>(continued)</i>	
135 (WRC-2000)	Criteria and process for the resolution of possible cases of misapplication of non-geostationary fixed-satellite service single-entry limits in Article 22
137 (WRC-2000)	Further studies on the sharing conditions between geostationary fixed-satellite service networks and non-geostationary fixed-satellite service systems and between non-geostationary fixed-satellite service systems
138 (WRC-2000)	Possible identification of spectrum for non-geostationary fixed-satellite service (Earth-to-space) gateway type operations
209 (Mob-87)	Study and implementation of a global land and maritime distress and safety system
214 (Rev.WRC-2000)	Sharing studies relating to consideration of the allocation of bands below 1 GHz to the non-geostationary mobile-satellite service
216 (Rev.WRC-2000)	Possible broadening of the secondary allocation to the mobile-satellite service (Earth-to-space) in the band 14-14.5 GHz to cover aeronautical applications
226 (WRC-2000)	Sharing studies for, and possible additional allocations to, the mobile-satellite service (space-to-Earth) in the 1-3 GHz range, including consideration of the band 1 518-1 525 MHz
227 (WRC-2000)	Sharing studies for, and possible additional allocations to, the mobile-satellite service (Earth-to-space) in the 1-3 GHz range, including consideration of the band 1 683-1 690 MHz
300 (Rev.WRC-2000)	Use and notification of the paired frequencies reserved for narrow-band direct-printing telegraphy and data transmission systems in the HF bands allocated on an exclusive basis to the maritime mobile service
310 (Rev.WRC-97)	Frequency provisions for development and future implementation of ship movement telemetry, telecommand and data exchange systems
312 (Rev.WRC-97)	Calling procedures for HF A1A and A1B Morse telegraphy
341 (WRC-97)	UHF frequencies used in the maritime mobile service for on-board communication
346 (WRC-97)	Protection of distress and safety communications on the frequencies 12 290 kHz and 16 420 kHz from harmful interference caused by these frequencies if also used for non-safety calling

RESOLUTIONS (<i>continued</i>)	
347 (WRC-97)	Use of digital telecommunication technologies in the MF and HF bands by the maritime mobile service
348 (WRC-97)	Studies required to provide priority to distress communications originated by shore-based search and rescue authorities
350 (WRC-2000)	Study on interference caused to the distress and safety frequencies 12 290 kHz and 16 420 kHz by routine calling
532 (WRC-97)	Review and possible revision of the 1997 broadcasting-satellite service Plans for Regions 1 and 3
537 (WRC-97)	Survey of HF broadcasting transmitter and receiver statistics as called for in Resolution 517 (Rev.WRC-97)
540 (WRC-2000)	Application and study of the regulatory procedures and associated sharing criteria contained in Appendices 30 and 30A and in the associated provisions of Articles 9 and 11
541 (WRC-2000)	Implementation of WRC-2000 broadcasting-satellite service Plans and associated broadcasting-satellite service feeder-link Plans of Appendices 30 and 30A
542 (WRC-2000)	Appendices 30 and 30A Regions 1 and 3 Plans and associated Lists of additional uses
602 (Mob-87)	Data transmission from maritime radiobeacons for differential radionavigation systems
603 (WRC-2000)	Studies on compatibility between stations of the radionavigation-satellite service (Earth-to-space) operating in the frequency band 5 000-5 010 MHz and the international standard system (microwave landing system) operating in the band 5 030-5 150 MHz
604 (WRC-2000)	Studies on compatibility between the radionavigation-satellite service (space-to-Earth) operating in the frequency band 5 010-5 030 MHz and the radio astronomy service operating in the band 4 990-5 000 MHz
605 (WRC-2000)	Use of the frequency band 1 164-1 215 MHz by systems of the radionavigation-satellite service (space-to-Earth)
606 (WRC-2000)	Use of the frequency band 1 215-1 300 MHz by systems of the radionavigation-satellite service (space-to-Earth)

RESOLUTIONS <i>(end)</i>	
607 (WRC-2000)	Studies on compatibility between stations of the radionavigation-satellite service (Earth-to-space) and the radiolocation service operating in the frequency band 1 300-1 350 MHz
645 (WRC-2000)	Global harmonization of spectrum for public protection and disaster relief
706 (Rev.WRC-2000)	Operation of the fixed service in the band 90-110 kHz
715 (Rev.WRC-97)	Studies concerning sharing between the radionavigation-satellite service and the mobile-satellite service in the bands 149.9-150.05 MHz and 399.9-400.05 MHz
723 (Rev.WRC-2000)	Consideration by a future competent world radiocommunication conference of issues dealing with allocations to science services
724 (WRC-97)	Use of the frequency band 5 250-5 350 MHz by spaceborne active sensors
725 (WRC-97)	Use of the frequency band 5 350-5 460 MHz by spaceborne active sensors
727 (Rev.WRC-2000)	Use of the frequency band 420-470 MHz by the Earth exploration-satellite service (active)
730 (WRC-2000)	Use of the frequency band 35.5-35.6 GHz by spaceborne precipitation radars
733 (WRC-2000)	Review of sharing conditions between services in the band 13.75-14 GHz
735 (WRC-2000)	Sharing procedures and criteria between receiving earth stations in the broadcasting-satellite service and transmitting earth stations or terrestrial stations in frequency bands allocated to the broadcasting-satellite service and the fixed-satellite service (Earth-to-space) or to terrestrial services
736 (WRC-2000)	Consideration by a future competent world radiocommunication conference of issues dealing with allocations to the mobile, fixed, radiolocation, Earth exploration-satellite (active), and space research (active) services in the frequency range 5 150-5 725 MHz
737 (WRC-2000)	Review of spectrum and regulatory requirements to facilitate worldwide harmonization of emerging terrestrial wireless interactive multimedia applications
800 (WRC-2000)	Agenda for the 2003 World Radiocommunication Conference
801 (WRC-2000)	Preliminary agenda for the 2005/2006 World Radiocommunication Conference

RECOMMENDATIONS	
35 (WRC-95)	Procedures for modification of a frequency allotment or assignment plan
64	Relating to protection ratios and minimum field strengths required
66 (Rev.WRC-2000)	Studies of the maximum permitted levels of unwanted emissions
319 (Mob-87)	The need for technical improvements to minimize the risk of adjacent channel harmful interference between assignments used for narrow-band direct-printing telegraphy and data transmission systems in accordance with Appendix 17 and Resolution 300 (Rev.Mob-87)
402	Relating to cooperation in the efficient use of worldwide frequencies in the aeronautical mobile (R) service
515 (Rev.WRC-97)	Introduction of high-frequency broadcasting transmitters and receivers capable of operation with spectrum-efficient modulation techniques
519 (WARC-92)	Introduction of single-sideband (SSB) emissions and possible advancement of the date for cessation of the use of double-sideband (DSB) emissions in the HF bands allocated to the broadcasting service
521 (WRC-95)	Technical parameters for use in the revision of Appendices 30 and 30A in response to Resolution 524 (WARC-92)
700	Relating to the utilization and sharing of frequency bands allocated to space radiocommunications
701	Relating to the use of the frequency band 1 330-1 400 MHz by the radio astronomy service
702	Relating to the use of the frequency bands 1 400-1 727 MHz, 101-120 GHz and 197-220 GHz for search for intentional emissions of extraterrestrial origin
709	Relating to sharing frequency bands between the aeronautical mobile service and the inter-satellite service
710	Relating to the use of airborne radars in the frequency bands shared between the inter-satellite service and the radiolocation service
715 (Orb-88)	Multi-band and/or multiservice satellite networks using the geostationary-satellite orbit
718 (WARC-92)	Alignment of allocations in the 7 MHz band allocated to the amateur service
719 (WARC-92)	Multiservice satellite networks using the geostationary-satellite orbit

RESOLUTION 2 (Rev.WRC-03)

Equitable use, by all countries, with equal rights, of the geostationary-satellite and other satellite orbits and of frequency bands for space radiocommunication services

The World Radiocommunication Conference (Geneva, 2003),

considering

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

taking into account

that the radio frequency spectrum and the geostationary-satellite orbit and other satellite orbits are limited natural resources and should be most effectively and economically used,

resolves

1 that the registration with the Radiocommunication Bureau of frequency assignments for space radiocommunication services and their use do not provide any permanent priority for any individual country or groups of countries and do not create an obstacle to the establishment of space systems by other countries;

2 that, accordingly, a country or a group of countries having registered with the Bureau frequencies for their space radiocommunication services need to take all practicable measures to facilitate the use of new space systems by other countries or groups of countries, in particular those of developing countries and least developed countries, so desiring;

3 that *resolves* 1 and 2 of this Resolution shall be taken into account by the administrations and the Bureau.

RESOLUTION 4 (Rev.WRC-03)

Period of validity of frequency assignments to space stations using the geostationary-satellite and other satellite orbits¹

The World Radiocommunication Conference (Geneva, 2003),

considering

- a) that rational and efficient use must be made of the frequency spectrum and the geostationary-satellite orbit and that account should be taken of the provisions of Resolution 2 (Rev.WRC-03) relating to the use by all countries, with equal rights and equitable access to the frequency bands and the associated satellite orbits for space radiocommunication services;
- b) that limiting the period of validity of frequency assignments to space stations using the geostationary-satellite orbit and other satellite orbits is a concept which would promote the attainment of these objectives;
- c) that amortizing the considerable investments made in connection with the development of space radiocommunications is a heavy burden for all administrations and that these investments should be spread over a predetermined and realistic period;
- d) that every effort should be made to encourage administrations in a position to do so to develop techniques designed to improve the utilization of the frequency spectrum and the geostationary-satellite orbit and other satellite orbits with a view to increasing the total radiocommunication facilities available to the world community;
- e) that an experimental procedure to gain experience from application of the new concept of notifying the period of validity of an assignment in space radiocommunication was introduced by WARC-79 and has been used by the Radiocommunication Bureau and administrations since then but that it is not possible to impose on administrations a statutory period identical in all cases;
- f) that administrations should be left to propose the period of validity themselves in the light of their operational service requirements and of the common interest, however the period of validity shall take into account, *inter alia*, the operational lifetime of the satellite systems, including space and earth stations, and the type of service provided,

¹ This Resolution does not apply to the frequency bands covered by the Allotment Plan contained in Appendix 30B.

resolves

1 that, until this Resolution is reviewed by the next competent world radiocommunication conference, frequency assignments to space radiocommunication stations located on the geostationary-satellite and other satellite orbits, noting *considering e)* and *f)*, shall not be considered perpetual and shall be dealt with as follows:

1.1 a frequency assignment to a space station² shall be deemed definitively discontinued after the expiry of the period of operation shown on the assignment notice, reckoned from the date on which the assignment was brought into service. This period shall be limited to that for which the satellite network was designed. The Bureau shall then invite the notifying administration to take steps to cancel the assignment. If the Bureau receives no reply within three months following the expiry of the period of operation, it shall insert a symbol in the Remarks Column of the Master Register to indicate that the assignment is not in conformity with this Resolution;

1.2 if a notifying administration which wishes to extend the period of operation originally shown on the assignment notice of a frequency assignment of an existing space station² informs the Bureau accordingly more than three years before the expiry of the period in question and if all other basic characteristics of that assignment remain unchanged, the Bureau shall amend as requested the period of operation originally recorded in the Master Register and publish that information in a special section of the Bureau's International Frequency Information Circular (BR IFIC);

1.3 if, at least three years before the expiry of the period of operation recorded in the Master Register of a frequency assignment to an existing space station², an administration initiates the coordination procedure specified in No. 9.7 to bring into service a new space station using the same assigned frequency and the same orbital position but with different technical characteristics, and if the Bureau finds after the notification that the new assignment conforms with the provisions of No. 11.31 and does not increase, in relation to the preceding assignment, the probability of interference to the detriment of a frequency assignment recorded in the Master Register or involved in the coordination procedure, the new assignment shall be given a favourable finding and shall be entered in the Master Register;

1.4 a notifying administration which wishes to modify a basic characteristic of a frequency assignment of a space station² recorded in the Master Register shall initiate, in any case other than those covered by *resolves* 1.2 and 1.3, the appropriate modification procedure in accordance with the provisions of Nos. 11.43A to 11.46;

2 that, for the application of the provisions of *resolves* 1.1 above, the information concerning the period of validity of frequency assignments to space stations shall be notified in addition to that contained in Appendix 4;

3 that the application of this Resolution shall not prejudice in any way the decisions of future radiocommunication conferences,

² The expression "space station" may apply to more than one satellite provided that only one satellite is in operation at any particular moment and that the stations installed on board successive satellites have identical basic characteristics.

invites ITU-R

to undertake studies with respect to the implementation of this Resolution,

invites the next competent world radiocommunication conference

to take cognizance of the results of ITU-R studies undertaken as a result of this Resolution and take action, as appropriate,

instructs the Secretary-General

to bring this Resolution to the attention of the Council.

RESOLUTION 5 (Rev.WRC-03)

Technical cooperation with the developing countries in the study of propagation in tropical and similar areas

The World Radiocommunication Conference (Geneva, 2003),

having noted

that the assistance provided for the developing countries by the Union in the field of telecommunications in cooperation with other United Nations specialized agencies, such as the United Nations Development Programme (UNDP), augurs well for the future,

aware

a) of the fact that the developing countries, particularly those in tropical and similar areas, (including the area referred to as zone C in the Final Acts of the Regional Administrative Conference for the Planning of VHF/UHF Television Broadcasting in the African Broadcasting Area and Neighbouring Countries (Geneva, 1989), the Red Sea, East Mediterranean, etc.), require adequate knowledge of radiowave propagation in their territories in order to make rational and economical use of the radio-frequency spectrum;

b) of the importance of propagation in radiocommunications;

c) of the importance of the work of ITU-T and ITU-R Study Groups for the development of telecommunications in general and radiocommunications in particular,

considering

a) the need for the developing countries themselves to study telecommunications in general and propagation in particular in their territories, this being the best means of enabling them to acquire telecommunication techniques and to plan their systems effectively and in conformity with the special conditions in the tropical areas;

b) the scarcity of resources available in these countries,

resolves to instruct the Secretary-General

1 to offer the assistance of the Union to developing countries in the tropical areas which endeavour to carry out national propagation studies in order to improve and develop their radiocommunications;

2 to assist these countries, if necessary with the collaboration of international and regional organizations such as the Asia-Pacific Broadcasting Union (ABU), Arab States Broadcasting Union (ASBU), African Telecommunication Union (ATU) and the Union of National Radio and Television Organizations of Africa (URTNA) which may be concerned, in carrying out national propagation measurement programmes, including collecting appropriate meteorological data, on the basis of ITU-R Recommendations and Questions in order to improve the use of the radio-frequency spectrum;

3 to arrange funds and resources for this purpose from the UNDP or other sources in order to enable the Union to provide the countries concerned with adequate and effective technical assistance for the purpose of this Resolution,

resolves to instruct the Director of the Radiocommunication Bureau

to include this activity in the operational plan, within existing budgetary resources of the Sector,

invites administrations

to submit the results of these propagation measurements to ITU-R for consideration in its studies,

invites the Council

to follow the progress made in carrying out programmes of propagation measurements and the results achieved, and to take any action that it considers necessary.

RESOLUTION 7 (Rev.WRC-03)

Development of national radio frequency management

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that the Radio Regulations contain, *inter alia*, procedures for the coordination, notification and registration of frequencies which specify the rights and obligations of Member States;
- b)* that the application of the above-mentioned procedures necessitates an appropriate radio frequency management unit in each Member State;
- c)* that the existence of such a unit helps Member States to safeguard their rights and to discharge their obligations under the Radio Regulations;
- d)* that the application of the Radio Regulations through the agency of such units is in the interest of the international community as a whole,

noting

that such a unit requires an adequate number of suitably qualified staff,

noting further

that the administrations of many developing countries need to create or to strengthen such a unit, appropriate to their administrative structure, with responsibility for the application of the Radio Regulations at the national and international levels,

recommends

that the administrations of such countries take appropriate action,

resolves

- 1 that meetings shall be organized between representatives of the Radiocommunication Bureau and the personnel involved in frequency management matters from administrations of developing and developed countries;
- 2 that such meetings shall be aimed at designing standard structures suitable for administrations of developing countries and include discussions concerning the establishment and operation of radio frequency management units;
- 3 that such meetings should also identify the particular needs of developing countries in establishing such units, and the means required to meet those needs,

recommends

that developing countries when planning the use of funds, particularly those received from international sources, make provision for participation in these meetings as well as for the introduction and development of such units,

invites the Council

to take the necessary measures for the organization of such meetings,

instructs the Secretary-General

1 to circulate this Resolution to all Member States, drawing their attention to its importance;

2 to circulate the results of such meetings, particularly to the developing countries;

3 to inform the developing countries of the types of assistance the ITU can provide in setting up the desired structure,

instructs the Director of the Radiocommunication Bureau

to include this activity in the Operational Plan, within existing budgetary resources of the Sector,

draws the attention of the next Plenipotentiary Conference to

1 the particular problems identified in this Resolution;

2 the need for prompt and effective action to resolve them;

3 the need to take all practicable measures to ensure that resources are made available for this purpose.

RESOLUTION 15 (Rev.WRC-03)

**International cooperation and technical assistance
in the field of space radiocommunications**

The World Radiocommunication Conference (Geneva, 2003),

considering

- a) that a large number of Member States are not in a position to take immediate advantage of satellite techniques for the development of their telecommunication services;
- b) that such Member States would benefit immensely through the technical assistance programmes sponsored by the Union,

recognizing

- a) that international satellite-communication systems are subject to the Convention and Regulations of the Union and that they permit participation of all countries including, in particular, the developing countries, in space communication systems;
- b) that a number of problems need to be solved in order that the developing countries may participate effectively in international space communication systems and integrate these systems with their national telecommunication networks,

resolves to instruct the Director of the Radiocommunication Bureau

to include this activity in the Operational Plan, within existing budgetary resources of the Sector,

invites the Council

- 1 to draw the attention of administrations to the means by which they may avail themselves of technical assistance in connection with the introduction of space communications;
- 2 to consider the most effective manner in which requests for such assistance by Member States may be formulated and presented in order to secure maximum financial and other assistance, including the allocation of the funds in the regular budget of ITU for implementing this Resolution, preferably within the budget of the Sector identified for the implementation of this Resolution;
- 3 to consider how best to make use of funds made available by the United Nations in accordance with its Resolution 1721 to give technical and other assistance to administrations of Member States to make effective use of space communications;
- 4 to consider in what way the work of the 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.

RESOLUTION 20 (Rev.WRC-03)

**Technical cooperation with developing countries in
the field of aeronautical telecommunications**

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that the allocations of the frequency bands and the provisions concerning various aeronautical mobile services have been revised several times by recent conferences;
- b)* that some of these frequency bands and provisions support the worldwide implementation of new aeronautical telecommunication systems;
- c)* that on the other hand, some of these frequency bands and provisions support existing aeronautical systems that may be affected by the revision;
- d)* that, as a consequence of *a)*, *b)* and *c)*, technological modernization will be necessary in order to maintain and improve the safety and regularity of international civil aviation, the accuracy and security of aeronautical radionavigation and the efficiency of distress and rescue systems;
- e)* that the developing countries may require assistance in improving the training of technical staff, as well as in introducing new systems, in coping with technological modernization and enhancing the operation of aeronautical telecommunications,

recognizing

- a)* the value of the assistance which, in conjunction with other international organizations, the Union has provided and may continue to provide to developing countries in the field of telecommunications;
- b)* that the original version of Resolution **20 (Mob-87)** established a good basis for the technical cooperation with developing countries in the field of aeronautical telecommunications that has been undertaken by the International Civil Aviation Organization (ICAO),

resolves to instruct the Secretary-General

- 1 to encourage ICAO to continue its assistance to developing countries which are endeavouring to improve their aeronautical telecommunications, in particular by providing them with technical advice for the planning, establishment, operation and maintenance of equipment, as well as help with the training of staff, essentially in matters relating to the new technologies;
- 2 for this purpose, to seek the continued collaboration of ICAO, the United Nations Conference for Trade and Development (UNCTAD) and other specialized agencies of the United Nations, as appropriate;

3 to continue to give special attention to seeking the aid of the United Nations Development Programme (UNDP) and other sources of financial support, to enable the Union to render sufficient and effective technical assistance in the field of aeronautical telecommunications,

invites the developing countries

so far as possible, to give a high level of priority to and include in their national programmes of requests for technical assistance projects relating to aeronautical telecommunications and to support multinational projects in that field.

RESOLUTION 21 (Rev.WRC-03)

**Implementation of changes in frequency allocations
between 5900 kHz and 19020 kHz**

The World Radiocommunication Conference (Geneva, 2003),

considering

- a) that parts of the frequency bands between 5900 kHz and 19020 kHz which were previously allocated on an exclusive or shared basis to the fixed and mobile services have been reallocated to the broadcasting service;
- b) that some existing fixed and mobile assignments may need to be removed progressively from those reallocated bands to make way for the broadcasting service;
- c) that the assignments to be removed, termed “displaced assignments”, must be reaccommodated in other appropriate frequency bands;
- d) that developing countries may require special assistance from the Radiocommunication Bureau in replacing their displaced assignments with appropriate protection;
- e) that procedures already exist in Article 11 that may be used to this effect,

recognizing

the difficulties that administrations and the Bureau might encounter during the period of transition from the previous allocations to those made by WARC-92,

resolves

- 1 that the transition period shall be from 1 April 1992 to 1 April 2007;
- 2 that administrations should no longer notify any frequency assignments to stations of the fixed and mobile services in the reallocated bands. Assignments notified in these bands after 1 April 1992 shall bear a symbol to indicate that the finding will be examined by the Bureau as of 1 April 2007 in accordance with the provisions of No. 11.31;
- 3 that the Bureau shall undertake a continuing action to review the Master International Frequency Register with the help of administrations. In this respect, the Bureau shall periodically consult the administrations concerning the frequency assignments to links for which another satisfactory means of telecommunication exists, with a view to either downgrading assignments of class of operation A or deleting such assignments;

4 that administrations shall, for assignments of class of operation A in the reallocated bands, either notify the replacement frequencies to the Bureau or request the Bureau's assistance in selecting the replacement frequencies in application of Articles 7 and 13;

5 that the Bureau shall develop in due time a draft procedure to be used for the replacement of remaining frequency assignments and shall consult administrations in accordance with Article 14;

6 that the Bureau should modify the draft procedures taking into account, to the extent practicable, comments received from administrations, and propose replacement assignments at the latest three years before 1 April 2007. In so doing, the Bureau shall request administrations to take appropriate action to bring their assignments in conformity with the Table of Frequency Allocations by the due date;

7 that a replacement frequency assignment whose basic characteristics, with the exception of the assigned frequency, have not been modified in the above process, shall keep its original date. However, if these basic characteristics of a replacement frequency assignment are different from those of the displaced assignment, the replacement assignment shall be treated in accordance with the relevant provisions of Section II of Article 11,

invites administrations

when seeking reaccommodation of the displaced assignments for their fixed and mobile services in the bands between 5 900 kHz and 19 020 kHz which have been reallocated to the broadcasting service, to make every effort to find replacement assignments in the bands allocated to the fixed and mobile services concerned.

RESOLUTION 25 (Rev.WRC-03)

Operation of global satellite systems for personal communications

The World Radiocommunication Conference (Geneva, 2003),

considering

a) that, in accordance with No.6 of its Constitution (Geneva, 1992), one of the purposes of the Union is “to promote the extension of the benefits of the new telecommunication technologies to all the world’s inhabitants”;

b) that, to this end, the Union is fostering the use of new technologies in telecommunications and is studying questions relating to this use in the Radiocommunication and the Telecommunication Standardization Sectors;

c) that the Telecommunication Development Sector is studying questions aimed at identifying the benefits that developing countries may derive from using new technologies;

d) that, among these new technologies, some constellations of non-geostationary satellites may provide global coverage and facilitate low-cost communications;

e) that the theme “global mobile personal communications by satellite” (GMPCS) was discussed at the first World Telecommunication Policy Forum established by Resolution 2 (Kyoto, 1994) of the Plenipotentiary Conference;

f) that Council Resolution 1116 instructs the Secretary-General to act as depositary of the GMPCS Memorandum of Understanding (MoU) and its Arrangements, to act as the registry for type-approval procedures and terminal types and to authorize the use of the abbreviation “ITU” as part of the GMPCS-MoU mark;

g) Recommendations ITU-R M.1343 and ITU-R M.1480 on the essential technical requirements of GMPCS earth stations that should be used by administrations as a common technical basis facilitating the global circulation and use of such GMPCS terminals in conformity with these Recommendations,

recognizing

a) that the spectrum available to global satellite systems for personal communications is limited;

b) that successful coordination does not in any way imply licensing authorization to provide a service within the territory of a Member State,

considering further

that other countries intending to use these systems should be guaranteed that they will be operated in accordance with the Constitution, the Convention and the Administrative Regulations,

noting

a) that the Constitution recognizes the sovereign right of each State to regulate its telecommunications;

b) that the International Telecommunication Regulations “recognize the right of any Member, subject to national law and should it decide to do so, to require that administrations and private operating agencies, which operate in its territory and provide an international telecommunication service to the public, be authorized by that Member”, and specifies that “within the framework of the present Regulations, the provision and operation of international telecommunication services in each relation is pursuant to mutual agreement between administrations”;

c) that Article **18** specifies the authorities for licensing the operation of stations within any given territory;

d) the right of each Member State to decide on its participation in these systems, and the obligations for entities and organizations providing international or national telecommunication services by means of these systems to comply with the legal, financial and regulatory requirements of the administrations in whose territory these services are authorized,

resolves

that administrations licensing global satellite systems and stations intended to provide public personal communications by means of fixed, mobile or transportable terminals shall ensure, when licensing these systems and stations, that they can be operated only from the territory or territories of administrations having authorized such service and stations in compliance with Articles **17** and **18**, in particular No. **18.1**,

requests administrations

1 to continue cooperating with worldwide satellite system operators in improving the established arrangements for the provision of service within their territories and with the Secretary-General in implementing the GMPCS-MoU and its Arrangements;

2 to participate actively in ITU-R studies in developing and improving relevant Recommendations,

reminds operators of such systems

to take account, when contracting agreements on the operation of their systems from the territory of a country, of any potential loss of revenue that the country may suffer from a possible reduction of its international traffic existing at the time such agreements are executed.

RESOLUTION 27 (Rev.WRC-03)

Use of incorporation by reference in the Radio Regulations

The World Radiocommunication Conference (Geneva, 2003),

considering

a) that the principles of incorporation by reference were adopted by WRC-95, revised by WRC-97 and further refined by WRC-2000 (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 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 inclusion in its 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-03)

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 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.

4 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:

4.1 the text incorporated by reference shall have the same treaty status as the Radio Regulations themselves;

4.2 the reference must be explicit, specifying the specific part of the text (if appropriate) and the version or issue number;

4.3 the text incorporated by reference must be submitted for adoption by a competent WRC in accordance with *resolves* 3;

4.4 all texts incorporated by reference shall be published following a WRC, in accordance with *resolves* 4.

5 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-2000)**.

ANNEX 2 TO RESOLUTION 27 (Rev.WRC-03)

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:

- 1 whether each reference is mandatory, i.e. incorporated by reference, or non-mandatory;
- 2 mandatory references shall use clear linking language, i.e. “shall”;
- 3 mandatory references shall be explicitly and specifically identified, e.g. “Recommendation ITU-R M.541-8”;
- 4 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”;
- 5 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 linking language, e.g. “should” or “may”, and would normally be made using the terminology “the most recent version” of a Recommendation.

ANNEX 3 TO RESOLUTION 27 (Rev.WRC-03)

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 shall be developed and maintained by the committees. This list 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.

RESOLUTION 28 (Rev.WRC-03)

**Revision of references to the text of ITU-R Recommendations
incorporated by reference in the Radio Regulations**

The World Radiocommunication Conference (Geneva, 2003),

considering

- a) that the Voluntary Group of Experts on simplification of the Radio Regulations (VGE) proposed the transfer of certain texts of the Radio Regulations to other documents, especially to ITU-R Recommendations, using the incorporation by reference procedure;
- b) that, in some cases, the provisions of the Radio Regulations imply an obligation on Member States to conform to the criteria or specifications incorporated by reference;
- c) that references to incorporated texts shall be explicit and shall refer to a precisely identified provision (see Resolution 27 (**Rev.WRC-2000**));
- d) that all texts of ITU-R Recommendations incorporated by reference are published in a volume of the Radio Regulations;
- e) that, taking into account the rapid evolution of technology, ITU-R may revise the ITU-R Recommendations containing text incorporated by reference at short intervals;
- f) that, following revision of an ITU-R Recommendation containing text incorporated by reference, the reference in the Radio Regulations shall continue to apply to the earlier version until such time as a competent WRC agrees to incorporate the new version;
- g) that it would be desirable that texts incorporated by reference reflect the most recent technical developments,

noting

that administrations need sufficient time to examine the potential consequences of changes to ITU-R Recommendations containing text incorporated by reference and would therefore benefit greatly from being advised, as early as possible, of which ITU-R Recommendations have been revised and approved during the elapsed study period or at the Radiocommunication Assembly preceding the WRC,

resolves

- 1 that each radiocommunication assembly shall communicate to the following WRC a list of the ITU-R Recommendations containing text incorporated by reference in the Radio Regulations which have been revised and approved during the elapsed study period;
- 2 that, on this basis, WRC should examine those revised ITU-R Recommendations, and decide whether or not to update the corresponding references in the Radio Regulations;
- 3 that, if the WRC decides not to update the corresponding references, the currently referenced version shall be maintained in the Radio Regulations;
- 4 that WRCs shall place the examination of ITU-R Recommendations in conformity with *resolves* 1 and *resolves* 2 of this Resolution on the agenda of future WRCs,

instructs the Director of the Radiocommunication Bureau

to provide the CPM immediately preceding each WRC with a list, for inclusion in the CPM Report, of those ITU-R Recommendations containing texts incorporated by reference that have been revised or approved since the previous WRC, or that may be revised in time for the following WRC,

urges administrations

- 1 to participate actively in the work of the radiocommunication study groups and the radiocommunication assembly on revision of those Recommendations to which mandatory references are made in the Radio Regulations;
- 2 to examine any indicated revisions of ITU-R Recommendations containing text incorporated by reference and to prepare proposals on possible updating of relevant references in the Radio Regulations.

RESOLUTION 33 (Rev.WRC-03)

**Bringing into use of space stations in the broadcasting-satellite service,
prior to the entry into force of agreements and associated plans for
the broadcasting-satellite service**

The World Radiocommunication Conference (Geneva, 2003),

considering

- a) that while Resolution **507 (Rev.WRC-03)** envisages plans for the broadcasting-satellite service (BSS), some administrations might nevertheless feel the need to bring stations in that service into use prior to such plans being established;
- b) that administrations should, as far as possible, avoid proliferation of space stations in the BSS before such plans have been established;
- c) that a space station in the BSS may cause harmful interference to terrestrial stations operating in the same frequency band, even if the latter are outside the service area of the space station;
- d) that the procedures specified in Articles **9** to **14** and Appendix **5** contain provisions for coordination between stations in the BSS and terrestrial stations, between space systems in that service and space systems of other administrations;
- e) that there are many existing and planned stations in the BSS not subject to agreements and associated plans that have submitted advance publication information (API) or a request for coordination under the existing Resolution **33** procedures and that some administrations are currently in coordination under these procedures,

resolves

1 that, except in those cases where agreements and associated plans for the BSS have been established and have entered into force, for satellite networks for which the API has been received following 1 January 1999, only the procedures of Articles **9** to **14**^{*} shall be applied for the coordination and notification of stations in the BSS and coordination and notification of other services in respect of that service;

* Or procedures contained in other provisions of these Regulations when they replace any of those in Articles **9** to **14** for the broadcasting-satellite service.

2 that, except in those cases where agreements and associated plans for the BSS have been established and have entered into force, for satellite networks for which the API has been received by the Radiocommunication Bureau prior to 1 January 1999, only the procedure in Sections A to C in this Resolution shall be applied;

3 that a future conference review the requirement for the procedures in this Resolution.

Section A – Coordination procedure between space stations in the broadcasting-satellite service and terrestrial stations

2.1 Before an administration notifies to the Bureau or brings into use any frequency assignment to a space station in the broadcasting-satellite service in a frequency band where this frequency band is allocated, with equal rights, to the broadcasting-satellite service and to a terrestrial radiocommunication service, either in the same Region or sub-Region or in different Regions or sub-Regions, it shall coordinate the use of this assignment with any other administration whose terrestrial radiocommunication services may be affected. For this purpose, it shall inform the Bureau of all the technical characteristics of the station, as listed in the relevant sections of Appendix 4, which are necessary to assess the risk of interference to a terrestrial radiocommunication service¹.

2.2 The Bureau shall publish this information in a Special Section of its International Frequency Information Circular (BR IFIC) and shall also, when the BR IFIC contains such information, so advise all administrations by circular telegram.

2.3 Any administration which considers that its terrestrial radiocommunication services may be affected shall forward its comments to the administration seeking coordination and, in any case, to the Bureau. These comments must be forwarded within four months from the date of the relevant BR IFIC. It shall be deemed that any administration which has not forwarded comments within that period considers that its terrestrial radiocommunication services are unlikely to be affected.

2.4 Any administration which has forwarded comments on the projected station shall either give its agreement, with a copy to the Bureau, or, if this is not possible, send to the administration seeking coordination all the data on which its comments are based as well as any suggestions it may be able to offer with a view to a satisfactory solution of the problem.

2.5 The administration which plans to bring into use a space station in the broadcasting-satellite service as well as any other administration which believes that its terrestrial radiocommunication services are likely to be affected by the station in question may request the assistance of the Bureau at any time during the coordination procedure.

¹ The calculation methods and the interference criteria to be employed in evaluating the interference should be based upon relevant ITU-R Recommendations agreed by the administrations concerned either as a result of Resolution 703 (Rev.WRC-03) or otherwise. In the event of disagreement on an ITU-R Recommendation or in the absence of such Recommendations, the methods and criteria shall be agreed between the administrations concerned. Such agreements shall be concluded without prejudice to other administrations.

2.6 In the event of continuing disagreement between an administration seeking to effect coordination and one with which coordination has been sought, the administration seeking coordination shall, except in the cases where the assistance of the Bureau has been requested, defer the submission of its notice concerning the proposed assignment by six months from the date of publication of the information according to § 2.2.

Section B – Coordination procedure between space stations in the broadcasting-satellite service and space systems of other administrations

3 An administration intending to bring into use a space station in the broadcasting-satellite service shall, for the purpose of coordination with space systems of other administrations, apply the following provisions of Article 11 of the Radio Regulations (edition of 1990, revised in 1994):

3.1 Nos. **1041** to **1058** inclusive.

3.2.1 Nos. **1060** to **1065**².

3.2.2 No coordination under § 3.2.1 is required when an administration proposes to change the characteristics of an existing assignment in such a way as not to increase the probability of harmful interference to stations in the space radiocommunication service of other administrations.

3.2.3 Nos. **1074** to **1105** inclusive.

Section C – Notification, examination and recording in the Master Register of assignments to space stations in the broadcasting-satellite service dealt with under this resolution

4.1 Any frequency assignment³ to a space station in the broadcasting-satellite service shall be notified to the Bureau. The notifying administration shall apply for this purpose the provisions of Nos. **1495** to **1497** of the Radio Regulations (edition of 1990, revised in 1994).

4.2 Notices made under § 4.1 shall initially be treated in accordance with No. **1498** of the Radio Regulations (edition of 1990, revised in 1994).

5.1 The Bureau shall examine each notice with respect to:

5.2 a) its conformity with the Convention, the Table of Frequency Allocations and the other provisions of the Radio Regulations, with the exception of those relating to the coordination procedures and to the probability of harmful interference, which are the subject of § 5.3, 5.4, and 5.5;

² See footnote 1.

³ The expression *frequency assignment*, wherever it appears in this Resolution, shall be understood to refer either to a new frequency assignment or to a change in an assignment already recorded in the Master International Frequency Register (hereinafter called the *Master Register*).

5.3 *b)* its conformity, where applicable, with the provisions of § 2.1 of Section A above, relating to coordination of the use of the frequency assignment with the other administrations concerned;

5.4 *c)* its conformity, where applicable, with the provisions of § 3.2.1 of Section B above, relating to coordination of the use of the frequency assignment with the other administrations concerned;

5.5 *d)* where appropriate, the probability of harmful interference to the service rendered by a station in a space or terrestrial radiocommunication service for which a frequency assignment has already been recorded in the Master Register in conformity with the provisions of No. **1240** or **1503** of the Radio Regulations (edition of 1990, revised in 1994), or No. **11.31**, as appropriate, if that assignment has not, in fact, caused harmful interference to the service rendered by a station for which an assignment has been previously recorded in the Master Register and which itself is in conformity with No. **1240** or **1503** of the Radio Regulations (edition of 1990, revised in 1994), or No. **11.31**, as appropriate.

6.1 Depending upon the findings of the Bureau subsequent to the examination prescribed in § 5.2, 5.3, 5.4 and 5.5, further action shall be as follows:

6.2 Where the Bureau reaches an unfavourable finding with respect to § 5.2, the notice shall be returned immediately by airmail to the notifying administration with the reasons of the Bureau for this finding together with such suggestions as the Bureau is able to offer with a view to a satisfactory solution of the problem.

6.3 Where the Bureau reaches a favourable finding with respect to § 5.2, or where it reaches the same finding after resubmission of the notice, it shall examine the notice with respect to the provisions of § 5.3 and 5.4.

6.4 Where the Bureau finds that the coordination procedures mentioned in § 5.3 and 5.4 have been successfully completed with all administrations whose services may be affected, the assignment shall be recorded in the Master Register. The date of receipt by the Bureau of the notice shall be entered in Column 2d of the Master Register with an entry 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 (Rev.WRC-03)**.

6.5 Where the Bureau finds that the coordination procedures mentioned in § 5.3 or 5.4 have not, as appropriate, been applied or have been unsuccessfully applied, the notice shall be returned immediately by airmail to the notifying administration with the reason for its return together with such suggestions as the Bureau is able to offer with a view to a satisfactory solution of the problem.

6.6 Where the notifying administration resubmits the notice and states that it has been unsuccessful in endeavouring to effect the coordination, the notice shall be examined by the Bureau with respect to § 5.5.

6.7 Where the notifying administration resubmits the notice and the Bureau finds that the coordination procedures have been successfully completed with all administrations whose services may be affected, the assignment shall be treated as indicated in § 6.4.

6.8 Where the Bureau reaches a favourable finding with respect to § 5.5, the assignment shall be recorded in the Master Register. The appropriate symbol indicating the finding by the Bureau shall indicate that the coordination procedures, as appropriate, referred to in § 2.1 or 3.2.1 were not successfully completed. The date of receipt by the Bureau of the notice shall be entered in Column 2d of the Master Register, with the remark mentioned in § 6.4.

6.9 Where the Bureau reaches an unfavourable finding with respect to § 5.5, the notice shall be returned immediately by airmail to the notifying administration with the reasons for the Bureau's finding together with such suggestions as the Bureau is able to offer with a view to a satisfactory solution of the problem.

6.10 If the administration resubmits the notice unchanged with the insistence that it be reconsidered, but should the Bureau's unfavourable finding under § 5.5 remain unchanged, the assignment shall be recorded in the Master Register. However, this entry shall be made only if the notifying administration informs the Bureau that the assignment has been in use for at least four months without any complaint of harmful interference having been received. The date of receipt by the Bureau of the original notice shall be entered in Column 2d of the Master Register, with the remark mentioned in § 6.4. An appropriate remark shall be placed in Column 13 to indicate that the assignment is not in conformity with the provisions of § 5.3, 5.4 or 5.5, as appropriate. In the event that the administration concerned receives no complaint of harmful interference concerning the operation of the station in question for a period of one year from the commencement of operation, the Bureau shall review its finding.

6.11 If harmful interference is actually caused to the reception of any space station in the broadcasting-satellite service whose frequency assignment has been recorded in the Master Register as a result of a favourable finding with respect to § 5.2, 5.3, 5.4 and 5.5 of this Resolution, as appropriate, by the use of a frequency assignment to a space station which has been subsequently recorded in the Master Register in accordance with the provisions of § 6.10 of this Resolution or of No. **1544** of the Radio Regulations (edition of 1990, revised in 1994), or No. **11.41**, as appropriate, the station using the latter frequency assignment must, upon receipt of advice thereof, immediately eliminate this harmful interference.

6.12 If harmful interference is actually caused to the reception of any space radiocommunication station using an assignment recorded in the Master Register as a result of a favourable finding with respect to Nos. **1503** to **1512** of the Radio Regulations (edition of 1990, revised in 1994), or Nos. **11.31** to **11.34**, as appropriate, by the use of an assignment to a space station in the broadcasting-satellite service which has been subsequently recorded in the Master Register in accordance with the provisions of § 6.10 of this Resolution, the station using the latter assignment must, on receipt of advice thereof, immediately eliminate this harmful interference.

6.13 If harmful interference is actually caused to the reception of any terrestrial station using an assignment recorded in the Master Register as a result of a favourable finding with respect to No. **1240** of the Radio Regulations (edition of 1990, revised in 1994), or No. **11.31**, as appropriate, by the use of an assignment to a space station in the broadcasting-satellite service which has been subsequently recorded in the Master Register in accordance with the provisions of § 6.10 of this Resolution, the station, using the latter assignment must, on receipt of advice thereof, immediately eliminate this harmful interference.

6.14 If harmful interference to the reception of any station whose assignment is in accordance with § 5.2 of this Resolution is actually caused by the use of a frequency assignment which is not in conformity with No. **1240**, **1352** or **1503** of the Radio Regulations (edition of 1990, revised in 1994), or No. **11.31**, as appropriate, the station using the latter frequency assignment must, upon receipt of advice thereof, immediately eliminate this harmful interference.

RESOLUTION 34 (Rev.WRC-03)

Establishment of the broadcasting-satellite service in Region 3 in the 12.5-12.75 GHz frequency band and sharing with space and terrestrial services in Regions 1, 2 and 3

The World Radiocommunication Conference (Geneva, 2003),

considering

that the World Administrative Conference (Geneva, 1979) has allocated the band 12.5-12.75 GHz to the broadcasting-satellite service for community reception in Region 3,

recognizing

that under Resolution **507 (Rev.WRC-03)** the Council may wish to empower a future competent radiocommunication conference to establish a plan for the broadcasting-satellite service in the band 12.5-12.75 GHz in Region 3,

resolves

1 that, until such time as a plan may be established for the broadcasting-satellite service in the band 12.5-12.75 GHz in Region 3, the relevant provisions of Sections A and B of Resolution **33 (Rev.WRC-03)** or of Article 9, as appropriate (see Resolution **33 (Rev.WRC-03)**) shall continue to apply to the coordination between stations in the broadcasting-satellite service in Region 3 and:

- a) space stations in the broadcasting-satellite and fixed-satellite services in Regions 1, 2 and 3;
- b) terrestrial stations in Regions 1, 2 and 3;

2 that the ITU-R shall study urgently the technical provisions which may be appropriate for the sharing between stations in the broadcasting-satellite service in Region 3 and:

- a) space stations in the broadcasting-satellite and fixed-satellite services in Regions 1 and 2;
- b) terrestrial stations in Regions 1 and 2;

3 that, until such time as technical provisions are developed by the ITU-R and accepted by administrations concerned under Resolution **703 (Rev.WRC-03)**, the sharing between space stations in the broadcasting-satellite service in Region 3 and terrestrial services in Regions 1, 2 and 3 shall be based on the following criteria as appropriate:

- a) the power flux-density at the Earth's surface, produced by emissions from a space station in the broadcasting-satellite service in Region 3 for all conditions and for all methods of modulation shall not exceed the limits given in Annex 5 of Appendix **30**;
- b) in addition to *resolves 3 a)* above, the provisions of Article **21** (Table **21-4**) shall apply in the countries mentioned in Nos. **5.494** and **5.496**;
- c) the limits given in *resolves 3 a)* and *b)* above may be exceeded on the territory of any country provided the administration of that country has so agreed.

RESOLUTION 42 (Rev.WRC-03)

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, 2003),

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 this Conference has 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-03)

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;

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.

- 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 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 date². 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.

² The provisions of Resolution 533 (Rev.WRC-2000) apply.

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.

RESOLUTION 49 (Rev.WRC-03)

**Administrative due diligence applicable to some satellite
radiocommunication services**

The World Radiocommunication Conference (Geneva, 2003),

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 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;

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 Master International Frequency Register (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;

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 WRC-07 and future competent world radiocommunication conferences on the results of the implementation of the administrative due diligence procedure.

ANNEX 1 TO RESOLUTION 49 (Rev.WRC-03)

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 supplementary provisions applicable to additional uses in the planned bands as defined in Article 2 of Appendix **30B** (Section III of Article 6) 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.

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 Section III of Article 6 of Appendix **30B** relating to additional uses 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 § 6.57 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 no longer be taken into account and shall not be recorded in the MIFR. 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 Section III of Article 6 of Appendix **30B** under § 3 above, the network shall also be deleted from the Appendix **30B** List, if applicable.

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-03)

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 Section III of Article 6 of Appendix **30B**
- 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.

RESOLUTION 56 (Rev.WRC-03)

**Modification of the procedures and requirements
for advance publication**

The World Radiocommunication Conference (Geneva, 2003),

considering

a) Resolution 86 (Marrakesh, 2002) of the Plenipotentiary Conference;

b) that there is concern among a number of administrations that some of the current procedures and requirements for advance publication may give rise to inequalities in the satellite filing and coordination process,

resolves

1 that, as from 5 July 2003, the Radiocommunication Bureau and administrations shall apply the provisions of No. **9.2**, as revised by this Conference;

2 that any request for coordination or modifications to a previously submitted API received by the Bureau after 5 July 2003 shall be examined in accordance with the provisions of No. **9.2** as revised by this Conference.

RESOLUTION 57 (WRC-2000)*

Modification of bringing into use and administrative due diligence requirements as a consequence of allocation changes above 71 GHz

The World Radiocommunication Conference (Istanbul, 2000),

considering

- a)* that, pursuant to agenda item 1.16 identified in Resolution **721 (WRC-97)**, the preparatory work for this Conference included consideration of the allocation of frequency bands above 71 GHz to the Earth exploration-satellite (passive) and radio astronomy services;
- b)* that agenda item 1.16 took into account Resolution **723 (WRC-97)**, which also included consideration of the allocation of frequency bands above 71 GHz to the space research service (passive);
- c)* that changes made to the allocations for these passive science services were accompanied by consequential changes to allocations above 71 GHz to active services;
- d)* that the allocation changes may cause delays in the design and development of space stations planning to use these allocations;
- e)* that the delays also have an impact on transmitters and receivers, on the same space stations, planning to use frequencies below 71 GHz;
- f)* that the Radiocommunication Bureau has already received advance publication and coordination information for satellite networks in the fixed-satellite, mobile-satellite or broadcasting-satellite services that includes the use of frequencies above 71 GHz;
- g)* that this advance publication or coordination information for satellite networks in the fixed-satellite, mobile-satellite or broadcasting-satellite services will have been based on the frequency allocations in force at the time the information was submitted;
- h)* that No. **11.44** requires that the notified date of bringing into use of any space station of a satellite network be no later than nine years (for advance publication information received prior to 22 November 1997) or seven years (for advance publication information received on or after 22 November 1997) after the date of receipt by the Bureau of the advance publication information under No. **9.1**;

* WRC-03 reviewed this Resolution and decided to suppress *resolves* 6.

i) that No. **11.44B** allows the notified date of bringing into use to be extended by the Bureau only if the due diligence information required by Resolution **49 (Rev.WRC-2000)** is provided for the satellite network; if the procedure for effecting coordination has commenced; and if the notifying administration certifies that the reason for the extension is one or more specific circumstances listed in Nos. **11.44C** to **11.44I**;

j) that none of the specific circumstances listed in Nos. **11.44C** to **11.44I** includes changes to the frequency allocations as a result of the decisions of a world radiocommunication conference;

k) that, in order to provide the necessary protection to the passive science services, satellite networks in the fixed-satellite, mobile-satellite or broadcasting-satellite services using frequencies above 71 GHz for which advance publication or coordination information is considered as having been received by the Bureau prior to 3 June 2000 must adhere to the revised Table of Frequency Allocations resulting from WRC-2000,

resolves

1 that, for satellite networks using frequencies above 71 GHz in the fixed-satellite, mobile-satellite or broadcasting-satellite services for which advance publication or coordination information is considered as having been received by the Bureau prior to 3 June 2000, the Bureau will extend the notified date of bringing into use under No. **11.44** up to 3 June 2007 at the request of the notifying administration;

2 that, notwithstanding the notified date of bringing into use in *resolves* 1, there shall be no change in the date that the advance publication or coordination information is considered as having been received by the Bureau;

3 that, for any satellite network subject to this Resolution, the notifying administration shall have until 31 December 2000 to resubmit to the Bureau the Appendix 4 advance publication information and coordination information for the space station reflecting the proposed modification in the frequency band above 71 GHz, and that this Appendix 4 information shall be excluded from the cost-recovery procedures;

4 that the provisions contained in Nos. **11.44B** to **11.44I** are applicable with respect to the date of bringing into use communicated to the Bureau under *resolves* 3;

5 that, for any satellite network subject to this Resolution and Resolution **49 (WRC-97)**, the notifying administration shall have until the new date of bringing into use under *resolves* 3 to send the administrative due diligence information to the Bureau, including any revision of administrative due diligence information submitted before 3 June 2000;

6

(SUP – WRC-03)

7 that, six months before the date specified in *resolves* 3, the Bureau will provide administrations with a list of the networks to which this Resolution applies, and the options under the above *resolves*;

8 that satellite networks using frequencies above 71 GHz for which the advanced publication or coordination information is considered as having been received by the Bureau prior to 3 June 2000 shall adhere to the revised Table of Frequency Allocations resulting from WRC-2000.

RESOLUTION 63 (Rev.WRC-03)

**Protection of radiocommunication services against interference
caused by radiation from industrial, scientific
and medical (ISM) equipment**

The World Radiocommunication Conference (Geneva, 2003),

considering

- a) that ISM equipment generates and uses locally radio frequency energy, whereby outward radiation cannot always be avoided;
- b) that there is an increasing amount of ISM equipment working on various frequencies throughout the spectrum;
- c) that in some cases a considerable part of the energy may be radiated by ISM equipment outside its working frequency;
- d) 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;
- e) that some radio services, 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 radionavigation or other safety services;
- f) 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,

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 the frequency bands designated in the Radio Regulations for this use and outside of those bands,

invites ITU-R

to continue, in collaboration with CISPR, its studies relating to radiation from ISM equipment within the frequency bands designated in the Radio Regulations for this use and outside of those bands in order to ensure adequate protection of radiocommunication services, 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.

RESOLUTION 74 (Rev.WRC-03)

Process to keep the technical bases of Appendix 7 current

The World Radiocommunication Conference (Geneva, 2003),

considering

- a) that Appendix 7 provides the method for the determination of the coordination area of an earth station, and the assumed technical coordination parameters for unknown terrestrial stations or earth stations;
- b) that the technical coordination parameters are contained in Tables 7, 8 and 9 of Annex 7 to Appendix 7;
- c) that the technical coordination parameter tables are based on Recommendation ITU-R SM.1448;
- d) that ITU-R studies on methods for the determination of the coordination area of an earth station are continuing, and the conclusions of these studies could lead to revision of Appendix 7; these methods under study are:
 - methods considering the cumulative impact in determining the coordination areas for high-density earth stations (fixed and mobile);
 - methods to address the modelling of VHF/UHF frequencies for percentages of time less than 1%;
 - methods to address propagation mode (1) water vapour density for both radio climatic Zones B and C;
 - refinements to propagation mode (2) to address elevation angle dependency and the displacement of the centre of the propagation mode (2) contour from the coordinating earth station;
- e) that the technical coordination parameter tables may also need to be modified when changes are made to the Table of Frequency Allocations at future world radiocommunication conferences (WRCs), or due to changes in technology or in applications;
- f) that the technical coordination parameter tables do not include values for all the necessary parameters of certain space radiocommunication services and terrestrial radiocommunication services sharing frequency bands with equal rights,

recognizing

- a) that Recommendation ITU-R SM.1448 was developed by ITU-R as a basis for the revision of Appendix 7;

b) that there is a need for future WRCs to keep Appendix 7 current with the latest techniques and to ensure protection of other radiocommunication services sharing the same frequency bands with equal rights, particularly through revision of the tables of technical coordination parameters,

invites ITU-R

1 to continue its study, as required, of the technical bases used for determination of the coordination area of an earth station, including recommended values for the missing entries in the tables of technical coordination parameters (Annex 7 to Appendix 7);

2 to maintain the relevant ITU-R texts in a format which would facilitate the future revision of Appendix 7;

3 to assess the significance of changes to the technical bases,

resolves

1 that when ITU-R concludes, based on its studies of the methods in *considering d)* for determination of the coordination area of an earth station and/or the values of technical coordination parameters, that a revision of Appendix 7 is warranted, the matter shall be brought to the attention of the Radiocommunication Assembly;

2 that, if the Radiocommunication Assembly confirms the improvements of the methods in *considering d)* for determination of the coordination area of an earth station and/or the values of technical coordination parameters which have been presented by ITU-R, the Director of the Radiocommunication Bureau shall identify the matter in the Director's report to the following WRC,

invites

1 WRCs, when presented with any significant changes through the Director's report, to consider the revision of Appendix 7 in light of the recommendation of the Radiocommunication Assembly, pursuant to *resolves* 1 and 2 above;

2 each WRC, when modifying the Table of Frequency Allocations, to consider any consequential changes that may be required to the technical coordination parameters of Annex 7 to Appendix 7 and, if necessary, request ITU-R to study the matter.

RESOLUTION 85 (WRC-03)

Application of Article 22 of the Radio Regulations to the protection of geostationary fixed-satellite service and broadcasting-satellite service networks from non-geostationary fixed-satellite service systems

The World Radiocommunication Conference (Geneva, 2003),

considering

a) that WRC-2000 adopted, in Article **22**, single-entry limits applicable to non-geostationary (non-GSO) fixed-satellite service (FSS) systems in certain parts of the frequency range 10.7-30 GHz to protect geostationary-satellite (GSO) networks operating in the same frequency bands;

b) that, taking into account Nos. **22.5H** and **22.5I**, wherever the limits referred to in *considering a)* are exceeded by a non-GSO FSS system to which the limits apply without the agreement of the concerned administrations, this constitutes a violation of the obligations under No. **22.2**;

c) that ITU-R has developed Recommendation ITU-R S.1503 to provide a functional description to be used in developing software tools for determining the conformity of non-GSO FSS networks with limits contained in Article **22**;

d) that there is currently no software tool available to the Radiocommunication Bureau for epfd examinations;

e) that the Bureau has issued Circular Letters CR/176 and CR/182, which request additional information from non-GSO systems in order to examine them for compliance with the Article **22** epfd limits;

f) that, since no epfd validation software is available, the Bureau has requested commitments from the notifying administrations that they will meet the epfd limits in Tables **22-1A**, **22-1B**, **22-1C**, **22-1D**, **22-1E**, **22-2** and **22-3**, and that under these commitments the Bureau gives qualified favourable findings to their systems;

g) that the Bureau is not in a position to perform its duties in relation to Nos. **9.7A** and **9.7B** due to the lack of epfd validation software;

h) that during the examination under Nos. **9.35** and **11.31**, the Bureau examines non-GSO FSS systems to ensure their compliance with the single-entry epfd limits given in Tables **22-1A**, **22-1B**, **22-1C**, **22-1D**, **22-1E**, **22-2** and **22-3**,

resolves

1 that since the Bureau is unable to examine non-GSO FSS systems subject to Nos. **22.5C**, **22.5D** and **22.5F** under Nos. **9.35** and/or **11.31**, the notifying administration shall send to the Bureau a commitment that the non-GSO FSS system complies with the limits given in Tables **22-1A**, **22-1B**, **22-1C**, **22-1D**, **22-1E**, **22-2** and **22-3** in addition to the information submitted under Nos. **9.30** and **11.15**;

2 that the Bureau shall issue either a qualified favourable finding under No. **9.35** or a favourable finding with a date of review under No. **11.31** with respect to the limits contained in Tables **22-1A**, **22-1B**, **22-1C**, **22-1D**, **22-1E**, **22-2** and **22-3**, if *resolves* 1 is satisfied, otherwise the non-GSO FSS system will receive a definitive unfavourable finding;

3 that if an administration believes that a non-GSO FSS system, for which the commitment referred to in *resolves* 1 was sent, has the potential to exceed the limits given in Tables **22-1A**, **22-1B**, **22-1C**, **22-1D**, **22-1E**, **22-2** and **22-3**, it may request from the notifying administration additional information with regard to the compliance with the limits mentioned above. Both administrations shall cooperate to resolve any difficulties, with the assistance of the Bureau, if so requested by either of the parties, and may exchange any additional relevant information that may be available;

4 that the Bureau shall determine coordination requirements between GSO FSS earth stations and non-GSO FSS systems under Nos. **9.7A** and **9.7B** based on bandwidth overlap, and GSO FSS earth station antenna maximum isotropic gain, *G/T* and emission bandwidth;

5 that this Resolution shall no longer be applied after the Bureau has communicated to all administrations via a Circular Letter that the epfd validation software is available and the Bureau is able to verify compliance with the limits in Tables **22-1A**, **22-1B**, **22-1C**, **22-1D**, **22-1E**, **22-2** and **22-3** and to determine the coordination requirements under Nos. **9.7A** and **9.7B**,

further resolves

that those provisions of the Radio Regulations that have been amended by this Conference and that are referred to in *resolves* 5 shall provisionally apply as from 5 July 2003,

instructs the Director of the Radiocommunication Bureau

1 to encourage administrations to develop the epfd validation software;

2 to review, once the epfd validation software is available, its findings made in accordance with Nos. **9.35** and **11.31**;

3 to review, once the epfd validation software is available, the coordination requirements under Nos. **9.7A** and **9.7B**.

RESOLUTION 86 (WRC-03)

**Scope and criteria to be used for the implementation of
Resolution 86 (Rev. Marrakesh, 2002) of the
Plenipotentiary Conference**

The World Radiocommunication Conference (Geneva, 2003),

considering

that the Plenipotentiary Conference discussed the application of Resolution 86 (Rev. Marrakesh, 2002) and decided to request this Conference to determine the scope and criteria to be used by future world radiocommunication conferences (WRCs) in the application of Resolution 86 (Rev. Marrakesh, 2002),

resolves

that the scope and criteria of Resolution 86 (Rev. Marrakesh, 2002) of the Plenipotentiary Conference to be considered by future WRCs be as follows:

1 to consider any proposals which deal with deficiencies in the advance publication, coordination and notification procedures of the Radio Regulations for space services which have either been identified by the Board and included in the Rules of Procedure or which have been identified by administrations or by the Radiocommunication Bureau, as appropriate;

2 to consider any proposals which are intended to transform the content of the Rules of Procedure into a regulatory text;

3 to ensure that these procedures, characteristics and appendices reflect the latest technologies, as far as possible;

4 to consider any proposals intended to facilitate, in accordance with Article 44 of the Constitution, the rational, efficient and economical use of radio frequencies and the associated orbits including the geostationary orbit in accordance with *resolves 2 of Resolution 80 (Rev.WRC-2000)* and *resolves to request the 2003 and subsequent world radiocommunication conferences* of Resolution 86 (Rev. Marrakesh, 2002) of the Plenipotentiary Conference;

5 to consider any changes to provisions of the Radio Regulations for space services that would result in the simplification of the procedures and the work of the Bureau and/or administrations;

6 to consider any changes to the Radio Regulations that follow from decisions of a Plenipotentiary Conference on space matters.

RESOLUTION 87 (WRC-03)

Date of entry into force of certain provisions of the Radio Regulations relating to the non-payment of cost-recovery fees

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that WRC-2000 adopted certain provisions in Article 9, Appendix 30, Appendix 30A and Appendix 30B relating to the consequences of non-payment of cost-recovery fees as adopted by the Council in Decision 482;
- b)* that WRC-2000 recommended that the Plenipotentiary Conference (Marrakesh, 2002) (PP-02) consider the date at which those provisions shall enter into force;
- c)* that PP-02 decided that the date of entry into force of those provisions shall be 1 August 2003;
- d)* that PP-02 recommended WRC-03 to implement that decision;
- e)* that with the PP-02 decision setting a date of entry into force of 1 August 2003, it may not be possible in all cases to give a reminder two months in advance (see No. 9.38.1 of the Radio Regulations),

recognizing

that Resolution 88 (Rev. Marrakesh, 2002) of the Plenipotentiary Conference recognizes that the provisions adopted by WRC-2000 established a linkage between the rights acquired by Member States in applying the relevant procedures of the Radio Regulations after 7 November 1998 and the payment of the fees for cost recovery for satellite network filings,

noting

that PP-02 instructed the Director of the Radiocommunication Bureau to send reminders 60 days before 1 August 2003,

resolves

- 1 that the date of entry into force of the footnotes to Nos. 9.2B and 9.38 in Article 9, to § 4.1.5, 4.1.15, 4.2.8 and 4.2.19 of Appendix 30, to § 4.1.5, 4.1.15, 4.2.8 and 4.2.19 of Appendix 30A and to the title of Article 6 of Appendix 30B shall be 1 August 2003;
- 2 that for those filings for which the deadline for payment is between 7 July 2003 and 5 September 2003, the reminder shall be sent out on 7 July 2003 and the provisions specified in *resolves* 1 above shall not be applied until 5 September 2003.

RESOLUTION 88 (WRC-03)

Rationalization of Articles 9 and 11 of the Radio Regulations

The World Radiocommunication Conference (Geneva, 2003),

considering

a) that the need for comprehensive simplification of the Radio Regulations was recognized formally by the ITU Plenipotentiary Conference (Nice, 1989), which went on to establish a Voluntary Group of Experts (VGE) with the remit to study the issues involved in improving the allocation and use of the radio-frequency spectrum and the simplification of the Radio Regulations, having particular regard to simplifying the coordination and notification procedures for satellite networks;

b) that the VGE made proposals to WRC-95 on the simplification of the Radio Regulations that resulted in the present structure of the simplified Radio Regulations in which the general procedures for the coordination and notification of radiocommunication services are contained in the current Articles 9 and 11, respectively;

c) that WRC-97 and WRC-2000 both continued the lengthy process of refining the provisions of Articles 9 and 11 with a view to eliminating inconsistencies and remedying omissions from their procedures;

d) that following the simplification process and the additions made by subsequent conferences, the provisions of Articles 9 and 11 have become difficult to read due to extensive cross-referencing, the lack of a logical progress in the sequence of the provisions and the complexity of the resulting text;

e) that due to the problems identified in *considering d)* there has been extensive development of the Rules of Procedure to facilitate the understanding and interpretation of these Articles with consequential increased time and costs expended by for both administrations and the Radiocommunication Bureau;

f) that the complexity of the Articles 9 and 11 provisions can present particular difficulties for developing countries,

noting

a) that the Plenipotentiary Conference (Minneapolis, 1998) adopted Resolution 86 which, together with the subsequent revisions made by the Plenipotentiary Conference (Marrakesh, 2002), requires each world radiocommunication conference (WRC) to review and update the advance publication, coordination, notification and recording procedures for frequency assignments pertaining to satellite networks, including the associated technical characteristics, and the related Appendices of the Radio Regulations;

b) that the Satellite Backlog Action Group (SAT-BAG) established by the Council at its 2001 session, in its report to WCR-03, recommends that this conference initiate a study of the relevant regulatory procedures in order to systematically remove unnecessary duplication, inconsistency and complexity;

c) that an example dealing with the inconsistencies and omissions in the provisions of Article 9 and 11 has been provided to this conference,

resolves

1 that the rationalization and clarification of Articles 9 and 11 be considered by a future competence conference under Resolution 86 (Rev. Marrakesh, 2002) of the Plenipotentiary Conference;

2 that WRC-07 should review the results of the studies to be undertaken by ITU-R and take appropriate action,

requests ITU-R

to undertake studies leading to the rationalization of the coordination and notification procedures, taking due account of No. 0.3,

invites administrations

to assist in the rationalization and clarification of the procedures for coordination and notification of radiocommunication services by submitting contributions to ITU-R relating to the above-mentioned difficulties.

RESOLUTION 89 (WRC-03)

Backlog in satellite filings

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that the backlog in the processing of satellite filings by the Radiocommunication Bureau continues to be a problem and that this backlog has an impact on administrations and the Bureau in trying to comply with the provisions of the Radio Regulations (RR);
- b)* that the Council, at its 2001 session, adopted Resolution 1182 in which it was recommended that the Board develop, as a matter of urgency, a set of Rules of Procedure, consistent with the RR, intended to eliminate the backlog;
- c)* that, in response to Resolution 1182, the Board, at its meeting in December 2001, adopted a number of provisional Rules of Procedure;
- d)* that measures other than the adoption of Rules of Procedure will also be necessary in order to resolve the backlog,

recognizing

- a)* that the need to resolve this backlog in the processing of satellite filings is in the interest of all Member States;
- b)* that exceptional measures are needed to enable the Bureau to absorb the backlog in the processing of satellite filings,

resolves to invite administrations

to submit contributions with a view to removing any unnecessary data in Appendix 4 so as to reduce the processing time of a notice,

instructs the Director of the Radiocommunication Bureau, within financial limitations,

- 1 to identify inconsistencies in Appendix 4 and suggest improvements in its structure;
- 2 to provide administrations with a more user-friendly software for the validation of all electronic filings in order to minimize/eliminate the exchange of correspondence between administrations and the Bureau, as well as the submission of incorrect or inadequate data elements to the Bureau;
- 3 to provide administrations with up-to-date information on the validation rules and course of action for each error message,

invites ITU-R

- 1 to conduct studies relating to data elements, data structure and the database, where appropriate, for Appendix 4;
- 2 to conduct studies on the development of software for examining all forms of notice for compliance with Article 5.

RESOLUTION 95 (Rev.WRC-03)

**General review of the Resolutions and Recommendations of
world administrative radio conferences and world
radiocommunication conferences**

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that it is important to keep the Resolutions and Recommendations of past world administrative radio conferences and world radiocommunication conferences under constant review, in order to keep them up to date;
- b)* that the reports of the Director of the Radiocommunication Bureau submitted to previous conferences provided a useful basis for a general review of the Resolutions and Recommendations of past conferences;
- c)* that some principles and guidelines are necessary for future conferences to treat the Resolutions and Recommendations of previous conferences which are not related to the agenda of the Conference,

resolves to invite future competent world radiocommunication conferences

- 1 to review the Resolutions and Recommendations of previous conferences that are related to the agenda of the Conference with a view to their possible revision, replacement or abrogation and to take appropriate action;
- 2 to review the Resolutions and Recommendations of previous conferences that are not related to any agenda item of the Conference with a view to:
 - abrogating those Resolutions and Recommendations that have served their purpose or have become no longer necessary;
 - reviewing the need for those Resolutions and Recommendations, or parts thereof, requesting ITU-R studies on which no progress has been made during the last two periods between conferences;
 - updating and modifying Resolutions and Recommendations, or parts thereof that have become out of date, and to correct obvious omissions, inconsistencies, ambiguities or editorial errors and effect any necessary alignment;
- 3 at the beginning of the conference, to determine which committee within the conference has the primary responsibility to review each of the Resolutions and Recommendations referred to in *resolves* 1 and 2 above,

instructs the Director of the Radiocommunication Bureau

1 to conduct a general review of the Resolutions and Recommendations of previous conferences and, after consultation with the Radiocommunication Advisory Group and the Chairmen and Vice-Chairmen of the Radiocommunication Study Groups, submit a report to the second session of the Conference Preparatory Meeting in respect of *resolves* 1 and *resolves* 2, including an indication of any associated agenda items;

2 to include in the above report, with the cooperation of the chairmen of the Radiocommunication Study Groups, the progress reports of ITU-R studies on the issues which have been requested by the Resolutions and Recommendations of previous conferences, but which are not placed on the agendas of the forthcoming two conferences,

invites the Conference Preparatory Meeting

to include, in its Report, the results of a general review of the Resolutions and Recommendations of previous conferences.

RESOLUTION 96 (WRC-03)

**Provisional application of certain provisions of the Radio Regulations
as revised by WRC-03 and abrogation of certain
Resolutions and Recommendations**

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that this Conference has adopted a partial revision to the Radio Regulations (RR) in accordance with its terms of reference which will enter into force on 1 January 2005;
- b)* that some of the provisions, as amended by this Conference, need to apply provisionally as of an earlier date;
- c)* that as a general rule, new and revised Resolutions and Recommendations enter into force at the time of 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 the conference,

resolves

1 that, as of 5 July 2003, the following provisions of the RR, as revised or established by this Conference, shall provisionally apply: Nos. **1.189, 5.197A, 5.311, 5.328A, 5.328B, 5.329, 5.331, 5.334, 5.380A, 5.386, 5.388A, 5.388B, 5.416, 5.418, 5.417A, 5.417B, 5.417C, 5.417D, 5.418A, 5.418B, 5.418C, 5.424A, 5.443B** and the associated allocations in the Table of Article 5 to the radionavigation-satellite service in the bands 1 164-1 215 MHz, 1 215-1 300 MHz, 1 559-1 610 MHz, 5 000-5 010 MHz and 5 010-5 030 MHz, No. **5.460** and the associated allocation in the Table of Article 5 in the band 7 145-7 235 MHz and the associated modifications to Table 21-2 and Table 21-3, Nos. **5.502, 5.503, 5.504B, 5.504C, 5.508A, 5.509A** and the associated allocations in the Table of Article 5 to the aeronautical mobile-satellite service on a secondary basis in the band 14-14.5 GHz, Nos. **5.457A, 5.457B, 5.504A, 5.506A, 5.506B, 5.516A** and the associated allocation in the Table of Article 5 to the fixed-satellite service (space-to-Earth) in the band 17.3-17.7 GHz, Nos. **5.446A, 5.446B, 5.447, 5.447E, 5.447F, 5.448A, 5.448B, 5.448C, 5.448D, 5.450A, 5.450B, 5.453** and the associated allocations in the Table of Article 5 to the mobile except aeronautical mobile, Earth exploration-satellite (active) and space research (active), and radiolocation services, Nos. **5.488, 5.537A, 5.543A, 5.547, 7.4A, A.9.6A, A.9.7, 9.1, 9.2, 9.5D, 9.6, ^{13A} 9.6.3, 9.14, A.11.4A, ^{5A} A.11.5, 11.44, 11.48, 19.50.1, 19.68, 19.68A, 19.72, 19.82A, 21.13A, 21.16.15, 21.16.16, 21.16.17, 21.16.18, 21.18, Table 21-4, Nos. **22.5C, 22.5CA, Table 22-1A, Table 22-1B, Table 22-1C, Table 22-1D, Table 22-1E, Table 22-2, Nos. 22.5H, 22.5I, 25.1 to 25.8, 25.9A, 25.9B, 25.11 and 52.221A, Table 5-1 of Appendix 5, Appendix 17 (Part A, Part B – Section I, § 5), Appendix 42;****

2 that, as of 1 August 2003, the following provisions of the RR, as revised or
established by this Conference, shall provisionally apply: Nos. **9.2B.1** and **9.38.1**;

3 that, as of 1 January 2004, the following provisions of the RR, as revised or
established by this Conference, shall provisionally apply: Article **12**, Appendix **4**;

4 that, as of 4 January 2004, the following provisions of the RR, as revised or
established by this Conference, shall provisionally apply: Nos. **5.551H** and **5.551I**;

5 that, as of 5 July 2003, the following provisions of the RR, which are suppressed by
this Conference, shall be abrogated: Nos. **11.44B** to **11.44I**, **19.49**, **19.115** and **19.116**,

further resolves

1 to abrogate the following Resolutions as of 5 July 2003:

Resolution **29 (WRC-97)**,
Resolution **44 (Mob-87)**,
Resolution **46 (Rev.WRC-97)**,
Resolution **53 (Rev.WRC-2000)**,
Resolution **59 (WRC-2000)**,
Resolution **77 (WRC-2000)**,
Resolution **78 (WRC-2000)**,
Resolution **82 (WRC-2000)**,
Resolution **83 (WRC-2000)**,
Resolution **84 (WRC-2000)**,
Resolution **127 (Rev.WRC-2000)**,
Resolution **128 (Rev.WRC-2000)**,
Resolution **135 (WRC-2000)**,
Resolution **137 (WRC-2000)**,
Resolution **138 (WRC-2000)**,
Resolution **209 (Mob-87)**,
Resolution **214 (Rev.WRC-2000)**,
Resolution **216 (Rev.WRC-2000)**,
Resolution **226 (WRC-2000)**,
Resolution **227 (WRC-2000)**,
Resolution **300 (Rev.WRC-2000)**,
Resolution **310 (Rev.WRC-97)**,
Resolution **312 (Rev.WRC-97)**,
Resolution **341 (WRC-97)**,
Resolution **346 (WRC-97)**,
Resolution **347 (WRC-97)**,
Resolution **348 (WRC-97)**,

Resolution **350 (WRC-2000)**,
Resolution **532 (WRC-97)**,
Resolution **537 (WRC-97)**,
Resolution **540 (WRC-2000)**,
Resolution **541 (WRC-2000)**,
Resolution **542 (WRC-2000)**,
Resolution **602 (Mob-87)**,
Resolution **603 (WRC-2000)**,
Resolution **604 (WRC-2000)**,
Resolution **605 (WRC-2000)**,
Resolution **606 (WRC-2000)**,
Resolution **607 (WRC-2000)**,
Resolution **645 (WRC-2000)**,
Resolution **706 (Rev.WRC-2000)**,
Resolution **715 (Rev.WRC-97)**,
Resolution **723 (Rev.WRC-2000)**,
Resolution **724 (WRC-97)**,
Resolution **725 (WRC-97)**,
Resolution **727 (Rev.WRC-2000)**,
Resolution **730 (WRC-2000)**,
Resolution **733 (WRC-2000)**,
Resolution **735 (WRC-2000)**,
Resolution **736 (WRC-2000)**,
Resolution **737 (WRC-2000)**,
Resolution **800 (WRC-2000)**,
Resolution **801 (WRC-2000)**;

2 to abrogate the following Recommendations as of 5 July 2003:

Recommendation **35 (WRC-95)**,
Recommendation **64**,
Recommendation **66 (Rev.WRC-2000)**,
Recommendation **319 (Mob-87)**,
Recommendation **402**,
Recommendation **515 (Rev.WRC-97)**,
Recommendation **519 (WARC-92)**,
Recommendation **521 (WRC-95)**,

Recommendation **700**,
Recommendation **701**,
Recommendation **702**,
Recommendation **709**,
Recommendation **710**,
Recommendation **715 (Orb-88)**,
Recommendation **718 (WARC-92)**,
Recommendation **719 (WARC-92)**.

RESOLUTION 114 (Rev.WRC-03)

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, 2003),

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 (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 precedence 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 fixed-satellite service 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 fixed-satellite service earth stations providing Earth-to-space feeder links in the band 5 091-5 150 MHz;
- b)* the small number of fixed-satellite service 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 fixed-satellite service 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 fixed-satellite service 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 fixed-satellite service 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 fixed-satellite service 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.

RESOLUTION 122 (Rev.WRC-03)

Use of the bands 47.2-47.5 GHz and 47.9-48.2 GHz by high altitude platform stations (HAPS) in the fixed service and by other services

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that the band 47.2-50.2 GHz is allocated to the fixed, mobile and fixed-satellite services on a co-primary basis;
- b)* that WRC-97 made provision for operation of HAPS, also known as stratospheric repeaters, within the fixed service in the bands 47.2-47.5 GHz and 47.9-48.2 GHz;
- c)* that ITU has among its purposes “to promote the extension of the benefits of the new telecommunication technologies to all the world’s inhabitants” (No. 6 of the Constitution);
- d)* that systems based on new technologies using high altitude platforms will be able to provide high-capacity, competitive services to urban and rural areas;
- e)* that the development of any service requires major investment and that manufacturers and operators should be given the confidence to make the necessary investment;
- f)* that high altitude platform systems are in an advanced stage of development and some countries have notified such systems to ITU in the bands 47.2-47.5 GHz and 47.9-48.2 GHz;
- g)* that Recommendation ITU-R F.1500 contains the characteristics of systems in the fixed service using HAPS;
- h)* that while the decision to deploy HAPS can be taken on a national basis, such deployment may affect neighbouring administrations, particularly in small countries;
- i)* that ITU-R has completed studies dealing with sharing between systems using HAPS in the fixed service and other types of systems in the fixed service in the bands 47.2-47.5 GHz and 47.9-48.2 GHz;
- j)* that the radio astronomy service has a primary allocation in the band 48.94-49.04 GHz;
- k)* that further studies are required on sharing between systems using HAPS and the radio astronomy service;

l) that No. 5.552 urges administrations to reserve fixed-satellite service (FSS) use of the band 47.2-49.2 GHz for feeder links for the broadcasting-satellite service (BSS), and that ITU-R studies indicate that HAPS in the fixed service may share with BSS feeder links;

m) that Recommendation ITU-R SF.1481 provides useful reference information in regard to sharing between systems using HAPS and geostationary FSS systems but also notes that further study of operational scenarios and mitigation techniques is required, and that such study would enable greater confidence in the feasibility of sharing of the radio spectrum in the 47.2-47.5 GHz band and 47.9-48.2 GHz band, which have been designated for systems using HAPS;

n) that studies such as described in *considering m)* are already in progress in ITU-R,

resolves

1 to encourage administrations to facilitate coordination between systems in the fixed service using HAPS operating in the bands 47.2-47.5 GHz and 47.9-48.2 GHz and systems of the co-primary satellite services in the same bands;

2 that, on a provisional basis, the procedures of Article 9 shall be used for coordination between satellite systems and systems using HAPS in the bands 47.2-47.5 GHz and 47.9-48.2 GHz;

3 to invite WRC-07 to review, for the bands 47.2-47.5 GHz and 47.9-48.2 GHz, the results of the studies specified in *invites ITU-R* below and consider refinement of the regulatory provisions applicable to HAPS stations in the fixed service in these bands,

invites ITU-R

1 to study, as a matter of urgency, power limitations applicable for HAPS ground stations to facilitate sharing with space station receivers;

2 to study the regulatory provisions that might be needed in order to address those cases where the deployment of HAPS in the territory of one administration may affect other administrations;

3 to continue to carry out studies in a most efficient and harmonized manner on the appropriate technical sharing criteria for the situations referred to in *considering k)* and *m)*, taking into account the operational environments and the requirements of systems in the FSS,

instructs the Director of the Radiocommunication Bureau

1 to maintain notices concerning HAPS that were received by the Bureau prior to 22 November 1997 and provisionally recorded in the Master International Frequency Register, until a date to be decided by a future WRC;

2 with effect from 5 July 2003, and pending review of the sharing studies in *considering k) and m)* and review of the notification process by WRC-07:

- to accept notices in the bands 47.2-47.5 GHz and 47.9-48.2 GHz only for HAPS in the fixed service and for feeder links for the BSS, and, for Region 2, for earth stations and geostationary space stations operating FSS networks providing service exclusively within Region 2;
- to defer the examination of such systems under Nos. **9.36** and **11.32** as well as the application of any Article **9** coordination procedure between the satellite systems and HAPS until further decision by WRC-07;
- to continue to process notices for FSS networks (except for feeder links for the BSS) for which complete information for advance publication has been received prior to 27 October 1997; and
- to inform the notifying administrations accordingly.

RESOLUTION 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

The World Radiocommunication Conference (Geneva, 2003),

considering

- a) that WRC-2000 made provisions for the operation of geostationary fixed-satellite service (GSO FSS) networks and non-geostationary fixed-satellite service (non-GSO FSS) systems in the 10-30 GHz frequency range;
- b) that there is an emerging interest in operating GSO FSS networks and non-GSO FSS systems in the 37.5-50.2 GHz frequency range;
- c) that there is a need to provide for the orderly development and implementation of new satellite technologies in the 37.5-50.2 GHz frequency range;
- d) that systems based on the use of new technologies associated with both GSO FSS networks and non-GSO FSS systems are capable of providing the most isolated regions of the world with high-capacity and low-cost means of communication;
- e) that there should be equitable access to the radio-frequency spectrum and orbital resources in a mutually acceptable manner that allows for new entrants in the provision of services;
- f) that the Radio Regulations should be sufficiently flexible to accommodate the introduction and implementation of innovative technologies as they evolve;
- g) that in the frequency range 37.5-50.2 GHz where there has been little or no deployment of satellite systems to date, administrations concerned with both GSO FSS and non-GSO FSS systems should be expected to exhibit flexibility in achieving the appropriate balance in the sharing environment;
- h) that this Conference, having considered the outcome of the ITU-R studies on this subject, as summarized in the CPM Report to this Conference, has decided that further studies are needed before the conditions for non-GSO FSS systems to share these bands with GSO FSS networks can reliably be determined,

resolves to invite administrations

to seek balanced sharing arrangements between GSO FSS networks and non-GSO FSS systems in the application of Article 22 to such systems in the 37.5-50.2 GHz frequency range, prior to the review by WRC-10 of the results of the studies called for by this Resolution,

invites ITU-R

1 to undertake, as a matter of urgency, further technical, operational and regulatory studies on sharing arrangements which achieve an appropriate balance between GSO FSS networks and non-GSO FSS systems in the frequency range 37.5-50.2 GHz. Such further studies should include, but not necessarily be limited to:

- a) techniques which individually or in combination avoid, or otherwise adequately mitigate, main beam-to-main beam coupling of interference in both directions between non-GSO FSS systems and GSO FSS networks at “in-line” instants. The studies should be based on the key parameters of systems firmly planned to operate in the bands concerned, and should be pursued sufficiently far to establish appropriate long-term and short-term interference criteria and to compute the time statistics of interference from non-GSO systems to GSO networks, and from GSO networks to non-GSO systems, to determine whether those criteria would be met. The computations and comparisons should be made firstly assuming no mitigation, and subsequently with each of the various mitigation techniques or combinations of mitigation techniques envisaged. The mitigation techniques thus investigated should include:
 - satellite diversity or arc avoidance;
 - geographical isolation between earth stations;
 - site diversity;
 - adaptive coding;
 - link balancing;
 - other appropriate techniques, if any;
 - b) the development of technical, operational and regulatory guidance which would enable WRC-10 to decide whether or not to include, in the Radio Regulations, epfd limits on non-GSO FSS systems for the protection of GSO FSS networks, and off-axis e.i.r.p. density limits on earth stations in GSO FSS networks for the protection of non-GSO FSS systems, in the frequency range 37.5-50.2 GHz. Such guidance should include quantitative values for suitable epfd↓, epfd↑ and off-axis e.i.r.p. density limits;
- 2 to report the results of these studies to WRC-10.

RESOLUTION 140 (WRC-03)

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

The World Radiocommunication Conference (Geneva, 2003),

considering

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

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

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

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

e) that ITU-R studies reported to this Conference considered HEO systems to be a sub-category of non-GSO systems and characterized their operational features;

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

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

noting

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

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

c) that the 19.7-20.2 GHz band is one of the few bands identified by this Conference on a global basis for high-density applications in the fixed-satellite service,

resolves to invite ITU-R

to develop, during this ITU-R study period, criteria which would protect GSO FSS networks in the band 19.7-20.2 GHz from unacceptable interference by HEO FSS systems taking account of the combined effect of interference into downlinks of the GSO FSS networks from HEO FSS systems and other non-GSO FSS systems,

invites administrations

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

instructs the Radiocommunication Bureau

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

RESOLUTION 141 (WRC-03)

**Sharing between certain types of non-geostationary-satellite systems
in the fixed-satellite service and stations in the fixed service
in the 17.7-19.7 GHz band**

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that a small number of non-geostationary satellite orbit (non-GSO) systems based on constellations of satellites in highly-inclined orbits have operated successfully in the fixed-satellite service (FSS) for many years, including in the 17.7-19.7 GHz band;
- b)* that since the late 1990s there has been a growing interest in non-GSO systems in a number of bands and for several space services, predominantly in the FSS allocations below 30 GHz;
- c)* that ITU-R studies reported to this Conference considered highly-inclined orbit systems to be a sub-category of non-GSO satellite systems and characterized their operational features;
- d)* that WRC-2000 modified the Article 21 power flux-density (pfd) limits for non-GSO satellite systems in the FSS in the band 17.7-19.3 GHz based on technical sharing studies involving non-GSO satellite systems using low-Earth orbits;
- e)* that ITU-R has commenced studies of the impact on fixed service stations of the pfd produced or to be produced by non-GSO FSS space stations using highly-inclined orbits;
- f)* that the band 17.7-19.7 GHz is heavily used in many countries for the fixed service, in particular for mobile telephone network infrastructure;
- g)* that ITU-R has not determined whether the current pfd limits for non-GSO FSS systems in Article 21 are adequate to protect the fixed service in the 17.7-19.7 GHz band from non-GSO satellite systems using highly-inclined orbits having an apogee altitude greater than 18 000 km and an orbital inclination between 35° and 145°;

invites ITU-R

1 to conduct, as a matter of urgency and in time for WRC-07, the appropriate technical studies to determine whether the current pfd limits for non-GSO FSS systems in Article 21 are adequate to protect the fixed service in the 17.7-19.7 GHz band from non-GSO systems described in *considering g)* without unduly constraining the use of these non-GSO FSS systems;

2 to determine whether there are technical and operational measures in the band 17.7-19.7 GHz that could be implemented in the fixed service to mitigate interference from FSS space stations as described in *considering g*),

resolves

to recommend that WRC-07 consider, taking into account the results of the studies referred to in *invites ITU-R 1*, the appropriate pfd limits for non-GSO space stations in the band 17.7-19.7 GHz described in *considering g*),

instructs the Radiocommunication Bureau

as of the end of WRC-07, to review, based on the values in Article **21** as adopted by WRC-07, and, if appropriate, revise any findings made on the compliance with the limits contained in Article **21** of a non-GSO FSS system, as described in *considering g*), for which complete advance publication information has not been received prior to 5 July 2003.

RESOLUTION 142 (WRC-03)

**Transitional arrangements relating to use of the frequency
band 11.7-12.2 GHz by geostationary-satellite networks
in the fixed-satellite service in Region 2**

The World Radiocommunication Conference (Geneva, 2003),

considering

a) that, in Region 2, the band 11.7-12.1 GHz is allocated on a co-primary basis to terrestrial services (except in the countries listed in No. **5.486**) and to the fixed-satellite service (FSS);

b) that, in Region 2, the band 12.1-12.2 GHz is allocated on a co-primary basis to terrestrial services in Peru (see No. **5.489**) and to the FSS;

c) that, in Regions 1 and 3, the band 11.7-12.2 GHz is allocated on a co-primary basis to terrestrial services and to the broadcasting-satellite service (BSS);

d) that WRC-2000 adopted Resolution **77** to protect terrestrial services in Regions 1, 2 and 3 from geostationary-satellite (GSO) networks in the FSS in Region 2, but did not clarify which procedures should be applied;

e) that the Rule of Procedure concerning No. **5.488** extended the applicability of Resolution **77** to coordination requests received from 1 January 1999 and to coordination requests received prior to 1 January 1999 for which Special Sections under former Article **14** had not been published;

f) that this Conference suppressed Resolution **77** and, through revision of No. **5.488**, replaced it with application of No. **9.14** for FSS in Region 2 to coordinate with stations in terrestrial services in all three Regions,

recognizing

that transitional measures are needed to address implementation of No. **9.14** for GSO FSS in Region 2 in the band 11.7-12.2 GHz,

resolves

1 that, for requests for coordination under Article **9** for GSO networks in the FSS in Region 2 in the band 11.7-12.2 GHz for which complete Appendix **4** information was received after 1 May 2002 by the Bureau, the Bureau shall apply No. **9.14** as adopted at this Conference;

- 2 that, for requests for coordination processed previously under Resolution 77, the Bureau shall apply No. 9.14 as adopted at this Conference which may involve publication of a list of such networks to initiate the No. 9.14 process;
- 3 that, for requests for notification under Article 11 involving networks processed under *resolves* 1 and 2 above, the provisions in Article 11 associated with No. 9.14 shall be applied;
- 4 that the provisions of Nos. 5.488, 9.14 and the part of Table 5-1 of Appendix 5 (Rev.WRC-03) referring to No. 9.14 as amended by this Conference shall be provisionally applied as from 5 July 2003.

RESOLUTION 143 (WRC-03)

Guidelines for the implementation of high-density applications in the fixed-satellite service in frequency bands identified for these applications

The World Radiocommunication Conference (Geneva, 2003),

considering

- a) that demand has been increasing steadily for global broadband communication services throughout the world, such as those provided by high-density applications in the fixed-satellite service (HDFSS);
- b) that HDFSS systems are characterized by flexible, rapid and ubiquitous deployment of large numbers of cost-optimized earth stations employing small antennas and having common technical characteristics;
- c) that HDFSS is an advanced broadband communication application concept that will provide access to a wide range of broadband telecommunication applications supported by fixed telecommunication networks (including the Internet), and thus will complement other telecommunication systems;
- d) that, as with other FSS systems, HDFSS offers great potential to establish telecommunication infrastructure rapidly;
- e) that HDFSS applications can be provided by satellites of any orbital type;
- f) that interference mitigation techniques have been and continue to be studied in ITU-R to facilitate sharing between HDFSS earth stations and terrestrial services;
- g) that to date, studies have not concluded on the practicability of implementation of interference mitigation techniques for all HDFSS earth stations,

noting

- a) that No. **5.516B** identifies bands for HDFSS;
- b) that, in some of these bands, the FSS allocations are co-primary with fixed and mobile service allocations as well as other services;
- c) that this identification does not preclude the use of these bands by other services or by other FSS applications, and does not establish priority in these Radio Regulations among users of the bands;

- d)* that, in the band 18.6-18.8 GHz, the FSS allocation is co-primary with the Earth exploration-satellite service (EESS) (passive) with the restrictions of Nos. **5.522A** and **5.522B**;
- e)* that radio astronomy observations are carried out in the 48.94-49.04 GHz band, and that such observations require protection at notified radio astronomy stations;
- f)* that co-frequency sharing between transmitting HDFSS earth stations and terrestrial services is difficult in the same geographical area;
- g)* that co-frequency sharing between receiving HDFSS earth stations and terrestrial stations in the same geographical area may be facilitated through the implementation of interference mitigation techniques, if practicable;
- h)* that many FSS systems with other types of earth stations and characteristics have already been brought into use or are planned to be brought into use in some of the frequency bands identified for HDFSS in No. **5.516B**;
- i)* that HDFSS stations in these bands are expected to be deployed in large numbers over urban, suburban and rural areas of large geographical extent;
- j)* that the 50.2-50.4 GHz band, adjacent to the band 48.2-50.2 GHz (Earth-to-space) identified for HDFSS in Region 2, is allocated to the EESS (passive),

recognizing

- a)* that in cases where FSS earth stations use bands that are shared on a co-primary basis with terrestrial services, the Radio Regulations stipulate that earth stations of the FSS shall be individually notified to the Bureau when their coordination contours extend into the territory of another administration;
- b)* that, as a consequence of their general characteristics, it is expected that the coordination of HDFSS earth stations with fixed service stations on an individual site-by-site basis between administrations will be a difficult and long process;
- c)* that, to minimize the burden for administrations, simplified coordination procedures and provisions can be agreed by administrations for large numbers of similar HDFSS earth stations associated with a given satellite system;
- d)* that harmonized worldwide bands for HDFSS would facilitate the implementation of HDFSS, thereby helping to maximize global access and economies of scale,

recognizing further

that HDFSS applications implemented on FSS networks and systems are subject to all provisions of the Radio Regulations applicable to the FSS, such as coordination and notification pursuant to Articles 9 and 11, including any requirements to coordinate with terrestrial services across international borders, and the provisions of Articles 21 and 22,

resolves

that administrations which implement HDFSS should consider the following guidelines:

- a) making some or all of the frequency bands identified in No. **5.516B** available for HDFSS applications;
- b) in making frequency bands available under *resolves a)*, take into account:
 - that HDFSS deployment will be simplified in bands that are not shared with terrestrial services;
 - in bands shared with terrestrial services, the impact that the further deployment of terrestrial stations would have on the existing and future development of HDFSS, and the further deployment of HDFSS earth stations would have on the existing and future development of terrestrial services;
- c) take into account the relevant technical characteristics applicable to HDFSS, as identified by ITU-R Recommendations (e.g. Recommendations ITU-R S.524-7 and ITU-R S.1594);
- d) take into account other existing and planned FSS systems, having different characteristics, in frequency bands where HDFSS is implemented in accordance with *resolves a)* above and the conditions specified in No. **5.516B**,

invites administrations

1 to give due consideration to the benefits of harmonized utilization of the spectrum for HDFSS on a global basis, taking into account the use and planned use of these bands by all other services to which these bands are allocated, as well as other types of FSS applications;

2 to consider implementing simplified procedures and provisions that facilitate the deployment of HDFSS systems in some or all of the bands identified in No. **5.516B**;

3 when considering the deployment of HDFSS systems in the upper portion of the band 48.2-50.2 GHz, to take into account as appropriate the potential impact such deployment may have on the satellite passive services in the adjacent band 50.2-50.4 GHz, and to participate in ITU-R studies on the compatibility between these services, taking into account No. **5.340**;

4 to consider, given *invites administrations* 3 above, and where practicable, starting the deployment of HDFSS earth stations in the lower part of the band 48.2-50.2 GHz.

RESOLUTION 144 (WRC-03)

**Special requirements of geographically small or narrow countries
operating earth stations in the fixed-satellite service
in the band 13.75-14 GHz**

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that WARC-92 made an additional allocation to the fixed-satellite service (FSS) (Earth-to-space) in the band 13.75-14 GHz;
- b)* that this band is shared with the radiolocation and radionavigation services;
- c)* that, following a decision by WRC-2000 and the completion of ITU-R studies, this Conference reviewed and revised the sharing conditions for the services in this band and adopted new regulations which govern sharing between the FSS, radiolocation and radionavigation services (see No. **5.502**);
- d)* that these revised sharing conditions additionally permit the operation of geostationary FSS earth stations in the band 13.75-14 GHz with antennas having diameters between 1.2 m and 4.5 m,

recognizing

- a)* that these sharing conditions of No. **5.502** will mean that countries which are geographically small or narrow will have significant difficulties deploying geostationary FSS earth stations in this band with antennas having diameters between 1.2 m and 4.5 m;
- b)* that in order to further facilitate sharing between the FSS and the maritime radiolocation systems operating in the radiolocation service, there may be a need to develop technical and operational methods;
- c)* that these technical and operational methods may be used to allow a greater deployment of FSS earth stations in the band 13.75-14 GHz in conformity with No. **5.502** while protecting the radiolocation service,

resolves

- 1* to invite ITU-R, as a matter of urgency, to conduct studies with a view to developing ITU-R Recommendations, which will establish technical or operational methods which will further facilitate sharing and may allow greater flexibility in the deployment of FSS earth stations in the band 13.75-14 GHz, in conformity with No. **5.502**, and which may also be used as a basis for the establishment of bilateral agreements between administrations;

2 that the administrations of geographically small or narrow countries may exceed the limitations on FSS earth station power flux-density at the low-water mark in No. **5.502** if such operation is in conformance with bilateral agreements with administrations deploying maritime radiolocation systems in the band 13.75-14 GHz,

encourages

administrations deploying maritime and land mobile radiolocation systems in the band 13.75-14 GHz rapidly to reach bilateral agreements relating to the operation of FSS earth stations in this band with administrations of those geographically small and narrow countries deploying these FSS earth stations,

invites

administrations deploying maritime radiolocation systems in the band 13.75 to 14 GHz to participate actively in the ITU-R studies referred to in *resolves* 1.

RESOLUTION 145 (WRC-03)

**Potential use of the bands 27.5-28.35 GHz and 31-31.3 GHz
by high altitude platform stations (HAPS)
in the fixed service**

The World Radiocommunication Conference (Geneva, 2003),

considering

- a) that WRC-97 made provision for the operation of 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 WRC-97 adopted No. **4.15A** specifying 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 at the present Conference, countries in Region 2 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 this Conference to permit the use of HAPS in the fixed service within 300 MHz of spectrum in the band 27.5-28.35 GHz and in the band 31-31.3 GHz in certain Region 3 countries and in one Region 1 country on a non-harmful interference, non-protection basis;
- f) that the bands 27.5-28.35 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 this Conference 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 27.5-28.35 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 27.5-28.35 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 a methodology for evaluating interference from the fixed-service system using HAPS into GSO FSS systems in the band 27.5-28.35 GHz in order to facilitate further studies;
- m) that HAPS technical and regulatory issues should continue to be studied in order to determine appropriate measures for protecting the fixed service and other co-primary services in the band 27.5-28.35 GHz;
- n) that pending the completion of studies, administrations in Region 2 may wish to consider deployment of HAPS systems in the fixed service within 300 MHz of spectrum at 27.5-28.35 GHz and in 300 MHz of spectrum at 31-31.3 GHz and to have some provisional means by which to authorize such use of HAPS in their territories,

noting

that systems using HAPS may operate in the bands 27.5-28.35 GHz and 31-31.3 GHz under No. 4.4,

resolves

1 to invite WRC-07 to review the results of the studies specified below and consider appropriate refinement of the regulatory provisions for the use of HAPS within the bands 27.5-28.35 GHz and 31-31.3 GHz;

2 that, notwithstanding No. 4.15A, in Region 2 the use of HAPS within the fixed-service allocations within the 27.5-28.35 GHz and 31-31.3 GHz bands shall be limited, pending the completion of the studies specified in *invites ITU-R 1* below, to 300 MHz in each band, that such use 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;

3 that, pursuant to *resolves* 2 above, any use by HAPS of the fixed-service allocation at 27.5-28.35 GHz 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;

4 that, on a provisional basis, the administrations listed in Nos. **5.537A** and **5.543A** and those administrations in Region 2 which intend to implement systems using HAPS in the fixed service in the bands 27.5-28.35 GHz and 31-31.3 GHz shall seek explicit agreement of concerned administrations with regard to their primary services to ensure that the conditions in Nos. **5.537A**, **5.543A**, *resolves* 2 and *resolves* 5 are met;

5 that systems using HAPS in the band 31-31.3 GHz, in accordance with *resolves* 2 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 Recommendation ITU-R RA.769. 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 take account of rain attenuation, provided that effective impact on the passive satellite does not exceed the impact under clear-sky conditions as given above,

invites ITU-R

1 to continue to conduct studies, as a matter of urgency, and taking into account the requirements of other fixed-service systems and other services, on the feasibility of identifying a suitable and preferably a common 300 MHz segment of the band 27.5-28.35 GHz paired with the 300 MHz band at 31-31.3 GHz, for use by HAPS in the countries listed in Nos. **5.537A** and **5.543A** or countries in Region 2 planning provisional operation;

2 to develop, one or more ITU-R Recommendations, technical sharing criteria or HAPS system design conditions that are necessary to ensure that HAPS applications in the fixed service operate successfully on a non-harmful interference, non-protected basis in the bands 27.5-28.35 GHz and 31-31.3 GHz;

3 to complete studies on the interference criteria and methodology for evaluating interference from the downlink (HAPS-to-ground direction) of systems using HAPS to the uplink of the GSO satellite networks in the FSS within the band 27.5-28.35 GHz, taking into account Recommendation ITU-R SF.1601 for the situations referred to in *considering l*);

4 to study the regulatory provisions that might be needed in order to address those cases where the deployment of HAPS in the fixed service in the bands 27.5-28.35 GHz and 31-31.3 GHz in the territory of one administration may affect other administrations;

5 to continue to carry out studies on the appropriate interference mitigation techniques for the situations referred to in *considering j*),

invites administrations

to advise the Radiocommunication Bureau of their intention to implement HAPS systems within the band 27.5-28.35 GHz and in the band 31-31.3 GHz, whether in countries listed in Nos. **5.537A** and **5.543A** or in accordance with *resolves* 2, and to specify the frequency bands (up to 300 MHz each within the 27.5-28.35 GHz and 31-31.3 GHz bands) they intend to use for such systems,

instructs the Director of the Radiocommunication Bureau

to publish in the International Frequency Information Circular (BR IFIC) a list of administrations who have so advised, and to publish the information on HAPS implementation received from administrations which intend to implement systems using HAPS in the fixed service in the bands 27.5-28.35 GHz and 31-31.3 GHz.

RESOLUTION 146 (WRC-03)

**Transitional arrangements for the application of
modified provisions of Appendix 30B**

The World Radiocommunication Conference (Geneva, 2003),

considering

- a) that the 1988 World Administrative Radio Conference (WARC Orb-88) established the fixed-satellite service (FSS) Plan contained in Appendix **30B**;
- b) that some of the technical parameters used in characterizing the Plan referred to in *considering a)* were adopted by WARC Orb-88 and could be improved to reflect evolution of technologies, as called for in Resolution 86 (Rev. Marrakesh, 2002) of the Plenipotentiary Conference;
- c) that only a limited number of satellite networks have been implemented under Appendix **30B**;
- d) that ITU-R studied the possibility of using improved antenna patterns and lower C/I criteria in Appendix **30B** and concluded that using relaxed parameters would greatly simplify the coordination of new satellite networks submitted under this Appendix,

noting

- a) that the Council, in Resolution 1182 adopted at its 2001 session, established the Satellite Backlog Action Group (SAT-BAG), to prepare and oversee a coordinated approach for treating the complex and related factors contributing to the backlog in the processing of satellite network filings by the Bureau;
- b) that SAT-BAG made several recommendations for the attention of this Conference, suggesting that, wherever there is an opportunity, immediate action that would assist in resolving the backlog be taken,

noting further

that this Conference has adopted several modifications to Appendix **30B**,

resolves

- 1 that, as from 5 July 2003, § 6.34 and 6.50 of Appendix **30B** as revised by this Conference, shall apply, regardless of the date of receipt of the submission of the information under Article 6 of Appendix **30B**;

2 that, as from 5 July 2003, § 6.43*bis* and 6.56*bis* of Appendix **30B** as adopted by this Conference, shall apply, regardless of the date of receipt of the submission of the information under Article 6 of Appendix **30B**;

3 that, as from 5 July 2003, the Bureau shall, in its examination in application of Appendix **30B**, use the parameters given in Section 1.6 of Annex 1 of Appendix **30B**, as revised by this Conference;

4 that the Bureau shall, in its examination of submissions received as from 5 July 2003 in application of Appendix **30B**, use the following parameters:

- a single entry *C/I* ratio value of 27 dB;
- an aggregate *C/I* ratio value of 23 dB;

5 that, once the parameters referred to in *resolves* 3 have been implemented, the Bureau shall compute the reference situations of the FSS Plan and publish this information in a circular letter;

6 that once the parameters referred to in *resolves* 4 have been implemented, the Bureau shall compute the reference situations of the FSS Plan and publish this information in a circular letter;

7 that, as from 5 July 2003, § 6.1, 6.29, 6.38 and 6.57 of Appendix **30B** as revised by this Conference, shall apply, regardless of the date of receipt of the submission of the information under Article 6 of Appendix **30B**;

8 that, as from 5 July 2003, the Bureau shall send a letter to all the notifying administrations with assignments in the List and for which it has not received confirmation of the date of bringing into use, requesting them to confirm that these assignments have been brought into use in accordance with § 6.1, 6.29, 6.38 and 6.57 of Appendix **30B**, as appropriate. Any assignment for which the Bureau has not received such confirmation, as well as the corresponding notification information, by 1 January 2004 shall then be cancelled as stipulated in § 6.1, 6.29, 6.38 and 6.57 of Appendix **30B**, as appropriate;

9 that, as from 5 July 2003, Article 8 of Appendix **30B**, except § 8.2 thereof, as revised by this Conference, shall apply, regardless of the date of receipt of the submission of the information under Article 6 of Appendix **30B**;

10 that as from 1 January 2004, § 8.2 of Appendix **30B** shall apply,

invites ITU-R

to review, as a matter of urgency, the regulatory procedures and associated technical criteria of Appendix **30B** and to report the results to WRC-07.

RESOLUTION 207 (Rev.WRC-03)

Measures to address unauthorized use of and interference to frequencies in the bands allocated to the maritime mobile service and to the aeronautical mobile (R) service

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that the HF frequencies currently used by the aeronautical and maritime mobile services for distress, safety and other communications, including allotted operational frequencies, suffer from harmful interference and are often subject to difficult propagation conditions;
- b)* that WRC-97 considered some aspects of the use of the HF bands for distress and safety communications in the context of the Global Maritime Distress and Safety System (GMDSS), especially with regard to regulatory measures;
- c)* that unauthorized operations using maritime and aeronautical frequencies in the HF bands are continuing to increase and are already a serious risk to HF distress, safety and other communications;
- d)* that some administrations have resorted to, for example, transmitting warning messages on operational HF channels as a means of deterring unauthorized users;
- e)* that provisions of the Radio Regulations prohibit the unauthorized use of certain safety frequencies for communications other than those related to safety;
- f)* that enforcing compliance with these regulatory provisions is becoming increasingly difficult with the availability of low-cost HF single side-band (SSB) transceivers;
- g)* that monitoring observations of the use of frequencies in the band 2 170-2 194 kHz and in the bands allocated exclusively to the maritime mobile service between 4 063 kHz and 27 500 kHz and to the aeronautical mobile (R) service between 2 850 kHz and 22 000 kHz show that a number of frequencies in these bands are still being used by stations of other services, many of which are operating in contravention of No. 23.2;
- h)* that, in certain situations, HF radio is the sole means of communication for the maritime mobile service and that certain frequencies in the bands mentioned in *considering g)* are reserved for distress and safety purposes;

i) that, in certain situations, HF radio is the sole means of communication for the aeronautical mobile (R) service and that this is a safety service;

j) that WRC-2000 and this Conference have reviewed the use of the HF bands by the aeronautical mobile (R) and maritime mobile services with a view to protecting operational, distress and safety communications;

k) that this Resolution identifies several interference mitigation techniques that can be employed by administrations on a non-mandatory basis,

considering in particular

a) that it is of paramount importance that the distress and safety channels of the maritime mobile service be kept free from harmful interference, since they are essential for the protection of the safety of life and property;

b) that it is also of paramount importance that channels directly concerned with the safe and regular conduct of aircraft operations be kept free from harmful interference, since they are essential for the safety of life and property,

resolves to invite ITU-R and ITU-D, as appropriate

to increase regional awareness of appropriate practices in order to help mitigate interference in the HF bands, especially on distress and safety channels,

invites administrations

1 to ensure that stations of services other than the maritime mobile service abstain from using frequencies in distress and safety channels and their guardbands and in the bands allocated exclusively to that service, except under the conditions expressly specified in Nos. **4.4**, **5.128**, **5.129**, **5.137** and **4.13** to **4.15**; and to ensure that stations of services other than the aeronautical mobile (R) service abstain from using frequencies allocated to that service except under the conditions expressly specified in Nos. **4.4** and **4.13**;

2 to make every effort to identify and locate the source of any unauthorized emission capable of endangering human life or property and the safe and regular conduct of aircraft operations, and to communicate their findings to the Radiocommunication Bureau;

3 to participate, in accordance with item 4 in the Annex, in any monitoring programmes organized by the Bureau or administrations, if so agreed among those administrations, without adversely affecting the rights of other administrations or conflicting with any provisions of the Radio Regulations;

4 to make every effort to prevent unauthorized transmissions in bands allocated to the maritime mobile service and the aeronautical mobile (R) service;

5 to request their competent authorities to take, within their respective jurisdiction, such legislative or regulatory measures which they consider necessary or appropriate in order to prevent stations from unauthorized use of distress and safety channels or from operating in contravention of No. 23.2;

6 to take all necessary steps in such cases of contravention of No. 23.2 to ensure the cessation of any transmissions contravening the provisions of the Radio Regulations on the frequencies or in the bands referred to in this Resolution;

7 to employ as many of the interference mitigation techniques referred to in the Annex as are appropriate for the maritime mobile and aeronautical mobile (R) services,

instructs the Radiocommunication Bureau

1 to seek the cooperation of administrations in identifying the sources of those emissions by all available means and in securing the cessation of those emissions;

2 when the station of another service transmitting in a band allocated to the maritime mobile service or to the aeronautical mobile (R) service has been identified, to inform the administration concerned;

3 to include the problem of interference to maritime and aeronautical distress and safety channels on the agenda of relevant regional radiocommunication seminars,

instructs the Secretary-General

to bring this Resolution to the attention of the International Maritime Organization and the International Civil Aviation Organization for such actions as they may consider appropriate.

ANNEX TO RESOLUTION 207 (Rev.WRC-03)

Interference mitigation techniques

This Annex lists several possible HF interference mitigation techniques that may be used, either in combination or singly, depending on the resources of administrations. Use of any or all of these techniques is not mandatory.

1 Alternative modulation methods

The use of digitally modulated emissions, such as QPSK, to replace or supplement analogue SSB voice (J3E) and data (J2B) emissions. This initiative would need to be adopted internationally to allow the interoperability of equipment. For example, ICAO has adopted an HF data-link standard to provide packet data communications using automated link establishment and adaptive frequency control techniques as a supplement to analogue SSB voice communications (see ICAO Convention, Annex 10).

2 Passive and active/adaptive antenna systems

Use of passive and active/adaptive antenna systems to reject unwanted signals.

3 Channel barring

Administrations should ensure through their licensing, equipment standardization and inspection arrangements that, in compliance with No. **43.1**, HF radio equipment cannot transmit on frequencies exclusively allocated to the aeronautical mobile (R) service, as detailed in Appendix **27**, except for frequencies allocated for worldwide use and shared with the aeronautical mobile (OR) service (see Appendix **26/3.4**).

4 Regional HF monitoring and direction-finding facilities

Collaboration and cooperation between regional administrations to coordinate the use of monitoring and direction-finding facilities.

5 Transmission of warning messages

Transmission of multilanguage warning messages on specific channels affected by strong or persistent interference. Such transmissions should be conducted after coordination with the users of the affected services and the administration(s) or competent authorities concerned.

6 Education and publicity initiatives

Administrations should provide education and publicity initiatives on the proper use of the radio-frequency spectrum in these bands.

RESOLUTION 221 (Rev.WRC-03)

Use of high altitude platform stations providing IMT-2000 in the bands 1 885-1 980 MHz, 2 010-2 025 MHz and 2 110-2 170 MHz in Regions 1 and 3 and 1 885-1 980 MHz and 2 110-2 160 MHz in Region 2

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that the bands 1 885-2 025 MHz and 2 110-2 200 MHz are identified in No. **5.388** as intended for use on a worldwide basis for IMT-2000, including the bands 1 980-2 010 MHz and 2 170-2 200 MHz for the terrestrial and satellite components of IMT-2000;
- b)* that a high altitude platform station (HAPS) is defined in No. **1.66A** as “a station located on an object at an altitude of 20 to 50 km and at a specified, nominal, fixed point relative to the Earth”;
- c)* that HAPS may offer a new means of providing IMT-2000 services with minimal network infrastructure as they are capable of providing service to a large footprint together with a dense coverage;
- d)* that the use of HAPS as base stations within the terrestrial component of IMT-2000 is optional for administrations, and that such use should not have any priority over other terrestrial IMT-2000 use;
- e)* that, in accordance with No. **5.388** and Resolution **212 (Rev.WRC-97)**, administrations may use the bands identified for IMT-2000, including the bands referred to in this Resolution, for stations of other primary services to which they are allocated;
- f)* that these bands are allocated to the fixed and mobile services on a co-primary basis;
- g)* that, in accordance with No. **5.388A**, HAPS may be used as base stations within the terrestrial component of IMT-2000 in the bands 1 885-1 980 MHz, 2 010-2 025 MHz and 2 110-2 170 MHz in Regions 1 and 3 and 1 885-1 980 MHz and 2 110-2 160 MHz in Region 2. Their use by IMT-2000 applications using HAPS as base stations does not preclude the use of these bands by any station in the services to which they are allocated and does not establish priority in the Radio Regulations;
- h)* that ITU-R has studied sharing and coordination between HAPS and other stations within IMT-2000, has considered compatibility of HAPS within IMT-2000 with some services having allocations in the adjacent bands, and has approved Recommendation ITU-R M.1456;

i) that radio interfaces of IMT-2000 HAPS are compliant with Recommendation ITU-R M.1457;

j) that ITU-R has addressed sharing between systems using HAPS and some existing systems, particularly PCS (personal communications system), MMDS (multichannel multipoint distribution system) and systems in the fixed service, which are currently operating in some countries in the bands 1 885-2 025 MHz and 2 110-2 200 MHz;

k) that HAPS stations are intended to transmit in the band 2 110-2 170 MHz in Regions 1 and 3 and in the band 2 110-2 160 MHz in Region 2;

l) that administrations planning to implement a HAPS as an IMT-2000 base station may need to exchange information, on a bilateral basis, with other concerned administrations, including data items describing the HAPS characteristics in a more detailed manner than the data items currently included in Annexes 1A and 1B of Appendix 4, as indicated in the Annex to this Resolution,

resolves

1 that:

1.1 for the purpose of protecting IMT-2000 mobile stations in neighbouring countries from co-channel interference, a HAPS operating as an IMT-2000 base station shall not exceed a co-channel power flux-density (pfd) of $-117 \text{ dB (W/(m}^2 \cdot \text{MHz))}$ 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;

1.2 a HAPS operating as an IMT-2000 base station shall not transmit outside the frequency bands 2 110-2 170 MHz in Regions 1 and 3 and 2 110-2 160 MHz in Region 2;

1.3 in Region 2, for the purpose of protecting MMDS stations in some neighbouring countries in the band 2 150-2 160 MHz from co-channel interference, a HAPS operating as an IMT-2000 base station shall not exceed the following co-channel power flux-density (pfd) 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 the HAPS;

- $-127 \text{ dB(W/(m}^2 \cdot \text{MHz))}$ for angles of arrival (θ) less than 7° above the horizontal plane;
- $-127 + 0.666 (\theta - 7) \text{ dB(W/(m}^2 \cdot \text{MHz))}$ for angles of arrival between 7° and 22° above the horizontal plane; and
- $-117 \text{ dB(W/(m}^2 \cdot \text{MHz))}$ for angles of arrival between 22° and 90° above the horizontal plane;

1.4 in some countries (see No. **5.388B**), for the purpose of protecting fixed and mobile services, including IMT-2000 mobile stations, in their territories from co-channel interference caused by a HAPS operating as an IMT-2000 base station in accordance with No. **5.388A** in neighbouring countries, the limits of **5.388B** shall apply;

2 that the limits referred to in this Resolution shall apply to all HAPS operating in accordance with No. **5.388A**;

3 that administrations wishing to implement HAPS within a terrestrial IMT-2000 system shall comply with the following:

3.1 for the purpose of protecting IMT-2000 stations operating in neighbouring countries from co-channel interference, a HAPS operating as a base station within IMT-2000 shall use antennas that comply with the following antenna pattern:

$$G(\psi) = G_m - 3(\psi/\psi_b)^2 \quad \text{dBi} \quad \text{for } 0^\circ \leq \psi \leq \psi_1$$

$$G(\psi) = G_m + L_N \quad \text{dBi} \quad \text{for } \psi_1 < \psi \leq \psi_2$$

$$G(\psi) = X - 60 \log(\psi) \quad \text{dBi} \quad \text{for } \psi_2 < \psi \leq \psi_3$$

$$G(\psi) = L_F \quad \text{dBi} \quad \text{for } \psi_3 < \psi \leq 90^\circ$$

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 in (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

$$\psi_1 = \psi_b \sqrt{-L_N/3} \quad \text{degrees}$$

$$\psi_2 = 3.745 \psi_b \quad \text{degrees}$$

$$X = G_m + L_N + 60 \log(\psi_2) \quad \text{dBi}$$

$$\psi_3 = 10^{(X-L_F)/60} \quad \text{degrees}$$

The 3 dB beamwidth ($2\psi_b$) is estimated by:

$$(\psi_b)^2 = 7.442 / (10^{0.1 G_m}) \quad \text{degrees}^2;$$

3.2 for the purpose of protecting mobile earth stations within the satellite component of IMT-2000 from interference, a HAPS operating as an IMT-2000 base station, shall not exceed an out-of-band pfd of -165 dB(W/(m² · 4 kHz)) at the Earth's surface in the bands 2 160-2 200 MHz in Region 2 and 2 170-2 200 MHz in Regions 1 and 3;

3.3 a HAPS operating as an IMT-2000 base station, in order to protect fixed stations from interference, shall not exceed the following limits of out-of-band power flux-density (pfd) at the Earth's surface in the bands 2 025-2 110 MHz:

- $-165 \text{ dB(W/(m}^2 \cdot \text{MHz))}$ for angles of arrival (θ) less than 5° above the horizontal plane;
- $-165 + 1.75 (\theta - 5) \text{ dB(W/(m}^2 \cdot \text{MHz))}$ for angles of arrival between 5° and 25° above the horizontal plane; and
- $-130 \text{ dB(W/(m}^2 \cdot \text{MHz))}$ for angles of arrival between 25° and 90° above the horizontal plane;

4 that, for facilitating consultations between administrations, administrations planning to implement a HAPS as an IMT-2000 base station shall furnish to the concerned administrations the additional data elements listed in the Annex to this Resolution, if so requested;

5 that administrations planning to implement a HAPS as an IMT-2000 base station shall notify the radio-frequency spectrum assignment(s) by submitting all mandatory elements of Appendix 4 and the additional characteristics listed in Annex to this Resolution to the Radio-communication Bureau for the examination of compliance with *resolves* 1.1, 1.3 and 1.4 above;

6 that, as of 5 July 2003, the Bureau and administrations shall apply provisionally the provisions of Nos. **5.388A** and **5.388B** as revised by this Conference for the frequency assignments to HAPS referred to in this Resolution, including those received before this date but not yet processed by the Bureau,

invites ITU-R

to develop, as a matter of urgency, an ITU-R Recommendation providing technical guidance to facilitate consultations with neighbouring administrations.

ANNEX TO RESOLUTION 221 (Rev.WRC-03)

Characteristics of a HAPS operating as an IMT-2000 base station in the frequency bands in accordance with Resolution 221 (Rev.WRC-03)

A General characteristics to be provided for the station

A.1 Identity of the station

- a) Identity of the station
- b) Country

A.2 Date of bringing into use

The date (actual or foreseen, as appropriate) of bringing the frequency assignment (new or modified) into use.

A.3 Administration or operating agency

Symbols for the administration or operating agency and for the address of the administration to which communication should be sent on urgent matters regarding interference, quality of emissions and questions referring to the technical operation of the station (see Article 15).

A.4 Position information of the HAPS

- a)* The nominal geographical longitude for the HAPS
- b)* The nominal geographical latitude for the HAPS
- c)* The nominal altitude for the HAPS
- d)* The planned longitudinal and latitudinal tolerance for the HAPS
- e)* The planned tolerance of altitude for the HAPS

A.5 Agreements

If appropriate, the country symbol of any administration or administration representing a group of administrations with which agreement has been reached, including where the agreement is to exceed the limits prescribed in Resolution 221 (Rev.WRC-03).

B Characteristics to be provided for each antenna beam**B.1 HAPS antenna characteristics**

- a)* The maximum isotropic gain (dBi).
- b)* HAPS antenna gain contours plotted on a map of the Earth's surface.

C Characteristics to be provided for each frequency assignment for HAPS antenna beam**C.1 Frequency range****C.2 Power density characteristics of the transmission**

The maximum value of the maximum power density (dB(W/MHz)), averaged over the worst 1 MHz supplied to the input of the antenna.

D Calculated pfd limit produced over any country in visibility of HAPS

The maximum power flux-density (pfd) calculated at the Earth's surface within each administration's territory over which the HAPS may be visible and over which these calculated pfd levels exceed the limits indicated in *resolves* 1.1, 1.3 and 1.4 of Resolution 221 (Rev.WRC-03).

E Table of characteristics to be submitted for a HAPS operating as an IMT-2000 base station in the frequency bands in accordance with Resolution 221 (Rev.WRC-03)

Item	Notification for HAPS station
A.1.a	X
A.1.b	X
A.2	X
A.3	O
A.4.a	X
A.4.b	X
A.4.c	X
A.4.d	X
A.4.e	X
A.5	+
B.1.a	X
B.1.b	X
C.1	X
C.2	X
D	X

X: Mandatory O: Optional +: Required in special cases

RESOLUTION 225 (Rev.WRC-03)

Use of additional frequency bands for the satellite component of IMT-2000

The World Radiocommunication Conference (Geneva, 2003),

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-2000 (IMT-2000) through No. **5.388** and Resolution **212 (Rev.WRC-97)**;

b) Resolutions **212 (Rev.WRC-97)**, **223 (WRC-2000)** and **224 (WRC-2000)** on the implementation of the terrestrial and satellite components of IMT-2000;

c) that the bands 1 525-1 544 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, 2 483.5-2 500 MHz, 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;

cbis) that at this Conference, the bands 1 518-1 525 MHz and 1 668-1 675 MHz were allocated to the mobile-satellite service on a co-primary basis with other services, under the conditions specified in the Radio Regulations;

d) 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 and radiodetermination-satellite service are in operation or planned, in accordance with the Table of Frequency Allocations, in the bands 1 525-1 559/1 626.5-1 660.5 MHz and 1 610-1 626.5/2 483.5-2 500 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-2000 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-2000 and the terrestrial component of IMT-2000, 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-2000,

resolves

1 that, in addition to the frequency bands indicated in *considering a)* and *resolves 2*, the frequency bands 1 525-1 544 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 and 2 483.5-2 500 MHz may be used by administrations wishing to implement the satellite component of IMT-2000, 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-2000 in No. **5.384A** and allocated to the mobile-satellite service may be used by administrations wishing to implement the satellite component of IMT-2000; however, depending on market developments, it may be possible in the longer term for bands 2 500-2 520 MHz and 2 670-2 690 MHz to be used by the terrestrial component of IMT-2000;

3 that this identification of frequency bands for the satellite component of IMT-2000 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,

4 that a future competent conference may consider adding the bands 1 518-1 525 MHz and 1 668-1 675 MHz to the frequency bands indicated in *resolves 1*, taking into account the impact on other services in these frequency bands,

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-2000 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,

instructs the Director of the Radiocommunication Bureau

to facilitate to the greatest extent possible the completion of these studies.

RESOLUTION 228 (Rev.WRC-03)

Studies on frequency-related matters for the future development of IMT-2000 and systems beyond IMT-2000 as defined by ITU-R

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that International Mobile Telecommunications-2000 (IMT-2000) systems started operation in some countries from the year 2000;
- b)* that Question ITU-R 229/8 addresses the future development of IMT-2000 and systems beyond IMT-2000;
- c)* that Question ITU-R 77-4/8 addresses the needs of developing countries in the development and implementation of mobile radiocommunication technology;
- d)* that Question ITU-D 18/2 addresses the strategy for migration of mobile networks to IMT-2000 and systems beyond IMT-2000;
- e)* that the technical characteristics of IMT-2000 are specified in ITU-R and ITU-T Recommendations, including Recommendation ITU-R M.1457 which contains the detailed specifications of the radio interfaces of IMT-2000;
- f)* that the future development of IMT-2000 and systems beyond IMT-2000 is being studied by ITU-R in accordance with Recommendation ITU-R M.1645;
- g)* that the technical characteristics of the future development of IMT-2000 and systems beyond IMT-2000 remain under study within ITU-R;
- h)* that an orderly process of change and development of IMT-2000 towards the capabilities and functionalities of systems beyond IMT-2000 is needed;
- i)* that adequate spectrum availability is a prerequisite for the success of the future development of IMT-2000 and systems beyond IMT-2000;
- j)* that it was eight years before the initial deployment of IMT-2000 that WARC-92 identified the frequency bands for IMT-2000 in No. **5.388** and in Resolution **212**;
- k)* that the review of IMT-2000 spectrum requirements at WRC-2000 concentrated on bands below 3 GHz;
- l)* that many countries have not yet made available spectrum already identified in the Radio Regulations for IMT-2000, due to various reasons, including the use of this spectrum by existing services;

m) that sharing and compatibility should be addressed between existing services and the future development of IMT-2000 and systems beyond IMT-2000;

n) that some of these existing services may have increasing spectrum demand in order to meet increasing user needs;

o) that information technologies and telecommunication usage evolve rapidly;

p) that continuing and accelerating growth is forecast in the demand for multimedia applications (such as high-speed data, IP-packet and video) by mobile communication systems, and is expected to be accommodated by IMT-2000, the future development of IMT-2000 and systems beyond IMT-2000, and other systems;

q) that the future development of IMT-2000 and systems beyond IMT-2000 is foreseen to address the need for higher data rates than those of currently deployed IMT-2000 systems;

r) that, for global operation and economy of scale, which are key requirements for the success of mobile communication systems, it is desirable to agree on a harmonized time-frame for common technical, operational and spectrum-related parameters of systems, taking account of relevant IMT-2000 and other experience;

s) that it is therefore timely to study demand, technical, spectrum and regulatory issues pertinent to the future development of IMT-2000 and systems beyond IMT-2000,

noting

a) that the IMT-2000 radio interfaces as defined in Recommendation ITU-R M.1457 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;

b) that ITU-R has envisaged that new elements of systems beyond IMT-2000 will be developed, which will closely interwork and be interoperable with currently operating IMT-2000 and its future enhancements;

c) that interoperability between different radio interfaces is desirable for the future development of IMT-2000 and systems beyond IMT-2000;

d) that ITU-R has already begun considering appropriate naming for the future development of IMT-2000 and systems beyond IMT-2000, for a decision in advance of WRC-07,

recognizing

- a) the time necessary to develop and agree on the technical, operational, spectrum and regulatory issues associated with the continuing enhancement of mobile services;
- b) that service functionalities in fixed, mobile and broadcasting networks are increasingly converging and interworking;
- c) that, in the future, mobile systems are expected to adopt more spectrum-efficient techniques;
- d) that a disparity exists between the telecommunication infrastructure available in developing and developed countries;
- e) the need, in many developing countries and countries with large areas of low-population density, for the cost-effective implementation of IMT-2000, the future development of IMT-2000 and systems beyond IMT-2000, and that the propagation characteristics of frequency bands below those identified in No. **5.317A** result in larger cells;
- f) that administrations have deployed or are planning to deploy IMT-2000 systems in the frequency bands identified in Nos. **5.317A**, **5.384A** and **5.388**, and some in frequency bands other than those identified for IMT-2000 which are allocated to the mobile service on a primary basis;
- g) that spectrum already identified for IMT-2000 should be included in spectrum estimates, and may also be used for the future development of IMT-2000 and systems beyond IMT-2000;
- h) that proximity to bands already identified for IMT-2000 may lead to reduced complexity of equipment;
- i) that some bands may not be appropriate for identification on a global basis for the future development of IMT-2000 and systems beyond IMT-2000 because of the extent of use of these bands by existing services;
- j) that frequencies below those identified for IMT-2000 in No. **5.317A** are extensively used by terrestrial services with applications other than IMT-2000 and systems beyond IMT-2000,

resolves

- 1 to invite ITU-R to further study technical and operational issues relating to the future development of IMT-2000 and systems beyond IMT-2000, and develop Recommendations as required;

2 to invite ITU-R to report, in time for WRC-07, on the results of studies on the spectrum requirements and potential frequency ranges suitable for the future development of IMT-2000 and systems beyond IMT-2000, taking into account:

- the evolving user needs, including the growth in demand for IMT-2000 services;
- the evolution of IMT-2000 and pre-IMT-2000 systems through advances in technology;
- the bands currently identified for IMT-2000;
- the time-frame in which spectrum would be needed;
- the period for migration from existing to future systems;
- the extensive use of frequencies below those identified for IMT-2000 in No. **5.317A**;

3 to invite ITU-R to conduct regulatory and technical studies on the usage of frequencies below those identified for IMT-2000 in No. **5.317A** for the future development of IMT-2000 and systems beyond IMT-2000, notably assessing their advantages and disadvantages, taking into account *recognizing e) and j) above*;

4 that the studies referred to in *resolves* 1 and 2 should take into consideration the particular needs of developing countries including use of the satellite component of IMT-2000 for suitable coverage of these countries;

5 that the studies referred to in *resolves* 1, 2 and 3 should include sharing and compatibility studies with services already having allocations in potential spectrum for the future development of IMT-2000 and systems beyond IMT-2000 taking into account the needs of other services;

6 that WRC-07 should consider frequency-related matters for the future development of IMT-2000 and systems beyond IMT-2000, taking due account of the results of ITU-R studies, in accordance with this Resolution,

invites the Director of the Telecommunication Development Bureau

to draw the attention of the Telecommunication Development Sector to this Resolution,

invites administrations

to participate in the studies by submitting contributions to ITU-R.

RESOLUTION 229 (WRC-03)

**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, 2003),

considering

- a)* that this Conference has 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 this Conference has 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 this Conference has 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 space research service (active) on a primary basis;
- g)* that the band 5 250-5 725 MHz is allocated on a primary basis to the radio-determination 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

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,

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 SA.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 SA.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 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;

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).

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 SA.1632;

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 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,

³ Administrations with existing regulations prior to this Conference may exercise some flexibility in determining transmitter power limits.

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 EESS 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.

RESOLUTION 230 (WRC-03)

**Consideration of mobile allocations for
wideband aeronautical telemetry
and associated telecommand**

The World Radiocommunication Conference (Geneva, 2003),

considering

- a) that there is a need to provide global spectrum to the mobile service for wideband aeronautical telemetry systems;
- b) that there is an identified need for additional spectrum required to meet future wideband aeronautical telemetry demands;
- c) that there is also a need to accommodate telecommand operations associated with aeronautical telemetry;
- d) that there is a need to protect existing services,

noting

- a) that a number of bands between 3 GHz and 30 GHz are already allocated to the mobile service, without excluding the aeronautical mobile service, on a secondary basis;
- b) that any spectrum allocated to the mobile service above 3 GHz (to include aeronautical telemetry) is not a substitution for existing allocations used for aeronautical telemetry purposes below 3 GHz, the requirement for which will continue,

recognizing

- a) that there are emerging telemetry systems with large data transfer requirements to support testing of commercial aircraft and other airframes;
- b) that the future technologies and performance expectations for airborne platforms contemplate a need for real-time monitoring of large data systems with multiple video streams (including high-definition video), high-definition sensors, and integrated high-speed avionics;
- c) that the 2000 Radiocommunication Assembly approved Question ITU-R 231/8, titled: "Operation of wideband aeronautical telemetry in bands above 3 GHz", with the target date of 2005;
- d) that those studies will provide a basis for considering regulatory changes, including additional allocations and recommendations, designed to accommodate justified spectrum requirements of aeronautical mobile telemetry consistent with the protection of incumbent services,

resolves

that WRC-07 be invited to:

- 1 consider the spectrum required to satisfy justified wideband aeronautical mobile telemetry requirements and associated telecommand above 3 GHz;
- 2 review, with a view to upgrading to primary, secondary allocations to the mobile service in the frequency range 3-16 GHz for the implementation of wideband aeronautical telemetry and associated telecommand;
- 3 consider possible additional allocations to the mobile service, including aeronautical mobile, on a primary basis in the frequency range 3-16 GHz for the implementation of wideband aeronautical telemetry and associated telecommand, taking into account *considering d)* above;
- 4 designate existing mobile allocations between 16 and 30 GHz for wideband aeronautical telemetry and associated telecommand,

invites ITU-R

to conduct, as a matter of urgency, studies to facilitate sharing between aeronautical mobile telemetry and the associated telecommand, on the one hand, and existing services, on the other hand, taking into account the *resolves* above.

RESOLUTION 331 (Rev.WRC-03)

Transition to the Global Maritime Distress and Safety System (GMDSS)

The World Radiocommunication Conference (Geneva, 2003),

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 some administrations and vessels, not subject to SOLAS, 1974, as amended, may wish to continue to use provisions of Appendix 13 for distress and safety communications for a few years after this Conference;

d) that it would be costly for administrations to maintain in parallel for an excessive period of time shore-based facilities necessary to support both the old and new distress and safety systems;

e) that there may be a need to maintain existing shore-based distress and safety services described in Appendix 13 for some years after this Conference so that vessels not subject to SOLAS, 1974, as amended and not yet using the techniques and frequencies of the GMDSS will be able to obtain assistance from these services until such time as they are able to participate in the GMDSS;

f) that the International Maritime Organization (IMO) has decided that on board SOLAS ships:

- listening watch on 2 182 kHz is no longer mandatory after 1 February 1999;
- listening watch on VHF channel 16 shall continue with a view to maintaining communication between SOLAS ships and vessels not fitted for the GMDSS;
- the required watch on VHF channel 16 will be reviewed prior to 2005;

- g) 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 no later than 1 February 2005;
- h) that listening watch by coast stations on 2 182 kHz is no longer mandatory;
- i) that the Radio Regulations require GMDSS ships to keep watch on the appropriate DSC distress frequencies;
- j) that separate provisions in the existing Radio Regulations designate VHF channel 16 and the frequency 2 182 kHz as the international channels for general calling by radiotelephony;
- k) that the Radio Regulations establish that ship stations should, when practicable, keep watch on VHF channel 13;
- l) that several administrations have established Vessel Traffic Service (VTS) systems and require their vessels to keep watch on local VTS channels;
- m) 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;
- n) that similarly, 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;
- o) that for the reasons in *noting further m)* and *n)* listed above, it will be necessary for some stations in the maritime mobile service to continue for some years to call each other by radiotelephony in certain situations,

considering

- a) that the operation of the GMDSS described in Chapter VII and the distress and safety system described in Appendix 13 differ in many crucial aspects, such as means and methods of alerting, communication facilities available, announcement and transmission of maritime safety information, etc.;
- b) that operation of the two systems in parallel for a long period would cause ever-increasing difficulties and incompatibilities between vessels operating in the two different systems and may thus seriously degrade safety at sea in general;
- c) that the GMDSS overcomes the deficiencies of the aural watch-keeping on maritime distress and calling frequencies on which the distress and safety system described in Appendix 13 relies, by replacing these watches by automatic watch, i.e. DSC and satellite communication systems;

d) that the listening watch on 2 182 kHz on board SOLAS ships and at some coast stations has ceased in accordance with the decisions of IMO mentioned in *noting further f)* above,

resolves

1 to retain, as an interim measure, the provisions permitting use of VHF channel 16 and the frequency 2 182 kHz for general voice-calling;

2 to urge all administrations to assist in enhancing safety at sea by:

- encouraging all vessels to make use of the GMDSS as soon as possible;
- encouraging, where appropriate, establishment of suitable shore-based facilities for GMDSS, either on an individual basis or in cooperation with other relevant parties in the area;
- 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**;

3 that administrations may release their ship stations and coast stations from the obligations described in Appendix 13 concerning listening watch on VHF channel 16 or 2 182 kHz or both, taking account of all aspects involved, such as:

- decisions by IMO and ITU on aural watch on 2 182 kHz and VHF channel 16;
- the GMDSS radio systems available in the area concerned;
- the compatibility problems mentioned in *considering a)* and *b)* above;
- the density and classes of vessels normally in the area;
- the geographical nature of the area and general navigational conditions within the area;
- other adequate measures taken to ensure safety communications for vessels sailing in the area,

when the development on transition to the GMDSS and the prevailing conditions in the area makes it reasonable to do so;

when doing so, administrations should:

- inform IMO of their decisions and submit to IMO details on the area concerned;
- inform the Secretary-General on the necessary details for inclusion in the List of Coast Stations,

resolves further

that the Secretary-General should ensure that such arrangements and details regarding the area concerned be indicated in relevant maritime publications,

instructs the Secretary-General

to bring this Resolution to the attention of IMO, the International Civil Aviation Organization and the International Association of Marine Aids to Navigation and Lighthouse Authorities.

RESOLUTION 339 (Rev.WRC-03)

Coordination of NAVTEX services

The World Radiocommunication Conference (Geneva, 2003),

considering

- a) that the International Maritime Organization (IMO) has established a Coordinating Panel on NAVTEX to, *inter alia*, coordinate the operational aspects of NAVTEX services, such as allocation of transmitter identification character (B1) and time schedules, in the planning stages for transmissions on the frequencies 490 kHz, 518 kHz or 4 209.5 kHz;
- b) that coordination in the frequencies 490 kHz, 518 kHz and 4 209.5 kHz is essentially operational;
- c) that the frequency band around 518 kHz is also allocated to the aeronautical radionavigation service on a primary basis,
- d) that the frequency band around 518 kHz is also allocated to the aeronautical radio-navigation service on a primary basis;
- e) that WRC-95 resolved in its Resolution **23 (WRC-95)** that, with effect from 18 November 1995, the Radiocommunication Bureau shall not examine with respect to Nos. **1241*** to **1245***, and shall not apply the related provisions to, frequency assignment notices in the non-planned bands below 28 000 kHz,

resolves

to invite administrations to apply the procedures established by IMO, taking into account the IMO NAVTEX Manual, for coordinating the use of the frequencies 490 kHz, 518 kHz and 4 209.5 kHz,

instructs the Secretary-General

- 1 to invite IMO to provide ITU with information on a regular basis on operational coordination for NAVTEX services on the frequencies 490 kHz, 518 kHz and 4 209.5 kHz;
- 2 to publish this information in the List of Coast Stations (see No. **20.7**).

* Note by the Secretariat: Edition of 1990, revised in 1994.

RESOLUTION 344 (Rev.WRC-03)

**Management of the maritime mobile service identity
numbering resource**

The World Radiocommunication Conference (Geneva, 2003),

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 first three digits of a ship station MMSI form the maritime identification digits (MID), which denote the ship's administration or geographical area of origin;
- f)* that each MID only has sufficient capacity to identify 999 ships using the three-trailing-zero number format, with the result that widespread use of MMSIs with three trailing zeros will rapidly exhaust the capacity of each MID,

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 Recommendation ITU-R M.585 contains guidance for the assignment of MMSIs,

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 growth of Inmarsat B, C or M ship earth station use by non-compulsory ships may further deplete the MMSI and MID resources;

c) 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,

noting further

a) that ITU-T has recommended that ITU-R assume sole responsibility 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 numbering format, taking into account:

- Sections II, V and VI of Article 19;
- regional variations in MMSI use;
- spare capacity within the MID resource; and
- the guidelines on MID and MMSI management 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, with a view to:

- improving the management of the MID and MMSI 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.

RESOLUTION 351 (WRC-03)

Review of the frequency and channel arrangements in the MF and HF bands allocated to the maritime mobile service with a view to improving efficiency by considering the use of new digital technology by the maritime mobile service

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that the agenda of this Conference included consideration of the use of new digital technology in the maritime mobile service (MMS) in the MF and HF bands;
- b)* that the introduction of new digital technology in the MMS shall not disrupt the distress and safety communications in the MF and HF bands including those established by the International Convention for the Safety of Life at Sea (SOLAS), 1974, as amended;
- c)* that changes made in Appendix 17 should not prejudice the future use of these frequencies or the capabilities of systems or new applications required for use by the MMS;
- d)* that the need to use new digital technologies in the MMS is growing rapidly;
- e)* that the use of new digital technology on HF and MF frequencies allocated to the MMS will make it possible to better respond to the emerging demand for new services;
- f)* that the HF bands allocated to the MMS for A1A Morse telegraphy and narrow-band direct-printing are significantly under-utilized at present;
- g)* that the ITU Radiocommunication Sector is conducting ongoing studies to improve the efficient use of these bands,

noting

that different digital technologies have already been developed and are in use in the MF and HF bands in several radiocommunication services,

noting also

that this conference has modified Appendix 17 to permit, on a voluntary basis, the use of various channels or bands identified in the MF and HF bands for initial testing and future introduction of new digital technology,

resolves

1 that, in order to provide full worldwide interoperability of equipment on ships, there should be one technology, or more than one interoperable worldwide technology, implemented under Appendix 17;

2 that, as soon as the ITU-R studies are completed, a future competent conference should consider necessary changes to Appendix 17 to enable the use of new technology by the MMS,

invites ITU-R

to finalize studies currently ongoing:

- to identify future requirements of the MMS;
- to identify the technical characteristics necessary to facilitate use of digital systems in the MF and HF bands allocated to the MMS, taking into account any relevant ITU-R Recommendations;
- to identify the digital system(s) to be used in the MF/HF bands by the MMS;
- to identify any necessary modifications to the frequency table contained within Appendix 17;
- to propose a timetable for the introduction of new digital technologies and any consequential changes to Appendix 17;
- to recommend how digital technologies can be introduced while ensuring compliance with distress and safety requirements,

instructs the Secretary-General

to bring this Resolution to the attention of the International Maritime Organization, the International Civil Aviation Organization, the International Association of Marine Aids to Navigation and Lighthouse Authorities and the Comité International Radio-Maritime.

RESOLUTION 352 (WRC-03)

Use of the carrier frequencies 12 290 kHz and 16 420 kHz for safety-related calling to and from rescue coordination centres

The World Radiocommunication Conference (Geneva, 2003),

considering

- a) that this Conference modified No. **52.221A** to allow safety-related calling to and from rescue coordination centres on the carrier frequencies 12 290 kHz and 16 420 kHz;
- b) that this limited safety-related calling function on these carrier frequencies will enhance the capability of those search and rescue organizations which maintain watch on these distress and safety frequencies to call vessels not utilizing the Global Maritime Distress and Safety System (GMDSS),

noting

- a) that regulation IV/4.8 of the International Convention for the Safety of Life at Sea (SOLAS), 1974, as amended, requires that SOLAS ships, while at sea, be capable of transmitting and receiving general radiocommunications to and from shore-based radio systems or networks;
- b) that general communications may include safety-related communications necessary for the safe operation of vessels,

further noting

that safety-related communications require adequate, effective and immediate access and protection,

recognizing

- a) that the International Maritime Organization (IMO) notes that distress, urgency and safety radiocommunications include, but are not limited to:
- transmissions of maritime safety information;
 - distress calls and traffic;
 - acknowledgment and relaying of distress calls;
 - search and rescue coordination communications;
 - ship movement service communications;

- communications related to the safe operation of ships;
- communications related to navigation;
- meteorological warnings;
- meteorological observations;
- ship position reports; and
- medical emergencies (e.g. MEDICO/MEDIVAC);

b) that distress, urgency and safety communications are defined in Articles 32 and 33,

resolves

1 that the carrier frequencies 12 290 kHz and 16 420 kHz be used only for distress, urgency and safety communications, and safety-related calling limited to that to and from rescue coordination centres;

2 that safety-related calling be initiated only after determination that other communications are not present on these frequencies;

3 that safety-related calling be minimized and not cause interference to distress, urgency and safety communications,

invites administrations

to encourage the coast and ship stations under their jurisdiction to use digital selective calling techniques,

instructs the Secretary-General

to bring this Resolution to the attention of the IMO.

RESOLUTION 353 (WRC-03)

**Maritime mobile service identities for equipment
other than shipborne mobile equipment**

The World Radiocommunication Conference (Geneva, 2003),

noting

- a)* that there is a need to assign maritime mobile service identities (MMSIs) for Automatic Identification Systems (AIS) on search and rescue (SAR) aircraft and aids to navigation in accordance with Recommendation ITU-R M.1371;
- b)* that administrations are required to notify ITU of ship and coast station MMSI assignments, in accordance with Nos. **19.99** and **20.16**;
- c)* that ITU provides data of all notified ships through the Maritime Mobile Access and Retrieval System (MARS);
- d)* that AIS equipment uses the MMSI for its identification;
- e)* that AIS equipment may be a valuable tool for use by SAR aircraft,

noting further

- a)* that Recommendation ITU-R M.585 and the Radio Regulations do not address the assignment and use of MMSIs for SAR aircraft and aids to navigation;
- b)* that MMSIs used for AIS on SAR aircraft should be entirely different from MMSIs assigned to ships or coast stations;
- c)* that a unique format for SAR aircraft is required to ensure compatibility with AIS;
- d)* that administrations assigning an MMSI to SAR aircraft should notify ITU of this assignment so that it can be considered for inclusion in the MARS system,

considering

- a)* that some administrations at present have a national requirement to operate AIS equipment on board SAR aircraft;
- b)* that, with respect to using AIS on SAR aircraft, there is a need to develop a provision for a standard format of the identification number,

resolves to invite ITU-R

to review the MMSI operational and procedural requirements and to develop an appropriate format which cannot be confused with the format used for ship and coast stations,

further resolves

in the light of results of the studies referred to in *resolves to invite ITU-R* above, to invite WRC-07 to consider necessary changes to the Radio Regulations to allow MMSIs for use on SAR aircraft,

instructs the Director of the Radiocommunication Bureau

to consider the possibility of making provision in the MARS system for the registration of MMSIs used on SAR aircraft, preferably without changing either the database format or the content of the paper publications,

invites administrations

to notify BR of MMSI assignments to SAR aircraft,

instructs the Secretary-General

to communicate this Resolution to the International Maritime Organization, the International Civil Aviation Organization and the International Association of Marine Aids to Navigation and Lighthouse Authorities.

RESOLUTION 413 (WRC-03)

Use of the band 108-117.975 MHz by aeronautical services

The World Radiocommunication Conference (Geneva, 2003),

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 and surveillance systems through a communication data link;
- e) the need for the broadcasting community to provide digital terrestrial sound broadcasting services,

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 of the Convention of the International Civil Aviation Organization (ICAO) 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 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 communication 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;

e) that surveillance functions include the observation of aircraft location and velocity, and weather conditions for the purpose of air traffic control and situational awareness/collision avoidance between aircraft,

resolves

1 that the provisions of this Resolution and of No. **5.197A** shall enter into force on 5 July 2003;

2 that any additional aeronautical systems¹ 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 of the ICAO Convention on International Civil Aviation for existing aeronautical radionavigation systems operating in this frequency band;

3 that additional aeronautical 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 these additional aeronautical systems excluding the ICAO systems identified in *recognizing d*) until all potential compatibility issues with the lower adjacent frequency band 87-108 MHz have been resolved,

invites ITU-R

to study any compatibility issues between the broadcasting and aeronautical services that may arise from the introduction of these additional aeronautical systems as referenced in *noting a*), or appropriate digital sound broadcasting systems, as 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.

¹ In the context of this Resolution, the term “additional aeronautical systems” refers to systems that transmit navigational information in support of air navigation and surveillance functions in accordance with recognized international aviation standards.

RESOLUTION 414 (WRC-03)

**Consideration of the frequency range between 108 MHz and 6 GHz
for new aeronautical applications**

The World Radiocommunication Conference (Geneva, 2003),

considering

- a) that new technologies are needed to support communications and air navigation, including airborne and ground surveillance applications;
- b) that the new technologies to support air navigation in *considering a)* may not conform to the definition of aeronautical radionavigation in the Radio Regulations;
- c) that the current aeronautical mobile band from 117.975-137 MHz will become saturated in some areas of the world and will no longer be able to support the increasing and new requirements;
- d) that new aviation security requirements are currently being defined internationally;
- e) that new applications and concepts in air traffic management which are data intensive are envisioned;
- f) that proposals to meet two current aviation safety objectives, i.e. to provide more information to the pilot and cockpit, and to reduce runway incursions, are being considered in the band 5 091-5 150 MHz;
- g) that there are requirements to support data links that carry critical aeronautical data from systems such as air traffic control radars, wind shear radars, remote maintenance monitoring systems, runway lighting, low-level wind shear alert systems, automated weather surface observing systems, or automatic weather observation systems,

recognizing

that it may not be feasible to introduce some of these new aviation applications in certain bands used by aeronautical safety communications, radionavigation and surveillance due to the possible incompatibility problems or possible spectrum congestion,

noting

a) that past experience has shown that the range 108 MHz to 6 GHz is suitable for aviation requirements;

b) that Resolutions **114 (Rev.WRC-03)** and **413 (WRC-03)** call for compatibility studies in the relevant aeronautical bands,

resolves

that WRC-07 considers additional allocations for the aeronautical mobile (R) service in parts of the bands between 108 MHz and 6 GHz, taking into account *considering c)* to g) above,

further resolves to invite ITU-R

1 to investigate, as a first step, the bands currently available for use by aeronautical systems in the frequency range between 108 MHz and 6 GHz in order to determine whether additional allocations to the aeronautical mobile (R) service are required and can be accommodated in these bands without placing undue constraints to services to which the frequency bands are currently allocated;

2 to further investigate, in case the first step above would not lead to satisfactory results, also the frequency bands currently not available for use by aeronautical systems, subject to not constraining the existing and planned use of such bands, taking account of existing use and future requirements in these bands;

3 to investigate how to accommodate the requirements for aeronautical systems in the band 5 091-5 150 MHz,

further invites

all members of the Radiocommunications Sector and especially the International Civil Aviation Organization (ICAO) to contribute to these studies,

requests the Secretary-General

to bring this Resolution to the attention of ICAO.

RESOLUTION 415 (WRC-03)

**Study of current satellite frequency allocations that will
support the modernization of civil aviation
telecommunication systems**

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that some developing countries still lack an appropriate communication infrastructure that meets the evolving requirements of modern civil aviation;
- b)* that the cost of providing and maintaining such an infrastructure, in particular a terrestrial infrastructure, is increasingly expensive, particularly in remote regions;
- c)* that satellite communication systems provide a real possibility to meet the demands of the International Civil Aviation Organization (ICAO) communication, navigation, surveillance and air traffic management (CNS/ATM), especially in the areas where a terrestrial communication infrastructure is not available,

further considering

- a)* that allocations to aeronautical services and for applications exist over a broad range of frequency bands;
- b)* that technologies now exist where different services can be accommodated by efficient use of a single spacecraft or satellite network;
- c)* that the benefits of establishing and utilizing satellite communication systems for civil aviation would also bring additional benefits for developing and sparsely populated countries by enabling the development of telecommunication systems in conjunction with the civil aviation systems,

noting

- 1 that Recommendation **34 (WRC-95)** states that future world radiocommunication conferences, whenever possible, should allocate frequency bands to the most broadly defined services with a view to providing maximum flexibility in spectrum use;
- 2 that Resolution **20 (Rev.WRC-2000)** resolves to instruct the Secretary-General “to encourage ICAO to continue its assistance to developing countries which are endeavouring to improve their aeronautical telecommunications”;
- 3 that there is a need to provide long-term spectrum availability for aeronautical satellite communications for safety purposes,

resolves to invite WRC-07

1 to examine the possibility of broadening the services and applications of the use of current satellite frequency allocations in order to allow the expansion of ICAO CNS/ATM systems that can also support other non-aeronautical telecommunication services;

2 to take appropriate actions, based on the results of the examination specified under *resolves* 1,

invites ITU-R

1 to study, as a matter of urgency, the current satellite frequency allocations that could meet aeronautical requirements to support the modernization of civil aviation telecommunication systems, especially those in developing countries, and to study in particular those radio frequencies that could be used to support both ICAO CNS/ATM systems and other non-aeronautical telecommunication services,

further invites

1 BDT to also examine this issue and provide assistance, as appropriate, that would facilitate developing countries to participate in the work of ITU-R on this matter;

2 ICAO, the International Air Transport Association (IATA), administrations and other organizations concerned to participate in the studies identified in *invites ITU-R* above,

requests the Secretary-General

to bring this Resolution to the attention of ICAO.

RESOLUTION 507 (Rev.WRC-03)

**Establishment of agreements and associated plans
for the broadcasting-satellite service**

The World Radiocommunication Conference (Geneva, 2003),

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.

RESOLUTION 517 (Rev.WRC-03)

Introduction of digitally modulated and single-sideband emissions in the high-frequency bands between 5900 kHz and 26 100 kHz allocated to the broadcasting service

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that digital techniques are being introduced into many existing services;
- b)* that digital and single-sideband (SSB) techniques allow more effective utilization of the frequency spectrum than double-sideband (DSB) techniques;
- c)* that digital and SSB techniques enable reception quality to be improved;
- d)* the relevant parts of Appendix 11 concerning the digital and SSB system specifications in the HF broadcasting services;
- e)* that ITU-R, in its Recommendation ITU-R BS.1514, has recommended system characteristics for digital sound broadcasts in the broadcast bands below 30 MHz;
- f)* that digital modulation techniques are expected to provide the means to achieve the optimum balance between sound quality, circuit reliability and bandwidth;
- g)* that digitally modulated emissions can, in general, provide more efficient coverage than amplitude-modulated transmissions by using fewer simultaneous frequencies and less power;
- h)* that it may be economically attractive, using current technology, to convert modern conventional DSB broadcasting systems to digital operation in accordance with *considering d)*;
- i)* that some DSB transmitters have been used with digital modulation techniques without transmitter modifications;
- j)* that ITU-R is carrying out further studies on the development of broadcasting using digitally modulated emissions in the bands allocated to the broadcasting service below 30 MHz;
- k)* that a long period could be needed for the introduction of digital broadcasting, taking into account the cost impact of replacement of transmitters and receivers,

resolves

1 that the early introduction of digitally modulated emissions as recommended by ITU-R in the HF bands between 5 900 kHz and 26 100 kHz allocated to the broadcasting service is to be encouraged;

2 that digitally modulated and SSB emissions shall comply with the characteristics specified in relevant parts of Appendix 11;

3 that whenever an administration replaces a DSB emission by an emission using digital or SSB modulation techniques, it shall ensure that the level of interference is not greater than that caused by the original DSB emission, and shall use the RF protection values specified in Resolution 543 (WRC-03) and Recommendation 517 (Rev.WRC-03);

4 that the continued use of DSB emissions may be reviewed by a future competent world radiocommunication conference based on administrations' experience with the introduction of digital HF broadcasting services,

instructs the Director of the Radiocommunication Bureau

to compile and provide to the future competent world radiocommunication conference referred to in *resolves* 4 the latest available complete statistics on the worldwide distribution of digital HF broadcasting receivers and transmitters,

invites ITU-R

to continue its studies on digital techniques in HF broadcasting with a view to assisting in the development of this technology for future use,

invites administrations

to encourage the inclusion in all new HF broadcasting transmitters put into service after 1 January 2004 of the capability to offer digital modulation,

further invites administrations

1 to assist the Director of the Radiocommunication Bureau by providing the relevant statistical data and to participate in ITU-R studies on matters relating to the development and introduction of digitally modulated emissions in the HF bands between 5 900 kHz and 26 100 kHz allocated to the broadcasting service;

2 to bring to the notice of transmitter and receiver manufacturers the recent results of relevant ITU-R studies on spectrum-efficient modulation techniques suitable for use at HF as well as the information referred to in *considering d) and e)*, and encourage the availability of affordable low-cost digital receivers.

RESOLUTION 525 (Rev.WRC-03)

**Introduction of high-definition television systems
of the broadcasting-satellite service in the
band 21.4-22.0 GHz in Regions 1 and 3**

The World Radiocommunication Conference (Geneva, 2003),

considering

a) that WRC-92 has reallocated the band 21.4-22.0 GHz in Regions 1 and 3 to the broadcasting-satellite service (BSS) to be implemented after 1 April 2007;

b) that until 1 April 2007 the existing services operating in the band 21.4-22.0 GHz in Regions 1 and 3 in accordance with the Table of Frequency Allocations are therefore entitled to continue operating without harmful interference from other services;

c) that it is nevertheless desirable to facilitate the introduction of experimental high-definition television (HDTV) systems in this band before 1 April 2007 without affecting the continued operation of existing services;

d) that it also may be possible to introduce operational HDTV systems in this band before 1 April 2007 without affecting the continued operation of existing services;

e) that after 1 April 2007 the introduction of HDTV systems in this band must be regulated in a flexible and equitable manner until such time as a future competent world radiocommunication conference has adopted definitive provisions for this purpose in accordance with Resolution **507 (Rev.WRC-03)**;

f) that procedures are required for the three sets of circumstances envisaged in *considerings c), d) and e)* above,

resolves

to adopt the interim procedures contained in the Annex hereto with effect from 1 April 1992,

invites all administrations

to comply with the above procedures,

instructs the Radiocommunication Bureau

to apply the above procedures.

ANNEX TO RESOLUTION 525 (Rev.WRC-03)

Interim procedures for the introduction of BSS (HDTV) systems in the band 21.4-22.0 GHz in Regions 1 and 3**Section I – General provisions**

1 It shall be understood that prior to 1 April 2007 all existing services in the band 21.4-22.0 GHz in Regions 1 and 3 operating in accordance with the Table of Frequency Allocations shall be entitled to continue to operate. After that date they may continue to operate, but they shall neither cause harmful interference to BSS (HDTV) systems nor be entitled to claim protection from such systems. It shall be understood that the introduction of an operational BSS (HDTV) system in the band 21.4-22.0 GHz in Regions 1 and 3 should be regulated by an interim procedure in a flexible and equitable manner until the date to be decided by a future competent conference.

Section II – Interim procedure relating to experimental BSS (HDTV) systems introduced before 1 April 2007

2 For the purpose of introducing experimental BSS (HDTV) systems in the band 21.4-22.0 GHz in Regions 1 and 3 before 1 April 2007 under the provisions of Article 27, the procedures contained in Sections A to C of Resolution 33 (Rev.WRC-03) or in Articles 9 to 14, as appropriate (see *resolves* 1 and 2 of Resolution 33 (Rev.WRC-03)), shall be applied.

Section III – Interim procedure relating to operational BSS (HDTV) systems introduced before 1 April 2007

3 For the purpose of introducing operational BSS (HDTV) systems in the band 21.4-22.0 GHz in Regions 1 and 3 before 1 April 2007, the procedure contained in Resolution 33 (Rev.WRC-03) shall be applied, if the power flux-density at the Earth's surface produced by emissions from a space station, on the territory of any other country, exceeds:

- $-115 \text{ dB(W/m}^2\text{)}$ in any 1 MHz band for angles of arrival between 0° and 5° above the horizontal plane; or
- $-105 \text{ dB(W/m}^2\text{)}$ in any 1 MHz band for angles of arrival between 25° and 90° above the horizontal plane; or
- values to be derived by linear interpolation between these limits for angles of arrival between 5° and 25° above the horizontal plane.

These limits relate to the power flux-density which would be obtained under assumed free-space propagation conditions.

4 If the power flux-density at the Earth's surface produced by emissions from a space station does not exceed these limits, the procedure in Section A of Resolution 33 (Rev.WRC-03) or No. 9.11, as appropriate (see *resolves* 1 and 2 of Resolution 33 (Rev.WRC-03)) shall not be applied.

**Section IV – Interim procedure relating to BSS (HDTV) systems
introduced after 1 April 2007**

5 For the purpose of introducing and operating BSS (HDTV) systems in the band 21.4-22.0 GHz in Regions 1 and 3 after 1 April 2007, and before a future conference has taken decisions on definitive procedures, all relevant provisions of Articles 9 to 14 except No. 9.11 shall be applied.

6 For the purpose of this Section, BSS (HDTV) systems introduced under provisions of Sections II and III of this Resolution shall be taken into account.

7 Administrations shall, to the maximum extent possible, seek to ensure that operational BSS (HDTV) systems introduced in the band 21.4-22.0 GHz in Regions 1 and 3 under Sections III or IV of this Resolution have characteristics which take into account the studies of the ITU-R for the preparation of a future competent world radiocommunication conference.

RESOLUTION 528 (Rev.WRC-03)

Introduction of the broadcasting-satellite service (sound) systems and complementary terrestrial broadcasting in the bands allocated to these services within the range 1-3 GHz

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that WARC-92 has made frequency allocations to the broadcasting-satellite service (sound) and complementary terrestrial broadcasting;
- b)* that it is necessary to ensure that the introduction of the broadcasting-satellite service (sound) and complementary terrestrial broadcasting proceeds in a flexible and equitable manner;
- c)* that efficient use of the spectrum will be enhanced by a worldwide allocation;
- d)* that a worldwide allocation may cause difficulties to some countries in relation to their existing services;
- e)* that future planning may limit the effect on other services,

resolves

- 1 that a competent conference should be convened, preferably not later than 1998, for the planning of the broadcasting-satellite service (sound) in the bands allocated to this service in the range 1-3 GHz; and the development of procedures for the coordinated use of complementary terrestrial broadcasting;
- 2 that this conference should review criteria for sharing with other services;
- 3 that in the interim period, broadcasting-satellite systems may only be introduced within the upper 25 MHz of the appropriate band in accordance with the procedures contained in Sections A to C of Resolution **33 (Rev.WRC-03)**, or in Articles **9** to **14**, as appropriate (see *resolves* 1 and 2 of Resolution **33 (Rev.WRC-03)**). The complementary terrestrial service may be introduced during this interim period subject to coordination with administrations whose services may be affected;
- 4 that the calculation methods and the interference criteria to be employed in evaluating the interference should be based upon relevant ITU-R Recommendations agreed by the administrations concerned as a result of Resolution **703 (Rev.WARC-92)** or otherwise,

invites the ITU-R

to conduct the necessary studies prior to the conference,

instructs the Secretary-General

to bring this Resolution to the attention of the Council to consider including in the agenda of a radiocommunication conference to be held preferably not later than the year 1998 the matters addressed above.

RESOLUTION 535 (Rev.WRC-03)

**Information needed for the application of Article 12
of the Radio Regulations**

The World Radiocommunication Conference (Geneva, 2003),

considering

that WRC-97 adopted Article 12 as a simple and flexible seasonal planning procedure for high-frequency broadcasting (HFBC) based on coordination,

considering further

that appropriate Rules of Procedure are to be developed by the Radiocommunication Bureau and adopted by the Radio Regulations Board,

instructs the Director of the Radiocommunication Bureau

1 to consider the information contained in the Annex to this Resolution in developing the Rules of Procedure;

2 to consider improvements to the established arrangements for the preparation, publication and dissemination of the information relating to the application of Article 12, in consultation with administrations and regional coordination groups,

invites administrations

1 to support the Director of the Radiocommunication Bureau in the preparation of these Rules of Procedure and in the development and testing of any accompanying computer software;

2 to submit their schedules in a common electronic format to be defined in the Rules of Procedure,

instructs the Secretary-General

to consider provision of the necessary funding to enable developing countries to participate fully in the application of Article 12 and relevant radiocommunications seminars.

ANNEX TO RESOLUTION 535 (Rev.WRC-03)

This Annex responds to the need for information in the application of Article 12; the flowchart in Description 2 provides an overview of the Procedure.

1 Software development

The Procedure will require a number of user-friendly software modules to be developed, tested and supplied to administrations by the Bureau. This will ensure that the same software modules are used by administrations and the Bureau for the analysis of the schedules.

The Bureau should:

- develop the aforementioned software with assistance from administrations;
- distribute the software, together with user instructions and relevant documentation;
- organize training in the use of the software;
- monitor the functional performance of the software and, if required, make necessary modifications.

2 Software modules

Data capture of requirements

A new module will be required that permits the capture of all data elements detailed in Description 3. This module should also contain validation routines that prevent inconsistent data being captured and sent to the Bureau for processing.

Propagation calculation

This new module should calculate the field strength and other necessary data at all relevant test points as described in Descriptions 1 and 4.

It should also include an option that allows administrations to select the optimum frequency bands for their requirements.

The output format of the data and the medium should be such as to allow easy publication and distribution of the results to all administrations.

The results of these calculations should be displayable in a graphical format.

Compatibility analysis

This module should use the output of the propagation calculation to provide a technical analysis of a requirement both alone and in the presence of other requirements as in Description 4. This analysis would be used in the coordination process.

The values for the parameters given in Description 4 should be user selectable, but in the absence of other values the recommended default values should be used.

The results of this analysis should be capable of being displayed in a graphical format for a defined service area as in Description 4.

Data query

This module should enable the user to perform typical data query functions.

DESCRIPTION 1

Selection of suitable frequency band(s)

General

In order to assist broadcasters and administrations in the preparation of their HF broadcasting requirements, the Bureau will prepare and distribute suitable computer software. This should be easy to use and the output should be easy to understand.

User input data

The user should be able to enter:

- the name of the transmitting station (for reference purposes);
- the geographic coordinates of the transmitting station;
- the transmitter power;
- the bands which are available for use;
- hours of transmission;
- sunspot number;
- months during which a service is required;
- the available antenna types, together with the relevant directions of maximum radiation;
- the required coverage area specified as a set of CIRAF zones and quadrants (or by means of relevant geographic information).

It is desirable that the software should be able to store the above information, once it has been entered correctly, and provide the user with an easy means of recalling any previously entered information.

Methodology and data

The software should use:

- Recommendation ITU-R BS.705 for the calculation of antenna patterns;
- Recommendation ITU-R P.533 for the prediction of wanted field-strength values;
- Recommendation ITU-R P.842 for the calculation of reliability values.

The set of 911 test points (agreed at WARC HFBC-87) should be used, supplemented where necessary with test points based on a geographic grid.

The software should calculate the field strength values and the fading margins at each test point inside the required service area for each of the frequency bands declared to be available, taking account of the relevant transmitting antenna characteristics for each frequency band. The desired RF signal-to-noise ratio should be user selectable with a default value of 34 dB in the case of double sideband (DSB) or as provided in the most recent version of Recommendation ITU-R BS.1615, as appropriate, in the case of digital emissions.

The dates for which calculations are made should be user selectable, the default values being:

- 0.5 month after the start of the season;
- mid-point of the season;
- 0.5 month before the end of the season.

The times for which calculations are made should be user selectable, the default values being:

- 30 min past the hour in which the requirement starts;
- 30 min past each successive hour until the hour in which the requirement stops.

Software output data

For rapid assessment of suitable bands, the software should calculate:

- the basic service reliability for each available band and for the relevant test points from the set of 911 test points;
- the basic area reliability for each available band and for the relevant test points from the set of 911 test points.

In order to provide information about the geographic distribution of wanted signal values within the required service area, additional results should be available from the software:

- a listing should be available giving, for each of the available bands, the basic circuit reliability (BCR) for each of the test points (from the set of 911 test points) inside the required service area.

In some cases, a graphical display of the BCR values throughout the required service area may be desirable. These values should be calculated at test points at 2° intervals of latitude and longitude throughout the required service area.

The BCR values should be displayed graphically as a set of coloured or hatched “pixels” scaled in steps of 10%. It should be noted that:

- reliability values relate to the use of a single frequency band;
- reliability values are a function of the desired RF signal-to-noise ratio (user selectable);
- the field-strength values should be calculated by the supplied software on the user’s own computer hardware. The software supplied should calculate the relevant reliability values based on these field-strength values and the user-supplied desired RF signal-to-noise values.

DESCRIPTION 2

Time sequence for the Procedure

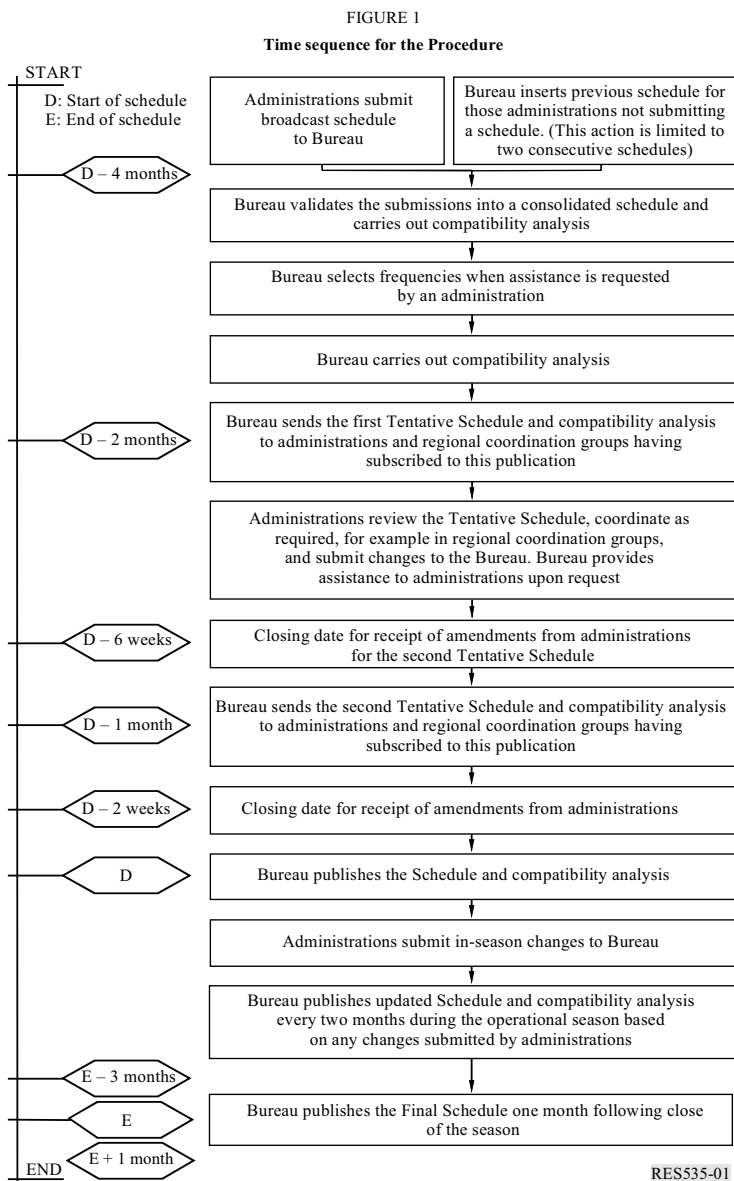
In the sequence outlined below, the start date for a given schedule period is defined as D and the end date for the same schedule period is defined as E.

Date	Action
D – 4 months	Closing date for administrations to send their schedules ¹ to the Radiocommunication Bureau (Bureau), preferably by electronic mail or on 3.5" diskette (720 kbytes or 1.44 Mbytes). Schedule data will be made available via TIES as soon as it has been processed.
D – 2 months	Bureau to send to administrations a consolidated schedule (the first Tentative Schedule) together with a complete compatibility analysis ² .
D – 6 weeks	Closing date for receipt of amendments from administrations to correct errors and other changes resulting from the coordination process to ensure that this information appears in the second Tentative Schedule for D – 1 month.
D – 1 month	Bureau to send to administrations a consolidated schedule (the second Tentative Schedule) together with a complete compatibility analysis ² .
D – 2 weeks	Closing date for receipt of amendments from administrations to correct errors and other changes resulting from the coordination process to ensure that this information appears in the Schedule for date D.
D	Bureau to issue the High Frequency Broadcasting Schedule and compatibility analysis.
D to E – 3 months	Administrations to correct errors and coordinate in-season changes of requirements, sending information to the Bureau as it becomes available. Bureau to issue updates of the Schedule and compatibility analysis at intervals of two months.
E	Closing date for receipt of final operational schedules from administrations to Bureau. No input is needed if there have been no changes to the information previously sent.
E + 1 month	Bureau to send to administrations the final consolidated schedule (the Final Schedule) together with a compatibility analysis.

¹ See Description 3.

² See Description 4. The schedules and the results of the analyses should be available on CD-ROM and in TIES.

Figure 1 shows, in flow chart form, the time sequence for the Procedure.



DESCRIPTION 3

Specification of input data for a requirement

The fields needed for a given requirement and their specifications are:

- frequency in kHz, up to 5-digit integer;
- start time, as 4-digit integer;
- stop time, as 4-digit integer;
- target service area, as a set of up to 12 CIRAF zones and quadrants up to a maximum of 30 characters;
- site code, a 3-character code from a list of codes, or a site name and its geographic coordinates;
- power in kW, up to 4-digit integer;
- azimuth of maximum radiation;
- slew angle, up to 2-digit integer representing the difference between the azimuth of maximum radiation and the direction of unslewed radiation;
- antenna code, up to 3-digit integer from a list of values, or a full antenna description, as given in Recommendation ITU-R BS.705;
- days of operation;
- start date, in the case that the requirement starts after the start of the schedule;
- stop date, in the case that the requirement stops before the end of the schedule;
- modulation choice, to specify if the requirement is to use DSB, single-side band (SSB) (see Recommendation ITU-R BS.640) or digital emission (see Recommendation ITU-R BS.1514). This field may be used to identify any other type of modulation when this has been defined for use by HFBC in an ITU-R Recommendation;
- administration code;
- broadcasting organization code;
- identification number;
- identification of synchronization with other requirements.

DESCRIPTION 4

Compatibility analysis**General**

In order to assess the performance of each requirement in the presence of noise and of the potential interference from other requirements using the same or adjacent channels, it is necessary to calculate the relevant reliability values. To this end, the Bureau will prepare suitable software, taking account of user requirements in terms of desired signal-to-noise and signal-to-interference ratios.

Input data

The schedule for a given season – this may be either an initial consolidated schedule (to permit assessment of those requirements which need coordination) or the High Frequency Broadcasting Schedule (to permit assessment of the likely performance of requirements during the relevant season).

Methodology and data

The software should use:

- Recommendation ITU-R BS.705 for the calculation of antenna patterns;
- Recommendation ITU-R P.533 for the prediction of the wanted field strength values at each test point for each wanted requirement;
- Recommendation ITU-R P.533 for the prediction of the potentially interfering field-strength values from all other co-channel or adjacent channel requirements at each test point for each wanted requirement;
- Recommendations **517 (Rev.WRC-03)** and ITU-R BS.560 for adjacent channel RF protection ratios;
- Recommendation ITU-R P.842 for the calculation of reliability values.

The set of 911 test points (agreed at WARC HFBC-87) should be used, supplemented where necessary with test points based on a geographic grid.

The software should calculate the wanted and unwanted field-strength values and the fading margins at each test point inside the required service area.

The desired RF signal-to-noise and RF protection ratios should be user selectable, the default values being 34 dB and 17 dB (DSB-to-DSB co-channel case), respectively. In the case of digital emissions, the desired RF signal-to-noise ratios are as provided in the most recent version of Recommendation ITU-R BS.1615. The default values of RF protection ratio to be used by the Bureau for its compatibility analyses are given in Section 1 of the Annex to Resolution **543 (WRC-03)**.

The dates for which a compatibility analysis is made should be user selectable, the default values being:

- 0.5 month after the start of the season;
- mid-point of the season;
- 0.5 month before the end of the season.

These default values should be used by the Bureau for its compatibility analyses.

The times for which a compatibility analysis is made should be user selectable, the default values being:

- 30 min past the hour in which the requirement starts;
- 30 min past each successive hour until the hour in which the requirement ends.

These default values should be used by the Bureau for its compatibility analyses.

Software output data

For rapid assessment of the performance of a requirement, the software should calculate:

- the overall service reliability for the relevant test points from the set of 911 test points;
- the overall area reliability for the relevant test points from the set of 911 test points.

In order to provide information about the geographic distribution of wanted and unwanted signal values for a given requirement, additional results should be available from the software:

- a listing should be available giving the overall circuit reliability for each of the relevant test points from the set of 911 test points.

In some cases, a graphical display of the coverage achieved throughout a required service area may be desirable. These values will need to be calculated by the user (with the supplied software and on the user's own computer hardware) at test points at 2° intervals of latitude and longitude throughout the required service area. The values should be displayed graphically as a set of coloured or hatched pixels in steps of 10%. It should be noted that:

- reliability values relate to the use of a single frequency;
- reliability values are a function of the desired RF signal-to-noise and RF protection ratios (both user selectable);
- the field-strength values for the test points (from the set of 911 test points) inside the required service area should be calculated by the Bureau. The software supplied should calculate the relevant reliability values based on these pre-calculated field strength values and the user-supplied desired signal-to-noise and signal-to-interference values;
- the field-strength values for the test points at 2° intervals should be calculated using the supplied software on the user's own computer hardware. The software supplied should calculate the relevant reliability values based on these field strength values and the user-supplied desired signal-to-noise and signal-to-interference values.

RESOLUTION 539 (Rev.WRC-03)

**Use of the band 2 605-2 655 MHz in certain Region 3 countries
by non-geostationary satellite systems in the
broadcasting-satellite service (sound)**

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that the band 2 535-2 655 MHz is allocated under No. **5.418** to the broadcasting-satellite service (BSS) (sound) in certain Region 3 countries;
- b)* that the provisions of Resolution **528 (WARC-92)** currently limit the use of this band by systems in the BSS (sound) to the upper 25 MHz of the band;
- c)* that, prior to WRC-2000, there were no coordination procedures applicable to non-geostationary (non-GSO) BSS (sound) systems in this band in relation to other non-GSO or GSO satellite networks;
- d)* that satellite technology has now advanced to the stage where non-GSO systems in the BSS (sound) are technically and economically feasible when operated with high elevation angles and that there are practical designs available to ensure that the radiation of the non-GSO satellite in the BSS (sound) outside the main beam is kept at low levels;
- e)* that satellite systems in the BSS as described in *considering d)* can be used for the delivery of high-quality, spectrally efficient BSS (sound) to portable and mobile terminals;
- f)* that non-GSO systems in the BSS (sound) in the band 2 630-2 655 MHz in Region 3 have been notified to ITU and are expected to be brought into use in the near future;
- g)* that, prior to WRC-2000, the protection of existing terrestrial services was addressed through the coordination procedures of No. **9.11**;
- h)* that the provision cited in *considering g)* may be inadequate to ensure the future deployment of terrestrial services in this band;
- i)* that a regulatory procedure is required in order to meet the dual objectives of providing adequate long-term protection to existing and planned terrestrial services while not placing undue constraints on the development and implementation of the non-GSO BSS (sound) system;
- j)* that there are non-GSO systems being planned for operation in the BSS (sound) in the band 2 605-2 655 MHz in Region 3 that have highly elliptical orbits;

k) that ITU-R has undertaken studies of the likely aggregate interference from a number of co-frequency broadcasting-satellite systems sharing with the terrestrial services on a co-primary basis;

l) that ITU-R has undertaken studies that assumed there is only one satellite active at any time in a non-GSO system operating in a highly elliptical orbit,

invites

a) administrations planning to operate non-GSO BSS (sound) systems in accordance with this Resolution, to take measures to design the system to minimize interference to terrestrial services outside the non-GSO BSS (sound) service area, for example as in *considering d)* above;

b) administrations, whose territory is geographically close to the territory of an administration planning to operate a non-GSO BSS (sound) system in accordance with this Resolution, and for which there is a correspondingly high elevation angle to the active satellite, to take measures to facilitate the operation of non-GSO BSS (sound) systems,

resolves

1 that any BSS (sound) system using non-geostationary orbits brought into operation in the band 2 605-2 655 MHz in Region 3 shall be operated such that the minimum elevation angle over the service area is not less than 55°, for the purposes of sharing with terrestrial services;

2 that, before an administration notifies to the Radiocommunication Bureau or brings into use a frequency assignment for a BSS (sound) system using non-GSO satellites in the band 2 630-2 655 MHz, for which complete Appendix 4 coordination information or notification information has been received after 2 June 2000, and in the band 2 605-2 630 MHz for which complete Appendix 4 coordination information or notification information has been received after 4 July 2003, the following regulatory arrangements shall apply.

The following mask of power flux-density values at the Earth's surface produced by emissions from a space station for all conditions and for all methods of modulation shall be used as the basis of the regulatory procedures of this Resolution:

-130	dB(W/(m ² · MHz))	for 0° ≤ θ ≤ 5°
-130 + 0.4 (θ - 5)	dB(W/(m ² · MHz))	for 5° < θ ≤ 25°
-122	dB(W/(m ² · MHz))	for 25° < θ ≤ 45°
-122 + 0.2 (θ - 45)	dB(W/(m ² · MHz))	for 45° < θ ≤ 65°
-118 + 0.09 (θ - 65)	dB(W/(m ² · MHz))	for 65° < θ ≤ 76°
-117	dB(W/(m ² · MHz))	for 76° < θ ≤ 90°

where θ is the angle of arrival of the incident wave above the horizontal plane, in degrees.

These values relate to the power flux-density and angles of arrival which would be obtained under free-space propagation conditions.

Furthermore:

- for angles of arrival less than 76° in the power flux-density mask above, if the limits are exceeded, the notifying administration shall obtain the explicit agreement from any administration identified by the Bureau in its examination below;
- for angles of arrival from 76° to 90° in the power flux-density mask above, the coordination procedure with respect to those administrations identified by the Bureau in its examination below will be that of No. **9.11**;

3 that systems in the BSS (sound) using non-GSO satellites shall be limited to national services unless agreement has been reached to include the territories of other administrations in the service area;

4 that, within the context of this Resolution, an administration listed in No. **5.418** or **5.417A** shall not have simultaneously two overlapping frequency assignments, one under that provision, and the other one under provision No. **5.416**;

5 that, as from 5 July 2003, the Bureau and administrations shall apply the provisions of Articles **9** and **11** taking into account Nos. **5.418**, **5.417A**, **5.417B**, **5.417C**, **5.417D**, **5.418A**, **5.418B**, **5.418C** and this Resolution, as revised by this Conference,

instructs the Radiocommunication Bureau

1 when applying *resolves* 2, to use the power flux-density mask in *resolves* 2; and

- for angles of arrival less than 76°, identify the affected administrations which have a primary allocation to terrestrial services in the same frequency band and on whose territory the power flux-density is exceeded and inform both the notifying and the affected administrations. At the notification stage the lack of any necessary agreement is considered as non-conformity with No. **11.31**;
- for angles of arrival from 76° to 90°, identify the affected administrations which have a primary allocation to terrestrial services in the same frequency band and on whose territory the power flux-density is exceeded and inform both the notifying and the affected administrations. At the notification stage each notice shall be examined in the application of No. **11.32** and, if appropriate, under No. **11.32A** with respect to the probability of harmful interference that may be caused to assignments for which coordination could not be successfully completed;

2 as from 5 July 2003, to apply *resolves* 5 in its examination of requests for coordination and notifications for any BSS (sound) systems using non-GSO satellites in the 2 630–2 655 MHz band for which complete Appendix **4** coordination information or notification information has been received after 2 June 2000.

RESOLUTION 543 (WRC-03)

Provisional RF protection ratio values for analogue and digitally modulated emissions in the HF broadcasting service

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that this Conference has resolved to encourage the introduction of digitally modulated emissions in the high frequency broadcast bands allocated to the broadcasting service and has revised Resolution **517** accordingly;
- b)* that the current use of the spectrum is based on the use of double-sideband (DSB) emissions;
- c)* that Appendix **11** gives details of the system parameters and the emission characteristics of the digitally modulated emissions;
- d)* that ITU-R is carrying out further studies on the development of HF broadcasting using digitally modulated emissions in the bands allocated to the broadcasting service below 30 MHz;
- e)* that RF co-channel and adjacent channel protection ratios are among the fundamental parameters when determining compatibility;
- f)* that the currently available values of RF protection ratios may need to be updated in the light of future ITU-R studies;
- g)* that Annex 1 to Recommendation ITU-R BS.1514 describes a digital system suitable for broadcasting in the bands below 30 MHz;
- h)* that there is a need to compile and maintain statistics on administrations' capability to introduce digital modulation systems for their HF broadcasting services,

resolves

- 1 that digital modulation in accordance with Resolution **517 (Rev.WRC-03)** may be used in any of the HF bands allocated to the broadcasting service; this accommodation has to be made with the appropriate amounts of protection given to both analogue and digital emissions as described in the Annex to this Resolution;
- 2 that the protection ratio values described in the Annex be used in the coordination process under Article **12** on a provisional basis;

3 to invite a future competent conference to revise these provisional protection ratio values, as appropriate,

invites ITU-R

1 to continue studies on digital techniques in HF broadcasting with the purpose to revise the RF protection ratio values for analogue and digitally modulated emissions in the HF broadcasting service as described in the Annex to this Resolution;

2 to report the results of these studies to the World Radiocommunication Conference 2007.

ANNEX TO RESOLUTION 543 (WRC-03)

Section 1 – Standard RF protection ratio values

RF protection ratio values to be used for seasonal planning under the provisions of Article 12 are contained in Table 1 in this Section.

The values are consistent with those in Recommendation ITU-R BS.1615.

The characteristics of the digital emission are based on the 64-QAM modulation system, protection level No. 1, robustness mode B, spectrum occupancy type 3 (as contained in Recommendation ITU-R BS.1514), which will be used extensively for HF skywave broadcasting in 10 kHz channels.

The characteristics of the analogue emission are based on double-sideband modulation as summarized in Part A of Appendix 11, with 53% modulation depth.

TABLE 1

Relative RF protection ratios (dB) associated with digitally modulated emissions in the HF bands allocated to the broadcasting service

Wanted signal	Unwanted signal	Frequency separation $f_{\text{unwanted}} - f_{\text{wanted}}$ (kHz)								
		-20	-15	-10	-5	0	5	10	15	20
Amplitude modulation	Digital	-47	-42	-32	3	6	3	-32	-42	-47
Digital	Amplitude modulation	-54	-48	-40	-3	0	-3	-40	-48	-54
Digital	Digital	-53	-47	-38	-3	0	-3	-38	-47	-53

In the case of an amplitude modulation (AM) signal interfered with by a digital signal, the protection ratios are determined by adding 17 dB (audio-frequency protection ratio) to the relative RF protection ratios in Table 1.

In the case of a digital signal interfered with by an AM signal, the protection ratios are determined by adding 7 dB (signal-to-interference ratio for a bit error ratio (BER) of 10^{-4}) to the relative RF protection ratios in Table 1.

In the case of a digital signal interfered with by a digital signal, the protection ratios are determined by adding 16 dB (signal-to-interference ratio for a BER of 10^{-4}) to the RF relative protection ratios in Table 1.

Section 2 – Correction values of RF protection ratios

Correction values of RF protection ratios for different wanted signal conditions such as AM modulation depths, AM quality grades and digital modulation modes are provided in this Section.

1 AM modulation depth

RF protection ratios for a wanted AM signal interfered with by a digital signal depend on the AM modulation depth. A modulation depth of 53% is used as a default value in this Annex. If a different modulation depth is used, a correction value for RF protection ratio is required. Table 2 provides correction values for typical modulation depths.

TABLE 2

Correction values (dB) to be used for other AM modulation depths in respect of wanted AM signal

Modulation depth (%)	30	38	53	<i>m</i>
Correction value (dB)	5	3	0	$20 \log (53/m)$

2 AM audio quality

RF protection ratios for a wanted AM signal interfered with by a digital signal depend on the required audio quality grade. If another quality grade is used, correction values of RF protection ratios as in Table 3 shall be added.

TABLE 3

Correction values (dB) to be used for other audio quality grades in respect of wanted AM signal

Audio quality grade	3	3.5	4
Correction value (dB)	0	7	12

3 Digital modulation scheme, protection level number and robustness mode

RF protection ratios for a wanted digital signal interfered with by an analogue or digital signal depend on the digital modulation scheme and mode. If any combination different from the default value in Section 1 is used, correction values of RF protection ratios as in Table 4 shall be added.

TABLE 4

Correction values (dB) to be used for other combinations of digital modulation scheme, protection level number and robustness mode in respect of wanted digital signal

Modulation scheme	Protection level number	Robustness mode		
		B	C	D
16-QAM	0	-7	-6	-6
	1	-5	-4	-4
64-QAM	0	-1	-1	0
	1	0	0	1

NOTE – 10 kHz nominal bandwidth.

Protection levels Nos. 2 and 3 and robustness mode A are not recommended for use in HF and are therefore not described here.

Section 3 – Explanatory examples

- a) In Table 1, first row <AM interfered with by Digital>: with the AF protection ratio = 17 dB, all values of relative protection ratios entered in that row of the Table must be increased by 17 dB in order to determine the absolute value of the RF protection ratio (RF PR). As examples:
- For co-channel interference (0 kHz separation) the RF PR would be $6 + 17 = 23$ dB.
 - For adjacent channel interference (± 10 kHz separation) the RF PR would be $-32 + 17 = -15$ dB.
 - For the case of modulation depth = 38% and audio quality grade = 4, a correction factor of 15 dB ($= 3 + 12$) is added to the RF protection ratio values described above.
- b) In Table 1, second row <Digital interfered with by AM>: all values of relative protection ratios entered in that row of the Table must be increased by 7 dB in order to determine the absolute value of the RF PR. As examples:
- For co-channel interference (0 kHz separation) the RF PR would be $0 + 7 = 7$ dB.
 - For adjacent channel interference (± 10 kHz separation) the RF PR would be $-40 + 7 = -33$ dB.

- c) In Table 1, third row <Digital interfered with by Digital>: all values of relative protection ratios entered in that row of the Table must be increased by 16 dB in order to determine the absolute value of the RF protection ratio. As examples:
- For co-channel interference (0 kHz separation) the RF PR would be $0 + 16 = 16$ dB.
 - For adjacent channel interference (± 10 kHz separation) the RF PR would be $-38 + 16 = -22$ dB.

RESOLUTION 544 (WRC-03)

**Identification of additional spectrum for the
broadcasting service in the HF bands**

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that the spectrum allocated to the broadcasting service from 4 MHz to 10 MHz is about 25 per cent of all the spectrum allocated to HF broadcasting;
- b)* that WARC-79 allocated an additional 125 kHz of spectrum to the broadcasting service below 10 MHz (9 775-9 900 kHz);
- c)* that WARC-92 allocated an additional 200 kHz to the broadcasting service, consisting of 100 kHz near 9 MHz, 50 kHz near 7 MHz and 50 kHz near 6 MHz, and that this additional spectrum will become available to the broadcasting service as from 1 April 2007;
- d)* that the agenda for WRC-07 includes the revision of allocations to the services in HF bands;
- e)* that the results of coordination under Article 12 demonstrate that the broadcasting bands below 10 MHz are congested, even when there are high levels of sunspot activity, with little more than half of the broadcasting requirements being satisfied;
- f)* that in recent schedule periods, the statistics made by ITU-R for analogue emissions show that in the bands below 10 MHz, around 250 kHz of additional spectrum is needed to clear the co-channel collisions and up to 800 kHz to clear both the co-channel and adjacent channel collisions;
- g)* that the introduction and promotion of the new digital technology that improves spectrum utilization and efficiency cannot completely solve current congestion problems;
- h)* that many administrations continue to use the HF bands for other services, including for fixed and mobile communications;
- i)* that this Conference has made decisions on the use of some parts of the band 7 100-7 450 kHz for use in HF broadcasting,

recognizing

that the specific bands for broadcasting in the tropical zone as referred to in No. 23.6 are to be used in accordance with No. 5.113,

noting

that ITU-R studies identified preferred bands, from which sufficient allocations could be made to the broadcasting service:

4 500-4 650 kHz
5 060-5 250 kHz
5 840-5 900 kHz
7 350-7 650 kHz
9 290-9 400 kHz
9 900-9 940 kHz,

noting further

that further studies are required on the potential allocation of the bands identified in *noting* above and of any other bands between 4 and 10 MHz that may be considered for allocation to the broadcasting service,

resolves to invite ITU-R

1 to carry out studies on this matter, particularly in respect of the bands identified in *noting* above, taking into account technical, operational, economic and other relevant factors, including the appropriate transitional arrangements, and how the introduction of digital emissions will affect the HF broadcasting requirements and how such reallocations will affect other services using these bands;

2 to bring the results of these studies to the attention of WRC-07,

further resolves

to recommend a future competent conference to conclude, where appropriate, on additional spectrum requirements for the broadcasting service, taking into account the interest of all affected services,

invites administrations

to participate actively in the aforementioned studies by submitting contributions to ITU-R.

RESOLUTION 545 (WRC-03)

Technical and regulatory procedures relating to the broadcasting-satellite service networks operating in the 620-790 MHz band

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that No. **5.311** provides the conditions under which the band 620-790 MHz may be used for assignments to television stations using frequency modulation in the broadcasting-satellite service (BSS);
- b)* that it is necessary to adequately protect terrestrial services including the terrestrial television broadcasting systems in this band;
- c)* that the sharing and associated provisions for satellite networks are under study in ITU-R with respect to the impact of such systems on the terrestrial services;
- d)* that geostationary-satellite (GSO) BSS networks and non-geostationary (non-GSO) BSS satellite networks or systems are at the stage of advance publication or coordination, or have been notified in the 620-790 MHz frequency band;
- e)* that studies are being undertaken to determine, *inter alia*, the planning criteria to be used for the Regional Radiocommunication Conference (RRC-04/05) for Region 1 and one country in Region 3;
- f)* that the impact of these GSO BSS networks and non-GSO BSS satellite networks or systems on terrestrial services including digital and analogue television broadcasting systems has yet to be examined;
- g)* that there are at present few GSO networks operating in accordance with No. **5.311**;
- h)* that it would be inappropriate to draw any conclusions regarding the form and levels of the protection criteria and their application to GSO BSS networks and non-GSO BSS satellite networks or systems until the completion of relevant studies and the approval of corresponding ITU-R Recommendations;
- i)* that many administrations have extensive infrastructure for the transmission and reception of analogue and digital television services between 620 MHz and 790 MHz,

noting

- a) that the protection of terrestrial television services in the band 620-790 MHz requires more study before any conclusion can be made about the appropriate pfd values;
- b) that studies called for in Recommendation **705** have been recently initiated but not completed;
- c) that the reference bandwidth of the pfd limit in No. **5.311** is undefined and guidance is urgently needed and has been requested by the Radiocommunication Bureau;
- d) that the existing provisions related to the band 620-790 MHz are ambiguous and have been difficult to apply by administrations and the Bureau,

resolves

- 1 that the processing of submissions of GSO BSS networks and non-GSO BSS satellite networks or systems in the frequency band 620-790 MHz received by the Bureau and not brought into use prior to 5 July 2003, irrespective of their date of receipt, shall be suspended pending WRC-07 decisions on the sharing criteria, including the pfd required to protect the terrestrial services in this frequency band;
- 2 to suspend the application of No. **5.311** and Recommendation **705** until the end of WRC-07 with respect to the GSO BSS networks and non-GSO BSS satellite networks or systems in the frequency band 620-790 MHz and for which notification is received between 5 July 2003 and the end of WRC-07;
- 3 that GSO BSS networks and non-GSO BSS satellite networks or systems in the frequency band 620-790 MHz other than those notified, brought into use and the date of bringing into use confirmed before the end of WRC-03, shall not be brought into use before the end of WRC-07;
- 4 that the notified date of bringing into use referred in Nos. **11.44** and **11.48** for GSO BSS networks and non-GSO BSS satellite networks or systems in this frequency band for which the Bureau receives notification prior to 5 July 2003 shall be extended by the length of the period from the date of receipt by the Bureau of the complete advanced publication information to the end of WRC-07;
- 5 that the BSS systems referred to in *resolves* 1 above shall not be taken into account in the application of *resolves* 3.1C and 3.4 of Council Resolution 1185;

6 that in the band 620-790 MHz, No. **22.2** shall continue to apply to assignments to non-GSO satellite systems in the BSS for which complete notification information is considered to have been received by the Bureau prior to 5 July 2003 in respect of assignments to GSO satellite networks in the BSS for which complete coordination information is considered to have been received by the Bureau prior to 5 July 2003. The relationship between GSO networks and non-GSO satellite networks or systems for which complete Appendix 4 information has been received by the Bureau after 4 July 2003 in the band 620-790 MHz is subject to the procedures to be decided at WRC-07,

invites ITU-R

to conduct studies as a matter of urgency, and develop sharing criteria and regulatory provisions, prior to WRC-07, for the protection of terrestrial services, in particular terrestrial television broadcasting services, in the 620-790 MHz band from GSO BSS networks and non-GSO BSS satellite networks or systems which it is planned to operate in this band,

instructs the Director of the Radiocommunication Bureau

subject to the decisions taken by WRC-07, to resume, as appropriate, the application of Nos. **5.311**, **9.34** and **11.30** and other relevant associated provisions of the Radio Regulations,

instructs the Secretary-General

to bring this Resolution to the attention of the Regional Radiocommunication Conference, 2004/2005 (RRC-04/05).

RESOLUTION 546 (WRC-03)

**Implementation of the decisions of WRC-03 relating to processing
of networks under Appendices 30 and 30A
of the Radio Regulations**

The World Radiocommunication Conference (Geneva, 2003),

considering

that this Conference has adopted new sharing criteria and associated calculation methods which are included in, or referenced in, the Annexes to Appendices **30** and **30A**,

recognizing

that the Radiocommunication Bureau needs clear instructions from this Conference on the sharing criteria and associated calculation methods to process the Appendices **30** and **30A** submissions, which are in various stages of treatment,

further recognizing

that it will take six months for the Radiocommunication Bureau to develop and test the software to implement the new sharing criteria and associated calculation methods adopted by this Conference,

resolves

1 that the revised Appendices **30** and **30A** as adopted at this Conference shall enter into force on 5 July 2003¹ with the exception of the revised Annexes referred to in *resolves* 2 and footnotes to § 4.1.5, 4.1.15, 4.2.8 and 4.2.19;

2 that the revised Annexes of these Appendices as adopted by this Conference shall enter into force on 1 January 2004¹;

3 that as from 1 January 2004², for requests for modifications or additional uses under Article 4 and submissions under Article 2A of Appendices **30** and **30A**, for which complete information was received prior to 1 January 2004 by the Bureau but which have not yet been published in a Special Section of the International Frequency Information Circular (BR IFIC), the Bureau shall apply the revised Appendices **30** and **30A** as adopted at this Conference;

¹ The use of the new criteria applied to networks published prior to 1 January 2004 shall not result in additional coordination requirements for those networks.

² Pending the completion of the relevant software referred to in *further recognizing*, the Bureau will continue to use the current software for processing of notices received prior to 5 July 2003.

4 that, as from 1 January 2004^{1, 2},

4.1 when applying § 4.1.11 or 4.2.15 of Appendix **30** or **30A**, the administrations and the Bureau shall apply the new criteria and associated calculation methods adopted by this Conference;

4.2 when applying § 4.1.12 or 4.2.16 of Appendix **30** or **30A**, an agreement shall be necessary with an administration having previously made a valid objection, when, using the new criteria and associated calculation methods adopted by this Conference, that administration is still considered as affected;

4.3 for notification under Article 5 of Appendices **30** and **30A** for which complete information was received prior to that date by the Bureau but not yet published in Part II or III of the BR IFIC, the Bureau shall apply the revised Appendices **30** and **30A** as adopted at this Conference;

5 that, as from 1 January 2004^{1, 2},

5.1 for requests for coordination under Article 7 of Appendices **30** and **30A** for which complete information was received prior to this date by the Bureau but not yet published in a Special Section of the BR IFIC, the Bureau shall apply the revised Appendices **30** and **30A** as adopted at this Conference;

5.2 in application of No. **11.32** with respect to Article 7 of Appendices **30** and **30A**, the Bureau shall apply the new criteria and associated calculation methods adopted by this Conference if changes to the characteristics published under No. **9.38** increase the probability of interference or if coordination agreements previously required are missing;

5.3 in application of No. **11.32** with respect to Article 6 of Appendices **30** and **30A**, the Bureau shall apply the new criteria and associated calculation methods adopted by this Conference.

¹ The use of the new criteria applied to networks published prior to 1 January 2004 shall not result in additional coordination requirements for those networks.

² Pending the completion of the relevant software referred to in *further recognizing*, the Bureau will continue to use the current software for processing of notices received prior to 5 July 2003.

RESOLUTION 547 (WRC-03)

Updating of the “Remarks” columns in the Tables of Article 9A of Appendix 30A and Article 11 of Appendix 30 of the Radio Regulations

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that this Conference updated the “Remarks” columns in the Tables of Article 9A of Appendix **30A** and Article 11 of Appendix **30** based on the results of studies by the Radiocommunication Bureau;
- b)* that this Conference adopted new Tables in Article 9A of Appendix **30A** and Article 11 of Appendix **30** of the Radio Regulations that specify affected or affecting networks or beams of administrations based on the results of studies by the Radiocommunication Bureau;
- c)* that this Conference adopted new sharing criteria in Appendices **30** and **30A**;
- d)* that it would be appropriate to update the Tables adopted at this Conference taking into account the sharing criteria adopted at this Conference;
- e)* that it would also be appropriate to update the results to reflect the changes in status of the fixed-satellite service networks and modifications to the characteristics, contained in these Tables,

recognizing

- a)* that the integrity of the Region 2 Plan and its associated provisions must be preserved;
- b)* that the compatibility between the broadcasting-satellite service (BSS) in Regions 1 and 3 and the other services in all three Regions must be ensured;
- c)* that the Bureau requires clear instructions from this Conference on how to update the results of compatibility analyses with a view to reducing the number of affected and affecting administrations or networks,

resolves

- 1 that the Bureau, using the revised criteria adopted at this Conference, shall carry out the required analyses based on the following Notes explaining the nature of the “Remarks” columns entries in order to reduce the number of affected and affecting administrations or networks taking into account modifications to satellite networks: Notes 5 to 7 in section 9A.2 of Article 9A of Appendix **30A** and Notes 5 to 8 in section 11.2 of Article 11 of Appendix **30**;

2 that, in addition to the use of the new criteria, the Bureau shall also take into account any changes in the characteristics and any suppression of assignments in the application of the Radio Regulations;

3 that the Bureau shall publish, not later than 1 January 2005, the updated results of its analyses, as indicated in *resolves* 1 and 2 above, together with its related conclusions, in a circular letter;

4 that, once the circular letter referred to in *resolves* 3 has been sent, administrations will have until one year before WRC-07 to decide whether they do or do not wish to continue appearing as “affected or affecting administrations”. In the case of a request by an administration whose name appears in the “Remarks” column as an affecting or affected BSS administration in Regions 1 and 3, its deletion from the “Remarks” column is subject to the agreement of the affected or affecting administration. The Bureau shall send a reminder to all administrations 45 days before the expiry of the above-mentioned deadline in the form of a circular telefax requesting comment or reply. If no reply is received from administrations within that period, it will be taken that there is no need to make any change,

instructs the Director of the Radiocommunication Bureau

to include the results of an up-to-date analysis based on this Resolution in his Report to WRC-07, under agenda item 7.1, for consideration by the Conference, with a view to its taking necessary action as appropriate.

RESOLUTION 548 (WRC-03)

**Application of the grouping concept in Appendices 30 and 30A
in Regions 1 and 3¹**

The World Radiocommunication Conference (Geneva, 2003),

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 this Conference;
- 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,

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 this Conference.

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 (except for merged networks referred to in *resolves 4 f*), with the same name for the satellite network and at the same orbital location.

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;
- 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 except under the provisions of *d*) or *e*) below;
 - c) for networks for which a submission was received by the Bureau under § 4.1.3 of Appendix **30** or **30A** but not yet processed under § 4.1.5 before 5 July 2003, not more than five networks within the same overlapping frequency bandwidth can be in a group in the List except under the provisions of *d*) or *e*) below;
 - d) for networks for which a submission was received by the Bureau under § 4.1.3 of Appendix **30** or **30A** and processed under § 4.1.5 before 5 July 2003, the number of networks that can be in a group in the List within the same overlapping frequency bandwidth cannot be further expanded by new networks beyond five;
 - e) for a group of networks in the List established prior to 5 July 2003, the number of networks within the same overlapping frequency bandwidth in the group cannot be further expanded by new networks beyond five;
 - ebis*) 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;
 - f) as a provisional measure, networks in the List may be optimized or merged to reduce the number of networks in accordance with the following principles:
 - no optimization or merging of networks in a group shall lead to an increased probability of harmful interference or require more protection than was the case for those networks prior to optimization/merging;

- the associated priority date and date of bringing into use for each assignment shall be maintained;
- networks in the List can be optimized or merged as described above, before 1 January 2004;
- upon entering into the List of networks submitted to the Bureau in accordance with § 4.1.3 before 5 July 2003, the List may be optimized or merged as described above;

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 Appendices **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,

instructs the Director of the Radiocommunication Bureau

1 to implement *resolves* 1 to 5 above as from 5 July 2003;

2 by 1 September 2003, to send a notice to administrations having networks in the Regions 1 and 3 List as of 5 July 2003 to bring *resolves* 4 *f*) to their attention;

3 upon processing and publication of a network for which a submission has been received by the Bureau under § 4.1.3 prior to 5 July 2003, send a notice to the notifying administration, bringing the provisions of *resolves* 4 *f*) to its attention and allowing the administration, within 30 days from the date of the notice, to optimize or merge its networks in the List in accordance with the principles in *resolves* 4 *f*),

instructs the Radio Regulations Board

to review and revise, as appropriate, the Rules of Procedure relating to the application of the grouping concept in Regions 1 and 3.

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.

RESOLUTION 608 (WRC-03)

Use of the frequency band 1 215-1 300 MHz by systems of the radionavigation-satellite service (space-to-Earth)

The World Radiocommunication Conference (Geneva, 2003),

considering

a) that WRC-2000 introduced a new allocation for the radionavigation-satellite service (RNSS) in the frequency band 1 260-1 300 MHz;

b) that the frequency bands 1 215-1 240 MHz and 1 240-1 260 MHz were already allocated to the RNSS;

c) that, in the band 1 215-1 260 MHz, RNSS (space-to-Earth) systems have been successfully operating for more than 20 years without any reports of interference to the radars which operate in this frequency band;

d) the importance of the continuing need for protection for the radiodetermination systems operating in the frequency band 1 215-1 300 MHz,

noting

that the provisions of No. **5.329** as adopted by this Conference, will provide for the operation of the RNSS (space-to-Earth) in the frequency band 1 215-1 300 MHz and will protect the radiolocation systems operating in that frequency band, in addition to the protection already provided to radionavigation service systems operating in the countries listed in No. **5.331**,

recognizing

1 that ITU-R carried out studies related to the protection of the radiodetermination systems operating in the frequency band 1 215-1 300 MHz and that these studies should continue pursuant to relevant ITU-R Questions, such as Questions ITU-R 62/8 and ITU-R 217/8, so as to prepare, as appropriate, ITU-R Recommendations;

2 that up to the end of WRC-2000, use of the RNSS in the band 1 215-1 260 MHz was subject only to the constraint that no harmful interference was caused to the radionavigation service in Algeria, Germany, Austria, Bahrain, Belgium, Benin, Bosnia and Herzegovina, Burundi, Cameroon, China, Croatia, Denmark, United Arab Emirates, France, Greece, India, Iran (Islamic Republic of), Iraq, Kenya, The Former Yugoslav Rep. of Macedonia, Liechtenstein, Luxembourg, Mali, Mauritania, Norway, Oman, Pakistan, Netherlands, Portugal, Qatar, Serbia and Montenegro, Senegal, Slovenia, Somalia, Sudan, Sri Lanka, Sweden, Switzerland and Turkey, furthermore, that No. **5.43** was applied,

resolves

that no constraints in addition to those in place prior to WRC-2000 (see *recognizing* 2) shall be placed on the use of RNSS (space-to-Earth) frequency assignments in the band 1 215-1 260 MHz brought into use until 2 June 2000,

instructs the Secretary-General

to communicate the contents of this Resolution to the International Civil Aviation Organization (ICAO) for such actions as it may consider appropriate, and to invite ICAO to participate actively in the study activity identified under *recognizing* 1.

RESOLUTION 609 (WRC-03)

**Protection of aeronautical radionavigation service systems from the
equivalent power flux-density produced by radionavigation-
satellite service networks and systems in the
1 164-1 215 MHz frequency band**

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that the band 960-1215 MHz is allocated on a primary basis to the aeronautical radionavigation service (ARNS) in all Regions;
- b)* that the band 1164-1215 MHz is also allocated on a primary basis to the radionavigation-satellite service (RNSS), subject to the condition in No. **5.328A** that operation of RNSS systems shall be in accordance with this Resolution;
- c)* that WRC-2000 provided for implementation of a provisional aggregate power flux-density (pfd) limit during the period between WRC-2000 and WRC-03, and requested ITU-R studies on the need for an aggregate pfd limit, and revision, if necessary, of the provisional pfd limit given in No. **5.328A**;
- d)* that this Conference has determined that protection of the ARNS from harmful interference can be achieved if the value of the equivalent pfd (epfd) produced by all the space stations of all RNSS (space-to-Earth) systems in the 1 164-1 215 MHz band does not exceed the level of $-121.5 \text{ dB(W/m}^2\text{)}$ in any 1 MHz band;
- e)* that only a limited number of RNSS systems are expected to be deployed in the 1 164-1215 MHz band, and only a few of these systems at most would have overlapping frequencies;
- f)* that ARNS systems can be protected without placing undue constraints on the development and operation of RNSS systems in this band;
- g)* that to achieve the objectives in *considering f)*, administrations operating or planning to operate RNSS systems will need to agree cooperatively through consultation meetings to equitably share the aggregate epfd in a manner to achieve the level of protection for ARNS systems that is stated in *considering d)*;
- h)* that it may be appropriate for representatives of administrations operating or planning to operate ARNS systems to be involved in determinations made pursuant to *considering g)*;

i) that this Conference has decided to apply the coordination provisions of Nos. **9.12**, **9.12A** and **9.13** to RNSS systems and networks for which complete coordination or notification information, as appropriate, is received by the Bureau after 1 January 2005,

noting

a) that WRC-2000 invited ITU-R to conduct the appropriate technical, operational and regulatory studies on the overall compatibility between the RNSS and the ARNS in the band 960-1215 MHz;

b) that WRC-2000 resolved to recommend that WRC-03 review the results of the studies,

recognizing

that under No. **7.5**, interested administrations have the ability, at any time, to request the assistance of the Bureau with respect to Articles **9** and **11** and associated procedures,

resolves

1 that in order to protect ARNS systems, administrations shall ensure, pursuant to this Resolution, that the efd level produced by all space stations of all RNSS systems does not exceed the level $-121.5 \text{ dB(W/m}^2\text{)}$ in any 1 MHz band;

2 that administrations operating or planning to operate in the 1164-1215 MHz frequency band RNSS systems or networks shall, in collaboration, take all necessary steps, including, if necessary, by means of appropriate modifications to their systems or networks, to ensure that the aggregate interference into ARNS systems caused by such RNSS systems or networks operating co-frequency in these frequency bands is shared equitably among the systems identified in *resolves* 3 and does not exceed the level of the aggregate protection criterion given in *resolves* 1 above;

3 that administrations, in carrying out their obligations under *resolves* 1 and 2 above, shall take into account only those RNSS systems with frequency assignments in the band 1 164-1 215 MHz that have met the criteria listed in the Annex to this Resolution through appropriate information provided to the consultation meetings referred to in *considering* g);

4 that administrations, in developing agreements to carry out their obligations under *resolves* 1 and 2 above, shall establish mechanisms to ensure that all potential RNSS system operators and administrations are given full visibility of the process;

5 that in order to allow multiple RNSS systems to operate in the frequency band 1 164-1215 MHz, no single RNSS system shall be permitted to use up the entire interference allowance specified in *resolves* 1 above in any 1 MHz of the 1 164-1 215 MHz band (see Recommendation **608 (WRC-03)**);

6 that to achieve the objectives in *resolves* 1 and 2 above, administrations operating or planning to operate RNSS systems will need to agree cooperatively through consultation meetings to achieve the level of protection for ARNS systems that is stated in *resolves* 1;

7 that administrations participating in this process of epfd calculation should hold consultation meetings on a regular basis (e.g. yearly);

8 the administrations participating in the consultation meeting shall designate one administration that shall communicate to the Bureau the results of any aggregate sharing determinations made in application of *resolves* 2 above, without regard to whether such determinations result in any modifications to the published characteristics of their respective systems or networks (see Recommendation **608 (WRC-03)**);

9 that administrations operating or planning to operate ARNS systems in the 1 164-1 215 MHz band should participate, as appropriate, in discussions and determinations relating to the *resolves* above;

10 that the methodology and the reference worst-case ARNS system antenna contained in Recommendation ITU-R M.1642 shall be used by administrations for calculating the aggregate epfd produced by all the space stations within all RNSS systems in the band 1 164-1 215 MHz,

instructs the Radiocommunication Bureau

1 to participate in consultation meetings mentioned under *resolves* 6 and to observe carefully results of the epfd calculation mentioned in *resolves* 1;

2 to determine whether the pfd level in *recommends* 1 of Recommendation **608 (WRC-03)** is exceeded by any subject space station, and to report the findings of this determination to the participants in the consultation meeting;

3 to publish in the International Frequency Information Circular (BR IFIC), the information referred to in *resolves* 8 and *instructs the Radiocommunication Bureau* 2,

invites the Radiocommunication Bureau

to examine the possibility, if needed, of developing software that can be used to calculate the epfd level mentioned under *resolves* 1,

invites administrations

1 to deal with RNSS intersystem matters, as required, as early as possible;

2 to provide the Bureau and all participants in the consultation meeting with access to appropriate software used to calculate the epfd level mentioned under *resolves* 1.

ANNEX TO RESOLUTION 609 (WRC-03)

Criteria for application of Resolution 609 (WRC-03)

1 Submission of appropriate Advance Publication information.

2 Entry into satellite manufacturing or procurement agreement, and entry into satellite launch agreement.

The RNSS system or network operator should possess:

- i) clear evidence of a binding agreement for the manufacture or procurement of its satellites; and
- ii) clear evidence of a binding agreement to launch its satellites.

The manufacturing or procurement agreement should identify the contract milestones leading to the completion of manufacture or procurement of satellites required for the service provision, and the launch agreement should identify the launch date, launch site and launch service provider. The notifying administration is responsible for authenticating the evidence of agreement.

The information required under this criterion may be submitted in the form of a written commitment by the responsible administration.

3 As an alternative to satellite manufacturing or procurement and launch agreements, clear evidence of guaranteed funding arrangements for the implementation of the project would be accepted. The notifying administration is responsible for authenticating the evidence of these arrangements and for providing such evidence to other interested administrations in furtherance of its obligations under this Resolution.

RESOLUTION 610 (WRC-03)

**Coordination and bilateral resolution of technical compatibility
issues for radionavigation-satellite service networks
and systems in the bands 1 164-1 300 MHz,
1 559-1 610 MHz and 5 010-5 030 MHz**

The World Radiocommunication Conference (Geneva, 2003),

considering

a) that WRC-2000 decided to allocate the bands 1 164-1 215 MHz, 1 260-1 300 MHz and 5 010-5 030 MHz to the radionavigation-satellite service (RNSS) (space-to-Earth) (space-to-space) in addition to the bands 1 215-1 260 MHz and 1 559-1 610 MHz that have already been allocated to the RNSS;

b) that this Conference established conditions for the protection of the aeronautical radionavigation service from RNSS systems in the 1 164-1 215 MHz band, for the protection of radiodetermination services from RNSS systems in the 1 215-1 300 MHz band, and for the protection of the radio astronomy service in the band 4 990-5 000 MHz from RNSS systems in the 5 010-5 030 MHz band;

c) that to date, RNSS systems have been able to resolve intersystem technical compatibility issues on a bilateral basis under Section I of Article 9, without the need for imposition of the coordination procedures of Section II of Article 9, however, in recent years, there has been an increase in the number of RNSS systems and networks filed with the Radiocommunication Bureau;

d) that this Conference has decided to apply, in the bands mentioned in *considering a)*, the coordination provisions of Nos. 9.12, 9.12A and 9.13 to RNSS systems and networks for which complete coordination or notification information, as appropriate, is received by the Radiocommunication Bureau after 1 January 2005, and the provisions of No. 9.7 already apply to geostationary-satellite networks in the RNSS;

e) that it is necessary to have a basis for administrations with RNSS systems that are not subject to Nos. 9.12, 9.12A and 9.13 to engage in bilateral coordinations to resolve intersystem technical compatibility issues within the RNSS;

f) that it is desirable, in order to reduce burdens on administrations operating or planning RNSS systems or networks, to conduct bilateral coordinations between RNSS systems and networks that are either in operation or that are actually in the process of being implemented,

resolves

1 that for administrations planning to operate RNSS systems subject to coordination under Nos. **9.7**, **9.12**, **9.12A** and/or **9.13** in the bands mentioned in *considering a)*, if an administration with which coordination is requested responds to the request under No. **9.52**, the requesting administration shall, during the process of coordination and upon request by the responding administration, inform the responding administration (with a copy to the Bureau) whether it has met the criteria listed in the Annex to this Resolution with respect to the subject network or system;

2 that administrations responding under No. **9.52** to a request for coordination under Nos. **9.7**, **9.12**, **9.12A** and/or **9.13** in the bands mentioned in *considering a)*, shall, during the process of coordination mentioned in *resolves 1* and upon request by the requesting administration, inform the requesting administration (with a copy to the Bureau) whether it has met the criteria listed in the Annex to this Resolution with respect to the subject network or system;

3 that administrations operating or planning to operate RNSS systems in the bands mentioned in *considering a)*, which systems are not subject to coordination under Section II of Article **9**, shall take all practicable steps to resolve issues of intersystem compatibility on a bilateral basis;

4 that in undertaking the obligations under *resolves 3* above, administrations operating or planning to operate RNSS systems or networks should first address intersystem compatibility between RNSS systems or networks that are actually in operation or are in the process of being implemented;

5 that for application of *resolves 4* above, an RNSS system or network that has satisfied the criteria listed in the Annex to this Resolution with respect to the subject network or system would be considered to be actually in the process of being implemented;

6 that when notifying the Bureau under No. **11.47** that a frequency assignment to station(s) in the RNSS in the bands mentioned in *considering a)* has been brought into use, the notifying administration, if it has not already done so, shall inform the Bureau whether it has met the criteria listed in the Annex to this Resolution;

7 that implementation of this Resolution shall be conducted in such a way as to promote the principle of equality and fairness in ensuring access for RNSS operators and planned RNSS systems in the above-referenced bands,

instructs the Radiocommunication Bureau

to provide, on request, assistance to administrations operating or planning to operate RNSS systems in the bands mentioned in *considering a)* above, which systems are not subject to coordination under Section II of Article **9**, in securing bilateral agreements with other RNSS systems as early as possible.

ANNEX TO RESOLUTION 610 (WRC-03)

Criteria for application of Resolution 610 (WRC-03)

1 Submission of appropriate Advance Publication information.

2 Entry into satellite manufacturing or procurement agreement, and entry into satellite launch agreement.

The RNSS system or network operator should possess:

- i) clear evidence of a binding agreement for the manufacture or procurement of its satellites; and
- ii) clear evidence of a binding agreement to launch its satellites.

The manufacturing or procurement agreement should identify the contract milestones leading to the completion of manufacture or procurement of satellites required for the service provision, and the launch agreement should identify the launch date, launch site and launch service provider. The notifying administration is responsible for authenticating the evidence of agreement.

The information required under this criterion may be submitted in the form of a written commitment by the responsible administration.

3 As an alternative to satellite manufacturing or procurement and launch agreements, clear evidence of guaranteed funding arrangements for the implementation of the project would be accepted. The notifying administration is responsible for authenticating the evidence of these arrangements.

RESOLUTION 646 (WRC-03)

Public protection and disaster relief

The World Radiocommunication Conference (Geneva, 2003),

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;
- h)* that continuing development of new technologies such as IMT-2000 and systems beyond IMT-2000 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. Marrakesh, 2002) of the Plenipotentiary Conference urges Member States to facilitate use of telecommunications for the safety and security of the personnel of humanitarian organizations;
- 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,

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 has just been established under the coordination of ITU with participation of international telecommunication service providers, related government departments, standards development organizations, and disaster relief organizations.

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;

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).

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;

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;

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.

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 2 ⁵: 746-806 MHz, 806-869 MHz, 4 940-4 990 MHz;
- in Region 3 ⁶: 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,

⁵ Venezuela has identified the band 380-400 MHz for public protection and disaster relief applications.

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.

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.

RESOLUTION 670 (WRC-03)

Notification and protection of earth stations in the meteorological-satellite service in the band 1 670-1 675 MHz

The World Radiocommunication Conference (Geneva, 2003),

considering

- a) that this Conference has made an allocation to the mobile-satellite service (MSS) (Earth-to-space) in the band 1 668-1 675 MHz;
- b) that there are existing earth stations operating in the meteorological-satellite service (space-to-Earth) in the band 1 670-1 710 MHz;
- c) that the existing earth stations of the meteorological-satellite service operating in the band 1 670-1 675 MHz are used for reception of unprocessed active and passive sensor data;
- d) that this Conference has added No. **5.380A** to ensure protection of existing earth stations in the meteorological-satellite service from mobile earth stations in the band 1 670-1 675 MHz;
- e) that, previously, some earth stations in the meteorological-satellite service have not needed to be registered,

considering further

that Recommendation ITU-R SA.1158 provides guidelines about the sharing between the MSS and the meteorological-satellite service,

invites administrations

to notify before 1 January 2004 assignments to any earth stations in the meteorological-satellite service which were operating in the band 1 670-1 675 MHz on 4 July 2003,

resolves

that if an administration operating an earth station in the meteorological-satellite service for which assignments have been notified in the band 1 670-1 675 MHz before 1 January 2004 subsequently notifies a new assignment to the same earth station in the same band, then this new assignment shall also be protected from harmful interference from the MSS,

instructs the Director of the Radiocommunication Bureau

to publish the list of meteorological-satellite service earth stations operating in the band 1 670-1 675 MHz notified before 1 January 2004,

instructs the Secretary-General

to bring this Resolution to the attention of the World Meteorological Organization.

RESOLUTION 703 (Rev.WRC-03)

**Calculation methods and interference criteria recommended by ITU-R
for sharing frequency bands between space radiocommunication and
terrestrial radiocommunication services or between space
radiocommunication services**

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that, in frequency bands shared with equal rights by space radiocommunication and terrestrial radiocommunication services, it is necessary to impose certain technical limitations and coordination procedures on each of the sharing services for the purpose of limiting mutual interference;
- b)* that, in frequency bands shared by space stations located on geostationary satellites, it is necessary to impose coordination procedures for the purpose of limiting mutual interference;
- c)* that the calculation methods and interference criteria relating to coordination procedures referred to in *considering a)* and *b)* are based upon ITU-R Recommendations;
- d)* that, in recognition of the successful sharing of the frequency bands by space radiocommunication and terrestrial radiocommunication services, and the continuing improvements in space technology and that of the Earth segment, each Radiocommunication Assembly has improved upon some of the technical criteria recommended by the preceding Assembly;
- e)* that the ITU Radiocommunication Assembly has approved a procedure for approving Recommendations between Radiocommunication Assemblies;
- f)* that the Constitution recognizes the right of Member States to make special arrangements on telecommunication matters; however, such arrangements shall not be in conflict with the terms of the Constitution, Convention or of the Regulations annexed thereto as far as harmful interference to the radio services of other countries is concerned;
- g)* that the use of this Resolution may reduce the need for incorporation by reference of some ITU-R Recommendations,

is of the opinion

- a)* that future decisions of the ITU-R are likely to make further changes in the recommended calculation methods and interference criteria;

b) that the administrations should whenever possible apply the current ITU-R Recommendations on sharing criteria when planning systems for use in frequency bands shared with equal rights between space radiocommunication and terrestrial radiocommunication services, or between space radiocommunication services,

invites administrations

to submit contributions to the Radiocommunication Study Groups, providing information on practical results and experience of sharing between terrestrial and space radiocommunication services or between space services, which help to bring about significant improvements in coordination procedures, calculation methods and harmful interference thresholds, and thereby to optimize the available orbit/spectrum resources,

resolves

1 that the Director of the Radiocommunication Bureau, in consultation with Study Group Chairmen, shall prepare a list identifying the relevant parts of new or revised Recommendations approved by the ITU-R affecting the calculation methods and the interference criteria and also those specific sections of the Radio Regulations to which they are applicable, relating to sharing between space radiocommunication and terrestrial radiocommunication services, or between space radiocommunication services. This list shall be prepared without delay following the approval of these Recommendations;

2 that the Director of the Radiocommunication Bureau shall forward this list to all administrations for information once every year.

RESOLUTION 734 (Rev.WRC-03)

Feasibility of use of high altitude platform stations in the fixed and mobile services in the frequency bands above 3 GHz allocated exclusively for terrestrial radiocommunication

The World Radiocommunication Conference (Geneva, 2003),

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 WRC-97 made provision for the use of HAPS within the fixed service in the bands 47.2-47.5 GHz and 47.9-48.2 GHz (see also Resolution **122 (Rev.WRC-03)**);
- d)* that in view of the altitude at which HAPS are placed, the area visible from a HAPS may be within a country or also include neighbouring countries;
- e)* that some administrations intend to operate systems using HAPS in the bands allocated exclusively by the Table of Frequency Allocations or by footnotes for terrestrial radiocommunication such as the fixed and mobile services,

recognizing

ITU-R studies relating to geometrical coordination distance from HAPS, as described in Recommendation ITU-R F.1501,

resolves

to recommend to a future competent WRC to review the feasibility of facilitating the implementation of systems using HAPS in the fixed and mobile services in bands above 3 GHz allocated exclusively by the Table of Frequency Allocations or by footnotes for terrestrial radiocommunication, taking into consideration studies already carried out,

invites ITU-R

to carry out regulatory and technical studies to determine the feasibility of facilitating systems using HAPS in the fixed and mobile services in bands above 3 GHz allocated exclusively by the Table of Frequency Allocations or by footnotes for terrestrial radiocommunication, recognizing the results of the studies already completed and taking account of existing use and future requirements in these bands, and any impact on allocations in adjacent bands,

encourages administrations

to contribute actively to the sharing studies in accordance with this Resolution.

RESOLUTION 738 (WRC-03)

Compatibility analyses between the Earth exploration-satellite service (passive) and active services

The World Radiocommunication Conference (Geneva, 2003),

considering

- a) that primary allocations have been made to various space services in the Earth-to-space direction such as the fixed-satellite service (FSS), mobile-satellite service and broadcasting-satellite service and/or to terrestrial services such as the fixed service, mobile service and broadcasting service, hereafter referred to as “active services”, in bands adjacent or nearby to bands allocated to the Earth exploration-satellite service (passive) (EESS);
- b) that unwanted emissions from active services may cause unacceptable interference to the EESS (passive);
- 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 the 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 may not be possible;
- e) that Recommendation ITU-R SM.1633 provides a list of band-pairs and a methodology for conducting, and a framework for documenting the results of, the compatibility studies between active and passive services operating in adjacent and nearby bands;
- f) that according to Recommendation ITU-R SM.1633, the EESS (passive) in the band 31.3-31.5 GHz can be protected if the unwanted emissions of fixed-service systems (except high-altitude platform stations (HAPS)) operating in the band 31.0-31.3 GHz do not exceed –38 dBW in a 100 MHz reference bandwidth in the band 31.3-31.5 GHz;
- g) that according to Recommendation ITU-R SM.1633, the EESS (passive) in the band 52.6-54.25 GHz can be protected if the unwanted emissions of fixed-service systems operating in the band 51.4-52.6 GHz do not exceed –33 dBW in a 100 MHz reference bandwidth in the band 52.6-54.25 GHz;
- h) that it is necessary to ensure an equitable burden sharing for achieving compatibility between active and passive services,

recognizing

- a) that Recommendation ITU-R SM.1633 addresses the compatibility between the EESS (passive) and active services operating in adjacent or nearby bands;
- b) that the relevant annexes in Recommendation ITU-R SM.1633 need further refinement;
- c) that Recommendation ITU-R SM.1633 does not address all band-pairs in the Table below where compatibility analyses need to be conducted;
- d) that additional measures may be required to protect the EESS (passive) from unwanted emissions of active services for the band-pairs listed in the Table,

resolves

1 to invite ITU-R to continue or to initiate studies on the compatibility analyses between EESS (passive) and the corresponding active services as listed in the Table with a view to updating Recommendation ITU-R SM.1633 or developing additional Recommendations;

TABLE

EESS (passive) band	Active service band	Active service
1 400-1 427 MHz	1 350-1 400 MHz	Fixed service (FS) Mobile service (MS) Radiolocation service (RLS)
1 400-1 427 MHz	1 427-1 429 MHz	FS, MS (except aeronautical mobile service (AMS)) and space research service (SRS) (Earth-to-space)
1 400-1 427 MHz	1 429-1 452 MHz	FS and MS
23.6-24 GHz	22.55-23.55 GHz	Inter-satellite service (ISS)
31.3-31.5 GHz	30-31 GHz	FSS (Earth-to-space)
50.2-50.4 GHz ¹	50.4-51.4 GHz ¹	FSS (Earth-to-space) ¹
50.2-50.4 GHz ¹	47.2-50.2 GHz (Regions 2 and 3) 49.44-50.2 GHz ¹ (Region 1)	FSS ¹

¹ Studies in this band must take into account No. 5.340.1 of the Radio Regulations.

2 to invite ITU-R to further study the impact of implementing the values provided in *considering f)* and *g)* for unwanted emissions of fixed-service systems operating in Regions 2 and 3, taking into account that the impact on fixed-service systems in Region 1 has already been investigated;

3 to recommend that WRC-07 review the results of the studies identified in *resolves* 1 and 2 in order to consider regulatory measures, if appropriate, to ensure the protection of the EESS (passive) operating in the bands listed in the Table from unwanted emissions of active services operating in the corresponding bands while taking into account the impact on all concerned services of implementing or not implementing such measures,

invites administrations

1 to provide the relevant characteristics of active and passive service systems operating in the bands identified in the Table;

2 to actively participate in the studies identified in *resolves* 1 and 2.

RESOLUTION 739 (WRC-03)

Compatibility between the radio astronomy service and the active space services in certain adjacent and nearby frequency bands

The World Radiocommunication Conference (Geneva, 2003),

considering

a) that adjacent or nearby primary service allocations have been made to the radio astronomy service, and to various space services, such as the fixed-satellite service (FSS), radionavigation-satellite service (RNSS), mobile-satellite service (MSS) and broadcasting-satellite service (BSS), hereafter referred to as “active space services”;

b) that, in many cases, the frequencies used by the radio astronomy service (RAS) are chosen to study natural phenomena producing radio emissions at frequencies fixed by the laws of nature, so shifting frequency to avoid or mitigate interference problems may not be possible;

c) that Recommendation ITU-R SM.1633 provides a methodology for conducting, and a framework for documenting the results of, compatibility studies between active space service and passive service band-pairs;

d) that Recommendation ITU-R SM.1633 also provides the results of compatibility studies between a passive service and an active space service in certain adjacent and nearby bands;

e) that appropriate consultation between administrations has the potential to lead to the development of innovative solutions and to the rapid deployment of systems;

f) that, for technical or operational reasons, more stringent spurious emission limits than the general limits in Appendix 3 may be required to protect the RAS from active services in specific bands,

noting

a) that the additional burden of undertaking any technical examination should not be placed on the Radiocommunication Bureau;

b) that a consultation procedure, as contained in this Resolution, would not place an additional burden on the Bureau;

c) that Recommendation ITU-R M.1583 provides a methodology based on the equivalent power flux-density (epfd) concept for calculation of interference resulting from unwanted emissions from non-geostationary (non-GSO) satellite systems of the MSS or RNSS into radio astronomy stations;

- d) that Recommendation ITU-R S.1586 provides a methodology based on the epfd concept for calculation of interference resulting from unwanted emissions from non-GSO systems of the FSS into radio astronomy stations;
- e) that Recommendation ITU-R RA.1631 provides antenna patterns to be used for compatibility analyses between non-GSO systems and RAS stations, based on the epfd concept;
- f) that Recommendation ITU-R RA.1513 provides 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%;
- g) that some of the results documented in Recommendation ITU-R SM.1633 may be used as threshold levels to initiate the consultation procedure;
- h) that the results of successful consultation between concerned administrations would ensure that the interests of both the active and passive services are considered;
- i) that measures taken by active space services to protect radio astronomy stations from interference may result in increased costs and/or reduced capabilities for those services;
- j) that conversely, not taking such measures may result in additional operating costs and reduced operational effectiveness for the radio astronomy stations concerned;
- k) that the implementation of additional interference mitigation measures at the radio astronomy station may increase operating costs and reduce observational effectiveness;
- l) that conversely, not implementing such measures may impose upon the active space services an additional cost burden and reduction in service capability;
- m) that studies for some of the band-pairs listed in Recommendation ITU-R SM.1633 are still in progress,

recognizing

- a) that unwanted emissions produced by stations of the active space services may cause unacceptable interference to stations of the RAS;
- b) that, although some unwanted emissions from transmitters on space stations can be controlled through careful design methods and appropriate testing procedures, other unwanted emissions, such as narrowband spurious emissions, generated by uncontrollable and/or unpredictable physical mechanisms, may only be detected after the spacecraft is launched;
- c) that there is an uncertainty in the pre-launch assessment of the levels of unwanted emissions;

d) that it is necessary to ensure an equitable sharing of burden for achieving compatibility between the active space services and the RAS;

e) that for those cases where difficulties are encountered in meeting the values in the Annex, a consultation procedure could be used to resolve the difficulties,

resolves

1 that an administration takes all reasonable steps to ensure that space stations being designed and constructed to operate in the bands in the Annex 1 meet the values given therein at any radio astronomy station operating in the corresponding bands identified in this Annex;

2 that in the event that during construction and prior to launch it is determined that, after having considered all reasonable means, the unwanted emissions from the space station cannot meet the values given in the Annex 1, the administration that notified the space station contacts, as soon as possible, the administration operating the radio astronomy station to confirm that *resolves* 1 has been fulfilled, and the concerned administrations enter into a consultation process in order to identify all practicable steps with a view to achieving a mutually acceptable solution;

3 that in the event, following the space station launch, an administration operating a radio astronomy station determines that, due to unexpected circumstances, a space station does not meet the values for unwanted emissions given in the Annex 1 at that radio astronomy station, it contacts the administration that notified the space station so that the administration that notified the space station confirms that *resolves* 1 has been fulfilled, and the concerned administrations enter into a consultation process in order to identify further steps with a view to achieving a mutually acceptable solution;

4 that the radio astronomy stations to be taken into account in applying *resolves* 1, 2 and 3 are those which are operating in the frequency band(s) identified in the Annex 1 and which are notified before the date of reception of the advance publication information of the space station to which this Resolution applies;

5 that the space stations to be considered in the application of the above *resolves* are those designed to operate in the space service frequency bands listed in the Annex 1 for which advance publication information is received by the Bureau following the entry into force of the Final Acts of this conference;

6 that the objective of the consultation process in *resolves* 1, 2 and 3 is to achieve a mutually acceptable solution, using as guidance Recommendation ITU-R SM.1633 and any other ITU-R Recommendations deemed relevant by the concerned administrations;

7 that the Bureau shall make no examination or finding with respect to this Resolution under either Article 9 or 11,

invites administrations

1 to take all appropriate and practicable steps, from the design phase onward, to ensure that unwanted emissions are minimized from space stations that are planned to operate in one or more space service allocations, in order to avoid exceeding the threshold levels of unwanted emissions identified in the Annex 1 at any radio astronomy station;

2 to take all practicable steps, from the design phase onward, to minimize the sensitivity of radio astronomy stations to interference and to take into account the need to implement interference mitigation measures.

ANNEX 1 TO RESOLUTION 739 (WRC-03)

Unwanted emission threshold levels

The unwanted emission threshold levels applicable to geostationary space stations are given in Table 1-1 in terms of power flux-density (pfd) in a reference bandwidth produced at a radio astronomy station.

In Table 1-1 the unwanted emission threshold levels given in the fourth, sixth and eighth columns (associated with the reference bandwidth contained in the adjacent columns) should be met by space stations operating in the bands indicated in the second column at the radio astronomy station operating in the band mentioned in the third column.

The unwanted emission threshold levels applicable to space stations of non-geostationary systems are given in Table 1-2 in terms of the equivalent power flux-density (epfd), produced at a radio astronomy station in a reference bandwidth, not to be exceeded during a given percentage of time, over the whole sky.

In Table 1-2 the epfd value given in the fourth, sixth and eighth columns (associated with the reference bandwidths contained in the adjacent column) should be met by space stations operating in the bands indicated in the second column at the radio astronomy station operating in the band mentioned in the third column. The epfd value at a given radio astronomy station shall be evaluated by using the antenna pattern and the RAS maximum antenna gain given in Recommendation ITU-R RA.1631. Guidance on the calculation of epfd can be found in Recommendations ITU-R S.1586 and ITU-R M.1583. The elevation angles of the radio astronomy stations to be taken into account in the epfd calculation are those higher than the minimum elevation angle θ_{min} of the radio telescope. In the absence of such information a value of 5° shall be taken. The percentage of time during which the epfd level shall not be exceeded is mentioned in Note ⁽¹⁾ of Table 1-2.

TABLE 1-1
pfd thresholds for unwanted emissions from geostationary space stations
at a radio astronomy station

Space service	Space service band	Radio astronomy band	Single dish, continuum observations		Single dish, spectral line observations		VLBI ⁽¹⁾
			pfd ⁽²⁾	Reference bandwidth	pfd ⁽²⁾	Reference bandwidth	pfd ⁽²⁾
	(MHz)	(MHz)	(dB(W/m ²))	(MHz)	(dB(W/m ²))	(kHz)	(dB(W/m ²))
BSS (space-to-Earth) MSS (space-to-Earth)	1 452-1 492 1 525-1 559	1 400-1 427	−180	27	−196	20	−166
MSS (space-to-Earth) MSS (space-to-Earth)	1 525-1 559 1 613.8-1 626.5	1 610.6-1 613.8	NA	NA	−194	20	−166
BSS (space-to-Earth) FSS (space-to-Earth)	2 655-2 670	2 690-2 700	−177	10	NR	25	−161
FSS (space-to-Earth)	2 670-2 690	2 690-2 700 (in Regions 1 and 3)	−177	10	NR	20	−161
	(GHz)	(GHz)	–	–	–	–	–
BSS (space-to-Earth)	21.4-22.0	22.21-22.5	NR	NR	NR	250	−128

NA: Not applicable, measurements of this type are not made in this band.

NR: No result available.

⁽¹⁾ The reference bandwidth used for spectral line observations has also been used as reference bandwidth for very long baseline interferometry (VLBI) observations. In VLBI bands, where no spectral line observations are conducted, the reference bandwidth for VLBI observations has been determined using the assumption of Recommendation ITU-R RA.769 for a typical spectrometer channel (3 km/s).

⁽²⁾ Integrated over the reference bandwidth with an integration time of 2 000 s.

TABLE 1-2
**epfd thresholds^{*} for unwanted emissions from non-GSO satellite systems
 at a radio astronomy station**

Space service	Space service band	Radio astronomy band	Single dish, continuum observations		Single dish, spectral line observations		VLBI ⁽¹⁾
			epfd ⁽²⁾	Reference bandwidth	epfd ⁽²⁾	Reference bandwidth	epfd ⁽²⁾
	(MHz)	(MHz)	(dB(W/m ²))	(MHz)	(dB(W/m ²))	(kHz)	(dB(W/m ²))
MSS (space-to-Earth)	1 613.8-1 626.5	1 610.6-1 613.8	NA	NA	−258	20	−230

NA: Not applicable, measurements of this type are not made in this band.

^{*} These epfd thresholds should not be exceeded for more than 2% of time.

⁽¹⁾ The reference bandwidth used for spectral line observations has also been used as reference bandwidth for VLBI observations. In VLBI bands, where no spectral line observations are conducted, the reference bandwidth for VLBI observations has been determined using the assumption of Recommendation ITU-R RA.769 for a typical spectrometer channel (3 km/s).

⁽²⁾ Integrated over the reference bandwidth with an integration time of 2 000 s.

RESOLUTION 740 (WRC-03)

Future compatibility analyses between the radio astronomy service and active space services in certain adjacent and nearby frequency bands

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that adjacent or nearby primary service allocations have been made to the radio astronomy service (RAS), and to various space services, such as the fixed-satellite service (FSS), mobile-satellite service (MSS), broadcasting-satellite service (BSS) and radionavigation satellite service (RNSS), hereafter referred to as “active space services”;
- b)* that unwanted emissions from active space services may cause unacceptable interference to the RAS;
- c)* that, for technical or operational reasons, the general limits in Appendix 3 may be insufficient in protecting the RAS in specific bands;
- d)* that, in many cases, the frequencies used by the RAS 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 may not be possible;
- e)* that Recommendation ITU-R SM.1633 provides a list of band-pairs and a methodology for conducting, and a framework for documenting the results of, the compatibility studies between certain active and passive services operating in specific adjacent and nearby band-pairs;
- f)* that it is necessary to ensure an equitable burden sharing for achieving compatibility between active and passive services,

recognizing

- a)* that Recommendation ITU-R SM.1633 addresses the compatibility between the RAS and the active space services in specific band-pairs;
- b)* that the relevant Annexes in Recommendation ITU-R SM.1633 need further refinement;
- c)* that measures beyond the general unwanted emission limits in Appendix 3 may be required to protect the RAS from unwanted emissions of active space services for the band-pairs listed in the Table,

TABLE

Band-pairs to be considered for further studies

Space service band	Space service	Radio astronomy service band
(MHz)		(MHz)
137-138	MSS (space-to-Earth)	150.05-153.0 (No. 5.208A)
387-390	MSS (space-to-Earth)	322-328.6 (No. 5.208A)
400.15-401	MSS (space-to-Earth)	406.1-410 (No. 5.208A)
620-790 (No. 5.311) see Resolution 545 (WRC-03)	BSS (space-to-Earth)	608-614
1 452-1 492	BSS (space-to-Earth) (non-GSO systems only)	1 400-1 427
1 525-1 559	MSS (space-to-Earth) (non-GSO systems only)	1 400-1 427
1 525-1 559	MSS (space-to-Earth) (non-GSO systems only)	1 610.6-1 613.8
1 559-1 610	RNSS (space-to-Earth)	1 610.6-1 613.8
2 655-2 670	BSS (space-to-Earth)	2 690-2 700
2 655-2 670	FSS (space-to-Earth) (Region 2)	2 690-2 700
2 670-2 690	FSS (space-to-Earth) (Region 2)	2 690-2 700
(GHz)		(GHz)
10.7-10.95	FSS (space-to-Earth)	10.6-10.7
21.4-22.0	BSS (space-to-Earth)	22.21-22.5

resolves

1 to invite ITU-R to study the compatibility between the RAS and the corresponding active space services as listed in the Table only, with a view to updating or developing ITU-R Recommendations, if appropriate;

2 that WRC-07 should consider the results of the studies as identified in *resolves* 1, in order to review and update, if appropriate, the tables of threshold levels for consultation in the Annex 1 to Resolution **739 (WRC-03)**,

invites administrations

to actively participate in the ITU-R studies identified in *resolves* 1 and to provide, where practicable, the relevant characteristics of active and passive service systems operating in the bands identified in the Table to this Resolution, as well as to indicate the impact on all concerned services of implementing or not implementing the compatibility solutions.

RESOLUTION 741 (WRC-03)

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, 2003),

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%,

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 4990-5000 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 5010-5030 MHz band shall not exceed -245 dB(W/m²) 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 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 5010-5030 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,

instructs the Radiocommunication Bureau

as from the end of this Conference, to review all RNSS systems for which complete coordination or notification information, as appropriate, has been received by the Bureau before the end of this Conference for the band 5010-5030 MHz, and, if appropriate, to revise its findings regarding compliance with No. **5.443B**, taking into account additional information received under *resolves* 4.

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.

RESOLUTION 742 (WRC-03)

Use of the frequency band 36-37 GHz

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that the frequency band 36-37 GHz is allocated to the Earth exploration-satellite service (EESS) (passive) and to the space research service (passive) on a primary basis;
- b)* that the frequency band 36-37 GHz is allocated to the fixed service and to the mobile service on a primary basis;
- c)* that the EESS (passive) protection criteria are contained in Recommendation ITU-R SA.1029;
- d)* that Recommendation ITU-R F.758-2 provides characteristics of fixed service point-to-multipoint systems operating in the band 36-37 GHz, but does not provide information on characteristics of fixed service point-to-point systems operating in this band;
- e)* that the band 36-37 GHz is not available for high-density applications in the fixed service (see No. **5.547**);
- f)* that the EESS (passive) operating in the band 36-37 GHz could receive interference from the emissions of systems of active services,

recognizing

- a)* that EESS (passive) systems may experience harmful interference if a high density of fixed-service stations is deployed in the band 36-37 GHz;
- b)* that sharing criteria between EESS (passive) and fixed-service systems need to be defined for the band 36-37 GHz,

resolves

- 1 to invite ITU-R to conduct sharing studies between the passive services and the fixed and mobile services in the band 36-37 GHz in order to define appropriate sharing criteria;
- 2 to recommend that a future competent conference review the results of the studies and consider the possible inclusion of the sharing criteria within the Radio Regulations,

invites administrations

- 1 to provide ITU-R with characteristics of active systems (fixed and mobile services) operating in the band 36-37 GHz;
- 2 to take into account that EESS (passive) systems may experience harmful interference if the band 36-37 GHz becomes heavily used by stations in the fixed or mobile-service prior to the establishment of the sharing criteria.

RESOLUTION 743 (WRC-03)

**Protection of single-dish radio astronomy stations in Region 2
in the 42.5-43.5 GHz band**

The World Radiocommunication Conference (Geneva, 2003),

considering

- a) that the band 42.5-43.5 GHz is allocated to the radio astronomy service (RAS) on a primary basis, and that both continuum and spectral line observations are conducted in this band;
- b) that there are primary allocations to the fixed-satellite service (FSS) (space-to-Earth) and to the broadcasting-satellite service (BSS) in the 42-42.5 GHz band;
- c) that a geostationary (GSO) FSS or BSS satellite operating in the 42-42.5 GHz band could encounter great difficulty in meeting the values given in No. **5.551I** for single-dish radio telescope observations in the 42.5-43.5 GHz band for 100% of the time;
- d) that an FSS or BSS satellite or system operating in the 42-42.5 GHz band would encounter great difficulty in meeting the power flux-density (pfd) level of $-153 \text{ dB(W/m}^2\text{)}$ in any 500 kHz for GSO satellites or the equivalent pfd (epfd) level of $-246 \text{ dB(W/m}^2\text{)}$ in any 500 kHz for any non-GSO system for single-dish radio telescope spectral-line observations near the 42.5 GHz band edge of the 42.5-43.5 GHz band, even when all practicable technical or operational measures to reduce the potential for interference detrimental to the RAS stations are employed;
- e) that because there are relatively few RAS stations operating single-dish telescopes in the band 42.5-43.5 GHz, and because there are expected to be relatively few FSS or BSS earth stations operating in the 42-42.5 GHz band, it may be feasible for both services to employ technical or operational measures, including but not limited to such interference mitigation techniques as geographical isolation, time sharing, etc., in order to reduce the potential for interference detrimental to the RAS stations operating in this band;
- f) that, taking into account the above *considerings*, it should be feasible to rely on arrangements between concerned RAS and FSS/BSS administrations to ensure that the unwanted emissions from FSS or BSS satellites and systems in the 42-42.5 GHz band do not cause interference detrimental to RAS stations in Region 2 conducting spectral-line observations in the 42.5-42.77 GHz band,

resolves

1 that a GSO FSS or BSS satellite in the band 42-42.5 GHz shall not exceed the values given in No. **5.551I** for more than 2% of the time at any radio astronomy station in Region 2 registered as a single-dish radio telescope in the 42.5-43.5 GHz band;

2 that an administration that plans to operate a GSO FSS or BSS satellite or a non-GSO FSS or BSS system in the 42-42.5 GHz band shall take all practicable steps to avoid exceeding the pfd value of $-153 \text{ dB(W/m}^2\text{)}$ in any 500 kHz for a GSO satellite, and the epfd value of $-246 \text{ dB(W/m}^2\text{)}$ in any 500 kHz for any non-GSO system in the 42.5-42.77 GHz band, for more than 2% of the time, at the site of a radio astronomy station registered as a single-dish radio telescope in Region 2;

3 that in the event that an administration planning to operate a GSO FSS or BSS satellite or a non-GSO FSS or BSS system in the band 42-42.5 GHz has taken all practicable steps to avoid exceeding the values and percentage of time criterion in *resolves* 2 in the 42.5-42.77 GHz band, but that nevertheless would not meet them, the administration planning to operate such a satellite or systems shall enter into discussions with the administration operating the affected radio astronomy station in Region 2 to arrive at a mutually satisfactory arrangement with respect to the unwanted emissions produced into the band 42.5-42.77 GHz;

4 that *resolves* 1, 2 and 3 shall apply with respect to any radio astronomy station in Region 2 registered as a single-dish radio telescope in the band 42.5-43.5 GHz that was in operation prior to 5 July 2003 and that has been notified to the Radiocommunication Bureau before 4 January 2004, or that was notified before the date of receipt of the complete Appendix 4 information for coordination or notification, as appropriate, for an FSS or BSS satellite or system to which this Resolution applies (see Note 1);

5 that an administration notifying a radio astronomy station in Region 2 as a single-dish radio telescope after the dates provided in *resolves* 4 may seek an agreement with administrations that have authorized FSS or BSS satellites or systems to which this Resolution applies,

invites ITU-R

to conduct studies and develop Recommendations to establish the appropriate balance between the percentage of time that GSO satellites operating in the 42-42.5 GHz band exceed the single-dish values in No. **5.551I** at the site of a radio astronomy station and the associated impact on radio astronomy observations.

NOTE 1 – For purposes of No. **5.551H**, No. **5.551I** and *resolves* 4 of this Resolution, the radio astronomy stations currently under construction in Sierra Negra, Mexico, $18^{\circ} 59' \text{ N}/97^{\circ} 18' \text{ W}$ (station Volcan Sierra Negra) and San Pedro de Atacama, Chile, $23^{\circ} 20' \text{ S}/67^{\circ} 44' \text{ W}$ (station Atacama Large Millimeter Array) to conduct observations in the 42.5-43.5 GHz band, shall be considered to have been in operation prior to 5 July 2003 if they are notified to the Radiocommunication Bureau before 1 January 2005.

RESOLUTION 744 (WRC-03)

Sharing between the mobile-satellite service (Earth-to-space) and the space research (passive) service in the band 1 668-1 668.4 MHz and between the mobile-satellite service (Earth-to-space) and the fixed and mobile services in the band 1 668.4-1 675 MHz

The World Radiocommunication Conference (Geneva, 2003),

considering

a) that this Conference has made a global allocation to the mobile-satellite service (MSS) (Earth-to-space) in the band 1 668-1 675 MHz and a global allocation to the MSS (space-to-Earth) in the band 1 518-1 525 MHz;

b) that due to sharing conditions between MSS (space-to-Earth) and the aeronautical mobile service for telemetry in the band 1 518-1 525 MHz (see No. **5.348B**), MSS operation in the United States of America is unlikely to be feasible;

c) that the above constraints on the MSS in the band 1 518-1 525 MHz therefore limit the possible use of the band 1 668-1 675 MHz by the MSS in the United States of America;

d) that the band 1 660.5-1 668.4 MHz is allocated to the space research (passive) service;

e) that in the band 1 668-1 668.4 MHz, mobile earth stations and space research (passive) stations are subject to coordination under No. **9.11A**;

f) that the band 1 670-1 675 MHz is currently planned for use in the United States of America for the fixed and mobile services,

considering further

a) that the band 1 668.4-1 675 MHz is allocated to the fixed and mobile services;

b) that No. **5.380** identifies the band 1 670-1 675 MHz for aeronautical public correspondence systems but that no such systems exist;

c) that sharing between mobile systems other than those referred to in No. **5.380** and the MSS in the band 1 670-1 675 MHz has not been studied, since mobile service system characteristics were not available;

d) that MSS systems in the band 1 668-1 675 MHz are not expected to become operational prior to 2007,

resolves

that, in the band 1 670-1 675 MHz, stations in the MSS shall not claim protection from fixed and mobile stations operating within the United States of America,

invites ITU-R

1 to complete, as a matter of urgency and in time for WRC-07, studies relating to provisions to protect space research (passive) space stations from harmful interference from mobile earth stations in the band 1 668-1 668.4 MHz, taking care to avoid undue constraints on either service;

2 to study, as a matter of urgency and in time for WRC-07, the use of the band 1 668.4-1 675 MHz by the mobile service, and to complete any relevant sharing studies between the mobile service and the MSS in this band, taking care to avoid undue constraints on either service;

3 to bring the results of these studies to the attention of WRC-07,

invites administrations and interested parties

to participate actively in these studies,

recommends

that WRC-07 take appropriate action based on the results of those studies, excluding modification of the above *resolves*.

RESOLUTION 745 (WRC-03)

Protection of existing services in all Regions from non-geostationary-satellite networks in the fixed-satellite service using the frequency bands around 1.4 GHz on a secondary basis

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that the agenda of this Conference included consideration of the adoption of allocations for feeder links for the non-geostationary (non-GSO) systems in the mobile-satellite service (MSS) around 1.4 GHz;
- b)* that the band 1 350-1 400 MHz is allocated on a primary basis to the radiolocation, fixed and mobile services in Region 1 and to the radiolocation service in Regions 2 and 3;
- c)* that Nos. **5.149**, **5.338** and **5.339** also apply to the band 1 350-1 400 MHz;
- d)* that the band 1 400-1 427 MHz is allocated to the Earth exploration-satellite service (EESS) (passive), radio astronomy and space research (passive) services on a primary basis in all Regions;
- e)* that No. **5.340** also applies to the band 1 400-1 427 MHz;
- f)* that the band 1 427-1 429 MHz is allocated in all Regions to the space operation (Earth-to-space), fixed and mobile (except aeronautical mobile) services on a primary basis;
- g)* that No. **5.341** also applies to the band 1 400-1 452 MHz;
- h)* that the band 1 429-1 452 MHz is allocated on a primary basis to the fixed service in all Regions, to the mobile service (except aeronautical mobile) in Region 1 and to the mobile service in Regions 2 and 3;
- i)* that No. **5.342** also applies to the band 1 429-1 452 MHz in Region 1;
- j)* that the Report of the 2002 Conference Preparatory Meeting (CPM) indicated that there were significant technical challenges to be overcome in some areas if existing services, particularly passive services, were to be protected from harmful interference from the operation of feeder links around 1.4 GHz;
- k)* that the Report of 2002 CPM also indicated that studies in ITU-R were incomplete for the radio astronomy, EESS (passive), space research, aeronautical mobile (aeronautical mobile telemetry (AMT)) and radiolocation services,

recognizing

that secondary allocations around 1.4 GHz to the fixed-satellite service (FSS) for feeder links for non-GSO satellite systems in the MSS with service links below 1 GHz may support the development of new services on a global basis,

resolves

1 that the additional allocations for the FSS on a secondary basis in the bands 1390-1392 MHz and 1430-1432 MHz for feeder links in the (Earth-to space) and (space-to-Earth) directions, respectively, for non-GSO satellite systems in the MSS with service links operating below 1 GHz, shall not be used until the completion of ITU-R studies on all identified compatibility issues as shown in Annex 1 to this Resolution and the results of these studies shall be reported to WRC-07 and the decisions should be taken by WRC-07 accordingly;

2 to recommend that decisions taken by WRC-07, including any provisions for the protection of other services to which the bands in *resolves* 1 are allocated, and of passive services in the adjacent band, apply to all non-GSO FSS systems in these bands filed to the Bureau after 5 July 2003,

further resolves to invite ITU-R, as a matter of urgency

1 to continue studies, and to carry out tests and demonstrations to validate the studies on operational and technical means to facilitate sharing around 1.4 GHz, including the frequency band 1390-1392 MHz, between existing and currently planned services and FSS feeder links (Earth-to-space) for use by non-GSO satellite systems in the MSS with service links operating below 1 GHz;

2 to conduct studies and carry out tests and demonstrations to validate the studies on operational and technical means to facilitate sharing around 1.4 GHz, including the frequency band 1430-1432 MHz, between existing and currently planned services and FSS feeder links (space-to-Earth) for use by non-GSO satellite systems in the MSS with service links operating below 1 GHz;

3 to carry out studies, including the measurement of emissions from equipment that would be employed in operational systems, to validate that the systems meet all requirements for the protection of passive services in the band 1400-1427 MHz from unwanted emissions from FSS feeder links around 1.4 GHz for non-GSO satellite systems in the MSS with service links operating below 1 GHz;

4 to study the power flux-density (pfd) values required to protect sensors of the EESS (passive) operating in the band 1400-1427 MHz.

ANNEX 1 TO RESOLUTION 745 (WRC-03)

Compatibility issues**Earth-to-space**

Service	Parameter of concern	1 350-1 400 MHz	1 400-1 427 MHz
Fixed service		Note 1	Note 2
Mobile service		Note 1	Note 2
Radiolocation	pfd limits	Note 1	Note 2
EESS (passive) (secondary) (No. 5.339)	e.i.r.p. limits	Note 1	Note 2
Radio astronomy	pfd limits, separation distances	Note 1	Note 1
EESS (passive)	Unwanted emission limits; limited filter rejection	Note 2	Note 1
Space research (passive)	pfd limits	Note 2	No issue

space-to-Earth

Service	Parameter of concern	1 350-1 400 MHz	1 400-1 427 MHz	1 429-1 452 MHz
Fixed service	pfd limits	Note 1	Note 2	Note 1
Mobile service	pfd limits; FSS shall not cause harmful interference	Note 1	Note 2	Note 1
Aeronautical mobile (AMT)	pfd limits	Note 2	Note 2	Note 1
Radio astronomy	epfd limits; issue % of time	Notes 1 and 2	Note 1	Note 2
EESS (passive)	Unwanted emission limits; limited filter rejection	Note 2	Note 1	Note 2
Space research (passive)	pfd limits	Note 2	Note 1	Note 2

NOTE 1 – Study considered in this Resolution.

NOTE 2 – No allocation (for radio astronomy: No. 5.149 applies to the band 1 350-1 400 MHz).

RESOLUTION 746 (WRC-03)

Issues dealing with allocations to science services

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that this Conference recognized the importance of proper consideration of science service issues based on technical and operational criteria developed in Radiocommunication Study Groups;
- b)* that the bandwidth requirements for transmission of data from high resolution sensors on the next generation geostationary meteorological satellites to be launched in the time-frame 2015-2020 are in excess of 200 MHz;
- c)* that a primary allocation to the geostationary meteorological satellite (space-to-Earth) exists in the band 18.1-18.3 GHz in No. **5.519**;
- d)* that the number of earth stations deployed to support these meteorological satellites will be low (on the order of five per Region);
- e)* that the band 18-18.4 GHz is allocated to the fixed, fixed-satellite and mobile services;
- f)* that the frequency band 10.6-10.68 GHz is allocated to the Earth exploration-satellite service (EESS) (passive), radio astronomy and space research (passive) services on a primary basis;
- g)* that the frequency band 10.6-10.68 GHz is also allocated to the mobile, except aeronautical mobile, and the fixed services on a primary basis, taking into account No. **5.482**;
- h)* that the EESS (passive) operating in the band 10.6-10.68 GHz may experience harmful interference from the emissions of systems of active services;
- i)* that the band 10.6-10.68 GHz is of primary interest for the measurement of rain, snow, sea state, ocean wind and soil moisture,

recognizing

- 1 that the bandwidth of the existing allocation for geostationary meteorological satellites in the band 18.1-18.3 GHz is insufficient to support the required data rates;
- 2 that sharing between geostationary meteorological satellites and the fixed, fixed-satellite and mobile services may be feasible in the band 18-18.4 GHz;
- 3 that the provisions given in No. **5.482** may not be sufficient to ensure the protection of the EESS (passive) in the band 10.6-10.68 GHz;

4 that sharing criteria between the EESS (passive) and the space research (passive) service on one hand and other primary services on the other hand need to be reviewed in the band 10.6-10.68 GHz,

resolves

1 to invite ITU-R to conduct sharing analyses between geostationary meteorological satellites operating in the space-to-Earth direction and the fixed, fixed-satellite and mobile services in the band 18-18.4 GHz to define appropriate sharing criteria with a view to extending the current 18.1-18.3 GHz geostationary meteorological satellites allocation in the space-to-Earth direction to 300 MHz of contiguous spectrum;

2 to invite ITU-R to conduct sharing analyses between the EESS (passive) and the space research service (passive) on one hand and the fixed and mobile services on the other hand in the band 10.6-10.68 GHz to determine appropriate sharing criteria;

3 to recommend that WRC-07 review the results of the studies under *resolves* 1 and 2 and consider the inclusion of the sharing criteria within the Radio Regulations;

4 to make appropriate modifications to the Table of Frequency Allocations with respect to *resolves* 1, based on proposals from administrations,

invites administrations

1 to contribute to the sharing studies between the meteorological satellite service and the fixed, fixed-satellite and mobile services in the 18-18.4 GHz band;

2 to provide the relevant characteristics of active systems (fixed and mobile services) operating in the band 10.6-10.68 GHz;

3 to contribute to the sharing studies between the EESS (passive) and the space research service (passive) on one hand and the other primary services on the other hand in the band 10.6-10.68 GHz,

invites ITU-R

to complete the necessary studies, as a matter of urgency, taking into account the present use of allocated bands, with a view to presenting, at the appropriate time, the technical information likely to be required as a basis for the work of the Conference,

instructs the Secretary-General

to bring this Resolution to the attention of the international and regional organizations concerned.

RESOLUTION 747 (WRC-03)

Possible upgrade of the radiolocation service to primary allocation status in the frequency bands 9 000-9 200 MHz and 9 300-9 500 MHz, and possible extension of the existing primary allocations to the Earth exploration-satellite service (active) and the space research service (active) in the band 9 500-9 800 MHz

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that there is a need to provide contiguous spectrum in the bands around 9 GHz for the radiolocation service allocated on a primary basis worldwide, in order to provide adequate spectrum for new radar systems to function;
- b)* that emerging requirements for increased image resolution and increased range accuracy necessitate wider contiguous emission bandwidths;
- c)* that there is a need to upgrade the status of frequency allocations to the radiolocation service in the frequency range 9 000-9 200 MHz and 9 300-9 500 MHz in order for existing and planned radar systems to satisfy their required missions;
- d)* that, while radionavigation is recognized as a safety service as delineated in No. **4.10**, radiolocation services have demonstrated compatible operations with radionavigation services in the bands 9 000-9 200 MHz and 9 300-9 500 MHz over many years because of using similar system characteristics of low-duty cycle emissions, scanning beams and interference reduction techniques;
- e)* that previous and ongoing studies in ITU-R addressing other bands indicate that compatibility in the bands 9 000-9 200 MHz and 9 300-9 500 MHz between the radionavigation and radiolocation services is feasible;
- f)* that radars in the radiolocation service operate on a primary basis worldwide in the 9 200-9 300 MHz and 9 800-10 000 MHz bands, and operate on a secondary basis with respect to the radionavigation service in the 9 000-9 200 MHz and 9 300-9 500 MHz;
- g)* that the Earth exploration-satellite (EESS) (active), space research (active), radiolocation and radionavigation services have an allocation on a primary basis in the frequency range 9 500-9 800 MHz, taking into account the constraints of footnote **5.476A**;
- h)* that it may be necessary to increase by up to 200 MHz the bandwidth available to the EESS (active) and the SRS (active) to satisfy global environmental monitoring requirements for improved resolution;

- i) that Recommendation ITU-R M.1313 contains the technical characteristics and protection criteria for maritime radars in the band 9 300-9 500 MHz;
- j) that Recommendation ITU-R M.1372 identifies interference reduction techniques which enhance compatibility among radar systems;
- k) that Recommendation ITU-R SA.1166 contains the technical characteristics and protection criteria for Earth sensors operating near 9 500 MHz,

recognizing

- a) that the 2003 Radiocommunication Assembly approved Question ITU-R 234/8 on the compatibility of radionavigation and radiolocation services operating in the bands 9 000-9 200 MHz and 9 300-9 500 MHz;
- b) that ITU-R and administrations have already started work on this issue by developing a preliminary draft new Recommendation on radar characteristics and protection criteria, and have conducted initial compatibility measurements;
- c) that it is important to protect the existing primary services having allocations in the frequency bands 9 000-9 200 MHz and 9 300-9 500 MHz;
- d) that an upgrade to a primary allocation worldwide may be required to give radar system developers, manufacturers and investors confidence that their systems will have the regulatory assurance to operate globally;
- e) that new EESS (active) systems are being considered for operation in the 9 300-9 800 MHz frequency range,

resolves to invite ITU-R

- 1 to continue to study, as a matter of urgency, the technical characteristics, protection criteria, and other factors of radiolocation and radionavigation systems that ensure compatible operations in the bands 9 000-9 200 MHz and 9 300-9 500 MHz;
- 2 to continue to study, as a matter of urgency, the technical characteristics, protection criteria, and other factors of radiolocation, radionavigation, EESS (active) and space research service (active) systems that ensure compatible operations in the band 9 300-9 500 MHz;
- 3 as a matter of urgency, with due regard to services to which these bands are allocated:
 - to study the compatibility between radars of the radiolocation and radionavigation services in the bands 9 000-9 200 MHz and 9 300-9 500 MHz through testing and measurements;
 - to continue to study and conduct test measurements to determine the protection criteria for radionavigation and radiolocation systems in the bands 9 000-9 200 MHz and 9 300-9 500 MHz;

- to study the compatibility between terrestrial radars of the radiolocation and radionavigation services, and spaceborne radars of the Earth exploration-satellite and space research services in the band 9 300-9 500 MHz;
- 4 in the event that sharing studies in the 9 300-9 500 MHz band lead to unsatisfactory conclusions which do not fully satisfy the requirement for an increase by up to 200 MHz of contiguous spectrum for EESS (active) and space research service (active), to carry out additional sharing studies in the alternative frequency range 9 800-10 000 MHz;
- 5 to include the results of the above studies in one or more Recommendation,

further resolves

that, taking into account the results of ITU-R studies, WRC-07 consider:

- 1 the upgrading of the radiolocation service to a primary allocation in the bands 9 000-9 200 MHz and 9 300-9 500 MHz; and
- 2 the possible extension by up to 200 MHz of the allocation in the band 9 500-9 800 MHz to the EESS (active) and the space research service (active),

invites ITU-R

to conduct, and complete in time for WRC-07, the appropriate studies leading to technical and operational recommendations to facilitate sharing between the radionavigation, radiolocation, EESS (active) and space research (active) services.

RESOLUTION 802 (WRC-03)

Agenda for the 2007 World Radiocommunication Conference

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that, in accordance with No. 118 of the Convention, the general scope of the agenda for a world radiocommunication conference should be established four to six years in advance and a final agenda shall be established by the Council two years before the conference;
- b)* Article 13 of the 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 this Conference has identified a number of urgent issues requiring further examination by WRC-07;
- b)* that, in preparing this agenda, many 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 2007 for a period of four weeks, with the following agenda:

1 on the basis of proposals from administrations, taking account of the results of WRC-03 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 with respect to the following items:

1.1 requests from administrations to delete their country footnotes or to have their country name deleted from footnotes, if no longer required, in accordance with Resolution **26 (Rev.WRC-97)**;

1.2 to consider allocations and regulatory issues related to the Earth exploration-satellite (passive) service, space research (passive) service and the meteorological satellite service in accordance with Resolutions **746 (WRC-03)** and **742 (WRC-03)**;

- 1.3 in accordance with Resolution **747 (WRC-03)**, consider upgrading the radiolocation service to primary allocation status in the bands 9000-9200 MHz and 9300-9500 MHz and extending by up to 200 MHz the existing primary allocations to the Earth exploration-satellite service (EESS) (active) and the space research service (SRS) (active) in the band 9500-9800 MHz without placing undue constraint on the services to which the bands are allocated;
- 1.4 to consider frequency-related matters for the future development of IMT-2000 and systems beyond IMT-2000 taking into account the results of ITU-R studies in accordance with Resolution **228 (Rev.WRC-03)**;
- 1.5 to consider spectrum requirements and possible additional spectrum allocations for aeronautical telecommand and high bit-rate aeronautical telemetry, in accordance with Resolution **230 (WRC-03)**;
- 1.6 to consider additional allocations for the aeronautical mobile (R) service in parts of the bands between 108 MHz and 6 GHz, in accordance with Resolution **414 (WRC-03)** and, to study current satellite frequency allocations, that will support the modernization of civil aviation telecommunication systems, taking into account Resolution **415 (WRC-03)**;
- 1.7 to consider the results of ITU-R studies regarding sharing between the mobile-satellite service and the SRS (passive) in the band 1668-1668.4 MHz, and between the mobile-satellite service and the mobile service in the band 1668.4-1675 MHz in accordance with Resolution **744 (WRC-03)**;
- 1.8 to consider the results of ITU-R studies on technical sharing and regulatory provisions for the application of high altitude platform stations operating in the bands 27.5-28.35 GHz and 31-31.3 GHz in response to Resolution **145 (WRC-03)**, and for high altitude platform stations operating in the bands 47.2-47.5 GHz and 47.9-48.2 GHz in response to Resolution **122 (Rev.WRC-03)**;
- 1.9 to review the technical, operational and regulatory provisions applicable to the use of the band 2500-2690 MHz by space services in order to facilitate sharing with current and future terrestrial services without placing undue constraint on the services to which the band is allocated;
- 1.10 to review the regulatory procedures and associated technical criteria of Appendix **30B** without any action on the allotments, the existing systems or the assignments in the List of Appendix **30B**;
- 1.11 to review sharing criteria and regulatory provisions for protection of terrestrial services, in particular the terrestrial television broadcasting service, in the band 620-790 MHz from broadcasting-satellite service networks and systems, in accordance with Resolution **545 (WRC-03)**;
- 1.12 to consider possible changes in response to Resolution 86 (Rev. Marrakesh, 2002) of the Plenipotentiary Conference: "Advance publication, coordination, notification and recording procedures for frequency assignments pertaining to satellite networks" in accordance with Resolution **86 (WRC-03)**;

1.13 taking into account Resolutions **729 (WRC-97)**, **351 (WRC-03)** and **544 (WRC-03)**, to review the allocations to all services in the HF bands between 4 MHz and 10 MHz, excluding those allocations to services in the frequency range 7000-7200 kHz and those bands whose allotment plans are in Appendices **25**, **26** and **27** and whose channelling arrangements are in Appendix **17**, taking account of the impact of new modulation techniques, adaptive control techniques and the spectrum requirements for HF broadcasting;

1.14 to review the operational procedures and requirements of the Global Maritime Distress and Safety System (GMDSS) and other related provisions of the Radio Regulations, taking into account Resolutions **331 (Rev.WRC-03)** and **342 (Rev.WRC-2000)** and the continued transition to the GMDSS, the experience since its introduction, and the needs of all classes of ships;

1.15 to consider a secondary allocation to the amateur service in the frequency band 135.7-137.8 kHz;

1.16 to consider the regulatory and operational provisions for Maritime Mobile Service Identities (MMSIs) for equipment other than shipborne mobile equipment, taking into account Resolutions **344 (Rev.WRC-03)** and **353 (WRC-03)**;

1.17 to consider the results of ITU-R studies on compatibility between the fixed-satellite service and other services around 1.4 GHz, in accordance with Resolution **745 (WRC-03)**;

1.18 to review pfd limits in the band 17.7-19.7 GHz for satellite systems using highly inclined orbits, in accordance with Resolution **141 (WRC-03)**;

1.19 to consider the results of the ITU-R studies regarding spectrum requirement for global broadband satellite systems in order to identify possible global harmonized fixed-satellite service frequency bands for the use of Internet applications, and consider the appropriate regulatory/technical provisions, taking also into account No. **5.516B**;

1.20 to consider the results of studies, and proposals for regulatory measures if appropriate regarding the protection of the EESS (passive) from unwanted emissions of active services in accordance with Resolution **738 (WRC-03)**;

1.21 to consider the results of studies regarding the compatibility between the radio astronomy service and the active space services in accordance with Resolution **740 (Rev.WRC-03)**, in order to review and update, if appropriate, the tables of threshold levels used for consultation that appear in the Annex to Resolution **739 (WRC-03)**;

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 principles contained in the Annex to Resolution **27 (Rev.WRC-03)**;

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-03)**, 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 in accordance with Article 7 of the Convention:

7.1 to consider and approve the Report of the Director of the Radiocommunication Bureau:

- on the activities of the Radiocommunication Sector since WRC-03;
- on any difficulties or inconsistencies encountered in the application of the Radio Regulations; and
- on action in response to Resolution **80 (Rev.WRC-2000)**;

7.2 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, taking into account Resolution **803 (WRC-03)**,

further resolves

to activate the Conference Preparatory Meeting and the Special Committee on Regulatory/Procedural Matters,

invites the Council

to finalize the agenda and arrange for the convening of WRC-07, 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-07,

instructs the Secretary-General

to communicate this Resolution to international and regional organizations concerned.

RESOLUTION 803 (WRC-03)

**Preliminary agenda for the 2010 World
Radiocommunication Conference**

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that, in accordance with No. 118 of the ITU Convention, the general scope of the agenda for WRC-10 should be established four to six years in advance;
- b)* Article 13 of the 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-10:

- 1 to take appropriate action in respect of those urgent issues that were specifically requested by WRC-07;
- 2 on the basis of proposals from administrations and the Report of the Conference Preparatory Meeting, and taking account of the results of WRC-07, to consider and take appropriate action in respect of the following items:
 - 2.1 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-97)**;
 - 2.2 to consider frequency allocations between 275 GHz and 3000 GHz taking into account the result of ITU-R studies in accordance with Resolution **950 (WRC-03)**;
 - 2.3 to consider results of ITU-R studies in accordance with Resolution **222 (WRC-2000)** to ensure spectrum availability and protection for the aeronautical mobile-satellite (R) service, and to take appropriate action on this subject, while retaining the generic allocation for the mobile-satellite service;
 - 2.4 to consider allocations to the mobile service in the band 806-862 MHz in Region 1, following the transition of analogue to digital TV;
 - 2.5 to consider the results of studies related to Resolution **136 (Rev.WRC-03)** dealing with sharing between non-GSO and GSO systems;

2.6 to consider the need to modify the provisional protection ratio values in the Annex to Resolution **543 (WRC-03)**, taking into account the experience of the coordination of seasonal scheduling of the HF bands allocated to the broadcasting service and relevant studies conducted by ITU-R since WRC-03;

2.7 to consider the progress of ITU-R studies concerning the technical and regulatory issues relative to the fixed service in the 81-86 and 92-100 GHz frequency bands, taking into account Resolutions **731 (WRC-2000)** and **732 (WRC-2000)**;

2.8 to consider the progress of the ITU-R studies concerning the development and regulatory requirements of terrestrial wireless interactive multimedia applications, in accordance with Recommendation **951 (WRC-03)** and to take any appropriate action on this subject;

3 to consider the results of the studies related to the following, with a view to considering them for inclusion in the agendas of future conferences:

3.1 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-GSO mobile-satellite service) in accordance with Resolution **114 (Rev.WRC-03)**;

4 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-03)**;

5 to consider such consequential changes and amendments to the Radio Regulations as may be necessitated by the decisions of the Conference;

6 in accordance with Resolution **95 (Rev.WRC-03)**, to review the Resolutions and Recommendations of previous conferences with a view to their possible revision, replacement or abrogation;

7 to review, and take appropriate action on, the Report from the Radiocommunication Assembly submitted in accordance with Nos. 135 and 136 of the Convention;

8 to identify those items requiring urgent action by the Radiocommunication Study Groups;

9 in accordance with Article 7 of the Convention:

9.1 to consider and approve the Report of the Director of the Radiocommunication Bureau on the activities of the Radiocommunication Sector since WRC-07;

9.2 to recommend to the Council items for inclusion in the agenda for the following WRC,

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-10,

instructs the Secretary-General

to communicate this Resolution to international and regional organizations concerned.

RESOLUTION 900 (WRC-03)

**Review of the Rule of Procedure for No. 9.35
of the Radio Regulations**

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that the existence of the backlog of satellite filings is a significant problem that has the potential of adversely affecting the rights of all administrations;
- b)* that the Board, at its 25th meeting, adopted a provisional Rule of Procedure partially suspending the examination of satellite network filings under No. 9.35,

recognizing

- a)* that there was no agreement regarding this provisional Rule of Procedure on its conformity with the Radio Regulations;
- b)* that the Radiocommunication Bureau is facing severe financial restraints,

resolves

- 1 that the Bureau shall henceforth resume full examination of satellite network filings under No. 9.35 for those filings considered as received from 1 May 2002;
- 2 that, for those satellite coordination filings having been subjected to the provisional Rule of Procedure mentioned in *considering b)* above, the Bureau shall carry out the process described in the Annex and inform administrations of the results;
- 3 that, when the Bureau examines the assignments under Article 11 (No. 11.31) for satellite networks covered by *resolves 2*, for which the full examination under No. 9.35 was not carried out and which were identified in step *c)* of the Annex referred to in *resolves 2*, if the Bureau determines that assignments in the coordination request submitted under No. 9.30 exceed the limits in force at the date of receipt of this coordination information as contained in Articles 21 and 22 and relevant Resolutions, these assignments will receive an unfavourable finding;
- 4 that those assignments for which the findings are favourable under *resolves 3* shall also be examined under Article 11 (No. 11.31) with respect to their notification information submitted in accordance with No. 11.15,

invites administrations

1 to take into account, in their bilateral and multilateral negotiations with the concerned administrations, the results of the Bureau's actions referred to under *resolves* 2 above;

2 to inform the Bureau, if they so wish, of their comments on the published information referred to in the Annex,

instructs the Radiocommunication Bureau

to provide the necessary assistance to requesting administrations,

instructs the Radio Regulations Board

to suppress the current Rule of Procedure on No. **9.35**.

ANNEX TO RESOLUTION 900 (WRC-03)

Procedure to be used by the Radiocommunication Bureau for networks examined under the Rule of Procedure on No. 9.35

The Bureau shall calculate the power flux-density (pfd)/e.i.r.p. for those networks that were subject to the Rule of Procedure on No. **9.35** and make these results available to administrations without re-establishment of findings, with no publication of modifications to CR/C Special Sections, and no update of the satellite network system database.

The procedure to be used by the Bureau for those networks that were subject to the Rule of Procedure on No. **9.35** shall be as follows:

- a) Identify networks that were examined at the coordination stage under the Rule of Procedure and which were given qualified favourable (B) findings.
- b) Run the pfd calculation program for each frequency assignment in the network to generate pfd/e.i.r.p. results. These results may be further refined by the Bureau, to the extent practicable, using a process applicable to all networks. This process will be developed and adopted by the Bureau prior to undertaking this procedure.
- c) Format the results of the pfd calculation program for readability to identify those assignments that may not be in conformity with the appropriate limits.
- d) Convert these results to an appropriate format.
- e) Place these results on the ITU website and publish them all on CD-ROM to be sent to all administrations.

RESOLUTION 901 (WRC-03)

Determination of the orbital arc separation for which coordination would be required between two satellite networks operating in a space service not subject to a Plan

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that WRC-2000 adopted a coordination arc concept in Appendix 5 to simplify the coordination between fixed-satellite service (FSS) networks in certain frequency bands between 3.4 GHz and 30 GHz;
- b)* that in frequency bands below 3.4 GHz, mobile-satellite service (MSS) satellite networks normally have to coordinate with other networks with overlapping service areas operating anywhere in the visible arc;
- c)* that the application of such a concept was limited to the frequency ranges where very large numbers of FSS satellite filings had been received by ITU-R;
- d)* that many satellite networks and systems are now proposing to use higher frequency bands for which the coordination arc does not yet apply;
- e)* that the Radio Regulations Board (RRB) adopted a Rule of Procedure on No. 9.36 that extended the coordination arc concept to the FSS and broadcasting-satellite service (BSS), not subject to a Plan, and in all bands above 3.4 GHz until a review by WRC-03;
- f)* that the use of the coordination arc considerably reduces the volume of data that needs to be supplied to the Radiocommunication Bureau under Section D of Annex 2 to Appendix 4;
- g)* that application of the coordination arc concept has the potential to reduce the workload of the Bureau in identifying affected administrations;
- h)* that the coordination arc concept may be valid for all geostationary space stations operating in any space radiocommunication service above 3.4 GHz that is not subject to a Plan, but may require different values for different services and frequency bands;
- i)* that the ITU-R studies for other services and for frequency bands above 17.3 GHz, except for the 17.7-20.2 GHz and 29.5-30 GHz ranges for the FSS, have not been completed;
- j)* that application of the coordination arc concept could facilitate the introduction of satellite services above 17.3 GHz after the studies conclude on the appropriate value(s) of the coordination arc,

recognizing

that there have been no difficulties resulting from the application of the coordination arc concept in the bands where it applies,

noting

that this Conference has incorporated part of the Rule of Procedure referred to in *considering e)* and extended the coordination arc of $\pm 8^\circ$ for the FSS in bands above 17.3 GHz on a provisional basis, and has adopted an alternative value of $\pm 16^\circ$ on a provisional basis for the coordination arc applicable for the BSS in these bands in Table 5-1 of Appendix 5,

resolves

to recommend that a future competent conference review the results of ITU-R studies on the application of the coordination arc value(s) to other frequency bands and other services, as applicable, and consider their inclusion in Appendix 5,

invites ITU-R

1 to conduct studies on the applicability of the coordination arc concept for space radiocommunication services not yet covered by these Regulations;

2 to recommend, as appropriate, the orbital separation required for triggering inter-service and intra-service coordination concerning the satellite services in frequency bands above 3.4 GHz for geostationary-satellite (GSO) networks not subject to a Plan and not already covered by the coordination arc concept specified in No. 9.7 (GSO/GSO) of Table 5-1 (Appendix 5), under items 1), 2) and 3) of the frequency band column, and subject to Section II of Article 9,

instructs the Director of the Radiocommunication Bureau

to report the results of these studies to the RRB once Recommendations are approved, and to the next competent conference,

instructs the Radio Regulations Board

1 to suppress the Rules of Procedure adopted at its 25th meeting relating to the application of the coordination arc;

2 to consider the results of the studies included in ITU-R Recommendations and, as appropriate, develop a provisional Rule of Procedure, until a decision by the next world radiocommunication conference, to apply the coordination arc value(s) to those services and frequency bands identified in *invites ITU-R 2*.

RESOLUTION 902 (WRC-03)

**Provisions relating to earth stations located on board vessels
which operate in fixed-satellite service networks in the
uplink bands 5925-6425 MHz and 14-14.5 GHz**

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that there is a demand for global wideband satellite communication services on vessels;
- b)* that the technology exists that enables earth stations on board vessels (ESVs) to use fixed-satellite service (FSS) networks operating in the uplink bands 5925-6425 MHz and 14-14.5 GHz;
- c)* that ESVs are currently operating through FSS networks in the bands 3700-4200 MHz, 5925-6425 MHz, 10.7-12.75 GHz and 14-14.5 GHz under No. 4.4;
- d)* that ESVs have the potential to cause unacceptable interference to other services in the bands 5925-6425 MHz and 14-14.5 GHz;
- e)* that, with respect to the bands considered in this Resolution, global coverage is only available in the band 5925-6425 MHz and that only a limited number of geostationary FSS systems can provide such global coverage;
- f)* that, without special regulatory provisions, ESVs could place a heavy coordination burden on some administrations, especially those in developing countries;
- g)* that, in order to ensure the protection and future growth of other services, ESVs need to operate under certain technical and operational limitations;
- h)* that, within ITU-R studies, based on agreed technical assumptions, minimum distances from the low-water mark as officially recognized by the coastal State have been calculated, beyond which an ESV will not have the potential to cause unacceptable interference to other services in the bands 5925-6425 MHz and 14-14.5 GHz;
- i)* that, in order to limit the interference into other networks in the FSS, it is necessary to establish maximum off-axis e.i.r.p. density limits on ESV emissions;
- j)* that establishing a minimum antenna diameter for ESVs has an impact on the number of ESVs that will ultimately be deployed, hence it will reduce interference into the fixed service,

noting

a) that ESVs may be assigned frequencies to operate in FSS networks in the bands 3 700-4 200 MHz, 5 925-6 425 MHz, 10.7-12.75 GHz and 14-14.5 GHz pursuant to No. 4.4 and shall not claim protection from, nor cause interference to, other services having allocations in these bands;

b) that the regulatory procedures of Article 9 apply for ESVs operating at specified fixed points,

resolves

that ESVs transmitting in the 5 925-6 425 MHz and 14-14.5 GHz bands shall operate under the regulatory and operational provisions contained in Annex 1 and the technical limitations in Annex 2 of this Resolution,

encourages concerned administrations

to cooperate with administrations which license ESVs while seeking agreement under the above-mentioned provisions, taking into consideration the provisions of Recommendation 37 (WRC-03),

instructs the Secretary-General

to bring this Resolution to the attention of the Secretary-General of the International Maritime Organization (IMO).

ANNEX 1 TO RESOLUTION 902 (WRC-03)

Regulatory and operational provisions for ESVs transmitting in the 5925-6425 MHz and 14-14.5 GHz bands

1 The administration that issues the licence for the use of ESVs in these bands (licensing administration) shall ensure that such stations follow the provisions of this Annex and thus do not present any potential to cause unacceptable interference to the services of other concerned administrations.

2 ESV service providers shall comply with the technical limitations listed in Annex 2 and, when operating within the minimum distances as identified in item 4 below, with the additional limitations agreed by the licensing and other concerned administrations.

3 In the 3 700-4 200 MHz band and 10.7-12.75 GHz range, ESVs in motion shall not claim protection from transmissions of terrestrial services operating in accordance with the Radio Regulations.

4 The minimum distances from the low-water mark as officially recognized by the coastal State beyond which ESVs can operate without the prior agreement of any administration are 300 km in the 5 925-6 425 MHz band and 125 km in the 14-14.5 GHz band, taking into account the technical limitations in Annex 2. Any transmissions from ESVs within the minimum distances shall be subject to the prior agreement of the concerned administration(s).

5 The potentially concerned administrations referred to in the previous item 4 are those where fixed or mobile services are allocated on a primary basis in the Table of Frequency Allocations of the Radio Regulations:

Frequency bands	Potentially concerned administrations
5 925-6 425 MHz	All three Regions
14-14.25 GHz	Countries listed in No. 5.505 , except those listed in No. 5.506B
14.25-14.3 GHz	Countries listed in Nos. 5.505 , 5.508 and 5.509 , except those listed in No. 5.506B
14.3-14.4 GHz	Regions 1 and 3, except countries listed in No. 5.506B
14.4-14.5 GHz	All three Regions, except countries listed in No. 5.506B

6 The ESV system shall include means of identification and mechanisms to immediately cease emissions, whenever the station does not operate in compliance with the provisions of items 2 and 4 above.

7 Cessation of emissions as referred to in item 6 above shall be implemented in such a way that the corresponding mechanisms cannot be bypassed on board the vessel, except under the provisions of No. **4.9**.

8 ESVs shall be equipped so as to:

- enable the licensing administration under the provisions of Article **18** to verify earth station performance; and
- enable the cessation of ESV emissions immediately upon request by an administration whose services may be affected.

9 Each licence-holder shall provide a point of contact to the administration with which agreements have been reached for the purpose of reporting unacceptable interference caused by the ESV.

10 When ESVs operating beyond the territorial sea but within the minimum distance (as referred to in item 4 above) fail to comply with the terms required by the concerned administration pursuant to items 2 and 4, then that administration may:

- request the ESV to comply with such terms or cease operation immediately; or
- request the licensing administration to require such compliance or immediate cessation of the operation.

ANNEX 2 TO RESOLUTION 902 (WRC-03)

Technical limitations applicable to ESVs transmitting in the bands
5925-6425 MHz and 14-14.5 GHz

	5 925-6 425 MHz	14-14.5 GHz
Minimum diameter of ESV antenna	2.4 m	1.2 m ¹
Tracking accuracy of ESV antenna	±0.2° (peak)	±0.2° (peak)
Maximum ESV e.i.r.p. spectral density toward the horizon	17 dB(W/MHz)	12.5 dB(W/MHz)
Maximum ESV e.i.r.p. towards the horizon	20.8 dBW	16.3 dBW
Maximum off-axis e.i.r.p. density ²	See below	See below

¹ While operations within the minimum distances are subject to specific agreement with concerned administrations, licensing administrations may authorize the deployment of smaller antenna sizes down to 0.6 m at 14 GHz provided that the interference to the terrestrial services is no greater than that which would be caused with an antenna size of 1.2 m, taking into account Recommendation ITU-R SF.1650. In any case, the use of smaller antenna size shall be in compliance with the tracking accuracy of ESV antenna, maximum ESV e.i.r.p. spectral density toward the horizon, maximum ESV e.i.r.p. towards the horizon and maximum off-axis e.i.r.p. density limits in the Table above and the protection requirements of the FSS intersystem coordination agreements.

² In any case, the e.i.r.p. off-axis limits shall be compliant with the FSS intersystem coordination agreements that may agree to more stringent off-axis e.i.r.p. levels.

Off-axis limits

For earth stations on board vessels operating in the 5925-6425 MHz band, at any angle ϕ specified below, off the main-lobe axis of an earth-station antenna, the maximum e.i.r.p. in any direction within 3° of the GSO shall not exceed the following values:

5 925-6 425 MHz

<i>Angle off-axis</i>	<i>Maximum e.i.r.p. per 4 kHz band</i>
$2.5^{\circ} \leq \phi \leq 7^{\circ}$	$(32 - 25 \log \phi)$ dB(W/4 kHz)
$7^{\circ} < \phi \leq 9.2^{\circ}$	11 dB(W/4 kHz)
$9.2^{\circ} < \phi \leq 48^{\circ}$	$(35 - 25 \log \phi)$ dB(W/4 kHz)
$48^{\circ} < \phi \leq 180^{\circ}$	-7 dB(W/4 kHz)

For ESV operating in the 14.0-14.5 GHz band, at any angle ϕ specified below, off the main-lobe axis of an earth station antenna, the maximum e.i.r.p. in any direction within 3° of the GSO shall not exceed the following values:

14.0-14.5 GHz

<i>Angle off-axis</i>	<i>Maximum e.i.r.p. in any 40 kHz band</i>
$2^\circ \leq \phi \leq 7^\circ$	$(33 - 25 \log \phi) \quad \text{dB(W/40 kHz)}$
$7^\circ < \phi \leq 9.2^\circ$	$12 \quad \text{dB(W/40 kHz)}$
$9.2^\circ < \phi \leq 48^\circ$	$(36 - 25 \log \phi) \quad \text{dB(W/40 kHz)}$
$48^\circ < \phi \leq 180^\circ$	$-6 \quad \text{dB(W/40 kHz)}$

RESOLUTION 950 (WRC-03)

**Consideration of the use of the frequencies
between 275 and 3 000 GHz**

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that, in the Table of Frequency Allocations, frequency bands above 275 GHz are not allocated;
- b)* that, notwithstanding *considering a)*, No. **5.565** makes provision for the use of the frequency band 275-1 000 GHz for the development of various passive services and all other services and recognizes the need to conduct further experimentation and research;
- c)* that No. **5.565** also makes provision for the protection of passive services until such time as the Table of Frequency Allocations may be extended;
- d)* that, in addition to the spectral lines identified by No. **5.565**, research activities in the bands above 275 GHz may yield other spectral lines of interest, such as those listed in Recommendation ITU-R RA.314;
- e)* that within various ITU-R study groups, studies on systems between 275 and 3 000 GHz, including system characteristics of suitable applications, are being considered;
- f)* that the present use of the bands between 275 and 3 000 GHz is mainly related to the passive services, however, with anticipated technology development, the bands may become increasingly important for suitable active service applications;
- g)* that sharing studies in ITU-R among passive services and all other services operating in frequencies between 275 and 3 000 GHz have not been completed,

recognizing

- a)* that propagation characteristics at frequencies above 275 GHz, such as atmospheric absorption and scattering, have a significant impact on the performance of both active and passive systems and need to be studied;
- b)* that it is necessary to investigate further the potential uses of the bands between 275 and 3 000 GHz by suitable applications,

noting

a) that significant infrastructure investments are being made under international collaboration for the use of these bands between 275 and 3 000 GHz, for example, the Atacama Large Millimetre Array (ALMA), a facility under construction that will provide new insights on the structure of the universe;

b) that BR Circular Letter CR/137 identified additional information for the Radiocommunication Bureau to record characteristics of active and passive sensors for Earth exploration-satellite service and space research service satellites, in frequency bands below 275 GHz,

further noting

a) that a process and format similar to that provided in *noting b)* could be used to record systems operating in the 275 to 3 000 GHz band;

b) that recording active and passive systems operating in the 275 to 3 000 GHz band will provide information until the date when it is determined that changes to the Radio Regulations are needed,

resolves

1 to consider at WRC-10 frequency allocations between 275 GHz and 3 000 GHz taking into account the result of the ITU-R studies;

2 that administrations may submit for inclusion in the Master International Frequency Register details on systems which operate between 275 and 3 000 GHz and which may be recorded by the Radiocommunication Bureau under Nos. **8.4**, **11.8** and **11.12**,

invites ITU-R

to conduct the necessary studies in time for consideration by WRC-10 with a view to the modification of No. **5.565** or the possible extension of the Table of Frequency Allocations above 275 GHz, including advice on the applications suitable for such bands,

instructs the Director of the Radiocommunication Bureau

to accept submissions referred to in *resolves 2*, and to record them in the Master International Frequency Register.

RESOLUTION 951 (WRC-03)

**Options to improve the international spectrum
regulatory framework**

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that spectrum is a finite resource and there is a continued increase in demand for radiocommunications;
- b)* that there is also an increasing number and diversity of applications that need to be accommodated in the radio spectrum;
- c)* that there is a keen interest in the rational, efficient and economic use of spectrum;
- d)* that by segregating bands for different radiocommunication services the best outcome in terms of spectrum efficiency may not be achieved;
- e)* that applications are emerging in which elements of different radiocommunication services (as defined in the Radio Regulations) are combined;
- f)* that there is a convergence of radio technologies, inasmuch as the same radio technology can be used in systems that operate in different radiocommunication services or with different allocation status (primary or secondary);
- g)* that similar data rates and quality of service attributes are available with different radiocommunication systems operating in different radiocommunication services;
- h)* that the use of modern underlying communication architectures and protocols, such as those used in packet radio systems, enables the concurrent provision of different applications from the same platform operating in the same frequency bands;
- i)* that evolving and emerging radiocommunication technologies may enable sharing with different existing technologies across different allocations over the traditional band segmentations;
- j)* that these evolving and emerging technologies may not require band segmentation within the traditional spectrum allocation framework;
- k)* that these or other evolving and emerging technologies may lead to more frequency-agile and interference-tolerant equipment and consequently to more flexible use of spectrum;
- l)* that some administrations are considering a flexible allocation framework with the aim of more efficient utilization of the spectrum on a national basis,

noting

that the purpose of the Radio Regulations is to ensure a framework for the effective management and use of spectrum and not to constrain the development of existing or new applications and technologies,

resolves

that studies be carried out by ITU-R to examine the effectiveness, appropriateness and impact of the Radio Regulations, with respect to the evolution of existing, emerging and future applications, systems and technologies, and to identify options for improvements in the Radio Regulations that address the *considering* and *noting* above,

instructs the Director of the Radiocommunication Bureau

to include the results of these studies in his Report to WRC-07 for the purposes of considering whether to place this subject on a future conference agenda,

invites administrations

to participate actively in the studies by submitting contributions to ITU-R.

RESOLUTION 952 (WRC-03)

**Studies regarding devices using
ultra-wideband technology**

The World Radiocommunication Conference (Geneva, 2003),

considering

- a) that studies on devices using ultra-wideband technology (UWB) are ongoing in ITU-R;
- b) that UWB devices could produce unacceptable degradation in frequency bands allocated to radiocommunication services, according to the performance and availability requirements of those services;
- c) that UWB devices are radio transmitters or receivers or both and hence are not considered as Industrial, Scientific and Medical (ISM) applications under No. **1.15**,

recognizing

that UWB technology holds promise for an array of new applications that may provide benefits for users,

resolves to invite ITU-R

to continue its studies relating to devices using UWB technology in order to ensure adequate protection of radiocommunication services,

instructs the Director of the Radiocommunication Bureau

- to draw the attention of the Comité International Spécial des Perturbations Radioélectriques (CISPR) to the definition of ISM applications under No. **1.15**;
- to invite CISPR to use this definition in CISPR Publication 11 until a new definition is developed in ITU-R in collaboration with CISPR;
- to inform CISPR that UWB devices which are radio transmitters or receivers or both and hence not considered as ISM applications by the ITU-R, are currently under study in ITU-R.

RECOMMENDATION 37 (WRC-03)

**Operational procedures for earth stations
on board vessels (ESVs) use**

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that under the provisions of Resolution **902 (WRC-03)** transmissions from ESVs within the distances defined in item 4 of Annex 1 of Resolution **902 (WRC-03)** should be based upon prior agreement of concerned administrations;
- b)* that it is desirable to provide guidance on activities to achieve such prior agreement with concerned administrations;
- c)* that such guidance should include the operational procedures for ESV use,

recommends

that operation of ESVs follow the procedures set forth in the Annex.

ANNEX 1 TO RECOMMENDATION 37 (WRC-03)

Operational procedures for ESV use**A Initiation of contact**

The ESV licensing administration or the licence-holder should contact, in advance of ESV operations within the minimum distances, the concerned administration(s) to obtain agreements that will establish the technical bases for avoiding unacceptable interference to the terrestrial facilities of the concerned administration or administrations.

The minimum distances and concerned administrations are defined in items 4 and 5 of Annex 1 of Resolution **902 (WRC-03)**, respectively.

B Recommended actions of licensing administrations, licence-holders and concerned administrations

- The licensing administration or the licence-holder should provide the technical and operational parameters required by the concerned administration, among them, if required, information on the movement of the ship(s) equipped with ESVs within the minimum distances.
- Concerned administrations that wish to permit the operation of ESVs should determine if they have terrestrial stations that could be affected by ESV operations with a view to identifying possible frequencies for ESV use that would avoid potential interference.

C Frequency use arrangements

National practices, as well as applicable Recommendations of ITU-R (such as ITU-R S.1587, ITU-R SF.1585, ITU-R SF.1648, ITU-R SF.1649, ITU-R SF.1650), may be used in reaching frequency usage arrangements.

D Avoidance of unacceptable interference

According to Annex 1 of Resolution **902 (WRC-03)** the ESV licensing administration shall ensure that such stations do not cause unacceptable interference to the services of other concerned administrations. In the event that unacceptable interference occurs, the licence-holder must eliminate the source of any interference from its station immediately upon being advised of such interference. Additionally, the licence-holder shall immediately terminate transmissions at the request of either the concerned administration or the ESV licensing administration if either administration determines that the ESV is causing unacceptable interference or is otherwise not being operated in compliance with the operating agreement.

RECOMMENDATION 75 (WRC-03)

Study of the boundary between the out-of-band and spurious domains of primary radars using magnetrons

The World Radiocommunication Conference (Geneva, 2003),

considering

- a) that the principal objective of Appendix 3 is to specify the maximum permitted level of unwanted emissions in the spurious domain;
- b) that the out-of-band and spurious domains of an emission are defined in Article 1;
- c) that Recommendation ITU-R SM.1541 specifies the boundary between the out-of-band and spurious domains for primary radars, and that the boundary is related to the emission mask based on the –40 dB bandwidth;
- d) that Appendix 3 refers to Recommendation ITU-R SM.1541;
- e) that the measurement method for unwanted emissions of radars is described in Recommendation ITU-R M.1177,

recognizing

- a) that § 3.3 of Annex 1 in Recommendation ITU-R SM.1539-1 mentions that the specification of the boundary between the out-of-band and spurious domains of primary radars is subject to ongoing studies in ITU-R and that there would be benefit in having these completed by the next Radiocommunication Assembly;
- b) that there is a possibility that calculated values for the –40 dB bandwidth related to unwanted emissions of primary radars using magnetrons underestimate the actual bandwidth,

recommends

- 1 that ITU-R study calculation methods for the –40 dB bandwidth necessary for the determination of the boundary between the spurious and out-of-band domains of primary radars using magnetrons;
- 2 that ITU-R establish improved measurement methods for unwanted emissions of primary radars using magnetrons,

invites administrations

to participate actively in the above studies by submitting contributions to ITU-R.

RECOMMENDATION 100 (Rev.WRC-03)

**Preferred frequency bands for systems
using tropospheric scatter**

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* the technical and operational difficulties pointed out by Recommendation ITU-R F.698 in the frequency bands shared by tropospheric scatter systems, space systems and other terrestrial systems;
- b)* the additional allocation of frequency bands made by WARC-79 and WARC-92 for the space services in view of their increasing development;
- c)* that the Radiocommunication Bureau requires administrations to supply specific information on systems using tropospheric scatter in order to verify compliance with certain provisions of the Radio Regulations (such as Nos. **5.410** and **21.16.3**),

recognizing nevertheless

that, to meet certain telecommunication requirements, administrations will wish to continue using tropospheric scatter systems,

noting

that the proliferation of such systems in all frequency bands and particularly in those shared with space systems is bound to aggravate an already difficult situation,

recommends that administrations

- 1 for the assignment of frequencies to new stations in systems using tropospheric scatter, take into account the latest information prepared by ITU-R to ensure that systems established in the future use a limited number of certain frequency bands;
- 2 in frequency assignment notifications to the Bureau, indicate expressly whether they relate to stations of tropospheric scatter systems.

RECOMMENDATION 517 (Rev.WRC-03)

Relative RF protection ratio values for single-sideband emissions in the HF bands allocated to the broadcasting service

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that WRC-97 adopted Article **12** as the seasonal planning procedure for the HF bands allocated to the broadcasting service;
- b)* that this procedure is based principally on the use of double-sideband (DSB) emissions;
- c)* that the RF co-channel protection ratio is one of the fundamental planning parameters;
- d)* that this Conference has adopted Resolution **517 (Rev.WRC-03)** relating to the introduction of digitally modulated and single-sideband (SSB) emissions in the HF bands allocated to the broadcasting service;
- e)* that the SSB system characteristics for HF broadcasting are contained in Appendix **11**;
- f)* that studies have shown that SSB emissions may require a lower RF co-channel protection ratio for the same reception quality,

recommends

that, in the preparation of the relevant Rules of Procedure for the application of Article **12**, the Bureau should use the values of relative RF protection ratio given in the Annex to this Recommendation relating to SSB and DSB emissions in the HF bands allocated to the broadcasting service.

ANNEX TO RECOMMENDATION 517 (Rev.WRC-03)

Relative RF protection ratio values

1 The values of relative RF protection ratio given in the table should be used whenever SSB emissions in conformity with the specification in Appendix **11** are involved in the use of the HF bands allocated to the broadcasting service.

2 For the reception of DSB and SSB (6 dB carrier reduction relative to peak envelope power) wanted signals, a conventional DSB receiver with envelope detection designed for a channel spacing of 10 kHz is assumed.

3 SSB signals with 6 dB carrier reduction relative to peak envelope power assume equivalent sideband power as specified in Appendix 11, Part B, § 1.2.

4 The figures for case 2 in the following Table relate to a situation where the centre frequency of the intermediate frequency pass-band of the DSB receiver is tuned to the carrier frequency of the wanted SSB signal. If this is not the case, the value for a difference of +5 kHz may increase to -1 dB.

Relative RF protection ratio values with reference to the co-channel RF protection ratio for DSB wanted and unwanted signals (dB)¹ for use in the HF bands allocated to the broadcasting service

	Wanted signal	Unwanted signal	Carrier frequency separation <i>f</i> unwanted – <i>f</i> wanted, Δ <i>f</i> (kHz)								
			–20	–15	–10	–5	0	+5	+10	+15	+20
1	DSB	SSB (6 dB carrier reduction relative to p.e.p.)	–51	–46	–32	+1	3	–2	–32	–46	–51
2	SSB (6 dB carrier reduction relative to p.e.p.)	DSB	–54	–49	–35	–3	0	–3	–35	–49	–54
3	SSB (6 dB carrier reduction relative to p.e.p.)	SSB (6 dB carrier reduction relative to p.e.p.)	–51	–46	–32	+1	0	–2	–32	–46	–51

¹ Frequency separation Δf less than -20 kHz, as well as Δf greater than 20 kHz, need not be considered.

RECOMMENDATION 608 (WRC-03)

**Guidelines for consultation meetings established in
Resolution 609 (WRC-03)**

The World Radiocommunication Conference (Geneva, 2003),

considering

a) that in accordance with the Radio Regulations (RR), the band 960-1215 MHz is allocated on a primary basis to the aeronautical radionavigation service (ARNS) in all the ITU Regions;

b) that WRC-2000 introduced a co-primary allocation for the radionavigation-satellite service (RNSS) in the frequency band 1164-1215 MHz (subject to the conditions specified under No. **5.328A**), with a provisional limit on the aggregate pfd produced by all the space stations within all radionavigation-satellite systems at the Earth's surface of $-115 \text{ dB(W/m}^2\text{)}$ in any 1 MHz band for all angles of arrival;

c) that this Conference revised this provisional limit and decided that the level of $-121.5 \text{ dB(W/m}^2\text{)}$ in any 1 MHz for the aggregate equivalent power flux-density (epfd) applying for all the space stations within all RNSS systems, taking into account the reference worst-case ARNS system antenna characteristics described in Annex 2 of Recommendation ITU-R M.1642, is adequate to ensure the protection of the ARNS in the band 1164-1215 MHz;

d) that this Conference decided that to achieve the objectives in *resolves* 1 and 2 of Resolution **609 (WRC-03)**, administrations operating or planning to operate RNSS systems will need to agree cooperatively through consultation meetings to achieve the level of protection for ARNS systems, and shall establish mechanisms to ensure that all potential RNSS system operators are given full visibility of the process but that only real systems are taken into account in the calculation of the aggregate epfd,

recommends

1 that in the implementation of *resolves* 5 of Resolution **609 (WRC-03)**, in the frequency band 1164-1215 MHz, the maximum pfd produced at the surface of the Earth by emissions from a space station in the RNSS, for all angles of arrival, should not exceed $-129 \text{ dB(W/m}^2\text{)}$ in any 1 MHz band under free space propagation conditions;

2 that the RNSS characteristics listed in the Annex 1, used when applying the methodology contained in Recommendation ITU-R M.1642, as well as the calculated aggregate epfd in $\text{dB(W/m}^2\text{)}$ in each 1 MHz in the range 1164-1215 MHz, should be made available in electronic format by the consultation meetings.

ANNEX 1 TO RECOMMENDATION 608 (WRC-03)

**List of RNSS system characteristics and format of the result of the aggregate
epfd calculation to be provided to the Radiocommunication
Bureau for publication for information**

I RNSS systems characteristics**I-1 RNSS ITU publication reference**

RNSS network name	Network ID	ITU Publication reference	IFIC
		AR11/A/....	
		API/A/....	
		AR11/C/....	
		CR/C/....	

I-2 Non-GSO satellite system constellation parameters

For each non-GSO satellite system, the following constellation parameters should be provided to the Bureau for publication for information:

- N : number of space stations of the non-GSO system
- K : number of orbital planes
- h : satellite altitude above the Earth (km)
- I : inclination angle of the orbital plane above the Equator (degrees).

Satellite index I	RAAN $\Omega_{i,0}$ (degrees)	Argument of latitude $E_{i,0}$ (degrees)
1
2
...
N

I-3 GSO satellite system longitude

For each GSO satellite network, the satellite longitude should be provided to the Bureau for publication for information, as follows:

- LonGSO _{i} : longitude of each of the GSO satellites (degrees).

I-4 Maximum non-GSO space station pfd versus the elevation angle at the Earth's surface (worst 1 MHz)

For the non-GSO satellite system space stations, the maximum pfd in the worst 1 MHz versus elevation angle should be provided to the Bureau for publication for information in a

table format as follows:

Elevation angle (each 1°)	pfd (dB(W/(m ² · MHz)))
–4	pfd (–4°)
–3	pfd (–3°)
...	...
...	...
90	pfd (–90°)

I-5 Maximum GSO space station pfd versus latitude and longitude at the Earth's surface (worst 1 MHz)

For each GSO satellite network space station, the maximum pfd in the worst 1 MHz, defined as the 1 MHz in which the pfd of the signal is maximum versus latitude and longitude should be provided to the Bureau for publication for information in a table format as follows:

Longitude (each 1°)	0	1	...	360
Latitude (each 1°)	Maximum pfd dB(W/m ²) in worst 1 MHz			
–90	pfd (0, –90)
–89
...
...
90	pfd (360, 90)

I-6 Spectrum for GSO satellite networks or non-GSO satellite systems

For each GSO satellite network or non-GSO satellite system, the level of spectrum emission in each 1 MHz relative to the spectrum value at the worst 1 MHz of the whole band (1 164–1 215 MHz) should also be provided to the Bureau for publication for information.

II Results of the aggregate epfd calculation in the worst MHz of the 1 164–1 215 MHz band

Maximum aggregate epfd in dB(W/m²) in the worst-case megahertz in the range 1 164–1 215 MHz.

RECOMMENDATION 722 (WRC-03)

**Review of technical, operational and frequency issues
for terrestrial wireless interactive multimedia
applications on a global basis**

The World Radiocommunication Conference (Geneva, 2003),

considering

- a) the technical evolution taking place in several areas of telecommunications;
- b) the ongoing convergence between some applications of the fixed, mobile and broadcasting services;
- c) the emergence of interactive multimedia applications to be delivered by wireless;
- d) the desirability of finding global solutions for terrestrial wireless interactive multimedia applications,

noting

- a) the historical practice of frequency segmentation, particularly the differences between Regions, but also segmentation between services, in the Table of Frequency Allocations (Article 5);
- b) Recommendation **34 (WRC-95)**, derived from the recommendations of the Voluntary Group of Experts (VGE) for the study of alternative allocation methods, merging of services, etc., which sets the objectives of allocating frequency bands on a worldwide basis and to the most broadly defined services, wherever possible;
- c) Resolution 9 (Rev.Istanbul, 2002) of the World Telecommunication Development Conference, calling for active participation by the developing countries in the review of global spectrum requirements for new technologies;
- d) that terrestrial wireless interactive multimedia applications are capable of supporting the bidirectional exchange of information between users or between users and servers and may be implemented within one or more of the mobile, fixed and broadcasting services;
- e) that ITU-R Study Groups are currently addressing the relevant issues, including, *inter alia*, the digitization of broadcasting services and studies on spectrum requirements,

recognizing

- a) the time necessary to develop and agree on the technical, operational and spectrum issues, and to resolve any regulatory impediments that may exist, associated with the introduction of multimedia wireless applications on a global basis;

- b) the need to further define and develop the terrestrial wireless interactive multimedia concept, and applications that may be delivered by fixed, mobile and broadcasting networks;
- c) that, for international operation and economies of scale, it is desirable to agree on the technical, operational and spectrum-related parameters of systems;
- d) that spectrum studies are a prerequisite for the technological and economic success of multimedia wireless applications,

recommends that ITU-R

- 1 continue its studies on the technical, operational and frequency issues and identify any regulatory impediments that may arise in relation to the introduction of terrestrial wireless interactive multimedia applications on a global basis;
- 2 prepare Reports and Recommendations as necessary,

invites administrations

to participate in these studies by submitting contributions to ITU-R.

RECOMMENDATION 723 (WRC-03)

**Spectrum usage and operational characteristics
of electronic news gathering systems**

The World Radiocommunication Conference (Geneva, 2003),

considering

- a)* that the use of portable and nomadic microwave radio equipment operating in appropriate fixed and mobile service bands commonly described as electronic news gathering (ENG) is now an important element in comprehensive news coverage by broadcasters;
- b)* that the growth of the use of the frequency bands between 500 MHz and 10 GHz for mobile, satellite and other radiocommunication applications has significantly reduced the flexibility of some administrations in providing adequate and appropriate spectrum to meet the needs of broadcasters including the temporary needs of visiting broadcasters of other administrations;
- c)* that digitization may provide an opportunity for more efficient spectrum usage for ENG that could assist with meeting a growing demand for spectrum by these systems;
- d)* that availability of relevant ITU publications on ENG can assist administrations in addressing ENG operations in their spectrum planning;
- e)* that it is desirable that administrations have available appropriate ITU-R Reports and Recommendations addressing the different technical and operational characteristics of applications using the fixed and mobile bands when developing proposals to WRCs addressing those bands,

recommends that ITU-R

- 1 continue the study, as a matter of urgency, of the technical, operational and frequency issues of ENG on a global basis;
- 2 prepare Reports and/or Recommendations as appropriate,

invites the Director of the Radiocommunication Bureau

to include the status of this study in his Report to WRC-07 for information,

invites administrations

to participate in this study by submitting contributions.

RECOMMENDATION 800 (WRC-03)

**Principles for establishing agendas for world
radiocommunication conferences**

The World Radiocommunication Conference (Geneva, 2003),

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 (WRC-2000)** 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 radio-communications 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,

recommends

- 1 that the principles in Annex 1 should be used when developing future WRC agendas;

- 2 that the template in Annex 2 should be used in proposing agenda items for WRCs,
invites administrations

to participate in regional activities for the preparation of future WRC agendas.

ANNEX 1 TO RECOMMENDATION 800 (WRC-03)

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 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-2000)** and Resolution 80 (Rev. Marrakesh, 2002) of the Plenipotentiary Conference;
- b) include, to the extent possible, agenda items that are proposed through 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.

ANNEX 2 TO RECOMMENDATION 800 (WRC-03)

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:

<i>Studies to be carried out by:</i>	<i>with the participation of:</i>
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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