APPENDIX 30 (REV.WRC-15)*

Provisions for all services and associated Plans and List[1] for the broadcasting-satellite service in the frequency bands 11.7-12.2 GHz (in Region 3), 11.7-12.5 GHz (in Region 1) and 12.2-12.7 GHz (in Region 2) (WRC-03)

(See Articles **9** and **11**) (WRC-03)

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* 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. See also Annex 7 for the orbital limitations. (WRC-2000)

[1] The Regions 1 and 3 List of additional uses is annexed to the Master International Frequency Register (see Resolution **542 (WRC-2000)****). (WRC-03)

** *Note by the Secretariat*: This Resolution was abrogated by WRC-03.

Note by the Secretariat: Reference to an Article with the number in roman is referring to an Article in this Appendix.

* *Note by the Secretariat*: This Resolution was revised by WRC-12 and WRC-15.

ARTICLE 1 (REV.WRC-03)

General definitions

1 For the purposes of this Appendix, the following terms shall have the meanings defined below:

1.1 *1977 Conference*: World Administrative Radio Conference for the Planning of the Broadcasting-Satellite Service in the Frequency Bands 11.7-12.2 GHz (in Regions 2 and 3) and 11.7-12.5 GHz (in Region 1), called in short World Broadcasting-Satellite Administrative Radio Conference (Geneva, 1977) (WARC-77).

1.2 *1983 Conference*: Regional Administrative Radio Conference for the Planning in Region 2 of the Broadcasting-Satellite Service in the Frequency Band 12.2-12.7 GHz and Associated Feeder Links in the Frequency Band 17.3-17.8 GHz, called in short Regional Administrative Conference for the Planning of the Broadcasting-Satellite Service in Region 2 (Geneva, 1983) (RARC Sat-R2).

1.3 *1985 Conference*: First Session of the World Administrative Radio Conference on the Use of the Geostationary-Satellite Orbit and the Planning of Space Services Utilizing It (Geneva, 1985), called in short WARC Orb-85.

1.3A *1997 Conference*: World Radiocommunication Conference (Geneva, 1997), called in short WRC-97.

1.3B *2000 Conference*: World Radiocommunication Conference (Istanbul, 2000), called in short WRC-2000.

1.4 *Regions 1 and 3 Plan*: The 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 contained in this Appendix.

1.5 *Region 2 Plan*: The Plan for the broadcasting-satellite service in the frequency band 12.2-12.7 GHz in Region 2 contained in this Appendix, together with any modifications resulting from the successful application of the procedures of Article 4.

1.6 *Frequency assignment in conformity with the Plan*:

– any frequency assignment which appears in the Regions 1 and 3 Plan; *or*

– any frequency assignment which appears in the Region 2 Plan or for which the procedure of Article 4 has been successfully applied.

1.7 *Additional use in Regions 1 and 3*: For the application of the provisions of this Appendix, additional uses in Regions 1 and 3 are:

– use of assignments with characteristics different from those appearing in the Regions 1 and 3 Plan and which are capable of causing more interference than the corresponding entries in the Plan;

– use of assignments in addition to those appearing in the Plan.

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)

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)

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 (WRC-03)

Frequency bands

2.1 The provisions of this Appendix apply to the broadcasting-satellite service in the frequency bands between 11.7 GHz and 12.2 GHz in Region 3, between 11.7 GHz and 12.5 GHz in Region 1 and between 12.2 GHz and 12.7 GHz in Region 2 and to the other services to which these bands are allocated in Regions 1, 2 and 3, insofar as their relationship to the broadcasting-satellite service in these bands is concerned.

2.2 (SUP - WRC-03)

ARTICLE 2A (REV.WRC-15)

Use of the guardbands

2A.1 The use of the guardbands defined in § 3.9 of Annex 5 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) is not subject to the application of Section I of Article **9**.

2A.1.1 Coordination between assignments intended to provide the space operation functions and assignments of the BSS subject to a Plan shall be effected using the provisions of Article 7.

2A.1.2 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, as appropriate.

* *Note by the Secretariat*: This Resolution was abrogated by WRC-03.

2A.1.3 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.

2A.1.4 Requests for the coordination referred to in §2A.1.1, 2A.1.2 and 2A.1.3 shall be sent by the requesting administration to the Bureau, together with the appropriate information listed in Appendix **4**.

2A.2 Any assignment intended to provide these functions in support of a geostationary-satellite network in the BSS shall be notified under Article **11** and brought into use within the following time-limits[1*bis*]: (WRC-15)

2A.2.1 *a)* for the case where the associated BSS assignments are contained in one of 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), within the regulatory time-limit referred to in § 4.1.3 or § 4.2.6 of Article 4 from the date of receipt by the Bureau of the complete Appendix **4** data for those assignments intended to provide the space operation functions;

2A.2.2 *b)* for the case where the associated BSS assignments have been submitted under § 4.1.3 or § 4.2.6 of Article 4 for entry in the Regions 1 and 3 List or a modification to the Region 2 Plan, within the regulatory time-limit referred to in § 4.1.3 or § 4.2.6 of Article 4 for those associated BSS assignments;

2A.2.3 *c)* for the case where the associated BSS assignments have already been brought into use in accordance with the Radio Regulations, within the regulatory time-limit referred to in § 4.1.3 and § 4.2.6 of Article 4 from the date of receipt by the Bureau of the complete Appendix **4** data for those assignments intended to provide the space operation functions.

2A.3 Section II of Article **23** does not apply to assignments in the guardbands intended to provide the above-mentioned functions.

ARTICLE 3 (WRC-2000)

Execution of the provisions and associated Plans

3.1 The Member States in Regions 1, 2 and 3 shall adopt, for their broadcasting-satellite space stations[2] operating in the frequency bands referred to in this Appendix, the characteristics specified in the appropriate Regional Plan and the associated provisions.

3.2 The Member States shall not change the characteristics specified in the Regions 1 and 3 Plan or in the Region 2 Plan, or bring into use assignments to broadcasting-satellite space stations or to stations in the other services to which these frequency bands are allocated, except as provided for in the Radio Regulations and the appropriate Articles and Annexes of this Appendix.

[1*bis*] The time-limit is established at the time when the request is received under § 2A.1.4. (WRC-15)

[2] Such stations may also be used for transmissions in the fixed-satellite service (space-to-Earth) in accordance with No. **5.492**.

3.3 The Regions 1 and 3 Plan is based on national coverage from the geostationary-satellite orbit. The associated procedures contained in this Appendix are intended to promote long-term flexibility of the Plan and to avoid monopolization of the planned bands and orbit by a country or a group of countries.

ARTICLE 4 (REV.WRC-15)

Procedures for modifications to the Region 2 Plan or for additional uses in Regions 1 and 3[3]

4.1 Provisions applicable to Regions 1 and 3

4.1.1 An administration proposing to include a new or modified assignment in the List shall seek the agreement of those administrations whose services are considered to be affected, i.e. administrations:

a) of Regions 1 and 3 having a frequency assignment to a space station in the broadcasting-satellite service which is included in the Regions 1 and 3 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 frequency assignment included in the 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 frequency assignment to a space station in the broadcasting-satellite service which is in conformity with the Region 2 Plan, or in respect of which proposed modifications to that Plan have 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 no frequency assignment in the broadcasting-satellite service with a necessary bandwidth, any portion of which falls within the necessary bandwidth of the proposed assignment, but in whose territory the power flux-density value exceeds the prescribed limit as a result of the proposed assignment, or having an assignment whose associated service area does not cover the whole of the territory of the administration, and in whose territory outside that service area the power flux-density from the proposed assignment exceeds the prescribed limit as a result of the proposed assignment; *or*

e) having a frequency assignment in the band 11.7-12.2 GHz in Region 2 or 12.2-12.5 GHz in Region 3 to a space station in the fixed-satellite service which is recorded in the Master International Frequency Register (Master Register) or for which complete coordination information has been received by the Bureau for coordination under No. **9.7**, or under § 7.1 of Article 7.

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[3] The provisions of Resolution **49 (Rev.WRC-15)** apply. (WRC-15)

4.1.2 The services of an administration are considered to be affected when the limits shown in Annex 1 are exceeded.

4.1.3 An administration, or one[4] 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 within eight years after the date of receipt by the Bureau of the relevant complete information[5]. A proposed new or modified assignment not included in the List within eight years after the date of receipt by the Bureau of the relevant complete information shall also lapse[5]. (WRC-07)

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[6]. 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 Resolutions **49 (Rev.WRC-15)** for the assignment with respect to the satellite that suffered the launch failure, if that information has not already been provided.

If, 11 months after the request for extension, the administration has not provided to the Bureau updated Resolution **49 (Rev.WRC-15)** information, the Bureau shall promptly send a reminder to the notifying administration. If, within one year of the request for extension, the administration has not provided to the Bureau updated Resolution **49 (Rev.WRC-15)** information for the new satellite under procurement, the related frequency assignments shall lapse. (WRC-15)

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[4] 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)

[5] The provisions of Resolution **533 (Rev.WRC-2000)*** apply. (WRC-03)

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

[6] 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)

4.1.4 If the information received by the Bureau under § 4.1.3 is found to be incomplete, the Bureau shall immediately seek from the administration concerned any clarification required and information not provided.

4.1.5 The Bureau shall determine, on the basis of Annex 1, the administrations whose frequency assignments are considered to be affected. The Bureau shall publish[7], in a Special Section of its International Frequency Information Circular (BR IFIC), the complete information received under § 4.1.3, together with the names of the affected administrations, the corresponding fixed-satellite service networks, the corresponding broadcasting-satellite service assignments and terrestrial stations, as appropriate. The Bureau shall immediately send a telegram/fax to the administration proposing the assignment, drawing its attention to the information contained in the relevant BR IFIC. (WRC-07)

4.1.6 The Bureau shall send a telegram/fax to the administrations listed in the Special Section of the BR IFIC, drawing their attention to the information it contains. (WRC-07)

4.1.7 An administration which considers that it should have been identified in the publication referred to under § 4.1.5 above shall, within four months of the date of publication of its relevant BR IFIC, and giving the technical reasons for so doing, request the Bureau to include its name in the publication. The Bureau shall study this information on the basis of Annex 1 and shall inform both administrations of its conclusions. Should the Bureau agree to the administration's request, it shall publish an addendum to the publication under § 4.1.5.

4.1.7*bis* 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)

4.1.8 The administration seeking agreement or the administration with which agreement is sought may request any additional technical information it considers necessary. The administrations shall inform the Bureau of such requests.

4.1.9 Comments from administrations identified in the publication referred to under § 4.1.5 above shall be sent to the Bureau and to the administration proposing the modification. (WRC-15)

4.1.10 An administration that has not notified its agreement 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 § 4.1.5 shall be deemed to have not agreed to the proposed assignment unless the provisions of § 4.1.10a to 4.1.10d and § 4.1.21 are applied. This time-limit may be extended:

– for an administration that has requested additional information under § 4.1.8, by up to three months; *or*

– for an administration that has requested the assistance of the Bureau under § 4.1.21, by up to three months following the date at which the Bureau communicated the result of its action. (WRC-15)

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[7] If the payments are not received in accordance with the provisions of Council Decision 482, as amended, on the implementation of cost recovery for satellite network filings, the Bureau shall cancel the publication, after informing the administration concerned. The Bureau shall inform all administrations of such action and that the network specified in the publication in question no longer has to be taken into consideration by the Bureau and other administrations. The Bureau shall send a reminder to the notifying administration not later than two months prior to the deadline for the payment in accordance with the above-mentioned Council Decision 482 unless the payment has already been received. (WRC-07)

4.1.10*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 § 4.1.10, bringing the matter to its attention. (WRC-03)

4.1.10*ter* (SUP - WRC-15)

4.1.10a After the same time period as specified in § 4.1.10, the notifying administration may, pursuant to § 4.1.21, request the Bureau to assist in respect of an administration which has not replied within this time period. (WRC-15)

4.1.10b The Bureau, acting under § 4.1.10a, shall send a reminder to the administration which has not replied, together with the results of its previously published compatibility analysis, containing the change in the values referred to in paragraph 1b of Annex 1 to Appendix **30**, requesting a decision. (WRC-15)

4.1.10c Fifteen days before the expiry of the 30-day period referred to in § 4.1.10d, the Bureau shall send a reminder to the above-mentioned administration drawing its attention to the consequence of no reply. (WRC-15)

4.1.10d If no decision is communicated to the Bureau within 30 days after the date of dispatch of the reminder under § 4.1.10b, it shall be deemed that the administration which has not given a decision has agreed to the proposed assignment. (WRC-15)

4.1.11 If, in seeking agreement, an administration modifies its initial proposal, it shall again apply the provisions of § 4.1 and the subsequent procedure in cases where:

– the assignments of any other administration received by the Bureau in accordance with § 4.1.3 or § 4.2.6, or § 2A.1.4 of Article 2A, or § 7.1 of Article 7, or No. **9.7** before this modified proposal is received under § 4.1.12;

– the assignments of any other administration contained in the Plans or the Lists; *or*

– the terrestrial services of any other administration,

are considered as being affected and receive more interference as a result of the modifications than that produced by the initial proposal. (WRC-15)

4.1.12 If agreement has been reached with the administrations identified in the publication referred to under § 4.1.5 above, the administration proposing the new or modified assignment may continue with the appropriate procedure in Article 5, and shall so inform the Bureau, indicating the final characteristics of the frequency assignment together with the names of the administrations with which agreement has been reached. (WRC-15)

4.1.12*bis* 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)

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)

4.1.14 Where the proposed assignment involves developing countries, administrations shall seek all practicable solutions conducive to the economical development of the broadcasting-satellite systems of these countries.

4.1.15 The Bureau shall publish[8] 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)

4.1.16 In case of disagreement on the part of an administration whose agreement has been sought, the requesting administration should first endeavour to solve the problem by exploring all possible means of meeting its requirement. If the problem still cannot be solved by such means, the administration whose agreement has been sought should endeavour to overcome the difficulties as far as possible, and shall state the technical reasons for any disagreement if the administration seeking the agreement requests it to do so.

4.1.17 If no agreement is reached between the administrations concerned, the Bureau shall carry out any study that may be requested by either one of these administrations; the Bureau shall inform them of the result of the study and shall make such recommendations as it may be able to offer for the solution of the problem.

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 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)

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)[9] of an assignment in the Regions 1 and 3 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 the interference produced by the assignment for which the provisions of § 4.1.18 have been applied. (WRC-03)

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 List or having initiated the procedure under § 4.1), as appropriate, then the status of the assignment in the List shall be reviewed accordingly.

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[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 the above-mentioned Council Decision 482 unless the payment has already been received. (WRC-07)

[9] For the definition of EPM, see § 3.4 of Annex 5. (WRC-03)

4.1.20 Should harmful interference be caused by an assignment included in the 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 List under § 4.1.18 shall, upon receipt of advice thereof, immediately eliminate this harmful interference.

4.1.21 An administration may, at any stage in the procedure described, or before applying it, request the assistance of the Bureau.

4.1.22 The relevant provisions of Article 5 shall be applied when frequency assignments are notified to the Bureau.

4.1.23 When a frequency assignment included in the 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 List.

4.1.24 No assignment in the 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.

4.1.25 Where an administration already having included in the List two assignments (not including those systems notified on behalf of a group of named administrations and included in the List by WRC-2000), in the same channel and covering the same service area, proposes to include in the 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 List in the same channel and which proposes to include in the 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-15)**, this administration shall be deemed to have given its agreement to inclusion in the List of the assignment of the latter administration. (WRC-15)

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)

4.1.27 When an administration has successfully applied this procedure and received all the agreements[10] required to include in the List assignments over its national territory, at an orbital location and/or in channels different from those appearing in the Plan for its country, it may request the next world radiocommunication conference to consider the inclusion in the 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 the Plan.

[10] In such a case, § 4.1.18 does not apply.

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)

4.1.28 The List, as updated, shall be published periodically by the Bureau.

4.1.29 New or modified assignments in the List shall be limited to digital modulation.

4.2 Provisions applicable to Region 2

4.2.1 When an administration intends to make a modification[11] to the Region 2 Plan, i.e.:

a) to modify the characteristics of any of its frequency assignments to a space station in the broadcasting-satellite service which are shown in the Region 2 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 Plan a new frequency assignment to a space station in the broadcasting-satellite service; *or*

c) to cancel a frequency assignment to a space station in the broadcasting-satellite service,

the following procedure shall be applied before any notification of the frequency assignment is made to the Bureau (see Article 5).

4.2.2 The term "frequency assignment in conformity with the Plan" used in this and the following Articles is defined in Article 1.

4.2.3 An administration proposing a modification to the characteristics of a frequency assignment in conformity with the Region 2 Plan, or the inclusion of a new frequency assignment in that Plan, shall seek the agreement of those administrations:

a) of Regions 1 and 3 having a frequency assignment to a space station in the broadcasting-satellite service which is in conformity with the Regions 1 and 3 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 frequency assignment included in the 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 frequency assignment in the Region 2 Plan to a space station in the broadcasting-satellite service in the same or adjacent channel which is in conformity with that Plan, or in respect of which proposed modifications to that Plan have been received by the Bureau in accordance with the provisions of § 4.2.6; *or*

[11] For assignments using analogue modulation, the intention not to employ energy dispersal in accordance with § 3.18 of Annex 5 shall be treated as a modification and thus subject to the appropriate provisions of this Article.

d) having no frequency assignment in the broadcasting-satellite service in the channel concerned, but in whose territory the power flux-density value exceeds the prescribed limit as a result of the proposed modification, or having an assignment whose associated service area does not cover the whole of the territory of the administration, and in whose territory outside that service area the power flux-density from the broadcasting-satellite space station subject to this modification exceeds the prescribed limit as a result of the proposed modification; *or*

e) having a frequency assignment in the band 12.5-12.7 GHz in Region 1 or 12.2-12.7 GHz in Region 3 to a space station in the fixed-satellite service which is recorded in the Master Register, or for which complete coordination information has been received by the Bureau for coordination under No. **9.7** or under § 7.1 of Article 7; *or*

f) having a frequency assignment to a space station in the broadcasting-satellite service in the band 12.5-12.7 GHz in Region 3 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*

– for which complete coordination information has been received by the Bureau for coordination under No. **9.7**[12] or under § 7.1 of Article 7;

g) whose services are considered to be affected.

4.2.4 Not used.

4.2.5 The services of an administration are considered to be affected when the limits shown in Annex 1 are exceeded.

4.2.6 An administration, or one[13] 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 within eight years after the date of receipt by the Bureau of the relevant complete information[14]. A request for a modification that has not been included in that Plan within eight years after the date of receipt by the Bureau of the relevant complete information shall also lapse[14]. (WRC-07)

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[12] Or under Resolution **33 (Rev.WRC-97)*** for assignments for which the API or the request for coordination has been received by the Bureau prior to 1 January 1999.

* *Note by the Secretariat*: This Resolution was revised by WRC-03 and WRC-15.

[13] 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)

[14] The provisions of Resolution **533 (Rev.WRC-2000)**** apply. (WRC-03)

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

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[15]. 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-15)** for the assignment with respect to the satellite that suffered the launch failure, if that information has not already been provided.

If, 11 months after the request for extension, the administration has not provided to the Bureau updated Resolution **49 (Rev.WRC-15)** information, the Bureau shall promptly send a reminder to the notifying administration. If, within one year of the request for extension, the administration has not provided to the Bureau updated Resolution **49 (Rev.WRC-15)** information for the new satellite under procurement, the related frequency assignments shall lapse. (WRC-15)

4.2.7 If the information received by the Bureau under § 4.2.6 is found to be incomplete, the Bureau shall immediately seek from the administration concerned any clarification required and information not provided.

4.2.8 The Bureau shall determine, on the basis of Annex 1, the administrations whose frequency assignments are considered to be affected within the meaning of § 4.2.3. The Bureau shall publish[16], in a Special Section of its BR IFIC, the complete information received under § 4.2.6, together with the names of the affected administrations, the corresponding fixed-satellite service networks, the corresponding broadcasting-satellite service assignments and terrestrial stations, as appropriate. The Bureau shall immediately send a telegram/fax to the administration proposing the modification to the Region 2 Plan, drawing its attention to the information contained in the relevant BR IFIC. (WRC-07)

[15] 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)

[16] If the payments are not received in accordance with the provisions of Council Decision 482, as amended, on the implementation of cost recovery for satellite network filings, the Bureau shall cancel the publication, after informing the administration concerned. The Bureau shall inform all administrations of such action and that the network specified in the publication in question no longer has to be taken into consideration by the Bureau and other administrations. The Bureau shall send a reminder to the notifying administration not later than two months prior to the deadline for the payment in accordance with the above-mentioned Council Decision 482 unless the payment has already been received. (WRC-07)

4.2.9 The Bureau shall send a telegram/fax to the administrations listed in the Special Section of its BR IFIC, drawing their attention to the information it contains. (WRC-07)

4.2.10 An administration which considers that it should have been included in the publication referred to under § 4.2.8 above shall, within four months of the date of publication in the relevant BR IFIC, and giving the technical reasons for so doing, request the Bureau to include its name in the publication. The Bureau shall study this information on the basis of Annex 1 and shall inform both administrations of its conclusions. Should the Bureau agree to the administration's request, it shall publish an addendum to the publication under § 4.2.8. (WRC-07)

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)

4.2.12 The administration seeking agreement or the administration with which agreement is sought may request any additional technical information it considers necessary. The administrations shall inform the Bureau of such requests.

4.2.13 Comments from administrations on the information published pursuant to § 4.2.8 should be sent either directly to the administration proposing the modification or through the Bureau. In any event, the Bureau shall be informed that comments have been made.

4.2.14 An administration that has not notified 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 § 4.2.8 shall be deemed to have agreed to the proposed assignment. This time-limit may be extended by up to three months for an administration that has requested additional information under § 4.2.12 or for an administration that has requested the assistance of the Bureau under § 4.2.22. In the latter case, the Bureau shall inform the administrations concerned of this request.

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)

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)

4.2.15 If, in seeking agreement, an administration modifies its initial proposal, it shall again apply the provisions of § 4.2 and the consequent procedure with respect to any other administration whose services might be affected as a result of modifications to the initial proposal.

4.2.16 If no comments have been received on the expiry of the periods specified in § 4.2.14, or if agreement has been reached with the administrations which have made comments and with which agreement is necessary, the administration proposing the modification may continue with the appropriate procedure in Article 5, and shall so inform the Bureau, indicating the final characteristics of the frequency assignment together with the names of the administrations with which agreement has been reached.

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)

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)

4.2.18 When the proposed modification to the Region 2 Plan involves developing countries, administrations shall seek all practicable solutions conducive to the economical development of the broadcasting-satellite systems of these countries.

4.2.19 The Bureau shall publish[17] 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)

4.2.20 When an administration proposing to modify the characteristics of a frequency assignment or to make a new frequency assignment receives notice of disagreement on the part of an administration whose agreement it has sought, it should first endeavour to solve the problem by exploring all possible means of meeting its requirement. If the problem still cannot be solved by such means, the administration whose agreement has been sought should endeavour to overcome the difficulties as far as possible, and shall state the technical reasons for any disagreement if the administration seeking the agreement requests it to do so.

4.2.21 If no agreement is reached between the administrations concerned, the Bureau shall carry out any study that may be requested by these administrations; the Bureau shall inform them of the result of the study and shall make such recommendations as it may be able to offer for the solution of the problem.

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 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)

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)

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[17] If the payments are not received in accordance with the provisions of Council Decision 482, as amended, on the implementation of cost recovery for satellite network filings, the Bureau shall cancel the publication, after informing the administration concerned. The Bureau shall inform all administrations of such action and that the network specified in the publication in question no longer has to be taken into consideration by the Bureau and other administrations. The Bureau shall send a reminder to the notifying administration not later than two months prior to the deadline for the payment in accordance with the above-mentioned Council Decision 482 unless the payment has already been received. (WRC-07)

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)

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)

4.2.22 An administration may at any stage in the procedure described, or before applying it, request the assistance of the Bureau.

4.2.23 The relevant provisions of Article 5 shall be applied when frequency assignments are notified to the Bureau.

4.2.24 Cancellation of frequency assignments

When a frequency assignment in conformity with the Region 2 Plan is no longer required, whether or not as a result of a modification, 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 Region 2 Plan.

4.2.25 Master copy of the Region 2 Plan

4.2.25.1 The Bureau shall maintain an up-to-date master copy of the Region 2 Plan, including the overall equivalent protection margins of each assignment, taking account of the application of the procedure set out in this Article. This master copy shall contain the overall equivalent protection margins derived from the Plan as established by the 1983 Conference and those derived from all modifications to the Plan as a result of the successful completion of the modification procedure set out in this Article.

4.2.25.2 An up-to-date version of the Region 2 Plan shall be published by the Secretary-General when justified by the circumstances.

ARTICLE 5 (REV.WRC-15)

Notification, examination and recording in the Master International Frequency Register of frequency assignments to space stations in the broadcasting-satellite service[18] (WRC-07)

5.1 Notification

5.1.1 Whenever an administration[19] 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)

5.1.2 For any notification under § 5.1.1, an individual notice for each frequency assignment shall be drawn up as prescribed in Appendix **4**, the various Sections of which specify the basic characteristics to be provided as appropriate. It is recommended that the notifying administration should also supply any other data it may consider useful. (WRC-2000)

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)

5.1.3 Each notice must reach the Bureau not earlier than three years before the date on which the frequency assignment is to be brought into use. In any case, the notice must reach the Bureau not later than three months before that date[20]. (WRC-2000)

5.1.4 Any frequency assignment the notice of which reaches the Bureau after the applicable period specified in § 5.1.3 shall, where it is to be recorded, bear a remark in the Master Register to indicate that it is not in conformity with § 5.1.3.

5.1.5 Any notice made under § 5.1.1 which does not contain the characteristics specified in Appendix **4** shall be returned by the Bureau immediately by airmail to the notifying administration with the relevant reasons. (WRC-2000)

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[18] If the payments are not received in accordance with the provisions of Council Decision 482, as amended, on the implementation of cost recovery for satellite network filings, the Bureau shall cancel the publication specified in § 5.1.6 and the corresponding entries in the Master Register under § 5.2.2, 5.2.2.1, 5.2.2.2 or 5.2.6, as appropriate, and the corresponding entries included in the Plan on and after 3 June 2000 or in the List, as appropriate, after informing the administration concerned. The Bureau shall inform all administrations of such action. The Bureau shall send a reminder to the notifying administration not later than two months prior to the deadline for the payment in accordance with the above-mentioned Council Decision 482 unless the payment has already been received. See also Resolution **905 (WRC-07)***. (WRC-07)

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

[19] 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)

[20] 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)

5.1.6 Upon receipt of a complete notice, the Bureau shall include its particulars, with the date of receipt, in its BR IFIC, which shall contain the particulars of all such notices received since the publication of the previous Circular. (WRC-2000)

5.1.7 The Circular shall constitute the acknowledgement to the notifying administration of the receipt of a complete notice.

5.1.8 Complete notices shall be considered by the Bureau in order of receipt. The Bureau shall not postpone its finding unless it lacks sufficient data to reach a decision; moreover, the Bureau shall not act upon any notice which has a technical bearing on an earlier notice still under consideration by the Bureau until it has reached a finding with respect to such earlier notice.

5.2 Examination and recording

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 dB(W/(m^2 · 27 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)

* *Note by the Secretariat*: This Resolution was revised by WRC-12 and WRC-15.

5.2.2 Where the Bureau reaches a favourable finding with respect to § 5.2.1 *a)*, 5.2.1 *b)* and 5.2.1 *c)*, the frequency assignment of an administration shall be recorded in the Master Register. The date of receipt of the notice by the Bureau shall be entered in the Master Register. In relations between administrations, all frequency assignments brought into use in conformity with the appropriate Regional Plan and recorded in the Master Register shall be considered to have the same status irrespective of the dates of receipt entered in the Master Register for such frequency assignments. (WRC-07)

5.2.2.1 Where the Bureau reaches a favourable finding with respect to § 5.2.1 *a)*, 5.2.1 *c)* and 5.2.1 *d)*, the frequency assignment shall be recorded in the Master Register. The date of receipt of the notice by the Bureau shall be entered in the Master Register. In relations between administrations, all frequency assignments brought into use in conformity with the appropriate Regional Plan and recorded in the Master Register shall be considered to have the same status irrespective of the dates of receipt entered in the Master Register for such frequency assignments. When recording these assignments, the Bureau shall indicate by an appropriate symbol the characteristics having a value different from that appearing in the appropriate regional Plan. (WRC-07)

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 the Master Register. 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 of receipt entered in the Master Register for such frequency assignments. (WRC-07)

5.2.2.3 In the case of Regions 1 and 3, 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)*, the notice shall be returned immediately by airmail to the notifying administration with the Bureau's reasons for this finding and with such suggestions as the Bureau may be able to offer with a view to a satisfactory solution of the problem. (WRC-2000)

5.2.3 Whenever a frequency assignment is recorded in the Master Register, the finding reached by the Bureau shall be indicated. (WRC-07)

5.2.4 Where the Bureau reaches an unfavourable finding with respect to:

– § 5.2.1 *a)*, *or*

– § 5.2.1 *c)*, *or*

– § 5.2.1 *b)* and 5.2.1 *d)* and, where applicable, § 5.2.1 *e)*,

the notice shall be returned immediately by airmail to the notifying administration with the reasons of the Bureau for this finding and with such suggestions as the Bureau may be able to offer with a view to a satisfactory solution of the problem. (WRC-2000)

* *Note by the Secretariat*: This Resolution was revised by WRC-12 and WRC-15.

5.2.5 Where the notifying administration resubmits the notice and the finding of the Bureau becomes favourable with respect to the appropriate parts of § 5.2.1, the notice shall be treated as in § 5.2.2, 5.2.2.1 or 5.2.2.2, as appropriate.

5.2.6 If the notifying administration resubmits the notice without modification and insists on its reconsideration, and if the Bureau's finding with respect to § 5.2.1 remains unfavourable, the notice is returned to the notifying administration in accordance with § 5.2.4. In this case, the notifying administration undertakes not to bring into use the frequency assignment until the condition specified in § 5.2.5 is fulfilled. For Regions 1, 2 and 3, in the event that the Bureau has been informed of agreement to modification of the Plan for a specified period of time in accordance with Article 4, the frequency assignment shall be recorded in the Master Register with a note indicating that the frequency assignment is valid only for the period specified. The notifying administration using the frequency assignment over a specified period shall not subsequently invoke this fact to justify the continued use of the frequency beyond the period specified unless it obtains the agreement of the administration(s) concerned.

5.2.7 If a frequency assignment notified in advance of bringing into use in conformity with § 5.1.3 has received a favourable finding by the Bureau with respect to the provisions of § 5.2.1, it shall be entered provisionally in the Master Register with a special symbol in the Remarks Column indicating the provisional nature of that entry.

5.2.8 When the Bureau has received confirmation that the frequency assignment has been brought into use, the Bureau shall remove the symbol in the Master Register.

5.2.9 The date of bringing into use notified by the administration concerned shall be recorded in the Master Register. (WRC-07)

5.2.10 Wherever the use of a frequency assignment to a space station recorded in the Master Register and emanating from the Regions 1 and 3 List is suspended for a period exceeding six months, the notifying administration shall inform the Bureau of the date on which such use was suspended. When the recorded assignment is brought back into use, the notifying administration shall so inform the Bureau, as soon as possible. On receipt of the information sent under this provision, the Bureau shall make that information available on the ITU website as soon as possible and shall publish it in the BR IFIC. The date on which the recorded assignment is brought back into use[20*bis*] shall be no later than three years from the date on which the use of the frequency assignment was suspended, provided that the notifying administration informs the Bureau of the suspension within six months from the date on which the use was suspended. If the notifying administration informs the Bureau of the suspension more than six months after the date on which the use of the frequency assignment was suspended, this three-year time period shall be reduced. In this case, the amount by which the three-year period shall be reduced shall be equal to the amount of time that has elapsed between the end of the six-month period and the date that the Bureau is informed of the suspension. If the notifying administration informs the Bureau of the suspension more than 21 months after the date on which the use of the frequency assignment was suspended, the frequency assignment shall be cancelled. (WRC-15)

[20*bis*] The date of bringing back into use of a frequency assignment to a space station in the geostationary-satellite orbit shall be the commencement of the 90-day period defined below. A frequency assignment to a space station in the geostationary-satellite orbit shall be considered as having been brought back into use when a space station in the geostationary-satellite orbit with the capability of transmitting or receiving that frequency assignment has been deployed and maintained at the notified orbital position for a continuous period of 90 days. The notifying administration shall inform the Bureau within 30 days from the end of the 90-day period. Resolution **40 (WRC-15)** shall apply. (WRC-15)

5.2.11 If a recorded frequency assignment stemming from the Regions 1 and 3 List is not brought back into use within the suspension period resulting from the application of § 5.2.10 above, the Bureau shall cancel the assignment from the Master Register and the assignment in the List, unless the assignment is one to which § 4.1.26 or § 4.1.27 is being applied. (WRC-15)

5.3 Cancellation of entries in the Master Register

5.3.1 Any notified frequency assignment to which the Article 4 procedures have been applied and which has been provisionally recorded under § 5.2.7 shall be brought into use no later than the end of the period provided under § 4.1.3, 4.1.3*bis*, 4.2.6 or 4.2.6*bis* of Article 4. Any other frequency assignment provisionally recorded under § 5.2.7 shall be brought into use by the date specified in the notice. Unless the Bureau has been informed by the notifying administration of the bringing into use of the assignment under § 5.2.8, it shall, no later than 15 days before the notified date of bringing into use or the end of the regulatory period established under § 4.1.3, 4.1.3*bis*, 4.2.6 or 4.2.6*bis* of Article 4, as appropriate, send a reminder requesting confirmation that the assignment has been brought into use within the regulatory period. If the Bureau does not receive that confirmation within 30 days following the notified date of bringing into use or the period provided under § 4.1.3, 4.1.3*bis*, 4.2.6 or 4.2.6*bis* of Article 4, as the case may be, it shall cancel the entry in the Master Register. (WRC-15)

5.3.2 If the use of any recorded frequency assignment is permanently discontinued, the notifying administration shall so inform the Bureau within three months, whereupon the entry shall be removed from the Master Register.

ARTICLE 6 (WRC-2000)

Coordination, notification and recording in the Master International Frequency Register of frequency assignments to terrestrial stations or to earth stations in the fixed-satellite service (Earth-to-space) affecting frequency assignments to broadcasting-satellite stations in the 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)[21]

6.1 The provisions of No. **9.19** and the associated provisions under Articles **9** and **11** are applicable in respect of 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:

a) to transmitting terrestrial stations in the band 11.7-12.7 GHz in all Regions;

b) to transmitting earth stations in the fixed-satellite service in the band 12.5-12.7 GHz (in Region 1).

6.2 In applying the procedures referred to in § 6.1, the provisions of Appendix **5** are replaced by the following:

6.2.1 These procedures are to be applied in respect of administrations whose territory is included within the service area associated with:

a) assignments in conformity with the appropriate Regional Plan in Appendix **30**;

b) assignments included in the Regions 1 and 3 List;

c) 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 or 4.2.

6.2.2 The criteria to be applied are those given in Annex 3.

[21] These procedures do not replace the procedures prescribed for terrestrial stations in Articles **9** and **11**.

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 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 involved[22]

7.1 The provisions of No. **9.7**[23] and the associated provisions under Articles **9** and **11** are applicable in respect of 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:

a) to transmitting space stations in the fixed-satellite service 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

b) to transmitting space stations in the broadcasting-satellite service in the band 12.5-12.7 GHz (in Region 3).

7.2 In applying the procedures referred to in § 7.1, the provisions of Appendix **5** are replaced by the following:

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)

7.2.2 The criteria to be applied are those given in Annex 4.

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[22] 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)

[23] The provisions of Resolution **33 (Rev.WRC-97)**[*] are applicable to space stations in the broadcasting-satellite service for which the advance publication information or the request for coordination has been received by the Bureau prior to 1 January 1999.

[*] *Note by the Secretariat*: This Resolution was revised by WRC-03 and WRC-15.

ARTICLE 8

Miscellaneous provisions relating to the procedures*

8.1 If so requested by any administration, the Board, using such means at its disposal as are appropriate in the circumstances, shall conduct a study of cases of alleged contravention or non-observance of these provisions or of harmful interference.

8.2 The Board shall thereupon prepare and forward to the administration or administrations concerned a report containing its findings and recommendations for the solution of the problem.

8.3 On receiving the Board's recommendations for the solution of the problem, an administration shall promptly acknowledge their receipt by telegram and shall indicate the action it intends to take. Where the Board's suggestions or recommendations are unacceptable to the administrations concerned, further efforts should be made by the Board to find an acceptable solution to the problem.

8.4 Where, as a result of a study, the Board submits to one or more administrations suggestions or recommendations for the solution of a problem, and where no reply has been received from one or more of these administrations within a period of three months, the Board shall consider that the suggestions or recommendations concerned are unacceptable to the administrations which did not answer. If it was the requesting administration which failed to answer within this period, the Board shall discontinue the study.

8.5 If so requested by any administration, particularly by an administration of a country in need of special assistance, the Board, using such means at its disposal as are appropriate in the circumstances, shall render the following assistance:

a) computation necessary in the application of Annexes 1, 3 and 4;

b) any other assistance of a technical nature for completion of the procedures in this Appendix.

8.6 In making a request to the Board under § 8.5, the administration shall provide the Board with the necessary information.

ARTICLE 9 (SUP - WRC-03)

* *Note by the Secretariat:* WRC-97 did not review this Article. The subject matter is also dealt with in Articles **13** and **14**, which were reviewed by WRC-97.

ARTICLE 10

The Plan for the broadcasting-satellite service in the frequency band 12.2-12.7 GHz in Region 2

10.1 COLUMN HEADINGS OF THE PLAN

Col. 1 *Beam identification* (Column 1 contains the symbol designating the country 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. 2 *Nominal orbital position*, in degrees and hundredths of a degree.

Col. 3 *Channel number* (see Table 4 showing channel numbers and corresponding assigned frequencies).

Col. 4 *Boresight* geographical coordinates, in degrees and hundredths of a degree.

Col. 5 *Antenna beamwidth*. This column contains two figures corresponding to the major axis and the minor axis respectively of the elliptical cross-section half-power beam, in degrees and hundredths of a degree.

Col. 6 *Orientation of the ellipse* determined as follows: in a plane normal to the beam axis, the direction of a major axis of the ellipse is specified as the angle measured anti-clockwise from a line parallel to the equatorial plane to the major axis of the ellipse to the nearest degree.

Col. 7 *Polarization* (1 = direct, 2 = indirect)[24].

Col. 8 *e.i.r.p.* in the direction of maximum radiation, in dBW.

Col. 9 *Remarks*.

10.2 TEXT FOR NOTES IN REMARKS COLUMN OF THE PLAN

1 Fast roll-off space station transmitting antenna as defined in Annex 5 (item 3.13.3).

2 Television standard with 625 lines using greater video bandwidth and necessary bandwidth of 27 MHz.

3 Not used

4 This assignment may be utilized in the geographical area of Anguilla (AIA) (which is in the beam area).

[24] See Annex 5 (§ 3.2) of this Appendix.

5 Feeder-link earth stations for this assignment may also be located in the territories of Puerto Rico and the United States Virgin Islands. Such operation shall not cause more interference nor require more protection than the assignment under the Plan.

6 Feeder-link earth stations for this assignment may also be located in the States of Alaska and Hawaii. Such operation shall not cause more interference nor require more protection than the assignment under the Plan.

7 The feeder-link earth station for this assignment may also be located at the point with geographical coordinates 3° 31′ West, 48° 46′ North. Such operation shall not cause more interference nor require more protection than the assignment under the Plan.

8 Feeder-link earth stations for this assignment may also be located at the points with the following geographical coordinates:

47° 55′ West	15° 47′ South	34° 53′ West	08° 04′ South
43° 13′ West	22° 55′ South	60° 02′ West	03° 06′ South
46° 38′ West	23° 33′ South	38° 31′ West	12° 56′ South
51° 13′ West	30° 02′ South	49° 15′ West	16° 40′ South

Such operation shall not cause more interference nor require more protection than the assignment under the Plan.

9/GR . . . This assignment is part of a group, the number of which follows the symbol. The group consists of the beams and has the number of channels assigned to it as indicated in Table 1 below.

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)

b) If an administration notifies the same frequency in more than one beam of a group for use at the same time, the aggregated *C*/*I* produced by all emissions from that group shall not exceed the *C*/*I* calculated on the basis of *a)* above.

10 This assignment shall be brought into use only when the limits given in Table 2 are not exceeded or with the agreement of the affected administration identified in Table 3.

These administrations shall be informed by the notifying administration of changes in characteristics before these beams are brought into use.

* *Note by the Secretariat*: This Resolution was revised by WRC-12 and WRC-15.

TABLE 1

Group	Beams in the group	Number of channels assigned to the group
GR1	ALS00002 HWA00002 USAPSA02	32 channels
GR2	ALS00003 HWA00003 USAPSA03	32 channels
GR3	ARGINSU4 ARGSUR04	16 channels
GR4	ARGINSU5 ARGSUR05	12 channels
GR5	BOLAND01 CLMAND01 EQACAND1 EQAGAND1 PRUAND02 VENAND03	16 channels
GR6	B SU111 B SU211	32 channels
GR7	B CE311 B CE411 B CE511	32 channels
GR8	B NO611 B NO711 B NO811	32 channels
GR9	B SU112 B SU212 B CE312 B CE412	32 channels
GR10	CAN01101 CAN01201	32 channels
GR11	*Not used*	
GR12	CAN01203 CAN01303 CAN01403	32 channels
GR13	CAN01304 CAN01404 CAN01504	32 channels
GR14	CAN01405 CAN01505 CAN01605	32 channels
GR15	*Not used*	
GR16	CHLCONT4 CHLCONT6	16 channels
GR17	CHLCONT5 PAQPAC01 CHLPAC02	16 channels
GR18	CRBBER01 CRBBLZ01 CRBJMC01 CRBBAH01 CRBECO01	16 channels
GR19	EQACOO01 EQAGOO01	16 channels
GR20	PTRVIR01 USAEHO02	32 channels
GR21	PTRVIR02 USAEHO03	32 channels
GR22	VEN02VEN VEN11VEN	4 channels

TABLE 2

Applicable criteria

Symbol	pfd limit criteria
a	§ 3, Annex 1
b	§ 5 *b)*, Annex 1
c	§ 5 *c)*, Annex 1
d	§ 5 *d)*, Annex 1

Note – Section 5 of Annex 1 was merged with Section 4 by WRC-2000. See also the Note to Table 3. (WRC-2000)

11 This assignment shall be brought into use only when the e.i.r.p. in the direction of all points situated within the service area and within the −3 dB contour of the "Metropole" beam (space-to-Earth) in the VIDEOSAT-3 network as described in ex-IFRB Special Section AR11/C/766 to BR IFIC No. 1678 of 2 July 1985 does not exceed the limit 26.8 dBW.

12 This assignment shall be brought into use only when the e.i.r.p. in the direction of all points situated within the service area and within the −3 dB contour of the "Metropole" beam (space-to-Earth) in the VIDEOSAT-3 network as described in ex-IFRB Special Section AR11/C/766 to Weekly Circular No. 1678 of 2 July 1985 does not exceed the limit 26.8 dBW, and when the e.i.r.p. in the direction of all points situated within the service area and also between the −3 dB and −6 dB contours of the same beam does not exceed the limit 29.5 dBW.

TABLE 3

Beam name	**Channels**	**Limit criteria ref. Table 2**	**Countries or geographical areas affected***
ALS00002	1, 4, 5, 6, 9, 10, 11, 14, 15, 16 All channels For channels 20 to 32	a c d	URS MNG/URS URS
ALS00003	1, 4, 5, 6, 9, 10, 11, 14, 15, 16 All channels For channels 20 to 32	a c d	URS URS URS
ARGINSU5	3, 7, 11, 15, 17, 19	b	NOR
ARGNORT4	2, 4, 6, 8, 10, 12, 14, 16, 18, 20	b	AOE/ASC/AZR/CPV/E/GMB/GNB/GUI/MRC/MTN/POR/SEN
ARGNORT5	2, 4, 6, 8, 10, 12, 14, 16, 18, 20	b	AFS/AGL/BOT/NMB/NOR/OCE/PTC/TKL/COD/ZMB/ZWE
ARGSUR04	1, 3, 5, 7, 9, 11, 13, 15, 17, 19	b	ASC
ARGSUR05	3, 7, 11, 15, 17, 19	b	NOR
B CE311	For channels 1 to 20	b	AGL/ALG/CAF/CME/COG/GAB/GNE/NGR/NIG/NMB/STP/TCD/COD
B CE312	For channels 1 to 20 For channels 1 to 20 All channels	b c c	AFS/BDI/BOT/LSO/RRW/TZA/UGA/ZMB/ZWE MOZ/MWI/TZA ETH/KEN/SDN
B CE411	For channels 1 to 20	b	AGL/ALG/CAF/CME/COG/CVA/E/GAB/GNE/I/LBY/MLT/NGR/NIG/SMR/STP/TCD/TUN/COD
B CE412	For channels 1 to 20 All channels	c c	CYP/TUR ARS/EGY/ISR/SDN/URS
B CE511	For channels 1 to 20	b	CAF/CME/COG/GAB/GNE/NIG/NMB/NOR/STP/COD
B NO611	For channels 1 to 20	b	BEN/GHA/TGO
B NO711	For channels 1 to 20	b	BEN
B SE911	2, 4, 6, 8, 10, 12, 14, 16, 18, 20	b	CPV

* *Note by the Secretariat*: This Table was not modified by WRC-97. As such, the references to ETH, TCH, URS and YUG in this column refer to the countries or geographical areas described by these symbols when the Plan was established.

TABLE 3 (*continued*)

Beam name	Channels	Limit criteria ref. Table 2	Countries or geographical areas affected*
B SU111	For channels 1 to 20	b	BFA/CTI/GHA/GUI/LBR/MTN/SHN/TRC
B SU211	For channels 1 to 20	b	ALG/BFA/CTI/GHA/GUI/LBR/MLI/MRC/ MTN/SHN/TRC
BERBER02	1, 5, 17 5, 9, 13	a a	CNR/E ISL
BOL00001	3, 7, 11, 15, 19	b	ALG/AOE/ASC/E/GMB/GNB/GUI/LBR/ MLI/MRC/MTN/POR/SEN/SRL/TRC
CAN01101	All channels For channels 20 to 32	c d	URS URS
CAN01201	All channels	c	URS
CAN01203	All channels	c	URS
CAN01303	All channels	c	URS
CAN01403	All channels	c	URS
CAN01404	For channels 1 to 20	b	ISL/POR
CAN01405	For channels 1 to 20	b	F/G/IRL/ISL
CAN01504	For channels 1 to 20	b	AOE/AZR/E/ISL/MRC/MTN/POR
CAN01505	For channels 1 to 20	b	ALG/E/F/G/IRL/ISL/MRC/POR
CAN01605	For channels 1 to 20	b	E/F/G/IRL/ISL/MRC/POR
CAN01606	For channels 1 to 20	b	BEL/F/G/HOL/IRL/ISL/LUX/NOR
CLMAND01	21, 23, 25, 27, 29, 31	c	URS
CLM00001	1, 3, 5, 7, 9, 11, 13, 15, 17, 19 21, 23, 25, 27, 29, 31	b c	AZR/CPV URS
CRBEC001	2, 4, 6, 8, 10, 12, 14, 16, 18, 20	b	ASC/AZR/GMB/GNB/GUI/ISL/MTN/ SEN/SRL
FLKANT01	1, 5, 9, 13	b	NOR
GRLDNK01	3, 7, 11, 15, 19	b	D/DNK/G/HOL/ISL/NOR/POL/S/TCH
GUFMGG02	4, 8, 12, 16, 20	b	NOR
HWA00002	For channels 1 to 20 All channels	b c	CHN/KRE MNG/URS
HWA00003	For channels 1 to 20 All channels	b c	CHN MNG/URS
MEX02NTE	All channels	c	URS
MEX01SUR	1, 3, 5, 7, 9, 11, 13, 15, 17, 19	b	KIR

TABLE 3 (*end*)

Beam name	Channels	Limit criteria ref. Table 2	Countries or geographical areas affected*
MEX02SUR	All channels	c	URS
PRU00004	2, 4, 6, 8, 10, 12, 14, 16, 18, 20	b	ALG/AOE/ASC/BFA/CTI/E/G/GMB/ GUI/ISL/LBR/MLI/MRC/MTN/POR/ SEN/SHN/SRL/TRC
SPMFRAN3	1, 5, 9, 13, 17	b	D/DNK/ISL/NOR/S
USAEH001	For channels 1 to 20	b	ALG/AUT/BEL/CVA/D/DNK/E/F/G/ HOL/I/ISL/LBY/LIE/LUX/MCO/MLT/ NGR/NIG/NOR/OCE/SMR/SUI/TCH/ TUN/YUG
USAEH002	For channels 1 to 20 All channels	b c	AZR/CPV/HWL URS
USAEH003	For channels 1 to 20 All channels	b c	MHL URS
USAEH004	For channels 1 to 20 All channels For channels 20 to 32	b c d	WAK URS URS
USAWH101	All channels	c	URS
USAWH102	All channels	c	URS
VENAND03	21, 23, 25, 27, 29, 31	c	URS
VEN11VEN	2, 4, 6, 8, 10, 12, 14, 16, 18, 20 20, 22, 24, 26, 28, 30, 32	b c	AZR/CPV URS

Note – The administrations listed in Table 3 were identified on the basis of the criteria adopted at the Regional Administrative Conference for the Planning of the Broadcasting-satellite Service in Region 2 (Geneva, 1983) (RARC Sat-R2), as shown in Table 2. WRC-2000 and WRC-03 revised the criteria applicable to determine affected administrations. Therefore, the Bureau, when receiving a notification for an assignment in the Region 2 Plan, shall determine which countries are affected on the basis of the revised criteria adopted by WRC-03, which may lead to a different set of affected administration(s) from that currently contained in Table 3. (WRC-07)

Country symbols

1 For the explanation of symbols designating countries or geographical areas in Region 2, see the Preface to the International Frequency List.

2 One additional symbol, CRB, has been created for the purposes of the 1983 Conference only, to designate to geographical area in the Caribbean Area. The five Caribbean beams are identified as follows:

CRBBAH01, CRBBER01, CRBBLZ01, CRBEC001 and CRBJMC01

and are intended collectively to provide coverage for the following countries or geographical areas: AIA, ATG, BAH, BER, BLZ, BRB, CYM, DMA, GRD, GUY, JMC, LCA, MSR, KNA, SUR, TCA, TRD, VCT and VRG to be so used if approved by them.

TABLE 4

Table showing correspondence between channel numbers and assigned frequencies

Channel No.	Assigned frequency (MHz)	Channel No.	Assigned frequency (MHz)
1	12 224.00	17	12 457.28
2	12 238.58	18	12 471.86
3	12 253.16	19	12 486.44
4	12 267.74	20	12 501.02
5	12 282.32	21	12 515.60
6	12 296.90	22	12 530.18
7	12 311.48	23	12 544.76
8	12 326.06	24	12 559.34
9	12 340.64	25	12 573.92
10	12 355.22	26	12 588.50
11	12 369.80	27	12 603.08
12	12 384.38	28	12 617.66
13	12 398.96	29	12 632.24
14	12 413.54	30	12 646.82
15	12 428.12	31	12 661.40
16	12 442.70	32	12 675.98

12 224.00 MHz (1)

1	2	3	4		5		6	7	8	9	
ALS00002	−166.20	1	−149.66	58.37	3.76	1.24	170	1	59.7	9/GR1	10
ALS00003	−175.20	1	−150.98	58.53	3.77	1.11	167	1	60.0	9/GR2	10
ARGINSU4	−94.20	1	−52.98	−59.81	3.40	0.80	19	1	59.9	9/GR3	
ARGSUR04	−94.20	1	−65.04	−43.33	3.32	1.50	40	1	60.7	9/GR3	10
B CE311	−64.20	1	−40.60	−6.07	3.04	2.06	174	1	61.6	8 9/GR7	10
B CE312	−45.20	1	−40.27	−6.06	3.44	2.09	174	1	61.0	8 9/GR9	10
B CE411	−64.20	1	−50.97	−15.27	3.86	1.38	49	1	62.6	8 9/GR7	10
B CE412	−45.20	1	−50.71	−15.30	3.57	1.56	52	1	62.7	8 9/GR9	10
B CE511	−64.20	1	−53.10	−2.90	2.44	2.13	104	1	63.0	8 9/GR7	10
B NO611	−74.20	1	−59.60	−11.62	2.85	1.69	165	2	62.8	8 9/GR8	10
B NO711	−74.20	1	−60.70	−1.78	3.54	1.78	126	2	62.8	8 9/GR8	10
B NO811	−74.20	1	−68.76	−4.71	2.37	1.65	73	2	62.8	8 9/GR8	
B SU111	−81.20	1	−51.12	−25.63	2.76	1.05	50	1	62.8	8 9/GR6	10
B SU112	−45.20	1	−50.75	−25.62	2.47	1.48	56	1	62.2	8 9/GR9	
B SU211	−81.20	1	−44.51	−16.95	3.22	1.36	60	1	62.5	8 9/GR6	10
B SU212	−45.20	1	−44.00	−16.87	3.20	1.96	58	1	61.3	8 9/GR9	
BAHIFRB1	−87.20	1	−76.06	24.16	1.81	0.80	142	1	61.6		
BERBERMU	−96.20	1	−64.77	32.32	0.80	0.80	90	2	56.8		
BERBER02	−31.00	1	−64.77	32.32	0.80	0.80	90	1	56.9	2	10
BOLAND01	−115.20	1	−65.04	−16.76	2.49	1.27	76	1	67.9	9/GR5	
CAN01101	−138.20	1	−125.63	57.24	3.45	1.27	157	1	59.5	9/GR10	10
CAN01201	−138.20	1	−112.04	55.95	3.35	0.97	151	1	59.6	9/GR10	10
CAN01202	−72.70	1	−107.70	55.63	2.74	1.12	32	1	59.6		
CAN01203	−129.20	1	−111.48	55.61	3.08	1.15	151	1	59.5	9/GR12	10
CAN01303	−129.20	1	−102.42	57.12	3.54	0.91	154	1	60.0	9/GR12	10
CAN01304	−91.20	1	−99.12	57.36	1.98	1.72	2	1	59.8	9/GR13	
CAN01403	−129.20	1	−89.75	52.02	4.68	0.80	148	1	61.8	9/GR12	10
CAN01404	−91.20	1	−84.82	52.42	3.10	2.05	152	1	60.4	9/GR13	10
CAN01405	−82.20	1	−84.00	52.39	2.84	2.29	172	1	60.3	9/GR14	10
CAN01504	−91.20	1	−72.66	53.77	3.57	1.67	156	1	60.2	9/GR13	10
CAN01505	−82.20	1	−71.77	53.79	3.30	1.89	162	1	60.1	9/GR14	10
CAN01605	−82.20	1	−61.50	49.55	2.65	1.40	143	1	60.3	9/GR14	10
CAN01606	−70.70	1	−61.30	49.55	2.40	1.65	148	1	60.2	10	
CHLCONT5	−106.20	1	−72.23	−35.57	2.60	0.80	55	1	59.4	9/GR17	
CHLPAC02	−106.20	1	−80.06	−30.06	1.36	0.80	69	1	59.2	9/GR17	
CLMAND01	−115.20	1	−74.72	5.93	3.85	1.63	114	1	64.9	9/GR5	
CLM00001	−103.20	1	−74.50	5.87	3.98	1.96	118	1	63.5	10	
EQACAND1	−115.20	1	−78.40	−1.61	1.37	0.95	75	1	64.0	9/GR5	
EQAGAND1	−115.20	1	−90.34	−0.62	0.90	0.81	89	1	61.3	9/GR5	
FLKANT01	−57.20	1	−44.54	−60.13	3.54	0.80	12	1	59.3	2	10
FLKFALKS	−31.00	1	−59.90	−51.64	0.80	0.80	90	1	58.1	2	
GRD00002	−42.20	1	−61.58	12.29	0.80	0.80	90	1	58.8		
HWA00002	−166.20	1	−165.79	23.42	4.20	0.80	160	1	58.8	9/GR1	10
HWA00003	−175.20	1	−166.10	23.42	4.25	0.80	159	1	58.8	9/GR2	10
MEX01NTE	−78.20	1	−105.81	26.01	2.89	2.08	155	1	60.5	1	
MEX01SUR	−69.20	1	−94.84	19.82	3.05	2.09	4	1	62.2	1	10
MEX02NTE	−136.20	1	−107.21	26.31	3.84	1.55	148	1	61.2	1	10
MEX02SUR	−127.20	1	−96.39	19.88	3.18	1.87	157	1	62.5	1	10
PAQPAC01	−106.20	1	−109.18	−27.53	0.80	0.80	90	1	56.2	9/GR17	
PRG00002	−99.20	1	−58.66	−23.32	1.45	1.04	76	1	60.2		
PRUAND02	−115.20	1	−74.69	−8.39	3.41	1.79	95	1	63.9	9/GR5	
PTRVIR01	−101.20	1	−65.85	18.12	0.80	0.80	90	1	60.5	1 6 9/GR20	
PTRVIR02	−110.20	1	−65.86	18.12	0.80	0.80	90	1	61.0	1 6 9/GR21	
SPMFRAN3	−53.20	1	−67.24	47.51	3.16	0.80	7	1	60.4	2 7	10
TRD00001	−84.70	1	−61.23	10.70	0.80	0.80	90	1	59.4		
URG00001	−71.70	1	−56.22	−32.52	1.02	0.89	11	1	60.0		
USAEH001	−61.70	1	−85.19	36.21	5.63	3.33	22	1	61.8	1 5 6	10
USAEH002	−101.20	1	−89.24	36.16	5.67	3.76	170	1	61.7	1 6 9/GR20	10
USAEH003	−110.20	1	−90.14	36.11	5.55	3.55	161	1	62.0	1 6 9/GR21	10
USAEH004	−119.20	1	−91.16	36.05	5.38	3.24	152	1	62.6	1 5 6	10
USAPSA02	−166.20	1	−117.80	40.58	4.03	0.82	135	1	63.2	9/GR1	
USAPSA03	−175.20	1	−118.27	40.12	3.62	0.80	136	1	65.0	9/GR2	
USAWH101	−148.20	1	−109.65	38.13	5.53	1.95	142	1	62.1	10	
USAWH102	−157.20	1	−111.41	38.57	5.51	1.54	138	1	63.2	10	
VENAND03	−115.20	1	−67.04	6.91	2.37	1.43	111	1	67.2	9/GR5	
VRG00001	−79.70	1	−64.37	18.48	0.80	0.80	90	1	58.3	4	

12 238.58 MHz (2)

1	2	3	4		5		6	7	8	9	
ALS00002	−165.80	2	−149.63	58.52	3.81	1.23	171	2	59.7	9/GR1	10
ALS00003	−174.80	2	−150.95	58.54	3.77	1.11	167	2	60.0	9/GR2	10
ARGNORT4	−93.80	2	−63.96	−30.01	3.86	1.99	48	2	65.6	10	
ARGNORT5	−54.80	2	−62.85	−29.80	3.24	2.89	47	2	63.5	10	
ATNBEAM1	−52.80	2	−66.44	14.87	1.83	0.80	39	2	61.0		
B CE311	−63.80	2	−40.60	−6.07	3.04	2.06	174	2	61.6	8 9/GR7	10
B CE312	−44.80	2	−40.26	−6.06	3.44	2.09	174	2	61.0	8 9/GR9	10
B CE411	−63.80	2	−50.97	−15.26	3.86	1.38	49	2	62.6	8 9/GR7	10
B CE412	−44.80	2	−50.71	−15.30	3.57	1.56	52	2	62.7	8 9/GR9	10
B CE511	−63.80	2	−53.11	−2.98	2.42	2.15	107	2	63.1	8 9/GR7	10
B NO611	−73.80	2	−59.60	−11.62	2.86	1.69	165	1	62.8	8 9/GR8	10
B NO711	−73.80	2	−60.70	−1.78	3.54	1.78	126	1	62.8	8 9/GR8	10
B NO811	−73.80	2	−68.75	−4.71	2.37	1.65	73	1	62.8	8 9/GR8	
B SE911	−101.80	2	−45.99	−19.09	2.22	0.80	62	2	65.3	8	10
B SU111	−80.80	2	−51.10	−25.64	2.76	1.06	50	2	62.8	8 9/GR6	10
B SU112	−44.80	2	−50.76	−25.62	2.47	1.48	56	2	62.3	8 9/GR9	
B SU211	−80.80	2	−44.51	−16.94	3.22	1.37	60	2	62.5	8 9/GR6	10
B SU212	−44.80	2	−43.99	−16.97	3.27	1.92	59	2	61.3	8 9/GR9	
CAN01101	−137.80	2	−125.60	57.24	3.45	1.27	157	2	59.5	9/GR10	10
CAN01201	−137.80	2	−111.92	55.89	3.33	0.98	151	2	59.6	9/GR10	10
CAN01202	−72.30	2	−107.64	55.62	2.75	1.11	32	2	59.6		
CAN01203	−128.80	2	−111.43	55.56	3.07	1.15	151	2	59.5	9/GR12	10
CAN01303	−128.80	2	−102.39	57.12	3.54	0.92	154	2	60.0	9/GR12	10
CAN01304	−90.80	2	−99.00	57.33	1.96	1.73	1	2	59.8	9/GR13	
CAN01403	−128.80	2	−89.70	52.02	4.67	0.80	148	2	61.8	9/GR12	10
CAN01404	−90.80	2	−84.78	52.41	3.09	2.06	153	2	60.4	9/GR13	10
CAN01405	−81.80	2	−84.02	52.34	2.82	2.30	172	2	60.3	9/GR14	10
CAN01504	−90.80	2	−72.68	53.78	3.57	1.67	157	2	60.2	9/GR13	10
CAN01505	−81.80	2	−71.76	53.76	3.30	1.89	162	2	60.1	9/GR14	10
CAN01605	−81.80	2	−61.54	49.50	2.66	1.39	144	2	60.3	9/GR14	10
CAN01606	−70.30	2	−61.32	49.51	2.41	1.65	148	2	60.2	10	
CHLCONT4	−105.80	2	−69.59	−23.20	2.21	0.80	68	2	59.1	9/GR16	
CHLCONT6	−105.80	2	−73.52	−55.52	3.65	1.31	39	2	59.6	9/GR16	
CRBBAH01	−92.30	2	−76.09	24.13	1.83	0.80	141	1	61.7	9/GR18	
CRBBER01	−92.30	2	−64.76	32.13	0.80	0.80	90	1	56.7	9/GR18	
CRBBLZ01	−92.30	2	−88.61	17.26	0.80	0.80	90	1	58.6	9/GR18	
CRBEC001	−92.30	2	−60.07	8.26	4.20	0.86	115	1	64.2	9/GR18	10
CRBJMC01	−92.30	2	−79.45	17.97	0.99	0.80	151	1	61.1	9/GR18	
CTR00201	−130.80	2	−84.33	9.67	0.82	0.80	119	2	65.6		
EQAC0001	−94.80	2	−78.31	−1.52	1.48	1.15	65	1	63.0	9/GR19	
EQAG0001	−94.80	2	−90.36	−0.57	0.94	0.89	99	1	61.0	9/GR19	
GUY00302	−33.80	2	−59.07	4.77	1.43	0.85	91	2	63.5		
HNDIFRB2	−107.30	2	−86.23	15.16	1.14	0.85	8	1	63.4		
HTI00002	−83.30	2	−73.28	18.96	0.82	0.80	11	2	60.9		
HWA00002	−165.80	2	−165.79	23.32	4.20	0.80	160	2	58.8	9/GR1	10
HWA00003	−174.80	2	−166.10	23.42	4.25	0.80	159	2	58.8	9/GR2	10
MEX01NTE	−77.80	2	−105.80	25.99	2.88	2.07	155	2	60.5	1	
MEX02NTE	−135.80	2	−107.36	26.32	3.80	1.57	149	2	61.2	1	10
MEX02SUR	−126.80	2	−96.39	19.88	3.19	1.87	158	2	62.5	1	10
PRU00004	−85.80	2	−74.19	−8.39	3.74	2.45	112	2	62.8	10	
PTRVIR01	−100.80	2	−65.85	18.12	0.80	0.80	90	2	60.6	1 6 9/GR20	
PTRVIR02	−109.80	2	−65.85	18.12	0.80	0.80	90	2	61.1	1 6 9/GR21	
TCA00001	−115.80	2	−71.79	21.53	0.80	0.80	90	2	60.4		
USAEH001	−61.30	2	−85.16	36.21	5.63	3.32	22	2	61.8	1 5 6	10
USAEH002	−100.80	2	−89.28	36.16	5.65	3.78	170	2	61.7	1 6 9/GR20	10
USAEH003	−109.80	2	−90.12	36.11	5.55	3.56	161	2	62.1	1 6 9/GR21	10
USAEH004	−118.80	2	−91.16	36.05	5.38	3.24	153	2	62.6	1 5 6	10
USAPSA02	−165.80	2	−117.79	40.58	4.04	0.82	135	2	63.2	9/GR1	
USAPSA03	−174.80	2	−118.20	40.15	3.63	0.80	136	2	64.9	9/GR2	
USAWH101	−147.80	2	−109.70	38.13	5.52	1.96	142	2	62.1	10	
USAWH102	−156.80	2	−111.40	38.57	5.51	1.55	138	2	63.2	10	
VCT00001	−79.30	2	−61.18	13.23	0.80	0.80	90	2	58.4		
VEN11VEN	−103.80	2	−66.79	6.90	2.50	1.77	122	2	65.1	10	

12 253.16 MHz (3)

1	2	3	4		5		6	7	8	9	
ALS00002	−166.20	3	−149.66	58.37	3.76	1.24	170	1	59.8	9/GR1	10
ALS00003	−175.20	3	−150.98	58.53	3.77	1.11	167	1	60.0	9/GR2	10
ARGINSU4	−94.20	3	−52.98	−59.81	3.40	0.80	19	1	59.9	9/GR3	
ARGINSU5	−55.20	3	−44.17	−59.91	3.77	0.80	13	1	59.3	9/GR4	10
ARGSUR04	−94.20	3	−65.04	−43.33	3.32	1.50	40	1	60.7	9/GR3	10
ARGSUR05	−55.20	3	−63.68	−43.01	2.54	2.38	152	1	60.1	9/GR4	10
ATGSJN01	−79.70	3	−61.79	17.07	0.80	0.80	90	1	58.4		
B CE311	−64.20	3	−40.60	−6.07	3.04	2.06	174	1	61.6	8 9/GR7	10
B CE312	−45.20	3	−40.27	−6.06	3.44	2.09	174	1	61.0	8 9/GR9	10
B CE411	−64.20	3	−50.97	−15.27	3.86	1.38	49	1	62.6	8 9/GR7	10
B CE412	−45.20	3	−50.71	−15.30	3.57	1.56	52	1	62.7	8 9/GR9	10
B CE511	−64.20	3	−53.10	−2.90	2.44	2.13	104	1	63.1	8 9/GR7	10
B NO611	−74.20	3	−59.60	−11.62	2.85	1.69	165	2	62.9	8 9/GR8	10
B NO711	−74.20	3	−60.70	−1.78	3.54	1.78	126	2	62.8	8 9/GR8	10
B NO811	−74.20	3	−68.76	−4.71	2.37	1.65	73	2	62.8	8 9/GR8	
B SU111	−81.20	3	−51.12	−25.63	2.76	1.05	50	1	62.9	8 9/GR6	10
B SU112	−45.20	3	−50.75	−25.62	2.47	1.48	56	1	62.3	8 9/GR9	
B SU211	−81.20	3	−44.51	−16.95	3.22	1.36	60	1	62.5	8 9/GR6	10
B SU212	−45.20	3	−44.00	−16.87	3.20	1.96	58	1	61.3	8 9/GR9	
BERBERMU	−96.20	3	−64.77	32.32	0.80	0.80	90	2	56.8		
BOLAND01	−115.20	3	−65.04	−16.76	2.49	1.27	76	1	67.9	9/GR5	
BOL00001	−87.20	3	−64.61	−16.71	2.52	2.19	85	1	63.8	10	
BRB00001	−92.70	3	−59.85	12.93	0.80	0.80	90	2	59.1		
CAN01101	−138.20	3	−125.63	57.24	3.45	1.27	157	1	59.5	9/GR10	10
CAN01201	−138.20	3	−112.04	55.95	3.35	0.97	151	1	59.6	9/GR10	10
CAN01202	−72.70	3	−107.70	55.63	2.74	1.12	32	1	59.6		
CAN01203	−129.20	3	−111.48	55.61	3.08	1.15	151	1	59.5	9/GR12	10
CAN01303	−129.20	3	−102.42	57.12	3.54	0.91	154	1	60.1	9/GR12	10
CAN01304	−91.20	3	−99.12	57.36	1.98	1.72	2	1	59.8	9/GR13	
CAN01403	−129.20	3	−89.75	52.02	4.68	0.80	148	1	61.8	9/GR12	10
CAN01404	−91.20	3	−84.82	52.42	3.10	2.05	152	1	60.4	9/GR13	10
CAN01405	−82.20	3	−84.00	52.39	2.84	2.29	172	1	60.3	9/GR14	10
CAN01504	−91.20	3	−72.66	53.77	3.57	1.67	156	1	60.2	9/GR13	10
CAN01505	−82.20	3	−71.77	53.79	3.30	1.89	162	1	60.1	9/GR14	10
CAN01605	−82.20	3	−61.50	49.55	2.65	1.40	143	1	60.3	9/GR14	10
CAN01606	−70.70	3	−61.30	49.55	2.40	1.65	148	1	60.2	10	
CHLCONT5	−106.20	3	−72.23	−35.57	2.60	0.80	55	1	59.4	9/GR17	
CHLPAC02	−106.20	3	−80.06	−30.06	1.36	0.80	69	1	59.2	9/GR17	
CLMAND01	−115.20	3	−74.72	5.93	3.85	1.63	114	1	65.0	9/GR5	
CLM00001	−103.20	3	−74.50	5.87	3.98	1.96	118	1	63.6	10	
CUB00001	−89.20	3	−79.81	21.62	2.24	0.80	168	1	61.1		
EQACAND1	−115.20	3	−78.40	−1.61	1.37	0.95	75	1	64.1	9/GR5	
EQAGAND1	−115.20	3	−90.34	−0.62	0.90	0.81	89	1	61.3	9/GR5	
GRD00002	−42.20	3	−61.58	12.29	0.80	0.80	90	1	58.8		
GRD00059	−57.20	3	−61.58	12.29	0.80	0.80	90	1	58.5		
GRLDNK01	−53.20	3	−44.89	66.56	2.70	0.82	173	1	60.0	2	10
HWA00002	−166.20	3	−165.79	23.42	4.20	0.80	160	1	58.8	9/GR1	10
HWA00003	−175.20	3	−166.10	23.42	4.25	0.80	159	1	58.8	9/GR2	10
MEX01NTE	−78.20	3	−105.81	26.01	2.89	2.08	155	1	60.5	1	
MEX01SUR	−69.20	3	−94.84	19.82	3.05	2.09	4	1	62.3	1	10
MEX02NTE	−136.20	3	−107.21	26.31	3.84	1.55	148	1	61.2	1	10
MEX02SUR	−127.20	3	−96.39	19.88	3.18	1.87	157	1	62.6	1	10
PAQPAC01	−106.20	3	−109.18	−27.53	0.80	0.80	90	1	56.2	9/GR17	
PRG00002	−99.20	3	−58.66	−23.32	1.45	1.04	76	1	60.2		
PRUAND02	−115.20	3	−74.69	−8.39	3.41	1.79	95	1	64.0	9/GR5	
PTRVIR01	−101.20	3	−65.85	18.12	0.80	0.80	90	1	60.6	1 6 9/GR20	
PTRVIR02	−110.20	3	−65.86	18.12	0.80	0.80	90	1	61.0	1 6 9/GR21	
SURINAM2	−84.70	3	−55.69	4.35	1.00	0.80	86	1	63.2		
URG00001	−71.70	3	−56.22	−32.52	1.02	0.89	11	1	60.0		
USAEH001	−61.70	3	−85.19	36.21	5.63	3.33	22	1	61.8	1 5 6	10
USAEH002	−101.20	3	−89.24	36.16	5.67	3.76	170	1	61.7	1 6 9/GR20	10
USAEH003	−110.20	3	−90.14	36.11	5.55	3.55	161	1	62.1	1 6 9/GR21	10
USAEH004	−119.20	3	−91.16	36.05	5.38	3.24	152	1	62.6	1 5 6	10
USAPSA02	−166.20	3	−117.80	40.58	4.03	0.82	135	1	63.3	9/GR1	
USAPSA03	−175.20	3	−118.27	40.12	3.62	0.80	136	1	65.0	9/GR2	
USAWH101	−148.20	3	−109.65	38.13	5.53	1.95	142	1	62.1	10	
USAWH102	−157.20	3	−111.41	38.57	5.51	1.54	138	1	63.2	10	
VENAND03	−115.20	3	−67.04	6.91	2.37	1.43	111	1	67.3	9/GR5	

12 267.74 MHz (4)

1	2	3	4		5		6	7	8	9	
ALS00002	−165.80	4	−149.63	58.52	3.81	1.23	171	2	59.8	9/GR1	10
ALS00003	−174.80	4	−150.95	58.54	3.77	1.11	167	2	60.0	9/GR2	10
ARGNORT4	−93.80	4	−63.96	−30.01	3.86	1.99	48	2	65.7	10	
ARGNORT5	−54.80	4	−62.85	−29.80	3.24	2.89	47	2	63.5	10	
B CE311	−63.80	4	−40.60	−6.07	3.04	2.06	174	2	61.6	8 9/GR7	10
B CE312	−44.80	4	−40.26	−6.06	3.44	2.09	174	2	61.0	8 9/GR9	10
B CE411	−63.80	4	−50.97	−15.26	3.86	1.38	49	2	62.6	8 9/GR7	10
B CE412	−44.80	4	−50.71	−15.30	3.57	1.56	52	2	62.8	8 9/GR9	10
B CE511	−63.80	4	−53.11	−2.98	2.42	2.15	107	2	63.1	8 9/GR7	10
B NO611	−73.80	4	−59.60	−11.62	2.86	1.69	165	1	62.9	8 9/GR8	10
B NO711	−73.80	4	−60.70	−1.78	3.54	1.78	126	1	62.8	8 9/GR8	10
B NO811	−73.80	4	−68.75	−4.71	2.37	1.65	73	1	62.8	8 9/GR8	
B SE911	−101.80	4	−45.99	−19.09	2.22	0.80	62	2	65.3	8	10
B SU111	−80.80	4	−51.10	−25.64	2.76	1.06	50	2	62.9	8 9/GR6	10
B SU112	−44.80	4	−50.76	−25.62	2.47	1.48	56	2	62.3	8 9/GR9	
B SU211	−80.80	4	−44.51	−16.94	3.22	1.37	60	2	62.5	8 9/GR6	10
B SU212	−44.80	4	−43.99	−16.97	3.27	1.92	59	2	61.3	8 9/GR9	
CAN01101	−137.80	4	−125.60	57.24	3.45	1.27	157	2	59.5	9/GR10	10
CAN01201	−137.80	4	−111.92	55.89	3.33	0.98	151	2	59.6	9/GR10	10
CAN01202	−72.30	4	−107.64	55.62	2.75	1.11	32	2	59.6		
CAN01203	−128.80	4	−111.43	55.56	3.07	1.15	151	2	59.5	9/GR12	10
CAN01303	−128.80	4	−102.39	57.12	3.54	0.92	154	2	60.1	9/GR12	10
CAN01304	−90.80	4	−99.00	57.33	1.96	1.73	1	2	59.8	9/GR13	
CAN01403	−128.80	4	−89.70	52.02	4.67	0.80	148	2	61.8	9/GR12	10
CAN01404	−90.80	4	−84.78	52.41	3.09	2.06	153	2	60.4	9/GR13	10
CAN01405	−81.80	4	−84.02	52.34	2.82	2.30	172	2	60.3	9/GR14	10
CAN01504	−90.80	4	−72.68	53.78	3.57	1.67	157	2	60.2	9/GR13	10
CAN01505	−81.80	4	−71.76	53.76	3.30	1.89	162	2	60.2	9/GR14	10
CAN01605	−81.80	4	−61.54	49.50	2.66	1.39	144	2	60.3	9/GR14	10
CAN01606	−70.30	4	−61.32	49.51	2.41	1.65	148	2	60.2	10	
CHLCONT4	−105.80	4	−69.59	−23.20	2.21	0.80	68	2	59.1	9/GR16	
CHLCONT6	−105.80	4	−73.52	−55.52	3.65	1.31	39	2	59.6	9/GR16	
CRBBAH01	−92.30	4	−76.09	24.13	1.83	0.80	141	1	61.7	9/GR18	
CRBBER01	−92.30	4	−64.76	32.13	0.80	0.80	90	1	56.8	9/GR18	
CRBBLZ01	−92.30	4	−88.61	17.26	0.80	0.80	90	1	58.7	9/GR18	
CRBEC001	−92.30	4	−60.07	8.26	4.20	0.86	115	1	64.3	9/GR18	10
CRBJMC01	−92.30	4	−79.45	17.97	0.99	0.80	151	1	61.1	9/GR18	
CYM00001	−115.80	4	−80.58	19.57	0.80	0.80	90	2	59.6		
DOMIFRB2	−83.30	4	−70.51	18.79	0.98	0.80	167	2	61.1		
EQAC0001	−94.80	4	−78.31	−1.52	1.48	1.15	65	1	63.0	9/GR19	
EQAG0001	−94.80	4	−90.36	−0.57	0.94	0.89	99	1	61.0	9/GR19	
GUFMGG02	−52.80	4	−56.42	8.47	4.16	0.81	123	2	62.7	2 7	10
HWA00002	−165.80	4	−165.79	23.32	4.20	0.80	160	2	58.8	9/GR1	10
HWA00003	−174.80	4	−166.10	23.42	4.25	0.80	159	2	58.8	9/GR2	10
JMC00005	−33.80	4	−77.27	18.12	0.80	0.80	90	2	60.6		
LCAIFRB1	−79.30	4	−61.15	13.90	0.80	0.80	90	2	58.4		
MEX01NTE	−77.80	4	−105.80	25.99	2.88	2.07	155	2	60.5	1	
MEX02NTE	−135.80	4	−107.36	26.32	3.80	1.57	149	2	61.2	1	10
MEX02SUR	−126.80	4	−96.39	19.88	3.19	1.87	158	2	62.5	1	10
PRU00004	−85.80	4	−74.19	−8.39	3.74	2.45	112	2	62.9	10	
PTRVIR01	−100.80	4	−65.85	18.12	0.80	0.80	90	2	60.6	1 6 9/GR20	
PTRVIR02	−109.80	4	−65.85	18.12	0.80	0.80	90	2	61.1	1 6 9/GR21	
SLVIFRB2	−107.30	4	−88.91	13.59	0.80	0.80	90	1	61.7		
USAEH001	−61.30	4	−85.16	36.21	5.63	3.32	22	2	61.9	1 5 6	10
USAEH002	−100.80	4	−89.28	36.16	5.65	3.78	170	2	61.7	1 6 9/GR20	10
USAEH003	−109.80	4	−90.12	36.11	5.55	3.56	161	2	62.1	1 6 9/GR21	10
USAEH004	−118.80	4	−91.16	36.05	5.38	3.24	153	2	62.6	1 5 6	10
USAPSA02	−165.80	4	−117.79	40.58	4.04	0.82	135	2	63.3	9/GR1	
USAPSA03	−174.80	4	−118.20	40.15	3.63	0.80	136	2	65.0	9/GR2	
USAWH101	−147.80	4	−109.70	38.13	5.52	1.96	142	2	62.1	10	
USAWH102	−156.80	4	−111.40	38.57	5.51	1.55	138	2	63.2	10	
VEN11VEN	−103.80	4	−66.79	6.90	2.50	1.77	122	2	65.2	10	

12 282.32 MHz (5)

1	2	3	4		5		6	7	8	9	
ALS00002	−166.20	5	−149.66	58.37	3.76	1.24	170	1	59.7	9/GR1	10
ALS00003	−175.20	5	−150.98	58.53	3.77	1.11	167	1	60.0	9/GR2	10
ARGINSU4	−94.20	5	−52.98	−59.81	3.40	0.80	19	1	59.9	9/GR3	
ARGSUR04	−94.20	5	−65.04	−43.33	3.32	1.50	40	1	60.7	9/GR3	10
B CE311	−64.20	5	−40.60	−6.07	3.04	2.06	174	1	61.6	89/GR7	10
B CE312	−45.20	5	−40.27	−6.06	3.44	2.09	174	1	61.0	89/GR9	10
B CE411	−64.20	5	−50.97	−15.27	3.86	1.38	49	1	62.6	89/GR7	10
B CE412	−45.20	5	−50.71	−15.30	3.57	1.56	52	1	62.7	89/GR9	10
B CE511	−64.20	5	−53.10	−2.90	2.44	2.13	104	1	63.0	89/GR7	10
B NO611	−74.20	5	−59.60	−11.62	2.85	1.69	165	2	62.8	89/GR8	10
B NO711	−74.20	5	−60.70	−1.78	3.54	1.78	126	2	62.8	89/GR8	10
B NO811	−74.20	5	−68.76	−4.71	2.37	1.65	73	2	62.8	89/GR8	
B SU111	−81.20	5	−51.12	−25.63	2.76	1.05	50	1	62.8	89/GR6	10
B SU112	−45.20	5	−50.75	−25.62	2.47	1.48	56	1	62.2	89/GR9	
B SU211	−81.20	5	−44.51	−16.95	3.22	1.36	60	1	62.5	89/GR6	10
B SU212	−45.20	5	−44.00	−16.87	3.20	1.96	58	1	61.3	89/GR9	
BAHIFRB1	−87.20	5	−76.06	24.16	1.81	0.80	142	1	61.6		
BERBERMU	−96.20	5	−64.77	32.32	0.80	0.80	90	2	56.8		
BERBER02	−31.00	5	−64.77	32.32	0.80	0.80	90	1	56.9	2	10
BOLAND01	−115.20	5	−65.04	−16.76	2.49	1.27	76	1	67.9	9/GR5	
CAN01101	−138.20	5	−125.63	57.24	3.45	1.27	157	1	59.5	9/GR10	10
CAN01201	−138.20	5	−112.04	55.95	3.35	0.97	151	1	59.6	9/GR10	10
CAN01202	−72.70	5	−107.70	55.63	2.74	1.12	32	1	59.6		
CAN01203	−129.20	5	−111.48	55.61	3.08	1.15	151	1	59.5	9/GR12	10
CAN01303	−129.20	5	−102.42	57.12	3.54	0.91	154	1	60.0	9/GR12	10
CAN01304	−91.20	5	−99.12	57.36	1.98	1.72	2	1	59.8	9/GR13	
CAN01403	−129.20	5	−89.75	52.02	4.68	0.80	148	1	61.8	9/GR12	10
CAN01404	−91.20	5	−84.82	52.42	3.10	2.05	152	1	60.4	9/GR13	10
CAN01405	−82.20	5	−84.00	52.39	2.84	2.29	172	1	60.3	9/GR14	10
CAN01504	−91.20	5	−72.66	53.77	3.57	1.67	156	1	60.2	9/GR13	10
CAN01505	−82.20	5	−71.77	53.79	3.30	1.89	162	1	60.1	9/GR14	10
CAN01605	−82.20	5	−61.50	49.55	2.65	1.40	143	1	60.3	9/GR14	10
CAN01606	−70.70	5	−61.30	49.55	2.40	1.65	148	1	60.2	10	
CHLCONT5	−106.20	5	−72.23	−35.57	2.60	0.80	55	1	59.4	9/GR17	
CHLPAC02	−106.20	5	−80.06	−30.06	1.36	0.80	69	1	59.2	9/GR17	
CLMAND01	−115.20	5	−74.72	5.93	3.85	1.63	114	1	64.9	9/GR5	
CLM00001	−103.20	5	−74.50	5.87	3.98	1.96	118	1	63.5	10	
EQACAND1	−115.20	5	−78.40	−1.61	1.37	0.95	75	1	64.0	9/GR5	
EQAGAND1	−115.20	5	−90.34	−0.62	0.90	0.81	89	1	61.3	9/GR5	
FLKANT01	−57.20	5	−44.54	−60.13	3.54	0.80	12	1	59.3	2	10
FLKFALKS	−31.00	5	−59.90	−51.64	0.80	0.80	90	1	58.1	2	
GRD00002	−42.20	5	−61.58	12.29	0.80	0.80	90	1	58.8		
HWA00002	−166.20	5	−165.79	23.42	4.20	0.80	160	1	58.8	9/GR1	10
HWA00003	−175.20	5	−166.10	23.42	4.25	0.80	159	1	58.8	9/GR2	10
MEX01NTE	−78.20	5	−105.81	26.01	2.89	2.08	155	1	60.5	1	
MEX01SUR	−69.20	5	−94.84	19.82	3.05	2.09	4	1	62.2	1	10
MEX02NTE	−136.20	5	−107.21	26.31	3.84	1.55	148	1	61.2	1	10
MEX02SUR	−127.20	5	−96.39	19.88	3.18	1.87	157	1	62.5	1	10
PAQPAC01	−106.20	5	−109.18	−27.53	0.80	0.80	90	1	56.2	9/GR17	
PRG00002	−99.20	5	−58.66	−23.32	1.45	1.04	76	1	60.2		
PRUAND02	−115.20	5	−74.69	−8.39	3.41	1.79	95	1	63.9	9/GR5	
PTRVIR01	−101.20	5	−65.85	18.12	0.80	0.80	90	1	60.5	169/GR20	
PTRVIR02	−110.20	5	−65.86	18.12	0.80	0.80	90	1	61.0	169/GR21	
SPMFRAN3	−53.20	5	−67.24	47.51	3.16	0.80	7	1	60.4	27	10
TRD00001	−84.70	5	−61.23	10.70	0.80	0.80	90	1	59.4		
URG00001	−71.70	5	−56.22	−32.52	1.02	0.89	11	1	60.0		
USAEH001	−61.70	5	−85.19	36.21	5.63	3.33	22	1	61.8	156	10
USAEH002	−101.20	5	−89.24	36.16	5.67	3.76	170	1	61.7	169/GR20	10
USAEH003	−110.20	5	−90.14	36.11	5.55	3.55	161	1	62.0	169/GR21	10
USAEH004	−119.20	5	−91.16	36.05	5.38	3.24	152	1	62.6	156	10
USAPSA02	−166.20	5	−117.80	40.58	4.03	0.82	135	1	63.2	9/GR1	
USAPSA03	−175.20	5	−118.27	40.12	3.62	0.80	136	1	65.0	9/GR2	
USAWH101	−148.20	5	−109.65	38.13	5.53	1.95	142	1	62.1	10	
USAWH102	−157.20	5	−111.41	38.57	5.51	1.54	138	1	63.2	10	
VENAND03	−115.20	5	−67.04	6.91	2.37	1.43	111	1	67.2	9/GR5	
VRG00001	−79.70	5	−64.37	18.48	0.80	0.80	90	1	58.3	4	

12 296.90 MHz (6)

1	2	3	4		5		6	7	8	9	
ALS00002	−165.80	6	−149.63	58.52	3.81	1.23	171	2	59.7	9/GR1	10
ALS00003	−174.80	6	−150.95	58.54	3.77	1.11	167	2	60.0	9/GR2	10
ARGNORT4	−93.80	6	−63.96	−30.01	3.86	1.99	48	2	65.6	10	
ARGNORT5	−54.80	6	−62.85	−29.80	3.24	2.89	47	2	63.5	10	
ATNBEAM1	−52.80	6	−66.44	14.87	1.83	0.80	39	2	61.0		
B CE311	−63.80	6	−40.60	−6.07	3.04	2.06	174	2	61.6	8 9/GR7	10
B CE312	−44.80	6	−40.26	−6.06	3.44	2.09	174	2	61.0	8 9/GR9	10
B CE411	−63.80	6	−50.97	−15.26	3.86	1.38	49	2	62.6	8 9/GR7	10
B CE412	−44.80	6	−50.71	−15.30	3.57	1.56	52	2	62.7	8 9/GR9	10
B CE511	−63.80	6	−53.11	−2.98	2.42	2.15	107	2	63.1	8 9/GR7	10
B NO611	−73.80	6	−59.60	−11.62	2.86	1.69	165	1	62.8	8 9/GR8	10
B NO711	−73.80	6	−60.70	−1.78	3.54	1.78	126	1	62.8	8 9/GR8	10
B NO811	−73.80	6	−68.75	−4.71	2.37	1.65	73	1	62.8	8 9/GR8	
B SE911	−101.80	6	−45.99	−19.09	2.22	0.80	62	2	65.3	8	10
B SU111	−80.80	6	−51.10	−25.64	2.76	1.06	50	2	62.8	8 9/GR6	10
B SU112	−44.80	6	−50.76	−25.62	2.47	1.48	56	2	62.3	8 9/GR9	
B SU211	−80.80	6	−44.51	−16.94	3.22	1.37	60	2	62.5	8 9/GR6	10
B SU212	−44.80	6	−43.99	−16.97	3.27	1.92	59	2	61.3	8 9/GR9	
CAN01101	−137.80	6	−125.60	57.24	3.45	1.27	157	2	59.5	9/GR10	10
CAN01201	−137.80	6	−111.92	55.89	3.33	0.98	151	2	59.6	9/GR10	10
CAN01202	−72.30	6	−107.64	55.62	2.75	1.11	32	2	59.6		
CAN01203	−128.80	6	−111.43	55.56	3.07	1.15	151	2	59.5	9/GR12	10
CAN01303	−128.80	6	−102.39	57.12	3.54	0.92	154	2	60.0	9/GR12	10
CAN01304	−90.80	6	−99.00	57.33	1.96	1.73	1	2	59.8	9/GR13	
CAN01403	−128.80	6	−89.70	52.02	4.67	0.80	148	2	61.8	9/GR12	10
CAN01404	−90.80	6	−84.78	52.41	3.09	2.06	153	2	60.4	9/GR13	10
CAN01405	−81.80	6	−84.02	52.34	2.82	2.30	172	2	60.3	9/GR14	10
CAN01504	−90.80	6	−72.68	53.78	3.57	1.67	157	2	60.2	9/GR13	10
CAN01505	−81.80	6	−71.76	53.76	3.30	1.89	162	2	60.1	9/GR14	10
CAN01605	−81.80	6	−61.54	49.50	2.66	1.39	144	2	60.3	9/GR14	10
CAN01606	−70.30	6	−61.32	49.51	2.41	1.65	148	2	60.2	10	
CHLCONT4	−105.80	6	−69.59	−23.20	2.21	0.80	68	2	59.1	9/GR16	
CHLCONT6	−105.80	6	−73.52	−55.52	3.65	1.31	39	2	59.6	9/GR16	
CRBBAH01	−92.30	6	−76.09	24.13	1.83	0.80	141	1	61.7	9/GR18	
CRBBER01	−92.30	6	−64.76	32.13	0.80	0.80	90	1	56.7	9/GR18	
CRBBLZ01	−92.30	6	−88.61	17.26	0.80	0.80	90	1	58.6	9/GR18	
CRBEC001	−92.30	6	−60.07	8.26	4.20	0.86	115	1	64.2	9/GR18	10
CRBJMC01	−92.30	6	−79.45	17.97	0.99	0.80	151	1	61.1	9/GR18	
CTR00201	−130.80	6	−84.33	9.67	0.82	0.80	119	2	65.6		
EQAC0001	−94.80	6	−78.31	−1.52	1.48	1.15	65	1	63.0	9/GR19	
EQAG0001	−94.80	6	−90.36	−0.57	0.94	0.89	99	1	61.0	9/GR19	
GUY00302	−33.80	6	−59.07	4.77	1.43	0.85	91	2	63.5		
HNDIFRB2	−107.30	6	−86.23	15.16	1.14	0.85	8	1	63.4		
HTI00002	−83.30	6	−73.28	18.96	0.82	0.80	11	2	60.9		
HWA00002	−165.80	6	−165.79	23.32	4.20	0.80	160	2	58.8	9/GR1	10
HWA00003	−174.80	6	−166.10	23.42	4.25	0.80	159	2	58.8	9/GR2	10
MEX01NTE	−77.80	6	−105.80	25.99	2.88	2.07	155	2	60.5	1	
MEX02NTE	−135.80	6	−107.36	26.32	3.80	1.57	149	2	61.2	1	10
MEX02SUR	−126.80	6	−96.39	19.88	3.19	1.87	158	2	62.5	1	10
PRU00004	−85.80	6	−74.19	−8.39	3.74	2.45	112	2	62.8	10	
PTRVIR01	−100.80	6	−65.85	18.12	0.80	0.80	90	2	60.6	1 6 9/GR20	
PTRVIR02	−109.80	6	−65.85	18.12	0.80	0.80	90	2	61.1	1 6 9/GR21	
TCA00001	−115.80	6	−71.79	21.53	0.80	0.80	90	2	60.4		
USAEH001	−61.30	6	−85.16	36.21	5.63	3.32	22	2	61.8	1 5 6	10
USAEH002	−100.80	6	−89.28	36.16	5.65	3.78	170	2	61.7	1 6 9/GR20	10
USAEH003	−109.80	6	−90.12	36.11	5.55	3.56	161	2	62.1	1 6 9/GR21	10
USAEH004	−118.80	6	−91.16	36.05	5.38	3.24	153	2	62.6	1 5 6	10
USAPSA02	−165.80	6	−117.79	40.58	4.04	0.82	135	2	63.2	9/GR1	
USAPSA03	−174.80	6	−118.20	40.15	3.63	0.80	136	2	64.9	9/GR2	
USAWH101	−147.80	6	−109.70	38.13	5.52	1.96	142	2	62.1	10	
USAWH102	−156.80	6	−111.40	38.57	5.51	1.55	138	2	63.2	10	
VCT00001	−79.30	6	−61.18	13.23	0.80	0.80	90	2	58.4		
VEN11VEN	−103.80	6	−66.79	6.90	2.50	1.77	122	2	65.1	10	

12 311.48 MHz (7)

1	2	3	4		5		6	7	8	9	
ALS00002	−166.20	7	−149.66	58.37	3.76	1.24	170	1	59.8	9/GR1	10
ALS00003	−175.20	7	−150.98	58.53	3.77	1.11	167	1	60.0	9/GR2	10
ARGINSU4	−94.20	7	−52.98	−59.81	3.40	0.80	19	1	59.9	9/GR3	
ARGINSU5	−55.20	7	−44.17	−59.91	3.77	0.80	13	1	59.3	9/GR4	10
ARGSUR04	−94.20	7	−65.04	−43.33	3.32	1.50	40	1	60.7	9/GR3	10
ARGSUR05	−55.20	7	−63.68	−43.01	2.54	2.38	152	1	60.1	9/GR4	10
ATGSJN01	−79.70	7	−61.79	17.07	0.80	0.80	90	1	58.4		
B CE311	−64.20	7	−40.60	−6.07	3.04	2.06	174	1	61.6	8 9/GR7	10
B CE312	−45.20	7	−40.27	−6.06	3.44	2.09	174	1	61.0	8 9/GR9	10
B CE411	−64.20	7	−50.97	−15.27	3.86	1.38	49	1	62.6	8 9/GR7	10
B CE412	−45.20	7	−50.71	−15.30	3.57	1.56	52	1	62.7	8 9/GR9	10
B CE511	−64.20	7	−53.10	−2.90	2.44	2.13	104	1	63.1	8 9/GR7	10
B NO611	−74.20	7	−59.60	−11.62	2.85	1.69	165	2	62.9	8 9/GR8	10
B NO711	−74.20	7	−60.70	−1.78	3.54	1.78	126	2	62.8	8 9/GR8	10
B NO811	−74.20	7	−68.76	−4.71	2.37	1.65	73	2	62.8	8 9/GR8	
B SU111	−81.20	7	−51.12	−25.63	2.76	1.05	50	1	62.9	8 9/GR6	10
B SU112	−45.20	7	−50.75	−25.62	2.47	1.48	56	1	62.3	8 9/GR9	
B SU211	−81.20	7	−44.51	−16.95	3.22	1.36	60	1	62.5	8 9/GR6	10
B SU212	−45.20	7	−44.00	−16.87	3.20	1.96	58	1	61.3	8 9/GR9	
BERBERMU	−96.20	7	−64.77	32.32	0.80	0.80	90	2	56.8		
BOLAND01	−115.20	7	−65.04	−16.76	2.49	1.27	76	1	67.9	9/GR5	
BOL00001	−87.20	7	−64.61	−16.71	2.52	2.19	85	1	63.8	10	
BRB00001	−92.70	7	−59.85	12.93	0.80	0.80	90	2	59.1		
CAN01101	−138.20	7	−125.63	57.24	3.45	1.27	157	1	59.5	9/GR10	10
CAN01201	−138.20	7	−112.04	55.95	3.35	0.97	151	1	59.6	9/GR10	10
CAN01202	−72.70	7	−107.70	55.63	2.74	1.12	32	1	59.6		
CAN01203	−129.20	7	−111.48	55.61	3.08	1.15	151	1	59.5	9/GR12	10
CAN01303	−129.20	7	−102.42	57.12	3.54	0.91	154	1	60.1	9/GR12	10
CAN01304	−91.20	7	−99.12	57.36	1.98	1.72	2	1	59.8	9/GR13	
CAN01403	−129.20	7	−89.75	52.02	4.68	0.80	148	1	61.8	9/GR12	10
CAN01404	−91.20	7	−84.82	52.42	3.10	2.05	152	1	60.4	9/GR13	10
CAN01405	−82.20	7	−84.00	52.39	2.84	2.29	172	1	60.3	9/GR14	10
CAN01504	−91.20	7	−72.66	53.77	3.57	1.67	156	1	60.2	9/GR13	10
CAN01505	−82.20	7	−71.77	53.79	3.30	1.89	162	1	60.1	9/GR14	10
CAN01605	−82.20	7	−61.50	49.55	2.65	1.40	143	1	60.3	9/GR14	10
CAN01606	−70.70	7	−61.30	49.55	2.40	1.65	148	1	60.2	10	
CHLCONT5	−106.20	7	−72.23	−35.57	2.60	0.80	55	1	59.4	9/GR17	
CHLPAC02	−106.20	7	−80.06	−30.06	1.36	0.80	69	1	59.2	9/GR17	
CLMAND01	−115.20	7	−74.72	5.93	3.85	1.63	114	1	65.0	9/GR5	
CLM00001	−103.20	7	−74.50	5.87	3.98	1.96	118	1	63.6	10	
CUB00001	−89.20	7	−79.81	21.62	2.24	0.80	168	1	61.1		
EQACAND1	−115.20	7	−78.40	−1.61	1.37	0.95	75	1	64.1	9/GR5	
EQAGAND1	−115.20	7	−90.34	−0.62	0.90	0.81	89	1	61.3	9/GR5	
GRD00002	−42.20	7	−61.58	12.29	0.80	0.80	90	1	58.8		
GRD00059	−57.20	7	−61.58	12.29	0.80	0.80	90	1	58.5		
GRLDNK01	−53.20	7	−44.89	66.56	2.70	0.82	173	1	60.0	2	10
HWA00002	−166.20	7	−165.79	23.42	4.20	0.80	160	1	58.8	9/GR1	10
HWA00003	−175.20	7	−166.10	23.42	4.25	0.80	159	1	58.8	9/GR2	10
MEX01NTE	−78.20	7	−105.81	26.01	2.89	2.08	155	1	60.5	1	
MEX01SUR	−69.20	7	−94.84	19.82	3.05	2.09	4	1	62.3	1	10
MEX02NTE	−136.20	7	−107.21	26.31	3.84	1.55	148	1	61.2	1	10
MEX02SUR	−127.20	7	−96.39	19.88	3.18	1.87	157	1	62.6	1	10
PAQPAC01	−106.20	7	−109.18	−27.53	0.80	0.80	90	1	56.2	9/GR17	
PRG00002	−99.20	7	−58.66	−23.32	1.45	1.04	76	1	60.2		
PRUAND02	−115.20	7	−74.69	−8.39	3.41	1.79	95	1	64.0	9/GR5	
PTRVIR01	−101.20	7	−65.85	18.12	0.80	0.80	90	1	60.6	1 6 9/GR20	
PTRVIR02	−110.20	7	−65.86	18.12	0.80	0.80	90	1	61.0	1 6 9/GR21	
SURINAM2	−84.70	7	−55.69	4.35	1.00	0.80	86	1	63.2		
URG00001	−71.70	7	−56.22	−32.52	1.02	0.89	11	1	60.0		
USAEH001	−61.70	7	−85.19	36.21	5.63	3.33	22	1	61.8	1 5 6	10
USAEH002	−101.20	7	−89.24	36.16	5.67	3.76	170	1	61.7	1 6 9/GR20	10
USAEH003	−110.20	7	−90.14	36.11	5.55	3.55	161	1	62.1	1 6 9/GR21	10
USAEH004	−119.20	7	−91.16	36.05	5.38	3.24	152	1	62.6	1 5 6	10
USAPSA02	−166.20	7	−117.80	40.58	4.03	0.82	135	1	63.3	9/GR1	
USAPSA03	−175.20	7	−118.27	40.12	3.62	0.80	136	1	65.0	9/GR2	
USAWH101	−148.20	7	−109.65	38.13	5.53	1.95	142	1	62.1	10	
USAWH102	−157.20	7	−111.41	38.57	5.51	1.54	138	1	63.2	10	
VENAND03	−115.20	7	−67.04	6.91	2.37	1.43	111	1	67.3	9/GR5	

12 326.06 MHz (8)

1	2	3	4		5		6	7	8	9	
ALS00002	−165.80	8	−149.63	58.52	3.81	1.23	171	2	59.8	9/GR1	10
ALS00003	−174.80	8	−150.95	58.54	3.77	1.11	167	2	60.0	9/GR2	10
ARGNORT4	−93.80	8	−63.96	−30.01	3.86	1.99	48	2	65.7	10	
ARGNORT5	−54.80	8	−62.85	−29.80	3.24	2.89	47	2	63.5	10	
B CE311	−63.80	8	−40.60	−6.07	3.04	2.06	174	2	61.6	8 9/GR7	10
B CE312	−44.80	8	−40.26	−6.06	3.44	2.09	174	2	61.0	8 9/GR9	10
B CE411	−63.80	8	−50.97	−15.26	3.86	1.38	49	2	62.6	8 9/GR7	10
B CE412	−44.80	8	−50.71	−15.30	3.57	1.56	52	2	62.8	8 9/GR9	10
B CE511	−63.80	8	−53.11	−2.98	2.42	2.15	107	2	63.1	8 9/GR7	10
B NO611	−73.80	8	−59.60	−11.62	2.86	1.69	165	1	62.9	8 9/GR8	10
B NO711	−73.80	8	−60.70	−1.78	3.54	1.78	126	1	62.8	8 9/GR8	10
B NO811	−73.80	8	−68.75	−4.71	2.37	1.65	73	1	62.8	8 9/GR8	
B SE911	−101.80	8	−45.99	−19.09	2.22	0.80	62	2	65.3	8	10
B SU111	−80.80	8	−51.10	−25.64	2.76	1.06	50	2	62.9	8 9/GR6	10
B SU112	−44.80	8	−50.76	−25.62	2.47	1.48	56	2	62.3	8 9/GR9	
B SU211	−80.80	8	−44.51	−16.94	3.22	1.37	60	2	62.5	8 9/GR6	10
B SU212	−44.80	8	−43.99	−16.97	3.27	1.92	59	2	61.3	8 9/GR9	
CAN01101	−137.80	8	−125.60	57.24	3.45	1.27	157	2	59.5	9/GR10	10
CAN01201	−137.80	8	−111.92	55.89	3.33	0.98	151	2	59.6	9/GR10	10
CAN01202	−72.30	8	−107.64	55.62	2.75	1.11	32	2	59.6		
CAN01203	−128.80	8	−111.43	55.56	3.07	1.15	151	2	59.5	9/GR12	10
CAN01303	−128.80	8	−102.39	57.12	3.54	0.92	154	2	60.1	9/GR12	10
CAN01304	−90.80	8	−99.00	57.33	1.96	1.73	1	2	59.8	9/GR13	
CAN01403	−128.80	8	−89.70	52.02	4.67	0.80	148	2	61.8	9/GR12	10
CAN01404	−90.80	8	−84.78	52.41	3.09	2.06	153	2	60.4	9/GR13	10
CAN01405	−81.80	8	−84.02	52.34	2.82	2.30	172	2	60.3	9/GR14	10
CAN01504	−90.80	8	−72.68	53.78	3.57	1.67	157	2	60.2	9/GR13	10
CAN01505	−81.80	8	−71.76	53.76	3.30	1.89	162	2	60.2	9/GR14	10
CAN01605	−81.80	8	−61.54	49.50	2.66	1.39	144	2	60.3	9/GR14	10
CAN01606	−70.30	8	−61.32	49.51	2.41	1.65	148	2	60.2	10	
CHLCONT4	−105.80	8	−69.59	−23.20	2.21	0.80	68	2	59.1	9/GR16	
CHLCONT6	−105.80	8	−73.52	−55.52	3.65	1.31	39	2	59.6	9/GR16	
CRBBAH01	−92.30	8	−76.09	24.13	1.83	0.80	141	1	61.7	9/GR18	
CRBBER01	−92.30	8	−64.76	32.13	0.80	0.80	90	1	56.8	9/GR18	
CRBBLZ01	−92.30	8	−88.61	17.26	0.80	0.80	90	1	58.7	9/GR18	
CRBEC001	−92.30	8	−60.07	8.26	4.20	0.86	115	1	64.3	9/GR18	10
CRBJMC01	−92.30	8	−79.45	17.97	0.99	0.80	151	1	61.1	9/GR18	
CYM00001	−115.80	8	−80.58	19.57	0.80	0.80	90	2	59.6		
DOMIFRB2	−83.30	8	−70.51	18.79	0.98	0.80	167	2	61.1		
EQAC0001	−94.80	8	−78.31	−1.52	1.48	1.15	65	1	63.0	9/GR19	
EQAG0001	−94.80	8	−90.36	−0.57	0.94	0.89	99	1	61.0	9/GR19	
GUFMGG02	−52.80	8	−56.42	8.47	4.16	0.81	123	2	62.7	2 7	10
HWA00002	−165.80	8	−165.79	23.32	4.20	0.80	160	2	58.8	9/GR1	10
HWA00003	−174.80	8	−166.10	23.42	4.25	0.80	159	2	58.8	9/GR2	10
JMC00005	−33.80	8	−77.27	18.12	0.80	0.80	90	2	60.6		
LCAIFRB1	−79.30	8	−61.15	13.90	0.80	0.80	90	2	58.4		
MEX01NTE	−77.80	8	−105.80	25.99	2.88	2.07	155	2	60.5	1	
MEX02NTE	−135.80	8	−107.36	26.32	3.80	1.57	149	2	61.2	1	10
MEX02SUR	−126.80	8	−96.39	19.88	3.19	1.87	158	2	62.5	1	10
PRU00004	−85.80	8	−74.19	−8.39	3.74	2.45	112	2	62.9	10	
PTRVIR01	−100.80	8	−65.85	18.12	0.80	0.80	90	2	60.6	1 6 9/GR20	
PTRVIR02	−109.80	8	−65.85	18.12	0.80	0.80	90	2	61.1	1 6 9/GR21	
SLVIFRB2	−107.30	8	−88.91	13.59	0.80	0.80	90	1	61.7		
USAEH001	−61.30	8	−85.16	36.21	5.63	3.32	22	2	61.9	1 5 6	10
USAEH002	−100.80	8	−89.28	36.16	5.65	3.78	170	2	61.7	1 6 9/GR20	10
USAEH003	−109.80	8	−90.12	36.11	5.55	3.56	161	2	62.1	1 6 9/GR21	10
USAEH004	−118.80	8	−91.16	36.05	5.38	3.24	153	2	62.6	1 5 6	10
USAPSA02	−165.80	8	−117.79	40.58	4.04	0.82	135	2	63.3	9/GR1	
USAPSA03	−174.80	8	−118.20	40.15	3.63	0.80	136	2	65.0	9/GR2	
USAWH101	−147.80	8	−109.70	38.13	5.52	1.96	142	2	62.1	10	
USAWH102	−156.80	8	−111.40	38.57	5.51	1.55	138	2	63.2	10	
VEN11VEN	−103.80	8	−66.79	6.90	2.50	1.77	122	2	65.2	10	

12 340.64 MHz (9)

1	2	3	4		5		6	7	8	9	
ALS00002	−166.20	9	−149.66	58.37	3.76	1.24	170	1	59.7	9/GR1	10
ALS00003	−175.20	9	−150.98	58.53	3.77	1.11	167	1	60.0	9/GR2	10
ARGINSU4	−94.20	9	−52.98	−59.81	3.40	0.80	19	1	59.9	9/GR3	
ARGSUR04	−94.20	9	−65.04	−43.33	3.32	1.50	40	1	60.7	9/GR3	10
B CE311	−64.20	9	−40.60	−6.07	3.04	2.06	174	1	61.6	8 9/GR7	10
B CE312	−45.20	9	−40.27	−6.06	3.44	2.09	174	1	61.0	8 9/GR9	10
B CE411	−64.20	9	−50.97	−15.27	3.86	1.38	49	1	62.6	8 9/GR7	10
B CE412	−45.20	9	−50.71	−15.30	3.57	1.56	52	1	62.7	8 9/GR9	10
B CE511	−64.20	9	−53.10	−2.90	2.44	2.13	104	1	63.0	8 9/GR7	10
B NO611	−74.20	9	−59.60	−11.62	2.85	1.69	165	2	62.8	8 9/GR8	10
B NO711	−74.20	9	−60.70	−1.78	3.54	1.78	126	2	62.8	8 9/GR8	10
B NO811	−74.20	9	−68.76	−4.71	2.37	1.65	73	2	62.8	8 9/GR8	
B SU111	−81.20	9	−51.12	−25.63	2.76	1.05	50	1	62.8	8 9/GR6	10
B SU112	−45.20	9	−50.75	−25.62	2.47	1.48	56	1	62.2	8 9/GR9	
B SU211	−81.20	9	−44.51	−16.95	3.22	1.36	60	1	62.5	8 9/GR6	10
B SU212	−45.20	9	−44.00	−16.87	3.20	1.96	58	1	61.3	8 9/GR9	
BAHIFRB1	−87.20	9	−76.06	24.16	1.81	0.80	142	1	61.6		
BERBERMU	−96.20	9	−64.77	32.32	0.80	0.80	90	2	56.8		
BERBER02	−31.00	9	−64.77	32.32	0.80	0.80	90	1	56.9	2	10
BOLAND01	−115.20	9	−65.04	−16.76	2.49	1.27	76	1	67.9	9/GR5	
CAN01101	−138.20	9	−125.63	57.24	3.45	1.27	157	1	59.5	9/GR10	10
CAN01201	−138.20	9	−112.04	55.95	3.35	0.97	151	1	59.6	9/GR10	10
CAN01202	−72.70	9	−107.70	55.63	2.74	1.12	32	1	59.6		
CAN01203	−129.20	9	−111.48	55.61	3.08	1.15	151	1	59.5	9/GR12	10
CAN01303	−129.20	9	−102.42	57.12	3.54	0.91	154	1	60.0	9/GR12	10
CAN01304	−91.20	9	−99.12	57.36	1.98	1.72	2	1	59.8	9/GR13	
CAN01403	−129.20	9	−89.75	52.02	4.68	0.80	148	1	61.8	9/GR12	10
CAN01404	−91.20	9	−84.82	52.42	3.10	2.05	152	1	60.4	9/GR13	10
CAN01405	−82.20	9	−84.00	52.39	2.84	2.29	172	1	60.3	9/GR14	10
CAN01504	−91.20	9	−72.66	53.77	3.57	1.67	156	1	60.2	9/GR13	10
CAN01505	−82.20	9	−71.77	53.79	3.30	1.89	162	1	60.1	9/GR14	10
CAN01605	−82.20	9	−61.50	49.55	2.65	1.40	143	1	60.3	9/GR14	10
CAN01606	−70.70	9	−61.30	49.55	2.40	1.65	148	1	60.2	10	
CHLCONT5	−106.20	9	−72.23	−35.57	2.60	0.80	55	1	59.4	9/GR17	
CHLPAC02	−106.20	9	−80.06	−30.06	1.36	0.80	69	1	59.2	9/GR17	
CLMAND01	−115.20	9	−74.72	5.93	3.85	1.63	114	1	64.9	9/GR5	
CLM00001	−103.20	9	−74.50	5.87	3.98	1.96	118	1	63.5	10	
EQACAND1	−115.20	9	−78.40	−1.61	1.37	0.95	75	1	64.0	9/GR5	
EQAGAND1	−115.20	9	−90.34	−0.62	0.90	0.81	89	1	61.3	9/GR5	
FLKANT01	−57.20	9	−44.54	−60.13	3.54	0.80	12	1	59.3	2	10
FLKFALKS	−31.00	9	−59.90	−51.64	0.80	0.80	90	1	58.1	2	
GRD00002	−42.20	9	−61.58	12.29	0.80	0.80	90	1	58.8		
HWA00002	−166.20	9	−165.79	23.42	4.20	0.80	160	1	58.8	9/GR1	10
HWA00003	−175.20	9	−166.10	23.42	4.25	0.80	159	1	58.8	9/GR2	10
MEX01NTE	−78.20	9	−105.81	26.01	2.89	2.08	155	1	60.5	1	
MEX01SUR	−69.20	9	−94.84	19.82	3.05	2.09	4	1	62.2	1	10
MEX02NTE	−136.20	9	−107.21	26.31	3.84	1.55	148	1	61.2	1	10
MEX02SUR	−127.20	9	−96.39	19.88	3.18	1.87	157	1	62.5	1	10
PAQPAC01	−106.20	9	−109.18	−27.53	0.80	0.80	90	1	56.2	9/GR17	
PRG00002	−99.20	9	−58.66	−23.32	1.45	1.04	76	1	60.2		
PRUAND02	−115.20	9	−74.69	−8.39	3.41	1.79	95	1	63.9	9/GR5	
PTRVIR01	−101.20	9	−65.85	18.12	0.80	0.80	90	1	60.5	1 6 9/GR20	
PTRVIR02	−110.20	9	−65.86	18.12	0.80	0.80	90	1	61.0	1 6 9/GR21	
SPMFRAN3	−53.20	9	−67.24	47.51	3.16	0.80	7	1	60.4	2 7	10
TRD00001	−84.70	9	−61.23	10.70	0.80	0.80	90	1	59.4		
URG00001	−71.70	9	−56.22	−32.52	1.02	0.89	11	1	60.0		
USAEH001	−61.70	9	−85.19	36.21	5.63	3.33	22	1	61.8	1 5 6	10
USAEH002	−101.20	9	−89.24	36.16	5.67	3.76	170	1	61.7	1 6 9/GR20	10
USAEH003	−110.20	9	−90.14	36.11	5.55	3.55	161	1	62.0	1 6 9/GR21	10
USAEH004	−119.20	9	−91.16	36.05	5.38	3.24	152	1	62.6	1 5 6	10
USAPSA02	−166.20	9	−117.80	40.58	4.03	0.82	135	1	63.2	9/GR1	
USAPSA03	−175.20	9	−118.27	40.12	3.62	0.80	136	1	65.0	9/GR2	
USAWH101	−148.20	9	−109.65	38.13	5.53	1.95	142	1	62.1	10	
USAWH102	−157.20	9	−111.41	38.57	5.51	1.54	138	1	63.2	10	
VENAND03	−115.20	9	−67.04	6.91	2.37	1.43	111	1	67.2	9/GR5	
VRG00001	−79.70	9	−64.37	18.48	0.80	0.80	90	1	58.3	4	

12 355.22 MHz (10)

1	2	3	4		5		6	7	8	9	
ALS00002	−165.80	10	−149.63	58.52	3.81	1.23	171	2	59.7	9/GR1	10
ALS00003	−174.80	10	−150.95	58.54	3.77	1.11	167	2	60.0	9/GR2	10
ARGNORT4	−93.80	10	−63.96	−30.01	3.86	1.99	48	2	65.6	10	
ARGNORT5	−54.80	10	−62.85	−29.80	3.24	2.89	47	2	63.5	10	
ATNBEAM1	−52.80	10	−66.44	14.87	1.83	0.80	39	2	61.0		
B CE311	−63.80	10	−40.60	−6.07	3.04	2.06	174	2	61.6	8 9/GR7	10
B CE312	−44.80	10	−40.26	−6.06	3.44	2.09	174	2	61.0	8 9/GR9	10
B CE411	−63.80	10	−50.97	−15.26	3.86	1.38	49	2	62.6	8 9/GR7	10
B CE412	−44.80	10	−50.71	−15.30	3.57	1.56	52	2	62.7	8 9/GR9	10
B CE511	−63.80	10	−53.11	−2.98	2.42	2.15	107	2	63.1	8 9/GR7	10
B NO611	−73.80	10	−59.60	−11.62	2.86	1.69	165	1	62.8	8 9/GR8	10
B NO711	−73.80	10	−60.70	−1.78	3.54	1.78	126	1	62.8	8 9/GR8	10
B NO811	−73.80	10	−68.75	−4.71	2.37	1.65	73	1	62.8	8 9/GR8	
B SE911	−101.80	10	−45.99	−19.09	2.22	0.80	62	2	65.3	8	10
B SU111	−80.80	10	−51.10	−25.64	2.76	1.06	50	2	62.8	8 9/GR6	10
B SU112	−44.80	10	−50.76	−25.62	2.47	1.48	56	2	62.3	8 9/GR9	
B SU211	−80.80	10	−44.51	−16.94	3.22	1.37	60	2	62.5	8 9/GR6	10
B SU212	−44.80	10	−43.99	−16.97	3.27	1.92	59	2	61.3	8 9/GR9	
CAN01101	−137.80	10	−125.60	57.24	3.45	1.27	157	2	59.5	9/GR10	10
CAN01201	−137.80	10	−111.92	55.89	3.33	0.98	151	2	59.6	9/GR10	10
CAN01202	−72.30	10	−107.64	55.62	2.75	1.11	32	2	59.6		
CAN01203	−128.80	10	−111.43	55.56	3.07	1.15	151	2	59.5	9/GR12	10
CAN01303	−128.80	10	−102.39	57.12	3.54	0.92	154	2	60.0	9/GR12	10
CAN01304	−90.80	10	−99.00	57.33	1.96	1.73	1	2	59.8	9/GR13	
CAN01403	−128.80	10	−89.70	52.02	4.67	0.80	148	2	61.8	9/GR12	10
CAN01404	−90.80	10	−84.78	52.41	3.09	2.06	153	2	60.4	9/GR13	10
CAN01405	−81.80	10	−84.02	52.34	2.82	2.30	172	2	60.3	9/GR14	10
CAN01504	−90.80	10	−72.68	53.78	3.57	1.67	157	2	60.2	9/GR13	10
CAN01505	−81.80	10	−71.76	53.76	3.30	1.89	162	2	60.1	9/GR14	10
CAN01605	−81.80	10	−61.54	49.50	2.66	1.39	144	2	60.3	9/GR14	10
CAN01606	−70.30	10	−61.32	49.51	2.41	1.65	148	2	60.2	10	
CHLCONT4	−105.80	10	−69.59	−23.20	2.21	0.80	68	2	59.1	9/GR16	
CHLCONT6	−105.80	10	−73.52	−55.52	3.65	1.31	39	2	59.6	9/GR16	
CRBBAH01	−92.30	10	−76.09	24.13	1.83	0.80	141	1	61.7	9/GR18	
CRBBER01	−92.30	10	−64.76	32.13	0.80	0.80	90	1	56.7	9/GR18	
CRBBLZ01	−92.30	10	−88.61	17.26	0.80	0.80	90	1	58.6	9/GR18	
CRBEC001	−92.30	10	−60.07	8.26	4.20	0.86	115	1	64.2	9/GR18	10
CRBJMC01	−92.30	10	−79.45	17.97	0.99	0.80	151	1	61.1	9/GR18	
CTR00201	−130.80	10	−84.33	9.67	0.82	0.80	119	2	65.6		
EQAC0001	−94.80	10	−78.31	−1.52	1.48	1.15	65	1	63.0	9/GR19	
EQAG0001	−94.80	10	−90.36	−0.57	0.94	0.89	99	1	61.0	9/GR19	
GUY00302	−33.80	10	−59.07	4.77	1.43	0.85	91	2	63.5		
HNDIFRB2	−107.30	10	−86.23	15.16	1.14	0.85	8	1	63.4		
HTI00002	−83.30	10	−73.28	18.96	0.82	0.80	11	2	60.9		
HWA00002	−165.80	10	−165.79	23.32	4.20	0.80	160	2	58.8	9/GR1	10
HWA00003	−174.80	10	−166.10	23.42	4.25	0.80	159	2	58.8	9/GR2	10
MEX01NTE	−77.80	10	−105.80	25.99	2.88	2.07	155	2	60.5	1	
MEX02NTE	−135.80	10	−107.36	26.32	3.80	1.57	149	2	61.2	1	10
MEX02SUR	−126.80	10	−96.39	19.88	3.19	1.87	158	2	62.5	1	10
PRU00004	−85.80	10	−74.19	−8.39	3.74	2.45	112	2	62.8	10	
PTRVIR01	−100.80	10	−65.85	18.12	0.80	0.80	90	2	60.6	1 6 9/GR20	
PTRVIR02	−109.80	10	−65.85	18.12	0.80	0.80	90	2	61.1	1 6 9/GR21	
TCA00001	−115.80	10	−71.79	21.53	0.80	0.80	90	2	60.4		
USAEH001	−61.30	10	−85.16	36.21	5.63	3.32	22	2	61.8	1 5 6	10
USAEH002	−100.80	10	−89.28	36.16	5.65	3.78	170	2	61.7	1 6 9/GR20	10
USAEH003	−109.80	10	−90.12	36.11	5.55	3.56	161	2	62.1	1 6 9/GR21	10
USAEH004	−118.80	10	−91.16	36.05	5.38	3.24	153	2	62.6	1 5 6	10
USAPSA02	−165.80	10	−117.79	40.58	4.04	0.82	135	2	63.2	9/GR1	
USAPSA03	−174.80	10	−118.20	40.15	3.63	0.80	136	2	64.9	9/GR2	
USAWH101	−147.80	10	−109.70	38.13	5.52	1.96	142	2	62.1	10	
USAWH102	−156.80	10	−111.40	38.57	5.51	1.55	138	2	63.2	10	
VCT00001	−79.30	10	−61.18	13.23	0.80	0.80	90	2	58.4		
VEN11VEN	−103.80	10	−66.79	6.90	2.50	1.77	122	2	65.1	10	

12 369.80 MHz (11)

1	2	3	4		5		6	7	8	9	
ALS00002	−166.20	11	−149.66	58.37	3.76	1.24	170	1	59.8	9/GR1	10
ALS00003	−175.20	11	−150.98	58.53	3.77	1.11	167	1	60.0	9/GR2	10
ARGINSU4	−94.20	11	−52.98	−59.81	3.40	0.80	19	1	59.9	9/GR3	
ARGINSU5	−55.20	11	−44.17	−59.91	3.77	0.80	13	1	59.3	9/GR4	10
ARGSUR04	−94.20	11	−65.04	−43.33	3.32	1.50	40	1	60.7	9/GR3	10
ARGSUR05	−55.20	11	−63.68	−43.01	2.54	2.38	152	1	60.1	9/GR4	10
ATGSJN01	−79.70	11	−61.79	17.07	0.80	0.80	90	1	58.4		
B CE311	−64.20	11	−40.60	−6.07	3.04	2.06	174	1	61.6	8 9/GR7	10
B CE312	−45.20	11	−40.27	−6.06	3.44	2.09	174	1	61.0	8 9/GR9	10
B CE411	−64.20	11	−50.97	−15.27	3.86	1.38	49	1	62.6	8 9/GR7	10
B CE412	−45.20	11	−50.71	−15.30	3.57	1.56	52	1	62.7	8 9/GR9	10
B CE511	−64.20	11	−53.10	−2.90	2.44	2.13	104	1	63.1	8 9/GR7	10
B NO611	−74.20	11	−59.60	−11.62	2.85	1.69	165	2	62.9	8 9/GR8	10
B NO711	−74.20	11	−60.70	−1.78	3.54	1.78	126	2	62.8	8 9/GR8	10
B NO811	−74.20	11	−68.76	−4.71	2.37	1.65	73	2	62.8	8 9/GR8	
B SU111	−81.20	11	−51.12	−25.63	2.76	1.05	50	1	62.9	8 9/GR6	10
B SU112	−45.20	11	−50.75	−25.62	2.47	1.48	56	1	62.3	8 9/GR9	
B SU211	−81.20	11	−44.51	−16.95	3.22	1.36	60	1	62.5	8 9/GR6	10
B SU212	−45.20	11	−44.00	−16.87	3.20	1.96	58	1	61.3	8 9/GR9	
BERBERMU	−96.20	11	−64.77	32.32	0.80	0.80	90	2	56.8		
BOLAND01	−115.20	11	−65.04	−16.76	2.49	1.27	76	1	67.9	9/GR5	
BOL00001	−87.20	11	−64.61	−16.71	2.52	2.19	85	1	63.8	10	
BRB00001	−92.70	11	−59.85	12.93	0.80	0.80	90	2	59.1		
CAN01101	−138.20	11	−125.63	57.24	3.45	1.27	157	1	59.5	9/GR10	10
CAN01201	−138.20	11	−112.04	55.95	3.35	0.97	151	1	59.6	9/GR10	10
CAN01202	−72.70	11	−107.70	55.63	2.74	1.12	32	1	59.6		
CAN01203	−129.20	11	−111.48	55.61	3.08	1.15	151	1	59.5	9/GR12	10
CAN01303	−129.20	11	−102.42	57.12	3.54	0.91	154	1	60.1	9/GR12	10
CAN01304	−91.20	11	−99.12	57.36	1.98	1.72	2	1	59.8	9/GR13	
CAN01403	−129.20	11	−89.75	52.02	4.68	0.80	148	1	61.8	9/GR12	10
CAN01404	−91.20	11	−84.82	52.42	3.10	2.05	152	1	60.4	9/GR13	10
CAN01405	−82.20	11	−84.00	52.39	2.84	2.29	172	1	60.3	9/GR14	10
CAN01504	−91.20	11	−72.66	53.77	3.57	1.67	156	1	60.2	9/GR13	10
CAN01505	−82.20	11	−71.77	53.79	3.30	1.89	162	1	60.1	9/GR14	10
CAN01605	−82.20	11	−61.50	49.55	2.65	1.40	143	1	60.3	9/GR14	10
CAN01606	−70.70	11	−61.30	49.55	2.40	1.65	148	1	60.2	10	
CHLCONT5	−106.20	11	−72.23	−35.57	2.60	0.80	55	1	59.4	9/GR17	
CHLPAC02	−106.20	11	−80.06	−30.06	1.36	0.80	69	1	59.2	9/GR17	
CLMAND01	−115.20	11	−74.72	5.93	3.85	1.63	114	1	65.0	9/GR5	
CLM00001	−103.20	11	−74.50	5.87	3.98	1.96	118	1	63.6	10	
CUB00001	−89.20	11	−79.81	21.62	2.24	0.80	168	1	61.1		
EQACAND1	−115.20	11	−78.40	−1.61	1.37	0.95	75	1	64.1	9/GR5	
EQAGAND1	−115.20	11	−90.34	−0.62	0.90	0.81	89	1	61.3	9/GR5	
GRD00002	−42.20	11	−61.58	12.29	0.80	0.80	90	1	58.8		
GRD00059	−57.20	11	−61.58	12.29	0.80	0.80	90	1	58.5		
GRLDNK01	−53.20	11	−44.89	66.56	2.70	0.82	173	1	60.0	2	10
GUY00201	−84.70	11	−59.19	4.78	1.44	0.85	95	1	63.5		
HWA00002	−166.20	11	−165.79	23.42	4.20	0.80	160	1	58.8	9/GR1	10
HWA00003	−175.20	11	−166.10	23.42	4.25	0.80	159	1	58.8	9/GR2	10
MEX01NTE	−78.20	11	−105.81	26.01	2.89	2.08	155	1	60.5	1	
MEX01SUR	−69.20	11	−94.84	19.82	3.05	2.09	4	1	62.3	1	10
MEX02NTE	−136.20	11	−107.21	26.31	3.84	1.55	148	1	61.2	1	10
MEX02SUR	−127.20	11	−96.39	19.88	3.18	1.87	157	1	62.6	1	10
PAQPAC01	−106.20	11	−109.18	−27.53	0.80	0.80	90	1	56.2	9/GR17	
PRG00002	−99.20	11	−58.66	−23.32	1.45	1.04	76	1	60.2		
PRUAND02	−115.20	11	−74.69	−8.39	3.41	1.79	95	1	64.0	9/GR5	
PTRVIR01	−101.20	11	−65.85	18.12	0.80	0.80	90	1	60.6	1 6 9/GR20	
PTRVIR02	−110.20	11	−65.86	18.12	0.80	0.80	90	1	61.0	1 6 9/GR21	
URG00001	−71.70	11	−56.22	−32.52	1.02	0.89	11	1	60.0		
USAEH001	−61.70	11	−85.19	36.21	5.63	3.33	22	1	61.8	1 5 6	10
USAEH002	−101.20	11	−89.24	36.16	5.67	3.76	170	1	61.7	1 6 9/GR20	10
USAEH003	−110.20	11	−90.14	36.11	5.55	3.55	161	1	62.1	1 6 9/GR21	10
USAEH004	−119.20	11	−91.16	36.05	5.38	3.24	152	1	62.6	1 5 6	10
USAPSA02	−166.20	11	−117.80	40.58	4.03	0.82	135	1	63.3	9/GR1	
USAPSA03	−175.20	11	−118.27	40.12	3.62	0.80	136	1	65.0	9/GR2	
USAWH101	−148.20	11	−109.65	38.13	5.53	1.95	142	1	62.1	10	
USAWH102	−157.20	11	−111.41	38.57	5.51	1.54	138	1	63.2	10	
VENAND03	−115.20	11	−67.04	6.91	2.37	1.43	111	1	67.3	9/GR5	

12 384.38 MHz (12)

1	2	3	4		5		6	7	8	9	
ALS00002	−165.80	12	−149.63	58.52	3.81	1.23	171	2	59.8	9/GR1	10
ALS00003	−174.80	12	−150.95	58.54	3.77	1.11	167	2	60.0	9/GR2	10
ARGNORT4	−93.80	12	−63.96	−30.01	3.86	1.99	48	2	65.7	10	
ARGNORT5	−54.80	12	−62.85	−29.80	3.24	2.89	47	2	63.5	10	
B CE311	−63.80	12	−40.60	−6.07	3.04	2.06	174	2	61.6	8 9/GR7	10
B CE312	−44.80	12	−40.26	−6.06	3.44	2.09	174	2	61.0	8 9/GR9	10
B CE411	−63.80	12	−50.97	−15.26	3.86	1.38	49	2	62.6	8 9/GR7	10
B CE412	−44.80	12	−50.71	−15.30	3.57	1.56	52	2	62.8	8 9/GR9	10
B CE511	−63.80	12	−53.11	−2.98	2.42	2.15	107	2	63.1	8 9/GR7	10
B NO611	−73.80	12	−59.60	−11.62	2.86	1.69	165	1	62.9	8 9/GR8	10
B NO711	−73.80	12	−60.70	−1.78	3.54	1.78	126	1	62.8	8 9/GR8	10
B NO811	−73.80	12	−68.75	−4.71	2.37	1.65	73	1	62.8	8 9/GR8	
B SE911	−101.80	12	−45.99	−19.09	2.22	0.80	62	2	65.3	8	10
B SU111	−80.80	12	−51.10	−25.64	2.76	1.06	50	2	62.9	8 9/GR6	10
B SU112	−44.80	12	−50.76	−25.62	2.47	1.48	56	2	62.3	8 9/GR9	
B SU211	−80.80	12	−44.51	−16.94	3.22	1.37	60	2	62.5	8 9/GR6	10
B SU212	−44.80	12	−43.99	−16.97	3.27	1.92	59	2	61.3	8 9/GR9	
CAN01101	−137.80	12	−125.60	57.24	3.45	1.27	157	2	59.5	9/GR10	10
CAN01201	−137.80	12	−111.92	55.89	3.33	0.98	151	2	59.6	9/GR10	10
CAN01202	−72.30	12	−107.64	55.62	2.75	1.11	32	2	59.6		
CAN01203	−128.80	12	−111.43	55.56	3.07	1.15	151	2	59.5	9/GR12	10
CAN01303	−128.80	12	−102.39	57.12	3.54	0.92	154	2	60.1	9/GR12	10
CAN01304	−90.80	12	−99.00	57.33	1.96	1.73	1	2	59.8	9/GR13	
CAN01403	−128.80	12	−89.70	52.02	4.67	0.80	148	2	61.8	9/GR12	10
CAN01404	−90.80	12	−84.78	52.41	3.09	2.06	153	2	60.4	9/GR13	10
CAN01405	−81.80	12	−84.02	52.34	2.82	2.30	172	2	60.3	9/GR14	10
CAN01504	−90.80	12	−72.68	53.78	3.57	1.67	157	2	60.2	9/GR13	10
CAN01505	−81.80	12	−71.76	53.76	3.30	1.89	162	2	60.2	9/GR14	10
CAN01605	−81.80	12	−61.54	49.50	2.66	1.39	144	2	60.3	9/GR14	10
CAN01606	−70.30	12	−61.32	49.51	2.41	1.65	148	2	60.2	10	
CHLCONT4	−105.80	12	−69.59	−23.20	2.21	0.80	68	2	59.1	9/GR16	
CHLCONT6	−105.80	12	−73.52	−55.52	3.65	1.31	39	2	59.6	9/GR16	
CRBBAH01	−92.30	12	−76.09	24.13	1.83	0.80	141	1	61.7	9/GR18	
CRBBER01	−92.30	12	−64.76	32.13	0.80	0.80	90	1	56.8	9/GR18	
CRBBLZ01	−92.30	12	−88.61	17.26	0.80	0.80	90	1	58.7	9/GR18	
CRBEC001	−92.30	12	−60.07	8.26	4.20	0.86	115	1	64.3	9/GR18	10
CRBJMC01	−92.30	12	−79.45	17.97	0.99	0.80	151	1	61.1	9/GR18	
CYM00001	−115.80	12	−80.58	19.57	0.80	0.80	90	2	59.6		
DOMIFRB2	−83.30	12	−70.51	18.79	0.98	0.80	167	2	61.1		
EQAC0001	−94.80	12	−78.31	−1.52	1.48	1.15	65	1	63.0	9/GR19	
EQAG0001	−94.80	12	−90.36	−0.57	0.94	0.89	99	1	61.0	9/GR19	
GUFMGG02	−52.80	12	−56.42	8.47	4.16	0.81	123	2	62.7	2 7	10
HWA00002	−165.80	12	−165.79	23.32	4.20	0.80	160	2	58.8	9/GR1	10
HWA00003	−174.80	12	−166.10	23.42	4.25	0.80	159	2	58.8	9/GR2	10
JMC00005	−33.80	12	−77.27	18.12	0.80	0.80	90	2	60.6		
LCAIFRB1	−79.30	12	−61.15	13.90	0.80	0.80	90	2	58.4		
MEX01NTE	−77.80	12	−105.80	25.99	2.88	2.07	155	2	60.5	1	
MEX02NTE	−135.80	12	−107.36	26.32	3.80	1.57	149	2	61.2	1	10
MEX02SUR	−126.80	12	−96.39	19.88	3.19	1.87	158	2	62.5	1	10
PRU00004	−85.80	12	−74.19	−8.39	3.74	2.45	112	2	62.9	10	
PTRVIR01	−100.80	12	−65.85	18.12	0.80	0.80	90	2	60.6	1 6 9/GR20	
PTRVIR02	−109.80	12	−65.85	18.12	0.80	0.80	90	2	61.1	1 6 9/GR21	
SLVIFRB2	−107.30	12	−88.91	13.59	0.80	0.80	90	1	61.7		
USAEH001	−61.30	12	−85.16	36.21	5.63	3.32	22	2	61.9	1 5 6	10
USAEH002	−100.80	12	−89.28	36.16	5.65	3.78	170	2	61.7	1 6 9/GR20	10
USAEH003	−109.80	12	−90.12	36.11	5.55	3.56	161	2	62.1	1 6 9/GR21	10
USAEH004	−118.80	12	−91.16	36.05	5.38	3.24	153	2	62.6	1 5 6	10
USAPSA02	−165.80	12	−117.79	40.58	4.04	0.82	135	2	63.3	9/GR1	
USAPSA03	−174.80	12	−118.20	40.15	3.63	0.80	136	2	65.0	9/GR2	
USAWH101	−147.80	12	−109.70	38.13	5.52	1.96	142	2	62.1	10	
USAWH102	−156.80	12	−111.40	38.57	5.51	1.55	138	2	63.2	10	
VEN11VEN	−103.80	12	−66.79	6.90	2.50	1.77	122	2	65.2	10	

12 398.96 MHz (13)

1	2	3	4		5		6	7	8	9	
ALS00002	−166.20	13	−149.66	58.37	3.76	1.24	170	1	59.7	9/GR1	10
ALS00003	−175.20	13	−150.98	58.53	3.77	1.11	167	1	60.0	9/GR2	10
ARGINSU4	−94.20	13	−52.98	−59.81	3.40	0.80	19	1	59.9	9/GR3	
ARGSUR04	−94.20	13	−65.04	−43.33	3.32	1.50	40	1	60.7	9/GR3	10
B CE311	−64.20	13	−40.60	−6.07	3.04	2.06	174	1	61.6	8 9/GR7	10
B CE312	−45.20	13	−40.27	−6.06	3.44	2.09	174	1	61.0	8 9/GR9	10
B CE411	−64.20	13	−50.97	−15.27	3.86	1.38	49	1	62.6	8 9/GR7	10
B CE412	−45.20	13	−50.71	−15.30	3.57	1.56	52	1	62.7	8 9/GR9	10
B CE511	−64.20	13	−53.10	−2.90	2.44	2.13	104	1	63.0	8 9/GR7	10
B NO611	−74.20	13	−59.60	−11.62	2.85	1.69	165	2	62.8	8 9/GR8	10
B NO711	−74.20	13	−60.70	−1.78	3.54	1.78	126	2	62.8	8 9/GR8	10
B NO811	−74.20	13	−68.76	−4.71	2.37	1.65	73	2	62.8	8 9/GR8	
B SU111	−81.20	13	−51.12	−25.63	2.76	1.05	50	1	62.8	8 9/GR6	10
B SU112	−45.20	13	−50.75	−25.62	2.47	1.48	56	1	62.2	8 9/GR9	
B SU211	−81.20	13	−44.51	−16.95	3.22	1.36	60	1	62.5	8 9/GR6	10
B SU212	−45.20	13	−44.00	−16.87	3.20	1.96	58	1	61.3	8 9/GR9	
BAHIFRB1	−87.20	13	−76.06	24.16	1.81	0.80	142	1	61.6		
BERBERMU	−96.20	13	−64.77	32.32	0.80	0.80	90	2	56.8		
BERBER02	−31.00	13	−64.77	32.32	0.80	0.80	90	1	56.9	2	10
BOLAND01	−115.20	13	−65.04	−16.76	2.49	1.27	76	1	67.9	9/GR5	
CAN01101	−138.20	13	−125.63	57.24	3.45	1.27	157	1	59.5	9/GR10	10
CAN01201	−138.20	13	−112.04	55.95	3.35	0.97	151	1	59.6	9/GR10	10
CAN01202	−72.70	13	−107.70	55.63	2.74	1.12	32	1	59.6		
CAN01203	−129.20	13	−111.48	55.61	3.08	1.15	151	1	59.5	9/GR12	10
CAN01303	−129.20	13	−102.42	57.12	3.54	0.91	154	1	60.0	9/GR12	10
CAN01304	−91.20	13	−99.12	57.36	1.98	1.72	2	1	59.8	9/GR13	
CAN01403	−129.20	13	−89.75	52.02	4.68	0.80	148	1	61.8	9/GR12	10
CAN01404	−91.20	13	−84.82	52.42	3.10	2.05	152	1	60.4	9/GR13	10
CAN01405	−82.20	13	−84.00	52.39	2.84	2.29	172	1	60.3	9/GR14	10
CAN01504	−91.20	13	−72.66	53.77	3.57	1.67	156	1	60.2	9/GR13	10
CAN01505	−82.20	13	−71.77	53.79	3.30	1.89	162	1	60.1	9/GR14	10
CAN01605	−82.20	13	−61.50	49.55	2.65	1.40	143	1	60.3	9/GR14	10
CAN01606	−70.70	13	−61.30	49.55	2.40	1.65	148	1	60.2	10	
CHLCONT5	−106.20	13	−72.23	−35.57	2.60	0.80	55	1	59.4	9/GR17	
CHLPAC02	−106.20	13	−80.06	−30.06	1.36	0.80	69	1	59.2	9/GR17	
CLMAND01	−115.20	13	−74.72	5.93	3.85	1.63	114	1	64.9	9/GR5	
CLM00001	−103.20	13	−74.50	5.87	3.98	1.96	118	1	63.5	10	
EQACAND1	−115.20	13	−78.40	−1.61	1.37	0.95	75	1	64.0	9/GR5	
EQAGAND1	−115.20	13	−90.34	−0.62	0.90	0.81	89	1	61.3	9/GR5	
FLKANT01	−57.20	13	−44.54	−60.13	3.54	0.80	12	1	59.3	2	10
FLKFALKS	−31.00	13	−59.90	−51.64	0.80	0.80	90	1	58.1	2	
GRD00002	−42.20	13	−61.58	12.29	0.80	0.80	90	1	58.8		
HWA00002	−166.20	13	−165.79	23.42	4.20	0.80	160	1	58.8	9/GR1	10
HWA00003	−175.20	13	−166.10	23.42	4.25	0.80	159	1	58.8	9/GR2	10
MEX01NTE	−78.20	13	−105.81	26.01	2.89	2.08	155	1	60.5	1	
MEX01SUR	−69.20	13	−94.84	19.82	3.05	2.09	4	1	62.2	1	10
MEX02NTE	−136.20	13	−107.21	26.31	3.84	1.55	148	1	61.2	1	10
MEX02SUR	−127.20	13	−96.39	19.88	3.18	1.87	157	1	62.5	1	10
PAQPAC01	−106.20	13	−109.18	−27.53	0.80	0.80	90	1	56.2	9/GR17	
PRG00002	−99.20	13	−58.66	−23.32	1.45	1.04	76	1	60.2		
PRUAND02	−115.20	13	−74.69	−8.39	3.41	1.79	95	1	63.9	9/GR5	
PTRVIR01	−101.20	13	−65.85	18.12	0.80	0.80	90	1	60.5	1 6 9/GR20	
PTRVIR02	−110.20	13	−65.86	18.12	0.80	0.80	90	1	61.0	1 6 9/GR21	
SPMFRAN3	−53.20	13	−67.24	47.51	3.16	0.80	7	1	60.4	2 7	10
TRD00001	−84.70	13	−61.23	10.70	0.80	0.80	90	1	59.4		
URG00001	−71.70	13	−56.22	−32.52	1.02	0.89	11	1	60.0		
USAEH001	−61.70	13	−85.19	36.21	5.63	3.33	22	1	61.8	1 5 6	10
USAEH002	−101.20	13	−89.24	36.16	5.67	3.76	170	1	61.7	1 6 9/GR20	10
USAEH003	−110.20	13	−90.14	36.11	5.55	3.55	161	1	62.0	1 6 9/GR21	10
USAEH004	−119.20	13	−91.16	36.05	5.38	3.24	152	1	62.6	1 5 6	10
USAPSA02	−166.20	13	−117.80	40.58	4.03	0.82	135	1	63.2	9/GR1	
USAPSA03	−175.20	13	−118.27	40.12	3.62	0.80	136	1	65.0	9/GR2	
USAWH101	−148.20	13	−109.65	38.13	5.53	1.95	142	1	62.1	10	
USAWH102	−157.20	13	−111.41	38.57	5.51	1.54	138	1	63.2	10	
VENAND03	−115.20	13	−67.04	6.91	2.37	1.43	111	1	67.2	9/GR5	
VRG00001	−79.70	13	−64.37	18.48	0.80	0.80	90	1	58.3	4	

12 413.54 MHz (14)

1	2	3	4	5	6	7	8	9
ALS00002	−165.80	14	−149.63 58.52	3.81 1.23	171	2	59.7	9/GR1 10
ALS00003	−174.80	14	−150.95 58.54	3.77 1.11	167	2	60.0	9/GR2 10
ARGNORT4	−93.80	14	−63.96 −30.01	3.86 1.99	48	2	65.6	10
ARGNORT5	−54.80	14	−62.85 −29.80	3.24 2.89	47	2	63.5	10
ATNBEAM1	−52.80	14	−66.44 14.87	1.83 0.80	39	2	61.0	
B CE311	−63.80	14	−40.60 −6.07	3.04 2.06	174	2	61.6	8 9/GR7 10
B CE312	−44.80	14	−40.26 −6.06	3.44 2.09	174	2	61.0	8 9/GR9 10
B CE411	−63.80	14	−50.97 −15.26	3.86 1.38	49	2	62.6	8 9/GR7 10
B CE412	−44.80	14	−50.71 −15.30	3.57 1.56	52	2	62.7	8 9/GR9 10
B CE511	−63.80	14	−53.11 −2.98	2.42 2.15	107	2	63.1	8 9/GR7 10
B NO611	−73.80	14	−59.60 −11.62	2.86 1.69	165	1	62.8	8 9/GR8 10
B NO711	−73.80	14	−60.70 −1.78	3.54 1.78	126	1	62.8	8 9/GR8 10
B NO811	−73.80	14	−68.75 −4.71	2.37 1.65	73	1	62.8	8 9/GR8
B SE911	−101.80	14	−45.99 −19.09	2.22 0.80	62	2	65.3	8 10
B SU111	−80.80	14	−51.10 −25.64	2.76 1.06	50	2	62.8	8 9/GR6 10
B SU112	−44.80	14	−50.76 −25.62	2.47 1.48	56	2	62.3	8 9/GR9
B SU211	−80.80	14	−44.51 −16.94	3.22 1.37	60	2	62.5	8 9/GR6 10
B SU212	−44.80	14	−43.99 −16.97	3.27 1.92	59	2	61.3	8 9/GR9
CAN01101	−137.80	14	−125.60 57.24	3.45 1.27	157	2	59.5	9/GR10 10
CAN01201	−137.80	14	−111.92 55.89	3.33 0.98	151	2	59.6	9/GR10 10
CAN01202	−72.30	14	−107.64 55.62	2.75 1.11	32	2	59.6	
CAN01203	−128.80	14	−111.43 55.56	3.07 1.15	151	2	59.5	9/GR12 10
CAN01303	−128.80	14	−102.39 57.12	3.54 0.92	154	2	60.0	9/GR12 10
CAN01304	−90.80	14	−99.00 57.33	1.96 1.73	1	2	59.8	9/GR13
CAN01403	−128.80	14	−89.70 52.02	4.67 0.80	148	2	61.8	9/GR12 10
CAN01404	−90.80	14	−84.78 52.41	3.09 2.06	153	2	60.4	9/GR13 10
CAN01405	−81.80	14	−84.02 52.34	2.82 2.30	172	2	60.3	9/GR14 10
CAN01504	−90.80	14	−72.68 53.78	3.57 1.67	157	2	60.2	9/GR13 10
CAN01505	−81.80	14	−71.76 53.76	3.30 1.89	162	2	60.1	9/GR14 10
CAN01605	−81.80	14	−61.54 49.50	2.66 1.39	144	2	60.3	9/GR14 10
CAN01606	−70.30	14	−61.32 49.51	2.41 1.65	148	2	60.2	10
CHLCONT4	−105.80	14	−69.59 −23.20	2.21 0.80	68	2	59.1	9/GR16
CHLCONT6	−105.80	14	−73.52 −55.52	3.65 1.31	39	2	59.6	9/GR16
CRBBAH01	−92.30	14	−76.09 24.13	1.83 0.80	141	1	61.7	9/GR18
CRBBER01	−92.30	14	−64.76 32.13	0.80 0.80	90	1	56.7	9/GR18
CRBBLZ01	−92.30	14	−88.61 17.26	0.80 0.80	90	1	58.6	9/GR18
CRBEC001	−92.30	14	−60.07 8.26	4.20 0.86	115	1	64.2	9/GR18 10
CRBJMC01	−92.30	14	−79.45 17.97	0.99 0.80	151	1	61.1	9/GR18
CTR00201	−130.80	14	−84.33 9.67	0.82 0.80	119	2	65.6	
EQAC0001	−94.80	14	−78.31 −1.52	1.48 1.15	65	1	63.0	9/GR19
EQAG0001	−94.80	14	−90.36 −0.57	0.94 0.89	99	1	61.0	9/GR19
GUY00302	−33.80	14	−59.07 4.77	1.43 0.85	91	2	63.5	
HNDIFRB2	−107.30	14	−86.23 15.16	1.14 0.85	8	1	63.4	
HTI00002	−83.30	14	−73.28 18.96	0.82 0.80	11	2	60.9	
HWA00002	−165.80	14	−165.79 23.32	4.20 0.80	160	2	58.8	9/GR1 10
HWA00003	−174.80	14	−166.10 23.42	4.25 0.80	159	2	58.8	9/GR2 10
MEX01NTE	−77.80	14	−105.80 25.99	2.88 2.07	155	2	60.5	1
MEX02NTE	−135.80	14	−107.36 26.32	3.80 1.57	149	2	61.2	1 10
MEX02SUR	−126.80	14	−96.39 19.88	3.19 1.87	158	2	62.5	1 10
PRU00004	−85.80	14	−74.19 −8.39	3.74 2.45	112	2	62.8	10
PTRVIR01	−100.80	14	−65.85 18.12	0.80 0.80	90	2	60.6	1 6 9/GR20
PTRVIR02	−109.80	14	−65.85 18.12	0.80 0.80	90	2	61.1	1 6 9/GR21
TCA00001	−115.80	14	−71.79 21.53	0.80 0.80	90	2	60.4	
USAEH001	−61.30	14	−85.16 36.21	5.63 3.32	22	2	61.8	1 5 6 10
USAEH002	−100.80	14	−89.28 36.16	5.65 3.78	170	2	61.7	1 6 9/GR20 10
USAEH003	−109.80	14	−90.12 36.11	5.55 3.56	161	2	62.1	1 6 9/GR21 10
USAEH004	−118.80	14	−91.16 36.05	5.38 3.24	153	2	62.6	1 5 6 10
USAPSA02	−165.80	14	−117.79 40.58	4.04 0.82	135	2	63.2	9/GR1
USAPSA03	−174.80	14	−118.20 40.15	3.63 0.80	136	2	64.9	9/GR2
USAWH101	−147.80	14	−109.70 38.13	5.52 1.96	142	2	62.1	10
USAWH102	−156.80	14	−111.40 38.57	5.51 1.55	138	2	63.2	10
VCT00001	−79.30	14	−61.18 13.23	0.80 0.80	90	2	58.4	
VEN11VEN	−103.80	14	−66.79 6.90	2.50 1.77	122	2	65.1	10

12 428.12 MHz (15)

1	2	3	4		5		6	7	8	9	
ALS00002	−166.20	15	−149.66	58.37	3.76	1.24	170	1	59.8	9/GR1	10
ALS00003	−175.20	15	−150.98	58.53	3.77	1.11	167	1	60.0	9/GR2	10
ARGINSU4	−94.20	15	−52.98	−59.81	3.40	0.80	19	1	59.9	9/GR3	
ARGINSU5	−55.20	15	−44.17	−59.91	3.77	0.80	13	1	59.3	9/GR4	10
ARGSUR04	−94.20	15	−65.04	−43.33	3.32	1.50	40	1	60.7	9/GR3	10
ARGSUR05	−55.20	15	−63.68	−43.01	2.54	2.38	152	1	60.1	9/GR4	10
ATGSJN01	−79.70	15	−61.79	17.07	0.80	0.80	90	1	58.4		
B CE311	−64.20	15	−40.60	−6.07	3.04	2.06	174	1	61.6	8 9/GR7	10
B CE312	−45.20	15	−40.27	−6.06	3.44	2.09	174	1	61.0	8 9/GR9	10
B CE411	−64.20	15	−50.97	−15.27	3.86	1.38	49	1	62.6	8 9/GR7	10
B CE412	−45.20	15	−50.71	−15.30	3.57	1.56	52	1	62.7	8 9/GR9	10
B CE511	−64.20	15	−53.10	−2.90	2.44	2.13	104	1	63.1	8 9/GR7	10
B NO611	−74.20	15	−59.60	−11.62	2.85	1.69	165	2	62.9	8 9/GR8	10
B NO711	−74.20	15	−60.70	−1.78	3.54	1.78	126	2	62.8	8 9/GR8	10
B NO811	−74.20	15	−68.76	−4.71	2.37	1.65	73	2	62.8	8 9/GR8	
B SU111	−81.20	15	−51.12	−25.63	2.76	1.05	50	1	62.9	8 9/GR6	10
B SU112	−45.20	15	−50.75	−25.62	2.47	1.48	56	1	62.3	8 9/GR9	
B SU211	−81.20	15	−44.51	−16.95	3.22	1.36	60	1	62.5	8 9/GR6	10
B SU212	−45.20	15	−44.00	−16.87	3.20	1.96	58	1	61.3	8 9/GR9	
BERBERMU	−96.20	15	−64.77	32.32	0.80	0.80	90	2	56.8		
BOLAND01	−115.20	15	−65.04	−16.76	2.49	1.27	76	1	67.9	9/GR5	
BOL00001	−87.20	15	−64.61	−16.71	2.52	2.19	85	1	63.8	10	
BRB00001	−92.70	15	−59.85	12.93	0.80	0.80	90	2	59.1		
CAN01101	−138.20	15	−125.63	57.24	3.45	1.27	157	1	59.5	9/GR10	10
CAN01201	−138.20	15	−112.04	55.95	3.35	0.97	151	1	59.6	9/GR10	10
CAN01202	−72.70	15	−107.70	55.63	2.74	1.12	32	1	59.6		
CAN01203	−129.20	15	−111.48	55.61	3.08	1.15	151	1	59.5	9/GR12	10
CAN01303	−129.20	15	−102.42	57.12	3.54	0.91	154	1	60.1	9/GR12	10
CAN01304	−91.20	15	−99.12	57.36	1.98	1.72	2	1	59.8	9/GR13	
CAN01403	−129.20	15	−89.75	52.02	4.68	0.80	148	1	61.8	9/GR12	10
CAN01404	−91.20	15	−84.82	52.42	3.10	2.05	152	1	60.4	9/GR13	10
CAN01405	−82.20	15	−84.00	52.39	2.84	2.29	172	1	60.3	9/GR14	10
CAN01504	−91.20	15	−72.66	53.77	3.57	1.67	156	1	60.2	9/GR13	10
CAN01505	−82.20	15	−71.77	53.79	3.30	1.89	162	1	60.1	9/GR14	10
CAN01605	−82.20	15	−61.50	49.55	2.65	1.40	143	1	60.3	9/GR14	10
CAN01606	−70.70	15	−61.30	49.55	2.40	1.65	148	1	60.2	10	
CHLCONT5	−106.20	15	−72.23	−35.57	2.60	0.80	55	1	59.4	9/GR17	
CHLPAC02	−106.20	15	−80.06	−30.06	1.36	0.80	69	1	59.2	9/GR17	
CLMAND01	−115.20	15	−74.72	5.93	3.85	1.63	114	1	65.0	9/GR5	
CLM00001	−103.20	15	−74.50	5.87	3.98	1.96	118	1	63.6	10	
CUB00001	−89.20	15	−79.81	21.62	2.24	0.80	168	1	61.1		
EQACAND1	−115.20	15	−78.40	−1.61	1.37	0.95	75	1	64.1	9/GR5	
EQAGAND1	−115.20	15	−90.34	−0.62	0.90	0.81	89	1	61.3	9/GR5	
GRD00002	−42.20	15	−61.58	12.29	0.80	0.80	90	1	58.8		
GRD00059	−57.20	15	−61.58	12.29	0.80	0.80	90	1	58.5		
GRLDNK01	−53.20	15	−44.89	66.56	2.70	0.82	173	1	60.0	2	10
GUY00201	−84.70	15	−59.19	4.78	1.44	0.85	95	1	63.5		
HWA00002	−166.20	15	−165.79	23.42	4.20	0.80	160	1	58.8	9/GR1	10
HWA00003	−175.20	15	−166.10	23.42	4.25	0.80	159	1	58.8	9/GR2	10
MEX01NTE	−78.20	15	−105.81	26.01	2.89	2.08	155	1	60.5	1	
MEX01SUR	−69.20	15	−94.84	19.82	3.05	2.09	4	1	62.3	1	10
MEX02NTE	−136.20	15	−107.21	26.31	3.84	1.55	148	1	61.2	1	10
MEX02SUR	−127.20	15	−96.39	19.88	3.18	1.87	157	1	62.6	1	10
PAQPAC01	−106.20	15	−109.18	−27.53	0.80	0.80	90	1	56.2	9/GR17	
PRG00002	−99.20	15	−58.66	−23.32	1.45	1.04	76	1	60.2		
PRUAND02	−115.20	15	−74.69	−8.39	3.41	1.79	95	1	64.0	9/GR5	
PTRVIR01	−101.20	15	−65.85	18.12	0.80	0.80	90	1	60.6	1 6 9/GR20	
PTRVIR02	−110.20	15	−65.86	18.12	0.80	0.80	90	1	61.0	1 6 9/GR21	
URG00001	−71.70	15	−56.22	−32.52	1.02	0.89	11	1	60.0		
USAEH001	−61.70	15	−85.19	36.21	5.63	3.33	22	1	61.8	1 5 6	10
USAEH002	−101.20	15	−89.24	36.16	5.67	3.76	170	1	61.7	1 6 9/GR20	10
USAEH003	−110.20	15	−90.14	36.11	5.55	3.55	161	1	62.1	1 6 9/GR21	10
USAEH004	−119.20	15	−91.16	36.05	5.38	3.24	152	1	62.6	1 5 6	10
USAPSA02	−166.20	15	−117.80	40.58	4.03	0.82	135	1	63.3	9/GR1	
USAPSA03	−175.20	15	−118.27	40.12	3.62	0.80	136	1	65.0	9/GR2	
USAWH101	−148.20	15	−109.65	38.13	5.53	1.95	142	1	62.1	10	
USAWH102	−157.20	15	−111.41	38.57	5.51	1.54	138	1	63.2	10	
VENAND03	−115.20	15	−67.04	6.91	2.37	1.43	111	1	67.3	9/GR5	

12 442.70 MHz (16)

1	2	3	4		5		6	7	8	9	
ALS00002	−165.80	16	−149.63	58.52	3.81	1.23	171	2	59.8	9/GR1	10
ALS00003	−174.80	16	−150.95	58.54	3.77	1.11	167	2	60.0	9/GR2	10
ARGNORT4	−93.80	16	−63.96	−30.01	3.86	1.99	48	2	65.7	10	
ARGNORT5	−54.80	16	−62.85	−29.80	3.24	2.89	47	2	63.5	10	
B CE311	−63.80	16	−40.60	−6.07	3.04	2.06	174	2	61.6	8 9/GR7	10
B CE312	−44.80	16	−40.26	−6.06	3.44	2.09	174	2	61.0	8 9/GR9	10
B CE411	−63.80	16	−50.97	−15.26	3.86	1.38	49	2	62.6	8 9/GR7	10
B CE412	−44.80	16	−50.71	−15.30	3.57	1.56	52	2	62.8	8 9/GR9	10
B CE511	−63.80	16	−53.11	−2.98	2.42	2.15	107	2	63.1	8 9/GR7	10
B NO611	−73.80	16	−59.60	−11.62	2.86	1.69	165	1	62.9	8 9/GR8	10
B NO711	−73.80	16	−60.70	−1.78	3.54	1.78	126	1	62.8	8 9/GR8	10
B NO811	−73.80	16	−68.75	−4.71	2.37	1.65	73	1	62.8	8 9/GR8	
B SE911	−101.80	16	−45.99	−19.09	2.22	0.80	62	2	65.3	8	10
B SU111	−80.80	16	−51.10	−25.64	2.76	1.06	50	2	62.9	8 9/GR6	10
B SU112	−44.80	16	−50.76	−25.62	2.47	1.48	56	2	62.3	8 9/GR9	
B SU211	−80.80	16	−44.51	−16.94	3.22	1.37	60	2	62.5	8 9/GR6	10
B SU212	−44.80	16	−43.99	−16.97	3.27	1.92	59	2	61.3	8 9/GR9	
CAN01101	−137.80	16	−125.60	57.24	3.45	1.27	157	2	59.5	9/GR10	10
CAN01201	−137.80	16	−111.92	55.89	3.33	0.98	151	2	59.6	9/GR10	10
CAN01202	−72.30	16	−107.64	55.62	2.75	1.11	32	2	59.6		
CAN01203	−128.80	16	−111.43	55.56	3.07	1.15	151	2	59.5	9/GR12	10
CAN01303	−128.80	16	−102.39	57.12	3.54	0.92	154	2	60.1	9/GR12	10
CAN01304	−90.80	16	−99.00	57.33	1.96	1.73	1	2	59.8	9/GR13	
CAN01403	−128.80	16	−89.70	52.02	4.67	0.80	148	2	61.8	9/GR12	10
CAN01404	−90.80	16	−84.78	52.41	3.09	2.06	153	2	60.4	9/GR13	10
CAN01405	−81.80	16	−84.02	52.34	2.82	2.30	172	2	60.3	9/GR14	10
CAN01504	−90.80	16	−72.68	53.78	3.57	1.67	157	2	60.2	9/GR13	10
CAN01505	−81.80	16	−71.76	53.76	3.30	1.89	162	2	60.2	9/GR14	10
CAN01605	−81.80	16	−61.54	49.50	2.66	1.39	144	2	60.3	9/GR14	10
CAN01606	−70.30	16	−61.32	49.51	2.41	1.65	148	2	60.2	10	
CHLCONT4	−105.80	16	−69.59	−23.20	2.21	0.80	68	2	59.1	9/GR16	
CHLCONT6	−105.80	16	−73.52	−55.52	3.65	1.31	39	2	59.6	9/GR16	
CRBBAH01	−92.30	16	−76.09	24.13	1.83	0.80	141	1	61.7	9/GR18	
CRBBER01	−92.30	16	−64.76	32.13	0.80	0.80	90	1	56.8	9/GR18	
CRBBLZ01	−92.30	16	−88.61	17.26	0.80	0.80	90	1	58.7	9/GR18	
CRBEC001	−92.30	16	−60.07	8.26	4.20	0.86	115	1	64.3	9/GR18	10
CRBJMC01	−92.30	16	−79.45	17.97	0.99	0.80	151	1	61.1	9/GR18	
CYM00001	−115.80	16	−80.58	19.57	0.80	0.80	90	2	59.6		
DOMIFRB2	−83.30	16	−70.51	18.79	0.98	0.80	167	2	61.1		
EQAC0001	−94.80	16	−78.31	−1.52	1.48	1.15	65	1	63.0	9/GR19	
EQAG0001	−94.80	16	−90.36	−0.57	0.94	0.89	99	1	61.0	9/GR19	
GUFMGG02	−52.80	16	−56.42	8.47	4.16	0.81	123	2	62.7	2 7	10
HWA00002	−165.80	16	−165.79	23.32	4.20	0.80	160	2	58.8	9/GR1	10
HWA00003	−174.80	16	−166.10	23.42	4.25	0.80	159	2	58.8	9/GR2	10
JMC00005	−33.80	16	−77.27	18.12	0.80	0.80	90	2	60.6		
LCAIFRB1	−79.30	16	−61.15	13.90	0.80	0.80	90	2	58.4		
MEX01NTE	−77.80	16	−105.80	25.99	2.88	2.07	155	2	60.5	1	
MEX02NTE	−135.80	16	−107.36	26.32	3.80	1.57	149	2	61.2	1	10
MEX02SUR	−126.80	16	−96.39	19.88	3.19	1.87	158	2	62.5	1	10
PRU00004	−85.80	16	−74.19	−8.39	3.74	2.45	112	2	62.9	10	
PTRVIR01	−100.80	16	−65.85	18.12	0.80	0.80	90	2	60.6	1 6 9/GR20	
PTRVIR02	−109.80	16	−65.85	18.12	0.80	0.80	90	2	61.1	1 6 9/GR21	
SLVIFRB2	−107.30	16	−88.91	13.59	0.80	0.80	90	1	61.7		
USAEH001	−61.30	16	−85.16	36.21	5.63	3.32	22	2	61.9	1 5 6	10
USAEH002	−100.80	16	−89.28	36.16	5.65	3.78	170	2	61.7	1 6 9/GR20	10
USAEH003	−109.80	16	−90.12	36.11	5.55	3.56	161	2	62.1	1 6 9/GR21	10
USAEH004	−118.80	16	−91.16	36.05	5.38	3.24	153	2	62.6	1 5 6	10
USAPSA02	−165.80	16	−117.79	40.58	4.04	0.82	135	2	63.3	9/GR1	
USAPSA03	−174.80	16	−118.20	40.15	3.63	0.80	136	2	65.0	9/GR2	
USAWH101	−147.80	16	−109.70	38.13	5.52	1.96	142	2	62.1	10	
USAWH102	−156.80	16	−111.40	38.57	5.51	1.55	138	2	63.2	10	
VEN11VEN	−103.80	16	−66.79	6.90	2.50	1.77	122	2	65.2	10	

12 457.28 MHz (17)

1	2	3	4		5		6	7	8	9	
ALS00002	−166.20	17	−149.66	58.37	3.76	1.24	170	1	59.9	9/GR1	10
ALS00003	−175.20	17	−150.98	58.53	3.77	1.11	167	1	60.2	9/GR2	10
ARGINSU4	−94.20	17	−52.98	−59.81	3.40	0.80	19	1	60.1	9/GR3	
ARGINSU5	−55.20	17	−44.17	−59.91	3.77	0.80	13	1	59.5	9/GR4	10
ARGSUR04	−94.20	17	−65.04	−43.33	3.32	1.50	40	1	60.9	9/GR3	10
ARGSUR05	−55.20	17	−63.68	−43.01	2.54	2.38	152	1	60.2	9/GR4	10
B CE311	−64.20	17	−40.60	−6.07	3.04	2.06	174	1	61.9	8 9/GR7	10
B CE312	−45.20	17	−40.27	−6.06	3.44	2.09	174	1	61.2	8 9/GR9	10
B CE411	−64.20	17	−50.97	−15.27	3.86	1.38	49	1	62.9	8 9/GR7	10
B CE412	−45.20	17	−50.71	−15.30	3.57	1.56	52	1	63.0	8 9/GR9	10
B CE511	−64.20	17	−53.10	−2.90	2.44	2.13	104	1	63.4	8 9/GR7	10
B NO611	−74.20	17	−59.60	−11.62	2.85	1.69	165	2	63.1	8 9/GR8	10
B NO711	−74.20	17	−60.70	−1.78	3.54	1.78	126	2	63.1	8 9/GR8	10
B NO811	−74.20	17	−68.76	−4.71	2.37	1.65	73	2	63.1	8 9/GR8	
B SU111	−81.20	17	−51.12	−25.63	2.76	1.05	50	1	63.2	8 9/GR6	10
B SU112	−45.20	17	−50.75	−25.62	2.47	1.48	56	1	62.5	8 9/GR9	
B SU211	−81.20	17	−44.51	−16.95	3.22	1.36	60	1	62.8	8 9/GR6	10
B SU212	−45.20	17	−44.00	−16.87	3.20	1.96	58	1	61.6	8 9/GR9	
BERBERMU	−96.20	17	−64.77	32.32	0.80	0.80	90	2	57.0		
BERBER02	−31.00	17	−64.77	32.32	0.80	0.80	90	1	57.1	2	10
BOLAND01	−115.20	17	−65.04	−16.76	2.49	1.27	76	1	68.0	9/GR5	
CAN01101	−138.20	17	−125.63	57.24	3.45	1.27	157	1	59.7	9/GR10	10
CAN01201	−138.20	17	−112.04	55.95	3.35	0.97	151	1	59.8	9/GR10	10
CAN01202	−72.70	17	−107.70	55.63	2.74	1.12	32	1	59.8		
CAN01203	−129.20	17	−111.48	55.61	3.08	1.15	151	1	59.7	9/GR12	10
CAN01303	−129.20	17	−102.42	57.12	3.54	0.91	154	1	60.2	9/GR12	10
CAN01304	−91.20	17	−99.12	57.36	1.98	1.72	2	1	60.0	9/GR13	
CAN01403	−129.20	17	−89.75	52.02	4.68	0.80	148	1	62.1	9/GR12	10
CAN01404	−91.20	17	−84.82	52.42	3.10	2.05	152	1	60.6	9/GR13	10
CAN01405	−82.20	17	−84.00	52.39	2.84	2.29	172	1	60.5	9/GR14	10
CAN01504	−91.20	17	−72.66	53.77	3.57	1.67	156	1	60.4	9/GR13	10
CAN01505	−82.20	17	−71.77	53.79	3.30	1.89	162	1	60.3	9/GR14	10
CAN01605	−82.20	17	−61.50	49.55	2.65	1.40	143	1	60.5	9/GR14	10
CAN01606	−70.70	17	−61.30	49.55	2.40	1.65	148	1	60.4	10	
CHLCONT5	−106.20	17	−72.23	−35.57	2.60	0.80	55	1	59.6	9/GR17	
CHLPAC02	−106.20	17	−80.06	−30.06	1.36	0.80	69	1	59.4	9/GR17	
CLMAND01	−115.20	17	−74.72	5.93	3.85	1.63	114	1	65.3	9/GR5	
CLM00001	−103.20	17	−74.50	5.87	3.98	1.96	118	1	63.9	10	
EQACAND1	−115.20	17	−78.40	−1.61	1.37	0.95	75	1	64.4	9/GR5	
EQAGAND1	−115.20	17	−90.34	−0.62	0.90	0.81	89	1	61.5	9/GR5	
FLKFALKS	−31.00	17	−59.90	−51.64	0.80	0.80	90	1	58.2	2	
HWA00002	−166.20	17	−165.79	23.42	4.20	0.80	160	1	59.0	9/GR1	10
HWA00003	−175.20	17	−166.10	23.42	4.25	0.80	159	1	58.9	9/GR2	10
JMC00002	−92.70	17	−77.30	18.12	0.80	0.80	90	2	60.1		
KNA00001	−79.70	17	−62.46	17.44	0.80	0.80	90	1	58.6		
MEX01NTE	−78.20	17	−105.81	26.01	2.89	2.08	155	1	60.7	1	
MEX01SUR	−69.20	17	−94.84	19.82	3.05	2.09	4	1	62.5	1	10
MEX02NTE	−136.20	17	−107.21	26.31	3.84	1.55	148	1	61.4	1	10
MEX02SUR	−127.20	17	−96.39	19.88	3.18	1.87	157	1	62.8	1	10
PAQPAC01	−106.20	17	−109.18	−27.53	0.80	0.80	90	1	56.4	9/GR17	
PRG00002	−99.20	17	−58.66	−23.32	1.45	1.04	76	1	60.4		
PRUAND02	−115.20	17	−74.69	−8.39	3.41	1.79	95	1	64.3	9/GR5	
PTRVIR01	−101.20	17	−65.85	18.12	0.80	0.80	90	1	60.8	1 6 9/GR20	
PTRVIR02	−110.20	17	−65.86	18.12	0.80	0.80	90	1	61.3	1 6 9/GR21	
SPMFRAN3	−53.20	17	−67.24	47.51	3.16	0.80	7	1	60.6	2 7	10
SURINAM2	−84.70	17	−55.69	4.35	1.00	0.80	86	1	63.5		
URG00001	−71.70	17	−56.22	−32.52	1.02	0.89	11	1	60.2		
USAEH001	−61.70	17	−85.19	36.21	5.63	3.33	22	1	62.1	1 5 6	10
USAEH002	−101.20	17	−89.24	36.16	5.67	3.76	170	1	62.0	1 6 9/GR20	10
USAEH003	−110.20	17	−90.14	36.11	5.55	3.55	161	1	62.3	1 6 9/GR21	10
USAEH004	−119.20	17	−91.16	36.05	5.38	3.24	152	1	62.9	1 5 6	10
USAPSA02	−166.20	17	−117.80	40.58	4.03	0.82	135	1	63.5	9/GR1	
USAPSA03	−175.20	17	−118.27	40.12	3.62	0.80	136	1	65.3	9/GR2	
USAWH101	−148.20	17	−109.65	38.13	5.53	1.95	142	1	62.3	10	
USAWH102	−157.20	17	−111.41	38.57	5.51	1.54	138	1	63.5	10	
VENAND03	−115.20	17	−67.04	6.91	2.37	1.43	111	1	67.6	9/GR5	

12 471.86 MHz (18)

1	2	3	4		5		6	7	8	9	
ALS00002	−165.80	18	−149.63	58.52	3.81	1.23	171	2	59.9	9/GR1	10
ALS00003	−174.80	18	−150.95	58.54	3.77	1.11	167	2	60.2	9/GR2	10
ARGNORT4	−93.80	18	−63.96	−30.01	3.86	1.99	48	2	66.0	10	
ARGNORT5	−54.80	18	−62.85	−29.80	3.24	2.89	47	2	63.8	10	
ATNBEAM1	−52.80	18	−66.44	14.87	1.83	0.80	39	2	61.3		
B CE311	−63.80	18	−40.60	−6.07	3.04	2.06	174	2	61.9	8 9/GR7	10
B CE312	−44.80	18	−40.26	−6.06	3.44	2.09	174	2	61.2	8 9/GR9	10
B CE411	−63.80	18	−50.97	−15.26	3.86	1.38	49	2	62.9	8 9/GR7	10
B CE412	−44.80	18	−50.71	−15.30	3.57	1.56	52	2	63.0	8 9/GR9	10
B CE511	−63.80	18	−53.11	−2.98	2.42	2.15	107	2	63.4	8 9/GR7	10
B NO611	−73.80	18	−59.60	−11.62	2.86	1.69	165	1	63.1	8 9/GR8	10
B NO711	−73.80	18	−60.70	−1.78	3.54	1.78	126	1	63.1	8 9/GR8	10
B NO811	−73.80	18	−68.75	−4.71	2.37	1.65	73	1	63.1	8 9/GR8	
B SE911	−101.80	18	−45.99	−19.09	2.22	0.80	62	2	65.7	8	10
B SU111	−80.80	18	−51.10	−25.64	2.76	1.06	50	2	63.1	8 9/GR6	10
B SU112	−44.80	18	−50.76	−25.62	2.47	1.48	56	2	62.6	8 9/GR9	
B SU211	−80.80	18	−44.51	−16.94	3.22	1.37	60	2	62.8	8 9/GR6	10
B SU212	−44.80	18	−43.99	−16.97	3.27	1.92	59	2	61.6	8 9/GR9	
BLZ00001	−115.80	18	−88.68	17.27	0.80	0.80	90	2	59.2		
CAN01101	−137.80	18	−125.60	57.24	3.45	1.27	157	2	59.7	9/GR10	10
CAN01201	−137.80	18	−111.92	55.89	3.33	0.98	151	2	59.8	9/GR10	10
CAN01202	−72.30	18	−107.64	55.62	2.75	1.11	32	2	59.8		
CAN01203	−128.80	18	−111.43	55.56	3.07	1.15	151	2	59.7	9/GR12	10
CAN01303	−128.80	18	−102.39	57.12	3.54	0.92	154	2	60.3	9/GR12	10
CAN01304	−90.80	18	−99.00	57.33	1.96	1.73	1	2	60.0	9/GR13	
CAN01403	−128.80	18	−89.70	52.02	4.67	0.80	148	2	62.1	9/GR12	10
CAN01404	−90.80	18	−84.78	52.41	3.09	2.06	153	2	60.6	9/GR13	10
CAN01405	−81.80	18	−84.02	52.34	2.82	2.30	172	2	60.5	9/GR14	10
CAN01504	−90.80	18	−72.68	53.78	3.57	1.67	157	2	60.4	9/GR13	10
CAN01505	−81.80	18	−71.76	53.76	3.30	1.89	162	2	60.3	9/GR14	10
CAN01605	−81.80	18	−61.54	49.50	2.66	1.39	144	2	60.5	9/GR14	10
CAN01606	−70.30	18	−61.32	49.51	2.41	1.65	148	2	60.4	10	
CHLCONT4	−105.80	18	−69.59	−23.20	2.21	0.80	68	2	59.3	9/GR16	
CHLCONT6	−105.80	18	−73.52	−55.52	3.65	1.31	39	2	59.7	9/GR16	
CRBBAH01	−92.30	18	−76.09	24.13	1.83	0.80	141	1	61.9	9/GR18	
CRBBER01	−92.30	18	−64.76	32.13	0.80	0.80	90	1	56.9	9/GR18	
CRBBLZ01	−92.30	18	−88.61	17.26	0.80	0.80	90	1	58.9	9/GR18	
CRBEC001	−92.30	18	−60.07	8.26	4.20	0.86	115	1	64.6	9/GR18	10
CRBJMC01	−92.30	18	−79.45	17.97	0.99	0.80	151	1	61.3	9/GR18	
CTR00201	−130.80	18	−84.33	9.67	0.82	0.80	119	2	66.0		
DMAIFRB1	−79.30	18	−61.30	15.35	0.80	0.80	90	2	58.7		
EQAC0001	−94.80	18	−78.31	−1.52	1.48	1.15	65	1	63.3	9/GR19	
EQAG0001	−94.80	18	−90.36	−0.57	0.94	0.89	99	1	61.2	9/GR19	
HWA00002	−165.80	18	−165.79	23.32	4.20	0.80	160	2	59.0	9/GR1	10
HWA00003	−174.80	18	−166.10	23.42	4.25	0.80	159	2	59.0	9/GR2	10
MEX01NTE	−77.80	18	−105.80	25.99	2.88	2.07	155	2	60.7	1	
MEX02NTE	−135.80	18	−107.36	26.32	3.80	1.57	149	2	61.4	1	10
MEX02SUR	−126.80	18	−96.39	19.88	3.19	1.87	158	2	62.8	1	10
NCG00003	−107.30	18	−84.99	12.90	1.05	1.01	176	1	63.6		
PRU00004	−85.80	18	−74.19	−8.39	3.74	2.45	112	2	63.1	10	
PTRVIR01	−100.80	18	−65.85	18.12	0.80	0.80	90	2	60.8	1 6 9/GR20	
PTRVIR02	−109.80	18	−65.85	18.12	0.80	0.80	90	2	61.4	1 6 9/GR21	
USAEH001	−61.30	18	−85.16	36.21	5.63	3.32	22	2	62.1	1 5 6	10
USAEH002	−100.80	18	−89.28	36.16	5.65	3.78	170	2	62.0	1 6 9/GR20	10
USAEH003	−109.80	18	−90.12	36.11	5.55	3.56	161	2	62.3	1 6 9/GR21	10
USAEH004	−118.80	18	−91.16	36.05	5.38	3.24	153	2	62.9	1 5 6	10
USAPSA02	−165.80	18	−117.79	40.58	4.04	0.82	135	2	63.5	9/GR1	
USAPSA03	−174.80	18	−118.20	40.15	3.63	0.80	136	2	65.3	9/GR2	
USAWH101	−147.80	18	−109.70	38.13	5.52	1.96	142	2	62.3	10	
USAWH102	−156.80	18	−111.40	38.57	5.51	1.55	138	2	63.5	10	
VEN11VEN	−103.80	18	−66.79	6.90	2.50	1.77	122	2	65.5	10	

12 486.44 MHz (19)

1	2	3	4		5		6	7	8	9	
ALS00002	−166.20	19	−149.66	58.37	3.76	1.24	170	1	60.0	9/GR1	10
ALS00003	−175.20	19	−150.98	58.53	3.77	1.11	167	1	60.2	9/GR2	10
ARGINSU4	−94.20	19	−52.98	−59.81	3.40	0.80	19	1	60.1	9/GR3	
ARGINSU5	−55.20	19	−44.17	−59.91	3.77	0.80	13	1	59.5	9/GR4	10
ARGSUR04	−94.20	19	−65.04	−43.33	3.32	1.50	40	1	60.9	9/GR3	10
ARGSUR05	−55.20	19	−63.68	−43.01	2.54	2.38	152	1	60.3	9/GR4	10
B CE311	−64.20	19	−40.60	−6.07	3.04	2.06	174	1	61.9	8 9/GR7	10
B CE312	−45.20	19	−40.27	−6.06	3.44	2.09	174	1	61.3	8 9/GR9	10
B CE411	−64.20	19	−50.97	−15.27	3.86	1.38	49	1	62.9	8 9/GR7	10
B CE412	−45.20	19	−50.71	−15.30	3.57	1.56	52	1	63.1	8 9/GR9	10
B CE511	−64.20	19	−53.10	−2.90	2.44	2.13	104	1	63.4	8 9/GR7	10
B NO611	−74.20	19	−59.60	−11.62	2.85	1.69	165	2	63.2	8 9/GR8	10
B NO711	−74.20	19	−60.70	−1.78	3.54	1.78	126	2	63.2	8 9/GR8	10
B NO811	−74.20	19	−68.76	−4.71	2.37	1.65	73	2	63.1	8 9/GR8	
B SU111	−81.20	19	−51.12	−25.63	2.76	1.05	50	1	63.2	8 9/GR6	10
B SU112	−45.20	19	−50.75	−25.62	2.47	1.48	56	1	62.6	8 9/GR9	
B SU211	−81.20	19	−44.51	−16.95	3.22	1.36	60	1	62.8	8 9/GR6	10
B SU212	−45.20	19	−44.00	−16.87	3.20	1.96	58	1	61.6	8 9/GR9	
BERBERMU	−96.20	19	−64.77	32.32	0.80	0.80	90	2	57.0		
BOLAND01	−115.20	19	−65.04	−16.76	2.49	1.27	76	1	68.1	9/GR5	
BOL00001	−87.20	19	−64.61	−16.71	2.52	2.19	85	1	64.2	10	
BRB00001	−92.70	19	−59.85	12.93	0.80	0.80	90	2	59.4		
CAN01101	−138.20	19	−125.63	57.24	3.45	1.27	157	1	59.7	9/GR10	10
CAN01201	−138.20	19	−112.04	55.95	3.35	0.97	151	1	59.8	9/GR10	10
CAN01202	−72.70	19	−107.70	55.63	2.74	1.12	32	1	59.8		
CAN01203	−129.20	19	−111.48	55.61	3.08	1.15	151	1	59.7	9/GR12	10
CAN01303	−129.20	19	−102.42	57.12	3.54	0.91	154	1	60.3	9/GR12	10
CAN01304	−91.20	19	−99.12	57.36	1.98	1.72	2	1	60.1	9/GR13	
CAN01403	−129.20	19	−89.75	52.02	4.68	0.80	148	1	62.1	9/GR12	10
CAN01404	−91.20	19	−84.82	52.42	3.10	2.05	152	1	60.6	9/GR13	10
CAN01405	−82.20	19	−84.00	52.39	2.84	2.29	172	1	60.5	9/GR14	10
CAN01504	−91.20	19	−72.66	53.77	3.57	1.67	156	1	60.4	9/GR13	10
CAN01505	−82.20	19	−71.77	53.79	3.30	1.89	162	1	60.4	9/GR14	10
CAN01605	−82.20	19	−61.50	49.55	2.65	1.40	143	1	60.5	9/GR14	10
CAN01606	−70.70	19	−61.30	49.55	2.40	1.65	148	1	60.5	10	
CHLCONT5	−106.20	19	−72.23	−35.57	2.60	0.80	55	1	59.6	9/GR17	
CHLPAC02	−106.20	19	−80.06	−30.06	1.36	0.80	69	1	59.4	9/GR17	
CLMAND01	−115.20	19	−74.72	5.93	3.85	1.63	114	1	65.4	9/GR5	
CLM00001	−103.20	19	−74.50	5.87	3.98	1.96	118	1	63.9	10	
CUB00001	−89.20	19	−79.81	21.62	2.24	0.80	168	1	61.3		
EQACAND1	−115.20	19	−78.40	−1.61	1.37	0.95	75	1	64.4	9/GR5	
EQAGAND1	−115.20	19	−90.34	−0.62	0.90	0.81	89	1	61.6	9/GR5	
GRD00059	−57.20	19	−61.58	12.29	0.80	0.80	90	1	58.7		
GRLDNK01	−53.20	19	−44.89	66.56	2.70	0.82	173	1	60.2	2	10
GUY00201	−84.70	19	−59.19	4.78	1.44	0.85	95	1	63.8		
HWA00002	−166.20	19	−165.79	23.42	4.20	0.80	160	1	59.0	9/GR1	10
HWA00003	−175.20	19	−166.10	23.42	4.25	0.80	159	1	59.0	9/GR2	10
MEX01NTE	−78.20	19	−105.81	26.01	2.89	2.08	155	1	60.8	1	
MEX01SUR	−69.20	19	−94.84	19.82	3.05	2.09	4	1	62.5	1	10
MEX02NTE	−136.20	19	−107.21	26.31	3.84	1.55	148	1	61.5	1	10
MEX02SUR	−127.20	19	−96.39	19.88	3.18	1.87	157	1	62.8	1	10
MSR00001	−79.70	19	−61.73	16.75	0.80	0.80	90	1	58.9	4	
PAQPAC01	−106.20	19	−109.18	−27.53	0.80	0.80	90	1	56.4	9/GR17	
PRG00002	−99.20	19	−58.66	−23.32	1.45	1.04	76	1	60.5		
PRUAND02	−115.20	19	−74.69	−8.39	3.41	1.79	95	1	64.3	9/GR5	
PTRVIR01	−101.20	19	−65.85	18.12	0.80	0.80	90	1	60.8	1 6 9/GR20	
PTRVIR02	−110.20	19	−65.86	18.12	0.80	0.80	90	1	61.3	1 6 9/GR21	
URG00001	−71.70	19	−56.22	−32.52	1.02	0.89	11	1	60.2		
USAEH001	−61.70	19	−85.19	36.21	5.63	3.33	22	1	62.1	1 5 6	10
USAEH002	−101.20	19	−89.24	36.16	5.67	3.76	170	1	62.0	1 6 9/GR20	10
USAEH003	−110.20	19	−90.14	36.11	5.55	3.55	161	1	62.4	1 6 9/GR21	10
USAEH004	−119.20	19	−91.16	36.05	5.38	3.24	152	1	62.9	1 5 6	10
USAPSA02	−166.20	19	−117.80	40.58	4.03	0.82	135	1	63.6	9/GR1	
USAPSA03	−175.20	19	−118.27	40.12	3.62	0.80	136	1	65.4	9/GR2	
USAWH101	−148.20	19	−109.65	38.13	5.53	1.95	142	1	62.4	10	
USAWH102	−157.20	19	−111.41	38.57	5.51	1.54	138	1	63.5	10	
VENAND03	−115.20	19	−67.04	6.91	2.37	1.43	111	1	67.7	9/GR5	

12 501.02 MHz (20)

1	2	3	4		5		6	7	8	9	
ALS00002	−165.80	20	−149.63	58.52	3.81	1.23	171	2	59.9	9/GR1	10
ALS00003	−174.80	20	−150.95	58.54	3.77	1.11	167	2	60.2	9/GR2	10
ARGNORT4	−93.80	20	−63.96	−30.01	3.86	1.99	48	2	66.1	10	
ARGNORT5	−54.80	20	−62.85	−29.80	3.24	2.89	47	2	63.9	10	
B CE311	−63.80	20	−40.60	−6.07	3.04	2.06	174	2	61.9	8 9/GR7	10
B CE312	−44.80	20	−40.26	−6.06	3.44	2.09	174	2	61.3	8 9/GR9	10 11
B CE411	−63.80	20	−50.97	−15.26	3.86	1.38	49	2	62.9	8 9/GR7	10
B CE412	−44.80	20	−50.71	−15.30	3.57	1.56	52	2	63.1	8 9/GR9	10 12
B CE511	−63.80	20	−53.11	−2.98	2.42	2.15	107	2	63.4	8 9/GR7	10
B NO611	−73.80	20	−59.60	−11.62	2.86	1.69	165	1	63.2	8 9/GR8	10
B NO711	−73.80	20	−60.70	−1.78	3.54	1.78	126	1	63.2	8 9/GR8	10
B NO811	−73.80	20	−68.75	−4.71	2.37	1.65	73	1	63.2	8 9/GR8	
B SE911	−101.80	20	−45.99	−19.09	2.22	0.80	62	2	65.7	8	10
B SU111	−80.80	20	−51.10	−25.64	2.76	1.06	50	2	63.2	8 9/GR6	10
B SU112	−44.80	20	−50.76	−25.62	2.47	1.48	56	2	62.6	8 9/GR9	11
B SU211	−80.80	20	−44.51	−16.94	3.22	1.37	60	2	62.8	8 9/GR6	10
B SU212	−44.80	20	−43.99	−16.97	3.27	1.92	59	2	61.6	8 9/GR9	12
CAN01101	−137.80	20	−125.60	57.24	3.45	1.27	157	2	59.7	9/GR10	10
CAN01201	−137.80	20	−111.92	55.89	3.33	0.98	151	2	59.8	9/GR10	10
CAN01202	−72.30	20	−107.64	55.62	2.75	1.11	32	2	59.8		
CAN01203	−128.80	20	−111.43	55.56	3.07	1.15	151	2	59.7	9/GR12	10
CAN01303	−128.80	20	−102.39	57.12	3.54	0.92	154	2	60.3	9/GR12	10
CAN01304	−90.80	20	−99.00	57.33	1.96	1.73	1	2	60.0	9/GR13	
CAN01403	−128.80	20	−89.70	52.02	4.67	0.80	148	2	62.1	9/GR12	10
CAN01404	−90.80	20	−84.78	52.41	3.09	2.06	153	2	60.6	9/GR13	10
CAN01405	−81.80	20	−84.02	52.34	2.82	2.30	172	2	60.5	9/GR14	10
CAN01504	−90.80	20	−72.68	53.78	3.57	1.67	157	2	60.4	9/GR13	10
CAN01505	−81.80	20	−71.76	53.76	3.30	1.89	162	2	60.4	9/GR14	10
CAN01605	−81.80	20	−61.54	49.50	2.66	1.39	144	2	60.5	9/GR14	10
CAN01606	−70.30	20	−61.32	49.51	2.41	1.65	148	2	60.5	10	
CHLCONT4	−105.80	20	−69.59	−23.20	2.21	0.80	68	2	59.3	9/GR16	
CHLCONT6	−105.80	20	−73.52	−55.52	3.65	1.31	39	2	59.8	9/GR16	
CRBBAH01	−92.30	20	−76.09	24.13	1.83	0.80	141	1	62.0	9/GR18	
CRBBER01	−92.30	20	−64.76	32.13	0.80	0.80	90	1	57.0	9/GR18	
CRBBLZ01	−92.30	20	−88.61	17.26	0.80	0.80	90	1	58.9	9/GR18	
CRBEC001	−92.30	20	−60.07	8.26	4.20	0.86	115	1	64.6	9/GR18	10
CRBJMC01	−92.30	20	−79.45	17.97	0.99	0.80	151	1	61.4	9/GR18	
EQAC0001	−94.80	20	−78.31	−1.52	1.48	1.15	65	1	63.3	9/GR19	
EQAG0001	−94.80	20	−90.36	−0.57	0.94	0.89	99	1	61.3	9/GR19	
GRD00003	−79.30	20	−61.62	12.34	0.80	0.80	90	2	58.9		
GTMIFRB2	−107.30	20	−90.50	15.64	1.03	0.80	84	1	61.4		
GUFMGG02	−52.80	20	−56.42	8.47	4.16	0.81	123	2	63.0	2 7	10
HWA00002	−165.80	20	−165.79	23.32	4.20	0.80	160	2	59.0	9/GR1	10
HWA00003	−174.80	20	−166.10	23.42	4.25	0.80	159	2	59.0	9/GR2	10
MEX01NTE	−77.80	20	−105.80	25.99	2.88	2.07	155	2	60.8	1	
MEX02NTE	−135.80	20	−107.36	26.32	3.80	1.57	149	2	61.5	1	10
MEX02SUR	−126.80	20	−96.39	19.88	3.19	1.87	158	2	62.8	1	10
PNRIFRB2	−121.00	20	−80.15	8.46	1.01	0.80	170	1	65.1		
PRU00004	−85.80	20	−74.19	−8.39	3.74	2.45	112	2	63.2	10	
PTRVIR01	−100.80	20	−65.85	18.12	0.80	0.80	90	2	60.9	1 6 9/GR20	
PTRVIR02	−109.80	20	−65.85	18.12	0.80	0.80	90	2	61.4	1 6 9/GR21	
USAEH001	−61.30	20	−85.16	36.21	5.63	3.32	22	2	62.1	1 5 6	10
USAEH002	−100.80	20	−89.28	36.16	5.65	3.78	170	2	62.0	1 6 9/GR20	10
USAEH003	−109.80	20	−90.12	36.11	5.55	3.56	161	2	62.4	1 6 9/GR21	10
USAEH004	−118.80	20	−91.16	36.05	5.38	3.24	153	2	62.9	1 5 6	10
USAPSA02	−165.80	20	−117.79	40.58	4.04	0.82	135	2	63.6	9/GR1	
USAPSA03	−174.80	20	−118.20	40.15	3.63	0.80	136	2	65.3	9/GR2	
USAWH101	−147.80	20	−109.70	38.13	5.52	1.96	142	2	62.4	10	
USAWH102	−156.80	20	−111.40	38.57	5.51	1.55	138	2	63.5	10	
VEN02VEN	−103.80	20	−63.50	15.50	0.80	0.80	90	2	60.1	9/GR22	
VEN11VEN	−103.80	20	−66.79	6.90	2.50	1.77	122	2	65.6	9/GR22	10

12 515.60 MHz (21)

1	2	3	4		5		6	7	8	9	
ALS00002	−166.20	21	−149.66	58.37	3.76	1.24	170	1	59.9	9/GR1	10
ALS00003	−175.20	21	−150.98	58.53	3.77	1.11	167	1	60.2	9/GR2	10
ARGINSU4	−94.20	21	−52.98	−59.81	3.40	0.80	19	1	60.1	9/GR3	
ARGINSU5	−55.20	21	−44.17	−59.91	3.77	0.80	13	1	59.5	9/GR4	
ARGSUR04	−94.20	21	−65.04	−43.33	3.32	1.50	40	1	60.9	9/GR3	
ARGSUR05	−55.20	21	−63.68	−43.01	2.54	2.38	152	1	60.2	9/GR4	
B CE311	−64.20	21	−40.60	−6.07	3.04	2.06	174	1	61.9	8 9/GR7	
B CE312	−45.20	21	−40.27	−6.06	3.44	2.09	174	1	61.2	8 9/GR9	10 11
B CE411	−64.20	21	−50.97	−15.27	3.86	1.38	49	1	62.9	8 9/GR7	
B CE412	−45.20	21	−50.71	−15.30	3.57	1.56	52	1	63.0	8 9/GR9	10 12
B CE511	−64.20	21	−53.10	−2.90	2.44	2.13	104	1	63.4	8 9/GR7	
B NO611	−74.20	21	−59.60	−11.62	2.85	1.69	165	2	63.1	8 9/GR8	
B NO711	−74.20	21	−60.70	−1.78	3.54	1.78	126	2	63.1	8 9/GR8	
B NO811	−74.20	21	−68.76	−4.71	2.37	1.65	73	2	63.1	8 9/GR8	
B SU111	−81.20	21	−51.12	−25.63	2.76	1.05	50	1	63.2	8 9/GR6	
B SU112	−45.20	21	−50.75	−25.62	2.47	1.48	56	1	62.5	8 9/GR9	11
B SU211	−81.20	21	−44.51	−16.95	3.22	1.36	60	1	62.8	8 9/GR6	
B SU212	−45.20	21	−44.00	−16.87	3.20	1.96	58	1	61.6	8 9/GR9	12
BERBERMU	−96.20	21	−64.77	32.32	0.80	0.80	90	2	57.0		
BOLAND01	−115.20	21	−65.04	−16.76	2.49	1.27	76	1	68.0	9/GR5	
CAN01101	−138.20	21	−125.63	57.24	3.45	1.27	157	1	59.7	9/GR10	10
CAN01201	−138.20	21	−112.04	55.95	3.35	0.97	151	1	59.8	9/GR10	10
CAN01202	−72.70	21	−107.70	55.63	2.74	1.12	32	1	59.8		
CAN01203	−129.20	21	−111.48	55.61	3.08	1.15	151	1	59.7	9/GR12	10
CAN01303	−129.20	21	−102.42	57.12	3.54	0.91	154	1	60.2	9/GR12	10
CAN01304	−91.20	21	−99.12	57.36	1.98	1.72	2	1	60.0	9/GR13	
CAN01403	−129.20	21	−89.75	52.02	4.68	0.80	148	1	62.1	9/GR12	10
CAN01404	−91.20	21	−84.82	52.42	3.10	2.05	152	1	60.6	9/GR13	
CAN01405	−82.20	21	−84.00	52.39	2.84	2.29	172	1	60.5	9/GR14	
CAN01504	−91.20	21	−72.66	53.77	3.57	1.67	156	1	60.4	9/GR13	
CAN01505	−82.20	21	−71.77	53.79	3.30	1.89	162	1	60.3	9/GR14	
CAN01605	−82.20	21	−61.50	49.55	2.65	1.40	143	1	60.5	9/GR14	
CAN01606	−70.70	21	−61.30	49.55	2.40	1.65	148	1	60.4		
CHLCONT5	−106.20	21	−72.23	−35.57	2.60	0.80	55	1	59.6	9/GR17	
CHLPAC02	−106.20	21	−80.06	−30.06	1.36	0.80	69	1	59.4	9/GR17	
CLMAND01	−115.20	21	−74.72	5.93	3.85	1.63	114	1	65.3	9/GR5	10
CLM00001	−103.20	21	−74.50	5.87	3.98	1.96	118	1	63.9	10	
EQACAND1	−115.20	21	−78.40	−1.61	1.37	0.95	75	1	64.4	9/GR5	
EQAGAND1	−115.20	21	−90.34	−0.62	0.90	0.81	89	1	61.5	9/GR5	
HWA00002	−166.20	21	−165.79	23.42	4.20	0.80	160	1	59.0	9/GR1	10
HWA00003	−175.20	21	−166.10	23.42	4.25	0.80	159	1	58.9	9/GR2	10
JMC00002	−92.70	21	−77.30	18.12	0.80	0.80	90	2	60.1		
KNA00001	−79.70	21	−62.46	17.44	0.80	0.80	90	1	58.6		
MEX01NTE	−78.20	21	−105.81	26.01	2.89	2.08	155	1	60.7	1	
MEX01SUR	−69.20	21	−94.84	19.82	3.05	2.09	4	1	62.5	1	
MEX02NTE	−136.20	21	−107.21	26.31	3.84	1.55	148	1	61.4	1	10
MEX02SUR	−127.20	21	−96.39	19.88	3.18	1.87	157	1	62.8	1	10
PAQPAC01	−106.20	21	−109.18	−27.53	0.80	0.80	90	1	56.4	9/GR17	
PRG00002	−99.20	21	−58.66	−23.32	1.45	1.04	76	1	60.4		
PRUAND02	−115.20	21	−74.69	−8.39	3.41	1.79	95	1	64.3	9/GR5	
PTRVIR01	−101.20	21	−65.85	18.12	0.80	0.80	90	1	60.8	1 6 9/GR20	
PTRVIR02	−110.20	21	−65.86	18.12	0.80	0.80	90	1	61.3	1 6 9/GR21	
SPMFRAN3	−53.20	21	−67.24	47.51	3.16	0.80	7	1	60.6	2 7	
SURINAM2	−84.70	21	−55.69	4.35	1.00	0.80	86	1	63.5		
URG00001	−71.70	21	−56.22	−32.52	1.02	0.89	11	1	60.2		
USAEH001	−61.70	21	−85.19	36.21	5.63	3.33	22	1	62.1	1 5 6	
USAEH002	−101.20	21	−89.24	36.16	5.67	3.76	170	1	62.0	1 6 9/GR20	10
USAEH003	−110.20	21	−90.14	36.11	5.55	3.55	161	1	62.3	1 6 9/GR21	10
USAEH004	−119.20	21	−91.16	36.05	5.38	3.24	152	1	62.9	1 5 6	10
USAPSA02	−166.20	21	−117.80	40.58	4.03	0.82	135	1	63.5	9/GR1	
USAPSA03	−175.20	21	−118.27	40.12	3.62	0.80	136	1	65.3	9/GR2	
USAWH101	−148.20	21	−109.65	38.13	5.53	1.95	142	1	62.3	10	
USAWH102	−157.20	21	−111.41	38.57	5.51	1.54	138	1	63.5	10	
VENAND03	−115.20	21	−67.04	6.91	2.37	1.43	111	1	67.6	9/GR5	10

12 530.18 MHz (22)

1	2	3	4		5		6	7	8	9	
ALS00002	−165.80	22	−149.63	58.52	3.81	1.23	171	2	59.9	9/GR1	10
ALS00003	−174.80	22	−150.95	58.54	3.77	1.11	167	2	60.2	9/GR2	10
ARGNORT4	−93.80	22	−63.96	−30.01	3.86	1.99	48	2	66.0		
ARGNORT5	−54.80	22	−62.85	−29.80	3.24	2.89	47	2	63.8		
ATNBEAM1	−52.80	22	−66.44	14.87	1.83	0.80	39	2	61.3		
B CE311	−63.80	22	−40.60	−6.07	3.04	2.06	174	2	61.9	8 9/GR7	
B CE312	−44.80	22	−40.26	−6.06	3.44	2.09	174	2	61.2	8 9/GR9	10 11
B CE411	−63.80	22	−50.97	−15.26	3.86	1.38	49	2	62.9	8 9/GR7	
B CE412	−44.80	22	−50.71	−15.30	3.57	1.56	52	2	63.0	8 9/GR9	10 12
B CE511	−63.80	22	−53.11	−2.98	2.42	2.15	107	2	63.4	8 9/GR7	
B NO611	−73.80	22	−59.60	−11.62	2.86	1.69	165	1	63.1	8 9/GR8	
B NO711	−73.80	22	−60.70	−1.78	3.54	1.78	126	1	63.1	8 9/GR8	
B NO811	−73.80	22	−68.75	−4.71	2.37	1.65	73	1	63.1	8 9/GR8	
B SE911	−101.80	22	−45.99	−19.09	2.22	0.80	62	2	65.7	8	
B SU111	−80.80	22	−51.10	−25.64	2.76	1.06	50	2	63.1	8 9/GR6	
B SU112	−44.80	22	−50.76	−25.62	2.47	1.48	56	2	62.6	8 9/GR9	11
B SU211	−80.80	22	−44.51	−16.94	3.22	1.37	60	2	62.8	8 9/GR6	
B SU212	−44.80	22	−43.99	−16.97	3.27	1.92	59	2	61.6	8 9/GR9	12
BLZ00001	−115.80	22	−88.68	17.27	0.80	0.80	90	2	59.2		
CAN01101	−137.80	22	−125.60	57.24	3.45	1.27	157	2	59.7	9/GR10	10
CAN01201	−137.80	22	−111.92	55.89	3.33	0.98	151	2	59.8	9/GR10	10
CAN01202	−72.30	22	−107.64	55.62	2.75	1.11	32	2	59.8		
CAN01203	−128.80	22	−111.43	55.56	3.07	1.15	151	2	59.7	9/GR12	10
CAN01303	−128.80	22	−102.39	57.12	3.54	0.92	154	2	60.3	9/GR12	10
CAN01304	−90.80	22	−99.00	57.33	1.96	1.73	1	2	60.0	9/GR13	
CAN01403	−128.80	22	−89.70	52.02	4.67	0.80	148	2	62.1	9/GR12	10
CAN01404	−90.80	22	−84.78	52.41	3.09	2.06	153	2	60.6	9/GR13	
CAN01405	−81.80	22	−84.02	52.34	2.82	2.30	172	2	60.5	9/GR14	
CAN01504	−90.80	22	−72.68	53.78	3.57	1.67	157	2	60.4	9/GR13	
CAN01505	−81.80	22	−71.76	53.76	3.30	1.89	162	2	60.3	9/GR14	
CAN01605	−81.80	22	−61.54	49.50	2.66	1.39	144	2	60.5	9/GR14	
CAN01606	−70.30	22	−61.32	49.51	2.41	1.65	148	2	60.4		
CHLCONT4	−105.80	22	−69.59	−23.20	2.21	0.80	68	2	59.3	9/GR16	
CHLCONT6	−105.80	22	−73.52	−55.52	3.65	1.31	39	2	59.7	9/GR16	
CRBBAH01	−92.30	22	−76.09	24.13	1.83	0.80	141	1	61.9	9/GR18	
CRBBER01	−92.30	22	−64.76	32.13	0.80	0.80	90	1	56.9	9/GR18	
CRBBLZ01	−92.30	22	−88.61	17.26	0.80	0.80	90	1	58.9	9/GR18	
CRBEC001	−92.30	22	−60.07	8.26	4.20	0.86	115	1	64.6	9/GR18	
CRBJMC01	−92.30	22	−79.45	17.97	0.99	0.80	151	1	61.3	9/GR18	
CTR00201	−130.80	22	−84.33	9.67	0.82	0.80	119	2	66.0		
DMAIFRB1	−79.30	22	−61.30	15.35	0.80	0.80	90	2	58.7		
EQAC0001	−94.80	22	−78.31	−1.52	1.48	1.15	65	1	63.3	9/GR19	
EQAG0001	−94.80	22	−90.36	−0.57	0.94	0.89	99	1	61.2	9/GR19	
HWA00002	−165.80	22	−165.79	23.32	4.20	0.80	160	2	59.0	9/GR1	10
HWA00003	−174.80	22	−166.10	23.42	4.25	0.80	159	2	59.0	9/GR2	10
MEX01NTE	−77.80	22	−105.80	25.99	2.88	2.07	155	2	60.7	1	
MEX02NTE	−135.80	22	−107.36	26.32	3.80	1.57	149	2	61.4	1	10
MEX02SUR	−126.80	22	−96.39	19.88	3.19	1.87	158	2	62.8	1	10
NCG00003	−107.30	22	−84.99	12.90	1.05	1.01	176	1	63.6		
PRU00004	−85.80	22	−74.19	−8.39	3.74	2.45	112	2	63.1		
PTRVIR01	−100.80	22	−65.85	18.12	0.80	0.80	90	2	60.8	1 6 9/GR20	
PTRVIR02	−109.80	22	−65.85	18.12	0.80	0.80	90	2	61.4	1 6 9/GR21	
USAEH001	−61.30	22	−85.16	36.21	5.63	3.32	22	2	62.1	1 5 6	
USAEH002	−100.80	22	−89.28	36.16	5.65	3.78	170	2	62.0	1 6 9/GR20	10
USAEH003	−109.80	22	−90.12	36.11	5.55	3.56	161	2	62.3	1 6 9/GR21	10
USAEH004	−118.80	22	−91.16	36.05	5.38	3.24	153	2	62.9	1 5 6	10
USAPSA02	−165.80	22	−117.79	40.58	4.04	0.82	135	2	63.5	9/GR1	
USAPSA03	−174.80	22	−118.20	40.15	3.63	0.80	136	2	65.3	9/GR2	
USAWH101	−147.80	22	−109.70	38.13	5.52	1.96	142	2	62.3	10	
USAWH102	−156.80	22	−111.40	38.57	5.51	1.55	138	2	63.5	10	
VEN11VEN	−103.80	22	−66.79	6.90	2.50	1.77	122	2	65.5	10	

12 544.76 MHz (23)

1	2	3	4		5		6	7	8	9	
ALS00002	−166.20	23	−149.66	58.37	3.76	1.24	170	1	60.0	9/GR1	10
ALS00003	−175.20	23	−150.98	58.53	3.77	1.11	167	1	60.2	9/GR2	10
ARGINSU4	−94.20	23	−52.98	−59.81	3.40	0.80	19	1	60.1	9/GR3	
ARGINSU5	−55.20	23	−44.17	−59.91	3.77	0.80	13	1	59.5	9/GR4	
ARGSUR04	−94.20	23	−65.04	−43.33	3.32	1.50	40	1	60.9	9/GR3	
ARGSUR05	−55.20	23	−63.68	−43.01	2.54	2.38	152	1	60.3	9/GR4	
B CE311	−64.20	23	−40.60	−6.07	3.04	2.06	174	1	61.9	8 9/GR7	
B CE312	−45.20	23	−40.27	−6.06	3.44	2.09	174	1	61.3	8 9/GR9	10 11
B CE411	−64.20	23	−50.97	−15.27	3.86	1.38	49	1	62.9	8 9/GR7	
B CE412	−45.20	23	−50.71	−15.30	3.57	1.56	52	1	63.1	8 9/GR9	10 12
B CE511	−64.20	23	−53.10	−2.90	2.44	2.13	104	1	63.4	8 9/GR7	
B NO611	−74.20	23	−59.60	−11.62	2.85	1.69	165	2	63.2	8 9/GR8	
B NO711	−74.20	23	−60.70	−1.78	3.54	1.78	126	2	63.2	8 9/GR8	
B NO811	−74.20	23	−68.76	−4.71	2.37	1.65	73	2	63.1	8 9/GR8	
B SU111	−81.20	23	−51.12	−25.63	2.76	1.05	50	1	63.2	8 9/GR6	
B SU112	−45.20	23	−50.75	−25.62	2.47	1.48	56	1	62.6	8 9/GR9	11
B SU211	−81.20	23	−44.51	−16.95	3.22	1.36	60	1	62.8	8 9/GR6	
B SU212	−45.20	23	−44.00	−16.87	3.20	1.96	58	1	61.6	8 9/GR9	12
BERBERMU	−96.20	23	−64.77	32.32	0.80	0.80	90	2	57.0		
BOLAND01	−115.20	23	−65.04	−16.76	2.49	1.27	76	1	68.1	9/GR5	
BOL00001	−87.20	23	−64.61	−16.71	2.52	2.19	85	1	64.2		
BRB00001	−92.70	23	−59.85	12.93	0.80	0.80	90	2	59.4		
CAN01101	−138.20	23	−125.63	57.24	3.45	1.27	157	1	59.7	9/GR10	10
CAN01201	−138.20	23	−112.04	55.95	3.35	0.97	151	1	59.8	9/GR10	10
CAN01202	−72.70	23	−107.70	55.63	2.74	1.12	32	1	59.8		
CAN01203	−129.20	23	−111.48	55.61	3.08	1.15	151	1	59.7	9/GR12	10
CAN01303	−129.20	23	−102.42	57.12	3.54	0.91	154	1	60.3	9/GR12	10
CAN01304	−91.20	23	−99.12	57.36	1.98	1.72	2	1	60.1	9/GR13	
CAN01403	−129.20	23	−89.75	52.02	4.68	0.80	148	1	62.1	9/GR12	10
CAN01404	−91.20	23	−84.82	52.42	3.10	2.05	152	1	60.6	9/GR13	
CAN01405	−82.20	23	−84.00	52.39	2.84	2.29	172	1	60.5	9/GR14	
CAN01504	−91.20	23	−72.66	53.77	3.57	1.67	156	1	60.4	9/GR13	
CAN01505	−82.20	23	−71.77	53.79	3.30	1.89	162	1	60.4	9/GR14	
CAN01605	−82.20	23	−61.50	49.55	2.65	1.40	143	1	60.5	9/GR14	
CAN01606	−70.70	23	−61.30	49.55	2.40	1.65	148	1	60.5		
CHLCONT5	−106.20	23	−72.23	−35.57	2.60	0.80	55	1	59.6	9/GR17	
CHLPAC02	−106.20	23	−80.06	−30.06	1.36	0.80	69	1	59.4	9/GR17	
CLMAND01	−115.20	23	−74.72	5.93	3.85	1.63	114	1	65.4	9/GR5	10
CLM00001	−103.20	23	−74.50	5.87	3.98	1.96	118	1	63.9	10	
CUB00001	−89.20	23	−79.81	21.62	2.24	0.80	168	1	61.3		
EQACAND1	−115.20	23	−78.40	−1.61	1.37	0.95	75	1	64.4	9/GR5	
EQAGAND1	−115.20	23	−90.34	−0.62	0.90	0.81	89	1	61.6	9/GR5	
GRD00059	−57.20	23	−61.58	12.29	0.80	0.80	90	1	58.7		
GRLDNK01	−53.20	23	−44.89	66.56	2.70	0.82	173	1	60.2	2	
GUY00201	−84.70	23	−59.19	4.78	1.44	0.85	95	1	63.8		
HWA00002	−166.20	23	−165.79	23.42	4.20	0.80	160	1	59.0	9/GR1	10
HWA00003	−175.20	23	−166.10	23.42	4.25	0.80	159	1	59.0	9/GR2	10
MEX01NTE	−78.20	23	−105.81	26.01	2.89	2.08	155	1	60.8	1	
MEX01SUR	−69.20	23	−94.84	19.82	3.05	2.09	4	1	62.5	1	
MEX02NTE	−136.20	23	−107.21	26.31	3.84	1.55	148	1	61.5	1	10
MEX02SUR	−127.20	23	−96.39	19.88	3.18	1.87	157	1	62.8	1	10
MSR00001	−79.70	23	−61.73	16.75	0.80	0.80	90	1	58.9	4	
PAQPAC01	−106.20	23	−109.18	−27.53	0.80	0.80	90	1	56.4	9/GR17	
PRG00002	−99.20	23	−58.66	−23.32	1.45	1.04	76	1	60.5		
PRUAND02	−115.20	23	−74.69	−8.39	3.41	1.79	95	1	64.3	9/GR5	
PTRVIR01	−101.20	23	−65.85	18.12	0.80	0.80	90	1	60.8	1 6 9/GR20	
PTRVIR02	−110.20	23	−65.86	18.12	0.80	0.80	90	1	61.3	1 6 9/GR21	
URG00001	−71.70	23	−56.22	−32.52	1.02	0.89	11	1	60.2		
USAEH001	−61.70	23	−85.19	36.21	5.63	3.33	22	1	62.1	1 5 6	
USAEH002	−101.20	23	−89.24	36.16	5.67	3.76	170	1	62.0	1 6 9/GR20	10
USAEH003	−110.20	23	−90.14	36.11	5.55	3.55	161	1	62.4	1 6 9/GR21	10
USAEH004	−119.20	23	−91.16	36.05	5.38	3.24	152	1	62.9	1 5 6	10
USAPSA02	−166.20	23	−117.80	40.58	4.03	0.82	135	1	63.6	9/GR1	
USAPSA03	−175.20	23	−118.27	40.12	3.62	0.80	136	1	65.4	9/GR2	
USAWH101	−148.20	23	−109.65	38.13	5.53	1.95	142	1	62.4	10	
USAWH102	−157.20	23	−111.41	38.57	5.51	1.54	138	1	63.5	10	
VENAND03	−115.20	23	−67.04	6.91	2.37	1.43	111	1	67.7	9/GR5	10

12 559.34 MHz (24)

1	2	3	4		5		6	7	8	9	
ALS00002	−165.80	24	−149.63	58.52	3.81	1.23	171	2	59.9	9/GR1	10
ALS00003	−174.80	24	−150.95	58.54	3.77	1.11	167	2	60.2	9/GR2	10
ARGNORT4	−93.80	24	−63.96	−30.01	3.86	1.99	48	2	66.1		
ARGNORT5	−54.80	24	−62.85	−29.80	3.24	2.89	47	2	63.9		
B CE311	−63.80	24	−40.60	−6.07	3.04	2.06	174	2	61.9	8 9/GR7	
B CE312	−44.80	24	−40.26	−6.06	3.44	2.09	174	2	61.3	8 9/GR9	10 11
B CE411	−63.80	24	−50.97	−15.26	3.86	1.38	49	2	62.9	8 9/GR7	
B CE412	−44.80	24	−50.71	−15.30	3.57	1.56	52	2	63.1	8 9/GR9	10 12
B CE511	−63.80	24	−53.11	−2.98	2.42	2.15	107	2	63.4	8 9/GR7	
B NO611	−73.80	24	−59.60	−11.62	2.86	1.69	165	1	63.2	8 9/GR8	
B NO711	−73.80	24	−60.70	−1.78	3.54	1.78	126	1	63.2	8 9/GR8	
B NO811	−73.80	24	−68.75	−4.71	2.37	1.65	73	1	63.2	8 9/GR8	
B SE911	−101.80	24	−45.99	−19.09	2.22	0.80	62	2	65.7	8	
B SU111	−80.80	24	−51.10	−25.64	2.76	1.06	50	2	63.2	8 9/GR6	
B SU112	−44.80	24	−50.76	−25.62	2.47	1.48	56	2	62.6	8 9/GR9	11
B SU211	−80.80	24	−44.51	−16.94	3.22	1.37	60	2	62.8	8 9/GR6	
B SU212	−44.80	24	−43.99	−16.97	3.27	1.92	59	2	61.6	8 9/GR9	12
CAN01101	−137.80	24	−125.60	57.24	3.45	1.27	157	2	59.7	9/GR10	10
CAN01201	−137.80	24	−111.92	55.89	3.33	0.98	151	2	59.8	9/GR10	10
CAN01202	−72.30	24	−107.64	55.62	2.75	1.11	32	2	59.8		
CAN01203	−128.80	24	−111.43	55.56	3.07	1.15	151	2	59.7	9/GR12	10
CAN01303	−128.80	24	−102.39	57.12	3.54	0.92	154	2	60.3	9/GR12	10
CAN01304	−90.80	24	−99.00	57.33	1.96	1.73	1	2	60.0	9/GR13	
CAN01403	−128.80	24	−89.70	52.02	4.67	0.80	148	2	62.1	9/GR12	10
CAN01404	−90.80	24	−84.78	52.41	3.09	2.06	153	2	60.6	9/GR13	
CAN01405	−81.80	24	−84.02	52.34	2.82	2.30	172	2	60.5	9/GR14	
CAN01504	−90.80	24	−72.68	53.78	3.57	1.67	157	2	60.4	9/GR13	
CAN01505	−81.80	24	−71.76	53.76	3.30	1.89	162	2	60.4	9/GR14	
CAN01605	−81.80	24	−61.54	49.50	2.66	1.39	144	2	60.5	9/GR14	
CAN01606	−70.30	24	−61.32	49.51	2.41	1.65	148	2	60.5		
CHLCONT4	−105.80	24	−69.59	−23.20	2.21	0.80	68	2	59.3	9/GR16	
CHLCONT6	−105.80	24	−73.52	−55.52	3.65	1.31	39	2	59.8	9/GR16	
CRBBAH01	−92.30	24	−76.09	24.13	1.83	0.80	141	1	62.0	9/GR18	
CRBBER01	−92.30	24	−64.76	32.13	0.80	0.80	90	1	57.0	9/GR18	
CRBBLZ01	−92.30	24	−88.61	17.26	0.80	0.80	90	1	58.9	9/GR18	
CRBEC001	−92.30	24	−60.07	8.26	4.20	0.86	115	1	64.6	9/GR18	
CRBJMC01	−92.30	24	−79.45	17.97	0.99	0.80	151	1	61.4	9/GR18	
EQAC0001	−94.80	24	−78.31	−1.52	1.48	1.15	65	1	63.3	9/GR19	
EQAG0001	−94.80	24	−90.36	−0.57	0.94	0.89	99	1	61.3	9/GR19	
GRD00003	−79.30	24	−61.62	12.34	0.80	0.80	90	2	58.9		
GTMIFRB2	−107.30	24	−90.50	15.64	1.03	0.80	84	1	61.4		
GUFMGG02	−52.80	24	−56.42	8.47	4.16	0.81	123	2	63.0	2 7	
HWA00002	−165.80	24	−165.79	23.32	4.20	0.80	160	2	59.0	9/GR1	10
HWA00003	−174.80	24	−166.10	23.42	4.25	0.80	159	2	59.0	9/GR2	10
MEX01NTE	−77.80	24	−105.80	25.99	2.88	2.07	155	2	60.8	1	
MEX02NTE	−135.80	24	−107.36	26.32	3.80	1.57	149	2	61.5	1	10
MEX02SUR	−126.80	24	−96.39	19.88	3.19	1.87	158	2	62.8	1	10
PNRIFRB2	−121.00	24	−80.15	8.46	1.01	0.80	170	1	65.1		
PRU00004	−85.80	24	−74.19	−8.39	3.74	2.45	112	2	63.2		
PTRVIR01	−100.80	24	−65.85	18.12	0.80	0.80	90	2	60.9	1 6 9/GR20	
PTRVIR02	−109.80	24	−65.85	18.12	0.80	0.80	90	2	61.4	1 6 9/GR21	
USAEH001	−61.30	24	−85.16	36.21	5.63	3.32	22	2	62.1	1 5 6	
USAEH002	−100.80	24	−89.28	36.16	5.65	3.78	170	2	62.0	1 6 9/GR20	10
USAEH003	−109.80	24	−90.12	36.11	5.55	3.56	161	2	62.4	1 6 9/GR21	10
USAEH004	−118.80	24	−91.16	36.05	5.38	3.24	153	2	62.9	1 5 6	10
USAPSA02	−165.80	24	−117.79	40.58	4.04	0.82	135	2	63.6	9/GR1	
USAPSA03	−174.80	24	−118.20	40.15	3.63	0.80	136	2	65.3	9/GR2	
USAWH101	−147.80	24	−109.70	38.13	5.52	1.96	142	2	62.4	10	
USAWH102	−156.80	24	−111.40	38.57	5.51	1.55	138	2	63.5	10	
VEN02VEN	−103.80	24	−63.50	15.50	0.80	0.80	90	2	60.1	9/GR22	
VEN11VEN	−103.80	24	−66.79	6.90	2.50	1.77	122	2	65.6	9/GR22	10

12 573.92 MHz (25)

1	2	3	4		5		6	7	8	9	
ALS00002	−166.20	25	−149.66	58.37	3.76	1.24	170	1	59.9	9/GR1	10
ALS00003	−175.20	25	−150.98	58.53	3.77	1.11	167	1	60.2	9/GR2	10
ARGINSU4	−94.20	25	−52.98	−59.81	3.40	0.80	19	1	60.1	9/GR3	
ARGINSU5	−55.20	25	−44.17	−59.91	3.77	0.80	13	1	59.5	9/GR4	
ARGSUR04	−94.20	25	−65.04	−43.33	3.32	1.50	40	1	60.9	9/GR3	
ARGSUR05	−55.20	25	−63.68	−43.01	2.54	2.38	152	1	60.2	9/GR4	
B CE311	−64.20	25	−40.60	−6.07	3.04	2.06	174	1	61.9	8 9/GR7	
B CE312	−45.20	25	−40.27	−6.06	3.44	2.09	174	1	61.2	8 9/GR9	10 11
B CE411	−64.20	25	−50.97	−15.27	3.86	1.38	49	1	62.9	8 9/GR7	
B CE412	−45.20	25	−50.71	−15.30	3.57	1.56	52	1	63.0	8 9/GR9	10 12
B CE511	−64.20	25	−53.10	−2.90	2.44	2.13	104	1	63.4	8 9/GR7	
B NO611	−74.20	25	−59.60	−11.62	2.85	1.69	165	2	63.1	8 9/GR8	
B NO711	−74.20	25	−60.70	−1.78	3.54	1.78	126	2	63.1	8 9/GR8	
B NO811	−74.20	25	−68.76	−4.71	2.37	1.65	73	2	63.1	8 9/GR8	
B SU111	−81.20	25	−51.12	−25.63	2.76	1.05	50	1	63.2	8 9/GR6	
B SU112	−45.20	25	−50.75	−25.62	2.47	1.48	56	1	62.5	8 9/GR9	11
B SU211	−81.20	25	−44.51	−16.95	3.22	1.36	60	1	62.8	8 9/GR6	
B SU212	−45.20	25	−44.00	−16.87	3.20	1.96	58	1	61.6	8 9/GR9	12
BERBERMU	−96.20	25	−64.77	32.32	0.80	0.80	90	2	57.0		
BOLAND01	−115.20	25	−65.04	−16.76	2.49	1.27	76	1	68.0	9/GR5	
CAN01101	−138.20	25	−125.63	57.24	3.45	1.27	157	1	59.7	9/GR10	10
CAN01201	−138.20	25	−112.04	55.95	3.35	0.97	151	1	59.8	9/GR10	10
CAN01202	−72.70	25	−107.70	55.63	2.74	1.12	32	1	59.8		
CAN01203	−129.20	25	−111.48	55.61	3.08	1.15	151	1	59.7	9/GR12	10
CAN01303	−129.20	25	−102.42	57.12	3.54	0.91	154	1	60.2	9/GR12	10
CAN01304	−91.20	25	−99.12	57.36	1.98	1.72	2	1	60.0	9/GR13	
CAN01403	−129.20	25	−89.75	52.02	4.68	0.80	148	1	62.1	9/GR12	10
CAN01404	−91.20	25	−84.82	52.42	3.10	2.05	152	1	60.6	9/GR13	
CAN01405	−82.20	25	−84.00	52.39	2.84	2.29	172	1	60.5	9/GR14	
CAN01504	−91.20	25	−72.66	53.77	3.57	1.67	156	1	60.4	9/GR13	
CAN01505	−82.20	25	−71.77	53.79	3.30	1.89	162	1	60.3	9/GR14	
CAN01605	−82.20	25	−61.50	49.55	2.65	1.40	143	1	60.5	9/GR14	
CAN01606	−70.70	25	−61.30	49.55	2.40	1.65	148	1	60.4		
CHLCONT5	−106.20	25	−72.23	−35.57	2.60	0.80	55	1	59.6	9/GR17	
CHLPAC02	−106.20	25	−80.06	−30.06	1.36	0.80	69	1	59.4	9/GR17	
CLMAND01	−115.20	25	−74.72	5.93	3.85	1.63	114	1	65.3	9/GR5	10
CLM00001	−103.20	25	−74.50	5.87	3.98	1.96	118	1	63.9	10	
EQACAND1	−115.20	25	−78.40	−1.61	1.37	0.95	75	1	64.4	9/GR5	
EQAGAND1	−115.20	25	−90.34	−0.62	0.90	0.81	89	1	61.5	9/GR5	
HWA00002	−166.20	25	−165.79	23.42	4.20	0.80	160	1	59.0	9/GR1	10
HWA00003	−175.20	25	−166.10	23.42	4.25	0.80	159	1	58.9	9/GR2	10
JMC00002	−92.70	25	−77.30	18.12	0.80	0.80	90	2	60.1		
KNA00001	−79.70	25	−62.46	17.44	0.80	0.80	90	1	58.6		
MEX01NTE	−78.20	25	−105.81	26.01	2.89	2.08	155	1	60.7	1	
MEX01SUR	−69.20	25	−94.84	19.82	3.05	2.09	4	1	62.5	1	
MEX02NTE	−136.20	25	−107.21	26.31	3.84	1.55	148	1	61.4	1	10
MEX02SUR	−127.20	25	−96.39	19.88	3.18	1.87	157	1	62.8	1	10
PAQPAC01	−106.20	25	−109.18	−27.53	0.80	0.80	90	1	56.4	9/GR17	
PRG00002	−99.20	25	−58.66	−23.32	1.45	1.04	76	1	60.4		
PRUAND02	−115.20	25	−74.69	−8.39	3.41	1.79	95	1	64.3	9/GR5	
PTRVIR01	−101.20	25	−65.85	18.12	0.80	0.80	90	1	60.8	1 6 9/GR20	
PTRVIR02	−110.20	25	−65.86	18.12	0.80	0.80	90	1	61.3	1 6 9/GR21	
SPMFRAN3	−53.20	25	−67.24	47.51	3.16	0.80	7	1	60.6	2 7	
SURINAM2	−84.70	25	−55.69	4.35	1.00	0.80	86	1	63.5		
URG00001	−71.70	25	−56.22	−32.52	1.02	0.89	11	1	60.2		
USAEH001	−61.70	25	−85.19	36.21	5.63	3.33	22	1	62.1	1 5 6	
USAEH002	−101.20	25	−89.24	36.16	5.67	3.76	170	1	62.0	1 6 9/GR20	10
USAEH003	−110.20	25	−90.14	36.11	5.55	3.55	161	1	62.3	1 6 9/GR21	10
USAEH004	−119.20	25	−91.16	36.05	5.38	3.24	152	1	62.9	1 5 6	10
USAPSA02	−166.20	25	−117.80	40.58	4.03	0.82	135	1	63.5	9/GR1	
USAPSA03	−175.20	25	−118.27	40.12	3.62	0.80	136	1	65.3	9/GR2	
USAWH101	−148.20	25	−109.65	38.13	5.53	1.95	142	1	62.3	10	
USAWH102	−157.20	25	−111.41	38.57	5.51	1.54	138	1	63.5	10	
VENAND03	−115.20	25	−67.04	6.91	2.37	1.43	111	1	67.6	9/GR5	10

12 588.50 MHz (26)

1	2	3	4		5		6	7	8	9	
ALS00002	−165.80	26	−149.63	58.52	3.81	1.23	171	2	59.9	9/GR1	10
ALS00003	−174.80	26	−150.95	58.54	3.77	1.11	167	2	60.2	9/GR2	10
ARGNORT4	−93.80	26	−63.96	−30.01	3.86	1.99	48	2	66.0		
ARGNORT5	−54.80	26	−62.85	−29.80	3.24	2.89	47	2	63.8		
ATNBEAM1	−52.80	26	−66.44	14.87	1.83	0.80	39	2	61.3		
B CE311	−63.80	26	−40.60	−6.07	3.04	2.06	174	2	61.9	8 9/GR7	
B CE312	−44.80	26	−40.26	−6.06	3.44	2.09	174	2	61.2	8 9/GR9	10 11
B CE411	−63.80	26	−50.97	−15.26	3.86	1.38	49	2	62.9	8 9/GR7	
B CE412	−44.80	26	−50.71	−15.30	3.57	1.56	52	2	63.0	8 9/GR9	10 12
B CE511	−63.80	26	−53.11	−2.98	2.42	2.15	107	2	63.4	8 9/GR7	
B NO611	−73.80	26	−59.60	−11.62	2.86	1.69	165	1	63.1	8 9/GR8	
B NO711	−73.80	26	−60.70	−1.78	3.54	1.78	126	1	63.1	8 9/GR8	
B NO811	−73.80	26	−68.75	−4.71	2.37	1.65	73	1	63.1	8 9/GR8	
B SE911	−101.80	26	−45.99	−19.09	2.22	0.80	62	2	65.7	8	
B SU111	−80.80	26	−51.10	−25.64	2.76	1.06	50	2	63.1	8 9/GR6	
B SU112	−44.80	26	−50.76	−25.62	2.47	1.48	56	2	62.6	8 9/GR9	11
B SU211	−80.80	26	−44.51	−16.94	3.22	1.37	60	2	62.8	8 9/GR6	
B SU212	−44.80	26	−43.99	−16.97	3.27	1.92	59	2	61.6	8 9/GR9	12
BLZ00001	−115.80	26	−88.68	17.27	0.80	0.80	90	2	59.2		
CAN01101	−137.80	26	−125.60	57.24	3.45	1.27	157	2	59.7	9/GR10	10
CAN01201	−137.80	26	−111.92	55.89	3.33	0.98	151	2	59.8	9/GR10	10
CAN01202	−72.30	26	−107.64	55.62	2.75	1.11	32	2	59.8		
CAN01203	−128.80	26	−111.43	55.56	3.07	1.15	151	2	59.7	9/GR12	10
CAN01303	−128.80	26	−102.39	57.12	3.54	0.92	154	2	60.3	9/GR12	10
CAN01304	−90.80	26	−99.00	57.33	1.96	1.73	1	2	60.0	9/GR13	
CAN01403	−128.80	26	−89.70	52.02	4.67	0.80	148	2	62.1	9/GR12	10
CAN01404	−90.80	26	−84.78	52.41	3.09	2.06	153	2	60.6	9/GR13	
CAN01405	−81.80	26	−84.02	52.34	2.82	2.30	172	2	60.5	9/GR14	
CAN01504	−90.80	26	−72.68	53.78	3.57	1.67	157	2	60.4	9/GR13	
CAN01505	−81.80	26	−71.76	53.76	3.30	1.89	162	2	60.3	9/GR14	
CAN01605	−81.80	26	−61.54	49.50	2.66	1.39	144	2	60.5	9/GR14	
CAN01606	−70.30	26	−61.32	49.51	2.41	1.65	148	2	60.4		
CHLCONT4	−105.80	26	−69.59	−23.20	2.21	0.80	68	2	59.3	9/GR16	
CHLCONT6	−105.80	26	−73.52	−55.52	3.65	1.31	39	2	59.7	9/GR16	
CRBBAH01	−92.30	26	−76.09	24.13	1.83	0.80	141	1	61.9	9/GR18	
CRBBER01	−92.30	26	−64.76	32.13	0.80	0.80	90	1	56.9	9/GR18	
CRBBLZ01	−92.30	26	−88.61	17.26	0.80	0.80	90	1	58.9	9/GR18	
CRBEC001	−92.30	26	−60.07	8.26	4.20	0.86	115	1	64.6	9/GR18	
CRBJMC01	−92.30	26	−79.45	17.97	0.99	0.80	151	1	61.3	9/GR18	
CTR00201	−130.80	26	−84.33	9.67	0.82	0.80	119	2	66.0		
DMAIFRB1	−79.30	26	−61.30	15.35	0.80	0.80	90	2	58.7		
EQAC0001	−94.80	26	−78.31	−1.52	1.48	1.15	65	1	63.3	9/GR19	
EQAG0001	−94.80	26	−90.36	−0.57	0.94	0.89	99	1	61.2	9/GR19	
HWA00002	−165.80	26	−165.79	23.32	4.20	0.80	160	2	59.0	9/GR1	10
HWA00003	−174.80	26	−166.10	23.42	4.25	0.80	159	2	59.0	9/GR2	10
MEX01NTE	−77.80	26	−105.80	25.99	2.88	2.07	155	2	60.7	1	
MEX02NTE	−135.80	26	−107.36	26.32	3.80	1.57	149	2	61.4	1	10
MEX02SUR	−126.80	26	−96.39	19.88	3.19	1.87	158	2	62.8	1	10
NCG00003	−107.30	26	−84.99	12.90	1.05	1.01	176	1	63.6		
PRU00004	−85.80	26	−74.19	−8.39	3.74	2.45	112	2	63.1		
PTRVIR01	−100.80	26	−65.85	18.12	0.80	0.80	90	2	60.8	1 6 9/GR20	
PTRVIR02	−109.80	26	−65.85	18.12	0.80	0.80	90	2	61.4	1 6 9/GR21	
USAEH001	−61.30	26	−85.16	36.21	5.63	3.32	22	2	62.1	1 5 6	
USAEH002	−100.80	26	−89.28	36.16	5.65	3.78	170	2	62.0	1 6 9/GR20	10
USAEH003	−109.80	26	−90.12	36.11	5.55	3.56	161	2	62.3	1 6 9/GR21	10
USAEH004	−118.80	26	−91.16	36.05	5.38	3.24	153	2	62.9	1 5 6	10
USAPSA02	−165.80	26	−117.79	40.58	4.04	0.82	135	2	63.5	9/GR1	
USAPSA03	−174.80	26	−118.20	40.15	3.63	0.80	136	2	65.3	9/GR2	
USAWH101	−147.80	26	−109.70	38.13	5.52	1.96	142	2	62.3	10	
USAWH102	−156.80	26	−111.40	38.57	5.51	1.55	138	2	63.5	10	
VEN11VEN	−103.80	26	−66.79	6.90	2.50	1.77	122	2	65.5	10	

12 603.08 MHz (27)

1	2	3	4		5		6	7	8	9	
ALS00002	−166.20	27	−149.66	58.37	3.76	1.24	170	1	60.0	9/GR1	10
ALS00003	−175.20	27	−150.98	58.53	3.77	1.11	167	1	60.2	9/GR2	10
ARGINSU4	−94.20	27	−52.98	−59.81	3.40	0.80	19	1	60.1	9/GR3	
ARGINSU5	−55.20	27	−44.17	−59.91	3.77	0.80	13	1	59.5	9/GR4	
ARGSUR04	−94.20	27	−65.04	−43.33	3.32	1.50	40	1	60.9	9/GR3	
ARGSUR05	−55.20	27	−63.68	−43.01	2.54	2.38	152	1	60.3	9/GR4	
B CE311	−64.20	27	−40.60	−6.07	3.04	2.06	174	1	61.9	8 9/GR7	
B CE312	−45.20	27	−40.27	−6.06	3.44	2.09	174	1	61.3	8 9/GR9	10 11
B CE411	−64.20	27	−50.97	−15.27	3.86	1.38	49	1	62.9	8 9/GR7	
B CE412	−45.20	27	−50.71	−15.30	3.57	1.56	52	1	63.1	8 9/GR9	10 12
B CE511	−64.20	27	−53.10	−2.90	2.44	2.13	104	1	63.4	8 9/GR7	
B NO611	−74.20	27	−59.60	−11.62	2.85	1.69	165	2	63.2	8 9/GR8	
B NO711	−74.20	27	−60.70	−1.78	3.54	1.78	126	2	63.2	8 9/GR8	
B NO811	−74.20	27	−68.76	−4.71	2.37	1.65	73	2	63.1	8 9/GR8	
B SU111	−81.20	27	−51.12	−25.63	2.76	1.05	50	1	63.2	8 9/GR6	
B SU112	−45.20	27	−50.75	−25.62	2.47	1.48	56	1	62.6	8 9/GR9	11
B SU211	−81.20	27	−44.51	−16.95	3.22	1.36	60	1	62.8	8 9/GR6	
B SU212	−45.20	27	−44.00	−16.87	3.20	1.96	58	1	61.6	8 9/GR9	12
BERBERMU	−96.20	27	−64.77	32.32	0.80	0.80	90	2	57.0		
BOLAND01	−115.20	27	−65.04	−16.76	2.49	1.27	76	1	68.1	9/GR5	
BOL00001	−87.20	27	−64.61	−16.71	2.52	2.19	85	1	64.2		
BRB00001	−92.70	27	−59.85	12.93	0.80	0.80	90	2	59.4		
CAN01101	−138.20	27	−125.63	57.24	3.45	1.27	157	1	59.7	9/GR10	10
CAN01201	−138.20	27	−112.04	55.95	3.35	0.97	151	1	59.8	9/GR10	10
CAN01202	−72.70	27	−107.70	55.63	2.74	1.12	32	1	59.8		
CAN01203	−129.20	27	−111.48	55.61	3.08	1.15	151	1	59.7	9/GR12	10
CAN01303	−129.20	27	−102.42	57.12	3.54	0.91	154	1	60.3	9/GR12	10
CAN01304	−91.20	27	−99.12	57.36	1.98	1.72	2	1	60.1	9/GR13	
CAN01403	−129.20	27	−89.75	52.02	4.68	0.80	148	1	62.1	9/GR12	10
CAN01404	−91.20	27	−84.82	52.42	3.10	2.05	152	1	60.6	9/GR13	
CAN01405	−82.20	27	−84.00	52.39	2.84	2.29	172	1	60.5	9/GR14	
CAN01504	−91.20	27	−72.66	53.77	3.57	1.67	156	1	60.4	9/GR13	
CAN01505	−82.20	27	−71.77	53.79	3.30	1.89	162	1	60.4	9/GR14	
CAN01605	−82.20	27	−61.50	49.55	2.65	1.40	143	1	60.5	9/GR14	
CAN01606	−70.70	27	−61.30	49.55	2.40	1.65	148	1	60.5		
CHLCONT5	−106.20	27	−72.23	−35.57	2.60	0.80	55	1	59.6	9/GR17	
CHLPAC02	−106.20	27	−80.06	−30.06	1.36	0.80	69	1	59.4	9/GR17	
CLMAND01	−115.20	27	−74.72	5.93	3.85	1.63	114	1	65.4	9/GR5	10
CLM00001	−103.20	27	−74.50	5.87	3.98	1.96	118	1	63.9	10	
CUB00001	−89.20	27	−79.81	21.62	2.24	0.80	168	1	61.3		
EQACAND1	−115.20	27	−78.40	−1.61	1.37	0.95	75	1	64.4	9/GR5	
EQAGAND1	−115.20	27	−90.34	−0.62	0.90	0.81	89	1	61.6	9/GR5	
GRD00059	−57.20	27	−61.58	12.29	0.80	0.80	90	1	58.7		
GRLDNK01	−53.20	27	−44.89	66.56	2.70	0.82	173	1	60.2	2	
GUY00201	−84.70	27	−59.19	4.78	1.44	0.85	95	1	63.8		
HWA00002	−166.20	27	−165.79	23.42	4.20	0.80	160	1	59.0	9/GR1	10
HWA00003	−175.20	27	−166.10	23.42	4.25	0.80	159	1	59.0	9/GR2	10
MEX01NTE	−78.20	27	−105.81	26.01	2.89	2.08	155	1	60.8	1	
MEX01SUR	−69.20	27	−94.84	19.82	3.05	2.09	4	1	62.5	1	
MEX02NTE	−136.20	27	−107.21	26.31	3.84	1.55	148	1	61.5	1	10
MEX02SUR	−127.20	27	−96.39	19.88	3.18	1.87	157	1	62.8	1	10
MSR00001	−79.70	27	−61.73	16.75	0.80	0.80	90	1	58.9	4	
PAQPAC01	−106.20	27	−109.18	−27.53	0.80	0.80	90	1	56.4	9/GR17	
PRG00002	−99.20	27	−58.66	−23.32	1.45	1.04	76	1	60.5		
PRUAND02	−115.20	27	−74.69	−8.39	3.41	1.79	95	1	64.3	9/GR5	
PTRVIR01	−101.20	27	−65.85	18.12	0.80	0.80	90	1	60.8	1 6 9/GR20	
PTRVIR02	−110.20	27	−65.86	18.12	0.80	0.80	90	1	61.3	1 6 9/GR21	
URG00001	−71.70	27	−56.22	−32.52	1.02	0.89	11	1	60.2		
USAEH001	−61.70	27	−85.19	36.21	5.63	3.33	22	1	62.1	1 5 6	
USAEH002	−101.20	27	−89.24	36.16	5.67	3.76	170	1	62.0	1 6 9/GR20	10
USAEH003	−110.20	27	−90.14	36.11	5.55	3.55	161	1	62.4	1 6 9/GR21	10
USAEH004	−119.20	27	−91.16	36.05	5.38	3.24	152	1	62.9	1 5 6	10
USAPSA02	−166.20	27	−117.80	40.58	4.03	0.82	135	1	63.6	9/GR1	
USAPSA03	−175.20	27	−118.27	40.12	3.62	0.80	136	1	65.4	9/GR2	
USAWH101	−148.20	27	−109.65	38.13	5.53	1.95	142	1	62.4	10	
USAWH102	−157.20	27	−111.41	38.57	5.51	1.54	138	1	63.5	10	
VENAND03	−115.20	27	−67.04	6.91	2.37	1.43	111	1	67.7	9/GR5	10

12 617.66 MHz (28)

1	2	3	4		5		6	7	8	9	
ALS00002	−165.80	28	−149.63	58.52	3.81	1.23	171	2	59.9	9/GR1	10
ALS00003	−174.80	28	−150.95	58.54	3.77	1.11	167	2	60.2	9/GR2	10
ARGNORT4	−93.80	28	−63.96	−30.01	3.86	1.99	48	2	66.1		
ARGNORT5	−54.80	28	−62.85	−29.80	3.24	2.89	47	2	63.9		
B CE311	−63.80	28	−40.60	−6.07	3.04	2.06	174	2	61.9	8 9/GR7	
B CE312	−44.80	28	−40.26	−6.06	3.44	2.09	174	2	61.3	8 9/GR9	10 11
B CE411	−63.80	28	−50.97	−15.26	3.86	1.38	49	2	62.9	8 9/GR7	
B CE412	−44.80	28	−50.71	−15.30	3.57	1.56	52	2	63.1	8 9/GR9	10 12
B CE511	−63.80	28	−53.11	−2.98	2.42	2.15	107	2	63.4	8 9/GR7	
B NO611	−73.80	28	−59.60	−11.62	2.86	1.69	165	1	63.2	8 9/GR8	
B NO711	−73.80	28	−60.70	−1.78	3.54	1.78	126	1	63.2	8 9/GR8	
B NO811	−73.80	28	−68.75	−4.71	2.37	1.65	73	1	63.2	8 9/GR8	
B SE911	−101.80	28	−45.99	−19.09	2.22	0.80	62	2	65.7	8	
B SU111	−80.80	28	−51.10	−25.64	2.76	1.06	50	2	63.2	8 9/GR6	
B SU112	−44.80	28	−50.76	−25.62	2.47	1.48	56	2	62.6	8 9/GR9	11
B SU211	−80.80	28	−44.51	−16.94	3.22	1.37	60	2	62.8	8 9/GR6	
B SU212	−44.80	28	−43.99	−16.97	3.27	1.92	59	2	61.6	8 9/GR9	12
CAN01101	−137.80	28	−125.60	57.24	3.45	1.27	157	2	59.7	9/GR10	10
CAN01201	−137.80	28	−111.92	55.89	3.33	0.98	151	2	59.8	9/GR10	10
CAN01202	−72.30	28	−107.64	55.62	2.75	1.11	32	2	59.8		
CAN01203	−128.80	28	−111.43	55.56	3.07	1.15	151	2	59.7	9/GR12	10
CAN01303	−128.80	28	−102.39	57.12	3.54	0.92	154	2	60.3	9/GR12	10
CAN01304	−90.80	28	−99.00	57.33	1.96	1.73	1	2	60.0	9/GR13	
CAN01403	−128.80	28	−89.70	52.02	4.67	0.80	148	2	62.1	9/GR12	10
CAN01404	−90.80	28	−84.78	52.41	3.09	2.06	153	2	60.6	9/GR13	
CAN01405	−81.80	28	−84.02	52.34	2.82	2.30	172	2	60.5	9/GR14	
CAN01504	−90.80	28	−72.68	53.78	3.57	1.67	157	2	60.4	9/GR13	
CAN01505	−81.80	28	−71.76	53.76	3.30	1.89	162	2	60.4	9/GR14	
CAN01605	−81.80	28	−61.54	49.50	2.66	1.39	144	2	60.5	9/GR14	
CAN01606	−70.30	28	−61.32	49.51	2.41	1.65	148	2	60.5		
CHLCONT4	−105.80	28	−69.59	−23.20	2.21	0.80	68	2	59.3	9/GR16	
CHLCONT6	−105.80	28	−73.52	−55.52	3.65	1.31	39	2	59.8	9/GR16	
CRBBAH01	−92.30	28	−76.09	24.13	1.83	0.80	141	1	62.0	9/GR18	
CRBBER01	−92.30	28	−64.76	32.13	0.80	0.80	90	1	57.0	9/GR18	
CRBBLZ01	−92.30	28	−88.61	17.26	0.80	0.80	90	1	58.9	9/GR18	
CRBEC001	−92.30	28	−60.07	8.26	4.20	0.86	115	1	64.6	9/GR18	
CRBJMC01	−92.30	28	−79.45	17.97	0.99	0.80	151	1	61.4	9/GR18	
EQAC0001	−94.80	28	−78.31	−1.52	1.48	1.15	65	1	63.3	9/GR19	
EQAG0001	−94.80	28	−90.36	−0.57	0.94	0.89	99	1	61.3	9/GR19	
GRD00003	−79.30	28	−61.62	12.34	0.80	0.80	90	2	58.9		
GTMIFRB2	−107.30	28	−90.50	15.64	1.03	0.80	84	1	61.4		
GUFMGG02	−52.80	28	−56.42	8.47	4.16	0.81	123	2	63.0	2 7	
HWA00002	−165.80	28	−165.79	23.32	4.20	0.80	160	2	59.0	9/GR1	10
HWA00003	−174.80	28	−166.10	23.42	4.25	0.80	159	2	59.0	9/GR2	10
MEX01NTE	−77.80	28	−105.80	25.99	2.88	2.07	155	2	60.8	1	
MEX02NTE	−135.80	28	−107.36	26.32	3.80	1.57	149	2	61.5	1	10
MEX02SUR	−126.80	28	−96.39	19.88	3.19	1.87	158	2	62.8	1	10
PNRIFRB2	−121.00	28	−80.15	8.46	1.01	0.80	170	1	65.1		
PRU00004	−85.80	28	−74.19	−8.39	3.74	2.45	112	2	63.2		
PTRVIR01	−100.80	28	−65.85	18.12	0.80	0.80	90	2	60.9	1 6 9/GR20	
PTRVIR02	−109.80	28	−65.85	18.12	0.80	0.80	90	2	61.4	1 6 9/GR21	
USAEH001	−61.30	28	−85.16	36.21	5.63	3.32	22	2	62.1	1 5 6	
USAEH002	−100.80	28	−89.28	36.16	5.65	3.78	170	2	62.0	1 6 9/GR20	10
USAEH003	−109.80	28	−90.12	36.11	5.55	3.56	161	2	62.4	1 6 9/GR21	10
USAEH004	−118.80	28	−91.16	36.05	5.38	3.24	153	2	62.9	1 5 6	10
USAPSA02	−165.80	28	−117.79	40.58	4.04	0.82	135	2	63.6	9/GR1	
USAPSA03	−174.80	28	−118.20	40.15	3.63	0.80	136	2	65.3	9/GR2	
USAWH101	−147.80	28	−109.70	38.13	5.52	1.96	142	2	62.4	10	
USAWH102	−156.80	28	−111.40	38.57	5.51	1.55	138	2	63.5	10	
VEN02VEN	−103.80	28	−63.50	15.50	0.80	0.80	90	2	60.1	9/GR22	
VEN11VEN	−103.80	28	−66.79	6.90	2.50	1.77	122	2	65.6	9/GR22	10

12 632.24 MHz (29)

1	2	3	4		5		6	7	8	9	
ALS00002	−166.20	29	−149.66	58.37	3.76	1.24	170	1	59.9	9/GR1	10
ALS00003	−175.20	29	−150.98	58.53	3.77	1.11	167	1	60.2	9/GR2	10
ARGINSU4	−94.20	29	−52.98	−59.81	3.40	0.80	19	1	60.1	9/GR3	
ARGINSU5	−55.20	29	−44.17	−59.91	3.77	0.80	13	1	59.5	9/GR4	
ARGSUR04	−94.20	29	−65.04	−43.33	3.32	1.50	40	1	60.9	9/GR3	
ARGSUR05	−55.20	29	−63.68	−43.01	2.54	2.38	152	1	60.2	9/GR4	
B CE311	−64.20	29	−40.60	−6.07	3.04	2.06	174	1	61.9	8 9/GR7	
B CE312	−45.20	29	−40.27	−6.06	3.44	2.09	174	1	61.2	8 9/GR9	10 11
B CE411	−64.20	29	−50.97	−15.27	3.86	1.38	49	1	62.9	8 9/GR7	
B CE412	−45.20	29	−50.71	−15.30	3.57	1.56	52	1	63.0	8 9/GR9	10 12
B CE511	−64.20	29	−53.10	−2.90	2.44	2.13	104	1	63.4	8 9/GR7	
B NO611	−74.20	29	−59.60	−11.62	2.85	1.69	165	2	63.1	8 9/GR8	
B NO711	−74.20	29	−60.70	−1.78	3.54	1.78	126	2	63.1	8 9/GR8	
B NO811	−74.20	29	−68.76	−4.71	2.37	1.65	73	2	63.1	8 9/GR8	
B SU111	−81.20	29	−51.12	−25.63	2.76	1.05	50	1	63.2	8 9/GR6	
B SU112	−45.20	29	−50.75	−25.62	2.47	1.48	56	1	62.5	8 9/GR9	11
B SU211	−81.20	29	−44.51	−16.95	3.22	1.36	60	1	62.8	8 9/GR6	
B SU212	−45.20	29	−44.00	−16.87	3.20	1.96	58	1	61.6	8 9/GR9	12
BERBERMU	−96.20	29	−64.77	32.32	0.80	0.80	90	2	57.0		
BOLAND01	−115.20	29	−65.04	−16.76	2.49	1.27	76	1	68.0	9/GR5	
CAN01101	−138.20	29	−125.63	57.24	3.45	1.27	157	1	59.7	9/GR10	10
CAN01201	−138.20	29	−112.04	55.95	3.35	0.97	151	1	59.8	9/GR10	10
CAN01202	−72.70	29	−107.70	55.63	2.74	1.12	32	1	59.8		
CAN01203	−129.20	29	−111.48	55.61	3.08	1.15	151	1	59.7	9/GR12	10
CAN01303	−129.20	29	−102.42	57.12	3.54	0.91	154	1	60.2	9/GR12	10
CAN01304	−91.20	29	−99.12	57.36	1.98	1.72	2	1	60.0	9/GR13	
CAN01403	−129.20	29	−89.75	52.02	4.68	0.80	148	1	62.1	9/GR12	10
CAN01404	−91.20	29	−84.82	52.42	3.10	2.05	152	1	60.6	9/GR13	
CAN01405	−82.20	29	−84.00	52.39	2.84	2.29	172	1	60.5	9/GR14	
CAN01504	−91.20	29	−72.66	53.77	3.57	1.67	156	1	60.4	9/GR13	
CAN01505	−82.20	29	−71.77	53.79	3.30	1.89	162	1	60.3	9/GR14	
CAN01605	−82.20	29	−61.50	49.55	2.65	1.40	143	1	60.5	9/GR14	
CAN01606	−70.70	29	−61.30	49.55	2.40	1.65	148	1	60.4		
CHLCONT5	−106.20	29	−72.23	−35.57	2.60	0.80	55	1	59.6	9/GR17	
CHLPAC02	−106.20	29	−80.06	−30.06	1.36	0.80	69	1	59.4	9/GR17	
CLMAND01	−115.20	29	−74.72	5.93	3.85	1.63	114	1	65.3	9/GR5	10
CLM00001	−103.20	29	−74.50	5.87	3.98	1.96	118	1	63.9	10	
EQACAND1	−115.20	29	−78.40	−1.61	1.37	0.95	75	1	64.4	9/GR5	
EQAGAND1	−115.20	29	−90.34	−0.62	0.90	0.81	89	1	61.5	9/GR5	
HWA00002	−166.20	29	−165.79	23.42	4.20	0.80	160	1	59.0	9/GR1	10
HWA00003	−175.20	29	−166.10	23.42	4.25	0.80	159	1	58.9	9/GR2	10
JMC00002	−92.70	29	−77.30	18.12	0.80	0.80	90	2	60.1		
KNA00001	−79.70	29	−62.46	17.44	0.80	0.80	90	1	58.6		
MEX01NTE	−78.20	29	−105.81	26.01	2.89	2.08	155	1	60.7	1	
MEX01SUR	−69.20	29	−94.84	19.82	3.05	2.09	4	1	62.5	1	
MEX02NTE	−136.20	29	−107.21	26.31	3.84	1.55	148	1	61.4	1	10
MEX02SUR	−127.20	29	−96.39	19.88	3.18	1.87	157	1	62.8	1	10
PAQPAC01	−106.20	29	−109.18	−27.53	0.80	0.80	90	1	56.4	9/GR17	
PRG00002	−99.20	29	−58.66	−23.32	1.45	1.04	76	1	60.4		
PRUAND02	−115.20	29	−74.69	−8.39	3.41	1.79	95	1	64.3	9/GR5	
PTRVIR01	−101.20	29	−65.85	18.12	0.80	0.80	90	1	60.8	1 6 9/GR20	
PTRVIR02	−110.20	29	−65.86	18.12	0.80	0.80	90	1	61.3	1 6 9/GR21	
SPMFRAN3	−53.20	29	−67.24	47.51	3.16	0.80	7	1	60.6	2 7	
SURINAM2	−84.70	29	−55.69	4.35	1.00	0.80	86	1	63.5		
URG00001	−71.70	29	−56.22	−32.52	1.02	0.89	11	1	60.2		
USAEH001	−61.70	29	−85.19	36.21	5.63	3.33	22	1	62.1	1 5 6	
USAEH002	−101.20	29	−89.24	36.16	5.67	3.76	170	1	62.0	1 6 9/GR20	10
USAEH003	−110.20	29	−90.14	36.11	5.55	3.55	161	1	62.3	1 6 9/GR21	10
USAEH004	−119.20	29	−91.16	36.05	5.38	3.24	152	1	62.9	1 5 6	10
USAPSA02	−166.20	29	−117.80	40.58	4.03	0.82	135	1	63.5	9/GR1	
USAPSA03	−175.20	29	−118.27	40.12	3.62	0.80	136	1	65.3	9/GR2	
USAWH101	−148.20	29	−109.65	38.13	5.53	1.95	142	1	62.3	10	
USAWH102	−157.20	29	−111.41	38.57	5.51	1.54	138	1	63.5	10	
VENAND03	−115.20	29	−67.04	6.91	2.37	1.43	111	1	67.6	9/GR5	10

12 646.82 MHz (30)

1	2	3	4		5		6	7	8	9	
ALS00002	−165.80	30	−149.63	58.52	3.81	1.23	171	2	59.9	9/GR1	10
ALS00003	−174.80	30	−150.95	58.54	3.77	1.11	167	2	60.2	9/GR2	10
ARGNORT4	−93.80	30	−63.96	−30.01	3.86	1.99	48	2	66.0		
ARGNORT5	−54.80	30	−62.85	−29.80	3.24	2.89	47	2	63.8		
ATNBEAM1	−52.80	30	−66.44	14.87	1.83	0.80	39	2	61.3		
B CE311	−63.80	30	−40.60	−6.07	3.04	2.06	174	2	61.9	8 9/GR7	
B CE312	−44.80	30	−40.26	−6.06	3.44	2.09	174	2	61.2	8 9/GR9	10 11
B CE411	−63.80	30	−50.97	−15.26	3.86	1.38	49	2	62.9	8 9/GR7	
B CE412	−44.80	30	−50.71	−15.30	3.57	1.56	52	2	63.0	8 9/GR9	10 12
B CE511	−63.80	30	−53.11	−2.98	2.42	2.15	107	2	63.4	8 9/GR7	
B NO611	−73.80	30	−59.60	−11.62	2.86	1.69	165	1	63.1	8 9/GR8	
B NO711	−73.80	30	−60.70	−1.78	3.54	1.78	126	1	63.1	8 9/GR8	
B NO811	−73.80	30	−68.75	−4.71	2.37	1.65	73	1	63.1	8 9/GR8	
B SE911	−101.80	30	−45.99	−19.09	2.22	0.80	62	2	65.7	8	
B SU111	−80.80	30	−51.10	−25.64	2.76	1.06	50	2	63.1	8 9/GR6	
B SU112	−44.80	30	−50.76	−25.62	2.47	1.48	56	2	62.6	8 9/GR9	11
B SU211	−80.80	30	−44.51	−16.94	3.22	1.37	60	2	62.8	8 9/GR6	
B SU212	−44.80	30	−43.99	−16.97	3.27	1.92	59	2	61.6	8 9/GR9	12
BLZ00001	−115.80	30	−88.68	17.27	0.80	0.80	90	2	59.2		
CAN01101	−137.80	30	−125.60	57.24	3.45	1.27	157	2	59.7	9/GR10	10
CAN01201	−137.80	30	−111.92	55.89	3.33	0.98	151	2	59.8	9/GR10	10
CAN01202	−72.30	30	−107.64	55.62	2.75	1.11	32	2	59.8		
CAN01203	−128.80	30	−111.43	55.56	3.07	1.15	151	2	59.7	9/GR12	10
CAN01303	−128.80	30	−102.39	57.12	3.54	0.92	154	2	60.3	9/GR12	10
CAN01304	−90.80	30	−99.00	57.33	1.96	1.73	1	2	60.0	9/GR13	
CAN01403	−128.80	30	−89.70	52.02	4.67	0.80	148	2	62.1	9/GR12	10
CAN01404	−90.80	30	−84.78	52.41	3.09	2.06	153	2	60.6	9/GR13	
CAN01405	−81.80	30	−84.02	52.34	2.82	2.30	172	2	60.5	9/GR14	
CAN01504	−90.80	30	−72.68	53.78	3.57	1.67	157	2	60.4	9/GR13	
CAN01505	−81.80	30	−71.76	53.76	3.30	1.89	162	2	60.3	9/GR14	
CAN01605	−81.80	30	−61.54	49.50	2.66	1.39	144	2	60.5	9/GR14	
CAN01606	−70.30	30	−61.32	49.51	2.41	1.65	148	2	60.4		
CHLCONT4	−105.80	30	−69.59	−23.20	2.21	0.80	68	2	59.3	9/GR16	
CHLCONT6	−105.80	30	−73.52	−55.52	3.65	1.31	39	2	59.7	9/GR16	
CRBBAH01	−92.30	30	−76.09	24.13	1.83	0.80	141	1	61.9	9/GR18	
CRBBER01	−92.30	30	−64.76	32.13	0.80	0.80	90	1	56.9	9/GR18	
CRBBLZ01	−92.30	30	−88.61	17.26	0.80	0.80	90	1	58.9	9/GR18	
CRBEC001	−92.30	30	−60.07	8.26	4.20	0.86	115	1	64.6	9/GR18	
CRBJMC01	−92.30	30	−79.45	17.97	0.99	0.80	151	1	61.3	9/GR18	
CTR00201	−130.80	30	−84.33	9.67	0.82	0.80	119	2	66.0		
DMAIFRB1	−79.30	30	−61.30	15.35	0.80	0.80	90	2	58.7		
EQAC0001	−94.80	30	−78.31	−1.52	1.48	1.15	65	1	63.3	9/GR19	
EQAG0001	−94.80	30	−90.36	−0.57	0.94	0.89	99	1	61.2	9/GR19	
HWA00002	−165.80	30	−165.79	23.32	4.20	0.80	160	2	59.0	9/GR1	10
HWA00003	−174.80	30	−166.10	23.42	4.25	0.80	159	2	59.0	9/GR2	10
MEX01NTE	−77.80	30	−105.80	25.99	2.88	2.07	155	2	60.7	1	
MEX02NTE	−135.80	30	−107.36	26.32	3.80	1.57	149	2	61.4	1	10
MEX02SUR	−126.80	30	−96.39	19.88	3.19	1.87	158	2	62.8	1	10
NCG00003	−107.30	30	−84.99	12.90	1.05	1.01	176	1	63.6		
PRU00004	−85.80	30	−74.19	−8.39	3.74	2.45	112	2	63.1		
PTRVIR01	−100.80	30	−65.85	18.12	0.80	0.80	90	2	60.8	1 6 9/GR20	
PTRVIR02	−109.80	30	−65.85	18.12	0.80	0.80	90	2	61.4	1 6 9/GR21	
USAEH001	−61.30	30	−85.16	36.21	5.63	3.32	22	2	62.1	1 5 6	
USAEH002	−100.80	30	−89.28	36.16	5.65	3.78	170	2	62.0	1 6 9/GR20	10
USAEH003	−109.80	30	−90.12	36.11	5.55	3.56	161	2	62.3	1 6 9/GR21	10
USAEH004	−118.80	30	−91.16	36.05	5.38	3.24	153	2	62.9	1 5 6	10
USAPSA02	−165.80	30	−117.79	40.58	4.04	0.82	135	2	63.5	9/GR1	
USAPSA03	−174.80	30	−118.20	40.15	3.63	0.80	136	2	65.3	9/GR2	
USAWH101	−147.80	30	−109.70	38.13	5.52	1.96	142	2	62.3	10	
USAWH102	−156.80	30	−111.40	38.57	5.51	1.55	138	2	63.5	10	
VEN11VEN	−103.80	30	−66.79	6.90	2.50	1.77	122	2	65.5	10	

12 661.40 MHz (31)

1	2	3	4		5		6	7	8	9	
ALS00002	−166.20	31	−149.66	58.37	3.76	1.24	170	1	60.0	9/GR1	10
ALS00003	−175.20	31	−150.98	58.53	3.77	1.11	167	1	60.2	9/GR2	10
ARGINSU4	−94.20	31	−52.98	−59.81	3.40	0.80	19	1	60.1	9/GR3	
ARGINSU5	−55.20	31	−44.17	−59.91	3.77	0.80	13	1	59.5	9/GR4	
ARGSUR04	−94.20	31	−65.04	−43.33	3.32	1.50	40	1	60.9	9/GR3	
ARGSUR05	−55.20	31	−63.68	−43.01	2.54	2.38	152	1	60.3	9/GR4	
B CE311	−64.20	31	−40.60	−6.07	3.04	2.06	174	1	61.9	8 9/GR7	
B CE312	−45.20	31	−40.27	−6.06	3.44	2.09	174	1	61.3	8 9/GR9	10 11
B CE411	−64.20	31	−50.97	−15.27	3.86	1.38	49	1	62.9	8 9/GR7	
B CE412	−45.20	31	−50.71	−15.30	3.57	1.56	52	1	63.1	8 9/GR9	10 12
B CE511	−64.20	31	−53.10	−2.90	2.44	2.13	104	1	63.4	8 9/GR7	
B NO611	−74.20	31	−59.60	−11.62	2.85	1.69	165	2	63.2	8 9/GR8	
B NO711	−74.20	31	−60.70	−1.78	3.54	1.78	126	2	63.2	8 9/GR8	
B NO811	−74.20	31	−68.76	−4.71	2.37	1.65	73	2	63.1	8 9/GR8	
B SU111	−81.20	31	−51.12	−25.63	2.76	1.05	50	1	63.2	8 9/GR6	
B SU112	−45.20	31	−50.75	−25.62	2.47	1.48	56	1	62.6	8 9/GR9	11
B SU211	−81.20	31	−44.51	−16.95	3.22	1.36	60	1	62.8	8 9/GR6	
B SU212	−45.20	31	−44.00	−16.87	3.20	1.96	58	1	61.6	8 9/GR9	12
BERBERMU	−96.20	31	−64.77	32.32	0.80	0.80	90	2	57.0		
BOLAND01	−115.20	31	−65.04	−16.76	2.49	1.27	76	1	68.1	9/GR5	
BOL00001	−87.20	31	−64.61	−16.71	2.52	2.19	85	1	64.2		
BRB00001	−92.70	31	−59.85	12.93	0.80	0.80	90	2	59.4		
CAN01101	−138.20	31	−125.63	57.24	3.45	1.27	157	1	59.7	9/GR10	10
CAN01201	−138.20	31	−112.04	55.95	3.35	0.97	151	1	59.8	9/GR10	10
CAN01202	−72.70	31	−107.70	55.63	2.74	1.12	32	1	59.8		
CAN01203	−129.20	31	−111.48	55.61	3.08	1.15	151	1	59.7	9/GR12	10
CAN01303	−129.20	31	−102.42	57.12	3.54	0.91	154	1	60.3	9/GR12	10
CAN01304	−91.20	31	−99.12	57.36	1.98	1.72	2	1	60.1	9/GR13	
CAN01403	−129.20	31	−89.75	52.02	4.68	0.80	148	1	62.1	9/GR12	10
CAN01404	−91.20	31	−84.82	52.42	3.10	2.05	152	1	60.6	9/GR13	
CAN01405	−82.20	31	−84.00	52.39	2.84	2.29	172	1	60.5	9/GR14	
CAN01504	−91.20	31	−72.66	53.77	3.57	1.67	156	1	60.4	9/GR13	
CAN01505	−82.20	31	−71.77	53.79	3.30	1.89	162	1	60.4	9/GR14	
CAN01605	−82.20	31	−61.50	49.55	2.65	1.40	143	1	60.5	9/GR14	
CAN01606	−70.70	31	−61.30	49.55	2.40	1.65	148	1	60.5		
CHLCONT5	−106.20	31	−72.23	−35.57	2.60	0.80	55	1	59.6	9/GR17	
CHLPAC02	−106.20	31	−80.06	−30.06	1.36	0.80	69	1	59.4	9/GR17	
CLMAND01	−115.20	31	−74.72	5.93	3.85	1.63	114	1	65.4	9/GR5	10
CLM00001	−103.20	31	−74.50	5.87	3.98	1.96	118	1	63.9	10	
CUB00001	−89.20	31	−79.81	21.62	2.24	0.80	168	1	61.3		
EQACAND1	−115.20	31	−78.40	−1.61	1.37	0.95	75	1	64.4	9/GR5	
EQAGAND1	−115.20	31	−90.34	−0.62	0.90	0.81	89	1	61.6	9/GR5	
GRD00059	−57.20	31	−61.58	12.29	0.80	0.80	90	1	58.7		
GRLDNK01	−53.20	31	−44.89	66.56	2.70	0.82	173	1	60.2	2	
GUY00201	−84.70	31	−59.19	4.78	1.44	0.85	95	1	63.8		
HWA00002	−166.20	31	−165.79	23.42	4.20	0.80	160	1	59.0	9/GR1	10
HWA00003	−175.20	31	−166.10	23.42	4.25	0.80	159	1	59.0	9/GR2	10
MEX01NTE	−78.20	31	−105.81	26.01	2.89	2.08	155	1	60.8	1	
MEX01SUR	−69.20	31	−94.84	19.82	3.05	2.09	4	1	62.5	1	
MEX02NTE	−136.20	31	−107.21	26.31	3.84	1.55	148	1	61.5	1	10
MEX02SUR	−127.20	31	−96.39	19.88	3.18	1.87	157	1	62.8	1	10
MSR00001	−79.70	31	−61.73	16.75	0.80	0.80	90	1	58.9	4	
PAQPAC01	−106.20	31	−109.18	−27.53	0.80	0.80	90	1	56.4	9/GR17	
PRG00002	−99.20	31	−58.66	−23.32	1.45	1.04	76	1	60.5		
PRUAND02	−115.20	31	−74.69	−8.39	3.41	1.79	95	1	64.3	9/GR5	
PTRVIR01	−101.20	31	−65.85	18.12	0.80	0.80	90	1	60.8	1 6 9/GR20	
PTRVIR02	−110.20	31	−65.86	18.12	0.80	0.80	90	1	61.3	1 6 9/GR21	
URG00001	−71.70	31	−56.22	−32.52	1.02	0.89	11	1	60.2		
USAEH001	−61.70	31	−85.19	36.21	5.63	3.33	22	1	62.1	1 5 6	
USAEH002	−101.20	31	−89.24	36.16	5.67	3.76	170	1	62.0	1 6 9/GR20	10
USAEH003	−110.20	31	−90.14	36.11	5.55	3.55	161	1	62.4	1 6 9/GR21	10
USAEH004	−119.20	31	−91.16	36.05	5.38	3.24	152	1	62.9	1 5 6	10
USAPSA02	−166.20	31	−117.80	40.58	4.03	0.82	135	1	63.6	9/GR1	
USAPSA03	−175.20	31	−118.27	40.12	3.62	0.80	136	1	65.4	9/GR2	
USAWH101	−148.20	31	−109.65	38.13	5.53	1.95	142	1	62.4	10	
USAWH102	−157.20	31	−111.41	38.57	5.51	1.54	138	1	63.5	10	
VENAND03	−115.20	31	−67.04	6.91	2.37	1.43	111	1	67.7	9/GR5	10

12 675.98 MHz (32)

1	2	3	4		5		6	7	8	9	
ALS00002	−165.80	32	−149.63	58.52	3.81	1.23	171	2	59.9	9/GR1	10
ALS00003	−174.80	32	−150.95	58.54	3.77	1.11	167	2	60.2	9/GR2	10
ARGNORT4	−93.80	32	−63.96	−30.01	3.86	1.99	48	2	66.1		
ARGNORT5	−54.80	32	−62.85	−29.80	3.24	2.89	47	2	63.9		
B CE311	−63.80	32	−40.60	−6.07	3.04	2.06	174	2	61.9	8 9/GR7	
B CE312	−44.80	32	−40.26	−6.06	3.44	2.09	174	2	61.3	8 9/GR9	10 11
B CE411	−63.80	32	−50.97	−15.26	3.86	1.38	49	2	62.9	8 9/GR7	
B CE412	−44.80	32	−50.71	−15.30	3.57	1.56	52	2	63.1	8 9/GR9	10 12
B CE511	−63.80	32	−53.11	−2.98	2.42	2.15	107	2	63.4	8 9/GR7	
B NO611	−73.80	32	−59.60	−11.62	2.86	1.69	165	1	63.2	8 9/GR8	
B NO711	−73.80	32	−60.70	−1.78	3.54	1.78	126	1	63.2	8 9/GR8	
B NO811	−73.80	32	−68.75	−4.71	2.37	1.65	73	1	63.2	8 9/GR8	
B SE911	−101.80	32	−45.99	−19.09	2.22	0.80	62	2	65.7	8	
B SU111	−80.80	32	−51.10	−25.64	2.76	1.06	50	2	63.2	8 9/GR6	
B SU112	−44.80	32	−50.76	−25.62	2.47	1.48	56	2	62.6	8 9/GR9	11
B SU211	−80.80	32	−44.51	−16.94	3.22	1.37	60	2	62.8	8 9/GR6	
B SU212	−44.80	32	−43.99	−16.97	3.27	1.92	59	2	61.6	8 9/GR9	12
CAN01101	−137.80	32	−125.60	57.24	3.45	1.27	157	2	59.7	9/GR10	10
CAN01201	−137.80	32	−111.92	55.89	3.33	0.98	151	2	59.8	9/GR10	10
CAN01202	−72.30	32	−107.64	55.62	2.75	1.11	32	2	59.8		
CAN01203	−128.80	32	−111.43	55.56	3.07	1.15	151	2	59.7	9/GR12	10
CAN01303	−128.80	32	−102.39	57.12	3.54	0.92	154	2	60.3	9/GR12	10
CAN01304	−90.80	32	−99.00	57.33	1.96	1.73	1	2	60.0	9/GR13	
CAN01403	−128.80	32	−89.70	52.02	4.67	0.80	148	2	62.1	9/GR12	10
CAN01404	−90.80	32	−84.78	52.41	3.09	2.06	153	2	60.6	9/GR13	
CAN01405	−81.80	32	−84.02	52.34	2.82	2.30	172	2	60.5	9/GR14	
CAN01504	−90.80	32	−72.68	53.78	3.57	1.67	157	2	60.4	9/GR13	
CAN01505	−81.80	32	−71.76	53.76	3.30	1.89	162	2	60.4	9/GR14	
CAN01605	−81.80	32	−61.54	49.50	2.66	1.39	144	2	60.5	9/GR14	
CAN01606	−70.30	32	−61.32	49.51	2.41	1.65	148	2	60.5		
CHLCONT4	−105.80	32	−69.59	−23.20	2.21	0.80	68	2	59.3	9/GR16	
CHLCONT6	−105.80	32	−73.52	−55.52	3.65	1.31	39	2	59.8	9/GR16	
CRBBAH01	−92.30	32	−76.09	24.13	1.83	0.80	141	1	62.0	9/GR18	
CRBBER01	−92.30	32	−64.76	32.13	0.80	0.80	90	1	57.0	9/GR18	
CRBBLZ01	−92.30	32	−88.61	17.26	0.80	0.80	90	1	58.9	9/GR18	
CRBEC001	−92.30	32	−60.07	8.26	4.20	0.86	115	1	64.6	9/GR18	
CRBJMC01	−92.30	32	−79.45	17.97	0.99	0.80	151	1	61.4	9/GR18	
EQAC0001	−94.80	32	−78.31	−1.52	1.48	1.15	65	1	63.3	9/GR19	
EQAG0001	−94.80	32	−90.36	−0.57	0.94	0.89	99	1	61.3	9/GR19	
GRD00003	−79.30	32	−61.62	12.34	0.80	0.80	90	2	58.9		
GTMIFRB2	−107.30	32	−90.50	15.64	1.03	0.80	84	1	61.4		
GUFMGG02	−52.80	32	−56.42	8.47	4.16	0.81	123	2	63.0	2 7	
HWA00002	−165.80	32	−165.79	23.32	4.20	0.80	160	2	59.0	9/GR1	10
HWA00003	−174.80	32	−166.10	23.42	4.25	0.80	159	2	59.0	9/GR2	10
MEX01NTE	−77.80	32	−105.80	25.99	2.88	2.07	155	2	60.8	1	
MEX02NTE	−135.80	32	−107.36	26.32	3.80	1.57	149	2	61.5	1	10
MEX02SUR	−126.80	32	−96.39	19.88	3.19	1.87	158	2	62.8	1	10
PNRIFRB2	−121.00	32	−80.15	8.46	1.01	0.80	170	1	65.1		
PRU00004	−85.80	32	−74.19	−8.39	3.74	2.45	112	2	63.2		
PTRVIR01	−100.80	32	−65.85	18.12	0.80	0.80	90	2	60.9	1 6 9/GR20	
PTRVIR02	−109.80	32	−65.85	18.12	0.80	0.80	90	2	61.4	1 6 9/GR21	
USAEH001	−61.30	32	−85.16	36.21	5.63	3.32	22	2	62.1	1 5 6	
USAEH002	−100.80	32	−89.28	36.16	5.65	3.78	170	2	62.0	1 6 9/GR20	10
USAEH003	−109.80	32	−90.12	36.11	5.55	3.56	161	2	62.4	1 6 9/GR21	10
USAEH004	−118.80	32	−91.16	36.05	5.38	3.24	153	2	62.9	1 5 6	10
USAPSA02	−165.80	32	−117.79	40.58	4.04	0.82	135	2	63.6	9/GR1	
USAPSA03	−174.80	32	−118.20	40.15	3.63	0.80	136	2	65.3	9/GR2	
USAWH101	−147.80	32	−109.70	38.13	5.52	1.96	142	2	62.4	10	
USAWH102	−156.80	32	−111.40	38.57	5.51	1.55	138	2	63.5	10	
VEN02VEN	−103.80	32	−63.50	15.50	0.80	0.80	90	2	60.1	9/GR22	
VEN11VEN	−103.80	32	−66.79	6.90	2.50	1.77	122	2	65.6	9/GR22	10

ARTICLE 11 (REV.WRC-15)

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

11.1 COLUMN HEADINGS OF THE PLAN

Col. 1 *Notifying administration symbol.*

Col. 2 *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. 3 *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. 4 *Nominal intersection of the beam axis with the Earth* (boresight or aim point in the case of a non-elliptical beam), longitude and latitude, in degrees and hundredths of a degree.

Col. 5 *Space station transmitting antenna characteristics* (elliptical beams). This column contains three numerical values corresponding to the major axis, the minor axis and the major axis orientation respectively of the elliptical cross-section half-power beamwidth, in degrees and hundredths of a degree. Orientation of the ellipse is determined as follows: in a plane normal to the beam axis, the direction of a major axis of the ellipse is specified as the angle measured anticlockwise from a line parallel to the equatorial plane to the major axis of the ellipse, to the nearest degree.

Col. 6 *Space station transmitting antenna pattern code.*

The codes used for the antenna pattern of the transmitting space station (downlink) antenna are defined as follows:

MOD13FRTSS	Figure 13 in Annex 5 (Recommendation ITU-R BO.1445)
R13TSS	Figure 9 and § 3.13.3 in Annex 5
R123FR	Figure 11 and § 3.13.3 in Annex 5

In cases where the "Space station transmitting antenna pattern code" field is blank, the necessary antenna pattern data are provided by shaped beam data submitted by the administration. These data are stored in Column 7. A particular shaped beam is identified by the combination of Column 1, Column 7 and Column 13. In such cases the maximum cross-polar gain is given under Column 8 in the "Cross-polar gain" field.

In cases where the "Space station transmitting antenna pattern code" field contains a code which starts with "CB_" characters, it is a composite beam. Any composite beam consists of two or more elliptical beams. Each composite beam is described in the special composite beam file as having the same name plus a GXT extension (e.g. the description of the CB_COMP_BM1 composite beam is stored in the CB_COMP_BM1.GXT file).

Col. 7 *Space station transmitting antenna shaped (non-elliptical and non-composite) beam identification.*

Col. 8 *Maximum space station transmitting antenna co-polar and cross-polar (in the case of shaped beam) isotropic gain (dBi).*

Col. 9 *Earth station receiving antenna pattern code and maximum antenna co-polar gain (dBi).*

The codes used for receiving earth station (downlink) antenna patterns are defined as follows:

R13RES	Figure 7 and § 3.7.2 in Annex 5
MODRES	Figure 7*bis* and § 3.7.2 in Annex 5 (Recommendation ITU-R BO.1213)

Col. 10 *Polarization* (CL – circular left, CR – circular right, LE – linear referenced to the equatorial plane) and polarization angle in degrees and hundredths of a degree (in the case of linear polarization only).

Col. 11 *e.i.r.p.* in the direction of maximum radiation (dBW).

Col. 12 *Designation of emission.*

Col. 13 *Identity of the space station.*

Col. 14 *Group code* (an identification code which indicates that all assignments with the same group identification code will be treated as a group).

Group code: if an assignment is part of the group:

a) The equivalent protection margin to be used for the application of Article 4 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.

b) If an administration notifies the same frequency in more than one beam of a group for use at the same time, the aggregate carrier-to-interference ratio (C/I) produced by all emissions from that group shall not exceed the C/I ratio calculated on the basis of § *a)* above.

Col. 15 *Assignment status.*

The assignment status codes used for beams are defined as follows:

P	Assignment in the Plan which has not been brought into use and/or the date of bringing into use has not been confirmed to the Bureau. For this category of assignments, WRC-2000 protection ratios are applied (21 dB co-channel and 16 dB adjacent channel).
PE	Assignment in the Plan which is in conformity with Appendix 30, has been notified, brought into use and the date of bringing into use has been confirmed to the Bureau before 12 May 2000. For this category of assignments, WRC-97 protection ratios are applied (24 dB co-channel and 16 dB adjacent channel).

Col. 16 *Remarks*.

11.2 TEXT FOR NOTES IN THE REMARKS COLUMN OF THE PLAN (REV.WRC-15)

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, Libya, 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 dB(W/(m^2 · 27 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 (Rev.WRC-15)**, has been received prior to 12 May 2000. (WRC-15)

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 (SUP - WRC-12)

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 (WRC-15)

Affected administrations and corresponding networks/beams identified based on Note 5 in § 11.2 of Article 11

Beam name	Channels	Ref. Table 1	Affected administrations*	Affected networks/beams*
ARS34000	40	c	CHN, G, J, KOR, MLA, THA, UAE, USA	AM-SAT A4, ASIASAT-AKX, ASIASAT-CKX, ASIASAT-EKX, EMARSAT-1G, JCSAT-3A, JCSAT-3B, KOREASAT-1, MEASAT-1, MEASAT-91.5E, N-SAT-110E, N-SAT-128, SJC-1, THAICOM-A2B, THAICOM-G1K
BEL01800	26, 28, 30, 32, 34, 36, 38, 40	c	PAK	PAKSAT-1
BFA10700	22, 24	c	E	HISPASAT-1, HISPASAT-2C3 KU
CVA08300	1, 3, 5, 7, 9, 11	c	USA	INTELSAT7 359E, INTELSAT8 359E, INTELSAT10 359E
CYP08600	1, 3, 5, 7, 9, 11, 13	c	USA	INTELSAT7 359E, INTELSAT8 359E
FSM00000	1, 3, 5, 7, 9, 11, 13	c	USA	INTELSAT7 157E
GMB30200	1, 5, 9, 13, 17	c	USA	USASAT-26A
GNB30400	22, 24	c	E	HISPASAT-1, HISPASAT-2C3 KU
GRC10500	2, 4, 6, 8, 10, 12	c	USA	INTELSAT7 359E, INTELSAT8 359E, INTELSAT10 359E
GUI19200	2, 4, 6, 8, 10, 12, 14, 16, 18, 20	c	USA	USASAT-26A
IRL21100	1, 3, 5, 7, 9, 11, 13, 15, 17, 19	c	USA	USASAT-26A
ISL04900	27	a	GUY	GUY00302
ISL04900	29, 39	a	JMC	JMC00005
ISL04900	31, 33, 35, 37	a	GUY, JMC	GUY00302, JMC00005
ISL04900	23	c	B, USA	B-SAT I, USASAT-14L
KIR__100	1, 3, 5, 7, 9, 11, 13	c	USA	INTELSAT7 177E, USASAT-14K
KIR__100	17	c	USA	USASAT-14K
MLI__100	1, 3, 5, 7, 9, 11, 13	c	USA	INTELSAT7 342E, INTELSAT8 342E, INTELSAT8 340E
MNG24800	31, 35	c	CHN, THA	APSTAR-4, THAICOM-A2B, THAICOM-G1K
MOZ30700	2, 6, 10	c	USA	INTELSAT7 359E, INTELSAT8 359E, INTELSAT10 359E
NGR11500	2, 4, 6, 8, 10, 12, 14, 16, 18, 20	c	USA	USASAT-26A
NOR12000	1, 3, 5, 7, 9, 11, 13	c	USA	INTELSAT7 359E, INTELSAT8 359E, INTELSAT10 359E
POR__100	1, 3, 5, 7, 9, 11, 13, 15, 17, 19	c	USA	USASAT-26A
RUS-4	28, 29, 33, 37	c	G, KOR	AM-SAT A4, KOREASAT-1, KOREASAT-2
RUS-4	31, 35, 39	c	G	AM-SAT A4
SEN22200	23	c	USA	USASAT-26A
SOM31200	26, 28, 30, 32, 34, 36, 38, 40	c	PAK	PAKSAT-1
TGO22600	1, 3, 5, 7, 9, 11	c	USA	INTELSAT8 330.5E
TGO22600	13	c	E, USA	HISPASAT-1, HISPASAT-2C3 KU, INTELSAT8 330.5E
TGO22600	15, 17, 19	c	E	HISPASAT-1, HISPASAT-2C3 KU
TJK06900	26, 28, 30, 32, 34, 36, 38, 40	c	PAK	PAKSAT-1
TKM06800	26, 28, 30, 32, 34, 36, 38, 40	c	UAE	EMARSAT-1G
TON21500	2, 6, 10, 14, 18	c	USA	USASAT-14K
ZWE13500	1, 3, 5, 7, 9, 11, 13	c	USA	INTELSAT7 359E, INTELSAT8 359E

* Administrations and corresponding networks/beams whose assignment(s) may receive interference from the beam shown in the left-hand column.

TABLE 3 (WRC-15)

Affecting administrations and corresponding networks/beams identified based on Notes 6 and 7 in § 11.2 of Article 11

Beam name	Channels	Note	Affecting administrations*	Affecting networks/beams*
AND34100	2, 6, 10, 12, 14, 16, 18, 20	7	USA	USASAT-26A
BFA10700	22, 24	7	E	HISPASAT-1, HISPASAT-2C3 KU
CVA08300	1, 3, 5, 7, 9, 11	7	USA	INTELSAT7 359E
CYP08600	1, 3, 5, 7, 9, 11, 13	7	USA	INTELSAT7 359E
DNK090XR	29	6	JMC	JMC00005
DNK090XR	33	6	GUY, JMC	GUY00302, JMC00005
DNK091XR	31, 35	6	GUY, JMC	GUY00302, JMC00005
FJI19300	1, 3, 5, 7, 9, 11, 13	7	HOL	INTELSAT7 183E
GMB30200	1, 3, 5, 7, 9, 11, 13, 15, 17, 19	7	USA	USASAT-26A
GNB30400	22, 24	7	E	HISPASAT-1, HISPASAT-2C3 KU
GRC10500	2, 4, 6, 8, 10, 12	7	USA	INTELSAT7 359E
GUI19200	2, 4, 6, 8, 10, 12, 14, 16, 18, 20	7	USA	USASAT-26A
IRL21100	1, 3, 5, 7, 9, 11, 13, 15, 17, 19	7	USA	USASAT-26A
ISL04900	27	6	GUY	GUY00302
ISL04900	29, 39	6	JMC	JMC00005
ISL04900	31, 33, 35, 37	6	GUY, JMC	GUY00302, JMC00005
KIR__100	1, 3, 5, 7, 9, 11, 13	7	USA	INTELSAT7 177E
MNG24800	27	7	J	SUPERBIRD-C
MNG24800	29, 31, 33, 35, 37, 39	7	J, THA	THAICOM-A2B, SUPERBIRD-C
MOZ30700	2, 6, 10, 12	7	USA	INTELSAT7 359E
MTN__100	22, 24, 26	7	USA	USASAT-26A
NGR11500	2, 4, 6, 8, 10, 12, 14, 16, 18, 20	7	USA	USASAT-26A
NOR12000	1, 3, 5, 7, 9, 11, 13	7	USA	INTELSAT7 359E
POR__100	1, 3, 5, 7, 9, 11, 13, 15, 17, 19	7	USA	USASAT-26A
RUS-4	25	7	J	JCSAT-1R, SUPERBIRD-C
RUS-4	28, 29	7	J, KOR	SUPERBIRD-C, KOREASAT-1, KOREASAT-2
RUS-4	31, 33, 35, 37, 39	7	J, KOR	SUPERBIRD-C, KOREASAT-1, KOREASAT-2
SEN22200	23, 25	7	USA	USASAT-26A
SMO05700	1, 3, 5, 7, 9, 11, 13	7	HOL	INTELSAT7 183E
SMR31100	1, 3, 5, 7, 9, 11, 13, 15, 17, 19	7	USA	USASAT-26A
SRL25900	27	6	GUY	GUY00302
SRL25900	29, 39	6	JMC	JMC00005
SRL25900	31, 33, 35, 37	6	GUY, JMC	GUY00302, JMC00005
TGO22600	13	7	E	HISPASAT-2C3 KU
TGO22600	15, 17, 19	7	E	HISPASAT-1, HISPASAT-2C3 KU
ZWE13500	1, 3, 5, 7, 9, 11, 13	7	USA	INTELSAT7 359E

* Administrations and corresponding networks/beams whose assignment(s) may cause interference to the beam shown in the left-hand column.

TABLE 4 (WRC-07)

Affecting administrations and corresponding terrestrial stations identified based on Note 8 in § 11.2 of Article 11

Beam name	Channels	Affecting administrations*	Affecting terrestrial stations*
EGY02600	2	ISR	HERZILIYA
F 09300	24, 26	SUI	GENEVE STUDIO C VOGT
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 (WRC-15)

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	
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	
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	
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	
ARS	ARS__100	17.00	44.72	23.76				CB_TSS_ARSA		37.81		MODRES	35.50	CL		57.7	27M0G7W		54	P	
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
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	
AUS	AUSB_100	164.00	132.38	−38.37				CB_TSS_AUSB		48.88		MODRES	35.50	CL		58.9	27M0G7W			P	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	

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						
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	
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	
CHN	CHN19000	122.00	114.17	23.32	0.91	0.60	2.88	MOD13FRTSS		47.08		MODRES	35.50	CR		58.9	27M0G7W			P	
CHN	CHN20000	122.00	113.55	22.20	0.60	0.60	0.00	MOD13FRTSS		48.88		MODRES	35.50	CL		57.0	27M0G7W			P	
CHN	CHNA_100	62.00	90.56	39.22				CB_TSS_CHNA		40.01		MODRES	35.50	CR		58.5	27M0G7W			P	
CHN	CHNC_100	134.00	105.77	27.56				CB_TSS_CHNC		39.51		MODRES	35.50	CL		57.1	27M0G7W			P	
CHN	CHNE_100	92.20	114.96	20.16				CB_TSS_CHNE		44.74		MODRES	35.50	CL		59.4	27M0G7W			P	
CHN	CHNF_100	92.20	123.54	45.78				CB_TSS_CHNF		43.71		MODRES	35.50	CR		60.4	27M0G7W			P	
CLN	CLN21900	50.00	80.60	7.70	1.18	0.60	106.00	R13TSS		45.95		MODRES	35.50	CL		56.7	27M0G7W			P	
CME	CME30000	−13.00	12.70	6.20	2.54	1.68	87.00	R13TSS		38.15		MODRES	35.50	CR		58.5	27M0G7W			P	
COD	COD__100	−19.20	21.85	−3.40				CB_TSS_CODA		38.36		MODRES	35.50	CR		59.7	27M0G7W			P	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
DNK	DNK__100	−25.20	2.92	59.62				CB_TSS_DNKA		48.88		MODRES	35.50	CL		58.3	27M0G7W			P	
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	
E	HISPA27D	−30.00	−4.00	39.00					COP	39.80	5.50	MODRES	38.43	CL		57.6	27M0G7W--	HISPASAT-1	01	PE	
E	HISPASA4	−30.00	−4.00	39.00					COP	39.80	5.50	MODRES	38.43	CL		57.6	27M0F8W	HISPASAT-1	01	PE	
EGY	EGY02600	−7.00	29.70	26.80	2.33	1.72	136.00	R13TSS		38.42		MODRES	35.50	CL		58.1	27M0G7W		12	P	8
ERI	ERI09200	22.80	39.41	14.98	1.67	0.95	145.48	R13TSS		42.44		MODRES	35.50	CR		58.9	27M0G7W			P	
EST	EST06100	44.50	25.06	58.60	0.77	0.60	12.27	R13TSS		47.81		MODRES	35.50	CR		58.7	27M0G7W			P	
ETH	ETH09200	36.00	40.29	8.95	2.87	2.16	174.06	R13TSS		36.52		MODRES	35.50	CL		58.7	27M0G7W			P	
F	F 09300	−7.00	3.52	45.41	2.22	1.15	159.34	R13TSS		40.39		MODRES	35.50	CL		58.8	27M0G7W		21	P	8
F	F____100	−7.00	50.00	−15.65				CB_TSS_F__A		48.88		MODRES	35.50	CR		58.9	27M0G7W			P	
F	NCL10000	140.00	166.00	−21.00	1.14	0.72	146.00	R13TSS		45.30		MODRES	35.50	CR		58.7	27M0G7W			P	
F	OCE10100	−160.00	−145.00	−16.30	4.34	3.54	4.00	R13TSS		32.58		MODRES	35.50	CL		58.5	27M0G7W			P	
F	WAL10200	140.00	−176.80	−14.00	0.74	0.60	29.00	R13TSS		47.97		MODRES	35.50	CR		59.4	27M0G7W			P	
FIN	FIN10300	22.80	22.50	64.50	1.38	0.76	171.00	MOD13FRTSS		44.24		MODRES	35.50	CL		54.5	27M0G7W		52	P	
FIN	FIN10400	22.80	15.87	61.15	2.24	0.91	16.70	MOD13FRTSS		41.37		MODRES	35.50	CL		54.5	27M0G7W		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	27M0G7W			P	7
FSM	FSM00000	158.00	151.90	5.48	5.15	1.57	167.00	R13TSS		35.38		MODRES	35.50	CR		58.9	27M0G7W			P	5
G	G 02700	−33.50	−3.50	53.80	1.84	0.72	142.00	R13TSS		43.23		MODRES	35.50	CR		58.0	27M0G7W			P	

1	2	3	4		5			6	7	8		9		10		11	12	13	14	15	16
Admin. symbol	Beam identification	Orbital position	Boresight		Space station antenna characteristics			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						
GAB	GAB26000	−13.20	11.80	−0.60	1.43	1.12	64.00	R13TSS		42.40		MODRES	35.50	CR		58.3	27M0G7W			P	
GEO	GEO06400	23.20	43.35	42.27	1.11	0.60	161.21	R13TSS		46.23		MODRES	35.50	CR		58.9	27M0G7W			P	
GHA	GHA10800	−25.00	−1.20	7.90	1.48	1.06	102.00	R13TSS		42.49		MODRES	35.50	CR		58.6	27M0G7W			P	
GMB	GMB30200	−37.20	−15.10	13.40	0.79	0.60	4.00	R13TSS		47.69		MODRES	35.50	CL		58.3	27M0G7W			P	5, 7
GNB	GNB30400	−30.00	−15.00	12.00	0.90	0.60	172.00	R13TSS		47.12		MODRES	35.50	CL		58.1	27M0G7W			P	5, 7
GNE	GNE30300	−18.80	10.30	1.50	0.68	0.60	10.00	R13TSS		48.34		MODRES	35.50	CL		58.8	27M0G7W			P	
GRC	GRC10500	−1.20	24.51	38.08	1.70	0.95	152.97	MOD13FRTSS		42.40		MODRES	35.50	CL		56.3	27M0G7W			P	5, 7
GUI	GUI19200	−37.00	−11.00	10.20	1.58	1.04	147.00	R13TSS		42.29		MODRES	35.50	CR		58.4	27M0G7W			P	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	27M0G7W			P	
HNG	HNG10602	−12.80	16.77	46.78	1.71	0.89	149.15	MOD13FRTSS		42.64		MODRES	35.50	CR		59.3	27M0G7W			P	
HNG	HNG10603	−12.80	16.77	46.78	1.71	0.89	149.15	MOD13FRTSS		42.64		MODRES	35.50	CR		59.3	27M0G7W		37	P	
HOL	HOL21300	38.20	5.12	51.96	1.00	1.00	24.53	MOD13FRTSS		44.45		MODRES	35.50	CL		58.5	27M0G7W			P	
HRV	HRV14801	−12.80	16.77	46.78	1.71	0.89	149.15	MOD13FRTSS		42.64		MODRES	35.50	CL		58.8	27M0G7W			P	
HRV	HRV14802	−12.80	16.77	46.78	1.71	0.89	149.15	MOD13FRTSS		42.64		MODRES	35.50	CR		58.8	27M0G7W			P	
HRV	HRV14803	−12.80	16.77	46.78	1.71	0.89	149.15	MOD13FRTSS		42.64		MODRES	35.50	CR		58.8	27M0G7W		37	P	
I	I 08200	9.00	12.67	40.74	1.99	1.35	144.20	R13TSS		40.14		MODRES	35.50	CR		54.5	27M0G7W			P	8
IND	IND03700	68.00	93.00	25.50	1.46	1.13	40.00	R13TSS		42.27		MODRES	35.50	CL		58.9	27M0G7W			P	
IND	IND04700	68.00	93.30	11.10	1.92	0.60	96.00	R13TSS		43.83		MODRES	35.50	CR		58.4	27M0G7W			P	
IND	INDA_100	55.80	76.16	14.72				CB_TSS_INDA		45.66		MODRES	35.50	CR		58.8	27M0G7W			P	
IND	INDB_100	55.80	83.43	24.22				CB_TSS_INDB		43.15		MODRES	35.50	CL		58.9	27M0G7W			P	
IND	INDD_100	68.00	74.37	29.16				CB_TSS_INDD		41.80		MODRES	35.50	CR		59.3	27M0G7W			P	
INS	INSA_100	80.20	108.82	−0.73				CB_TSS_INSA		38.88		MODRES	35.50	CR		59.2	27M0G7W			P	
INS	INSB_100	104.00	129.75	−3.50				CB_TSS_INSB		37.53		MODRES	35.50	CL		58.8	27M0G7W			P	
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	
IRQ	IRQ25600	50.00	43.78	33.28	1.74	1.23	156.76	R13TSS		41.14		MODRES	35.50	CL		58.3	27M0G7W			P	
ISL	ISL04900	−33.50	−19.00	64.90	1.00	0.60	177.00	R13TSS		46.67		MODRES	35.50	CL		60.8	27M0G7W			P	5, 6
ISL	ISL05000	−33.50	−15.35	63.25	1.58	0.60	169.00	R13TSS		44.67		MODRES	35.50	CR		57.3	27M0G7W			P	
ISR	ISR11000	−4.00	34.95	31.32	0.73	0.60	110.02	R13TSS		48.01		MODRES	35.50	CR		58.8	27M0G7W			P	
J	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	
J	J 11100	110.00	134.50	31.50	3.52	3.30	68.00	R13TSS		33.80		MODRES	35.50	CR		*	34M5G7W		02	P	
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	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	
KEN	KEN24900	−0.80	37.95	0.92	2.13	1.34	98.35	R13TSS		39.90		MODRES	35.50	CL		58.7	27M0G7W			P	
KGZ	KGZ07000	50.00	73.91	41.32	1.47	0.64	5.05	R13TSS		44.75		MODRES	35.50	CR		59.0	27M0G7W			P	
KIR	KIR__100	176.00	−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	

* 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.

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						
KOR	KOR11200	116.00	127.50	36.00	1.24	1.02	168.00	R13TSS		43.80		MODRES	35.50	CL		***	27M0G7W		03	P	
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	
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	
LAO	LAO28400	122.20	103.71	18.17	1.87	1.03	123.99	MOD13FRTSS		41.60		MODRES	35.50	CR		58.8	33M0G7W			P	
LBN	LBN27900	11.00	37.55	34.02	1.47	0.91	73.16	MOD13FRTSS		43.19		MODRES	35.50	CR		55.5	27M0G7W			P	
LBR	LBR24400	−33.50	−9.30	6.60	1.22	0.70	133.00	R13TSS		45.13		MODRES	35.50	CR		58.2	27M0G7W			P	
LBY	LBY__100	−24.80	17.62	26.55				CB_TSS_LBYA		40.30		MODRES	35.50	CL		58.0	27M0G7W			P	
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	
LTU	LTU06100	23.20	24.51	56.09				CB_TSS_LTUA		48.21		MODRES	35.50	CL		56.9	27M0G7W			P	
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	
LVA	LVA06100	23.20	24.51	56.09				CB_TSS_LVAA		48.21		MODRES	35.50	CR		56.9	27M0G7W			P	
MAU	MAU__100	29.00	58.61	−15.88				CB_TSS_MAUA		41.42		MODRES	35.50	CL		59.0	27M0G7W			P	
MCO	MCO11600	34.20	7.93	43.59	1.28	0.60	21.73	MOD13FRTSS		45.58		MODRES	35.50	CL		58.6	27M0G7W			P	
MDA	MDA06300	50.00	28.45	46.99	0.60	0.60	90.00	R13TSS		48.88		MODRES	35.50	CR		58.9	27M0G7W			P	
MDG	MDG23600	29.00	46.60	−18.80	2.72	1.14	65.00	R13TSS		39.53		MODRES	35.50	CL		58.3	27M0G7W			P	
MHL	MHL00000	146.00	167.64	9.83	2.07	0.90	157.42	R13TSS		41.75		MODRES	35.50	CR		59.0	27M0G7W			P	
MKD	MKD14800	22.80	21.61	41.56	0.60	0.60	90.00	R13TSS		48.88		MODRES	35.50	CR		58.9	27M0G7W			P	
MLA	MLA__100	91.50	108.05	4.00				CB_TSS_MLAA		43.00		MODRES	35.50	CR		58.4	27M0G7W			P	
MLD	MLD30600	50.00	72.95	5.78	1.19	0.91	104.53	R13TSS		44.09		MODRES	35.50	CR		58.7	27M0G7W			P	
MLI	MLI__100	−19.20	−5.35	17.11				CB_TSS_MLIB		41.21		MODRES	35.50	CR		58.7	27M0G7W			P	5
MLT	MLT14700	22.80	14.40	35.90	0.60	0.60	0.00	R13TSS		48.88		MODRES	35.50	CR		56.0	27M0G7W			P	
MNG	MNG24800	74.00	102.20	46.60	3.60	1.13	169.00	R13TSS		38.35		MODRES	35.50	CR		59.0	27M0G7W			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	27M0G7W			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	27M0G7W			P	
MTN	MTN__100	−36.80	−10.52	19.66				CB_TSS_MTNA		41.91		MODRES	35.50	CR		55.5	27M0G7W			P	7
MWI	MWI30800	4.80	33.79	−13.25	1.56	0.70	92.69	R13TSS		44.10		MODRES	35.50	CR		59.2	27M0G7W			P	
NGR	NGR11500	−37.20	7.63	17.01	2.20	1.80	102.40	R13TSS		38.48		MODRES	35.50	CL		59.5	27M0G7W			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	27M0G7W			P	
NMB	NMB02500	−18.80	17.50	−21.60	2.66	1.90	48.00	R13TSS		37.41		MODRES	35.50	CL		59.7	27M0G7W			P	
NOR	NOR12000	−0.80	13.42	62.76	1.43	0.60	19.61	MOD13FRTSS		45.10		MODRES	35.50	CL		56.2	27M0G7W		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	27M0G7W		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	27M0G7W			P	
NRU	NRU30900	134.00	167.00	−0.50	0.60	0.60	0.00	R13TSS		48.88		MODRES	35.50	CL		57.5	27M0G7W			P	
NZL	NZL__100	158.00	−170.68	−19.72				CB_TSS_NZLA		48.88		MODRES	35.50	CL		59.6	27M0G7W			P	
OMA	OMA12300	17.20	55.60	21.00	1.88	1.02	100.00	R13TSS		41.62		MODRES	35.50	CR		58.3	27M0G7W			P	
PAK	PAK12700	38.20	69.60	29.50	2.30	2.16	14.00	R13TSS		37.49		MODRES	35.50	CR		58.9	27M0G7W			P	
PHL	PHL28500	98.00	121.30	11.10	3.46	1.76	99.00	R13TSS		36.60		MODRES	35.50	CL		58.7	27M0G7W			P	
PLW	PLW00000	140.00	132.98	5.51	1.30	0.60	55.41	R13TSS		45.53		MODRES	35.50	CR		58.8	27M0G7W			P	
PNG	PNG13100	134.00	148.07	−6.65	3.13	2.30	168.32	MOD13FRTSS		35.87		MODRES	35.50	CR		54.5	27M0G7W			P	
POL	POL13200	50.00	20.07	51.86	1.20	0.69	17.76	R13TSS		45.26		MODRES	35.50	CL		59.2	27M0G7W			P	

*** 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						
POR	POR__100	−37.00	−15.92	37.65				CB_TSS_PORA		47.17		MODRES	35.50	CR		58.4	27M0G7W			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	27M0G7W			P	3
QAT	QAT24700	20.00	51.38	25.26	0.60	0.60	90.00	R13TSS		48.88		MODRES	35.50	CL		54.5	27M0G7W			P	
ROU	ROU13600	50.00	25.12	45.75	1.17	0.73	9.52	R13TSS		45.15		MODRES	35.50	CR		58.9	27M0G7W			P	
RRW	RRW31000	11.00	30.00	−2.10	0.66	0.60	42.00	R13TSS		48.47		MODRES	35.50	CL		59.8	27M0G7W			P	
RUS	RSTREA11	36.00	38.00	53.00	2.20	2.20	0.00	R13TSS		37.70		MODRES	35.50	CL		53.0	27M0F8W	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	27M0F8W	RST-1	05	PE	
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	
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	
SDN	SDN__100	−7.00	30.24	13.53				CB_TSS_SDNA		40.26		MODRES	35.50	CR		59.4	27M0G7W			P	
SEN	SEN22200	−37.00	−14.40	13.80	1.46	1.04	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	
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	
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	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	
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
SRB	SRB14800	−7.00	20.50	43.98	0.91	0.60	145.16	R13TSS		47.07		MODRES	35.50	CR		58.9	27M0G7W			P	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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

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						
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	
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
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
TLS	TLS00000	128.00	126.03	−8.72	0.66	0.60	13.92	R13TSS		48.50		MODRES	35.50	CR		58.9	27M0G7W			P	
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
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	
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	
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	
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	
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	
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	
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	
USA	USAA_100	170.00	−170.51	−12.72				CB_TSS_USAA		48.88		MODRES	35.50	CL		56.1	27M0G7W			P	
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	
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	
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	
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	
YEM	YEM__100	11.00	48.05	14.64				CB_TSS_YEMA		47.63		MODRES	35.50	CL		54.9	27M0G7W			P	
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	
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

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).

TABLE 6B

Minimum equivalent protection margin of assignments in the Regions 1 and 3 Plan (sorted by orbital position)

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 EPM																																							
–178.00	FJI	FJI19300	CR	6.1		6.1		6.1		6.1		6.1		6.1		6.1		6.1		6.1		6.1		6.1		6.1																	
–178.00	SMO	SMO05700	CR	1.6		1.6		1.6		1.6		1.6		1.6		1.6		1.6		1.6		1.6		1.6		1.6																	
–160.00	F	OCE10100	CL		99.9		99.9		99.9		99.9		99.9		99.9		99.9		99.9		99.9		99.9		99.9		99.9																
–37.20	GMB	GMB30200	CL	4.6		1.9		1.9		1.9		1.9		1.9		1.9		1.9		1.9		1.9																					
–37.20	IRL	IRL21100	CL	2.6		0.6		0.6		0.6		0.6		0.6		0.6		0.6		0.6		0.6																					
–37.20	NGR	NGR11500	CL		6.8		6.8		6.8		6.8		6.8		6.8		6.8		6.8		6.8		6.9																				
–37.00	AND	AND34100	CL		0.3		0.3		0.3		0.3		0.3		0.3		0.3		0.3		0.3		0.8																				
–37.00	GUI	GUI19200	CR		0.9		0.9		0.9		0.9		0.9		0.9		0.9		0.9		0.9		1.5																				
–37.00	POR	POR__100	CR	2.4		1.1		1.1		1.1		1.1		1.1		1.1		1.1		1.1		1.1																					
–37.00	SEN	SEN22200	CL																					–0.3		4.7		4.7		4.7		4.7		4.7		4.7		4.7		4.7		4.7	
–36.80	MTN	MTN__100	CR																						1.1		1.1		1.1		1.1		1.1		1.1		1.1		1.1		1.1		3.9
–36.80	SMR	SMR31100	CR	4.4		3.2		3.2		3.1		3.1		3.1		3.2		3.2		3.2		3.2																					
–33.50	CPV	CPV30100	CL		9.5		9.5		9.5		9.5		9.5		9.5		9.5		9.5		9.5		8.8																				
–33.50	DNK	DNK090XR	CR																													0.9				0.9							
–33.50	DNK	DNK091XR	CR																															–0.9				–0.9					
–33.50	G	G 02700	CR		–0.1		0.1		–0.1		–0.1		–0.1		–0.1		0.2		–0.1		0.1		0.3																				
–33.50	ISL	ISL04900	CL																					8.8		7.2		7.2		10.1		14.8		3.6		14.8		3.6		21.7		21.7	
–33.50	ISL	ISL05000	CR																						0.1		0.1		0.1														
–33.50	LBR	LBR24400	CR	3.3		0.4		0.4		0.4		0.4		0.4		0.4		0.4		0.4		0.4																					
–33.50	SRL	SRL25900	CR																					–0.4		1.0		1.0		1.0		1.0		0.9		1.0		0.9		1.0		1.0	
–30.00	BFA	BFA10700	CL																						1.5		1.5		1.5		1.5		1.5		1.5		1.5		1.5		1.5		2.4
–30.00	E	E___100	CL																					8.3		5.9		5.9		5.9		5.9		5.9		5.6		5.9		5.6		5.9	
–30.00	E	HISP33D1	CL																							–0.4				–0.4				–0.4				–0.4				–0.4	
–30.00	E	HISP33D2	CL																							–1.0				–1.0				–1.0				–1.0				–1.0	
–30.00	E	HISPA27D	CL																							1.3				1.3				1.3				1.3				1.3	
–30.00	E	HISPASA4	CL																							1.3				1.3				1.3				1.3				1.3	
–30.00	GNB	GNB30400	CL																						0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.7
–30.00	TGO	TGO22600	CR	7.9		7.5		7.5		7.5		7.5		7.5		7.5		7.5		7.5		7.5																					
–25.20	DNK	DNK__100	CL	–0.9		–1.5		–1.5		–1.5		–1.5		–1.5		–1.5		–1.5		–1.5		–1.5																					
–25.20	MRC	MRC20900	CR	0.1		–0.4		–0.4		–0.4		–0.4		–0.4		–0.3		–0.3		–0.4		–0.4																					
–25.20	TUN	TUN15000	CR																					–1.0		–0.8		–0.8		–0.8		–0.8		–0.8		–0.8		–0.8		–0.8		–0.8	
–25.20	TUN	TUN27200	CR																																	–0.9				–0.9			
–25.00	GHA	GHA10800	CR																					7.1		5.2		5.2		5.2		5.2		5.2		4.7		5.2		4.7		5.2	
–24.80	AGL	AGL29500	CL	4.6		3.6		3.6		3.6		3.6		3.6		3.6		3.6		3.6		3.6																					

1	2	3	4	5																																							
Orbital Position	Admin. symbol	Beam Identifica-tion	Polar-ization 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 EPM																																							
–24.80	ALG	ALG__100	CL																						–0.7		–0.7		–0.7		–0.7		–0.7		–0.8		–0.8		–0.8		–0.8		2.2
–24.80	CTI	CTI23700	CL	3.4		2.9		2.9		2.9		2.9		2.9		2.9		2.9		2.9		2.9																					
–24.80	LBY	LBY__100	CL		2.4		2.4		2.4		2.4		2.4		2.4		2.4		2.4		2.4		2.7																				
–19.20	BEN	BEN23300	CL	3.1		2.6		2.6		2.6		2.6		2.6		2.6		2.6		2.6		2.6																					
–19.20	COD	COD__100	CR		4.7		4.7		4.7		4.7		4.7		4.7		4.7		4.7		4.7		5.9																				
–19.20	MLI	MLI__100	CR	5.6		4.6		4.6		4.6		4.6		4.6		4.6		4.6		4.6		4.6																					
–19.20	NIG	NIG11900	CR																						3.5		3.5		3.5		3.5		3.5		3.5		3.5		3.5		3.5		4.1
–18.80	AUT	AUT01600	CR																					0.9		–0.1		0.0		0.0		0.1		0.0		0.1		0.0		0.0		0.0	
–18.80	D	D 08700	CR	1.1		–0.2		–0.1		–0.2		–0.1		–0.1		–0.1		–0.1		–0.1		–0.2																					
–18.80	GNE	GNE30300	CL																					2.0		1.4		1.4		1.4		1.4		1.4		1.4		1.4		1.4		1.4	
–18.80	LIE	LIE25300	CL																						0.4		0.4		0.4		0.4		0.4		0.4		0.4		0.4		0.4		2.8
–18.80	NMB	NMB02500	CL																					8.6		9.6		9.6		9.6		9.6		9.6		9.6		9.6		9.6		9.6	
–18.80	SUI	SUI14000	CL		0.2		0.7		0.2		0.7		0.3		0.7		0.3		0.7		0.2		0.8																				
–13.20	CAF	CAF25800	CL																						1.4		1.4		1.4		1.4		1.4		1.4		1.4		1.4		1.4		1.5
–13.20	COG	COG23500	CL	0.8		0.7		0.7		0.7		0.7		0.7		0.7		0.7		0.7		0.7																					
–13.20	GAB	GAB26000	CR	0.5		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0																					
–13.20	PSE	YYY00000	CL																					5.3		4.8		5.1		4.9		5.1		4.9		5.1		4.9		5.1		4.9	
–13.00	CME	CME30000	CR																						0.4		0.4		0.4		0.5		0.4		0.5		0.4		0.5		0.4		0.5
–12.80	CZE	CZE14401	CL	1.9								0.8								0.6								–0.9								–0.8							
–12.80	CZE	CZE14402	CR														0.1														–0.9								–0.9				
–12.80	CZE	CZE14403	CR		0.1*																				–0.9*		–0.9*																
–12.80	HNG	HNG10601	CL			1.1								1.2								1.1								–0.3								–0.3					
–12.80	HNG	HNG10602	CR						0.6																								–0.4								–0.4		
–12.80	HNG	HNG10603	CR		0.6*																				–0.4*		–0.4*																
–12.80	HRV	HRV14801	CL					0.6								0.8								0.3								–0.8								–0.8			
–12.80	HRV	HRV14802	CR										0.1																						–0.9								–0.2
–12.80	HRV	HRV14803	CR		0.1*																				–0.9*		–0.9*																
–12.80	SVK	SVK14401	CL							1.1								1.2								–0.4								–0.3								–0.3	
–12.80	SVK	SVK14402	CR																		0.6								–0.4								–0.4						
–12.80	SVK	SVK14403	CR		0.6*																				–0.4*		–0.4*																
–7.00	EGY	EGY02600	CL		10.9		10.9		10.9		10.9		10.9		10.9		10.9		10.9		10.9		5.9																				
–7.00	F	F 09300	CL																						5.4		4.3		5.6		4.3		5.6		4.8		5.6		4.8		5.6		5.5
–7.00	F	F____100	CR																					5.0		5.1		5.1		5.1		5.1		5.1		5.1		5.1		5.1		5.1	
–7.00	SRB	SRB14800	CR																						–1.2		–1.1		–0.6		–0.9		–0.6		–0.9		–0.6		–0.9		–0.6		–0.5
–7.00	SDN	SDN__100	CR																					5.4		8.0		8.0		8.0		8.0		8.0		8.0		8.0		8.0		8.0	

* This assignment shall only be used by the Administrations of Croatia, Czech Republic, Hungary and Slovakia on the basis of equal access subject to mutual agreement between them.

1	2	3	4	5																																							
Orbital Position	Admin. symbol	Beam Identifica-tion	Polar-ization 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 EPM																																							
–7.00	STP	STP24100	CR		6.1		5.6		5.6		5.6		5.6		5.6		5.6		5.6		5.6		4.9																				
–4.00	ISR	ISR11000	CR																						3.1		3.0		3.1		3.0		3.1		3.0		3.1		3.0		3.1		5.7
–1.20	BUL	BUL02000	CL																						1.0		–0.4		1.6		–0.4		1.6		–0.4		1.6		–0.4		1.6		–0.3
–1.20	CVA	CVA08300	CR	2.2		0.5		0.9		0.9		0.9		0.9																													
–1.20	CVA	CVA08500	CR																						–0.8																		
–1.20	CYP	CYP08600	CR	1.4		0.0		0.5		0.5		0.5		0.5		2.2		2.2		2.2		1.5																					
–1.20	GRC	GRC10500	CL		–0.4		0.6		–0.1		0.8		–0.1		0.9		–0.1		0.9		–0.3		1.0																				
–1.00	MOZ	MOZ30700	CL		2.8		3.8		2.8		3.8		2.8		3.8		2.8		3.8		2.8		3.6																				
–0.80	BOT	BOT29700	CL																						1.5		0.9		1.5		0.9		1.5		0.9		1.5		0.9		1.5		2.2
–0.80	KEN	KEN24900	CL																						3.8		2.8		3.9		2.8		3.9		2.8		3.9		2.8		3.9		3.3
–0.80	NOR	NOR12000	CL	4.4		2.0		–0.7		–0.7		–0.7		–0.7		–0.6		–0.6		–0.6		1.1																					
–0.80	NOR	NOR12100	CL																								–0.6				–0.6												
–0.80	ZMB	ZMB31400	CR																					2.8		3.2		4.3		3.2		4.3		3.2		4.3		3.2		4.3		3.2	
–0.80	ZWE	ZWE13500	CR	5.5		2.6		2.6		2.6		2.6		2.6		2.6		2.6		2.6		2.6																					
4.80	AFS	AFS02100	CL																					4.5		5.6		5.6		5.6		5.2		5.2		5.2		5.2		5.2		5.2	
4.80	LSO	LSO30500	CR	3.9		2.9		2.9		2.9		2.9		2.9		3.1		3.1		3.1		2.9																					
4.80	MWI	MWI30800	CR		3.2		3.8		3.3		3.9		3.3		3.9		3.9		3.9		3.8		3.4																				
4.80	SWZ	SWZ31300	CL	4.5		3.2		3.2		3.2		3.2		3.2		3.4		3.4		3.4		3.2																					
5.00	S	S 13800	CL																					4.7		–0.4		2.3		–0.4		2.3		0.6		4.5		0.6		4.5		0.6	
5.00	S	S 13900	CL																														8.7										
9.00	I	I 08200	CR																						–3.6		–3.8		–3.6		–3.8		–3.8		–3.8		–3.8		–3.8		–3.8		–2.6
11.00	BDI	BDI27000	CL																						3.0		3.0		3.0		3.0		3.0		3.0		3.0		3.0		3.0		5.6
11.00	JOR	JOR22400	CL		–1.0		–0.8		–0.7		–0.7		–0.7		–0.7		–0.7		–0.7		–0.8		0.0																				
11.00	KWT	KWT11300	CR																						5.4		5.4		5.4		5.4		5.4		5.4		5.4		5.4		5.4		6.3
11.00	LBN	LBN27900	CR	0.9		–0.6		–0.1		–0.1		–0.1		–0.1		–0.1		–0.1		–0.1		–0.6																					
11.00	RRW	RRW31000	CL		10.2		10.2		10.2		10.2		10.2		10.2		10.2		10.2		10.2		5.7																				
11.00	SYR	SYR22900	CL																						–1.0		–1.0		–1.0		–1.0		–1.0		–1.0		–1.0		–1.0		–1.0		–0.5
11.00	SYR	SYR33900	CL																																								1.4**
11.00	TZA	TZA22500	CR																					2.6		3.6		3.6		3.6		3.6		3.6		3.6		3.6		3.6		3.6	
11.00	YEM	YEM__100	CL	2.1		–0.3		–0.3		–0.3		–0.3		–0.3		–0.3		–0.3		–0.3		–0.3																					
16.80	DJI	DJI09900	CL		8.2		8.2		8.1		8.1		8.1		8.1		8.1		8.1		8.1		6.7																				
17.00	ARS	ARS__100	CL																						–0.4		–0.4		–0.4		–0.4		–0.4		–0.4		–0.4		–0.4		–0.4		0.0
17.00	ARS	ARS34000	CL																																								2.0
17.00	TCD	TCD14300	CR	9.8		8.8		8.8		8.8		8.8		8.8		8.8		8.8		8.8		8.8																					
17.00	UGA	UGA05100	CL																					3.6		4.0		4.0		4.0		4.0		4.0		4.0		4.0		4.0		4.0	

** See Note 1 of § 11.2.

1	2	3	4	5																																							
Orbital Position	Admin. symbol	Beam Identifica-tion	Polar-ization 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 EPM																																							
17.20	OMA	OMA12300	CR																						1.7		1.7		1.7		1.7		1.7		1.7		1.7		1.7		1.7		0.9
20.00	QAT	QAT24700	CL		5.9		5.9		5.9		5.9		5.9		5.9		5.9		5.8		5.8		6.2**																				
22.80	ARM	ARM06400	CR																						0.5		0.5		0.5		0.5		0.5		0.5		0.5		0.4		0.5		2.7
22.80	ERI	ERI09200	CR																					2.3		2.8		2.8		2.8		2.8		2.8		2.8		2.8		2.8		2.8	
22.80	FIN	FIN10300	CL																						–0.5		1.2		1.9		2.0		1.8		2.1		1.7		2.2		1.6		4.9
22.80	FIN	FIN10400	CL																																				–0.4				1.1
22.80	MKD	MKD14800	CR																					3.6		3.3		3.3		3.3		3.3		3.3		3.3		3.2		3.3		3.3	
22.80	MLT	MLT14700	CR																						1.7		1.8		1.7		1.8		1.7		1.8		1.7		1.7		1.8		3.4
23.20	AZE	AZE06400	CL																					0.6		–0.1		–0.1		–0.1		–0.1		–0.1		–0.1		–0.1		–0.1		–0.1	
23.20	GEO	GEO06400	CR	5.3		4.1		4.1		4.1		4.1		4.1		4.1		4.1		4.1		4.1																					
23.20	LTU	LTU06100	CL	1.4		0.1		0.0		0.0		–0.1		–0.1		–0.1		–0.2		–0.2		–0.2																					
23.20	LVA	LVA06100	CR		–0.8		–0.8		–0.8		–0.8		–0.9		–0.9		–0.9		–0.9		–0.9		–0.3																				
28.20	LUX	LUX11400	CL	3.1		2.9		2.8		2.8		2.8		2.8		2.8		2.8		2.8		2.8																					
29.00	COM	COM20700	CR																					11.2		9.5		9.5		9.5		9.5		9.5		9.5		9.5		9.5		9.6	
29.00	MAU	MAU__100	CL																						11.0		11.0		11.0		11.0		11.0		11.0		11.0		11.1		11.1		12.7
29.00	MDG	MDG23600	CL	14.0		13.6		13.5		13.4		13.4		13.3		13.3		13.2		13.2		13.2																					
33.80	SVN	SVN14800	CR		0.5		0.5		0.5		0.5		0.5		0.5		0.5		0.5		0.4		1.6																				
33.80	UZB	UZB07100	CR	3.3		1.9		1.9		1.9		1.9		1.9		1.9		1.9		1.9		1.9																					
34.00	BHR	BHR25500	CR																					0.9		0.9		8.7		8.8		9.2		8.8		9.2		8.8		9.2		8.8	
34.00	IRN	IRN10900	CL	1.2		0.9		0.9		0.9		0.9		0.9		0.9		0.9		0.9		0.9		8.8		8.5																	
34.20	MCO	MCO11600	CL	0.7		–1.0		–1.0		–1.0		–1.0		–1.0		–1.0		–1.0		–1.0		–1.0																					
36.00	ETH	ETH09200	CL		11.8		11.8		11.8		11.8		11.8		11.8		11.8		11.8		11.8		12.1																				
36.00	RUS	RSTREA11	CL																											–3.6				–3.6				–3.6				–3.6	
36.00	RUS	RSTREA12	CR																												–4.3				–4.3				–4.3				–4.2
36.00	RUS	RSTRED11	CL																											–3.6				–3.6				–3.6				–3.6	
36.00	RUS	RSTRED12	CR																												–4.3				–4.3				–4.3				–4.2
36.00	RUS	RSTRSD11	CL																									4.5		4.9		4.9		4.9		4.9		4.9		4.9		4.9	
36.00	RUS	RSTRSD12	CR																										3.4		3.4		3.4		3.4		3.4		3.4		3.4		3.4
36.00	RUS	RSTRSD13	CL																									4.9		5.0		5.0		5.0		5.0		5.0		5.0		5.0	
36.00	RUS	RSTRSD14	CR																										3.5		3.5		3.5		3.5		3.5		3.5		3.5		3.6
37.80	BLR	BLR06200	CL	3.8		1.3		1.3		1.3		1.3		1.3		1.3		1.3		1.3		1.3																					
37.80	SOM	SOM31200	CR																						3.3		3.3		11.7		10.2		11.7		10.2		11.7		10.2		11.7		10.4
38.00	TJK	TJK06900	CL																						0.6		1.2		7.9		7.8		7.9		7.8		7.9		7.8		7.9		7.9
38.20	BEL	BEL01800	CL																						2.5		2.2		2.0		1.7		2.0		1.7		2.0		1.7		2.0		3.4
38.20	HOL	HOL21300	CL		1.6		1.6		1.6		1.6		1.6		1.6		1.6		1.6		1.6		2.5																				
38.20	PAK	PAK12700	CR		3.5		3.5		3.5		3.5		3.5		3.5		3.5		3.5		3.5		4.6		2.0		2.1																

** See Note 1 of § 11.2.

1	2	3	4	5																																							
Orbital Position	Admin. symbol	Beam Identifica-tion	Polar-ization 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 EPM																																							
38.20	UKR	UKR06300	CR		0.6		0.6		0.6		0.6		0.6		0.6		0.6		0.6		0.6		1.5																				
42.00	TUR	TUR14500	CL		1.7		1.7		1.7		1.7		1.7		1.7		1.7		1.7		1.7		1.7																				
42.50	SEY	SEY00000	CR																						12.3		13.0		13.1		13.1		13.1		13.1		13.1		13.1		13.1		14.4
44.50	EST	EST06100	CR	6.6		5.6		5.6		5.6		5.6		5.6		5.6		5.6		5.6		5.6																					
50.00	AFG	AFG__100	CL	–0.3		–0.5		–0.5		–0.5		–0.5		–0.5		–0.5		–0.5		–0.5		–0.5		3.0		2.2																	
50.00	CLN	CLN21900	CL	0.8		0.5		0.5		0.5		0.5		0.5		0.5		0.5		0.5		0.5		1.5		1.6																	
50.00	IRQ	IRQ25600	CL	4.2		3.6		3.6		3.6		3.6		3.6		3.6		3.6		3.6		3.6**																					
50.00	KGZ	KGZ07000	CR		0.5		0.5		0.5		0.5		0.5		0.5		0.5		0.5		0.5		1.0																				
50.00	MDA	MDA06300	CR																						0.7		0.7		1.4		1.4		1.4		1.4		1.4		1.4		1.4		1.4
50.00	MLD	MLD30600	CR	6.3		4.8		4.8		4.8		4.8		4.8		4.8		4.8		4.8		4.8		4.7		4.3																	
50.00	NPL	NPL12200	CR		3.1		3.1		3.1		3.1		3.1		3.1		3.1		3.1		3.1		3.2		2.2		3.4																
50.00	POL	POL13200	CL																						2.4		2.7		3.1		3.1		3.1		3.1		3.1		3.1		3.1		3.2
50.00	ROU	ROU13600	CR	4.9		3.9		3.9		3.9		3.9		3.9		3.9		3.9		3.9		3.9																					
50.00	TKM	TKM06800	CR																						1.0		2.4		8.5		8.5		8.5		8.5		8.5		8.5		8.5		8.7
52.50	UAE	UAE27400	CR																					3.2		3.2		14.3		15.1		15.1		15.1		15.1		15.1		15.1		15.1**	
55.80	IND	INDA_100	CR		2.6		2.6		2.6		2.6		2.6		2.6		2.6		2.6		2.6		3.2		3.9		6.4																
55.80	IND	INDB_100	CL	2.7		2.1		2.1		2.1		2.1		2.1		2.1		2.1		2.1		2.1		3.2		3.2																	
56.00	BIH	BIH14800	CL	5.9		5.9		5.9		5.9		5.9		5.9		5.9		5.9		5.9		5.9																					
56.00	RUS	RSTRSD21	CL																									9.3		11.6		11.6		11.6		11.6		11.6		11.6		11.6	
56.00	RUS	RSTRSD22	CR																										3.5		3.5		3.5		3.5		3.5		3.5		3.5		3.6
56.40	KAZ	KAZ06600	CR	3.6		1.3		1.3		1.3		1.3		1.3		1.3		1.3		1.3		1.3																					
62.00	ALB	ALB29600	CL																						8.6		10.9		33.5		33.5		33.5		33.5		33.5		33.5		33.5		34.4
62.00	CHN	CHN15500	CL	2.7		1.5		1.5		1.5		1.5		1.5		1.5		1.5		1.5		1.5		1.5		1.5																	
62.00	CHN	CHNA_100	CR		1.9		1.9		1.9		1.9		1.9		1.9		1.9		1.9		1.9		2.1		2.3		5.3																
68.00	IND	IND03700	CL		4.5		4.5		4.5		4.5		4.5		4.5		4.5		4.5		4.5		4.5		4.5		7.2																
68.00	IND	IND04700	CR	5.4		5.0		5.0		5.0		5.0		5.0		5.0		5.0		5.0		5.0		5.0		5.0																	
68.00	IND	INDD_100	CR	6.0		4.6		4.6		4.6		4.6		4.6		4.6		4.6		4.6		4.6		4.6		4.6																	
74.00	BGD	BGD22000	CR	12.1		11.0		11.0		11.0		11.0		11.0		11.0		11.0		11.0		11.0		4.1		4.1																	
74.00	BRU	BRU33000	CR		5.1		5.1		5.1		5.1		5.1		5.1		5.1		5.1		5.1		4.8		4.5		6.9																
74.00	MNG	MNG24800	CR																					6.6		6.6		26.4		99.9		99.9		99.9		99.9		99.9		99.9		99.9	
80.20	INS	INSA_100	CR	12.8		9.7		9.7		9.7		9.7		9.7		9.7		9.7		9.7		9.7		9.7		9.7																	
86.00	BTN	BTN03100	CR	11.8		8.9		8.9		8.9		8.9		8.9		8.9		8.9		8.9		8.9		8.9		8.9																	
86.00	CBG	CBG29900	CR		9.7		9.7		9.7		9.7		9.7		9.7		9.7		9.7		9.7		9.7		9.7		11.7																
86.00	RUS	RSTRSD31	CL																									5.5		99.9		99.9		99.9		99.9		99.9		99.9		99.9	
86.00	RUS	RSTRSD32	CR																										99.9		99.9		99.9		99.9		99.9		99.9		99.9		99.9
88.00	SNG	SNG15100	CL	2.3		1.3		1.3		1.3		1.3		1.3		1.3		1.3		1.3		1.3		1.3		1.3																	

** See Note 1 of § 11.2.

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 EPM																																							
91.50	MLA	MLA__100	CR		0.8		0.8		0.8		0.8		0.8		0.8		0.8		0.8		0.8		0.8		0.8		3.5**																
92.20	CHN	CHNE_100	CL	4.4		1.5		1.5		1.5		1.5		1.5		1.5		1.5		1.5		1.5		1.5		1.5																	
92.20	CHN	CHNF_100	CR		4.4		4.4		4.4		4.4		4.4		4.4		4.4		4.4		4.4		4.4		4.4		6.6																
98.00	PHL	PHL28500	CL		2.3		2.3		2.3		2.3		2.3		2.3		2.3		2.3		2.3		2.3		2.3		4.7																
98.00	THA	THA14200	CL	1.8		–0.2		–0.2		–0.2		–0.2		–0.2		–0.2		–0.2		–0.2		–0.2		–0.2		–0.2																	
104.00	BRM	BRM29800	CL	2.1		–0.1		–0.1		–0.1		–0.1		–0.1		–0.1		–0.1		–0.1		–0.1		–0.1		–0.1																	
104.00	INS	INSB_100	CL		4.1		4.1		4.1		4.1		4.1		4.1		4.1		4.1		4.1		4.1		4.1		4.9**																
107.00	VTN	VTN32500	CR		0.2		0.2		0.2		0.2		0.2		0.2		0.2		0.2		0.2		0.2		0.2		3.1																
109.85	J	000BS–3N	CR	6.3		4.3		4.3		4.3		4.2		4.1		6.5		12.6																									
109.85	J	J 10985	CR	6.2		4.2		4.2		4.2		4.2		4.0		6.6		13.9		13.9		13.9		13.9		13.9																	
110.00	J	J 11100	CR	5.5		3.5		3.5		3.4		3.4		3.3		5.9		13.8		13.8		13.8		13.8		13.8																	
110.00	J	J 1110E	CR	5.4		3.4		3.4		3.4		3.3		3.1		5.6		12.4																									
110.00	RUS	RUS00401	CL																									13.2		99.9		99.9		99.9		99.9		99.9		99.9		99.9	
110.00	RUS	RUS00402	CR																										99.9		99.9												
116.00	KOR	KO11201D	CL		5.6		5.7		5.6		5.2		5.0		5.3																												
116.00	KOR	KOR11200	CL		–0.8		–0.8		–0.8		–0.8		–1.2		–1.2		4.3		3.9		3.9		3.9		3.9		4.9																
116.00	KOR	KOR11201	CL		5.6		5.7		5.6		5.2		5.0		5.3																												
121.80	USA	MRA33200	CR	5.3		3.5		3.5		3.5		3.5		3.5		3.5		3.5		3.5		3.5		3.5		3.5																	
122.00	CHN	CHN19000	CR	2.9		0.4		0.4		0.4		0.3		0.3		0.3		0.0		0.0		0.0		0.0		0.0																	
122.00	CHN	CHN20000	CL		1.4		1.4		1.4		1.3		1.3		1.4		0.9		0.7		0.7		0.7		0.7		2.4																
122.00	USA	GUM33100	CL		6.0		6.0		6.0		6.0		6.0		6.0		6.0		6.0		6.0		6.0		6.0		8.6																
122.20	LAO	LAO28400	CR		–1.8		–1.8		–1.8		–1.8		–1.8		–1.8		–1.8		–1.8		–1.8		–1.8		–1.8		–0.5																
128.00	SLM	SLM00000	CL	13.3		11.9		11.9		11.9		11.9		11.9		11.9		11.7		11.7		11.7		11.7		11.7																	
128.00	TLS	TLS00000	CR		9.4		9.3		9.3		9.3		9.3		9.3		9.3		9.2		9.2		9.2		9.2		10.4																
134.00	CHN	CHN15800	CR		–1.0		–1.0		–1.0		–1.0		–1.0		–1.0		–1.0		–1.0		–1.0		–1.0		–1.0		1.3																
134.00	CHN	CHNC_100	CL	2.1		–0.4		–0.4		–0.4		–0.4		–0.4		–0.4		–0.4		–0.4		–0.4		–0.4		–0.4																	
134.00	NRU	NRU30900	CL	8.6		7.3		7.3		7.3		7.3		7.3		7.3		7.3		7.3		7.3		7.3		7.3																	
134.00	PNG	PNG13100	CR		6.4		6.4		6.4		6.4		6.4		6.4		6.4		6.4		6.4		6.4		6.4		7.5																
140.00	F	NCL10000	CR		4.2		4.2		4.2		4.2		4.2		4.2		4.2		4.2		4.2		4.2		4.2		5.3																
140.00	F	WAL10200	CR		7.8		7.8		7.8		7.8		7.8		7.8		7.8		7.8		7.8		7.8		7.8		7.9																
140.00	KRE	KRE28600	CL	15.5		14.0		14.0		14.0		14.0		14.0		14.0		14.0		14.0		14.0		14.0		14.0																	
140.00	PLW	PLW00000	CR		11.2		11.2		11.2		11.2		11.2		11.2		11.2		11.2		11.2		11.2		11.2		11.4																
140.00	RUS	RSTRSD51	CL																									15.8		99.9		99.9		99.9		99.9		99.9		99.9		99.9	
140.00	RUS	RSTRSD52	CR																										99.9		99.9		99.9		99.9		99.9		99.9		99.9		99.9
140.00	USA	WAK33400	CR	16.0		14.0		14.0		14.0		14.0		14.0		14.0		14.0		14.0		14.0		14.0		14.0																	
140.00	VUT	VUT12800	CL	7.1		4.3		4.3		4.3		4.3		4.3		4.3		4.3		4.3		4.3		4.3		4.3																	
146.00	MHL	MHL00000	CR		25.2		25.1		25.2		25.1		25.2		25.4		25.5		25.4		25.5		25.4		25.5		26.3																
152.00	AUS	AUS00400	CR			5.7				5.7				5.7				5.7				5.7				5.7																	
152.00	AUS	AUS0040A	CR			16.9				16.9				16.9				16.9				16.9				16.9																	
152.00	AUS	AUS0040B	CR			16.3				16.3				16.3				16.3				16.3				16.3																	

** See Note 1 of § 11.2.

1	2	3	4	5																																							
Orbital Position	Admin. symbol	Beam Identifica-tion	Polar-ization 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 EPM																																							
152.00	AUS	AUS0040C	CR			17.4				17.4				17.4				17.4				17.4				17.4																	
152.00	AUS	AUS00500	CL				5.1				5.1				9.1				9.1				9.1				9.1																
152.00	AUS	AUS00600	CL		4.3				4.3				4.3				8.7				8.7				8.7																		
152.00	AUS	AUSA_100	CR	9.2				7.5				7.5																															
158.00	FSM	FSM00000	CR	14.9		23.5		14.6		23.5		14.6		23.5		23.8		24.9		25.3		24.9		25.3		24.9																	
158.00	NZL	NZL__100	CL		12.1		8.5		12.1		8.5		12.1		8.6		12.1		12.1		12.1		12.1		12.1		15.1																
164.00	AUS	AUS00700	CR			4.8				4.8				4.8				9.4				9.4				9.4																	
164.00	AUS	AUS0070A	CR			7.7				7.7				7.7				15.8				15.8				15.8																	
164.00	AUS	AUS00800	CL		5.4				5.4				5.4				5.4				5.4				5.4																		
164.00	AUS	AUS00900	CR	7.8				3.6				3.6				3.6				7.2				7.2																			
164.00	AUS	AUS0090A	CR	13.0				7.1				7.1				7.1				13.0				13.0																			
164.00	AUS	AUS0090B	CR	16.2				7.7				7.7				7.7				15.7				15.7																			
164.00	AUS	AUSB_100	CL				4.6				4.6				4.6																												
170.00	USA	PLM33200	CL		6.5		6.5		6.5		6.5		6.5		6.5		6.5		6.5		6.5		6.5		6.5		9.2																
170.00	USA	USAA_100	CL	9.9		7.4		7.4		7.4		7.4		7.4		7.4		7.4		7.4		7.4		7.4		7.4																	
170.75	TON	TON21500	CR		9.6		9.6		9.6		9.6		9.6		9.6		9.6		9.7		9.7		9.7		9.7		11.6																
176.00	KIR	KIR__100	CL	13.4		10.5		10.5		10.5		10.5		10.5		10.5		10.5		10.5		10.5		10.5		10.5																	
176.00	TUV	TUV00000	CR		6.2		6.2		6.2		6.2		6.2		6.2		6.2		6.2		6.2		6.2		6.2		9.1																

11.3 (SUP - WRC-03)

ARTICLE 12

Relationship to Resolution 507 (REV.WRC-03)*

12.1 The provisions and associated Plans for the broadcasting-satellite service in Regions 1 and 3 and in Region 2, of this Appendix, shall be regarded as including a world agreement and associated Plans for Regions 1, 2 and 3 in accordance with *resolves* 1 of Resolution **507 (Rev.WRC-03)***, which requires the stations in the broadcasting-satellite service to be established and operated in accordance with such agreements and associated Plans.

ARTICLE 13

Interference

13.1 The Member States of the Union shall endeavour to agree on the action required to reduce harmful interference which might be caused by the application of these provisions and the associated Plans.

ARTICLE 14

Period of validity of the provisions and associated Plans

14.1 For Regions 1 and 3, the provisions and associated Plan have been prepared in order to meet the requirements of the broadcasting-satellite service in the bands concerned for a period of at least fifteen years from 1 January 1979.

14.2 For Region 2, the provisions and associated Plan have been prepared in order to meet the requirements of the broadcasting-satellite service in the bands concerned for a period extending until at least 1 January 1994.

14.3 In any event, the provisions and associated Plans shall remain in force until their revision by a competent radiocommunication conference convened in accordance with the relevant provisions of the Constitution and Convention in force.

* *Note by the Secretariat*: This Resolution was revised by WRC-12 and WRC-15.

ANNEX 1 (REV.WRC-15)

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 administration[25]

(See Article 4)

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 dB(W/(m^2 · 27 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: (WRC-15)

-147 dB(W/(m^2 · 27 MHz)) for $0° \leq \theta < 0.23°$

$-135.7 + 17.74 \log \theta$ dB(W/(m^2 · 27 MHz)) for $0.23° \leq \theta < 2.0°$

$-136.7 + 1.66\,\theta^2$ dB(W/(m^2 · 27 MHz)) for $2.0° \leq \theta < 3.59°$

$-129.2 + 25 \log \theta$ dB(W/(m^2 · 27 MHz)) for $3.59° \leq \theta < 9°$

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;

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[25] With respect to this Annex, except for Section 2, the limits relate to the power flux-density which would be obtained assuming free-space propagation conditions.

With respect to Section 2 of this Annex, the limit specified relates to the overall equivalent protection margin calculated in accordance with § 2.2.4 of Annex 5.

[26] (SUP - WRC-15)

b) the effect of the proposed new or modified assignments in the List is that the equivalent downlink protection margin[27] 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)

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 margin[28] 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)

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:

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[27] For the definition of the equivalent protection margin, see § 3.4 of Annex 5.

[28] For the definition of the overall equivalent protection margin, see § 1.11 of Annex 5.

-147 dB(W/(m^2 · 27 MHz))	for $0° \le \theta < 0.23°$
$-135.7 + 17.74 \log \theta$ dB(W/(m^2 · 27 MHz))	for $0.23° \le \theta < 1.8°$
$-134.0 + 0.89\ \theta^2$ dB(W/(m^2 · 27 MHz))	for $1.8° \le \theta < 5.0°$
$-129.2 + 25 \log \theta$ dB(W/(m^2 · 27 MHz))	for $5.0° \le \theta < 10.57°$
-103.6 dB(W/(m^2 · 27 MHz))	for $10.57° \le \theta$

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 § 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:

-147 dB(W/(m^2 · 27 MHz))	for $0° \le \theta < 0.23°$
$-135.7 + 17.74 \log \theta$ dB(W/(m^2 · 27 MHz))	for $0.23° \le \theta < 2.0°$
$-136.7 + 1.66\ \theta^2$ dB(W/(m^2 · 27 MHz))	for $2.0° \le \theta < 3.59°$
$-129.2 + 25 \log \theta$ dB(W/(m^2 · 27 MHz))	for $3.59° \le \theta < 10.57°$
-103.6 dB(W/(m^2 · 27 MHz))	for $10.57° \le \theta$

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. (WRC-03)

4 Limits to the power flux-density to protect the terrestrial services of other administrations[29, 30, 31]

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.

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29 See § 3.18 of Annex 5.

30 In the band 12.5-12.7 GHz in Region 1, these limits are applicable only to the territory of administrations mentioned in Nos. **5.494** and **5.496**.

31 See Resolution **34***.

* *Note by the Secretariat*: This Resolution was revised by WRC-03 and WRC-15.

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 dB(W/(m$^2 \cdot$ 4 kHz)) for $\theta \leq 5°$

$-148 + 0.5\,(\theta - 5)$ dB(W/(m$^2 \cdot$ 4 kHz) for $5° < \theta \leq 25°$

-138 dB(W/(m$^2 \cdot$ 4 kHz)) for $25° < \theta \leq 90°$

where θ represents the angle of arrival. (WRC-03)

5 (Not used.)

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 frequency band 11.7-12.2 GHz[32] in Region 2 or in the frequency 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 frequency band 12.5-12.7 GHz in Region 1 and in the frequency 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 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:

[32] Including assignments operating under No. **5.485**.

$-186.5 \quad \text{dB}(\text{W}/(\text{m}^2 \cdot 40 \text{ kHz}))$	for $0° \leq \theta < 0.054°$
$-164.0 + 17.74 \log \theta \quad \text{dB}(\text{W}/(\text{m}^2 \cdot 40 \text{ kHz}))$	for $0.054° \leq \theta < 2.0°$
$-165.0 + 1.66\, \theta^2 \quad \text{dB}(\text{W}/(\text{m}^2 \cdot 40 \text{ kHz}))$	for $2.0° \leq \theta < 3.59°$
$-157.5 + 25 \log \theta \quad \text{dB}(\text{W}/(\text{m}^2 \cdot 40 \text{ kHz}))$	for $3.59° \leq \theta < 10.57°$
$-131.9 \quad \text{dB}(\text{W}/(\text{m}^2 \cdot 40 \text{ kHz}))$	for $10.57° \leq \theta$

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.

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:

$-186.5 \quad \text{dB}(\text{W}/(\text{m}^2 \cdot 40 \text{ kHz}))$	for $0° \leq \theta < 0.054°$
$-164.0 + 17.74 \log \theta \quad \text{dB}(\text{W}/(\text{m}^2 \cdot 40 \text{ kHz}))$	for $0.054° \leq \theta < 1.8°$
$-162.3 + 0.89\, \theta^2 \quad \text{dB}(\text{W}/(\text{m}^2 \cdot 40 \text{ kHz}))$	for $1.8° \leq \theta < 5.0°$
$-157.5 + 25 \log \theta \quad \text{dB}(\text{W}/(\text{m}^2 \cdot 40 \text{ kHz}))$	for $5.0° \leq \theta < 10.57°$
$-131.9 \quad \text{dB}(\text{W}/(\text{m}^2 \cdot 40 \text{ kHz}))$	for $10.57° \leq \theta$

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.

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-15)**, had been received by the Bureau prior to 30 March 2002. (WRC-15)

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 is considered as being affected if the proposed modification to the Region 2 Plan would result in:

– the value of $\Delta T/T$ of its overlapping frequency assignments in the fixed-satellite service in Region 1 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 $\Delta T/T$ of its overlapping frequency assignments in the fixed-satellite service in Region 1 resulting from the proposed modification exceeds 6%,

using the method of Appendix **8** (Case II). (WRC-07)

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**.

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:

$$F = F_0 - R + D + P \qquad (1)$$

where:

F: the maximum permissible interfering power flux-density (dB(W/m^2)) within the necessary bandwidth of the broadcasting-satellite;

F_0: the wanted power flux-density (dB(W/m^2)) 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 dB(W/(m^2 · 27 MHz)) for service areas in Regions 1 and 3, *and*

b) −115 dB(W/(m^2 · 24 MHz)), as well as in dB(W/(m^2 · 27 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 dB(W/(m^2 · 24 MHz)), as well as in dB(W/(m^2 · 27 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.

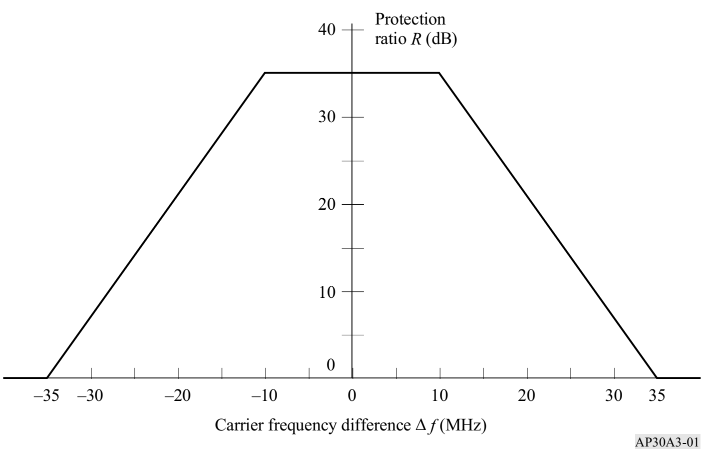
2.3.2 For the analogue BSS assignments in the Region 2 Plan and for notified BSS assignments in Regions 1 and 3 Plan and List which are in conformity with the Plans and List of Appendix **30** and which have been brought into use and for which the date of bringing into use has been confirmed to the Bureau 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)



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):

$$
\begin{aligned}
&D = 0.0025((d/\lambda)\ \varphi)^2 && \text{dB} && \text{for } 0° \leq \varphi < \varphi_m \\
&D = G_{max} - (29 - 25 \log(\varphi_r)) && \text{dB} && \text{for } \varphi_m \leq \varphi < \varphi_r \\
&D = G_{max} - (29 - 25 \log(\varphi)) && \text{dB} && \text{for } \varphi_r \leq \varphi \leq 14.45° \\
&D = G_{max} && \text{dB} && \text{for } \varphi > 14.45°
\end{aligned}
\qquad (2)
$$

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)

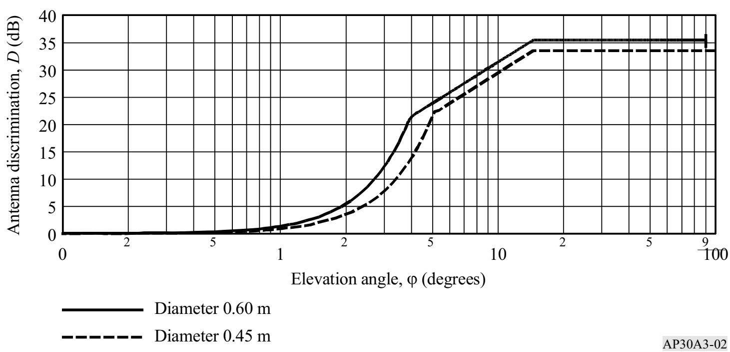
λ: the wavelength (m).

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.

$$
\begin{aligned}
D &= 0 && \text{dB} && \text{for } 0° \leq \varphi \leq 0.43° \\
D &= 4.15\,\varphi^2 && \text{dB} && \text{for } 0.43° < \varphi \leq 1.92° \\
D &= 8.24 + 25 \log \varphi && \text{dB} && \text{for } 1.92° < \varphi \leq 25° \\
D &= 43.2 && \text{dB} && \text{for } \varphi > 25°
\end{aligned} \tag{3}
$$

NOTE 2 – For the graphical determination of D see Fig. 3. The unit for φ is degrees.

2.5 Polarization discrimination (*P*)

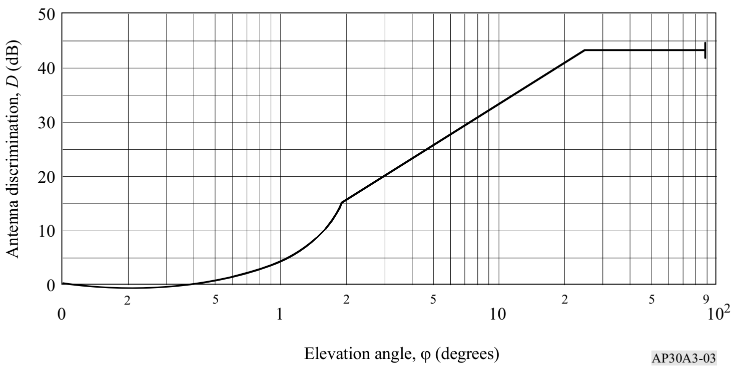
The value of P is equal to:

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/m^2)) 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:

$$F_p = E - A + 10 \log (4\pi/\lambda^2) \tag{4}$$

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:

$$d_{min}(f) = 100 + \frac{(\beta_p - f)}{2} \tag{5}$$

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:

$$\zeta_r = \begin{cases} |\zeta| - 1.8 & \text{for } |\zeta| > 1.8° \\ 0 & \text{for } |\zeta| \le 1.8° \end{cases} \tag{6}$$

where ζ is the earth station latitude (degrees).

β_p is then determined using:

$$\beta_p = \begin{cases} 10^{(1.67-0.015\zeta_r)} & \text{for } \zeta_r \leq 70° \\ 4.17 & \text{for } \zeta_r > 70° \end{cases} \tag{7}$$

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):

$$A_c = \frac{-6}{1 + d_c} \tag{8}$$

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:

$$A_1 = 122.43 + 16.5 \log f + A_c \tag{9}$$

3.2.2.2 *Distance-dependent part of the loss (dB) for ducting*

a) The specific attenuation (dB/km) due to dry air is given as:

$$\gamma_0 = \left(7.19 \times 10^{-3} + \frac{6.09}{f^2 + 0.227} + \frac{4.81}{(f - 57)^2 + 1.50} \right) f^2 \times 10^{-3} \tag{10}$$

b) 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:

$$\gamma_w(\rho) = \left(0.050 + 0.0021\rho + \frac{3.6}{(f - 22.2)^2 + 8.5} \right) f^2 \rho \times 10^{-4} \tag{11}$$

c) 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:

$$\gamma_{wdl} = \gamma_w (7.5) \tag{12}$$

d) 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:

$$\gamma_{wds} = \gamma_w (10.0) \tag{13}$$

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.

e) Specific attenuation due to gaseous absorption (dB/km):

$$\gamma_g = \gamma_0 + \gamma_{wdl} \left(\frac{d_t}{d_i} \right) + \gamma_{wds} \left(1 - \frac{d_t}{d_i} \right) \tag{14}$$

where:

d_t (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.

f) Values for zone-dependent parameters:

$$\tau = 1 - \exp\left(- \left(4.12 \times 10^{-4} (d_{lm})^{2.41} \right) \right) \tag{15}$$

where:

d_{lm} (km): longest continuous inland distance (Zone A2) along the path considered.

$$\mu_1 = \left(10^{\frac{-d_{tm}}{16 - 6.6\tau}} + \left(10^{-(0.496 + 0.354\tau)}\right)^5 \right)^{0.2} \tag{16}$$

where:

d_{tm} (km): longest continuous land (i.e. inland + coastal) distance (Zone A1 + Zone A2) along the path considered.

μ_1 is limited to $\mu_1 \leq 1$.

$$\sigma = -0.6 - 8.5 \times 10^{-9} d_i^{3.1} \tau \tag{17}$$

σ is limited to $\sigma \geq -3.4$.

$$\mu_2 = \left(2.48 \times 10^{-4} d_i^2\right)^{\sigma} \tag{18}$$

μ_2 is limited to $\mu_2 \leq 1$.

$$\mu_4 = \begin{cases} 10^{(-0.935 + 0.0176\zeta_r) \log \mu_1} & \text{for} \quad \zeta_r \leq 70° \\ 10^{0.3 \log \mu_1} & \text{for} \quad \zeta_r \leq 70° \end{cases} \tag{19}$$

g) 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:

$$\beta = \beta_e \cdot \mu_1 \cdot \mu_2 \cdot \mu_4 \tag{20}$$

$$\Gamma_1 = \frac{1.076}{(2.0058 - \log \beta)^{1.012}} \exp\left(-\left(9.51 - 4.8 \log \beta + 0.198 (\log \beta)^2\right) \times 10^{-6} d_i^{1.13}\right) \tag{21}$$

h) Distance-dependent part of the loss (dB) for ducting:

$$L_5(p) = (\gamma_d + \gamma_g) d_i + (1.2 + 3.7 \times 10^{-3} d_i) \log\left(\frac{p}{\beta}\right) + 12\left(\frac{p}{\beta}\right)^{\Gamma_1} + C_{2i} \tag{22}$$

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).

$$\gamma_d = 0.05 f^{1/3} \tag{23}$$

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.

i) Attenuation due to ducting:

$$A_{duct} = A_1 + L_5(p) \tag{24}$$

3.2.3 For the tropospheric scatter model

3.2.3.1 *Distance-independent part of the loss (dB) for tropospheric scatter*

$$A_2 = 187.36 + 10\varepsilon_h + L_f - 0.15N_0 - 10.1\left(-\log\left(\frac{p}{50}\right)\right)^{0.7} \tag{25}$$

where:

ε_h: earth station horizon elevation angle (degrees)

N_0: path centre sea level surface refractivity given as:

$$N_0 = 330 + 62.6\, e^{-\left(\frac{\zeta - 2}{32.7}\right)^2} \tag{26}$$

L_f: the frequency-dependent part of the loss (dB), given as:

$$L_f = 25\log(f) - 2.5\left(\log\left(\frac{f}{2}\right)\right)^2 \tag{27}$$

3.2.3.2 *Distance-dependent part of the loss (dB) for tropospheric scatter*

$$L_6(p) = 20\log(d_i) + 5.73 \times 10^{-4}(112 - 15\cos(2\zeta))d_i + (\gamma_0 + \gamma_{wt})d_i + C_{2i} \tag{28}$$

Total attenuation due to tropospheric scatter:

$$A_{trop} = A_2 + L_6(p) \tag{29}$$

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:

$$A_{min} = \min(A_{duct}, A_{trop}) \tag{30}$$

ANNEX 4 (REV.WRC-15)

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 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: (WRC-07)

-147 dB(W/(m$^2 \cdot$ 27 MHz)) for $0° \leq \theta < 0.23°$

$-135.7 + 17.74 \log \theta$ dB(W/(m$^2 \cdot$ 27 MHz)) for $0.23° \leq \theta < 2.0°$

$-136.7 + 1.66\, \theta^2$ dB(W/(m$^2 \cdot$ 27 MHz)) for $2.0° \leq \theta < 3.59°$

$-129.2 + 25 \log \theta$ dB(W/(m$^2 \cdot$ 27 MHz)) for $3.59° \leq \theta < 10.57°$

-103.6 dB(W/(m$^2 \cdot$ 27 MHz)) for $10.57° \leq \theta$

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: (WRC-15)

-147 dB(W/(m^2 · 27 MHz)) for $0° \leq \theta < 0.23°$

$-135.7 + 17.74 \log \theta$ dB(W/(m^2 · 27 MHz)) for $0.23° \leq \theta < 1.8°$

$-134.0 + 0.89 \theta^2$ dB(W/(m^2 · 27 MHz)) for $1.8° \leq \theta < 5.0°$

$-129.2 + 25 \log \theta$ dB(W/(m^2 · 27 MHz)) for $5.0° \leq \theta < 10.57°$

-103.6 dB(W/(m^2 · 27 MHz)) for $10.57° \leq \theta$

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 dB(W/(m^2 · 27 MHz)) for $0° \leq \theta < 0.23°$

$-135.7 + 17.74 \log \theta$ dB(W/(m^2 · 27 MHz)) for $0.23° \leq \theta < 1.8°$

$-134.0 + 0.89 \theta^2$ dB(W/(m^2 · 27 MHz)) for $1.8° \leq \theta < 5.0°$

$-129.2 + 25 \log \theta$ dB(W/(m^2 · 27 MHz)) for $5.0° \leq \theta < 10.57°$

-103.6 dB(W/(m^2 · 27 MHz)) for $10.57° \leq \theta$

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.

33 (SUP - WRC-15)

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 application[34] (Rev.WRC-03)

1 Definitions

1.1 Downlink service area

The area on the surface of the Earth in which the administration responsible for the service has the right to demand that the agreed protection conditions be provided.

NOTE – In the definition of service area, it is made clear that within the service area the agreed protection conditions can be demanded. This is the area where there should be at least the wanted power flux-density and protection against interference based on the agreed protection ratio for the agreed percentage of time.

1.2 Downlink coverage area

The area on the surface of the Earth delineated by a contour of a constant given value of power flux-density which would permit the wanted quality of reception in the absence of interference.

NOTE 1 – In accordance with the provisions of No. **23.13**, the coverage area must be the smallest area which encompasses the service area.

NOTE 2 – The coverage area, which will normally encompass the entire service area, will result from the intersection of the antenna beam (elliptical, circular, or shaped) with the surface of the Earth, and will be defined by a given value of power flux-density. For example, it would be the area delineated by the contour corresponding to the level specified in § 3.16 of this Annex. There will usually be an area outside the service area but within the coverage area in which the power flux-density will be at least equivalent to the minimum specified value; however, protection against interference will not be provided in this area.

NOTE 3 – If coverage is provided by a steerable beam, the contour delineating the coverage area will depend on the pointing capability of the beam and will not necessarily cover the entire service area.

1.3 Downlink beam area

The area delineated by the intersection of the half-power beam of the satellite transmitting antenna with the surface of the Earth. The downlink beam area concept was generally used for planning purposes in conjunction with elliptical beams.

NOTE – The beam area is simply that area on the Earth's surface corresponding to the –3 dB points on the satellite antenna radiation pattern. In many cases the beam area would almost coincide with the coverage area, the discrepancy being accounted for by the permanent difference in path lengths from the satellite throughout the beam area, and also by the permanent variations, if any, in propagation factors across the area. However, for a service area where the maximumdimension as seen from the satellite position is less than 0.6° in Regions 1 and 3, and less than 0.8° in Region 2 (the agreed minimum practicable satellite antenna half-power beamwidths), there could be a significant difference between the beam area and the coverage area.

[34] In revising this Annex at WRC-97 and at WRC-2000, no changes have been made to the technical data applicable to the Region 2 Plan. However, for all three Regions, it should be noted that some of the parameters of networks proposed as modifications to the Region 2 Plan and the Regions 1 and 3 List may differ from the technical data presented herein. (WRC-2000)

1.4 Nominal orbital position

The longitude of a position in the geostationary-satellite orbit associated with a frequency assignment to a space station in a space radiocommunication service. The position is given in degrees from the Greenwich meridian.

NOTE – Definitions in § 1.6 to 1.11 are applicable to Region 2. (WRC-2000)

1.5 Adjacent channel

The RF channel in the broadcasting-satellite service frequency Plan, or in the associated feeder-link frequency Plan, which is situated immediately higher or lower in frequency with respect to the reference channel.

1.6 Second adjacent channel

The RF channel in the broadcasting-satellite service frequency Plan, or in the associated feeder-link frequency Plan, which is situated immediately beyond either of the adjacent channels, with respect to the reference channel.

1.7 Overall carrier-to-interference ratio

The overall carrier-to-interference ratio is the ratio of the wanted carrier power to the sum of all interfering RF powers in a given channel including both feeder links and downlinks. The overall carrier-to-interference ratio due to interference from the given channel is calculated as the reciprocal of the sum of the reciprocals of the feeder-link carrier-to-interference ratio and the down-link carrier-to-interference ratio referred to the satellite receiver input and earth station receiver input, respectively[35].

1.8 Overall co-channel protection margin

The overall co-channel protection margin in a given channel is the difference in decibels between the overall co-channel carrier-to-interference ratio and the co-channel protection ratio.

1.9 Overall adjacent channel protection margin

The overall adjacent channel protection margin is the difference in decibels between the overall adjacent channel carrier-to-interference ratio and the adjacent channel protection ratio.

---

[35] There are a total of five overall carrier-to-interference ratios used in the analysis of the Plan for the broadcasting-satellite service in Region 2, namely, co-channel, upper and lower adjacent channels, and upper and lower second adjacent channels. In Regions 1 and 3, three ratios are normally used, namely, co-channel and upper and lower adjacent channels. However, see the footnote to the definition of M_4 and M_5 in § 1.11 of this Annex.

1.10 Overall second adjacent channel protection margin

The overall second adjacent channel protection margin is the difference in decibels between the overall second adjacent channel carrier-to-interference ratio and the second adjacent channel protection ratio.

1.11 Overall equivalent protection margin[36]

The overall equivalent protection margin, M, is given in decibels by the expression:

$$M = -10 \log \left(\sum_{i=1}^{5} 10^{\left(-M_i / 10\right)} \right)$$

where:

M_1 : overall co-channel protection margin (dB) (as defined in § 1.8);

M_2, M_3 : overall adjacent channel protection margins for the upper and lower adjacent channels, respectively (dB) (as defined in § 1.9);

M_4, M_5 : overall second adjacent channel protection margins for the upper and lower second adjacent channels, respectively (dB) (as defined in § 1.10)[37].

The adjective "equivalent" indicates that the protection margins for all interference sources from the adjacent and second adjacent channels as well as co-channel interference sources have been included. (WRC-2000)

2 Radio propagation factors

In Regions 1 and 3:

2.1 The propagation loss on the space-to-Earth path (used for computing downlink e.i.r.p. and as a guide in choosing orbital locations during the development of the Plan) is equal to the free-space path loss plus the atmospheric absorption and the rain attenuation exceeded for 1% of the worst month. Values of this attenuation can be calculated as a function of angle of elevation for the rain-climatic zones shown in Figs. 1 and 2 from Recommendation ITU-R P.837-1 by applying the method described in Recommendation ITU-R P.618-5.

[36] For calculation of overall equivalent protection margin for Regions 1 and 3, as defined at WARC Orb-88, see alternative formula in § 1.12 to Annex 3 of Appendix **30A**.

[37] M_4 and M_5 are applicable only for Region 2. (WRC-2000)

FIGURE 1

Rain-climatic zones for Regions 1 and 3 between longitudes 45° W and 105° E

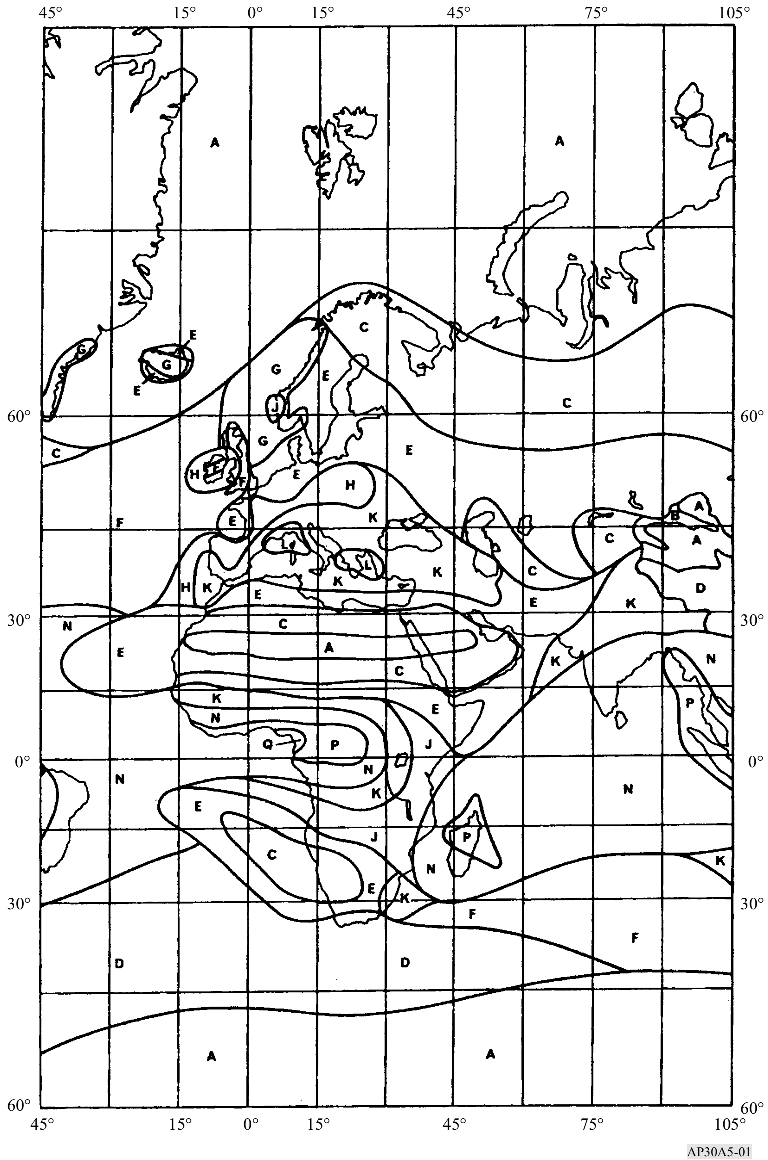


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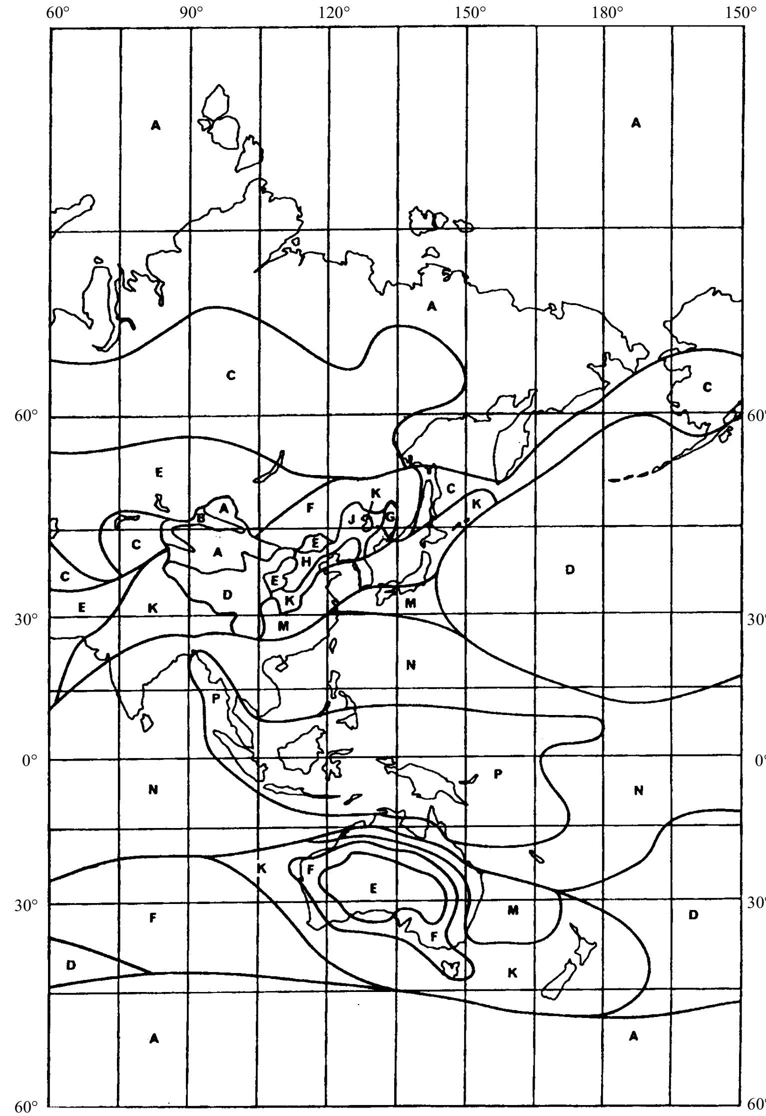
FIGURE 2

Rain-climatic zones for Regions 1 and 3 between longitudes 60° E and 150° W



In Region 2:

2.2 The propagation loss on a space-Earth path is equal to the free-space path loss plus the atmospheric absorption loss plus the rain attenuation exceeded for 1% of the worst month.

2.2.1 Atmospheric absorption

The loss due to atmospheric absorption (i.e. clear-sky attenuation) is given by:

$$A_a = \frac{92.20}{\cos\theta}\left[0.017F_o + 0.002\rho F_w\right] \qquad \text{dB} \qquad \text{for } \theta < 5°$$

where:

$$F_o = \left[24.88\tan\theta + 0.339\sqrt{1\,416.77\tan^2\theta + 5.51}\right]^{-1}$$

$$F_w = \left[40.81\tan\theta + 0.339\sqrt{3\,811.66\tan^2\theta + 5.51}\right]^{-1}$$

and:

$$A_a = \frac{0.042 + 0.003\,\rho}{\sin\theta} \qquad \text{dB} \qquad \text{for } \theta \geq 5°$$

where:

θ: elevation angle (degrees),

ρ: surface water vapour concentration (g/m^3), being

ρ = 10 g/m^3 for rain climatic zones A to K and

ρ = 20 g/m^3 for rain climatic zones M to P (see Fig. 3).

2.2.2 Rain attenuation

The rain attenuation A_p of circularly polarized signals exceeded for 1% of the worst month at 12.5 GHz is given by:

$$A_p = 0.21\,\gamma\,L\,r \qquad \text{dB} \qquad (31)$$

where:

L: slant path length through rain

$$= \frac{2(h_R - h_0)}{\left\{\sin^2\theta + 2\dfrac{h_R - h_0}{8\,500}\right\}^{1/2} + \sin\theta} \qquad \text{km}$$

r: rain path length reduction factor

$$= \frac{90}{90 + 4L \cos\theta}$$

h_R: rain height (km)

$$= c\left\{5.1 - 2.15 \log\left(1 + 10^{(\zeta - 27)/25}\right)\right\} \quad \text{km}$$

where:

$c = 0.6$ for $|\zeta| \leq 20°$

$c = 0.6 + 0.02\,(|\zeta| - 20)$ for $20° < |\zeta| \leq 40°$

$c = 1.0$ for $|\zeta| > 40°$

h_0: height (km) above mean sea level of the earth station;

ζ: earth station latitude (degrees);

θ: elevation angle (degrees);

γ: specific rain attenuation = $0.0202\ R^{1.198}$ dB/km;

R: rain intensity (mm/h) obtained from the table below for the rain climatic zones identified in Fig. 3.

(NOTE – The method is based on R exceeded for 0.01% of an average year.)

Rainfall intensity (*R*) for the rain climatic zones (exceeded for 0.01% of an average year) (see Fig. 3)

Rain climatic zone	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**K**	**M**	**N**	**P**
Rainfall intensity (mm/h)	8	12	15	19	22	28	30	42	63	95	145

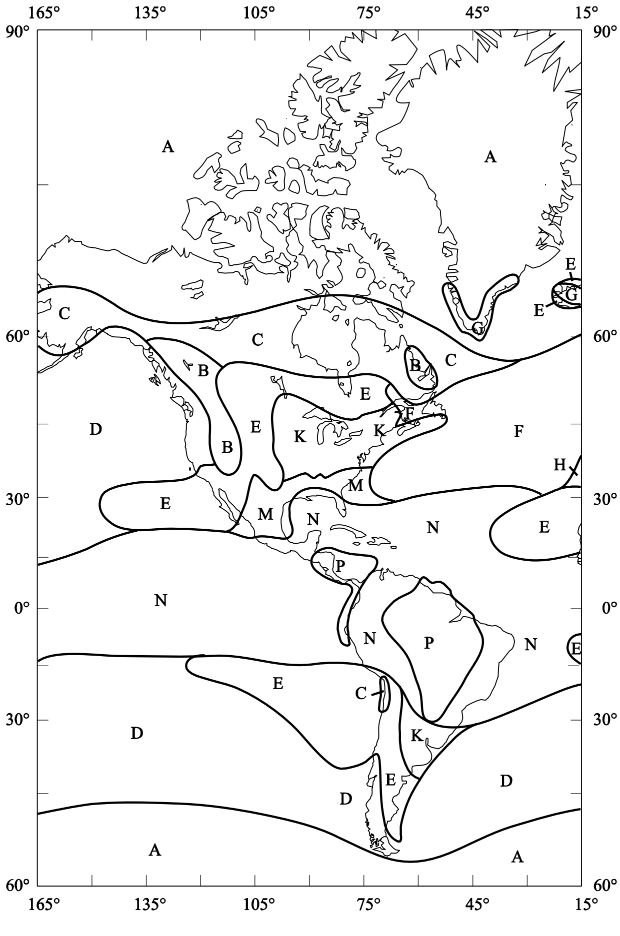
Figure 4 presents plots of rain attenuation, as calculated using equation (31), of circularly polarized signals exceeded for 1% of the worst month at 12.5 GHz, as a function of earth station latitude and elevation angle for each of the rain climatic zones shown in Fig. 3.

2.2.3 Rain attenuation limit

In the analysis of the Plan for the broadcasting-satellite service in Region 2, a maximum downlink attenuation of 9 dB was agreed in order to limit the inhomogeneity of broadcasting-satellite power flux-density and to facilitate sharing during clear-sky conditions.

FIGURE 3

Rain-climatic zones (Region 2)



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2.2.4 Procedure for calculating the carrier-to-interference ratio at a test point

The calculation of the down-link carrier-to-interference ratio (exceeded for 99% of the worst month) used to obtain the overall equivalent protection margin at a test point is the minimum value of the carrier-to-interference ratio obtained assuming:

i) clear-sky conditions (i.e. including atmospheric absorption); *or*

ii) rain-faded conditions corresponding to an attenuation value exceeded for 1% of the worst month.

2.3 Depolarization

Rain and ice can cause depolarization of radio frequency signals. The level of the co-polar component relative to the depolarized component is given by the cross-polarization discrimination (XPD) ratio. For circularly polarized emissions, the XPD ratio (dB) exceeded for 99% of the worst month is obtained from:

$$XPD = 30 \log f - 40 \log (\cos \theta) - 20 \log A_p \qquad \text{for } 5° \leq \theta \leq 60° \qquad (32)$$

where A_p (dB) is the co-polar rain attenuation exceeded for 1% of the worst month (calculated in § 2.2), f is the frequency in GHz and θ is the elevation angle. For angles of θ greater than 60°, use $\theta = 60°$ in equation (32).

FIGURE 4

Rain attenuation values exceeded for 1% of the worst month (sea level) for Region 2 rain-climatic zones

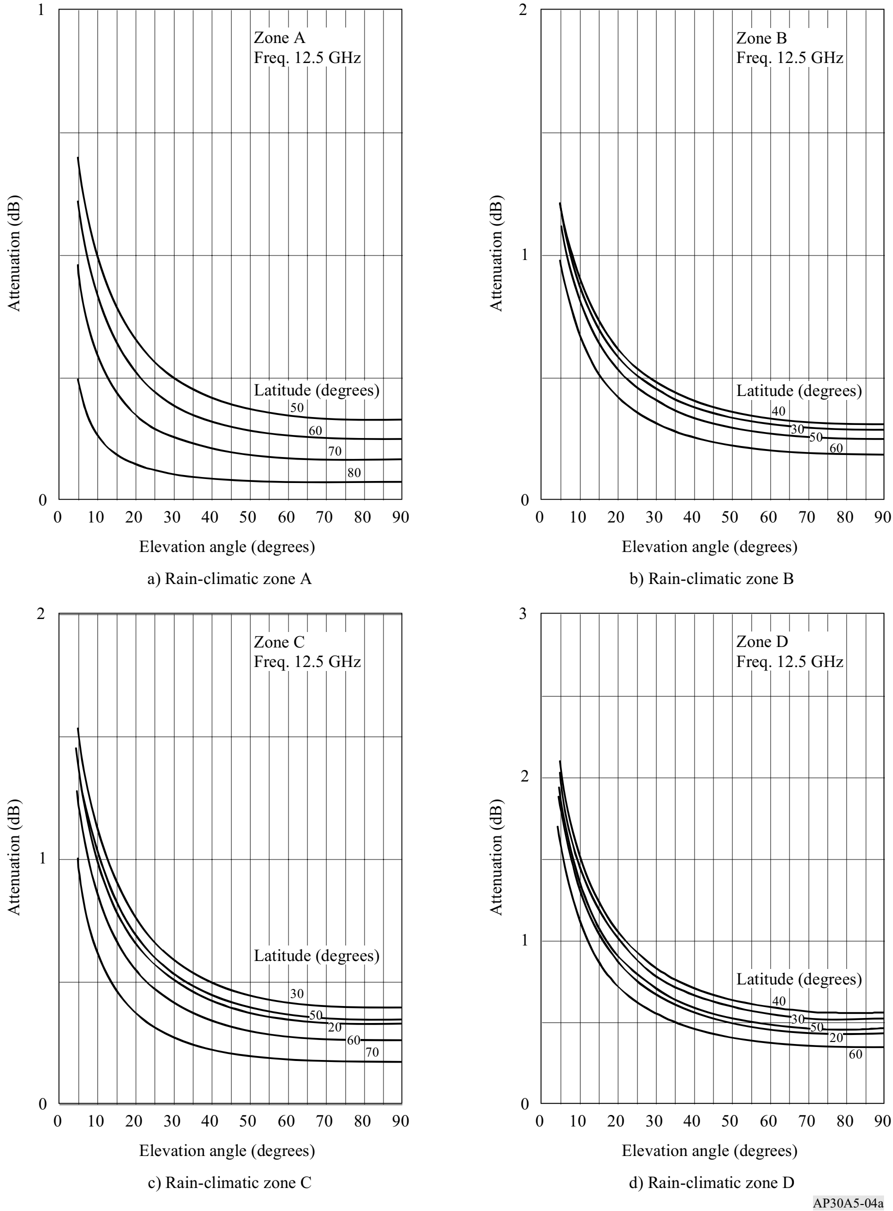


FIGURE 4 (*continued*)

Rain attenuation values exceeded for 1% of the worst month (sea level) for Region 2 rain-climatic zones

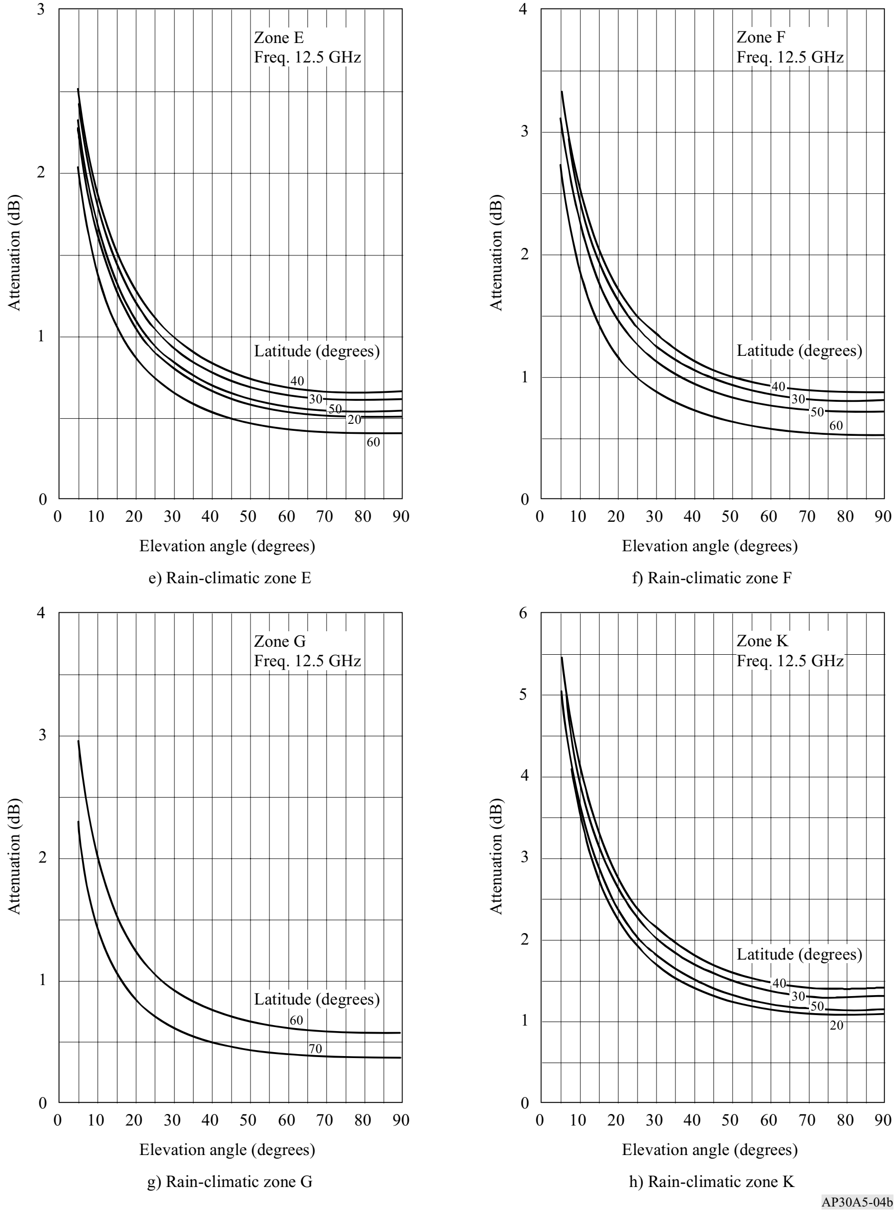
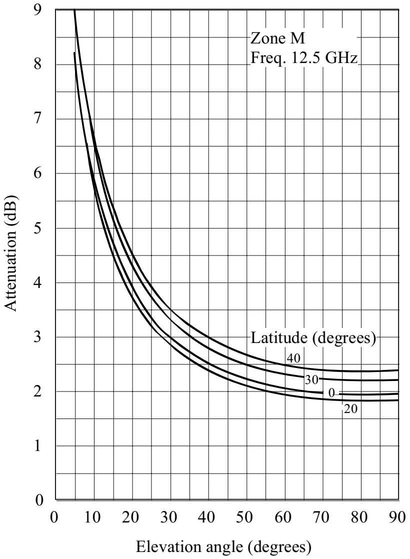
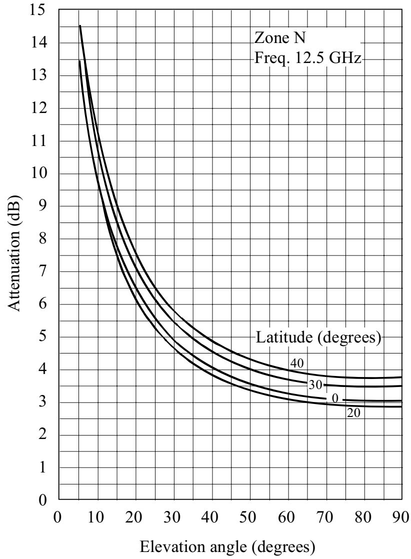


FIGURE 4 (*continued*)

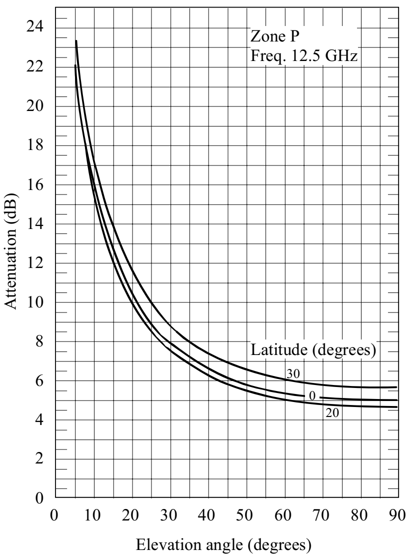
Rain attenuation values exceeded for 1% of the worst month (sea level) for Region 2 rain-climatic zones



j) Rain-climatic zone M



k) Rain-climatic zone N



l) Rain-climatic zone P

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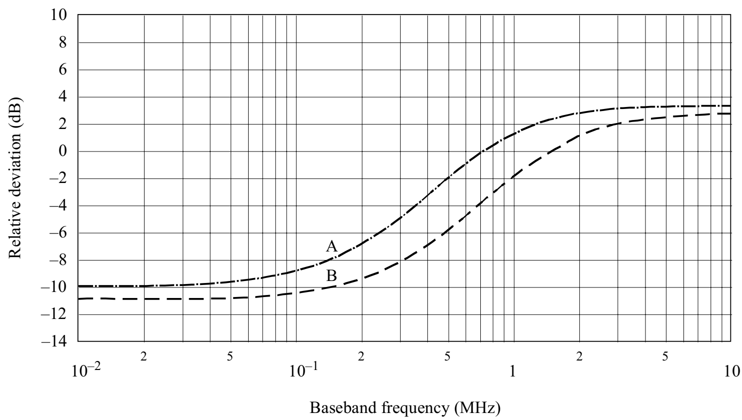
3 Basic technical characteristics

3.1 Type of modulation

3.1.1 At WARC-77 and during revision of the Regions 1 and 3 Plan at WRC-97, planning of the broadcasting-satellite service was based on the use of a signal consisting of a video signal with an associated carrier, frequency-modulated by a sound signal, both frequency-modulating a carrier in the 12 GHz band, with a pre-emphasis characteristic in accordance with Fig. 5 (from Recommendation ITU-R F.405-1*). The WRC-2000 Regions 1 and 3 Plan and the List are generally based on digital modulation of sound and television signals. (WRC-2000)

FIGURE 5

Pre-emphasis characteristic for television on 525- and 625-line systems



Curves A: 525-line system
B: 625-line system

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3.1.2 In Region 2, planning is based on the use of a frequency-modulated composite-coded colour television signal with two sound sub-carriers. However, in recognition of the need to provide for the use of new, enhanced television coding and modulation formats (e.g. time-compressed, multiplexed analogue video component signals and digitally-coded sound and data signals), values of the important technical characteristics have been chosen to take into consideration the implementation of these new formats within the provisions of the Plan.

* *Note by the Secretariat*: This Recommendation was suppressed by the Radiocommunication Assembly (Geneva, 2003).

3.1.3 Nevertheless, other modulating signals having different characteristics (e.g. 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) are not precluded, provided that appropriate protection masks and calculation methods[38] are applied or if the use of such characteristics complies with the provisions of § 3.2 of Article 3.

3.2 Polarization

3.2.1 For the planning of the broadcasting-satellite service, circular polarization is generally used. However, for implementation of assignments in the Plan, linear polarization may also be used, subject to the successful application of the modification procedure of Article 4.

3.2.2 In Regions 1 and 3, the polarization of different beams intended to serve the same area should, if possible, be the same.

3.2.3 The terms "direct" and "indirect" used in the Plans to indicate the direction of rotation of circularly-polarized waves correspond to right-hand (clockwise) and left-hand (anti-clockwise) polarization respectively according to the following definitions:

Direct polarization (right-hand or clockwise polarization):

An elliptically or circularly-polarized electromagnetic wave, in which the electric field-intensity vector, observed in any *fixed plane*, normal to the direction of propagation, whilst looking in (i.e., not against) the direction of propagation, rotates *with time* in a *right-hand* or clockwise direction.

NOTE – For right-hand circularly-polarized plane waves, the ends of the electric vectors drawn from any points along a straight line normal to the plane of the wave front form, *at any instant*, a *left-hand* helix.

Indirect polarization (left-hand or anti-clockwise polarization):

An elliptically or circularly-polarized electromagnetic wave, in which the electric field-intensity vector, observed in any *fixed plane*, normal to the direction of propagation, whilst looking in (i.e., not against) the direction of propagation, rotates *with time* in a *left-hand* or anti-clockwise direction.

NOTE – For left-hand circularly-polarized plane waves, the ends of the electric vectors drawn from any points along a straight line normal to the plane of the wave front form, *at any instant*, a *right-hand* helix.

3.2.4 Linear polarization is defined in Recommendation ITU-R BO.1212. This Recommendation should be used when analysing linearly polarized signals.

[38] Protection masks for verifying that this provision is met are not yet fully defined in existing ITU-R Recommendations. Recommendations for interference between analogue and digital signals are still under development. In absence of criteria to evaluate interference, the Bureau will use the worst-case approach as adopted by the Radio Regulations Board.

3.3 Carrier-to-noise ratio

For the purpose of planning the broadcasting-satellite service, the carrier-to-noise ratio is equal to or exceeds 14 dB for 99% of the worst month.

In Regions 1 and 3, the reduction in quality in the down-link due to thermal noise in the feeder-link is taken as equivalent to a degradation in the down-link carrier-to-noise ratio not exceeding 0.5 dB for 99% of the worst month. In Region 2, as a guide for planning, the reduction in quality in the down-link due to thermal noise in the feeder link is taken as equivalent to a degradation in the down-link carrier-to-noise ratio of approximately 0.5 dB not exceeded for 99% of the worst month, but the feeder-link and down-link Plans are evaluated on the basis of the overall carrier-to-noise ratio of 14 dB for the combined down-link and feeder-link contributions.

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[39, 40]:

– 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[40, 41, 42]:

– 24 dB for co-channel signals;

– 16 dB for adjacent channel signals.

---

[39] These protection ratio values were used 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.

[40] The equivalent protection margin M is given in dB by the formula:

$$M = -10 \log (10^{-M_1/10} + 10^{-M_2/10} + 10^{-M_3/10})$$

where M_1 is the value (dB) of the protection margin for the same channel. This is defined in the following expression where the powers are evaluated at the receiver input:

$$\frac{\text{wanted power}}{\text{sum of the co-channel interfering powers}} \text{ (dB)} - \text{co-channel protection ration (dB)}$$

M_2 and M_3 are the values (dB) of the upper and lower adjacent-channel protection margins respectively.

The definition of the adjacent-channel protection margin is similar to that for the co-channel case except that the adjacent-channel protection ratio and the sum of the interfering powers due to emissions in the adjacent channel are considered.

[41] These protection ratio values were used 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 between 27 October 1997 and 12 May 2000. (WRC-2000)

[42] These protection ratio values were used for protection of digital and analogue assignments from analogue emissions. (WRC-2000)

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 dB[43].

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 process[44].

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[45]).

In Region 2, the following protection ratios have been adopted for the purpose of calculating the overall equivalent protection margin[46]:

– 28 dB for co-channel signals;

– 13.6 dB for adjacent-channel signals;

– −9.9 dB for second adjacent-channel signals.

---

43 The overall protection margin calculation method used is based on the first formula in § 1.12 of Annex 3 to Appendix **30A**.

44 For analogue assignments, the protection ratios adopted by WRC-97 were used (24 dB co-channel and 16 dB adjacent channel). (WRC-2000)

45 Annex 3 of this Recommendation may be applied only in compatibility analysis for bilateral coordination between administrations. (WRC-03)

46 The definitions in § 1.7, 1.8, 1.9, 1.10 and 1.11 of this Annex apply to these calculations. (WRC-03)

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)

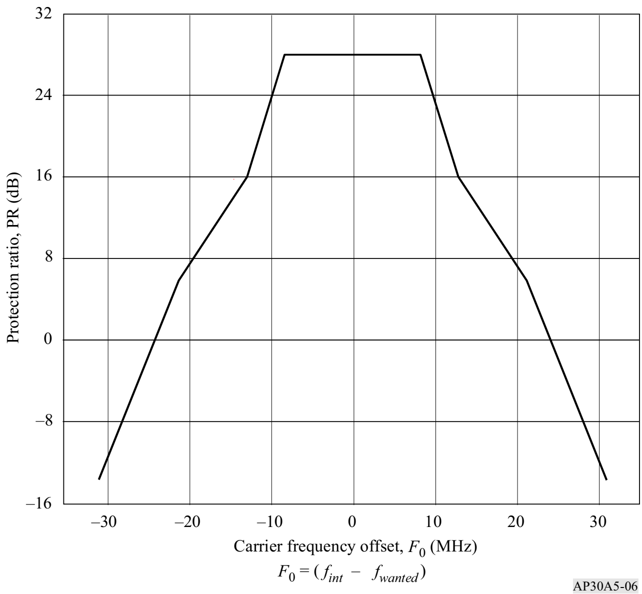
3.4.1 Adjacent channel protection ratio template for Region 2[47] (FMTV into FMTV)

The protection ratios for adjacent channels are derived from the template given in Fig. 6. The template is symmetrical and is given in terms of absolute levels for the *C*/*I* ratios.

The template is obtained by joining the segment for adjacent channels to the horizontal extension of the co-channel protection ratio value. The adjacent channel protection ratio cannot be adjusted relative to the co-channel value.

FIGURE 6

Protection ratio template (FMTV/FMTV), for planning of broadcasting-satellite systems in Region 2



[47] See Annex 6 for the protection ratio template for interference between TV/FM signals in Regions 1 and 3.

The template is given by the following expressions:

$$PR = \begin{cases} 28 & \text{dB} & \text{for} & |F_0| \leq 8.36\ \text{MHz} \\ -2.762\ |F_0| + 51.09 & \text{dB} & \text{for} & 8.36 < |F_0| \leq 12.87\ \text{MHz} \\ -1.154\ |F_0| + 30.4 & \text{dB} & \text{for} & 12.87 < |F_0| \leq 21.25\ \text{MHz} \\ -2.00\ |F_0| + 48.38 & \text{dB} & \text{for} & |F_0| > 21.25\ \text{MHz} \end{cases}$$

where PR is the protection ratio (dB) and $|F_0|$ is the carrier spacing between the interfering and wanted signals (MHz).

3.5 Channel spacing

3.5.1 Channel spacing in the Plans

In Regions 1 and 3, the spacing between the assigned frequencies of two adjacent channels is 19.18 MHz.

In Region 2, the spacing between the assigned frequencies of two adjacent channels is 14.58 MHz, which corresponds to 32 channels in the 500 MHz bandwidth allocated to the broadcasting-satellite service.

The Plans give the assigned frequencies for each channel.

However, in the Regions 1 and 3 Plan, for the implementation of assignments different frequency spacing may be used subject to the successful application of the modification procedure of Article 4, ITU-R Recommendations for protection masks should be used if available. In the absence of such Recommendations, the Bureau should apply the worst-case approach as adopted by the Radio Regulations Board.

3.5.2 Arrangement of channels in the same beam

Planning in Region 1 at the 1977 Conference was carried out by trying to restrict all the channels radiated within a single antenna beam within a frequency range of 400 MHz, in order to simplify receiver construction. Such a restriction was considered unnecessary for the revision of the Regions 1 and 3 Plan at WRC-97.

3.5.3 Spacing between assigned channel frequencies feeding a common antenna

In the 1977 Plan for Regions 1 and 3, owing to technical difficulties in the output circuit of a satellite transmitter, spacing between the assigned frequencies of two channels feeding a common antenna was required to be greater than 40 MHz. This restriction was not imposed in the revision of the Plan.

3.6 Figure of merit (*G*/*T*) of a receiving station in the broadcasting-satellite service

In planning the broadcasting-satellite service, the value of the figure of merit *G*/*T* for clear-sky conditions is:

for Regions 1 and 3:

The original 1977 broadcasting-satellite service Plan used values[48] of:

6 dB(K^{-1}) for individual reception

14 dB(K^{-1}) for community reception, *and*

for Region 2:

10 dB(K^{-1}) for individual reception.

The 1997 revision of the Regions 1 and 3 Plan is based on a uniform value of the figure of merit *G*/*T* equal to 11 dB(K^{-1}).

These values were calculated from a formula which allows for pointing error, polarization effects and equipment ageing.

See also Report ITU-R BO.473-3 (Annex 1).

3.7 Receiving antennas

3.7.1 Half-power beamwidth of receiving antennas

In the development of the original 1977 broadcasting-satellite service Plan for Regions 1 and 3, the minimum receiving antenna diameter was such that the half-power beamwidth was 2° for individual reception and 1° for community reception.

In revising this Plan at WRC-97, the minimum receiving antenna diameter was such that the half-power beamwidth was 2.86°. (WRC-07)

For planning the broadcasting-satellite service in Region 2, the minimum receiving antenna diameter must be such that the half-power beamwidth φ_0 is 1.7°.

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[48] These values are still used 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.

3.7.2 Receiving antenna reference patterns

The co-polar and cross-polar receiving antenna reference patterns are given in Figs. 7, 7*bis* and 8.

a) For Regions 1 and 3, the original 1977 Conference Plan was based on the antenna pattern[49] shown in Fig. 7 where the relative antenna gain (dB) is given by the curves for:

– individual reception, for which use should be made of:

  – Curve A for the co-polar component;

  – Curve B for the cross-polar component;

– community reception, for which use should be made of:

  – Curve A′ up to the intersection with Curve C, then Curve C, for the co-polar component;

  – Curve B for the cross-polar component.

The WRC-97 revision of the Regions 1 and 3 broadcasting-satellite service Plan was based on the absolute gain (dBi) patterns for a 60 cm antenna given in Recommendation ITU-R BO.1213 as shown in Fig. 7*bis*.

b) For Region 2, the relative antenna gain (dB) is given by the curves in Fig. 8 for individual reception, for which use should be made of:

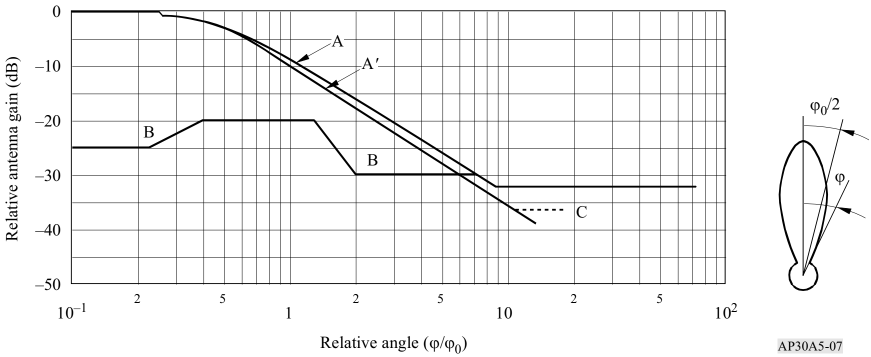
  – Curve A for the co-polar component;

  – Curve B for the cross-polar component.

[49] This antenna pattern is used in the broadcasting-satellite service Plan for Regions 1 and 3 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.

FIGURE 7

Co-polar and cross-polar receiving antenna reference patterns in Regions 1 and 3



Curve A: co-polar component for individual reception without side-lobe suppression (dB relative to main beam gain)

0	for 0	$\leq$	$\varphi \leq 0.25\ \varphi_0$	
$-12\left(\dfrac{\varphi}{\varphi_0}\right)^2$	for $0.25\ \varphi_0$	$<$	$\varphi \leq 0.707\ \varphi_0$	
$-\left[9.0 + 20\log\left(\dfrac{\varphi}{\varphi_0}\right)\right]$	for $0.707\ \varphi_0$	$<$	$\varphi \leq 1.26\ \varphi_0$	
$-\left[8.5 + 25\log\left(\dfrac{\varphi}{\varphi_0}\right)\right]$	for $1.26\ \varphi_0$	$<$	$\varphi \leq 9.55\ \varphi_0$	
-33	for		$\varphi < 9.55\ \varphi_0$	

Curve A′: co-polar component for community reception without side-lobe suppression (dB relative to main beam gain)

0	for 0	$\leq$	$\varphi \leq 0.25\ \varphi_0$	
$-12\left(\dfrac{\varphi}{\varphi_0}\right)^2$	for $0.25\ \varphi_0$	$<$	$\varphi \leq 0.86\ \varphi_0$	
$-\left[10.5 + 25\log\left(\dfrac{\varphi}{\varphi_0}\right)\right]$	for	$\varphi > 0.86\ \varphi_0$		up to intersection with Curve C (then Curve C)

Curve B: cross-polar component for both types of reception (dB relative to main beam gain)

-25	for	$0 \leq \varphi \leq 0.25\ \varphi_0$
$-\left(30 + 40 \log \left\| \frac{\varphi}{\varphi_0} - 1 \right\| \right)$	for	$0.25\ \varphi_0 < \varphi \leq 0.44\ \varphi_0$
-20	for	$0.44\ \varphi_0 < \varphi \leq 1.4\ \varphi_0$
$-\left(30 + 25 \log \left\| \frac{\varphi}{\varphi_0} - 1 \right\| \right)$	for	$1.4\ \varphi_0 < \varphi \leq 2\ \varphi_0$

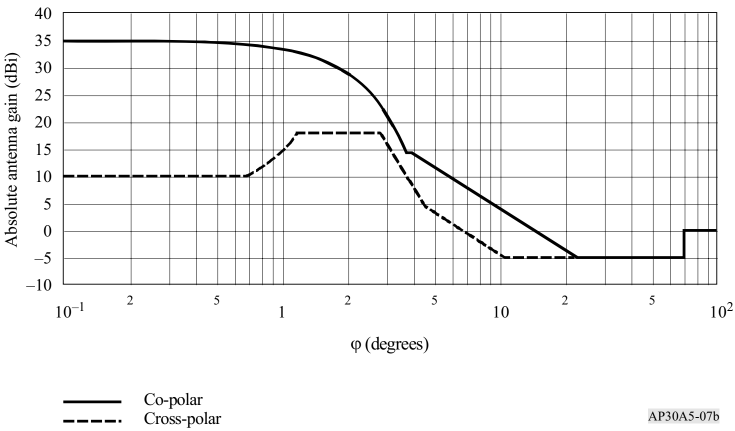
-30 until intersection with co-polar component curve; then co-polar component curve.

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 37 dBi).

NOTE – For values of φ_0 see § 3.7.1.

FIGURE 7*bis* (WRC-03)

Reference receiving earth station antenna patterns used at WRC-97 for revising the Regions 1 and 3 broadcasting-satellite service Plan



Co-polar pattern:

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

where:

$$\varphi_m = \frac{\lambda}{D} \sqrt{\frac{G_{max} - G_1}{0.0025}}$$

$$G_{co}(\varphi) = G_1 = 29 - 25 \log \varphi_r \quad \text{for } \varphi_m \leq \varphi < \varphi_r$$

where:

$$\varphi_r = 95 \frac{\lambda}{D}$$

$$G_{co}(\varphi) = 29 - 25 \log \varphi \quad \text{for } \varphi_r \leq \varphi < \varphi_b$$

where:

$$\varphi_b = 10^{(34/25)}$$

$G_{co}(\varphi) = -5$ dBi	for φ_b	$\leq \varphi < 70°$
$G_{co}(\varphi) = 0$ dBi	for 70°	$\leq \varphi < 180°$

Cross-polar pattern:

$G_{cross}(\varphi) = G_{max} - 25$ for $0 \leq \varphi < 0.25\,\varphi_0$

where:

$$\varphi_0 = 2\frac{\lambda}{D}\sqrt{\frac{3}{0.0025}} \text{ = 3 dB beamwidth}$$

$$G_{cross}(\varphi) = G_{max} - 25 + 8\left(\frac{\varphi - 0.25\,\varphi_0}{0.19\,\varphi_0}\right) \quad \text{for } 0.25\,\varphi_0 \leq \varphi < 0.44\,\varphi_0$$

$$G_{cross}(\varphi) = G_{max} - 17 \quad \text{for } 0.44\,\varphi_0 \leq \varphi < \varphi_0$$

$$G_{cross}(\varphi) = G_{max} - 17 + C\left|\frac{\varphi - \varphi_0}{\varphi_1 - \varphi_0}\right| \quad \text{for } \varphi_0 \leq \varphi < \varphi_1$$ (WRC-07)

where:

λ: wavelength corresponding to 12.1 GHz (m)

$C = 21 - 25\log\varphi_1 - (G_{max} - 17)$

$$\varphi_1 = \frac{\varphi_0}{2}\sqrt{10.1875}$$

$$G_{cross}(\varphi) = 21 - 25\log\varphi \quad \text{for } \varphi_1 \leq \varphi < \varphi_2$$

where:

$$\varphi_2 = 10^{(26/25)}$$

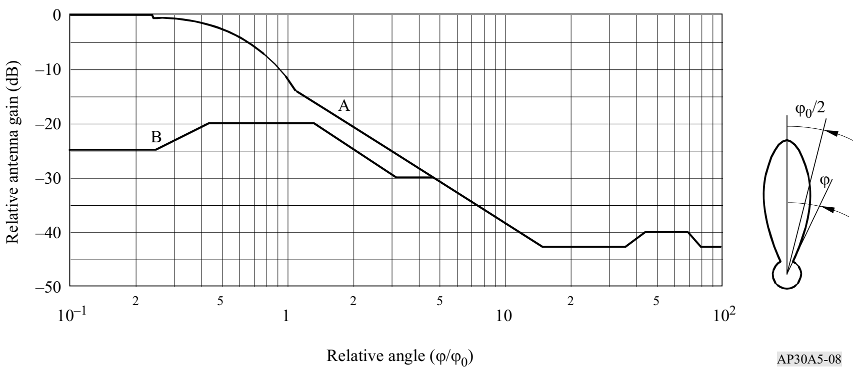
$G_{cross}(\varphi) = -5$ dBi	for	$\varphi_2 \leq \varphi < 70°$
$G_{cross}(\varphi) = 0$ dBi	for	$70° \leq \varphi < 180°$

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)

FIGURE 8

Reference patterns for co-polar and cross-polar components for receiving earth station antennas in Region 2



Curve A: co-polar component without side-lobe suppression (dB relative to main beam gain)

0	for	0	$\leq \varphi \leq$	$0.25\ \varphi_0$
$-12\ (\varphi/\varphi_0)^2$	for	$0.25\ \varphi_0$	$< \varphi \leq$	$1.13\ \varphi_0$
$-\{14\ +\ 25\log(\varphi/\varphi_0)\}$	for	$1.13\ \varphi_0$	$< \varphi \leq$	$14.7\ \varphi_0$
-43.2	for	$14.7\ \varphi_0$	$< \varphi \leq$	$35\ \varphi_0$
$-\{85.2\ -\ 27.2\log(\varphi/\varphi_0)\}$	for	$35\ \varphi_0$	$< \varphi \leq$	$45.1\ \varphi_0$
-40.2	for	$45.1\ \varphi_0$	$< \varphi \leq$	$70\ \varphi_0$
$-\{-55.2\ +\ 51.7\log(\varphi/\varphi_0)\}$	for	$70\ \varphi_0$	$< \varphi \leq$	$80\ \varphi_0$
-43.2	for	$80\ \varphi_0$	$< \varphi \leq$	$180°$

Curve B: cross-polar component (dB relative to main beam gain)

-25	for	0	$\leq \varphi \leq$	$0.25\ \varphi_0$
$-\left(30 + 40\log\left\|\frac{\varphi}{\varphi_0} - 1\right\|\right)$	for	$0.25\ \varphi_0$	$< \varphi \leq$	$0.44\ \varphi_0$
-20	for	$0.44\ \varphi_0$	$< \varphi \leq$	$1.28\ \varphi_0$
$-\left(17.3 + 25\log\left\|\frac{\varphi}{\varphi_0}\right\|\right)$	for	$1.28\ \varphi_0$	$< \varphi \leq$	$3.22\ \varphi_0$

-30 until intersection with co-polar component curve; then co-polar component curve.

NOTE 1 – For values of φ_0 see § 3.7.1.

NOTE 2 – In the angular range between 0.1 φ_0 and 1.13 φ_0 the co-polar and cross-polar gains must not exceed the reference patterns.

NOTE 3 – At off-axis angles larger than 1.13 φ_0 and for 90% of all sidelobe peaks in each of the reference angular windows, the gain must not exceed the reference patterns. The reference angular windows are 1.13 φ_0 to 3 φ_0, 3 φ_0 to 6 φ_0, 6 φ_0 to 10 φ_0, 10 φ_0 to 20 φ_0, 20 φ_0 to 40 φ_0, 40 φ_0 to 75 φ_0 and 75 φ_0 to 180°.

3.8 Necessary bandwidth

WARC-77 Regions 1 and 3 Plan and the WRC-97 revision of the Regions 1 and 3 Plan used the following:

– 625-line systems in Regions 1 and 3: 27 MHz;

– 525-line systems in Region 3: 27 MHz. (WRC-2000)

The planning at WRC-2000 was generally based on a necessary bandwidth of 27 MHz. (WRC-2000)

In Region 2, the Plan is based on a channel bandwidth of 24 MHz[50], but different bandwidths may be implemented in accordance with the provisions of this Appendix, provided that applicable ITU-R Recommendations are available. In the absence of such Recommendations, the Bureau will use the worst-case approach. (WRC-2000)

If different bandwidths and/or channel spacing are submitted, they will be treated in accordance with applicable ITU-R Recommendations for protection masks when available. In the absence of such Recommendations, the Bureau will use the worst-case approach. (WRC-2000)

3.9 Guardbands

3.9.1 A guardband is defined as the portion of the frequency spectrum between the edge of the allocated band and the edge of the necessary bandwidth of the emission in the nearest channel.

3.9.2 For the planning of the broadcasting-satellite service, the guardbands chosen at the 1977 Conference to protect the services in adjacent frequency bands are shown in the Table below.

Regions	Guardband at the lower edge of the band (MHz)	Guardband at the upper edge of the band (MHz)
1	14	11
2	12	12
3	14	11

For Regions 1 and 3 at WARC-77, the guardbands were derived on the assumption of analogue emissions and a maximum beam centre e.i.r.p. of 67 dBW (value relating to individual reception), and a filter roll-off of 2 dB/MHz. If smaller e.i.r.p. values are assumed, the guardbands can be reduced in width by 0.5 MHz for each decibel decrease in e.i.r.p. The degree of possible reduction also depends on improvements in technology and on the type of modulation. (WRC-2000)

[50] For France, Denmark and some of the United Kingdom requirements which use 625-line standards with greater video bandwidth, the channels shown in the Plan have a necessary bandwidth of 27 MHz. This is indicated by an appropriate symbol in the Plan.

3.9.3 (SUP - WRC-97)

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)

3.10 Orbital spacing

The Plan for Regions 1 and 3 has been based generally on nominal orbital positions spaced uniformly at intervals of 6°. The Plan for Region 2 has been based on a non-uniform spacing.

3.11 Satellite station-keeping

Space stations in the broadcasting-satellite service must be maintained in position with an accuracy equal to or better than ±0.1° in the E-W directions. For such space stations, the maintenance of the tolerance ±0.1° in the N-S direction is recommended but is not a requirement.

3.12 Elevation angle of receiving antennas

The Plans have been based on the desirability of a minimum angle of elevation of 20° to minimize the required e.i.r.p. of the satellite and to reduce the effects of shadowing and the possibility of interference from terrestrial services. However, for areas situated in latitudes above about 60°, the angle of elevation is of necessity less than 20°. Attention is also drawn to § 2.1 for the Regions 1 and 3 Plan and to § 2.2.3 for the Region 2 Plan.

For mountainous areas where an elevation angle of 20° may not suffice, an angle of at least 30° has been provided, where possible, to provide an acceptable service. An angle of elevation of at least 40° has been considered for service areas subject to high precipitation, but exceptions were made in some cases in Region 2.

Some dry, non-mountainous areas may be given an acceptable service at angles of elevation less than 20°.

In areas with small elevation angles, the shadowing effect of tall buildings may have to be taken into account.

In choosing a satellite position designed to give the maximum angle of elevation at the ground, the influence of such a position on the eclipse period was taken into account at the 1977 Conference. In the revision of the Regions 1 and 3 Plan at WRC-97, this influence was not considered to be a significant constraint on the choice of orbital position.

3.13 Transmitting antennas

3.13.1 Cross-section of transmitted beam

Planning in Regions 1, 2 and 3 has been generally based on the use of satellite transmitting antennas with beams of elliptical cross-section.

If the cross-section of the emitted beam is elliptical, the effective beamwidth φ_0 is a function of the angle of rotation between the plane containing the satellite and the major axis of the beam cross-section and the plane in which the beamwidth is required.

The relationship between the maximum gain of an antenna and the half-power beamwidth can be derived from the expression:

$$G_m = \frac{27\ 843}{ab}$$

where:

> a and b are the angles (degrees) subtended at the satellite by the major and minor axes of the elliptical cross-section of the beam; an antenna efficiency of 55% was assumed.

However, in implementing their assignments, administrations can choose beams other than elliptical, as described in Annex 2 to this Appendix, subject to successful application of the modification procedure of this Appendix.

3.13.2 Minimum beamwidth of transmitting antenna

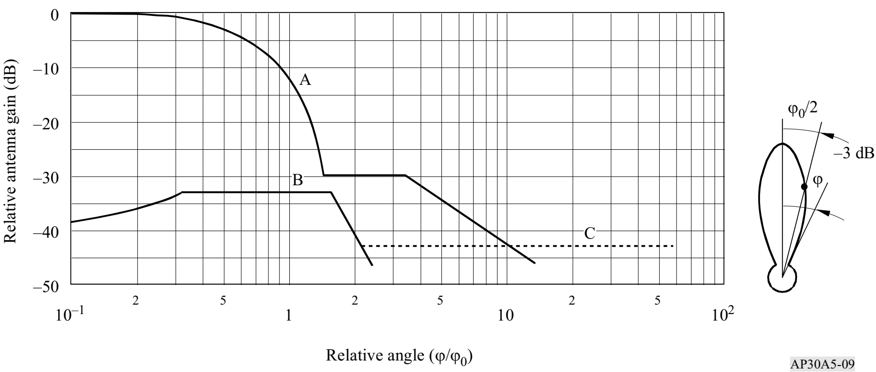
A minimum value of 0.6° for the half-power beamwidth of a transmitting antenna has been adopted for planning for Regions 1 and 3, and 0.8° for Region 2.

3.13.3 Transmitting antenna reference patterns

The reference patterns for the co-polar and cross-polar components of satellite transmitting antennas used in preparing the Plans are given in Fig. 9 for Regions 1 and 3, and in Fig. 10 for Region 2.

FIGURE 9

Reference patterns for co-polar and cross-polar components for satellite transmitting antennas in Regions 1 and 3



Curve A: co-polar component (dB relative to main beam gain)

$-12\left(\frac{\varphi}{\varphi_0}\right)^2$	for $0 \leq \varphi \leq 1.58\ \varphi_0$	
-30	for $1.58\ \varphi_0 < \varphi \leq 3.16\ \varphi_0$	
$-\left[17.5 = 25 \log\left(\frac{\varphi}{\varphi_0}\right)\right]$	for $\varphi > 3.16\ \varphi_0$	

after intersection with Curve C: as Curve C

Curve B: cross-polar component (dB relative to main beam gain)

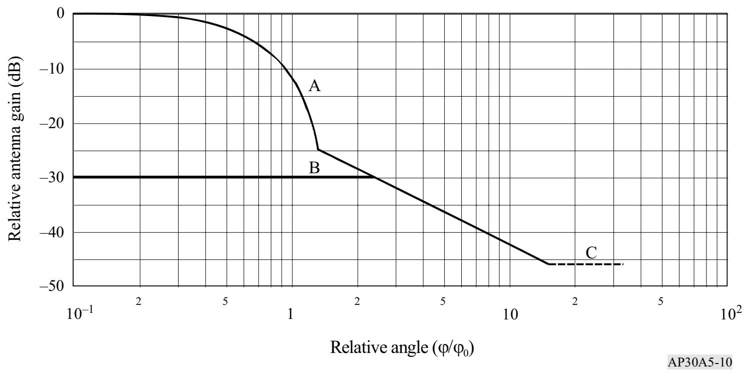
$-\left(40 + 40 \log\left\lvert\frac{\varphi}{\varphi_0} - 1\right\rvert\right)$	for $0 \leq \varphi \leq 0.33\ \varphi_0$	
-33	for $0.33\ \varphi_0 < \varphi \leq 1.67\ \varphi_0$	
$-\left(40 + 40 \log\left\lvert\frac{\varphi}{\varphi_0} - 1\right\rvert\right)$	for $\varphi > 1.67\ \varphi_0$	

after intersection with Curve C: as 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 43 dBi).

FIGURE 10

Reference patterns for co-polar and cross-polar components for satellite transmitting antennas in Region 2



Curve A: co-polar component (dB relative to main beam gain)

$$-12\left(\frac{\varphi}{\varphi_0}\right)^2 \quad \text{for} \quad 0 \leq (\varphi/\varphi_0) \leq 1.45$$

$$-\left(22 + 20\log\left(\frac{\varphi}{\varphi_0}\right)\right) \quad \text{for} \quad (\varphi/\varphi_0) > 1.45$$

after intersection with Curve C: Curve C

Curve B: cross-polar component (dB relative to main beam gain)

$$-30 \quad \text{for} \quad 0 \leq (\varphi/\varphi_0) \leq 2.51$$

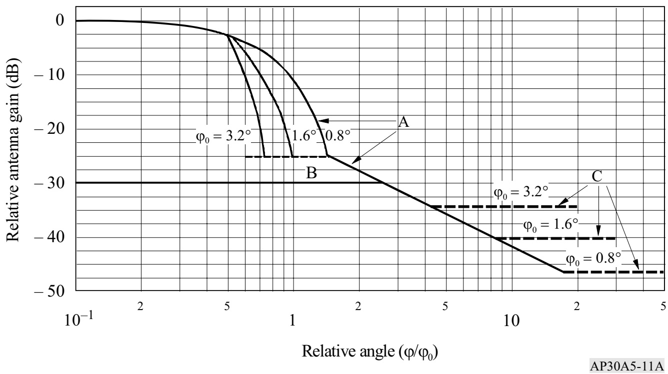
after intersection with co-polar pattern: co-polar pattern

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 46 dBi).

In Region 2, when it was necessary to reduce interference, the pattern shown in Fig. 11A was used; this use is indicated in the Plan by an appropriate symbol. This pattern is derived from an antenna producing an elliptical beam with fast roll-off in the main lobe assuming a “beamlet” half-power beamwidth of 0.8°. For Regions 1 and 3, the pattern shown in Fig. 11B, based on a “beamlet” beamwidth of 0.6° was used. Curves for three different values of φ_0 are shown as examples in Fig. 11A and in Fig. 11B.

FIGURE 11A

Reference patterns for co-polar and cross-polar components for satellite transmitting antennas with roll-off in the main beam for Region 2



Curve A: co-polar component (dB relative to main beam gain)

$$-12\left(\frac{\varphi}{\varphi_0}\right)^2 \qquad \text{for } 0 \leq (\varphi/\varphi_0) \leq 0.5$$

$$-12\left(\frac{\dfrac{\varphi}{\varphi_0} - x}{\dfrac{B_{min}}{\varphi_0}}\right)^2 \qquad \text{for } 0.5 < (\varphi/\varphi_0) \leq \left(\frac{1.45}{\varphi_0}B_{min} + x\right)$$

$$-25.23 \qquad \text{for } \left(\frac{1.45}{\varphi_0}B_{min} + x\right) < (\varphi/\varphi_0) \leq 1.45$$

$$-\left(22 + 20\log\left(\frac{\varphi}{\varphi_0}\right)\right) \qquad \text{for } (\varphi/\varphi_0) > 1.45$$

after intersection with Curve C: Curve C

Curve B: cross-polar component (dB relative to main beam gain)

$$-30 \qquad \text{for } 0 \leq (\varphi/\varphi_0) < 2.51$$

after intersection with co-polar pattern: co-polar pattern

Curve C: minus the on-axis gain (Curves A and C represent examples of three antennas having different values of φ_0 as labelled in Fig. 11A. The on-axis gains of these antennas are approximately 34, 40 and 46 dBi, respectively).

where:

φ : off-axis angle (degrees)

φ_0 : dimension of the minimum ellipse fitted around the downlink service area in the direction of interest (degrees)

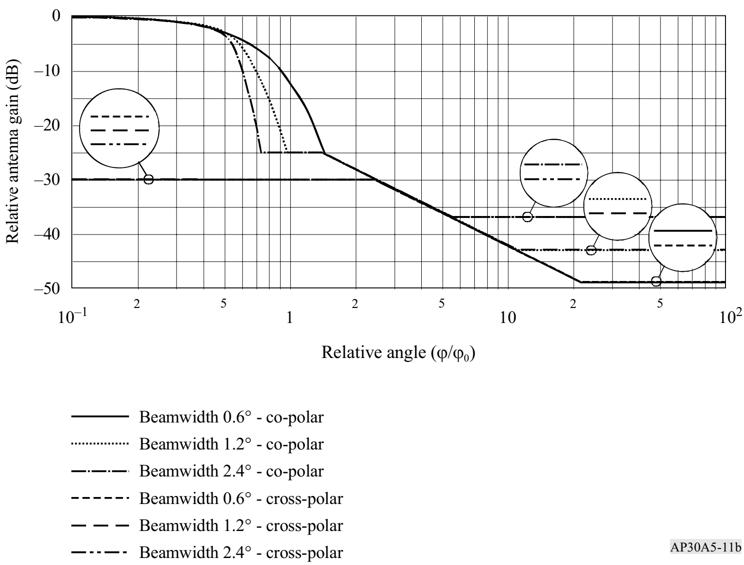
B_{min} = 0.8° for Region 2 and B_{min} = 0.6° for Regions 1 and 3

$$x = 0.5\left(1 - \frac{0.8}{\varphi_0}\right) \quad \text{in Region 2}$$

$$x = 0.5\left(1 - \frac{0.6}{\varphi_0}\right) \quad \text{in Regions 1 and 3}$$

FIGURE 11B

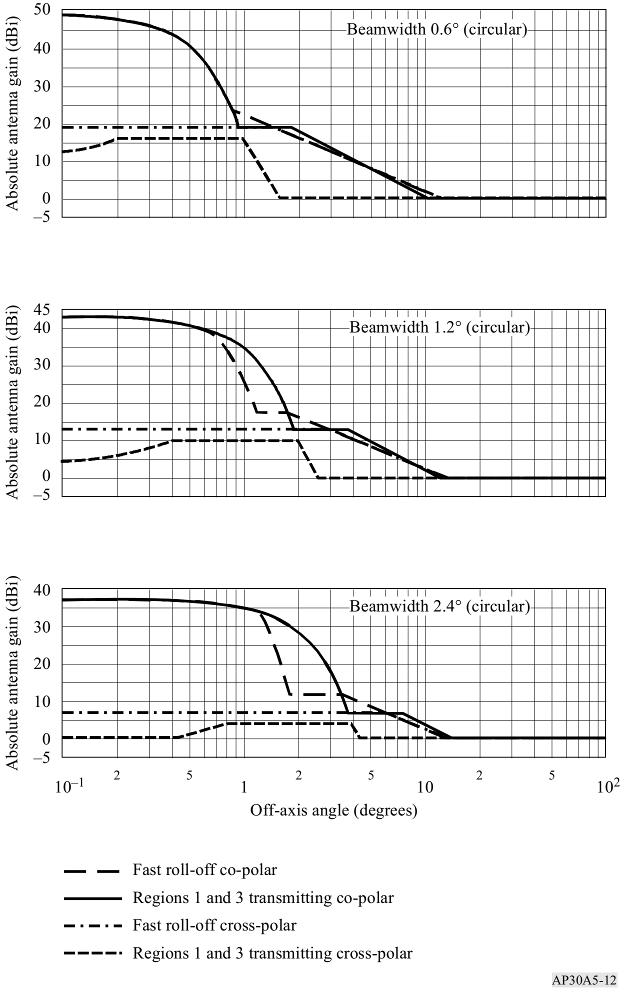
Fast roll-off antenna for Regions 1 and 3 Plan revision (beamlet beamwidth of 0.6°)



The difference in performance between the fast roll-off satellite transmitting antenna and the reference satellite transmitting antenna for Regions 1 and 3 is shown in Fig. 12.

FIGURE 12

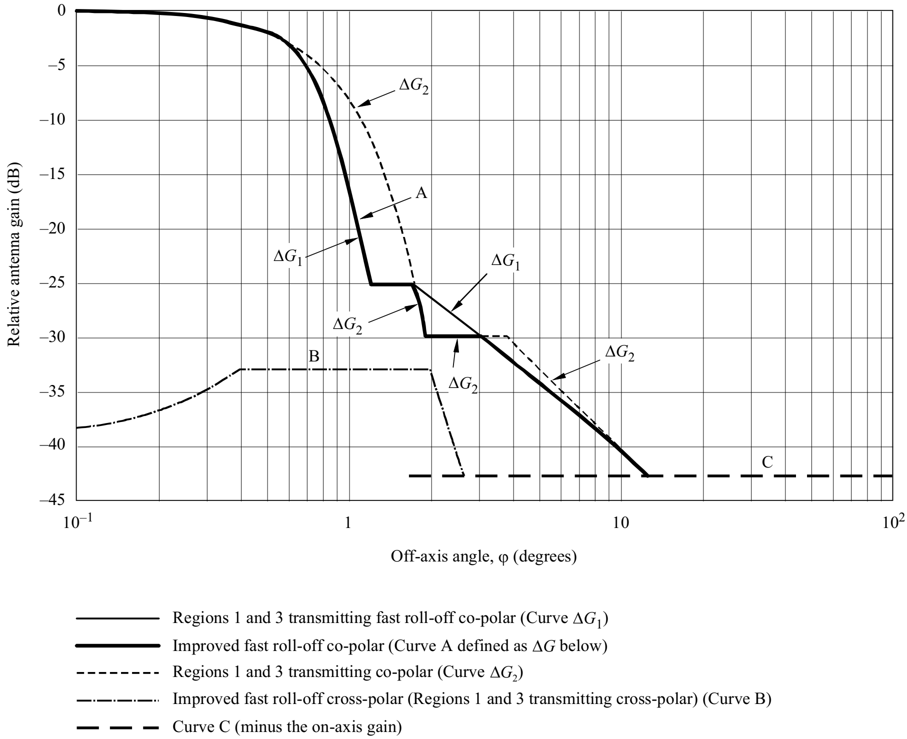
Comparison between fast roll-off and Regions 1 and 3 reference satellite transmitting antennas



The improved fast roll-off satellite transmitting antenna pattern described in Recommendation ITU-R BO.1445 (see Fig. 13) has been used in the planning at WRC-2000. (WRC-2000)

FIGURE 13 (Rev.WRC-03)

Improved fast roll-off satellite transmitting antenna pattern for Regions 1 and 3



Note 1 – The diagram gives the example curves in the case of a satellite antenna beamwidth of φ_0 = 1.2° (circular).

AP30A5-13

Curve A: co-polar relative gain (dB relative to main beam gain):

$$\Delta G = \min(\Delta G_1, \Delta G_2)$$

where:

$$\Delta G_1 = -12(\varphi/\varphi_0)^2 \qquad \text{for } 0 \leq (\varphi/\varphi_0) \leq 0.5$$

$$\Delta G_1 = -12\left(\frac{\dfrac{\varphi}{\varphi_0} - x}{\dfrac{B_{min}}{\varphi_0}}\right)^2 \qquad \text{for } 0.5 < (\varphi/\varphi_0) \leq \left(\frac{1.45}{\varphi_0}B_{min} + x\right)$$ (WRC-2000)

$\Delta G_1 = -25.23$ for $\left(\frac{1.45}{\varphi_0} B_{min} + x\right) < (\varphi/\varphi_0) \leq 1.45$ (WRC-03)

$\Delta G_1 = -(22 + 20 \log(\varphi/\varphi_0))$ for $(\varphi/\varphi_0) > 1.45$

$\Delta G_1 = -(G_{on\text{-}axis})$ after intersection with Curve C

$\Delta G_2 = -12(\varphi/\varphi_0)^2$ for $0 \leq \varphi \leq 1.58\ \varphi_0$

$\Delta G_2 = -30$ for $1.58\ \varphi_0 < \varphi \leq 3.16\ \varphi_0$

$\Delta G_2 = -(17.5 + 25 \log(\varphi/\varphi_0))$ for $\varphi > 3.16\ \varphi_0$

$\Delta G_2 = -(G_{on\text{-}axis})$ after intersection with Curve C

Curve B: cross-polar relative gain (dB):

$-\left(40 + 40 \log\left|\frac{\varphi}{\varphi_0} - 1\right|\right)$ for $0 \leq \varphi \leq 0.33\ \varphi_0$

-33 for $0.33\ \varphi_0 < \varphi \leq 1.67\ \varphi_0$

$-\left(40 + 40 \log\left|\frac{\varphi}{\varphi_0} - 1\right|\right)$ for $\varphi > 1.67\ \varphi_0$

$-(G_{on\text{-}axis})$ 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

$x = 0.5\left(1 - \frac{B_{min}}{\varphi_0}\right)$ (WRC-2000)

3.13.4 Composite beam

A composite beam represents a single beam (i.e. "simulated shaped beam") and is formed by combining two or more elliptical beams at a given orbital position. In general, composite beams were used at WRC-2000 for administrations which had more than one beam at a given orbital position in the WRC-97 Regions 1 and 3 Plan. (WRC-2000)

3.14 Satellite antenna pointing accuracy

3.14.1 The deviation of the antenna beam from its nominal pointing direction must not exceed a limit of 0.1° in any direction. Moreover, the angular rotation of a transmitting beam about its axis must not exceed a limit of ±1°; the limit on rotation is not necessary for beams of circular cross-section using circular polarization[51].

3.14.2 The following factors contribute to the total variation in the area on the surface of the Earth illuminated by the satellite beam:

– variations in satellite station-keeping;

– the variations caused by the pointing tolerances, which become more significant for coverage areas with low angles of elevation;

– the effect of the yaw error, which increases as the beam ellipse lengthens.

3.14.3 The effect of these possible variations should be assessed on a case-by-case basis, since their total effect on the area covered will vary with the geometry of the satellite beam, and it would not be reasonable to indicate a single value of shift in the area covered for all situations.

3.14.4 If linear polarization is used for an emission, yaw error makes a significant contribution to increasing the transmitted cross-polarized component; this increases the interference with other carriers which were originally cross-polarized with the emission in question.

3.15 Limitation of output power in the satellite transmitter

The output power of a space station transmitter in the broadcasting-satellite service must not rise by more than 0.25 dB relative to its nominal value throughout the life of the satellite.

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[51] In the original 1977 broadcasting-satellite service Plan for Regions 1 and 3, the angular rotation of a transmitting beam about its axis must not exceed a limit of ±2°. This limit is still applied 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.

3.16 Power flux-density at edge of coverage area

The original 1977 broadcasting-satellite service Plan used the following values[52] of the power flux-density at the edge of the coverage area exceeded for 99% of the worst month:

−103 dB(W/m^2) for individual reception in Regions 1 and 3;

−107 dB(W/m^2) for individual reception in Region 2 for 24 MHz, as well as for 27 MHz with respect to the cases mentioned in the footnote to § 3.8.

−111 dB(W/m^2) for community reception in Regions 1 and 3.

The 1997 revision of the Regions 1 and 3 Plan was generally based on a uniform value of the power flux-density at the edge of coverage area equal to −108 dB(W/m^2). This corresponds to the general reduction in e.i.r.p. of 5 dB referenced to the average e.i.r.p. of 63.9 dBW in the 1977 broadcasting-satellite service Plan.

3.17 Difference between the e.i.r.p. directed towards the edge of the coverage area and that on the axis of the beam

For planning, the absolute value of the difference between the e.i.r.p. directed towards the edge of the coverage area and that on the axis of the beam should preferably be 3 dB.

If the beam area is larger than the coverage area, the value will be less than 3 dB.

3.18 Use of energy dispersal

For planning, an energy dispersal value has been adopted which reduces by 22 dB the spectral power flux-density measured in a 4 kHz bandwidth in relation to that measured in the entire bandwidth: For frequency-modulated television signals, this reduction corresponds to a peak-to-peak deviation of 600 kHz. Digital modulation can achieve appropriate energy dispersal by proper implementation of digital modulation (e.g. by applying spectrum scrambling and/or interleaving).

3.19 Orbital separation limit for interference calculation

WRC-2000 has adopted the use of an orbital separation limit for interference calculation in Regions 1 and 3. Beyond this limit no interference was taken into account.

Initially, the values used for the orbital separation limit were 15° for co-polar and 9° for cross-polar emissions. At a later stage, the unique value of the orbital separation limit of 9° was adopted by WRC-2000. (WRC-2000)

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52 These values are still used 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.

ANNEX 6[53] (WRC-03)

Criteria for sharing between services

Part A – Technical bases for the criteria for interregional sharing between space services in Annexes 1 and 4

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 θ) 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).

[2] This antenna diameter does not apply for broadcasting-satellite service.

[53] Sections 1 and 2 are applicable when the services of Regions 1 or 3 are involved. Section 3 is applicable to all Regions.

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 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:

$$PFD_{all}(\theta) = 10 \log(\Delta T / T) + 10 \log(k\, T\, b_{rf}) + G_m - G_a(\varphi)$$

where:

$PFD_{all}(\theta)$: 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 m^2 effective aperture (dBi/m^2)

$G_a(\varphi)$: 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 sections 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 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/(m² · 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 section 1 above							

1 This antenna diameter applies to certain cases (see Annexes 1, 3 and 4).

2 This antenna diameter does not apply for broadcasting satellite service.

Part B – Sharing criteria used in establishing the WARC SAT-77 Plan

1 Protection requirements for sharing between services in the 12 GHz band

1.1 The establishment of sharing criteria for the different services using the 12 GHz band should be based on the protection requirements listed in the table below.

1.2 The values given as “total acceptable” are those necessary to protect the wanted signal. The “single entry” values are those which should be used as a guide for determining sharing criteria. The total interference from all sources must be calculated, since satisfying the “single entry” criteria for each source may not guarantee that the total interference meets the above protection requirements. A “single entry” is defined as the aggregate of emissions from any one station entering any receiver in the wanted service within the channel to be protected.

1.3 The carrier-to-interference ratio (C/I) refers to the ratio of the wanted-to-interfering power at the affected ground station. The value given shall be exceeded for 80% of the worst month for the fixed-satellite service, and for 99% of the worst month for the broadcasting service and the broadcasting-satellite service.

1.4 The term N refers to the post-demodulation noise power at a point of 0 dBm0 relative test tone level in any voice channel of an FDM/FM telephony system. The value given shall not be exceeded for 80% of the worst month.

1.5 The specified values of protection ratio (i.e., the carrier-to-interference power ratio corresponding to a specified picture quality) are applicable, for planning purposes, to television signals of any of the several television standards.

Wanted service[1]	Wanted signal[1]	Interfering service[1]	Interfering signal[1]	Protection requirements[2]	
				Total acceptable[3]	Single entry
BSS	TV/FM	BSS, FSS, FS, BS	TV/FM	C/I = 30 dB [4, 7]	C/I = 35 dB [4]
FSS	FDM/FM	BSS	TV/FM	N = 500 pW0p [8]	N = 300 pW0p
FSS	TV/FM	BSS, FSS	TV/FM	C/I = 32 dB [5]	C/I = 37 dB [5]
FSS	4φ-PSK	BSS, FSS	TV/FM	C/I = 30 dB	C/I = 35 dB
FSS	FDM/FM	FSS	FDM/FM	N = 1 000 pW0p	N = 400 pW0p
FS	FDM/FM	BSS	TV/FM	N = 1 000 pW0p	−125 dB(W/(m^2 · 4 kHz)) [6]
BS	TV/VSB	BSS	TV/FM	C/I = 50 dB	Not applicable

1 BSS: broadcasting-satellite service
FSS: fixed-satellite service
BS: broadcasting service
FS: fixed service
TV: television
FM: frequency modulation
FDM: frequency division multiplex
4φ-PSK: quadraphase shift keying
VSB: vestigial sideband.

2 These limits include both up-link and down-link contributions.

3 Values (dB) are protection ratios for the sum of interfering signals. Values (pW0p) represent interference noise in the worst telephone channels caused by the sum of interfering signals.

4 For BSS satellites located at the interfaces of the Regions 1 and 3 Plan and the Region 2 Plan, the C/I ratios should be 1 dB higher.

5 See Recommendation ITU-R S.483-3.

6 This value may be suitably modified for tropical regions to take account of rain attenuation. Allowance may also be made for polarization discrimination.

7 C/I: ratio of carrier-to-interfering signal.

8 N: noise power.

1.6 For broadcasting-satellite service systems with FM/TV as the wanted signal, the protection ratios are given for particular reference conditions, the most important of which are:

a) frequency deviation of the wanted signal (12 MHz peak-to-peak);

b) quality of the wanted service (grade 4.5)[54];

c) co-channel carriers (no carrier-frequency offset).

54 Impairment grade on a 5-point scale as defined in Recommendation ITU-R BT.500-7.

1.7 If system design is based on conditions other than those of § *a)* and *b)* above, the FM/TV protection ratio is given by:

$$R = 12.5 - 20 \log(D_v/12) - Q + 1.1\, Q^2 \qquad \text{dB}$$

where:

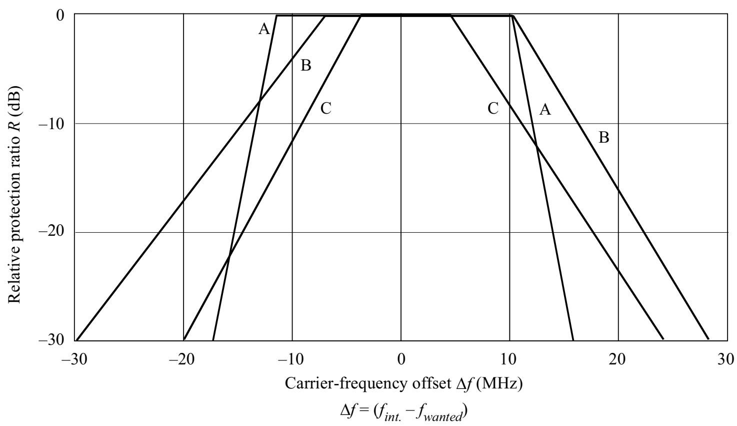
D_v: nominal peak-to-peak frequency deviation (MHz);

Q: the impairment grade, concerning the interference only.

1.8 When carriers are offset in frequency, condition of § *c)* does not apply and the adjacent channel protection ratios should be adjusted according to the frequency offset as shown in Fig. 1. For example, at a frequency offset of 20 MHz, the total acceptable ratio of protection against interference to an FM/TV signal from another FM/TV signal is 13 dB. The corresponding "single entry" value is 18 dB.

FIGURE 1

Reference case protection ratios relative to co-channel values



Curves A : TV/VSB-wanted, TV/FM interfering
B : TV/FM-wanted, TV/FM interfering
C : TV/FM-wanted, TV/VSB interfering

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2 Reference antenna diameter for a fixed-satellite earth station to be used in calculating interference from space stations in the broadcasting-satellite service

2.1 For antennas larger than 100 λ (2.5 m) in the fixed-satellite service, the gain of the side-lobes is given by the expression 32 − 25 log θ, where θ is the angle from the boresight (Recommendation ITU-R S.465-5). The side-lobe gain is independent of antenna diameter.

2.2 However, in the case of transmitting earth stations, the level of interference radiated into the up-link of other satellite systems would be inversely proportional to the square of the antenna diameter. In this case, the interference decreases with increasing antenna diameter. Since the 11.7-12.2 GHz band is only assigned in the space-to-Earth direction in the fixed-satellite service, this point is not of direct concern to the broadcasting-satellite service.

2.3 Hence it does not appear appropriate, for antenna diameters greater than 100 λ, to specify a minimum antenna diameter for receiving earth stations in the fixed-satellite service sharing the band 11.7-12.2 GHz. It may be useful to consider a 4.5 m antenna having an efficiency of 60% and an on-axis gain of 53 dB as typical for the purpose of planning the sharing of this band.

3 Use of energy dispersal in the broadcasting-satellite service

3.1 Artificial energy dispersal is useful in promoting sharing between the broadcasting-satellite service and the other services to which the band is also allocated.

3.2 Such energy dispersal is achieved by the addition at baseband of a triangular waveform to the video signal to form a composite baseband which, in turn, is used to frequency-modulate the up-link carrier. The frequency of the triangular waveform is usually synchronized at a sub-multiple of the television frame frequency. Typical frequencies range from 12.5 Hz to 30 Hz.

3.3 The Table below gives the relative reduction in spectral power flux-density in a 4 kHz bandwidth as a function of the peak-to-peak deviation due to the energy dispersal signal. This Table is based on the following equation:

$$\text{Relative reduction (dB) in a 4 kHz band} = 10 \log \frac{\Delta F_{pp} + \delta f_{rms}}{4}$$

where:

ΔF_{pp}: peak-to-peak deviation due to the energy dispersal signal (kHz);

δf_{rms}: rms deviation due to “natural” energy dispersal (kHz).

In compiling the table below, a value of 40 kHz has been assumed for δf_{rms}, on the basis of the value of 10 dB for "natural" dispersion given in Table IV of ex-CCIR Report 631* (Rev.76).

Reduction of spectral power flux-density relative to a 4 kHz bandwidth

Peak-to-peak deviation (kHz)	Relative reduction (dB)
0	10
100	15.44
200	17.78
300	19.29
400	20.41
500	21.30
600	22.04
700	22.67
800	23.22
900	23.71
1 000	24.15

3.4 The value of energy dispersal for the broadcasting-satellite service has been determined such that the spectral power flux-density measured in a 4 kHz bandwidth is reduced by 22 dB relative to that measured in the entire bandwidth; this reduction corresponds to a peak-to-peak deviation of 600 kHz.

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.

* *Note by the Secretariat*: See Report ITU-R BO.631.

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]

[1] Proposed new or modified assignments in the List which involve this orbital position shall not exceed the power flux-density limit −138 dB(W/(m^2 · 27 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 ±0.2°	33.5° W	30° W	25° W ±0.2°	19° W ±0.2°	13° W ±0.2°	7° W ±0.2°	4° W [1]	1° W ±0.2°	5° E ±0.2°	9° E [1]

[1] Proposed new or modified assignments in the List which involve this orbital position shall not exceed the power flux-density limit –138 dB(W/(m^2 · 27 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 ±0.2° 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**.)

APPENDIX 30A (REV.WRC-15)*

Provisions and associated Plans and List[1] for feeder links for the broadcasting-satellite service (11.7-12.5 GHz in Region 1, 12.2-12.7 GHz in Region 2 and 11.7-12.2 GHz in Region 3) in the frequency bands 14.5-14.8 GHz[2] and 17.3-18.1 GHz in Regions 1 and 3, and 17.3-17.8 GHz in Region 2 (WRC-03)

(See Articles **9** and **11**) (WRC-03)

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* 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)

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)

** *Note by the Secretariat*: This Resolution was abrogated by WRC-03.

2 This use of the band 14.5-14.8 GHz is reserved for countries outside Europe.

Note by the Secretariat: Reference to an Article with the number in roman is referring to an Article in this Appendix.

ARTICLE 1 (REV.WRC-03)

General definitions

1 For the purposes of this Appendix, the following terms shall have the meanings defined below:

1.1 *Regions 1 and 3 feeder-link Plan*: The Plan for feeder links in the frequency bands 14.5-14.8 GHz[3] and 17.3-18.1 GHz for the broadcasting-satellite service in Regions 1 and 3 contained in this Appendix.

1.2 *Region 2 feeder-link Plan*: The Plan for feeder links in the frequency band 17.3-17.8 GHz for the broadcasting-satellite service in Region 2 contained in this Appendix, together with any modifications resulting from the successful application of the procedure of Article 4.

1.3 *Frequency assignment in conformity with the Plan*:

– any frequency assignment for a receiving space station or transmitting earth station which appears in the Regions 1 and 3 feeder-link Plan; *or*

– any frequency assignment for a receiving space station or transmitting earth station which appears in the Region 2 feeder-link Plan or for which the procedure of Article 4 has been successfully applied.

1.4 *1983 Conference*: Regional Administrative Radio Conference for the Planning in Region 2 of the Broadcasting-Satellite Service in the Frequency Band 12.2-12.7 GHz and Associated Feeder-links in the Frequency Band 17.3-17.8 GHz, called in short Regional Administrative Conference for the Planning of the Broadcasting-Satellite Service in Region 2 (Geneva, 1983) (RARC Sat-R2).

1.5 *1985 Conference*: First Session of the World Administrative Radio Conference on the Use of the Geostationary-Satellite Orbit and the Planning of Space Services Utilizing It (Geneva, 1985), called in short WARC Orb-85.

1.6 *1988 Conference*: Second Session of the World Administrative Radio Conference on the Use of the Geostationary-Satellite Orbit and the Planning of Space Services Utilizing It (Geneva, 1988), called in short WARC Orb-88.

1.7 *1997 Conference*: World Radiocommunication Conference (Geneva, 1997), called in short WRC-97.

1.8 *2000 Conference*: World Radiocommunication Conference (Istanbul, 2000), called in short WRC-2000.

[3] This use of the band 14.5-14.8 GHz is reserved for countries outside Europe.

1.9 *Additional use in Regions 1 and 3*: For the application of the provisions of this Appendix, additional uses in Regions 1 and 3 are:

a) use of assignments with characteristics different from those appearing in the Regions 1 and 3 feeder-link Plan and which are capable of causing more interference than the corresponding entries in that Plan;

b) use of assignments in addition to those appearing in the Regions 1 and 3 feeder-link Plan.

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)

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)

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 (WRC-03)

Frequency bands

2.1 The provisions of this Appendix apply to the feeder-links in the fixed-satellite service (Earth-to-space) in the frequency bands 14.5-14.8 GHz and 17.3-18.1 GHz for the broadcasting-satellite service in Regions 1 and 3, and 17.3-17.z8 GHz for the broadcasting-satellite service in Region 2 and to other services to which these bands are allocated in Regions 1, 2 and 3 so far as their relationship to the fixed-satellite service (Earth-to-space) in these bands is concerned.

2.2 (SUP - WRC-03)

ARTICLE 2A (REV.WRC-15)

Use of the guardbands

2A.1 The use of the guardbands defined in § 3.1 and 4.1 of Annex 3 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 is not subject to the application of Section I of Article **9**.

[*] *Note by the Secretariat*: This Resolution was abrogated by WRC-03.

2A.1.1 Coordination between assignments intended to provide the space operation functions and assignments of the BSS feeder link subject to a Plan shall be effected using the provisions of Article 7.

2A.1.2 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.

2A.1.3 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.

2A.1.4 Requests for the coordination referred to in § 2A.1.1, 2A.1.2 and 2A.1.3 shall be sent by the requesting administration to the Bureau, together with the appropriate information listed in Appendix **4**.

2A.2 Any assignment intended to provide these functions in support of a geostationary-satellite network for the BSS feeder link shall be notified under Article **11** and brought into use within the following time-limits[3bis]: (WRC-15)

2A.2.1 *a)* for the case where the associated BSS feeder-link assignments are contained in one of 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), within the regulatory time-limit referred to in § 4.1.3 or 4.2.6 of Article 4 from the date of receipt by the Bureau of the complete Appendix **4** data for those assignments intended to provide the space operation functions;

2A.2.2 *b)* for the case where the associated BSS feeder-link assignments have been submitted under § 4.1.3 or § 4.2.6 of Article 4 for entry in the Regions 1 and 3 List or a modification to the Region 2 Plan, within the regulatory time-limit referred to in § 4.1.3 or § 4.2.6 of Article 4 for those associated BSS feeder-link assignments;

2A.2.3 *c)* for the case where the associated BSS feeder-link assignments have already been brought into use in accordance with the Radio Regulations, within the regulatory time-limit referred to in § 4.1.3 and § 4.2.6 of Article 4 from the date of receipt by the Bureau of the complete Appendix **4** data for those assignments intended to provide these space operation functions.

ARTICLE 3 (REV.WRC-03)

Execution of the provisions and associated Plans

3.1 The Member States in Regions 1, 2 and 3 shall adopt, for their feeder-link space and earth stations in the fixed-satellite service (Earth-to-space) in the frequency bands referred to in this Appendix, the characteristics specified in the appropriate Regional Plan and the associated provisions.

[3bis] The time-limit is established at the time when the request is received under § 2A.1.4. (WRC-15)

3.2 The Member States shall not change the characteristics specified in the Region 1 and 3 feeder-link Plan or in the Region 2 feeder-link Plan, or bring into use assignments to receiving space stations or transmitting earth stations in the fixed-satellite service or to stations of the other services to which these frequency bands are allocated, except as provided for in the Radio Regulations and the appropriate Articles and Annexes of this Appendix.

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)

3.4 The Regions 1 and 3 feeder-link Plan is based on national coverage from the geostationary-satellite orbit. The associated procedures contained in this Appendix are intended to promote long-term flexibility of the Plan and to avoid monopolization of the planned bands and orbit by a country or a group of countries.

ARTICLE 4 (REV.WRC-15)

Procedures for modifications to the Region 2 feeder-link Plan or for additional uses in Regions 1 and 3

4.1 Provisions applicable to Regions 1 and 3

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, 5]:

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*

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* *Note by the Secretariat*: This Resolution was revised by WRC-12 and WRC-15.

4 Agreement with administrations having a frequency assignment in the bands 14.5-14.8 GHz or 17.7-18.1 GHz to a terrestrial station, or having a frequency assignment in the band 17.7-18.1 GHz to an earth station in the fixed-satellite service (space-to-Earth), or having a frequency assignment in the band 17.3-17.8 GHz in the broadcasting-satellite service shall be sought under No. **9.17**, No. **9.17A** or No. **9.19**, respectively.

5 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)

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 frequency 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, or a frequency assignment in the frequency band 14.5-14.75 GHz in countries listed in Resolution **163 (WRC-15)** and in the frequency band 14.5-14.8 GHz in countries listed in Resolution **164 (WRC-15)**, in the fixed-satellite service (Earth-to-space) not subject to a Plan, 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-15)

4.1.2 The services of an administration are considered to be affected when the limits shown in Annex 1 are exceeded.

4.1.3 An administration, or one[6] 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 within eight years after the date of receipt by the Bureau of the relevant complete information. A proposed new or modified assignment not included in the List within eight years after the date of receipt by the Bureau of the relevant complete information[7] shall also lapse. (WRC-07)

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.

[6] 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)

[7] The provisions of Resolution **533 (Rev.WRC-2000)*** apply. (WRC-03)

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

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[8]. 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-15)** for the assignment with respect to the satellite that suffered the launch failure, if that information has not already been provided.

If, 11 months after the request for extension, the administration has not provided to the Bureau updated Resolution **49 (Rev.WRC-15)** information, the Bureau shall promptly send a reminder to the notifying administration. If, within one year of the request for extension, the administration has not provided to the Bureau updated Resolution **49 (Rev.WRC-15)** information for the new satellite under procurement, the related frequency assignments shall lapse. (WRC-15)

4.1.4 If the information received by the Bureau under § 4.1.3 is found to be incomplete, the Bureau shall immediately seek from the administration concerned any clarification required and information not provided.

4.1.5 The Bureau shall determine, on the basis of Annex 1, the administrations whose frequency assignments are considered to be affected. The Bureau shall publish[9], in a Special Section of its International Frequency Information Circular (BR IFIC), the complete information received under § 4.1.3, together with the names of the affected administrations, the corresponding fixed-satellite service networks, and the corresponding feeder-links to broadcasting-satellite service assignments, as appropriate. The Bureau shall immediately send a telegram/fax to the administration proposing the assignment, drawing its attention to the information contained in the relevant BR IFIC. (WRC-07)

4.1.6 The Bureau shall send a telegram/fax to the administrations listed in the Special Section of the BR IFIC, drawing their attention to the information it contains. (WRC-07)

4.1.7 An administration which considers that it should have been identified in the publication referred to under § 4.1.5 above shall, within four months of the date of publication of its relevant BR IFIC, and giving the technical reasons for so doing, request the Bureau to include its name in the publication. The Bureau shall study this information on the basis of Annex 1 and shall inform both administrations of its conclusions. Should the Bureau agree to the administration's request, it shall publish an addendum to the publication under § 4.1.5.

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8 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)

9 If the payments are not received in accordance with the provisions of Council Decision 482, as amended, on the implementation of cost recovery for satellite network filings, the Bureau shall cancel the publication, after informing the administration concerned. The Bureau shall inform all administrations of such action and that the network specified in the publication in question no longer has to be taken into consideration by the Bureau and other administrations. The Bureau shall send a reminder to the notifying administration not later than two months prior to the deadline for the payment in accordance with the above-mentioned Council Decision 482 unless the payment has already been received. (WRC-07)

4.1.7*bis* 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)

4.1.8 The administration seeking agreement or the administration with which agreement is sought may request any additional technical information it considers necessary. The administrations shall inform the Bureau of such requests.

4.1.9 Comments from administrations identified in the publication referred to under § 4.1.5 above shall be sent to the Bureau and to the administration proposing the modification. (WRC-15)

4.1.10 An administration that has not notified its agreement 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 § 4.1.5 shall be deemed to have not agreed to the proposed assignment unless the provisions of § 4.1.10a to 4.1.10d and § 4.1.21 are applied. This time-limit may be extended:

– for an administration that has requested additional information under § 4.1.8, by up to three months, *or*

– for an administration that has requested the assistance of the Bureau under § 4.1.21, by up to three months following the date at which the Bureau communicated the result of its action. (WRC-15)

4.1.10*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 § 4.1.10, bringing the matter to its attention. (WRC-03)

4.1.10*ter* (SUP - WRC-15)

4.1.10a After the same time period as specified in § 4.1.10, the notifying administration may, pursuant to § 4.1.21, request the Bureau to assist in respect of an administration which has not replied within this time period. (WRC-15)

4.1.10b The Bureau, acting under § 4.1.10a, shall send a reminder to the administration which has not replied, together with the results of its previously published compatibility analysis, containing the change in the values referred to in paragraph 4 of Annex 1 to Appendix **30A**, requesting a decision. (WRC-15)

4.1.10c Fifteen days before the expiry of the 30-day period referred to in § 4.1.10d, the Bureau shall send a reminder to the above-mentioned administration drawing its attention to the consequence of no reply. (WRC-15)

4.1.10d If no decision is communicated to the Bureau within 30 days after the date of dispatch of the reminder under § 4.1.10b, it shall be deemed that the administration which has not given a decision has agreed to the proposed assignment. (WRC-15)

4.1.11 If, in seeking agreement, an administration modifies its initial proposal, it shall again apply the provisions of § 4.1 and the subsequent procedure in cases where:

– the assignments of any other administration received by the Bureau in accordance with § 4.1.3 or § 4.2.6, or § 2A.1.4 of Article 2A, or § 7.1 of Article 7, or No. **9.7** before this modified proposal is received under § 4.1.12; *or*

– the assignments of any other administration contained in the Plans or the Lists,

are considered as being affected and receive more interference as a result of the modifications than that produced by the initial proposal. (WRC-15)

4.1.12 If agreement has been reached with the administrations identified in the publication referred to under § 4.1.5 above, the administration proposing the new or modified assignment may continue with the appropriate procedure in Article 5 and shall inform the Bureau, indicating the final characteristics of the frequency assignment together with the names of the administrations with which agreement has been reached. (WRC-15)

4.1.12*bis* 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)

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)

4.1.14 Where the proposed assignment involves developing countries, administrations shall seek all practicable solutions conducive to the economical development of the broadcasting-satellite systems of these countries.

4.1.15 The Bureau shall publish[10] 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)

4.1.16 In case of disagreement on the part of an administration whose agreement has been sought, the requesting administration should first endeavour to solve the problem by exploring all possible means of meeting its requirement. If the problem still cannot be solved by such means, the administration whose agreement has been sought should endeavour to overcome the difficulties as far as possible, and shall state the technical reasons for any disagreement if the administration seeking the agreement requests it to do so.

4.1.17 If no agreement is reached between the administrations concerned, the Bureau shall carry out any study that may be requested by either one of these administrations; the Bureau shall inform them of the result of the study and shall make such recommendations as it may be able to offer for the solution of the problem.

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[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 the above-mentioned Council Decision 482 unless the payment has already been received. (WRC-07)

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 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)

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)[11] 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)

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)

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)

4.1.21 An administration may, at any stage in the procedure described, or before applying it, request the assistance of the Bureau.

4.1.22 The relevant provisions of Article 5 shall be applied when frequency assignments are notified to the Bureau.

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)

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[11] For the definition of the EPM, see § 1.7 of Annex 3. (WRC-03)

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)

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-15)**, 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-15)

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)

4.1.27 When an administration has successfully applied this procedure and received all the agreements[12] 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)

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 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)

[12] In such a case, § 4.1.18 does not apply.

4.1.28 The feeder-link List, as updated, shall be published periodically by the Bureau. (WRC-03)

4.1.29 New or modified assignments in the feeder-link List shall be limited to digital modulation. (WRC-03)

4.2 Provisions applicable to Region 2

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)

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[13, 14, 15]:

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)

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[*] *Note by the Secretariat*: This Resolution was revised by WRC-12 and WRC-15.

[13] Agreement with administrations having a frequency assignment in the bands 17.7-17.8 GHz to a terrestrial station or to an earth station in the fixed-satellite service (space-to-Earth) shall be sought under No. **9.17** or No. **9.17A**, respectively.

[14] 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)

[15] Agreement with administrations having a frequency assignment in the band 17.3-17.8 GHz to an earth station in the broadcasting-satellite service shall be sought under No. **9.19**.

4.2.3 (Not used.)

4.2.4 The services of an administration are considered to be affected when the limits shown in Annex 1 are exceeded.

4.2.5 The agreement referred to in § 4.2.2 is not required when an administration proposes to bring into use, with characteristics appearing in the Region 2 feeder-link Plan, a fixed feeder-link earth station in the band 17.3-17.8 GHz or a transportable feeder-link earth station in the band 17.3-17.7 GHz. Administrations may communicate to the Bureau the characteristics of such earth stations for inclusion in this Plan.

4.2.6 An administration, or one[16] 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 within eight years after the date of receipt by the Bureau of the relevant complete information[17]. A request for a modification that has not been included in that Plan within eight years after the date of receipt by the Bureau of the relevant complete information[17] shall also lapse. (WRC-07)

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 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[18]. 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-15)** for the assignment with respect to the satellite that suffered the launch failure, if that information has not already been provided.

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[16] 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)

[17] The provisions of Resolution **533 (Rev.WRC-2000)*** apply. (WRC-03)

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

[18] 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)

If, 11 months after the request for extension, the administration has not provided to the Bureau updated Resolution **49 (Rev.WRC-15)** information, the Bureau shall promptly send a reminder to the notifying administration. If, within one year of the request for extension, the administration has not provided to the Bureau updated Resolution **49 (Rev.WRC-15)** information for the new satellite under procurement, the related frequency assignments shall lapse. (WRC-15)

4.2.7 If the information received by the Bureau under § 4.2.6 is found to be incomplete, the Bureau shall immediately seek from the administration concerned any clarification required and information not provided.

4.2.8 The Bureau shall determine, on the basis of Annex 1, the administrations whose frequency assignments are considered to be affected within the meaning of § 4.2.2. The Bureau shall publish[19], in a Special Section of its BR IFIC, the complete information received under § 4.2.6, together with the names of the affected administrations, the corresponding fixed-satellite service networks, and the corresponding feeder links to broadcasting-satellite service assignments, as appropriate. The Bureau shall immediately send a telegram/fax to the administration proposing the modification to the Region 2 feeder-link Plan, drawing its attention to the information contained in the relevant BR IFIC. (WRC-07)

4.2.9 The Bureau shall send a telegram/fax to the administrations listed in the Special Section of its BR IFIC, drawing their attention to the information it contains. (WRC-07)

4.2.10 An administration which considers that it should have been included in the publication referred to under § 4.2.8 above shall, within four months of the date of publication in the relevant BR IFIC, and giving the technical reasons for so doing, request the Bureau to include its name in the publication. The Bureau shall study this information on the basis of Annex 1 and shall inform both administrations of its conclusions. Should the Bureau agree to the administration's request, it shall publish an addendum to the publication under § 4.2.8. (WRC-07)

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)

4.2.12 The administration seeking agreement or the administration with which agreement is sought may request any additional technical information it considers necessary. The administrations shall inform the Bureau of such requests.

4.2.13 Comments from administrations on the information published pursuant to § 4.2.8 should be sent either directly to the administration proposing the modification or through the Bureau. In any event, the Bureau shall be informed that comments have been made.

[19] If the payments are not received in accordance with the provisions of Council Decision 482, as amended, on the implementation of cost recovery for satellite network filings, the Bureau shall cancel the publication, after informing the administration concerned. The Bureau shall inform all administrations of such action and that the network specified in the publication in question no longer has to be taken into consideration by the Bureau and other administrations. The Bureau shall send a reminder to the notifying administration not later than two months prior to the deadline for the payment in accordance with the above-mentioned Council Decision 482 unless the payment has already been received. (WRC-07)

4.2.14 An administration which has not notified 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 § 4.2.8 shall be deemed to have agreed to the proposed modification. This time-limit may be extended by up to three months for an administration which has requested additional information under § 4.2.12 or for an administration which has requested the assistance of the Bureau under § 4.2.22. In the latter case, the Bureau shall inform the administrations concerned of this request.

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)

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. (WRC-03)

4.2.15 If, in seeking agreement, an administration modifies its initial proposal, it shall again apply the provisions of § 4.2 and the consequent procedure with respect to any other administration whose services might be affected as a result of modifications to the initial proposal.

4.2.16 If no comments have been received on the expiry of the periods specified in § 4.2.14, or if agreement has been reached with the administrations which have made comments and with which agreement is necessary, the administration proposing the modification may continue with the appropriate procedure in Article 5, and shall so inform the Bureau, indicating the final characteristics of the frequency assignment together with the names of the administrations with which agreement has been reached.

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)

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)

4.2.18 When the proposed modification to the Region 2 feeder-link Plan involves developing countries, administrations shall seek all practicable solutions conducive to the economical development of the broadcasting-satellite systems of these countries.

4.2.19 The Bureau shall publish[20] 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)

[20] If the payments are not received in accordance with the provisions of Council Decision 482, as amended, on the implementation of cost recovery for satellite network filings, the Bureau shall cancel the publication, after informing the administration concerned. The Bureau shall inform all administrations of such action and that the network specified in the publication in question no longer has to be taken into consideration by the Bureau and other administrations. The Bureau shall send a reminder to the notifying administration not later than two months prior to the deadline for the payment in accordance with the above-mentioned Council Decision 482 unless the payment has already been received. (WRC-07)

4.2.20 When an administration proposing to modify the characteristics of a frequency assignment or to make a new frequency assignment receives notice of disagreement on the part of an administration whose agreement it has sought, it should first endeavour to solve the problem by exploring all possible means of meeting its requirement. If the problem still cannot be solved by such means, the administration whose agreement has been sought should endeavour to overcome the difficulties as far as possible, and shall state the technical reasons for any disagreement if the administration seeking the agreement requests it to do so.

4.2.21 If no agreement is reached between the administrations concerned, the Bureau shall carry out any study that may be requested by these administrations; the Bureau shall inform them of the result of the study and shall make such recommendations as it may be able to offer for the solution of the problem.

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 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)

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)

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)

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)

4.2.22 An administration may at any stage in the procedure described, or before applying it, request the assistance of the Bureau.

4.2.23 The relevant provisions of Article 5 shall be applied when frequency assignments are notified to the Bureau.

4.2.24 Cancellation of frequency assignments

When a frequency assignment in conformity with the Region 2 feeder-link Plan is no longer required, whether or not as a result of a modification, 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 Region 2 feeder-link Plan.

4.2.25 Master copy of the Region 2 feeder-link Plan

4.2.25.1 The Bureau shall maintain an up-to-date master copy of the Region 2 feeder-link Plan, including the overall equivalent protection margins of each assignment, taking account of the application of the procedure set out in this Article. This master copy shall contain the overall equivalent protection margins derived from that Plan as established by the 1983 Conference and those derived from all modifications to that Plan as a result of the successful completion of the modification procedure set out in this Article.

4.2.25.2 An up-to-date version of the Region 2 feeder-link Plan shall be published by the Secretary-General when justified by the circumstances.

ARTICLE 5 (REV.WRC-15)

Coordination, notification, examination and recording in the Master International Frequency Register of frequency assignments to feeder-link transmitting earth stations and receiving space stations in the fixed-satellite service[21, 22] (WRC-07)

5.1 Coordination and notification

5.1.1 When an administration wishes to determine whether it is possible to use, at a given location, an amount of power control which is in excess of that contained in column 12 of the Regions 1 and 3 feeder-link Plan, it shall request the Bureau to determine the amount of permissible power control (not to exceed 10 dB) from that given location using the procedure contained in § 3.11 of Annex 3.

5.1.2 Whenever an administration[23] 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)

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[21] Notification of assignments to transmitting feeder-link earth stations included in the Region 2 feeder-link Plan after 2 June 2000, or included in the feeder-link List, following successful application of Article 4, shall be effected applying the provisions of Article **11** following completion of the procedure of Article **9**. (WRC-03)

[22] If the payments are not received in accordance with the provisions of Council Decision 482, as amended, on the implementation of cost recovery for satellite network filings, the Bureau shall cancel the publication specified in § 5.1.10 and the corresponding entries in the Master Register under § 5.2.2, 5.2.2.1 or 5.2.2.2, as appropriate, and the corresponding entries included in the Plan on and after 3 June 2000 or in the List, as appropriate, after informing the administration concerned. The Bureau shall inform all administrations of such action. The Bureau shall send a reminder to the notifying administration not later than two months prior to the deadline for the payment in accordance with the above-mentioned Council Decision 482 unless the payment has already been received. See also Resolution **905 (WRC-07)***. (WRC-07)

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

[23] 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)

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)

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)

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[24]. (WRC-03)

5.1.5 If an administration with which coordination is sought under § 5.1.4 does not respond within three months, the administration intending to bring into use a frequency assignment to a feeder-link earth station shall notify this frequency assignment in accordance with § 5.1.2 above.

5.1.6 For any notification under § 5.1.2, an individual notice for each frequency assignment shall be drawn up as prescribed in Appendix **4**, the various sections of which specify the basic characteristics to be provided as appropriate. It is recommended that the notifying administration should also supply any other data it may consider useful.

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)

5.1.7 Each notice must reach the Bureau not earlier than three years before the date on which the frequency assignment is to be brought into use. In any case, the notice must reach the Bureau not later than three months before that date.

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[24] 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)

5.1.8 Any frequency assignment the notice of which reaches the Bureau after the applicable period specified in § 5.1.7 shall, where it is to be recorded, bear a remark in the Master Register to indicate that it is not in conformity with § 5.1.7.

5.1.9 Any notice made under § 5.1.2 which does not contain the characteristics specified in Appendix **4** shall be returned by the Bureau immediately by airmail to the notifying administration with the relevant reasons.

5.1.10 Upon receipt of a complete notice, the Bureau shall include its particulars, with the date of receipt, in its BR IFIC which shall contain the particulars of all such notices received since the publication of the previous Circular.

5.1.11 The Circular shall constitute the acknowledgements to the notifying administration of the receipt of a complete notice.

5.1.12 Complete notices shall be considered by the Bureau in order of receipt. The Bureau shall not postpone its finding unless it lacks sufficient data to reach a decision; moreover, the Bureau shall not act upon any notice which has a technical bearing on an earlier notice still under consideration by the Bureau until it has reached a finding with respect to such earlier notice.

5.2 Examination and recording

5.2.1 The Bureau shall examine each notice:

a) with respect to its conformity with the Convention and the relevant provisions of the Radio Regulations (with the exception of those relating to § *b)*, *c)*, *d)*, *e)* and *f)* below); *and*

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)

c) with respect to the coordination requirements specified in the Remarks column of Article 9 or Article 9A; *or*

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; (WRC-03)

e) for Region 2, with respect to its conformity with the provisions of Resolution **42 (Rev.WRC-03)***; (WRC-03)

f) for Regions 1 and 3, with respect to its conformity with the provisions of § 5.1.3 and also its conformity with § 5.1.4 or 5.1.5 relating to coordination.

5.2.2 When the Bureau reaches a favourable finding with respect to § 5.2.1 *a)*, 5.2.1 *b)*, 5.2.1 *c)* and 5.2.1 *f)*, the frequency assignment of an administration shall be recorded in the Master Register. The date of receipt of the notice by the Bureau shall be entered in the Master Register. In relations between administrations all frequency assignments brought into use in conformity with the feeder-link Plan and recorded in the Master Register shall be considered to have the same status irrespective of the dates of receipt entered in the Master Register for such frequency assignments. (WRC-07)

5.2.2.1 When the Bureau reaches a favourable finding with respect to § 5.2.1 *a)*, 5.2.1 *c)*, 5.2.1 *d)* and 5.2.1 *f)*, the frequency assignment shall be recorded in the Master Register. The date of receipt of the notice by the Bureau shall be entered in the Master Register. In relations between administrations, all frequency assignments brought into use in conformity with the feeder-link Plan and recorded in the Master Register shall be considered to have the same status irrespective of the dates of receipt entered in the Master Register for such frequency assignments. When recording these assignments, the Bureau shall indicate by an appropriate symbol the characteristics having a value different from that appearing in that Plan. (WRC-07)

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 the Master Register. 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 of receipt entered in the Master Register 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-07)

5.2.2.3 In the case of Regions 1 and 3, 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)*, the notice shall be returned immediately by airmail to the notifying administration with the Bureau's reasons for this finding and with such suggestions as the Bureau may be able to offer with a view to a satisfactory solution of the problem.

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* *Note by the Secretariat*: This Resolution was revised by WRC-12 and WRC-15.

5.2.2.4 In the case of Regions 1 and 3, when the Bureau reaches a favourable finding with respect to § 5.2.1 *a)*, 5.2.1 *b)*, 5.2.1 *c)* and 5.2.1 *d)* but an unfavourable finding with respect to § 5.2.1 *f)*, the notice shall be returned immediately by airmail to the notifying administration with the Bureau's reasons for this finding and with such suggestions as the Bureau may be able to offer with a view to a satisfactory solution of the problem. If the unfavourable finding under § 5.2.1 *f)* is due to the coordination under § 5.1.3 only not being effected, the administration shall undertake only to bring this assignment into use with an e.i.r.p. level not greater than the sum of the values specified in columns 11 and 12 of the Regions 1 and 3 feeder-link Plan.

5.2.2.5 When an assignment is recorded as a result of a favourable finding with respect to § 5.2.1 *f)*, a remark shall be included indicating that coordination has been effected.

5.2.3 Whenever a frequency assignment is recorded in the Master Register, the finding reached by the Bureau shall be indicated. (WRC-07)

5.2.4 When the Bureau reaches an unfavourable finding with respect to:

– § 5.2.1 *a)*, *or*

– § 5.2.1 *c)*, *or*

– § 5.2.1 *b)* and 5.2.1 *d)* and, where appropriate, § 5.2.1 *e)*,

the notice shall be returned immediately by airmail to the notifying administration with the Bureau's reasons for this finding and with such suggestions as the Bureau may be able to offer with a view to a satisfactory solution of the problem.

5.2.5 When the notifying administration resubmits the notice and the finding of the Bureau becomes favourable with respect to the appropriate parts of § 5.2.1, the notice shall be treated as in § 5.2.2, 5.2.2.1 or 5.2.2.2 as appropriate.

5.2.6 If the notifying administration resubmits the notice without modification and insists on its reconsideration, and if the Bureau's finding with respect to § 5.2.1 remains unfavourable, the notice is returned to the notifying administration in accordance with § 5.2.4. In this case, the notifying administration undertakes not to bring into use the frequency assignment until the condition specified in § 5.2.5 is fulfilled.

5.2.7 If a frequency assignment notified in advance of bringing into use in conformity with § 5.1.3 has received a favourable finding by the Bureau with respect to the provisions of § 5.2.1, it shall be entered provisionally in the Master Register with a special symbol in the Remarks Column indicating the provisional nature of that entry.

5.2.8 When the Bureau has received confirmation that the frequency assignment has been brought into use, the Bureau shall remove the symbol in the Master Register.

5.2.9 The date of bringing into use notified by the administration concerned shall be recorded in the Master Register. (WRC-07)

5.2.10 Wherever the use of a frequency assignment to a space station recorded in the Master Register and emanating from the Regions 1 and 3 List is suspended for a period exceeding six months, the notifying administration shall inform the Bureau of the date on which such use was suspended. When the recorded assignment is brought back into use, the notifying administration shall so inform the Bureau, as soon as possible. On receipt of the information sent under this provision, the Bureau shall make that information available on the ITU website as soon as possible and shall publish it in the BR IFIC. The date on which the recorded assignment is brought back into use[24*bis*] shall be no later than three years from the date on which the use of the frequency assignment was suspended, provided that the notifying administration informs the Bureau of the suspension within six months from the date on which the use was suspended. If the notifying administration informs the Bureau of the suspension more than six months after the date on which the use of the frequency assignment was suspended, this three-year time period shall be reduced. In this case, the amount by which the three-year period shall be reduced shall be equal to the amount of time that has elapsed between the end of the six-month period and the date that the Bureau is informed of the suspension. If the notifying administration informs the Bureau of the suspension more than 21 months after the date on which the use of the frequency assignment was suspended, the frequency assignment shall be cancelled. (WRC-15)

5.2.11 If a recorded frequency assignment stemming from the Regions 1 and 3 List is not brought back into use within the suspension period resulting from the application of § 5.2.10 above, the Bureau shall cancel the assignment from the Master Register and the assignment in the List, unless the assignment is one to which § 4.1.26 or § 4.1.27 is being applied. (WRC-15)

5.3 Cancellation of entries in the Master Register

5.3.1 Any notified frequency assignment to which the Article 4 procedures have been applied and which has been provisionally recorded under § 5.2.7 shall be brought into use no later than the end of the period provided under § 4.1.3, 4.1.3*bis*, 4.2.6 or 4.2.6*bis* of Article 4. Any other frequency assignment provisionally recorded under § 5.2.7 shall be brought into use by the date specified in the notice. Unless the Bureau has been informed by the notifying administration of the bringing into use of the assignment under § 5.2.8, it shall, no later than 15 days before the notified date of bringing into use or the end of the regulatory period established under § 4.1.3, 4.1.3*bis*, 4.2.6 or 4.2.6*bis* of Article 4, as appropriate, send a reminder requesting confirmation that the assignment has been brought into use within the regulatory period. If the Bureau does not receive that confirmation within 30 days following the notified date of bringing into use or the period provided under § 4.1.3, 4.1.3*bis*, 4.2.6 or 4.2.6*bis* of Article 4, as the case may be, it shall cancel the entry in the Master Register. (WRC-15)

5.3.2 If the use of any recorded frequency assignment is permanently discontinued, the notifying administration shall so inform the Bureau within three months, whereupon the entry shall be removed from the Master Register.

[24*bis*] The date of bringing back into use of a frequency assignment to a space station in the geostationary-satellite orbit shall be the commencement of the 90-day period defined below. A frequency assignment to a space station in the geostationary-satellite orbit shall be considered as having been brought back into use when a space station in the geostationary-satellite orbit with the capability of transmitting or receiving that frequency assignment has been deployed and maintained at the notified orbital position for a continuous period of 90 days. The notifying administration shall inform the Bureau within 30 days from the end of the 90-day period. Resolution **40 (WRC-15)** shall apply. (WRC-15)

ARTICLE 6 (REV.WRC-15)

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[25] are involved[26]

6.1 Administrations planning to implement assignments for 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 should evaluate the level of interference assessed on the basis of coordination contours calculated in accordance with Appendix **7**[27], which might be caused by a feeder-link earth station located on the territory of another administration and included in the service area of an assignment to a broadcasting-satellite service feeder-link space station which is in conformity with the appropriate regional feeder-link Plan. Should the administration planning terrestrial stations find that interference may be caused by such a feeder-link earth station, it may request the administration responsible for the feeder-link earth station to indicate the geographical coordinates, the antenna characteristics and the horizon elevation angle around its existing and planned feeder-link earth stations.

6.2 In the case of Region 2, when the entry in the feeder-link Plan contains information on specific earth stations, this shall be used in the interference calculations referred to in § 6.1 above. Where such information is not contained in the Region 2 feeder-link Plan, an administration which receives a request under § 6.1 shall, within a period of four months, communicate the details of the feeder-link earth stations to the administration planning the terrestrial station, and to the Bureau in order to update this Plan.

6.3 In the case of Regions 1 and 3, an administration which receives a request under § 6.1 shall, within a period of four months, communicate the details of the feeder-link stations to the administration planning the terrestrial station, and to the Bureau for information.

6.4 If, at the end of the period of four months, the administration responsible for the terrestrial station does not receive a reply, it may request the assistance of the Bureau.

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[25] Only assignments included in the Region 2 feeder-link Plan before 3 June 2000 shall be taken into account. (WRC-03)

[26] These procedures do not replace the procedures prescribed for terrestrial stations in Articles **9** and **11**. (WRC-03)

[27] In the case of Regions 1 and 3, the feeder-link earth-station power to be taken into account is obtained by adding the values specified in Columns 11 and 12 of the feeder-link Plan.

6.5 If the administration responsible for the feeder-link earth station does not communicate to the Bureau, within a period of four months, the information requested under § 6.1, this administration shall only implement its feeder-link earth station provided it does not cause harmful interference to the terrestrial station under consideration.

6.6 If, as a result of the application of this Article, an agreement is reached with the administration responsible for the feeder-link earth station or no comments have been received, the administration responsible for the terrestrial station may notify this station under Article **11** for recording in the Master Register. A remark shall be included indicating either that an agreement has been reached or that no comments have been received.

ARTICLE 7 (REV.WRC-15)

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 frequency band 17.3-18.1 GHz and in Regions 2 and 3 in the frequency band 17.7-18.1 GHz, to stations in the fixed-satellite service (Earth-to-space) in Region 2 in the frequency band 17.8-18.1 GHz, to stations in the fixed-satellite service (Earth-to-space) in countries listed in Resolution 163 (WRC-15) in the frequency band 14.5-14.75 GHz and in countries listed in Resolution 164 (WRC-15) in the frequency band 14.5-14.8 GHz where those stations are not for feeder links for the broadcasting-satellite service, and to stations in the broadcasting-satellite service in Region 2 in the frequency band 17.3-17.8 GHz when frequency assignments to feeder links for broadcasting-satellite stations in the frequency bands 14.5-14.8 GHz and 17.3-18.1 GHz in Regions 1 and 3 or in the band 17.3-17.8 GHz in Region 2 are involved[28]

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

7.1 The provisions of No. **9.7**[29] 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 frequency band 17.3-18.1 GHz, to transmitting space stations in the fixed-satellite service in Regions 2 and 3 in

[28] 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)

[29] The provisions of Resolution **33 (Rev.WRC-97)**[*] are applicable to space stations in the broadcasting-satellite service for which the advance publication information or the request for coordination has been received by the Bureau prior to 1 January 1999.

[*] *Note by the Secretariat*: This Resolution was revised by WRC-03 and WRC-15.

the frequency band 17.7-18.1 GHz, to transmitting earth stations in the fixed-satellite service in Region 2 in the frequency band 17.8-18.1 GHz, to transmitting earth stations in the fixed-satellite service in countries listed in Resolution **163 (WRC-15)** in the frequency band 14.5-14.75 GHz and in countries listed in Resolution **164 (WRC-15)** in the frequency band 14.5-14.8 GHz where those stations are not for feeder links for the broadcasting-satellite service, and to transmitting space stations in the broadcasting-satellite service in Region 2 in the frequency band 17.3-17.8 GHz. (WRC-15)

7.2 In applying the procedures referred to in § 7.1, the provisions of Appendix **5** are replaced by the following:

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)

7.2.2 The criteria to be applied are those given in Annex 4.

7.2*bis* In applying the procedures referred to in § 7.1 for FSS frequency assignments in countries listed in Resolution **163 (WRC-15)** in the frequency band 14.5-14.75 GHz and in countries listed in Resolution **164 (WRC-15)** in the frequency band 14.5-14.8 GHz not for feeder links for the broadcasting-satellite service, the provision of No. **11.41** is replaced by the following provision. No. **11.41.2** continues to apply. (WRC-15)

7.2*bis*.1 If, after a notice is returned under No. **11.38**, the notifying administration resubmits the notice and insists upon its reconsideration, and the assignment which was the basis of the unfavourable finding is neither an assignment in the Regions 1 and 3 Plan, nor an assignment of definitive recording in the Regions 1 and 3 feeder-link List or one for which the complete Appendix **4** information has been received under § 4.1.12 for the definitive recording by the date of submission pursuant to No. **9.30** of this notice, the Bureau shall enter the assignment in the Master Register with an indication of those administrations whose assignments were the basis of the unfavourable finding, provided that such resubmission is accompanied with a formal commitment indicating that, if unacceptable interference is caused to the Regions 1 and 3 recorded assignments which were the basis of the unfavourable finding, the notifying administration of the FSS shall immediately eliminate this unacceptable interference (see also No. **11.42**). (WRC-15)

Section II – Coordination with assignments in conformity with the appropriate Regional feeder-link Plan in Appendix 30A

7.3 Administrations planning to implement assignments for receiving earth stations in all Regions in the band 17.7-18.1 GHz in the fixed-satellite service (space-to-Earth) or in the band 17.3-17.8 GHz in the broadcasting-satellite service should evaluate the level of interference, assessed on the basis of coordination contours calculated in accordance with Appendix **7**, which might be caused by a feeder-link earth station located on the territory of another administration and included in the service area of an assignment to a broadcasting-satellite service feeder-link space station which is in conformity with the appropriate Regional feeder-link Plan. Should the administration planning receiving earth stations find that interference may be caused by such a feeder-link earth station, it may request the administration responsible for the feeder-link earth station to indicate the geographical coordinates, the antenna characteristics and the elevation angle of the horizon around its existing and planned feeder-link earth stations.

7.4 In the case of Region 2, when the entry in the feeder-link Plan contains information on specific earth stations this shall be used in the interference calculations mentioned in § 7.3 above. Where such information is not contained in this Plan an administration which receives a request under § 7.3 shall, within a period of four months, communicate the details of the feeder-link earth stations to the administration planning the receiving earth station, and to the Bureau in order to update this Plan.

7.5 In the case of Regions 1 and 3, an administration which receives a request under § 7.3 shall, within a period of four months, communicate the details of the feeder-link earth stations to the administration planning the receiving earth station, and to the Bureau for information.

7.6 If, at the end of the period of four months, the administration responsible for the fixed-satellite or broadcasting-satellite receiving earth station(s) does not receive a reply, it may request the assistance of the Bureau.

7.7 If the administration responsible for the feeder-link earth stations does not communicate to the Bureau, within a period of four months, the information requested under § 7.3, this administration shall only implement its feeder-link earth station provided it does not cause harmful interference to the fixed-satellite or broadcasting-satellite earth station(s) under consideration.

7.8 If, as a result of the application of this Article, an agreement is reached with the administration responsible for the feeder-link earth station or no comments have been received, and where the station is recorded in the Master Register in accordance with Article **11**, the Bureau shall enter a remark indicating either that an agreement has been reached or that no comments have been received.

Section III – Coordination with assignments in the Regions 1 and 3 feeder-link List, or for which the procedure of Article 4 has been initiated

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 8

Miscellaneous provisions relating to the procedures*

Section I – Studies and Recommendations

8.1.1 If it is requested by any administration, the Board, using such means at its disposal as are appropriate in the circumstances, shall conduct a study of cases of alleged contravention or non-observance of these provisions, or of harmful interference.

8.1.2 The Board shall thereupon prepare and forward to the administrations concerned a report containing its findings and recommendations for the solution of the problem.

8.1.3 On receiving the Board's recommendations for the solution of the problem, an administration shall promptly acknowledge the receipt by telegram and shall subsequently indicate the action it intends to take. In cases when the Board's suggestions or recommendations are unacceptable to the administrations concerned, further efforts should be made by the Board to find an acceptable solution to the problem.

8.1.4 In a case where, as a result of a study, the Board submits to one or more administrations suggestions or recommendations for the solution of a problem, and where no answer has been received from one or more of these administrations within a period of four months, the Board shall consider that the suggestions or recommendations concerned are unacceptable to the administrations which did not answer. If it was the requesting administration which failed to answer within this period, the Board shall close the study.

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* *Note by the Secretariat*: WRC-97 did not review this Article. The subject matter is also dealt with in Articles **13** and **14**, which were reviewed by WRC-97.

Section II – Miscellaneous provisions

8.2.1 If it is requested by any administration, particularly by an administration of a country in need of special assistance, the Board, using such means at its disposal as are appropriate in the circumstances, shall render the following assistance:

a) computation necessary in the application of Annexes 1, 3 and 4;

b) any other assistance of a technical nature for completion of the procedures in this Appendix.

8.2.2 In making a request to the Board under § 8.2.1, the administration shall furnish the Board with the necessary information.

ARTICLE 9 (REV.WRC-12)

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

9.1 COLUMN HEADINGS OF THE PLAN

Col. 1 *Beam identification* (column 1 contains the symbol designating the country 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. 2 *Nominal orbital position*, in degrees and hundredths of a degree.

Col. 3 *Channel number* (see Table 2 showing channel numbers and corresponding assigned frequencies).

Col. 4 *Boresight geographical coordinates*, in degrees and hundredths of a degree.

Col. 5 *Antenna beamwidth*. This column contains two figures corresponding to the major axis and the minor axis respectively of the elliptical cross section half-power beam, in degrees and hundredths of a degree.

Col. 6 *Orientation of the ellipse* determined as follows: in a plane normal to the beam axis, the direction of a major axis of the ellipse is specified as the angle measured anticlockwise from a line parallel to the equatorial plane to the major axis of the ellipse to the nearest degree.

Col. 7 *Polarization* (1 = direct, 2 = indirect)[30].

Col. 8 Earth station *e.i.r.p.* in the direction of maximum radiation, in dBW.

Col. 9 Remarks[31].

[30] See Annex 3 (§ 4.8) to this Appendix.

[31] The location of earth stations, together with the antenna characteristics and elevation angle of the horizon, are given as an annex to this Plan, and will be published when the Plan is republished in accordance with § 4.2.25.2 of Article 4.

9.2 TEXT FOR NOTES IN REMARKS COLUMN OF THE PLAN

1 Fast roll-off space station receiving antenna as defined in Annex 3 (§ 4.6.3).

2 Television standard with 625 lines using greater video bandwidth and necessary bandwidth of 27 MHz.

3 This assignment may cause interference to feeder-link assignments* of Spain, Guinea-Bissau and Portugal in the Regions 1 and 3 feeder-link Plan adopted at the 1988 Conference and shall only be brought into use if:

a) the administrations of Spain, Guinea-Bissau and Portugal agree: *or*

b) their feeder-link equivalent protection margins, as defined in § 1.7 of Annex 3, are positive.

The affected administrations shall be informed by the notifying administration of the required changes in characteristics before this assignment is brought into use.

4 This assignment may be utilized in the geographical area of Anguilla (AIA) (which is in the beam area).

5 Feeder-link earth stations for this assignment may also be located in the territories of Puerto Rico and the United States Virgin Islands. Such operation shall not cause more interference nor require more protection than the assignment under the Plan.

6 Feeder-link earth stations for this assignment may also be located in the States of Alaska and Hawaii. Such operation shall not cause more interference nor require more protection than the assignment under the Plan.

7 The feeder-link earth station for this assignment may also be located at the point with geographical coordinates 3° 31′ West, 48° 46′ North. Such operation shall not cause more interference nor require more protection than the assignment under the Plan.

8 Feeder-link earth stations for this assignment may also be located at the points with the following geographical coordinates:

47° 55′ West	15° 47′ South	34° 53′ West	08° 04′ South
43° 13′ West	22° 55′ South	60° 02′ West	03° 06′ South
46° 38′ West	23° 33′ South	38° 31′ West	12° 56′ South
51° 13′ West	30° 02′ South	49° 15′ West	16° 40′ South

Such operation shall not cause more interference nor require more protection than the assignment under the Plan.

* *Note by the Secretariat*: Since the orbital positions of these countries were changed by WRC-97, this paragraph might need to be revised.

9/GR. . This assignment is part of a group, the number of which follows the symbol. The group consists of the beams and has the number of channels assigned to it as indicated in Table 1.

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).

b) If an administration notifies the same frequency in more than one beam of a group for use at the same time, the overall *C/I* produced by all emissions from that group shall not exceed the *C/I* calculated on the basis of § *a)* above.

TABLE 1

Group	**Beams in the group**	**Number of channels assigned to the group**
GR1	ALS00002 HWA00002 USAPSA02	32 channels
GR2	ALS00003 HWA00003 USAPSA03	32 channels
GR3	ARGINSU4 ARGSUR04	16 channels
GR4	ARGINSU5 ARGSUR05	12 channels
GR5	BOLAND01 CLMAND01 EQACAND1 EQAGAND1 PRUAND02 VENAND03	16 channels
GR6	B SU111 B SU211	32 channels
GR7	B CE311 B CE411 B CE511	32 channels
GR8	B NO611 B NO711 B NO811	32 channels
GR9	B SU112 B SU212 B CE312 B CE412	32 channels
GR10	CAN01101 CAN01201	32 channels
GR11	*Not used*	
GR12	CAN01203 CAN01303 CAN01403	32 channels
GR13	CAN01304 CAN01404 CAN01504	32 channels
GR14	CAN01405 CAN01505 CAN01605	32 channels
GR15	*Not used*	
GR16	CHLCONT4 CHLCONT6	16 channels
GR17	CHLCONT5 PAQPAC01 CHLPAC02	16 channels
GR18	CRBBER01 CRBBLZ01 CRBJMC01 CRBBAH01 CRBEC001	16 channels
GR19	EQACOO01 EQAGOO01	16 channels
GR20	PTRVIR01 USAEHO02	32 channels
GR21	PTRVIR02 USAEHO03	32 channels
GR22	VEN02VEN VEN11VEN	4 channels

* *Note by the Secretariat*: This Resolution was revised by WRC-12 and WRC-15.

Country symbols

1 For the explanation of symbols designating countries or geographical areas in Region 2, see the Preface to the International Frequency List.

2 One additional symbol, CRB, has been created for the purposes of the 1983 Conference only, to designate to geographical area in the Caribbean Area. The five Caribbean beams are identified as follows:

CRBBAH01, CRBBER01, CRBBLZ01, CRBEC001 and CRBJMC01

and are intended collectively to provide coverage for the following countries or geographical areas: AIA, ATG, BAH, BER, BLZ, BRB, CYM, DMA, GRD, GUY, JMC, LCA, MSR, KNA, SUR, TCA, TRD, VCT and VRG to be so used if approved by them.

TABLE 2

Table showing correspondence between channel numbers and assigned frequencies

Channel No.	Assigned frequency (MHz)	Channel No.	Assigned frequency (MHz)
1	17 324.00	17	17 557.28
2	17 338.58	18	17 571.86
3	17 353.16	19	17 586.44
4	17 367.74	20	17 601.02
5	17 382.32	21	17 615.60
6	17 396.90	22	17 630.18
7	17 411.48	23	17 644.76
8	17 426.06	24	17 659.34
9	17 440.64	25	17 673.92
10	17 455.22	26	17 688.50
11	17 469.80	27	17 703.08
12	17 484.38	28	17 717.66
13	17 498.96	29	17 732.24
14	17 513.54	30	17 746.82
15	17 528.12	31	17 761.40
16	17 542.70	32	17 775.98

17 324.00 MHz (1)

1	2	3	4		5		6	7	8	9
ALS00002	−166.20	1	−109.94	36.86	6.04	1.11	137	1	87.4	9/GR1
ALS000/03	−175.20	1	−116.23	37.50	5.60	0.75	132	1	87.4	9/GR2
ARGINSU4	−94.20	1	−52.98	−59.81	3.40	0.68	19	1	87.4	9/GR3
ARGSUR04	−94.20	1	−65.04	−43.33	3.32	1.50	40	1	87.4	9/GR3
B CE311	−64.20	1	−40.60	−6.07	3.04	2.06	174	1	87.4	8 9/GR7
B CE312	−45.20	1	−40.27	−6.06	3.44	2.09	174	1	87.4	8 9/GR9
B CE411	−64.20	1	−50.97	−15.27	3.86	1.38	49	1	87.4	8 9/GR7
B CE412	−45.20	1	−50.71	−15.30	3.57	1.56	52	1	87.4	8 9/GR9
B CE511	−64.20	1	−53.10	−2.90	2.44	2.13	104	1	87.4	8 9/GR7
B NO611	−74.20	1	−59.60	−11.62	2.85	1.69	165	2	87.4	8 9/GR8
B NO711	−74.20	1	−60.70	−1.78	3.54	1.78	126	2	87.4	8 9/GR8
B NO811	−74.20	1	−68.76	−4.71	2.37	1.65	73	2	87.4	8 9/GR8
B SU111	−81.20	1	−51.12	−25.63	2.76	1.05	50	1	87.4	8 9/GR6
B SU112	−45.20	1	−50.75	−25.62	2.47	1.48	56	1	87.4	8 9/GR9
B SU211	−81.20	1	−44.51	−16.95	3.22	1.36	60	1	87.4	8 9/GR6
B SU212	−45.20	1	−44.00	−16.87	3.20	1.96	58	1	87.4	8 9/GR9
BAHIFRB1	−87.20	1	−76.06	24.16	1.81	0.70	142	1	87.4	
BERBERMU	−96.20	1	−64.77	32.32	0.60	0.60	90	2	87.4	
BERBER02	−31.00	1	−64.77	32.32	0.60	0.60	90	1	87.4	2 3
BOLAND01	−115.20	1	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
CAN01101	−138.20	1	−114.60	51.08	7.28	1.10	160	1	87.4	9/GR10
CAN01201	−138.20	1	−114.60	51.08	7.28	1.10	160	1	87.4	9/GR10
CAN01202	−72.70	1	−81.34	50.02	7.96	2.55	5	1	87.4	
CAN01203	−129.20	1	−113.02	51.08	7.47	1.26	162	1	87.4	9/GR12
CAN01303	−129.20	1	−113.02	51.08	7.47	1.26	162	1	87.4	9/GR12
CAN01304	−91.20	1	−86.71	50.48	8.58	2.54	178	1	87.4	9/GR13
CAN01403	−129.20	1	−113.02	51.08	7.47	1.26	162	1	87.4	9/GR12
CAN01404	−91.20	1	−86.71	50.48	8.58	2.54	178	1	87.4	9/GR13
CAN01405	−82.20	1	−84.11	50.20	8.31	2.58	1	1	87.4	9/GR14
CAN01504	−91.20	1	−86.71	50.48	8.58	2.54	178	1	87.4	9/GR13
CAN01505	−82.20	1	−84.11	50.20	8.31	2.58	1	1	87.4	9/GR14
CAN01605	−82.20	1	−84.11	50.20	8.31	2.58	1	1	87.4	9/GR14
CAN01606	−70.70	1	−80.77	50.03	7.88	2.53	6	1	87.4	
CHLCONT5	−106.20	1	−72.23	−35.57	2.60	0.68	55	1	87.4	9/GR17
CHLPAC02	−106.20	1	−80.06	−30.06	1.36	0.68	69	1	87.4	9/GR17
CLMAND01	−115.20	1	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
CLM00001	−103.20	1	−74.50	5.87	3.98	1.96	118	1	87.4	
EQACAND1	−115.20	1	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
EQAGAND1	−115.20	1	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
FLKANT01	−57.20	1	−44.54	−60.13	3.54	0.68	12	1	87.4	2
FLKFALKS	−31.00	1	−59.90	−51.64	0.60	0.60	90	1	87.4	2 3
GRD00002	−42.20	1	−61.58	12.29	0.60	0.60	90	1	87.4	
HWA00002	−166.20	1	−109.94	36.86	6.04	1.11	137	1	87.4	9/GR1
HWA00003	−175.20	1	−116.23	37.50	5.60	0.75	132	1	87.4	9/GR2
MEX01NTE	−78.20	1	−105.81	26.01	2.89	2.08	155	1	87.4	1
MEX01SUR	−69.20	1	−94.84	19.82	3.05	2.09	4	1	87.4	1
MEX02NTE	−136.20	1	−107.21	26.31	3.84	1.55	148	1	87.4	1
MEX02SUR	−127.20	1	−96.39	19.88	3.18	1.87	157	1	87.4	1
PAQPAC01	−106.20	1	−109.18	−27.53	0.60	0.60	90	1	87.4	9/GR17
PRG00002	−99.20	1	−58.66	−23.32	1.45	1.04	76	1	87.4	
PRUAND02	−115.20	1	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
PTRVIR01	−101.20	1	−93.94	36.32	8.24	3.56	171	1	87.4	1 6 9/GR20
PTRVIR02	−110.20	1	−95.23	36.29	8.27	3.37	168	1	87.4	1 6 9/GR21
SPMFRAN3	−53.20	1	−67.24	47.51	3.16	0.79	7	1	87.4	2 7
TRD00001	−84.70	1	−61.23	10.70	0.60	0.60	90	1	87.4	
URG00001	−71.70	1	−56.22	−32.52	1.02	0.89	11	1	87.4	
USAEH001	−61.70	1	−87.57	36.17	6.42	3.49	12	1	87.4	1 5 6
USAEH002	−101.20	1	−93.94	36.32	8.24	3.56	171	1	87.4	1 6 9/GR20
USAEH003	−110.20	1	−95.23	36.29	8.27	3.37	168	1	87.4	1 6 9/GR21
USAEH004	−119.20	1	−96.45	36.21	8.20	3.12	165	1	87.4	1 5 6
USAPSA02	−166.20	1	−109.94	36.86	6.04	1.11	137	1	87.4	9/GR1
USAPSA03	−175.20	1	−116.23	37.50	5.60	0.75	132	1	87.4	9/GR2
USAWH101	−148.20	1	−111.02	40.68	4.36	2.15	162	1	87.4	
USAWH102	−157.20	1	−113.07	40.74	3.72	1.78	149	1	87.4	
VENAND03	−115.20	1	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
VRG00001	−79.70	1	−64.37	18.48	0.60	0.60	90	1	87.4	4

17 338.58 MHz (2)

1	2	3	4		5		6	7	8	9
ALS00002	−165.80	2	−109.83	36.82	6.03	1.12	137	2	87.4	9/GR1
ALS00003	−174.80	2	−116.10	37.47	5.60	0.76	132	2	87.4	9/GR2
ARGNORT4	−93.80	2	−63.96	−30.01	3.86	1.99	48	2	87.4	
ARGNORT5	−54.80	2	−62.85	−29.80	3.24	2.89	47	2	87.4	
ATNBEAM1	−52.80	2	−66.44	14.87	1.83	0.68	39	2	87.4	
B CE311	−63.80	2	−40.60	−6.07	3.04	2.06	174	2	87.4	8 9/GR7
B CE312	−44.80	2	−40.26	−6.06	3.44	2.09	174	2	87.4	8 9/GR9
B CE411	−63.80	2	−50.97	−15.26	3.86	1.38	49	2	87.4	8 9/GR7
B CE412	−44.80	2	−50.71	−15.30	3.57	1.56	52	2	87.4	8 9/GR9
B CE511	−63.80	2	−53.11	−2.98	2.42	2.15	107	2	87.4	8 9/GR7
B NO611	−73.80	2	−59.60	−11.62	2.86	1.69	165	1	87.4	8 9/GR8
B NO711	−73.80	2	−60.70	−1.78	3.54	1.78	126	1	87.4	8 9/GR8
B NO811	−73.80	2	−68.75	−4.71	2.37	1.65	73	1	87.4	8 9/GR8
B SE911	−101.80	2	−45.99	−19.09	2.22	0.79	62	2	87.4	8
B SU111	−80.80	2	−51.10	−25.64	2.76	1.06	50	2	87.4	8 9/GR6
B SU112	−44.80	2	−50.76	−25.62	2.47	1.48	56	2	87.4	8 9/GR9
B SU211	−80.80	2	−44.51	−16.94	3.22	1.37	60	2	87.4	8 9/GR6
B SU212	−44.80	2	−43.99	−16.97	3.27	1.92	59	2	87.4	8 9/GR9
CAN01101	−137.80	2	−114.10	50.92	7.22	1.11	160	2	87.4	9/GR10
CAN01201	−137.80	2	−114.10	50.92	7.22	1.11	160	2	87.4	9/GR10
CAN01202	−72.30	2	−81.23	50.12	7.99	2.53	5	2	87.4	
CAN01203	−128.80	2	−113.04	51.04	7.53	1.26	162	2	87.4	9/GR12
CAN01303	−128.80	2	−113.04	51.04	7.53	1.26	162	2	87.4	9/GR12
CAN01304	−90.80	2	−86.57	50.48	8.59	2.54	178	2	87.4	9/GR13
CAN01403	−128.80	2	−113.04	51.04	7.53	1.26	162	2	87.4	9/GR12
CAN01404	−90.80	2	−86.57	50.48	8.59	2.54	178	2	87.4	9/GR13
CAN01405	−81.80	2	−83.80	50.22	8.35	2.57	2	2	87.4	9/GR14
CAN01504	−90.80	2	−86.57	50.48	8.59	2.54	178	2	87.4	9/GR13
CAN01505	−81.80	2	−83.80	50.22	8.35	2.57	2	2	87.4	9/GR14
CAN01605	−81.80	2	−83.80	50.22	8.35	2.57	2	2	87.4	9/GR14
CAN01606	−70.30	2	−80.64	50.02	7.88	2.52	6	2	87.4	
CHLCONT4	−105.80	2	−69.59	−23.20	2.21	0.69	68	2	87.4	9/GR16
CHLCONT6	−105.80	2	−73.52	−55.52	3.65	1.31	39	2	87.4	9/GR16
CRBBAH01	−92.30	2	−76.09	24.13	1.83	0.68	141	1	87.4	9/GR18
CRBBER01	−92.30	2	−64.76	32.13	0.60	0.60	90	1	87.4	9/GR18
CRBBLZ01	−92.30	2	−88.61	17.26	0.64	0.64	90	1	87.4	9/GR18
CRBEC001	−92.30	2	−60.07	8.26	4.20	0.86	115	1	87.4	9/GR18
CRBJMC01	−92.30	2	−79.45	17.97	0.99	0.68	151	1	87.4	9/GR18
CTR00201	−130.80	2	−84.33	9.67	0.82	0.68	119	2	87.4	
EQAC0001	−94.80	2	−78.31	−1.52	1.48	1.15	65	1	87.4	9/GR19
EQAG0001	−94.80	2	−90.36	−0.57	0.94	0.89	99	1	87.4	9/GR19
GUY00302	−33.80	2	−59.07	4.77	1.43	0.85	91	2	87.4	
HNDIFRB2	−107.30	2	−86.23	15.16	1.14	0.85	8	1	87.4	
HTI00002	−83.30	2	−73.28	18.96	0.82	0.68	11	2	87.4	
HWA00002	−165.80	2	−109.83	36.82	6.03	1.12	137	2	87.4	9/GR1
HWA00003	−174.80	2	−116.10	37.47	5.60	0.76	132	2	87.4	9/GR2
MEX01NTE	−77.80	2	−105.80	25.99	2.88	2.07	155	2	87.4	1
MEX02NTE	−135.80	2	−107.36	26.32	3.80	1.57	149	2	87.4	1
MEX02SUR	−126.80	2	−96.39	19.88	3.19	1.87	158	2	87.4	1
PRU00004	−85.80	2	−74.19	−8.39	3.74	2.45	112	2	87.4	
PTRVIR01	−100.80	2	−93.85	36.31	8.26	3.55	171	2	87.4	1 6 9/GR20
PTRVIR02	−109.80	2	−95.47	36.38	8.10	3.45	168	2	87.4	1 6 9/GR21
TCA00001	−115.80	2	−71.79	21.53	0.60	0.60	90	2	87.4	
USAEH001	−61.30	2	−87.53	36.18	6.41	3.49	12	2	87.4	1 5 6
USAEH002	−100.80	2	−93.85	36.31	8.26	3.55	171	2	87.4	1 6 9/GR20
USAEH003	−109.80	2	−95.47	36.38	8.10	3.45	168	2	87.4	1 6 9/GR21
USAEH004	−118.80	2	−96.42	36.21	8.20	3.12	165	2	87.4	1 5 6
USAPSA02	−165.80	2	−109.83	36.82	6.03	1.12	137	2	87.4	9/GR1
USAPSA03	−174.80	2	−116.10	37.47	5.60	0.76	132	2	87.4	9/GR2
USAWH101	−147.80	2	−111.01	40.67	4.38	2.15	162	2	87.4	
USAWH102	−156.80	2	−113.01	40.71	3.74	1.79	149	2	87.4	
VCT00001	−79.30	2	−61.18	13.23	0.60	0.60	90	2	87.4	
VEN11VEN	−103.80	2	−66.79	6.90	2.50	1.77	122	2	87.4	

17 353.16 MHz (3)

1	2	3	4		5		6	7	8	9
ALS00002	−166.20	3	−109.94	36.86	6.04	1.11	137	1	87.4	9/GR1
ALS00003	−175.20	3	−116.23	37.50	5.60	0.75	132	1	87.4	9/GR2
ARGINSU4	−94.20	3	−52.98	−59.81	3.40	0.68	19	1	87.4	9/GR3
ARGINSU5	−55.20	3	−44.17	−59.91	3.77	0.70	13	1	87.4	9/GR4
ARGSUR04	−94.20	3	−65.04	−43.33	3.32	1.50	40	1	87.4	9/GR3
ARGSUR05	−55.20	3	−63.68	−43.01	2.54	2.38	152	1	87.4	9/GR4
ATGSJN01	−79.70	3	−61.79	17.07	0.60	0.60	90	1	87.4	
B CE311	−64.20	3	−40.60	−6.07	3.04	2.06	174	1	87.4	8 9/GR7
B CE312	−45.20	3	−40.27	−6.06	3.44	2.09	174	1	87.4	8 9/GR9
B CE411	−64.20	3	−50.97	−15.27	3.86	1.38	49	1	87.4	8 9/GR7
B CE412	−45.20	3	−50.71	−15.30	3.57	1.56	52	1	87.4	8 9/GR9
B CE511	−64.20	3	−53.10	−2.90	2.44	2.13	104	1	87.4	8 9/GR7
B NO611	−74.20	3	−59.60	−11.62	2.85	1.69	165	2	87.4	8 9/GR8
B NO711	−74.20	3	−60.70	−1.78	3.54	1.78	126	2	87.4	8 9/GR8
B NO811	−74.20	3	−68.76	−4.71	2.37	1.65	73	2	87.4	8 9/GR8
B SU111	−81.20	3	−51.12	−25.63	2.76	1.05	50	1	87.4	8 9/GR6
B SU112	−45.20	3	−50.75	−25.62	2.47	1.48	56	1	87.4	8 9/GR9
B SU211	−81.20	3	−44.51	−16.95	3.22	1.36	60	1	87.4	8 9/GR6
B SU212	−45.20	3	−44.00	−16.87	3.20	1.96	58	1	87.4	8 9/GR9
BERBERMU	−96.20	3	−64.77	32.32	0.60	0.60	90	2	87.4	
BOLAND01	−115.20	3	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
BOL00001	−87.20	3	−64.61	−16.71	2.52	2.19	85	1	87.4	
BRB00001	−92.70	3	−59.85	12.93	0.60	0.60	90	2	87.4	
CAN01101	−138.20	3	−114.60	51.08	7.28	1.10	160	1	87.4	9/GR10
CAN01201	−138.20	3	−114.60	51.08	7.28	1.10	160	1	87.4	9/GR10
CAN01202	−72.70	3	−81.34	50.02	7.96	2.55	5	1	87.4	
CAN01203	−129.20	3	−113.02	51.08	7.47	1.26	162	1	87.4	9/GR12
CAN01303	−129.20	3	−113.02	51.08	7.47	1.26	162	1	87.4	9/GR12
CAN01304	−91.20	3	−86.71	50.48	8.58	2.54	178	1	87.4	9/GR13
CAN01403	−129.20	3	−113.02	51.08	7.47	1.26	162	1	87.4	9/GR12
CAN01404	−91.20	3	−86.71	50.48	8.58	2.54	178	1	87.4	9/GR13
CAN01405	−82.20	3	−84.11	50.20	8.31	2.58	1	1	87.4	9/GR14
CAN01504	−91.20	3	−86.71	50.48	8.58	2.54	178	1	87.4	9/GR13
CAN01505	−82.20	3	−84.11	50.20	8.31	2.58	1	1	87.4	9/GR14
CAN01605	−82.20	3	−84.11	50.20	8.31	2.58	1	1	87.4	9/GR14
CAN01606	−70.70	3	−80.77	50.03	7.88	2.53	6	1	87.4	
CHLCONT5	−106.20	3	−72.23	−35.57	2.60	0.68	55	1	87.4	9/GR17
CHLPAC02	−106.20	3	−80.06	−30.06	1.36	0.68	69	1	87.4	9/GR17
CLMAND01	−115.20	3	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
CLM00001	−103.20	3	−74.50	5.87	3.98	1.96	118	1	87.4	
CUB00001	−89.20	3	−79.81	21.62	2.24	0.68	168	1	87.4	
EQACAND1	−115.20	3	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
EQAGAND1	−115.20	3	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
GRD00002	−42.20	3	−61.58	12.29	0.60	0.60	90	1	87.4	
GRD00059	−57.20	3	−61.58	12.29	0.60	0.60	90	1	87.4	
GRLDNK01	−53.20	3	−44.89	66.56	2.70	0.82	173	1	87.4	2
HWA00002	−166.20	3	−109.94	36.86	6.04	1.11	137	1	87.4	9/GR1
HWA00003	−175.20	3	−116.23	37.50	5.60	0.75	132	1	87.4	9/GR2
MEX01NTE	−78.20	3	−105.81	26.01	2.89	2.08	155	1	87.4	1
MEX01SUR	−69.20	3	−94.84	19.82	3.05	2.09	4	1	87.4	1
MEX02NTE	−136.20	3	−107.21	26.31	3.84	1.55	148	1	87.4	1
MEX02SUR	−127.20	3	−96.39	19.88	3.18	1.87	157	1	87.4	1
PAQPAC01	−106.20	3	−109.18	−27.53	0.60	0.60	90	1	87.4	9/GR17
PRG00002	−99.20	3	−58.66	−23.32	1.45	1.04	76	1	87.4	
PRUAND02	−115.20	3	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
PTRVIR01	−101.20	3	−93.94	36.32	8.24	3.56	171	1	87.4	1 6 9/GR20
PTRVIR02	−110.20	3	−95.23	36.29	8.27	3.37	168	1	87.4	1 6 9/GR21
SURINAM2	−84.70	3	−55.69	4.35	1.00	0.69	86	1	87.4	
URG00001	−71.70	3	−56.22	−32.52	1.02	0.89	11	1	87.4	
USAEH001	−61.70	3	−87.57	36.17	6.42	3.49	12	1	87.4	1 5 6
USAEH002	−101.20	3	−93.94	36.32	8.24	3.56	171	1	87.4	1 6 9/GR20
USAEH003	−110.20	3	−95.23	36.29	8.27	3.37	168	1	87.4	1 6 9/GR21
USAEH004	−119.20	3	−96.45	36.21	8.20	3.12	165	1	87.4	1 5 6
USAPSA02	−166.20	3	−109.94	36.86	6.04	1.11	137	1	87.4	9/GR1
USAPSA03	−175.20	3	−116.23	37.50	5.60	0.75	132	1	87.4	9/GR2
USAWH101	−148.20	3	−111.02	40.68	4.36	2.15	162	1	87.4	
USAWH102	−157.20	3	−113.07	40.74	3.72	1.78	149	1	87.4	
VENAND03	−115.20	3	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5

17 367.74 MHz (4)

1	2	3	4		5		6	7	8	9
ALS00002	−165.80	4	−109.83	36.82	6.03	1.12	137	2	87.4	9/GR1
ALS00003	−174.80	4	−116.10	37.47	5.60	0.76	132	2	87.4	9/GR2
ARGNORT4	−93.80	4	−63.96	−30.01	3.86	1.99	48	2	87.4	
ARGNORT5	−54.80	4	−62.85	−29.80	3.24	2.89	47	2	87.4	
B CE311	−63.80	4	−40.60	−6.07	3.04	2.06	174	2	87.4	8 9/GR7
B CE312	−44.80	4	−40.26	−6.06	3.44	2.09	174	2	87.4	8 9/GR9
B CE411	−63.80	4	−50.97	−15.26	3.86	1.38	49	2	87.4	8 9/GR7
B CE412	−44.80	4	−50.71	−15.30	3.57	1.56	52	2	87.4	8 9/GR9
B CE511	−63.80	4	−53.11	−2.98	2.42	2.15	107	2	87.4	8 9/GR7
B NO611	−73.80	4	−59.60	−11.62	2.86	1.69	165	1	87.4	8 9/GR8
B NO711	−73.80	4	−60.70	−1.78	3.54	1.78	126	1	87.4	8 9/GR8
B NO811	−73.80	4	−68.75	−4.71	2.37	1.65	73	1	87.4	8 9/GR8
B SE911	−101.80	4	−45.99	−19.09	2.22	0.79	62	2	87.4	8
B SU111	−80.80	4	−51.10	−25.64	2.76	1.06	50	2	87.4	8 9/GR6
B SU112	−44.80	4	−50.76	−25.62	2.47	1.48	56	2	87.4	8 9/GR9
B SU211	−80.80	4	−44.51	−16.94	3.22	1.37	60	2	87.4	8 9/GR6
B SU212	−44.80	4	−43.99	−16.97	3.27	1.92	59	2	87.4	8 9/GR9
CAN01101	−137.80	4	−114.10	50.92	7.22	1.11	160	2	87.4	9/GR10
CAN01201	−137.80	4	−114.10	50.92	7.22	1.11	160	2	87.4	9/GR10
CAN01202	−72.30	4	−81.23	50.12	7.99	2.53	5	2	87.4	
CAN01203	−128.80	4	−113.04	51.04	7.53	1.26	162	2	87.4	9/GR12
CAN01303	−128.80	4	−113.04	51.04	7.53	1.26	162	2	87.4	9/GR12
CAN01304	−90.80	4	−86.57	50.48	8.59	2.54	178	2	87.4	9/GR13
CAN01403	−128.80	4	−113.04	51.04	7.53	1.26	162	2	87.4	9/GR12
CAN01404	−90.80	4	−86.57	50.48	8.59	2.54	178	2	87.4	9/GR13
CAN01405	−81.80	4	−83.80	50.22	8.35	2.57	2	2	87.4	9/GR14
CAN01504	−90.80	4	−86.57	50.48	8.59	2.54	178	2	87.4	9/GR13
CAN01505	−81.80	4	−83.80	50.22	8.35	2.57	2	2	87.4	9/GR14
CAN01605	−81.80	4	−83.80	50.22	8.35	2.57	2	2	87.4	9/GR14
CAN01606	−70.30	4	−80.64	50.02	7.88	2.52	6	2	87.4	
CHLCONT4	−105.80	4	−69.59	−23.20	2.21	0.69	68	2	87.4	9/GR16
CHLCONT6	−105.80	4	−73.52	−55.52	3.65	1.31	39	2	87.4	9/GR16
CRBBAH01	−92.30	4	−76.09	24.13	1.83	0.68	141	1	87.4	9/GR18
CRBBER01	−92.30	4	−64.76	32.13	0.60	0.60	90	1	87.4	9/GR18
CRBBLZ01	−92.30	4	−88.61	17.26	0.64	0.64	90	1	87.4	9/GR18
CRBEC001	−92.30	4	−60.07	8.26	4.20	0.86	115	1	87.4	9/GR18
CRBJMC01	−92.30	4	−79.45	17.97	0.99	0.68	151	1	87.4	9/GR18
CYM00001	−115.80	4	−80.58	19.57	0.60	0.60	90	2	87.4	
DOMIFRB2	−83.30	4	−70.51	18.79	0.98	0.69	167	2	87.4	
EQAC0001	−94.80	4	−78.31	−1.52	1.48	1.15	65	1	87.4	9/GR19
EQAG0001	−94.80	4	−90.36	−0.57	0.94	0.89	99	1	87.4	9/GR19
GUFMGG02	−52.80	4	−56.42	8.47	4.16	0.81	123	2	87.4	2 7
HWA00002	−165.80	4	−109.83	36.82	6.03	1.12	137	2	87.4	9/GR1
HWA00003	−174.80	4	−116.10	37.47	5.60	0.76	132	2	87.4	9/GR2
JMC00005	−33.80	4	−77.27	18.12	0.60	0.60	90	2	87.4	
LCAIFRB1	−79.30	4	−61.15	13.90	0.60	0.60	90	2	87.4	
MEX01NTE	−77.80	4	−105.80	25.99	2.88	2.07	155	2	87.4	1
MEX02NTE	−135.80	4	−107.36	26.32	3.80	1.57	149	2	87.4	1
MEX02SUR	−126.80	4	−96.39	19.88	3.19	1.87	158	2	87.4	1
PRU00004	−85.80	4	−74.19	−8.39	3.74	2.45	112	2	87.4	
PTRVIR01	−100.80	4	−93.85	36.31	8.26	3.55	171	2	87.4	1 6 9/GR20
PTRVIR02	−109.80	4	−95.47	36.38	8.10	3.45	168	2	87.4	1 6 9/GR21
SLVIFRB2	−107.30	4	−88.91	13.59	0.60	0.60	90	1	87.4	
USAEH001	−61.30	4	−87.53	36.18	6.41	3.49	12	2	87.4	1 5 6
USAEH002	−100.80	4	−93.85	36.31	8.26	3.55	171	2	87.4	1 6 9/GR20
USAEH003	−109.80	4	−95.47	36.38	8.10	3.45	168	2	87.4	1 6 9/GR21
USAEH004	−118.80	4	−96.42	36.21	8.20	3.12	165	2	87.4	1 5 6
USAPSA02	−165.80	4	−109.83	36.82	6.03	1.12	137	2	87.4	9/GR1
USAPSA03	−174.80	4	−116.10	37.47	5.60	0.76	132	2	87.4	9/GR2
USAWH101	−147.80	4	−111.01	40.67	4.38	2.15	162	2	87.4	
USAWH102	−156.80	4	−113.01	40.71	3.74	1.79	149	2	87.4	
VEN11VEN	−103.80	4	−66.79	6.90	2.50	1.77	122	2	87.4	

17 382.32 MHz (5)

1	2	3	4		5		6	7	8	9
ALS00002	−166.20	5	−109.94	36.86	6.04	1.11	137	1	87.4	9/GR1
ALS00003	−175.20	5	−116.23	37.50	5.60	0.75	132	1	87.4	9/GR2
ARGINSU4	−94.20	5	−52.98	−59.81	3.40	0.68	19	1	87.4	9/GR3
ARGSUR04	−94.20	5	−65.04	−43.33	3.32	1.50	40	1	87.4	9/GR3
B CE311	−64.20	5	−40.60	−6.07	3.04	2.06	174	1	87.4	89/GR7
B CE312	−45.20	5	−40.27	−6.06	3.44	2.09	174	1	87.4	89/GR9
B CE411	−64.20	5	−50.97	−15.27	3.86	1.38	49	1	87.4	89/GR7
B CE412	−45.20	5	−50.71	−15.30	3.57	1.56	52	1	87.4	89/GR9
B CE511	−64.20	5	−53.10	−2.90	2.44	2.13	104	1	87.4	89/GR7
B NO611	−74.20	5	−59.60	−11.62	2.85	1.69	165	2	87.4	89/GR8
B NO711	−74.20	5	−60.70	−1.78	3.54	1.78	126	2	87.4	89/GR8
B NO811	−74.20	5	−68.76	−4.71	2.37	1.65	73	2	87.4	89/GR8
B SU111	−81.20	5	−51.12	−25.63	2.76	1.05	50	1	87.4	89/GR6
B SU112	−45.20	5	−50.75	−25.62	2.47	1.48	56	1	87.4	89/GR9
B SU211	−81.20	5	−44.51	−16.95	3.22	1.36	60	1	87.4	89/GR6
B SU212	−45.20	5	−44.00	−16.87	3.20	1.96	58	1	87.4	89/GR9
BAHIFRB1	−87.20	5	−76.06	24.16	1.81	0.70	142	1	87.4	
BERBERMU	−96.20	5	−64.77	32.32	0.60	0.60	90	2	87.4	
BERBER02	−31.00	5	−64.77	32.32	0.60	0.60	90	1	87.4	2 3
BOLAND01	−115.20	5	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
CAN01101	−138.20	5	−114.60	51.08	7.28	1.10	160	1	87.4	9/GR10
CAN01201	−138.20	5	−114.60	51.08	7.28	1.10	160	1	87.4	9/GR10
CAN01202	−72.70	5	−81.34	50.02	7.96	2.55	5	1	87.4	
CAN01203	−129.20	5	−113.02	51.08	7.47	1.26	162	1	87.4	9/GR12
CAN01303	−129.20	5	−113.02	51.08	7.47	1.26	162	1	87.4	9/GR12
CAN01304	−91.20	5	−86.71	50.48	8.58	2.54	178	1	87.4	9/GR13
CAN01403	−129.20	5	−113.02	51.08	7.47	1.26	162	1	87.4	9/GR12
CAN01404	−91.20	5	−86.71	50.48	8.58	2.54	178	1	87.4	9/GR13
CAN01405	−82.20	5	−84.11	50.20	8.31	2.58	1	1	87.4	9/GR14
CAN01504	−91.20	5	−86.71	50.48	8.58	2.54	178	1	87.4	9/GR13
CAN01505	−82.20	5	−84.11	50.20	8.31	2.58	1	1	87.4	9/GR14
CAN01605	−82.20	5	−84.11	50.20	8.31	2.58	1	1	87.4	9/GR14
CAN01606	−70.70	5	−80.77	50.03	7.88	2.53	6	1	87.4	
CHLCONT5	−106.20	5	−72.23	−35.57	2.60	0.68	55	1	87.4	9/GR17
CHLPAC02	−106.20	5	−80.06	−30.06	1.36	0.68	69	1	87.4	9/GR17
CLMAND01	−115.20	5	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
CLM00001	−103.20	5	−74.50	5.87	3.98	1.96	118	1	87.4	
EQACAND1	−115.20	5	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
EQAGAND1	−115.20	5	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
FLKANT01	−57.20	5	−44.54	−60.13	3.54	0.68	12	1	87.4	2
FLKFALKS	−31.00	5	−59.90	−51.64	0.60	0.60	90	1	87.4	2 3
GRD00002	−42.20	5	−61.58	12.29	0.60	0.60	90	1	87.4	
HWA00002	−166.20	5	−109.94	36.86	6.04	1.11	137	1	87.4	9/GR1
HWA00003	−175.20	5	−116.23	37.50	5.60	0.75	132	1	87.4	9/GR2
MEX01NTE	−78.20	5	−105.81	26.01	2.89	2.08	155	1	87.4	1
MEX01SUR	−69.20	5	−94.84	19.82	3.05	2.09	4	1	87.4	1
MEX02NTE	−136.20	5	−107.21	26.31	3.84	1.55	148	1	87.4	1
MEX02SUR	−127.20	5	−96.39	19.88	3.18	1.87	157	1	87.4	1
PAQPAC01	−106.20	5	−109.18	−27.53	0.60	0.60	90	1	87.4	9/GR17
PRG00002	−99.20	5	−58.66	−23.32	1.45	1.04	76	1	87.4	
PRUAND02	−115.20	5	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
PTRVIR01	−101.20	5	−93.94	36.32	8.24	3.56	171	1	87.4	169/GR20
PTRVIR02	−110.20	5	−95.23	36.29	8.27	3.37	168	1	87.4	169/GR21
SPMFRAN3	−53.20	5	−67.24	47.51	3.16	0.79	7	1	87.4	2 7
TRD00001	−84.70	5	−61.23	10.70	0.60	0.60	90	1	87.4	
URG00001	−71.70	5	−56.22	−32.52	1.02	0.89	11	1	87.4	
USAEH001	−61.70	5	−87.57	36.17	6.42	3.49	12	1	87.4	156
USAEH002	−101.20	5	−93.94	36.32	8.24	3.56	171	1	87.4	169/GR20
USAEH003	−110.20	5	−95.23	36.29	8.27	3.37	168	1	87.4	169/GR21
USAEH004	−119.20	5	−96.45	36.21	8.20	3.12	165	1	87.4	156
USAPSA02	−166.20	5	−109.94	36.86	6.04	1.11	137	1	87.4	9/GR1
USAPSA03	−175.20	5	−116.23	37.50	5.60	0.75	132	1	87.4	9/GR2
USAWH101	−148.20	5	−111.02	40.68	4.36	2.15	162	1	87.4	
USAWH102	−157.20	5	−113.07	40.74	3.72	1.78	149	1	87.4	
VENAND03	−115.20	5	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
VRG00001	−79.70	5	−64.37	18.48	0.60	0.60	90	1	87.4	4

17 396.90 MHz (6)

1	2	3	4		5		6	7	8	9
ALS00002	−165.80	6	−109.83	36.82	6.03	1.12	137	2	87.4	9/GR1
ALS00003	−174.80	6	−116.10	37.47	5.60	0.76	132	2	87.4	9/GR2
ARGNORT4	−93.80	6	−63.96	−30.01	3.86	1.99	48	2	87.4	
ARGNORT5	−54.80	6	−62.85	−29.80	3.24	2.89	47	2	87.4	
ATNBEAM1	−52.80	6	−66.44	14.87	1.83	0.68	39	2	87.4	
B CE311	−63.80	6	−40.60	−6.07	3.04	2.06	174	2	87.4	8 9/GR7
B CE312	−44.80	6	−40.26	−6.06	3.44	2.09	174	2	87.4	8 9/GR9
B CE411	−63.80	6	−50.97	−15.26	3.86	1.38	49	2	87.4	8 9/GR7
B CE412	−44.80	6	−50.71	−15.30	3.57	1.56	52	2	87.4	8 9/GR9
B CE511	−63.80	6	−53.11	−2.98	2.42	2.15	107	2	87.4	8 9/GR7
B NO611	−73.80	6	−59.60	−11.62	2.86	1.69	165	1	87.4	8 9/GR8
B NO711	−73.80	6	−60.70	−1.78	3.54	1.78	126	1	87.4	8 9/GR8
B NO811	−73.80	6	−68.75	−4.71	2.37	1.65	73	1	87.4	8 9/GR8
B SE911	−101.80	6	−45.99	−19.09	2.22	0.79	62	2	87.4	8
B SU111	−80.80	6	−51.10	−25.64	2.76	1.06	50	2	87.4	8 9/GR6
B SU112	−44.80	6	−50.76	−25.62	2.47	1.48	56	2	87.4	8 9/GR9
B SU211	−80.80	6	−44.51	−16.94	3.22	1.37	60	2	87.4	8 9/GR6
B SU212	−44.80	6	−43.99	−16.97	3.27	1.92	59	2	87.4	8 9/GR9
CAN01101	−137.80	6	−114.10	50.92	7.22	1.11	160	2	87.4	9/GR10
CAN01201	−137.80	6	−114.10	50.92	7.22	1.11	160	2	87.4	9/GR10
CAN01202	−72.30	6	−81.23	50.12	7.99	2.53	5	2	87.4	
CAN01203	−128.80	6	−113.04	51.04	7.53	1.26	162	2	87.4	9/GR12
CAN01303	−128.80	6	−113.04	51.04	7.53	1.26	162	2	87.4	9/GR12
CAN01304	−90.80	6	−86.57	50.48	8.59	2.54	178	2	87.4	9/GR13
CAN01403	−128.80	6	−113.04	51.04	7.53	1.26	162	2	87.4	9/GR12
CAN01404	−90.80	6	−86.57	50.48	8.59	2.54	178	2	87.4	9/GR13
CAN01405	−81.80	6	−83.80	50.22	8.35	2.57	2	2	87.4	9/GR14
CAN01504	−90.80	6	−86.57	50.48	8.59	2.54	178	2	87.4	9/GR13
CAN01505	−81.80	6	−83.80	50.22	8.35	2.57	2	2	87.4	9/GR14
CAN01605	−81.80	6	−83.80	50.22	8.35	2.57	2	2	87.4	9/GR14
CAN01606	−70.30	6	−80.64	50.02	7.88	2.52	6	2	87.4	
CHLCONT4	−105.80	6	−69.59	−23.20	2.21	0.69	68	2	87.4	9/GR16
CHLCONT6	−105.80	6	−73.52	−55.52	3.65	1.31	39	2	87.4	9/GR16
CRBBAH01	−92.30	6	−76.09	24.13	1.83	0.68	141	1	87.4	9/GR18
CRBBER01	−92.30	6	−64.76	32.13	0.60	0.60	90	1	87.4	9/GR18
CRBBLZ01	−92.30	6	−88.61	17.26	0.64	0.64	90	1	87.4	9/GR18
CRBEC001	−92.30	6	−60.07	8.26	4.20	0.86	115	1	87.4	9/GR18
CRBJMC01	−92.30	6	−79.45	17.97	0.99	0.68	151	1	87.4	9/GR18
CTR00201	−130.80	6	−84.33	9.67	0.82	0.68	119	2	87.4	
EQAC0001	−94.80	6	−78.31	−1.52	1.48	1.15	65	1	87.4	9/GR19
EQAG0001	−94.80	6	−90.36	−0.57	0.94	0.89	99	1	87.4	9/GR19
GUY00302	−33.80	6	−59.07	4.77	1.43	0.85	91	2	87.4	
HNDIFRB2	−107.30	6	−86.23	15.16	1.14	0.85	8	1	87.4	
HTI00002	−83.30	6	−73.28	18.96	0.82	0.68	11	2	87.4	
HWA00002	−165.80	6	−109.83	36.82	6.03	1.12	137	2	87.4	9/GR1
HWA00003	−174.80	6	−116.10	37.47	5.60	0.76	132	2	87.4	9/GR2
MEX01NTE	−77.80	6	−105.80	25.99	2.88	2.07	155	2	87.4	1
MEX02NTE	−135.80	6	−107.36	26.32	3.80	1.57	149	2	87.4	1
MEX02SUR	−126.80	6	−96.39	19.88	3.19	1.87	158	2	87.4	1
PRU00004	−85.80	6	−74.19	−8.39	3.74	2.45	112	2	87.4	
PTRVIR01	−100.80	6	−93.85	36.31	8.26	3.55	171	2	87.4	1 6 9/GR20
PTRVIR02	−109.80	6	−95.47	36.38	8.10	3.45	168	2	87.4	1 6 9/GR21
TCA00001	−115.80	6	−71.79	21.53	0.60	0.60	90	2	87.4	
USAEH001	−61.30	6	−87.53	36.18	6.41	3.49	12	2	87.4	1 5 6
USAEH002	−100.80	6	−93.85	36.31	8.26	3.55	171	2	87.4	1 6 9/GR20
USAEH003	−109.80	6	−95.47	36.38	8.10	3.45	168	2	87.4	1 6 9/GR21
USAEH004	−118.80	6	−96.42	36.21	8.20	3.12	165	2	87.4	1 5 6
USAPSA02	−165.80	6	−109.83	36.82	6.03	1.12	137	2	87.4	9/GR1
USAPSA03	−174.80	6	−116.10	37.47	5.60	0.76	132	2	87.4	9/GR2
USAWH101	−147.80	6	−111.01	40.67	4.38	2.15	162	2	87.4	
USAWH102	−156.80	6	−113.01	40.71	3.74	1.79	149	2	87.4	
VCT00001	−79.30	6	−61.18	13.23	0.60	0.60	90	2	87.4	
VEN11VEN	−103.80	6	−66.79	6.90	2.50	1.77	122	2	87.4	

17 411.48 MHz (7)

1	2	3	4		5		6	7	8	9
ALS00002	−166.20	7	−109.94	36.86	6.04	1.11	137	1	87.4	9/GR1
ALS00003	−175.20	7	−116.23	37.50	5.60	0.75	132	1	87.4	9/GR2
ARGINSU4	−94.20	7	−52.98	−59.81	3.40	0.68	19	1	87.4	9/GR3
ARGINSU5	−55.20	7	−44.17	−59.91	3.77	0.70	13	1	87.4	9/GR4
ARGSUR04	−94.20	7	−65.04	−43.33	3.32	1.50	40	1	87.4	9/GR3
ARGSUR05	−55.20	7	−63.68	−43.01	2.54	2.38	152	1	87.4	9/GR4
ATGSJN01	−79.70	7	−61.79	17.07	0.60	0.60	90	1	87.4	
B CE311	−64.20	7	−40.60	−6.07	3.04	2.06	174	1	87.4	8 9/GR7
B CE312	−45.20	7	−40.27	−6.06	3.44	2.09	174	1	87.4	8 9/GR9
B CE411	−64.20	7	−50.97	−15.27	3.86	1.38	49	1	87.4	8 9/GR7
B CE412	−45.20	7	−50.71	−15.30	3.57	1.56	52	1	87.4	8 9/GR9
B CE511	−64.20	7	−53.10	−2.90	2.44	2.13	104	1	87.4	8 9/GR7
B NO611	−74.20	7	−59.60	−11.62	2.85	1.69	165	2	87.4	8 9/GR8
B NO711	−74.20	7	−60.70	−1.78	3.54	1.78	126	2	87.4	8 9/GR8
B NO811	−74.20	7	−68.76	−4.71	2.37	1.65	73	2	87.4	8 9/GR8
B SU111	−81.20	7	−51.12	−25.63	2.76	1.05	50	1	87.4	8 9/GR6
B SU112	−45.20	7	−50.75	−25.62	2.47	1.48	56	1	87.4	8 9/GR9
B SU211	−81.20	7	−44.51	−16.95	3.22	1.36	60	1	87.4	8 9/GR6
B SU212	−45.20	7	−44.00	−16.87	3.20	1.96	58	1	87.4	8 9/GR9
BERBERMU	−96.20	7	−64.77	32.32	0.60	0.60	90	2	87.4	
BOLAND01	−115.20	7	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
BOL00001	−87.20	7	−64.61	−16.71	2.52	2.19	85	1	87.4	
BRB00001	−92.70	7	−59.85	12.93	0.60	0.60	90	2	87.4	
CAN01101	−138.20	7	−114.60	51.08	7.28	1.10	160	1	87.4	9/GR10
CAN01201	−138.20	7	−114.60	51.08	7.28	1.10	160	1	87.4	9/GR10
CAN01202	−72.70	7	−81.34	50.02	7.96	2.55	5	1	87.4	
CAN01203	−129.20	7	−113.02	51.08	7.47	1.26	162	1	87.4	9/GR12
CAN01303	−129.20	7	−113.02	51.08	7.47	1.26	162	1	87.4	9/GR12
CAN01304	−91.20	7	−86.71	50.48	8.58	2.54	178	1	87.4	9/GR13
CAN01403	−129.20	7	−113.02	51.08	7.47	1.26	162	1	87.4	9/GR12
CAN01404	−91.20	7	−86.71	50.48	8.58	2.54	178	1	87.4	9/GR13
CAN01405	−82.20	7	−84.11	50.20	8.31	2.58	1	1	87.4	9/GR14
CAN01504	−91.20	7	−86.71	50.48	8.58	2.54	178	1	87.4	9/GR13
CAN01505	−82.20	7	−84.11	50.20	8.31	2.58	1	1	87.4	9/GR14
CAN01605	−82.20	7	−84.11	50.20	8.31	2.58	1	1	87.4	9/GR14
CAN01606	−70.70	7	−80.77	50.03	7.88	2.53	6	1	87.4	
CHLCONT5	−106.20	7	−72.23	−35.57	2.60	0.68	55	1	87.4	9/GR17
CHLPAC02	−106.20	7	−80.06	−30.06	1.36	0.68	69	1	87.4	9/GR17
CLMAND01	−115.20	7	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
CLM00001	−103.20	7	−74.50	5.87	3.98	1.96	118	1	87.4	
CUB00001	−89.20	7	−79.81	21.62	2.24	0.68	168	1	87.4	
EQACAND1	−115.20	7	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
EQAGAND1	−115.20	7	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
GRD00002	−42.20	7	−61.58	12.29	0.60	0.60	90	1	87.4	
GRD00059	−57.20	7	−61.58	12.29	0.60	0.60	90	1	87.4	
GRLDNK01	−53.20	7	−44.89	66.56	2.70	0.82	173	1	87.4	2
HWA00002	−166.20	7	−109.94	36.86	6.04	1.11	137	1	87.4	9/GR1
HWA00003	−175.20	7	−116.23	37.50	5.60	0.75	132	1	87.4	9/GR2
MEX01NTE	−78.20	7	−105.81	26.01	2.89	2.08	155	1	87.4	1
MEX01SUR	−69.20	7	−94.84	19.82	3.05	2.09	4	1	87.4	1
MEX02NTE	−136.20	7	−107.21	26.31	3.84	1.55	148	1	87.4	1
MEX02SUR	−127.20	7	−96.39	19.88	3.18	1.87	157	1	87.4	1
PAQPAC01	−106.20	7	−109.18	−27.53	0.60	0.60	90	1	87.4	9/GR17
PRG00002	−99.20	7	−58.66	−23.32	1.45	1.04	76	1	87.4	
PRUAND02	−115.20	7	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
PTRVIR01	−101.20	7	−93.94	36.32	8.24	3.56	171	1	87.4	1 6 9/GR20
PTRVIR02	−110.20	7	−95.23	36.29	8.27	3.37	168	1	87.4	1 6 9/GR21
SURINAM2	−84.70	7	−55.69	4.35	1.00	0.69	86	1	87.4	
URG00001	−71.70	7	−56.22	−32.52	1.02	0.89	11	1	87.4	
USAEH001	−61.70	7	−87.57	36.17	6.42	3.49	12	1	87.4	1 5 6
USAEH002	−101.20	7	−93.94	36.32	8.24	3.56	171	1	87.4	1 6 9/GR20
USAEH003	−110.20	7	−95.23	36.29	8.27	3.37	168	1	87.4	1 6 9/GR21
USAEH004	−119.20	7	−96.45	36.21	8.20	3.12	165	1	87.4	1 5 6
USAPSA02	−166.20	7	−109.94	36.86	6.04	1.11	137	1	87.4	9/GR1
USAPSA03	−175.20	7	−116.23	37.50	5.60	0.75	132	1	87.4	9/GR2
USAWH101	−148.20	7	−111.02	40.68	4.36	2.15	162	1	87.4	
USAWH102	−157.20	7	−113.07	40.74	3.72	1.78	149	1	87.4	
VENAND03	−115.20	7	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5

17 426.06 MHz (8)

1	2	3	4		5		6	7	8	9
ALS00002	−165.80	8	−109.83	36.82	6.03	1.12	137	2	87.4	9/GR1
ALS00003	−174.80	8	−116.10	37.47	5.60	0.76	132	2	87.4	9/GR2
ARGNORT4	−93.80	8	−63.96	−30.01	3.86	1.99	48	2	87.4	
ARGNORT5	−54.80	8	−62.85	−29.80	3.24	2.89	47	2	87.4	
B CE311	−63.80	8	−40.60	−6.07	3.04	2.06	174	2	87.4	8 9/GR7
B CE312	−44.80	8	−40.26	−6.06	3.44	2.09	174	2	87.4	8 9/GR9
B CE411	−63.80	8	−50.97	−15.26	3.86	1.38	49	2	87.4	8 9/GR7
B CE412	−44.80	8	−50.71	−15.30	3.57	1.56	52	2	87.4	8 9/GR9
B CE511	−63.80	8	−53.11	−2.98	2.42	2.15	107	2	87.4	8 9/GR7
B NO611	−73.80	8	−59.60	−11.62	2.86	1.69	165	1	87.4	8 9/GR8
B NO711	−73.80	8	−60.70	−1.78	3.54	1.78	126	1	87.4	8 9/GR8
B NO811	−73.80	8	−68.75	−4.71	2.37	1.65	73	1	87.4	8 9/GR8
B SE911	−101.80	8	−45.99	−19.09	2.22	0.79	62	2	87.4	8
B SU111	−80.80	8	−51.10	−25.64	2.76	1.06	50	2	87.4	8 9/GR6
B SU112	−44.80	8	−50.76	−25.62	2.47	1.48	56	2	87.4	8 9/GR9
B SU211	−80.80	8	−44.51	−16.94	3.22	1.37	60	2	87.4	8 9/GR6
B SU212	−44.80	8	−43.99	−16.97	3.27	1.92	59	2	87.4	8 9/GR9
CAN01101	−137.80	8	−114.10	50.92	7.22	1.11	160	2	87.4	9/GR10
CAN01201	−137.80	8	−114.10	50.92	7.22	1.11	160	2	87.4	9/GR10
CAN01202	−72.30	8	−81.23	50.12	7.99	2.53	5	2	87.4	
CAN01203	−128.80	8	−113.04	51.04	7.53	1.26	162	2	87.4	9/GR12
CAN01303	−128.80	8	−113.04	51.04	7.53	1.26	162	2	87.4	9/GR12
CAN01304	−90.80	8	−86.57	50.48	8.59	2.54	178	2	87.4	9/GR13
CAN01403	−128.80	8	−113.04	51.04	7.53	1.26	162	2	87.4	9/GR12
CAN01404	−90.80	8	−86.57	50.48	8.59	2.54	178	2	87.4	9/GR13
CAN01405	−81.80	8	−83.80	50.22	8.35	2.57	2	2	87.4	9/GR14
CAN01504	−90.80	8	−86.57	50.48	8.59	2.54	178	2	87.4	9/GR13
CAN01505	−81.80	8	−83.80	50.22	8.35	2.57	2	2	87.4	9/GR14
CAN01605	−81.80	8	−83.80	50.22	8.35	2.57	2	2	87.4	9/GR14
CAN01606	−70.30	8	−80.64	50.02	7.88	2.52	6	2	87.4	
CHLCONT4	−105.80	8	−69.59	−23.20	2.21	0.69	68	2	87.4	9/GR16
CHLCONT6	−105.80	8	−73.52	−55.52	3.65	1.31	39	2	87.4	9/GR16
CRBBAH01	−92.30	8	−76.09	24.13	1.83	0.68	141	1	87.4	9/GR18
CRBBER01	−92.30	8	−64.76	32.13	0.60	0.60	90	1	87.4	9/GR18
CRBBLZ01	−92.30	8	−88.61	17.26	0.64	0.64	90	1	87.4	9/GR18
CRBEC001	−92.30	8	−60.07	8.26	4.20	0.86	115	1	87.4	9/GR18
CRBJMC01	−92.30	8	−79.45	17.97	0.99	0.68	151	1	87.4	9/GR18
CYM00001	−115.80	8	−80.58	19.57	0.60	0.60	90	2	87.4	
DOMIFRB2	−83.30	8	−70.51	18.79	0.98	0.69	167	2	87.4	
EQAC0001	−94.80	8	−78.31	−1.52	1.48	1.15	65	1	87.4	9/GR19
EQAG0001	−94.80	8	−90.36	−0.57	0.94	0.89	99	1	87.4	9/GR19
GUFMGG02	−52.80	8	−56.42	8.47	4.16	0.81	123	2	87.4	2 7
HWA00002	−165.80	8	−109.83	36.82	6.03	1.12	137	2	87.4	9/GR1
HWA00003	−174.80	8	−116.10	37.47	5.60	0.76	132	2	87.4	9/GR2
JMC00005	−33.80	8	−77.27	18.12	0.60	0.60	90	2	87.4	
LCAIFRB1	−79.30	8	−61.15	13.90	0.60	0.60	90	2	87.4	
MEX01NTE	−77.80	8	−105.80	25.99	2.88	2.07	155	2	87.4	1
MEX02NTE	−135.80	8	−107.36	26.32	3.80	1.57	149	2	87.4	1
MEX02SUR	−126.80	8	−96.39	19.88	3.19	1.87	158	2	87.4	1
PRU00004	−85.80	8	−74.19	−8.39	3.74	2.45	112	2	87.4	
PTRVIR01	−100.80	8	−93.85	36.31	8.26	3.55	171	2	87.4	1 6 9/GR20
PTRVIR02	−109.80	8	−95.47	36.38	8.10	3.45	168	2	87.4	1 6 9/GR21
SLVIFRB2	−107.30	8	−88.91	13.59	0.60	0.60	90	1	87.4	
USAEH001	−61.30	8	−87.53	36.18	6.41	3.49	12	2	87.4	1 5 6
USAEH002	−100.80	8	−93.85	36.31	8.26	3.55	71	2	87.4	1 6 9/GR20
USAEH003	−109.80	8	−95.47	36.38	8.10	3.45	168	2	87.4	1 6 9/GR21
USAEH004	−118.80	8	−96.42	36.21	8.20	3.12	165	2	87.4	1 5 6
USAPSA02	−165.80	8	−109.83	36.82	6.03	1.12	137	2	87.4	9/GR1
USAPSA03	−174.80	8	−116.10	37.47	5.60	0.76	132	2	87.4	9/GR2
USAWH101	−147.80	8	−111.01	40.67	4.38	2.15	162	2	87.4	
USAWH102	−156.80	8	−113.01	40.71	3.74	1.79	149	2	87.4	
VEN11VEN	−103.80	8	−66.79	6.90	2.50	1.77	122	2	87.4	

17 440.64 MHz (9)

1	2	3	4		5		6	7	8	9
ALS00002	−166.20	9	−109.94	36.86	6.04	1.11	137	1	87.4	9/GR1
ALS00003	−175.20	9	−116.23	37.50	5.60	0.75	132	1	87.4	9/GR2
ARGINSU4	−94.20	9	−52.98	−59.81	3.40	0.68	19	1	87.4	9/GR3
ARGSUR04	−94.20	9	−65.04	−43.33	3.32	1.50	40	1	87.4	9/GR3
B CE311	−64.20	9	−40.60	−6.07	3.04	2.06	174	1	87.4	8 9/GR7
B CE312	−45.20	9	−40.27	−6.06	3.44	2.09	174	1	87.4	8 9/GR9
B CE411	−64.20	9	−50.97	−15.27	3.86	1.38	49	1	87.4	8 9/GR7
B CE412	−45.20	9	−50.71	−15.30	3.57	1.56	52	1	87.4	8 9/GR9
B CE511	−64.20	9	−53.10	−2.90	2.44	2.13	104	1	87.4	8 9/GR7
B NO611	−74.20	9	−59.60	−11.62	2.85	1.69	165	2	87.4	8 9/GR8
B NO711	−74.20	9	−60.70	−1.78	3.54	1.78	126	2	87.4	8 9/GR8
B NO811	−74.20	9	−68.76	−4.71	2.37	1.65	73	2	87.4	8 9/GR8
B SU111	−81.20	9	−51.12	−25.63	2.76	1.05	50	1	87.4	8 9/GR6
B SU112	−45.20	9	−50.75	−25.62	2.47	1.48	56	1	87.4	8 9/GR9
B SU211	−81.20	9	−44.51	−16.95	3.22	1.36	60	1	87.4	8 9/GR6
B SU212	−45.20	9	−44.00	−16.87	3.20	1.96	58	1	87.4	8 9/GR9
BAHIFRB1	−87.20	9	−76.06	24.16	1.81	0.70	142	1	87.4	
BERBERMU	−96.20	9	−64.77	32.32	0.60	0.60	90	2	87.4	
BERBER02	−31.00	9	−64.77	32.32	0.60	0.60	90	1	87.4	2 3
BOLAND01	−115.20	9	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
CAN01101	−138.20	9	−114.60	51.08	7.28	1.10	160	1	87.4	9/GR10
CAN01201	−138.20	9	−114.60	51.08	7.28	1.10	160	1	87.4	9/GR10
CAN01202	−72.70	9	−81.34	50.02	7.96	2.55	5	1	87.4	
CAN01203	−129.20	9	−113.02	51.08	7.47	1.26	162	1	87.4	9/GR12
CAN01303	−129.20	9	−113.02	51.08	7.47	1.26	162	1	87.4	9/GR12
CAN01304	−91.20	9	−86.71	50.48	8.58	2.54	178	1	87.4	9/GR13
CAN01403	−129.20	9	−113.02	51.08	7.47	1.26	162	1	87.4	9/GR12
CAN01404	−91.20	9	−86.71	50.48	8.58	2.54	178	1	87.4	9/GR13
CAN01405	−82.20	9	−84.11	50.20	8.31	2.58	1	1	87.4	9/GR14
CAN01504	−91.20	9	−86.71	50.48	8.58	2.54	178	1	87.4	9/GR13
CAN01505	−82.20	9	−84.11	50.20	8.31	2.58	1	1	87.4	9/GR14
CAN01605	−82.20	9	−84.11	50.20	8.31	2.58	1	1	87.4	9/GR14
CAN01606	−70.70	9	−80.77	50.03	7.88	2.53	6	1	87.4	
CHLCONT5	−106.20	9	−72.23	−35.57	2.60	0.68	55	1	87.4	9/GR17
CHLPAC02	−106.20	9	−80.06	−30.06	1.36	0.68	69	1	87.4	9/GR17
CLMAND01	−115.20	9	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
CLM00001	−103.20	9	−74.50	5.87	3.98	1.96	118	1	87.4	
EQACAND1	−115.20	9	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
EQAGAND1	−115.20	9	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
FLKANT01	−57.20	9	−44.54	−60.13	3.54	0.68	12	1	87.4	2
FLKFALKS	−31.00	9	−59.90	−51.64	0.60	0.60	90	1	87.4	2 3
GRD00002	−42.20	9	−61.58	12.29	0.60	0.60	90	1	87.4	
HWA00002	−166.20	9	−109.94	36.86	6.04	1.11	137	1	87.4	9/GR1
HWA00003	−175.20	9	−116.23	37.50	5.60	0.75	132	1	87.4	9/GR2
MEX01NTE	−78.20	9	−105.81	26.01	2.89	2.08	155	1	87.4	1
MEX01SUR	−69.20	9	−94.84	19.82	3.05	2.09	4	1	87.4	1
MEX02NTE	−136.20	9	−107.21	26.31	3.84	1.55	148	1	87.4	1
MEX02SUR	−127.20	9	−96.39	19.88	3.18	1.87	157	1	87.4	1
PAQPAC01	−106.20	9	−109.18	−27.53	0.60	0.60	90	1	87.4	9/GR17
PRG00002	−99.20	9	−58.66	−23.32	1.45	1.04	76	1	87.4	
PRUAND02	−115.20	9	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
PTRVIR01	−101.20	9	−93.94	36.32	8.24	3.56	171	1	87.4	1 6 9/GR20
PTRVIR02	−110.20	9	−95.23	36.29	8.27	3.37	168	1	87.4	1 6 9/GR21
SPMFRAN3	−53.20	9	−67.24	47.51	3.16	0.79	7	1	87.4	2 7
TRD00001	−84.70	9	−61.23	10.70	0.60	0.60	90	1	87.4	
URG00001	−71.70	9	−56.22	−32.52	1.02	0.89	11	1	87.4	
USAEH001	−61.70	9	−87.57	36.17	6.42	3.49	12	1	87.4	1 5 6
USAEH002	−101.20	9	−93.94	36.32	8.24	3.56	171	1	87.4	1 6 9/GR20
USAEH003	−110.20	9	−95.23	36.29	8.27	3.37	168	1	87.4	1 6 9/GR21
USAEH004	−119.20	9	−96.45	36.21	8.20	3.12	165	1	87.4	1 5 6
USAPSA02	−166.20	9	−109.94	36.86	6.04	1.11	137	1	87.4	9/GR1
USAPSA03	−175.20	9	−116.23	37.50	5.60	0.75	132	1	87.4	9/GR2
USAWH101	−148.20	9	−111.02	40.68	4.36	2.15	162	1	87.4	
USAWH102	−157.20	9	−113.07	40.74	3.72	1.78	149	1	87.4	
VENAND03	−115.20	9	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
VRG00001	−79.70	9	−64.37	18.48	0.60	0.60	90	1	87.4	4

17 455.22 MHz (10)

1	2	3	4		5		6	7	8	9
ALS00002	−165.80	10	−109.83	36.82	6.03	1.12	137	2	87.4	9/GR1
ALS00003	−174.80	10	−116.10	37.47	5.60	0.76	132	2	87.4	9/GR2
ARGNORT4	−93.80	10	−63.96	−30.01	3.86	1.99	48	2	87.4	
ARGNORT5	−54.80	10	−62.85	−29.80	3.24	2.89	47	2	87.4	
ATNBEAM1	−52.80	10	−66.44	14.87	1.83	0.68	39	2	87.4	
B CE311	−63.80	10	−40.60	−6.07	3.04	2.06	174	2	87.4	8 9/GR7
B CE312	−44.80	10	−40.26	−6.06	3.44	2.09	174	2	87.4	8 9/GR9
B CE411	−63.80	10	−50.97	−15.26	3.86	1.38	49	2	87.4	8 9/GR7
B CE412	−44.80	10	−50.71	−15.30	3.57	1.56	52	2	87.4	8 9/GR9
B CE511	−63.80	10	−53.11	−2.98	2.42	2.15	107	2	87.4	8 9/GR7
B NO611	−73.80	10	−59.60	−11.62	2.86	1.69	165	1	87.4	8 9/GR8
B NO711	−73.80	10	−60.70	−1.78	3.54	1.78	126	1	87.4	8 9/GR8
B NO811	−73.80	10	−68.75	−4.71	2.37	1.65	73	1	87.4	8 9/GR8
B SE911	−101.80	10	−45.99	−19.09	2.22	0.79	62	2	87.4	8
B SU111	−80.80	10	−51.10	−25.64	2.76	1.06	50	2	87.4	8 9/GR6
B SU112	−44.80	10	−50.76	−25.62	2.47	1.48	56	2	87.4	8 9/GR9
B SU211	−80.80	10	−44.51	−16.94	3.22	1.37	60	2	87.4	8 9/GR6
B SU212	−44.80	10	−43.99	−16.97	3.27	1.92	59	2	87.4	8 9/GR9
CAN01101	−137.80	10	−114.10	50.92	7.22	1.11	160	2	87.4	9/GR10
CAN01201	−137.80	10	−114.10	50.92	7.22	1.11	160	2	87.4	9/GR10
CAN01202	−72.30	10	−81.23	50.12	7.99	2.53	5	2	87.4	
CAN01203	−128.80	10	−113.04	51.04	7.53	1.26	162	2	87.4	9/GR12
CAN01303	−128.80	10	−113.04	51.04	7.53	1.26	162	2	87.4	9/GR12
CAN01304	−90.80	10	−86.57	50.48	8.59	2.54	178	2	87.4	9/GR13
CAN01403	−128.80	10	−113.04	51.04	7.53	1.26	162	2	87.4	9/GR12
CAN01404	−90.80	10	−86.57	50.48	8.59	2.54	178	2	87.4	9/GR13
CAN01405	−81.80	10	−83.80	50.22	8.35	2.57	2	2	87.4	9/GR14
CAN01504	−90.80	10	−86.57	50.48	8.59	2.54	178	2	87.4	9/GR13
CAN01505	−81.80	10	−83.80	50.22	8.35	2.57	2	2	87.4	9/GR14
CAN01605	−81.80	10	−83.80	50.22	8.35	2.57	2	2	87.4	9/GR14
CAN01606	−70.30	10	−80.64	50.02	7.88	2.52	6	2	87.4	
CHLCONT4	−105.80	10	−69.59	−23.20	2.21	0.69	68	2	87.4	9/GR16
CHLCONT6	−105.80	10	−73.52	−55.52	3.65	1.31	39	2	87.4	9/GR16
CRBBAH01	−92.30	10	−76.09	24.13	1.83	0.68	141	1	87.4	9/GR18
CRBBER01	−92.30	10	−64.76	32.13	0.60	0.60	90	1	87.4	9/GR18
CRBBLZ01	−92.30	10	−88.61	17.26	0.64	0.64	90	1	87.4	9/GR18
CRBEC001	−92.30	10	−60.07	8.26	4.20	0.86	115	1	87.4	9/GR18
CRBJMC01	−92.30	10	−79.45	17.97	0.99	0.68	151	1	87.4	9/GR18
CTR00201	−130.80	10	−84.33	9.67	0.82	0.68	119	2	87.4	
EQAC0001	−94.80	10	−78.31	−1.52	1.48	1.15	65	1	87.4	9/GR19
EQAG0001	−94.80	10	−90.36	−0.57	0.94	0.89	99	1	87.4	9/GR19
GUY00302	−33.80	10	−59.07	4.77	1.43	0.85	91	2	87.4	
HNDIFRB2	−107.30	10	−86.23	15.16	1.14	0.85	8	1	87.4	
HTI00002	−83.30	10	−73.28	18.96	0.82	0.68	11	2	87.4	
HWA00002	−165.80	10	−109.83	36.82	6.03	1.12	137	2	87.4	9/GR1
HWA00003	−174.80	10	−116.10	37.47	5.60	0.76	132	2	87.4	9/GR2
MEX01NTE	−77.80	10	−105.80	25.99	2.88	2.07	155	2	87.4	1
MEX02NTE	−135.80	10	−107.36	26.32	3.80	1.57	149	2	87.4	1
MEX02SUR	−126.80	10	−96.39	19.88	3.19	1.87	158	2	87.4	1
PRU00004	−85.80	10	−74.19	−8.39	3.74	2.45	112	2	87.4	
PTRVIR01	−100.80	10	−93.85	36.31	8.26	3.55	171	2	87.4	1 6 9/GR20
PTRVIR02	−109.80	10	−95.47	36.38	8.10	3.45	168	2	87.4	1 6 9/GR21
TCA00001	−115.80	10	−71.79	21.53	0.60	0.60	90	2	87.4	
USAEH001	−61.30	10	−87.53	36.18	6.41	3.49	12	2	87.4	1 5 6
USAEH002	−100.80	10	−93.85	36.31	8.26	3.55	171	2	87.4	1 6 9/GR20
USAEH003	−109.80	10	−95.47	36.38	8.10	3.45	168	2	87.4	1 6 9/GR21
USAEH004	−118.80	10	−96.42	36.21	8.20	3.12	165	2	87.4	1 5 6
USAPSA02	−165.80	10	−109.83	36.82	6.03	1.12	137	2	87.4	9/GR1
USAPSA03	−174.80	10	−116.10	37.47	5.60	0.76	132	2	87.4	9/GR2
USAWH101	−147.80	10	−111.01	40.67	4.38	2.15	162	2	87.4	
USAWH102	−156.80	10	−113.01	40.71	3.74	1.79	149	2	87.4	
VCT00001	−79.30	10	−61.18	13.23	0.60	0.60	90	2	87.4	
VEN11VEN	−103.80	10	−66.79	6.90	2.50	1.77	122	2	87.4	

17 469.80 MHz (11)

1	2	3	4		5		6	7	8	9
ALS00002	−166.20	11	−109.94	36.86	6.04	1.11	137	1	87.4	9/GR1
ALS00003	−175.20	11	−116.23	37.50	5.60	0.75	132	1	87.4	9/GR2
ARGINSU4	−94.20	11	−52.98	−59.81	3.40	0.68	19	1	87.4	9/GR3
ARGINSU5	−55.20	11	−44.17	−59.91	3.77	0.70	13	1	87.4	9/GR4
ARGSUR04	−94.20	11	−65.04	−43.33	3.32	1.50	40	1	87.4	9/GR3
ARGSUR05	−55.20	11	−63.68	−43.01	2.54	2.38	152	1	87.4	9/GR4
ATGSJN01	−79.70	11	−61.79	17.07	0.60	0.60	90	1	87.4	
B CE311	−64.20	11	−40.60	−6.07	3.04	2.06	174	1	87.4	8 9/GR7
B CE312	−45.20	11	−40.27	−6.06	3.44	2.09	174	1	87.4	8 9/GR9
B CE411	−64.20	11	−50.97	−15.27	3.86	1.38	49	1	87.4	8 9/GR7
B CE412	−45.20	11	−50.71	−15.30	3.57	1.56	52	1	87.4	8 9/GR9
B CE511	−64.20	11	−53.10	−2.90	2.44	2.13	104	1	87.4	8 9/GR7
B NO611	−74.20	11	−59.60	−11.62	2.85	1.69	165	2	87.4	8 9/GR8
B NO711	−74.20	11	−60.70	−1.78	3.54	1.78	126	2	87.4	8 9/GR8
B NO811	−74.20	11	−68.76	−4.71	2.37	1.65	73	2	87.4	8 9/GR8
B SU111	−81.20	11	−51.12	−25.63	2.76	1.05	50	1	87.4	8 9/GR6
B SU112	−45.20	11	−50.75	−25.62	2.47	1.48	56	1	87.4	8 9/GR9
B SU211	−81.20	11	−44.51	−16.95	3.22	1.36	60	1	87.4	8 9/GR6
B SU212	−45.20	11	−44.00	−16.87	3.20	1.96	58	1	87.4	8 9/GR9
BERBERMU	−96.20	11	−64.77	32.32	0.60	0.60	90	2	87.4	
BOLAND01	−115.20	11	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
BOL00001	−87.20	11	−64.61	−16.71	2.52	2.19	85	1	87.4	
BRB00001	−92.70	11	−59.85	12.93	0.60	0.60	90	2	87.4	
CAN01101	−138.20	11	−114.60	51.08	7.28	1.10	160	1	87.4	9/GR10
CAN01201	−138.20	11	−114.60	51.08	7.28	1.10	160	1	87.4	9/GR10
CAN01202	−72.70	11	−81.34	50.02	7.96	2.55	5	1	87.4	
CAN01203	−129.20	11	−113.02	51.08	7.47	1.26	162	1	87.4	9/GR12
CAN01303	−129.20	11	−113.02	51.08	7.47	1.26	162	1	87.4	9/GR12
CAN01304	−91.20	11	−86.71	50.48	8.58	2.54	178	1	87.4	9/GR13
CAN01403	−129.20	11	−113.02	51.08	7.47	1.26	162	1	87.4	9/GR12
CAN01404	−91.20	11	−86.71	50.48	8.58	2.54	178	1	87.4	9/GR13
CAN01405	−82.20	11	−84.11	50.20	8.31	2.58	1	1	87.4	9/GR14
CAN01504	−91.20	11	−86.71	50.48	8.58	2.54	178	1	87.4	9/GR13
CAN01505	−82.20	11	−84.11	50.20	8.31	2.58	1	1	87.4	9/GR14
CAN01605	−82.20	11	−84.11	50.20	8.31	2.58	1	1	87.4	9/GR14
CAN01606	−70.70	11	−80.77	50.03	7.88	2.53	6	1	87.4	
CHLCONT5	−106.20	11	−72.23	−35.57	2.60	0.68	55	1	87.4	9/GR17
CHLPAC02	−106.20	11	−80.06	−30.06	1.36	0.68	69	1	87.4	9/GR17
CLMAND01	−115.20	11	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
CLM00001	−103.20	11	−74.50	5.87	3.98	1.96	118	1	87.4	
CUB00001	−89.20	11	−79.81	21.62	2.24	0.68	168	1	87.4	
EQACAND1	−115.20	11	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
EQAGAND1	−115.20	11	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
GRD00002	−42.20	11	−61.58	12.29	0.60	0.60	90	1	87.4	
GRD00059	−57.20	11	−61.58	12.29	0.60	0.60	90	1	87.4	
GRLDNK01	−53.20	11	−44.89	66.56	2.70	0.82	173	1	87.4	2
GUY00201	−84.70	11	−59.19	4.78	1.44	0.85	95	1	87.4	
HWA00002	−166.20	11	−109.94	36.86	6.04	1.11	137	1	87.4	9/GR1
HWA00003	−175.20	11	−116.23	37.50	5.60	0.75	132	1	87.4	9/GR2
MEX01NTE	−78.20	11	−105.81	26.01	2.89	2.08	155	1	87.4	1
MEX01SUR	−69.20	11	−94.84	19.82	3.05	2.09	4	1	87.4	1
MEX02NTE	−136.20	11	−107.21	26.31	3.84	1.55	148	1	87.4	1
MEX02SUR	−127.20	11	−96.39	19.88	3.18	1.87	157	1	87.4	1
PAQPAC01	−106.20	11	−109.18	−27.53	0.60	0.60	90	1	87.4	9/GR17
PRG00002	−99.20	11	−58.66	−23.32	1.45	1.04	76	1	87.4	
PRUAND02	−115.20	11	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
PTRVIR01	−101.20	11	−93.94	36.32	8.24	3.56	171	1	87.4	1 6 9/GR20
PTRVIR02	−110.20	11	−95.23	36.29	8.27	3.37	168	1	87.4	1 6 9/GR21
URG00001	−71.70	11	−56.22	−32.52	1.02	0.89	11	1	87.4	
USAEH001	−61.70	11	−87.57	36.17	6.42	3.49	12	1	87.4	1 5 6
USAEH002	−101.20	11	−93.94	36.32	8.24	3.56	171	1	87.4	1 6 9/GR20
USAEH003	−110.20	11	−95.23	36.29	8.27	3.37	168	1	87.4	1 6 9/GR21
USAEH004	−119.20	11	−96.45	36.21	8.20	3.12	165	1	87.4	1 5 6
USAPSA02	−166.20	11	−109.94	36.86	6.04	1.11	137	1	87.4	9/GR1
USAPSA03	−175.20	11	−116.23	37.50	5.60	0.75	132	1	87.4	9/GR2
USAWH101	−148.20	11	−111.02	40.68	4.36	2.15	162	1	87.4	
USAWH102	−157.20	11	−113.07	40.74	3.72	1.78	149	1	87.4	
VENAND03	−115.20	11	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5

17 484.38 MHz (12)

1	2	3	4		5		6	7	8	9
ALS00002	−165.80	12	−109.83	36.82	6.03	1.12	137	2	87.4	9/GR1
ALS00003	−174.80	12	−116.10	37.47	5.60	0.76	132	2	87.4	9/GR2
ARGNORT4	−93.80	12	−63.96	−30.01	3.86	1.99	48	2	87.4	
ARGNORT5	−54.80	12	−62.85	−29.80	3.24	2.89	47	2	87.4	
B CE311	−63.80	12	−40.60	−6.07	3.04	2.06	174	2	87.4	8 9/GR7
B CE312	−44.80	12	−40.26	−6.06	3.44	2.09	174	2	87.4	8 9/GR9
B CE411	−63.80	12	−50.97	−15.26	3.86	1.38	49	2	87.4	8 9/GR7
B CE412	−44.80	12	−50.71	−15.30	3.57	1.56	52	2	87.4	8 9/GR9
B CE511	−63.80	12	−53.11	−2.98	2.42	2.15	107	2	87.4	8 9/GR7
B NO611	−73.80	12	−59.60	−11.62	2.86	1.69	165	1	87.4	8 9/GR8
B NO711	−73.80	12	−60.70	−1.78	3.54	1.78	126	1	87.4	8 9/GR8
B NO811	−73.80	12	−68.75	−4.71	2.37	1.65	73	1	87.4	8 9/GR8
B SE911	−101.80	12	−45.99	−19.09	2.22	0.79	62	2	87.4	8
B SU111	−80.80	12	−51.10	−25.64	2.76	1.06	50	2	87.4	8 9/GR6
B SU112	−44.80	12	−50.76	−25.62	2.47	1.48	56	2	87.4	8 9/GR9
B SU211	−80.80	12	−44.51	−16.94	3.22	1.37	60	2	87.4	8 9/GR6
B SU212	−44.80	12	−43.99	−16.97	3.27	1.92	59	2	87.4	8 9/GR9
CAN01101	−137.80	12	−114.10	50.92	7.22	1.11	160	2	87.4	9/GR10
CAN01201	−137.80	12	−114.10	50.92	7.22	1.11	160	2	87.4	9/GR10
CAN01202	−72.30	12	−81.23	50.12	7.99	2.53	5	2	87.4	
CAN01203	−128.80	12	−113.04	51.04	7.53	1.26	162	2	87.4	9/GR12
CAN01303	−128.80	12	−113.04	51.04	7.53	1.26	162	2	87.4	9/GR12
CAN01304	−90.80	12	−86.57	50.48	8.58	2.54	178	2	87.4	9/GR13
CAN01403	−128.80	12	−113.04	51.04	7.53	1.26	162	2	87.4	9/GR12
CAN01404	−90.80	12	−86.57	50.48	8.59	2.54	178	2	87.4	9/GR13
CAN01405	−81.80	12	−83.80	50.22	8.35	2.57	2	2	87.4	9/GR14
CAN01504	−90.80	12	−86.57	50.48	8.59	2.54	178	2	87.4	9/GR13
CAN01505	−81.80	12	−83.80	50.22	8.35	2.57	2	2	87.4	9/GR14
CAN01605	−81.80	12	−83.80	50.22	8.35	2.57	2	2	87.4	9/GR14
CAN01606	−70.30	12	−80.64	50.02	7.88	2.52	6	2	87.4	
CHLCONT4	−105.80	12	−69.59	−23.20	2.21	0.69	68	2	87.4	9/GR16
CHLCONT6	−105.80	12	−73.52	−55.52	3.65	1.31	39	2	87.4	9/GR16
CRBBAH01	−92.30	12	−76.09	24.13	1.83	0.68	141	1	87.4	9/GR18
CRBBER01	−92.30	12	−64.76	32.13	0.60	0.60	90	1	87.4	9/GR18
CRBBLZ01	−92.30	12	−88.61	17.26	0.64	0.64	90	1	87.4	9/GR18
CRBEC001	−92.30	12	−60.07	8.26	4.20	0.86	115	1	87.4	9/GR18
CRBJMC01	−92.30	12	−79.45	17.97	0.99	0.68	151	1	87.4	9/GR18
CYM00001	−115.80	12	−80.58	19.57	0.60	0.60	90	2	87.4	
DOMIFRB2	−83.30	12	−70.51	18.79	0.98	0.69	167	2	87.4	
EQAC0001	−94.80	12	−78.31	−1.52	1.48	1.15	65	1	87.4	9/GR19
EQAG0001	−94.80	12	−90.36	−0.57	0.94	0.89	99	1	87.4	9/GR19
GUFMGG02	−52.80	12	−56.42	8.47	4.16	0.81	123	2	87.4	2 7
HWA00002	−165.80	12	−109.83	36.82	6.03	1.12	137	2	87.4	9/GR1
HWA00003	−174.80	12	−116.10	37.47	5.60	0.76	132	2	87.4	9/GR2
JMC00005	−33.80	12	−77.27	18.12	0.60	0.60	90	2	87.4	
LCAIFRB1	−79.30	12	−61.15	13.90	0.60	0.60	90	2	87.4	
MEX01NTE	−77.80	12	−105.80	25.99	2.88	2.07	155	2	87.4	1
MEX02NTE	−135.80	12	−107.36	26.32	3.80	1.57	149	2	87.4	1
MEX02SUR	−126.80	12	−96.39	19.88	3.19	1.87	158	2	87.4	1
PRU00004	−85.80	12	−74.19	−8.39	3.74	2.45	112	2	87.4	
PTRVIR01	−100.80	12	−93.85	36.31	8.26	3.55	171	2	87.4	1 6 9/GR20
PTRVIR02	−109.80	12	−95.47	36.38	8.10	3.45	168	2	87.4	1 6 9/GR21
SLVIFRB2	−107.30	12	−88.91	13.59	0.60	0.60	90	1	87.4	
USAEH001	−61.30	12	−87.53	36.18	6.41	3.49	12	2	87.4	1 5 6
USAEH002	−100.80	12	−93.85	36.31	8.26	3.55	171	2	87.4	1 6 9/GR20
USAEH003	−109.80	12	−95.47	36.38	8.10	3.45	168	2	87.4	1 6 9/GR21
USAEH004	−118.80	12	−96.42	36.21	8.20	3.12	165	2	87.4	1 5 6
USAPSA02	−165.80	12	−109.83	36.82	6.03	1.12	137	2	87.4	9/GR1
USAPSA03	−174.80	12	−116.10	37.47	5.60	0.76	132	2	87.4	9/GR2
USAWH101	−147.80	12	−111.01	40.67	4.38	2.15	162	2	87.4	
USAWH102	−156.80	12	−113.01	40.71	3.74	1.79	149	2	87.4	
VEN11VEN	−103.80	12	−66.79	6.90	2.50	1.77	122	2	87.4	

17 498.96 MHz (13)

1	2	3	4		5		6	7	8	9
ALS00002	−166.20	13	−109.94	36.86	6.04	1.11	137	1	87.4	9/GR1
ALS00003	−175.20	13	−116.23	37.50	5.60	0.75	132	1	87.4	9/GR2
ARGINSU4	−94.20	13	−52.98	−59.81	3.40	0.68	19	1	87.4	9/GR3
ARGSUR04	−94.20	13	−65.04	−43.33	3.32	1.50	40	1	87.4	9/GR3
B CE311	−64.20	13	−40.60	−6.07	3.04	2.06	174	1	87.4	8 9/GR7
B CE312	−45.20	13	−40.27	−6.06	3.44	2.09	174	1	87.4	8 9/GR9
B CE411	−64.20	13	−50.97	−15.27	3.86	1.38	49	1	87.4	8 9/GR7
B CE412	−45.20	13	−50.71	−15.30	3.57	1.56	52	1	87.4	8 9/GR9
B CE511	−64.20	13	−53.10	−2.90	2.44	2.13	104	1	87.4	8 9/GR7
B NO611	−74.20	13	−59.60	−11.62	2.85	1.69	165	2	87.4	8 9/GR8
B NO711	−74.20	13	−60.70	−1.78	3.54	1.78	126	2	87.4	8 9/GR8
B NO811	−74.20	13	−68.76	−4.71	2.37	1.65	73	2	87.4	8 9/GR8
B SU111	−81.20	13	−51.12	−25.63	2.76	1.05	50	1	87.4	8 9/GR6
B SU112	−45.20	13	−50.75	−25.62	2.47	1.48	56	1	87.4	8 9/GR9
B SU211	−81.20	13	−44.51	−16.95	3.22	1.36	60	1	87.4	8 9/GR6
B SU212	−45.20	13	−44.00	−16.87	3.20	1.96	58	1	87.4	8 9/GR9
BAHIFRB1	−87.20	13	−76.06	24.16	1.81	0.70	142	1	87.4	
BERBERMU	−96.20	13	−64.77	32.32	0.60	0.60	90	2	87.4	
BERBER02	−31.00	13	−64.77	32.32	0.60	0.60	90	1	87.4	2 3
BOLAND01	−115.20	13	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
CAN01101	−138.20	13	−114.60	51.08	7.28	1.10	160	1	87.4	9/GR10
CAN01201	−138.20	13	−114.60	51.08	7.28	1.10	160	1	87.4	9/GR10
CAN01202	−72.70	13	−81.34	50.02	7.96	2.55	5	1	87.4	
CAN01203	−129.20	13	−113.02	51.08	7.47	1.26	162	1	87.4	9/GR12
CAN01303	−129.20	13	−113.02	51.08	7.47	1.26	162	1	87.4	9/GR12
CAN01304	−91.20	13	−86.71	50.48	8.58	2.54	178	1	87.4	9/GR13
CAN01403	−129.20	13	−113.02	51.08	7.47	1.26	162	1	87.4	9/GR12
CAN01404	−91.20	13	−86.71	50.48	8.58	2.54	178	1	87.4	9/GR13
CAN01405	−82.20	13	−84.11	50.20	8.31	2.58	1	1	87.4	9/GR14
CAN01504	−91.20	13	−86.71	50.48	8.58	2.54	178	1	87.4	9/GR13
CAN01505	−82.20	13	−84.11	50.20	8.31	2.58	1	1	87.4	9/GR14
CAN01605	−82.20	13	−84.11	50.20	8.31	2.58	1	1	87.4	9/GR14
CAN01606	−70.70	13	−80.77	50.03	7.88	2.53	6	1	87.4	
CHLCONT5	−106.20	13	−72.23	−35.57	2.60	0.68	55	1	87.4	9/GR17
CHLPAC02	−106.20	13	−80.06	−30.06	1.36	0.68	69	1	87.4	9/GR17
CLMAND01	−115.20	13	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
CLM00001	−103.20	13	−74.50	5.87	3.98	1.96	118	1	87.4	
EQACAND1	−115.20	13	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
EQAGAND1	−115.20	13	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
FLKANT01	−57.20	13	−44.54	−60.13	3.54	0.68	12	1	87.4	2
FLKFALKS	−31.00	13	−59.90	−51.64	0.60	0.60	90	1	87.4	2 3
GRD00002	−42.20	13	−61.58	12.29	0.60	0.60	90	1	87.4	
HWA00002	−166.20	13	−109.94	36.86	6.04	1.11	137	1	87.4	9/GR1
HWA00003	−175.20	13	−116.23	37.50	5.60	0.75	132	1	87.4	9/GR2
MEX01NTE	−78.20	13	−105.81	26.01	2.89	2.08	155	1	87.4	1
MEX01SUR	−69.20	13	−94.84	19.82	3.05	2.09	4	1	87.4	1
MEX02NTE	−136.20	13	−107.21	26.31	3.84	1.55	148	1	87.4	1
MEX02SUR	−127.20	13	−96.39	19.88	3.18	1.87	157	1	87.4	1
PAQPAC01	−106.20	13	−109.18	−27.53	0.60	0.60	90	1	87.4	9/GR17
PRG00002	−99.20	13	−58.66	−23.32	1.45	1.04	76	1	87.4	
PRUAND02	−115.20	13	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
PTRVIR01	−101.20	13	−93.94	36.32	8.24	3.56	171	1	87.4	1 6 9/GR20
PTRVIR02	−110.20	13	−95.23	36.29	8.27	3.37	168	1	87.4	1 6 9/GR21
SPMFRAN3	−53.20	13	−67.24	47.51	3.16	0.79	7	1	87.4	2 7
TRD00001	−84.70	13	−61.23	10.70	0.60	0.60	90	1	87.4	
URG00001	−71.70	13	−56.22	−32.52	1.02	0.89	11	1	87.4	
USAEH001	−61.70	13	−87.57	36.17	6.42	3.49	12	1	87.4	1 5 6
USAEH002	−101.20	13	−93.94	36.32	8.24	3.56	171	1	87.4	1 6 9/GR20
USAEH003	−110.20	13	−95.23	36.29	8.27	3.37	168	1	87.4	1 6 9/GR21
USAEH004	−119.20	13	−96.45	36.21	8.20	3.12	165	1	87.4	1 5 6
USAPSA02	−166.20	13	−109.94	36.86	6.04	1.11	137	1	87.4	9/GR1
USAPSA03	−175.20	13	−116.23	37.50	5.60	0.75	132	1	87.4	9/GR2
USAWH101	−148.20	13	−111.02	40.68	4.36	2.15	162	1	87.4	
USAWH102	−157.20	13	−113.07	40.74	3.72	1.78	149	1	87.4	
VENAND03	−115.20	13	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
VRG00001	−79.70	13	−64.37	18.48	0.60	0.60	90	1	87.4	4

17 513.54 MHz (14)

1	2	3	4		5		6	7	8	9
ALS00002	−165.80	14	−109.83	36.82	6.03	1.12	137	2	87.4	9/GR1
ALS00003	−174.80	14	−116.10	37.47	5.60	0.76	132	2	87.4	9/GR2
ARGNORT4	−93.80	14	−63.96	−30.01	3.86	1.99	48	2	87.4	
ARGNORT5	−54.80	14	−62.85	−29.80	3.24	2.89	47	2	87.4	
ATNBEAM1	−52.80	14	−66.44	14.87	1.83	0.68	39	2	87.4	
B CE311	−63.80	14	−40.60	−6.07	3.04	2.06	174	2	87.4	8 9/GR7
B CE312	−44.80	14	−40.26	−6.06	3.44	2.09	174	2	87.4	8 9/GR9
B CE411	−63.80	14	−50.97	−15.26	3.86	1.38	49	2	87.4	8 9/GR7
B CE412	−44.80	14	−50.71	−15.30	3.57	1.56	52	2	87.4	8 9/GR9
B CE511	−63.80	14	−53.11	−2.98	2.42	2.15	107	2	87.4	8 9/GR7
B NO611	−73.80	14	−59.60	−11.62	2.86	1.69	165	1	87.4	8 9/GR8
B NO711	−73.80	14	−60.70	−1.78	3.54	1.78	126	1	87.4	8 9/GR8
B NO811	−73.80	14	−68.75	−4.71	2.37	1.65	73	1	87.4	8 9/GR8
B SE911	−101.80	14	−45.99	−19.09	2.22	0.79	62	2	87.4	8
B SU111	−80.80	14	−51.10	−25.64	2.76	1.06	50	2	87.4	8 9/GR6
B SU112	−44.80	14	−50.76	−25.62	2.47	1.48	56	2	87.4	8 9/GR9
B SU211	−80.80	14	−44.51	−16.94	3.22	1.37	60	2	87.4	8 9/GR6
B SU212	−44.80	14	−43.99	−16.97	3.27	1.92	59	2	87.4	8 9/GR9
CAN01101	−137.80	14	−114.10	50.92	7.22	1.11	160	2	87.4	9/GR10
CAN01201	−137.80	14	−114.10	50.92	7.22	1.11	160	2	87.4	9/GR10
CAN01202	−72.30	14	−81.23	50.12	7.99	2.53	5	2	87.4	
CAN01203	−128.80	14	−113.04	51.04	7.53	1.26	162	2	87.4	9/GR12
CAN01303	−128.80	14	−113.04	51.04	7.53	1.26	162	2	87.4	9/GR12
CAN01304	−90.80	14	−86.57	50.48	8.59	2.54	178	2	87.4	9/GR13
CAN01403	−128.80	14	−113.04	51.04	7.53	1.26	162	2	87.4	9/GR12
CAN01404	−90.80	14	−86.57	50.48	8.59	2.54	178	2	87.4	9/GR13
CAN01405	−81.80	14	−83.80	50.22	8.35	2.57	2	2	87.4	9/GR14
CAN01504	−90.80	14	−86.57	50.48	8.59	2.54	178	2	87.4	9/GR13
CAN01505	−81.80	14	−83.80	50.22	8.35	2.57	2	2	87.4	9/GR14
CAN01605	−81.80	14	−83.80	50.22	8.35	2.57	2	2	87.4	9/GR14
CAN01606	−70.30	14	−80.64	50.02	7.88	2.52	6	2	87.4	
CHLCONT4	−105.80	14	−69.59	−23.20	2.21	0.69	68	2	87.4	9/GR16
CHLCONT6	−105.80	14	−73.52	−55.52	3.65	1.31	39	2	87.4	9/GR16
CRBBAH01	−92.30	14	−76.09	24.13	1.83	0.68	141	1	87.4	9/GR18
CRBBER01	−92.30	14	−64.76	32.13	0.60	0.60	90	1	87.4	9/GR18
CRBBLZ01	−92.30	14	−88.61	17.26	0.64	0.64	90	1	87.4	9/GR18
CRBEC001	−92.30	14	−60.07	8.26	4.20	0.86	115	1	87.4	9/GR18
CRBJMC01	−92.30	14	−79.45	17.97	0.99	0.68	151	1	87.4	9/GR18
CTR00201	−130.80	14	−84.33	9.67	0.82	0.68	119	2	87.4	
EQAC0001	−94.80	14	−78.31	−1.52	1.48	1.15	65	1	87.4	9/GR19
EQAG0001	−94.80	14	−90.36	−0.57	0.94	0.89	99	1	87.4	9/GR19
GUY00302	−33.80	14	−59.07	4.77	1.43	0.85	91	2	87.4	
HNDIFRB2	−107.30	14	−86.23	15.16	1.14	0.85	8	1	87.4	
HTI00002	−83.30	14	−73.28	18.96	0.82	0.68	11	2	87.4	
HWA00002	−165.80	14	−109.83	36.82	6.03	1.12	137	2	87.4	9/GR1
HWA00003	−174.80	14	−116.10	37.47	5.60	0.76	132	2	87.4	9/GR2
MEX01NTE	−77.80	14	−105.80	25.99	2.88	2.07	155	2	87.4	1
MEX02NTE	−135.80	14	−107.36	26.32	3.80	1.57	149	2	87.4	1
MEX02SUR	−126.80	14	−96.39	19.88	3.19	1.87	158	2	87.4	1
PRU00004	−85.80	14	−74.19	−8.39	3.74	2.45	112	2	87.4	
PTRVIR01	−100.80	14	−93.85	36.31	8.26	3.55	171	2	87.4	1 6 9/GR20
PTRVIR02	−109.80	14	−95.47	36.38	8.10	3.45	168	2	87.4	1 6 9/GR21
TCA00001	−115.80	14	−71.79	21.53	0.60	0.60	90	2	87.4	
USAEH001	−61.30	14	−87.53	36.18	6.41	3.49	12	2	87.4	1 5 6
USAEH002	−100.80	14	−93.85	36.31	8.26	3.55	171	2	87.4	1 6 9/GR20
USAEH003	−109.80	14	−95.47	36.38	8.10	3.45	168	2	87.4	1 6 9/GR21
USAEH004	−118.80	14	−96.42	36.21	8.20	3.12	165	2	87.4	1 5 6
USAPSA02	−165.80	14	−109.83	36.82	6.03	1.12	137	2	87.4	9/GR1
USAPSA03	−174.80	14	−116.10	37.47	5.60	0.76	132	2	87.4	9/GR2
USAWH101	−147.80	14	−111.01	40.67	4.38	2.15	162	2	87.4	
USAWH102	−156.80	14	−113.01	40.71	3.74	1.79	149	2	87.4	
VCT00001	−79.30	14	−61.18	13.23	0.60	0.60	90	2	87.4	
VEN11VEN	−103.80	14	−66.79	6.90	2.50	1.77	122	2	87.4	

17 528.12 MHz (15)

1	2	3	4		5		6	7	8	9
ALS00002	−166.20	15	−109.94	36.86	6.04	1.11	137	1	87.4	9/GR1
ALS00003	−175.20	15	−116.23	37.50	5.60	0.75	132	1	87.4	9/GR2
ARGINSU4	−94.20	15	−52.98	−59.81	3.40	0.68	19	1	87.4	9/GR3
ARGINSU5	−55.20	15	−44.17	−59.91	3.77	0.70	13	1	87.4	9/GR4
ARGSUR04	−94.20	15	−65.04	−43.33	3.32	1.50	40	1	87.4	9/GR3
ARGSUR05	−55.20	15	−63.68	−43.01	2.54	2.38	152	1	87.4	9/GR4
ATGSJN01	−79.70	15	−61.79	17.07	0.60	0.60	90	1	87.4	
B CE311	−64.20	15	−40.60	−6.07	3.04	2.06	174	1	87.4	8 9/GR7
B CE312	−45.20	15	−40.27	−6.06	3.44	2.09	174	1	87.4	8 9/GR9
B CE411	−64.20	15	−50.97	−15.27	3.86	1.38	49	1	87.4	8 9/GR7
B CE412	−45.20	15	−50.71	−15.30	3.57	1.56	52	1	87.4	8 9/GR9
B CE511	−64.20	15	−53.10	−2.90	2.44	2.13	104	1	87.4	8 9/GR7
B NO611	−74.20	15	−59.60	−11.62	2.85	1.69	165	2	87.4	8 9/GR8
B NO711	−74.20	15	−60.70	−1.78	3.54	1.78	126	2	87.4	8 9/GR8
B NO811	−74.20	15	−68.76	−4.71	2.37	1.65	73	2	87.4	8 9/GR8
B SU111	−81.20	15	−51.12	−25.63	2.76	1.05	50	1	87.4	8 9/GR6
B SU112	−45.20	15	−50.75	−25.62	2.47	1.48	56	1	87.4	8 9/GR9
B SU211	−81.20	15	−44.51	−16.95	3.22	1.36	60	1	87.4	8 9/GR6
B SU212	−45.20	15	−44.00	−16.87	3.20	1.96	58	1	87.4	8 9/GR9
BERBERMU	−96.20	15	−64.77	32.32	0.60	0.60	90	2	87.4	
BOLAND01	−115.20	15	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
BOL00001	−87.20	15	−64.61	−16.71	2.52	2.19	85	1	87.4	
BRB00001	−92.70	15	−59.85	12.93	0.60	0.60	90	2	87.4	
CAN01101	−138.20	15	−114.60	51.08	7.28	1.10	160	1	87.4	9/GR10
CAN01201	−138.20	15	−114.60	51.08	7.28	1.10	160	1	87.4	9/GR10
CAN01202	−72.70	15	−81.34	50.02	7.96	2.55	5	1	87.4	
CAN01203	−129.20	15	−113.02	51.08	7.47	1.26	162	1	87.4	9/GR12
CAN01303	−129.20	15	−113.02	51.08	7.47	1.26	162	1	87.4	9/GR12
CAN01304	−91.20	15	−86.71	50.48	8.58	2.54	178	1	87.4	9/GR13
CAN01403	−129.20	15	−113.02	51.08	7.47	1.26	162	1	87.4	9/GR12
CAN01404	−91.20	15	−86.71	50.48	8.58	2.54	178	1	87.4	9/GR13
CAN01405	−82.20	15	−84.11	50.20	8.31	2.58	1	1	87.4	9/GR14
CAN01504	−91.20	15	−86.71	50.48	8.58	2.54	178	1	87.4	9/GR13
CAN01505	−82.20	15	−84.11	50.20	8.31	2.58	1	1	87.4	9/GR14
CAN01605	−82.20	15	−84.11	50.20	8.31	2.58	1	1	87.4	9/GR14
CAN01606	−70.70	15	−80.77	50.03	7.88	2.53	6	1	87.4	
CHLCONT5	−106.20	15	−72.23	−35.57	2.60	0.68	55	1	87.4	9/GR17
CHLPAC02	−106.20	15	−80.06	−30.06	1.36	0.68	69	1	87.4	9/GR17
CLMAND01	−115.20	15	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
CLM00001	−103.20	15	−74.50	5.87	3.98	1.96	118	1	87.4	
CUB00001	−89.20	15	−79.81	21.62	2.24	0.68	168	1	87.4	
EQACAND1	−115.20	15	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
EQAGAND1	−115.20	15	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
GRD00002	−42.20	15	−61.58	12.29	0.60	0.60	90	1	87.4	
GRD00059	−57.20	15	−61.58	12.29	0.60	0.60	90	1	87.4	
GRLDNK01	−53.20	15	−44.89	66.56	2.70	0.82	173	1	87.4	2
GUY00201	−84.70	15	−59.19	4.78	1.44	0.85	95	1	87.4	
HWA00002	−166.20	15	−109.94	36.86	6.04	1.11	137	1	87.4	9/GR1
HWA00003	−175.20	15	−116.23	37.50	5.60	0.75	132	1	87.4	9/GR2
MEX01NTE	−78.20	15	−105.81	26.01	2.89	2.08	155	1	87.4	1
MEX01SUR	−69.20	15	−94.84	19.82	3.05	2.09	4	1	87.4	1
MEX02NTE	−136.20	15	−107.21	26.31	3.84	1.55	148	1	87.4	1
MEX02SUR	−127.20	15	−96.39	19.88	3.18	1.87	157	1	87.4	1
PAQPAC01	−106.20	15	−109.18	−27.53	0.60	0.60	90	1	87.4	9/GR17
PRG00002	−99.20	15	−58.66	−23.32	1.45	1.04	76	1	87.4	
PRUAND02	−115.20	15	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
PTRVIR01	−101.20	15	−93.94	36.32	8.24	3.56	171	1	87.4	1 6 9/GR20
PTRVIR02	−110.20	15	−95.23	36.29	8.27	3.37	168	1	87.4	1 6 9/GR21
URG00001	−71.70	15	−56.22	−32.52	1.02	0.89	11	1	87.4	
USAEH001	−61.70	15	−87.57	36.17	6.42	3.49	12	1	87.4	1 5 6
USAEH002	−101.20	15	−93.94	36.32	8.24	3.56	171	1	87.4	1 6 9/GR20
USAEH003	−110.20	15	−95.23	36.29	8.27	3.37	168	1	87.4	1 6 9/GR21
USAEH004	−119.20	15	−96.45	36.21	8.20	3.12	165	1	87.4	1 5 6
USAPSA02	−166.20	15	−109.94	36.86	6.04	1.11	137	1	87.4	9/GR1
USAPSA03	−175.20	15	−116.23	37.50	5.60	0.75	132	1	87.4	9/GR2
USAWH101	−148.20	15	−111.02	40.68	4.36	2.15	162	1	87.4	
USAWH102	−157.20	15	−113.07	40.74	3.72	1.78	149	1	87.4	
VENAND03	−115.20	15	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5

17 542.70 MHz (16)

1	2	3	4		5		6	7	8	9
ALS00002	−165.80	16	−109.83	36.82	6.03	1.12	137	2	87.4	9/GR1
ALS00003	−174.80	16	−116.10	37.47	5.60	0.76	132	2	87.4	9/GR2
ARGNORT4	−93.80	16	−63.96	−30.01	3.86	1.99	48	2	87.4	
ARGNORT5	−54.80	16	−62.85	−29.80	3.24	2.89	47	2	87.4	
B CE311	−63.80	16	−40.60	−6.07	3.04	2.06	174	2	87.4	8 9/GR7
B CE312	−44.80	16	−40.26	−6.06	3.44	2.09	174	2	87.4	8 9/GR9
B CE411	−63.80	16	−50.97	−15.26	3.86	1.38	49	2	87.4	8 9/GR7
B CE412	−44.80	16	−50.71	−15.30	3.57	1.56	52	2	87.4	8 9/GR9
B CE511	−63.80	16	−53.11	−2.98	2.42	2.15	107	2	87.4	8 9/GR7
B NO611	−73.80	16	−59.60	−11.62	2.86	1.69	165	1	87.4	8 9/GR8
B NO711	−73.80	16	−60.70	−1.78	3.54	1.78	126	1	87.4	8 9/GR8
B NO811	−73.80	16	−68.75	−4.71	2.37	1.65	73	1	87.4	8 9/GR8
B SE911	−101.80	16	−45.99	−19.09	2.22	0.79	62	2	87.4	8
B SU111	−80.80	16	−51.10	−25.64	2.76	1.06	50	2	87.4	8 9/GR6
B SU112	−44.80	16	−50.76	−25.62	2.47	1.48	56	2	87.4	8 9/GR9
B SU211	−80.80	16	−44.51	−16.94	3.22	1.37	60	2	87.4	8 9/GR6
B SU212	−44.80	16	−43.99	−16.97	3.27	1.92	59	2	87.4	8 9/GR9
CAN01101	−137.80	16	−114.10	50.92	7.22	1.11	160	2	87.4	9/GR10
CAN01201	−137.80	16	−114.10	50.92	7.22	1.11	160	2	87.4	9/GR10
CAN01202	−72.30	16	−81.23	50.12	7.99	2.53	5	2	87.4	
CAN01203	−128.80	16	−113.04	51.04	7.53	1.26	162	2	87.4	9/GR12
CAN01303	−128.80	16	−113.04	51.04	7.53	1.26	162	2	87.4	9/GR12
CAN01304	−90.80	16	−86.57	50.48	8.59	2.54	178	2	87.4	9/GR13
CAN01403	−128.80	16	−113.04	51.04	7.53	1.26	162	2	87.4	9/GR12
CAN01404	−90.80	16	−86.57	50.48	8.59	2.54	178	2	87.4	9/GR13
CAN01405	−81.80	16	−83.80	50.22	8.35	2.57	2	2	87.4	9/GR14
CAN01504	−90.80	16	−86.57	50.48	8.59	2.54	178	2	87.4	9/GR13
CAN01505	−81.80	16	−83.80	50.22	8.35	2.57	2	2	87.4	9/GR14
CAN01605	−81.80	16	−83.80	50.22	8.35	2.57	2	2	87.4	9/GR14
CAN01606	−70.30	16	−80.64	50.02	7.88	2.52	6	2	87.4	
CHLCONT4	−105.80	16	−69.59	−23.20	2.21	0.69	68	2	87.4	9/GR16
CHLCONT6	−105.80	16	−73.52	−55.52	3.65	1.31	39	2	87.4	9/GR16
CRBBAH01	−92.30	16	−76.09	24.13	1.83	0.68	141	1	87.4	9/GR18
CRBBER01	−92.30	16	−64.76	32.13	0.60	0.60	90	1	87.4	9/GR18
CRBBLZ01	−92.30	16	−88.61	17.26	0.64	0.64	90	1	87.4	9/GR18
CRBEC001	−92.30	16	−60.07	8.26	4.20	0.86	115	1	87.4	9/GR18
CRBJMC01	−92.30	16	−79.45	17.97	0.99	0.68	151	1	87.4	9/GR18
CYM00001	−115.80	16	−80.58	19.57	0.60	0.60	90	2	87.4	
DOMIFRB2	−83.30	16	−70.51	18.79	0.98	0.69	167	2	87.4	
EQAC0001	−94.80	16	−78.31	−1.52	1.48	1.15	65	1	87.4	9/GR19
EQAG0001	−94.80	16	−90.36	−0.57	0.94	0.89	99	1	87.4	9/GR19
GUFMGG02	−52.80	16	−56.42	8.47	4.16	0.81	123	2	87.4	2 7
HWA00002	−165.80	16	−109.83	36.82	6.03	1.12	137	2	87.4	9/GR1
HWA00003	−174.80	16	−116.10	37.47	5.60	0.76	132	2	87.4	9/GR2
JMC00005	−33.80	16	−77.27	18.12	0.60	0.60	90	2	87.4	
LCAIFRB1	−79.30	16	−61.15	13.90	0.60	0.60	90	2	87.4	
MEX01NTE	−77.80	16	−105.80	25.99	2.88	2.07	155	2	87.4	1
MEX02NTE	−135.80	16	−107.36	26.32	3.80	1.57	149	2	87.4	1
MEX02SUR	−126.80	16	−96.39	19.88	3.19	1.87	158	2	87.4	1
PRU00004	−85.80	16	−74.19	−8.39	3.74	2.45	112	2	87.4	
PTRVIR01	−100.80	16	−93.85	36.31	8.26	3.55	171	2	87.4	1 6 9/GR20
PTRVIR02	−109.80	16	−95.47	36.38	8.10	3.45	168	2	87.4	1 6 9/GR21
SLVIFRB2	−107.30	16	−88.91	13.59	0.60	0.60	90	1	87.4	
USAEH001	−61.30	16	−87.53	36.18	6.41	3.49	12	2	87.4	1 5 6
USAEH002	−100.80	16	−93.85	36.31	8.26	3.55	171	2	87.4	1 6 9/GR20
USAEH003	−109.80	16	−95.47	36.38	8.10	3.45	168	2	87.4	1 6 9/GR21
USAEH004	−118.80	16	−96.42	36.21	8.20	3.12	165	2	87.4	1 5 6
USAPSA02	−165.80	16	−109.83	36.82	6.03	1.12	137	2	87.4	9/GR1
USAPSA03	−174.80	16	−116.10	37.47	5.60	0.76	132	2	87.4	9/GR2
USAWH101	−147.80	16	−111.01	40.67	4.38	2.15	162	2	87.4	
USAWH102	−156.80	16	−113.01	40.71	3.74	1.79	149	2	87.4	
VEN11VEN	−103.80	16	−66.79	6.90	2.50	1.77	122	2	87.4	

17 557.28 MHz (17)

1	2	3	4		5		6	7	8	9
ALS00002	−166.20	17	−109.94	36.86	6.04	1.11	137	1	87.4	9/GR1
ALS00003	−175.20	17	−116.23	37.50	5.60	0.75	132	1	87.4	9/GR2
ARGINSU4	−94.20	17	−52.98	−59.81	3.40	0.68	19	1	87.4	9/GR3
ARGINSU5	−55.20	17	−44.17	−59.91	3.77	0.70	13	1	87.4	9/GR4
ARGSUR04	−94.20	17	−65.04	−43.33	3.32	1.50	40	1	87.4	9/GR3
ARGSUR05	−55.20	17	−63.68	−43.01	2.54	2.38	152	1	87.4	9/GR4
B CE311	−64.20	17	−40.60	−6.07	3.04	2.06	174	1	87.4	9/GR3
B CE312	−45.20	17	−40.27	−6.06	3.44	2.09	174	1	87.4	9/GR4
B CE411	−64.20	17	−50.97	−15.27	3.86	1.38	49	1	87.4	8 9/GR7
B CE412	−45.20	17	−50.71	−15.30	3.57	1.56	52	1	87.4	8 9/GR9
B CE511	−64.20	17	−53.10	−2.90	2.44	2.13	104	1	87.4	8 9/GR7
B NO611	−74.20	17	−59.60	−11.62	2.85	1.69	165	2	87.4	8 9/GR8
B NO711	−74.20	17	−60.70	−1.78	3.54	1.78	126	2	87.4	8 9/GR8
B NO811	−74.20	17	−68.76	−4.71	2.37	1.65	73	2	87.4	8 9/GR8
B SU111	−81.20	17	−51.12	−25.63	2.76	1.05	50	1	87.4	8 9/GR6
B SU112	−45.20	17	−50.75	−25.62	2.47	1.48	56	1	87.4	8 9/GR9
B SU211	−81.20	17	−44.51	−16.95	3.22	1.36	60	1	87.4	8 9/GR6
B SU212	−45.20	17	−44.00	−16.87	3.20	1.96	58	1	87.4	8 9/GR9
BERBERMU	−96.20	17	−64.77	32.32	0.60	0.60	90	2	87.4	
BERBER02	−31.00	17	−64.77	32.32	0.60	0.60	90	1	87.4	2 3
BOLAND01	−115.20	17	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
CAN01101	−138.20	17	−125.63	57.24	3.45	1.27	157	1	87.4	9/GR10
CAN01201	−138.20	17	−112.04	55.95	3.35	0.97	151	1	87.4	9/GR10
CAN01202	−72.70	17	−107.70	55.63	2.74	1.12	32	1	87.4	
CAN01203	−129.20	17	−111.48	55.61	3.08	1.15	151	1	87.4	9/GR12
CAN01303	−129.20	17	−102.42	57.12	3.54	0.91	154	1	87.4	9/GR12
CAN01304	−91.20	17	−99.12	57.36	1.98	1.72	2	1	87.4	9/GR13
CAN01403	−129.20	17	−89.75	52.02	4.68	0.78	148	1	87.4	9/GR12
CAN01404	−91.20	17	−84.82	52.42	3.10	2.05	152	1	87.4	9/GR13
CAN01405	−82.20	17	−84.00	52.39	2.84	2.29	172	1	87.4	9/GR14
CAN01504	−91.20	17	−72.66	53.77	3.57	1.67	156	1	87.4	9/GR13
CAN01505	−82.20	17	−71.77	53.79	3.30	1.89	162	1	87.4	9/GR14
CAN01605	−82.20	17	−61.50	49.55	2.65	1.40	143	1	87.4	9/GR14
CAN01606	−70.70	17	−61.30	49.55	2.40	1.65	148	1	87.4	
CHLCONT5	−106.20	17	−72.23	−35.57	2.60	0.68	55	1	87.4	9/GR17
CHLPAC02	−106.20	17	−80.06	−30.06	1.36	0.68	69	1	87.4	9/GR17
CLMAND01	−115.20	17	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
CLM00001	−103.20	17	−74.50	5.87	3.98	1.96	118	1	87.4	
EQACAND1	−115.20	17	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
EQAGAND1	−115.20	17	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
FLKFALKS	−31.00	17	−59.90	−51.64	0.60	0.60	90	1	87.4	2 3
HWA00002	−166.20	17	−165.79	23.42	4.20	0.68	160	1	87.4	9/GR1
HWA00003	−175.20	17	−166.10	23.42	4.25	0.68	159	1	87.4	9/GR2
JMC00002	−92.70	17	−77.30	18.12	0.62	0.62	90	2	87.4	
KNA00001	−79.70	17	−62.46	17.44	0.60	0.60	90	1	87.4	
MEX01NTE	−78.20	17	−105.81	26.01	2.89	2.08	155	1	87.4	1
MEX01SUR	−69.20	17	−94.84	19.82	3.05	2.09	4	1	87.4	1
MEX02NTE	−136.20	17	−107.21	26.31	3.84	1.55	148	1	87.4	1
MEX02SUR	−127.20	17	−96.39	19.88	3.18	1.87	157	1	87.4	1
PAQPAC01	−106.20	17	−109.18	−27.53	0.60	0.60	90	1	87.4	9/GR17
PRG00002	−99.20	17	−58.66	−23.32	1.45	1.04	76	1	87.4	
PRUAND02	−115.20	17	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
PTRVIR01	−101.20	17	−93.94	36.32	8.24	3.56	171	1	87.4	1 6 9/GR20
PTRVIR02	−110.20	17	−95.23	36.29	8.27	3.37	168	1	87.4	1 6 9/GR21
SPMFRAN3	−53.20	17	−67.24	47.51	3.16	0.79	7	1	87.4	2 7
SURINAM2	−84.70	17	−55.69	4.35	1.00	0.69	86	1	87.4	
URG00001	−71.70	17	−56.22	−32.52	1.02	0.89	11	1	87.4	
USAEH001	−61.70	17	−87.57	36.17	6.42	3.49	12	1	87.4	1 5 6
USAEH002	−101.20	17	−93.94	36.32	8.24	3.56	171	1	87.4	1 6 9/GR20
USAEH003	−110.20	17	−95.23	36.29	8.27	3.37	168	1	87.4	1 6 9/GR21
USAEH004	−119.20	17	−96.45	36.21	8.20	3.12	165	1	87.4	1 5 6
USAPSA02	−166.20	17	−109.94	36.86	6.04	1.11	137	1	87.4	9/GR1
USAPSA03	−175.20	17	−116.23	37.50	5.60	0.75	132	1	87.4	9/GR2
USAWH101	−148.20	17	−111.02	40.68	4.36	2.15	162	1	87.4	
USAWH102	−157.20	17	−113.07	40.74	3.72	1.78	149	1	87.4	
VENAND03	−115.20	17	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5

17 571.86 MHz (18)

1	2	3	4		5		6	7	8	9
ALS00002	−165.80	18	−109.83	36.82	6.03	1.12	137	2	87.4	9/GR1
ALS00003	−174.80	18	−116.10	37.47	5.60	0.76	132	2	87.4	9/GR2
ARGNORT4	−93.80	18	−63.96	−30.01	3.86	1.99	48	2	87.4	
ARGNORT5	−54.80	18	−62.85	−29.80	3.24	2.89	47	2	87.4	
ATNBEAM1	−52.80	18	−66.44	14.87	1.83	0.68	39	2	87.4	
B CE311	−63.80	18	−40.60	−6.07	3.04	2.06	174	2	87.4	8 9/GR7
B CE312	−44.80	18	−40.26	−6.06	3.44	2.09	174	2	87.4	8 9/GR9
B CE411	−63.80	18	−50.97	−15.26	3.86	1.38	49	2	87.4	8 9/GR7
B CE412	−44.80	18	−50.71	−15.30	3.57	1.56	52	2	87.4	8 9/GR9
B CE511	−63.80	18	−53.11	−2.98	2.42	2.15	107	2	87.4	8 9/GR7
B NO611	−73.80	18	−59.60	−11.62	2.86	1.69	165	1	87.4	8 9/GR8
B NO711	−73.80	18	−60.70	−1.78	3.54	1.78	126	1	87.4	8 9/GR8
B NO811	−73.80	18	−68.75	−4.71	2.37	1.65	73	1	87.4	8 9/GR8
B SE911	−101.80	18	−45.99	−19.09	2.22	0.79	62	2	87.4	8
B SU111	−80.80	18	−51.10	−25.64	2.76	1.06	50	2	87.4	8 9/GR6
B SU112	−44.80	18	−50.76	−25.62	2.47	1.48	56	2	87.4	8 9/GR9
B SU211	−80.80	18	−44.51	−16.94	3.22	1.37	60	2	87.4	8 9/GR6
B SU212	−44.80	18	−43.99	−16.97	3.27	1.92	59	2	87.4	8 9/GR9
BLZ00001	−115.80	18	−88.68	17.27	0.62	0.62	90	2	87.4	
CAN01101	−137.80	18	−125.60	57.24	3.45	1.27	157	2	87.4	9/GR10
CAN01201	−137.80	18	−111.92	55.89	3.33	0.98	151	2	87.4	9/GR10
CAN01202	−72.30	18	−107.64	55.62	2.75	1.11	32	2	87.4	
CAN01203	−128.80	18	−111.43	55.56	3.07	1.15	151	2	87.4	9/GR12
CAN01303	−128.80	18	−102.39	57.12	3.54	0.92	154	2	87.4	9/GR12
CAN01304	−90.80	18	−99.00	57.33	1.96	1.73	1	2	87.4	9/GR13
CAN01403	−128.80	18	−89.70	52.02	4.67	0.79	148	2	87.4	9/GR12
CAN01404	−90.80	18	−84.78	52.41	3.09	2.06	153	2	87.4	9/GR13
CAN01405	−81.80	18	−84.02	52.34	2.82	2.30	172	2	87.4	9/GR14
CAN01504	−90.80	18	−72.68	53.78	3.57	1.67	157	2	87.4	9/GR13
CAN01505	−81.80	18	−71.76	53.76	3.30	1.89	162	2	87.4	9/GR14
CAN01605	−81.80	18	−61.54	49.50	2.66	1.39	144	2	87.4	9/GR14
CAN01606	−70.30	18	−61.32	49.51	2.41	1.65	148	2	87.4	
CHLCONT4	−105.80	18	−69.59	−23.20	2.21	0.69	68	2	87.4	9/GR16
CHLCONT6	−105.80	18	−73.52	−55.52	3.65	1.31	39	2	87.4	9/GR16
CRBBAH01	−92.30	18	−76.09	24.13	1.83	0.68	141	1	87.4	9/GR18
CRBBER01	−92.30	18	−64.76	32.13	0.60	0.60	90	1	87.4	9/GR18
CRBBLZ01	−92.30	18	−88.61	17.26	0.64	0.64	90	1	87.4	9/GR18
CRBEC001	−92.30	18	−60.07	8.26	4.20	0.86	115	1	87.4	9/GR18
CRBJMC01	−92.30	18	−79.45	17.97	0.99	0.68	151	1	87.4	9/GR18
CTR00201	−130.80	18	−84.33	9.67	0.82	0.68	119	2	87.4	
DMAIFRB1	−79.30	18	−61.30	15.35	0.60	0.60	90	2	87.4	
EQAC0001	−94.80	18	−78.31	−1.52	1.48	1.15	65	1	87.4	9/GR19
EQAG0001	−94.80	18	−90.36	−0.57	0.94	0.89	99	1	87.4	9/GR19
HWA00002	−165.80	18	−165.79	23.32	4.20	0.68	160	2	87.4	9/GR1
HWA00003	−174.80	18	−166.10	23.42	4.25	0.68	159	2	87.4	9/GR2
MEX01NTE	−77.80	18	−105.80	25.99	2.88	2.07	155	2	87.4	1
MEX02NTE	−135.80	18	−107.36	26.32	3.80	1.57	149	2	87.4	1
MEX02SUR	−126.80	18	−96.39	19.88	3.19	1.87	158	2	87.4	1
NCG00003	−107.30	18	−84.99	12.90	1.05	1.01	176	1	87.4	
PRU00004	−85.80	18	−74.19	−8.39	3.74	2.45	112	2	87.4	
PTRVIR01	−100.80	18	−93.85	36.31	8.26	3.55	171	2	87.4	1 6 9/GR20
PTRVIR02	−109.80	18	−95.47	36.38	8.10	3.45	168	2	87.4	1 6 9/GR21
USAEH001	−61.30	18	−87.53	36.18	6.41	3.49	12	2	87.4	1 5 6
USAEH002	−100.80	18	−93.85	36.31	8.26	3.55	171	2	87.4	1 6 9/GR20
USAEH003	−109.80	18	−95.47	36.38	8.10	3.45	168	2	87.4	1 6 9/GR21
USAEH004	−118.80	18	−96.42	36.21	8.20	3.12	165	2	87.4	1 5 6
USAPSA02	−165.80	18	−109.83	36.82	6.03	1.12	137	2	87.4	9/GR1
USAPSA03	−174.80	18	−116.10	37.47	5.60	0.76	132	2	87.4	9/GR2
USAWH101	−147.80	18	−111.01	40.67	4.38	2.15	162	2	87.4	
USAWH102	−156.80	18	−113.01	40.71	3.74	1.79	149	2	87.4	
VEN11VEN	−103.80	18	−66.79	6.90	2.50	1.77	122	2	87.4	

17 586.44 MHz (19)

1	2	3	4		5		6	7	8	9
ALS00002	−166.20	19	−109.94	36.86	6.04	1.11	137	1	87.4	9/GR1
ALS00003	−175.20	19	−116.23	37.50	5.60	0.75	132	1	87.4	9/GR2
ARGINSU4	−94.20	19	−52.98	−59.81	3.40	0.68	19	1	87.4	9/GR3
ARGINSU5	−55.20	19	−44.17	−59.91	3.77	0.70	13	1	87.4	9/GR4
ARGSUR04	−94.20	19	−65.04	−43.33	3.32	1.50	40	1	87.4	9/GR3
ARGSUR05	−55.20	19	−63.68	−43.01	2.54	2.38	152	1	87.4	9/GR4
B CE311	−64.20	19	−40.60	−6.07	3.04	2.06	174	1	87.4	8 9/GR7
B CE312	−45.20	19	−40.27	−6.06	3.44	2.09	174	1	87.4	8 9/GR9
B CE411	−64.20	19	−50.97	−15.27	3.86	1.38	49	1	87.4	8 9/GR7
B CE412	−45.20	19	−50.71	−15.30	3.57	1.56	52	1	87.4	8 9/GR9
B CE511	−64.20	19	−53.10	−2.90	2.44	2.13	104	1	87.4	8 9/GR7
B NO611	−74.20	19	−59.60	−11.62	2.85	1.69	165	2	87.4	8 9/GR8
B NO711	−74.20	19	−60.70	−1.78	3.54	1.78	126	2	87.4	8 9/GR8
B NO811	−74.20	19	−68.76	−4.71	2.37	1.65	73	2	87.4	8 9/GR8
B SU111	−81.20	19	−51.12	−25.63	2.76	1.05	50	1	87.4	8 9/GR6
B SU112	−45.20	19	−50.75	−25.62	2.47	1.48	56	1	87.4	8 9/GR9
B SU211	−81.20	19	−44.51	−16.95	3.22	1.36	60	1	87.4	8 9/GR6
B SU212	−45.20	19	−44.00	−16.87	3.20	1.96	58	1	87.4	8 9/GR9
BERBERMU	−96.20	19	−64.77	32.32	0.60	0.60	90	2	87.4	
BOLAND01	−115.20	19	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
BOL00001	−87.20	19	−64.61	−16.71	2.52	2.19	85	1	87.4	
BRB00001	−92.70	19	−59.85	12.93	0.60	0.60	90	2	87.4	
CAN01101	−138.20	19	−125.63	57.24	3.45	1.27	157	1	87.4	9/GR10
CAN01201	−138.20	19	−112.04	55.95	3.35	0.97	151	1	87.4	9/GR10
CAN01202	−72.70	19	−107.70	55.63	2.74	1.12	32	1	87.4	
CAN01203	−129.20	19	−111.48	55.61	3.08	1.15	151	1	87.4	9/GR12
CAN01303	−129.20	19	−102.42	57.12	3.54	0.91	154	1	87.4	9/GR12
CAN01304	−91.20	19	−99.12	57.36	1.98	1.72	2	1	87.4	9/GR13
CAN01403	−129.20	19	−89.75	52.02	4.68	0.78	148	1	87.4	9/GR12
CAN01404	−91.20	19	−84.82	52.42	3.10	2.05	152	1	87.4	9/GR13
CAN01405	−82.20	19	−84.00	52.39	2.84	2.29	172	1	87.4	9/GR14
CAN01504	−91.20	19	−72.66	53.77	3.57	1.67	156	1	87.4	9/GR13
CAN01505	−82.20	19	−71.77	53.79	3.30	1.89	162	1	87.4	9/GR14
CAN01605	−82.20	19	−61.50	49.55	2.65	1.40	143	1	87.4	9/GR14
CAN01606	−70.70	19	−61.30	49.55	2.40	1.65	148	1	87.4	
CHLCONT5	−106.20	19	−72.23	−35.57	2.60	0.68	55	1	87.4	9/GR17
CHLPAC02	−106.20	19	−80.06	−30.06	1.36	0.68	69	1	87.4	9/GR17
CLMAND01	−115.20	19	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
CLM00001	−103.20	19	−74.50	5.87	3.98	1.96	118	1	87.4	
CUB00001	−89.20	19	−79.81	21.62	2.24	0.68	168	1	87.4	
EQACAND1	−115.20	19	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
EQAGAND1	−115.20	19	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
GRD00059	−57.20	19	−61.58	12.29	0.60	0.60	90	1	87.4	
GRLDNK01	−53.20	19	−44.89	66.56	2.70	0.82	173	1	87.4	2
GUY00201	−84.70	19	−59.19	4.78	1.44	0.85	95	1	87.4	
HWA00002	−166.20	19	−165.79	23.42	4.20	0.68	160	1	87.4	9/GR1
HWA00003	−175.20	19	−166.10	23.42	4.25	0.68	159	1	87.4	9/GR2
MEX01NTE	−78.20	19	−105.81	26.01	2.89	2.08	155	1	87.4	1
MEX01SUR	−69.20	19	−94.84	19.82	3.05	2.09	4	1	87.4	1
MEX02NTE	−136.20	19	−107.21	26.31	3.84	1.55	148	1	87.4	1
MEX02SUR	−127.20	19	−96.39	19.88	3.18	1.87	157	1	87.4	1
MSR00001	−79.70	19	−61.73	16.75	0.60	0.60	90	1	87.4	4
PAQPAC01	−106.20	19	−109.18	−27.53	0.60	0.60	90	1	87.4	9/GR17
PRG00002	−99.20	19	−58.66	−23.32	1.45	1.04	76	1	87.4	
PRUAND02	−115.20	19	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
PTRVIR01	−101.20	19	−93.94	36.32	8.24	3.56	171	1	87.4	1 6 9/GR20
PTRVIR02	−110.20	19	−95.23	36.29	8.27	3.37	168	1	87.4	1 6 9/GR21
URG00001	−71.70	19	−56.22	−32.52	1.02	0.89	11	1	87.4	
USAEH001	−61.70	19	−87.57	36.17	6.42	3.49	12	1	87.4	1 5 6
USAEH002	−101.20	19	−93.94	36.32	8.24	3.56	171	1	87.4	1 6 9/GR20
USAEH003	−110.20	19	−95.23	36.29	8.27	3.37	168	1	87.4	1 6 9/GR21
USAEH004	−119.20	19	−96.45	36.31	8.20	3.12	165	1	87.4	1 5 6
USAPSA02	−166.20	19	−109.94	36.86	6.04	1.11	137	1	87.4	9/GR1
USAPSA03	−175.20	19	−116.23	37.50	5.60	0.75	132	1	87.4	9/GR2
USAWH101	−148.20	19	−111.02	40.68	4.36	2.15	162	1	87.4	
USAWH102	−157.20	19	−113.07	40.74	3.72	1.78	149	1	87.4	
VENAND03	−115.20	19	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5

17 601.02 MHz (20)

1	2	3	4		5		6	7	8	9
ALS00002	−165.80	20	−109.83	36.82	6.03	1.12	137	2	87.4	9/GR1
ALS00003	−174.80	20	−116.10	37.47	5.60	0.76	132	2	87.4	9/GR2
ARGNORT4	−93.80	20	−63.96	−30.01	3.86	1.99	48	2	87.4	
ARGNORT5	−54.80	20	−62.85	−29.80	3.24	2.89	47	2	87.4	
B CE311	−63.80	20	−40.60	−6.07	3.04	2.06	174	2	87.4	8 9/GR7
B CE312	−44.80	20	−40.26	−6.06	3.44	2.09	174	2	87.4	8 9/GR9
B CE411	−63.80	20	−50.97	−15.26	3.86	1.38	49	2	87.4	8 9/GR7
B CE412	−44.80	20	−50.71	−15.30	3.57	1.56	52	2	87.4	8 9/GR9
B CE511	−63.80	20	−53.11	−2.98	2.42	2.15	107	2	87.4	8 9/GR7
B NO611	−73.80	20	−59.60	−11.62	2.86	1.69	165	1	87.4	8 9/GR8
B NO711	−73.80	20	−60.70	−1.78	3.54	1.78	126	1	87.4	8 9/GR8
B NO811	−73.80	20	−68.75	−4.71	2.37	1.65	73	1	87.4	8 9/GR8
B SE911	−101.80	20	−45.99	−19.09	2.22	0.79	62	2	87.4	8
B SU111	−80.80	20	−51.10	−25.64	2.76	1.06	50	2	87.4	8 9/GR6
B SU112	−44.80	20	−50.76	−25.62	2.47	1.48	56	2	87.4	8 9/GR9
B SU211	−80.80	20	−44.51	−16.94	3.22	1.37	60	2	87.4	8 9/GR6
B SU212	−44.80	20	−43.99	−16.97	3.27	1.92	59	2	87.4	8 9/GR9
CAN01101	−137.80	20	−125.60	57.24	3.45	1.27	157	2	87.4	9/GR10
CAN01201	−137.80	20	−111.92	55.89	3.33	0.98	151	2	87.4	9/GR10
CAN01202	−72.30	20	−107.64	55.62	2.75	1.11	32	2	87.4	
CAN01203	−128.80	20	−111.43	55.56	3.07	1.15	151	2	87.4	9/GR12
CAN01303	−128.80	20	−102.39	57.12	3.54	0.92	154	2	87.4	9/GR12
CAN01304	−90.80	20	−99.00	57.33	1.96	1.73	1	2	87.4	9/GR13
CAN01403	−128.80	20	−89.70	52.02	4.67	0.79	148	2	87.4	9/GR12
CAN01404	−90.80	20	−84.78	52.41	3.09	2.06	153	2	87.4	9/GR13
CAN01405	−81.80	20	−84.02	52.34	2.82	2.30	172	2	87.4	9/GR14
CAN01504	−90.80	20	−72.68	53.78	3.57	1.67	157	2	87.4	9/GR13
CAN01505	−81.80	20	−71.76	53.76	3.30	1.89	162	2	87.4	9/GR14
CAN01605	−81.80	20	−61.54	49.50	2.66	1.39	144	2	87.4	9/GR14
CAN01606	−70.30	20	−61.32	49.51	2.41	1.65	148	2	87.4	
CHLCONT4	−105.80	20	−69.59	−23.20	2.21	0.69	68	2	87.4	9/GR16
CHLCONT6	−105.80	20	−73.52	−55.52	3.65	1.31	39	2	87.4	9/GR16
CRBBAH01	−92.30	20	−76.09	24.13	1.83	0.68	141	1	87.4	9/GR18
CRBBER01	−92.30	20	−64.76	32.13	0.60	0.60	90	1	87.4	9/GR18
CRBBLZ01	−92.30	20	−88.61	17.26	0.64	0.64	90	1	87.4	9/GR18
CRBEC001	−92.30	20	−60.07	8.26	4.20	0.86	115	1	87.4	9/GR18
CRBJMC01	−92.30	20	−79.45	17.97	0.99	0.68	151	1	87.4	9/GR18
EQAC0001	−94.80	20	−78.31	−1.52	1.48	1.15	65	1	87.4	9/GR19
EQAG0001	−94.80	20	−90.36	−0.57	0.94	0.89	99	1	87.4	9/GR19
GRD00003	−79.30	20	−61.62	12.34	0.60	0.60	90	2	87.4	
GTMIFRB2	−107.30	20	−90.50	15.64	1.03	0.74	84	1	87.4	
GUFMGG02	−52.80	20	−56.42	8.47	4.16	0.81	123	2	87.4	2 7
HWA00002	−165.80	20	−165.79	23.32	4.20	0.68	160	2	87.4	9/GR1
HWA00003	−174.80	20	−166.10	23.42	4.25	0.68	159	2	87.4	9/GR2
MEX01NTE	−77.80	20	−105.80	25.99	2.88	2.07	155	2	87.4	1
MEX02NTE	−135.80	20	−107.36	26.32	3.80	1.57	149	2	87.4	1
MEX02SUR	−126.80	20	−96.39	19.88	3.19	1.87	158	2	87.4	1
PNRIFRB2	−121.00	20	−80.15	8.46	1.01	0.73	170	1	87.4	
PRU00004	−85.80	20	−74.19	−8.39	3.74	2.45	112	2	87.4	
PTRVIR01	−100.80	20	−93.85	36.31	8.26	3.55	171	2	87.4	1 6 9/GR20
PTRVIR02	−109.80	20	−95.47	36.38	8.10	3.45	168	2	87.4	1 6 9/GR21
USAEH001	−61.30	20	−87.53	36.18	6.41	3.49	12	2	87.4	1 5 6
USAEH002	−100.80	20	−93.85	36.31	8.26	3.55	171	2	87.4	1 6 9/GR20
USAEH003	−109.80	20	−95.47	36.38	8.10	3.45	168	2	87.4	1 6 9/GR21
USAEH004	−118.80	20	−96.42	36.21	8.20	3.12	165	2	87.4	1 5 6
USAPSA02	−165.80	20	−109.83	36.82	6.03	1.12	137	2	87.4	9/GR1
USAPSA03	−174.80	20	−116.10	37.47	5.60	0.76	132	2	87.4	9/GR2
USAWH101	−147.80	20	−111.01	40.67	4.38	2.15	162	2	87.4	
USAWH102	−156.80	20	−113.01	40.71	3.74	1.79	149	2	87.4	
VEN02VEN	−103.80	20	−66.79	6.90	2.50	1.77	122	2	87.4	9/GR22
VEN11VEN	−103.80	20	−66.79	6.90	2.50	1.77	122	2	87.4	9/GR22

17 615.60 MHz (21)

1	2	3	4		5		6	7	8	9
ALS00002	−166.20	21	−109.94	36.86	6.04	1.11	137	1	87.4	9/GR1
ALS00003	−175.20	21	−116.23	37.50	5.60	0.75	132	1	87.4	9/GR2
ARGINSU4	−94.20	21	−52.98	−59.81	3.40	0.68	19	1	87.4	9/GR3
ARGINSU5	−55.20	21	−44.17	−59.91	3.77	0.70	13	1	87.4	9/GR4
ARGSUR04	−94.20	21	−65.04	−43.33	3.32	1.50	40	1	87.4	9/GR3
ARGSUR05	−55.20	21	−63.68	−43.01	2.54	2.38	152	1	87.4	9/GR4
B CE311	−64.20	21	−40.60	−6.07	3.04	2.06	174	1	87.4	8 9/GR7
B CE312	−45.20	21	−40.27	−6.06	3.44	2.09	174	1	87.4	8 9/GR9
B CE411	−64.20	21	−50.97	−15.27	3.86	1.38	49	1	87.4	8 9/GR7
B CE412	−45.20	21	−50.71	−15.30	3.57	1.56	52	1	87.4	8 9/GR9
B CE511	−64.20	21	−53.10	−2.90	2.44	2.13	104	1	87.4	8 9/GR7
B NO611	−74.20	21	−59.60	−11.62	2.85	1.69	165	2	87.4	8 9/GR8
B NO711	−74.20	21	−60.70	−1.78	3.54	1.78	126	2	87.4	8 9/GR8
B NO811	−74.20	21	−68.76	−4.71	2.37	1.65	73	2	87.4	8 9/GR8
B SU111	−81.20	21	−51.12	−25.63	2.76	1.05	50	1	87.4	8 9/GR6
B SU112	−45.20	21	−50.75	−25.62	2.47	1.48	56	1	87.4	8 9/GR9
B SU211	−81.20	21	−44.51	−16.95	3.22	1.36	60	1	87.4	8 9/GR6
B SU212	−45.20	21	−44.00	−16.87	3.20	1.96	58	1	87.4	8 9/GR9
BERBERMU	−96.20	21	−64.77	32.32	0.60	0.60	90	2	87.4	
BOLAND01	−115.20	21	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
CAN01101	−138.20	21	−125.63	57.24	3.45	1.27	157	1	87.4	9/GR10
CAN01201	−138.20	21	−112.04	55.95	3.35	0.97	151	1	87.4	9/GR10
CAN01202	−72.70	21	−107.70	55.63	2.74	1.12	32	1	87.4	
CAN01203	−129.20	21	−111.48	55.61	3.08	1.15	151	1	87.4	9/GR12
CAN01303	−129.20	21	−102.42	57.12	3.54	0.91	154	1	87.4	9/GR12
CAN01304	−91.20	21	−99.12	57.36	1.98	1.72	2	1	87.4	9/GR13
CAN01403	−129.20	21	−89.75	52.02	4.68	0.78	148	1	87.4	9/GR12
CAN01404	−91.20	21	−84.82	52.42	3.10	2.05	152	1	87.4	9/GR13
CAN01405	−82.20	21	−84.00	52.39	2.84	2.29	172	1	87.4	9/GR14
CAN01504	−91.20	21	−72.66	53.77	3.57	1.67	156	1	87.4	9/GR13
CAN01505	−82.20	21	−71.77	53.79	3.30	1.89	162	1	87.4	9/GR14
CAN01605	−82.20	21	−61.50	49.55	2.65	1.40	143	1	87.4	9/GR14
CAN01606	−70.70	21	−61.30	49.55	2.40	1.65	148	1	87.4	
CHLCONT5	−106.20	21	−72.23	−35.57	2.60	0.68	55	1	87.4	9/GR17
CHLPAC02	−106.20	21	−80.06	−30.06	1.36	0.68	69	1	87.4	9/GR17
CLMAND01	−115.20	21	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
CLM00001	−103.20	21	−74.50	5.87	3.98	1.96	118	1	87.4	
EQACAND1	−115.20	21	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
EQAGAND1	−115.20	21	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
HWA00002	−166.20	21	−165.79	23.42	4.20	0.68	160	1	87.4	9/GR1
HWA00003	−175.20	21	−166.10	23.42	4.25	0.68	159	1	87.4	9/GR2
JMC00002	−92.70	21	−77.30	18.12	0.62	0.62	90	2	87.4	
KNA00001	−79.70	21	−62.46	17.44	0.60	0.60	90	1	87.4	
MEX01NTE	−78.20	21	−105.81	26.01	2.89	2.08	155	1	87.4	1
MEX01SUR	−69.20	21	−94.84	19.82	3.05	2.09	4	1	87.4	1
MEX02NTE	−136.20	21	−107.21	26.31	3.84	1.55	148	1	87.4	1
MEX02SUR	−127.20	21	−96.39	19.88	3.18	1.87	157	1	87.4	1
PAQPAC01	−106.20	21	−109.18	−27.53	0.60	0.60	90	1	87.4	9/GR17
PRG00002	−99.20	21	−58.66	−23.32	1.45	1.04	76	1	87.4	
PRUAND02	−115.20	21	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
PTRVIR01	−101.20	21	−93.94	36.32	8.24	3.56	171	1	87.4	1 6 9/GR20
PTRVIR02	−110.20	21	−95.23	36.29	8.27	3.37	168	1	87.4	1 6 9/GR21
SPMFRAN3	−53.20	21	−67.24	47.51	3.16	0.79	7	1	87.4	2 7
SURINAM2	−84.70	21	−55.69	4.35	1.00	0.69	86	1	87.4	
URG00001	−71.70	21	−56.22	−32.52	1.02	0.89	11	1	87.4	
USAEH001	−61.70	21	−87.57	36.17	6.42	3.49	12	1	87.4	1 5 6
USAEH002	−101.20	21	−93.94	36.32	8.24	3.56	171	1	87.4	1 6 9/GR20
USAEH003	−110.20	21	−95.23	36.29	8.27	3.37	168	1	87.4	1 6 9/GR21
USAEH004	−119.20	21	−96.45	36.21	8.20	3.12	165	1	87.4	1 5 6
USAPSA02	−166.20	21	−109.94	36.86	6.04	1.11	137	1	87.4	9/GR1
USAPSA03	−175.20	21	−116.23	37.50	5.60	0.75	132	1	87.4	9/GR2
USAWH101	−148.20	21	−111.02	40.68	4.36	2.15	162	1	87.4	
USAWH102	−157.20	21	−113.07	40.74	3.72	1.78	149	1	87.4	
VENAND03	−115.20	21	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5

17 630.18 MHz (22)

1	2	3	4		5		6	7	8	9
ALS00002	−165.80	22	−109.83	36.82	6.03	1.12	137	2	87.4	9/GR1
ALS00003	−174.80	22	−116.10	37.47	5.60	0.76	132	2	87.4	9/GR2
ARGNORT4	−93.80	22	−63.96	−30.01	3.86	1.99	48	2	87.4	
ARGNORT5	−54.80	22	−62.85	−29.80	3.24	2.89	47	2	87.4	
ATNBEAM1	−52.80	22	−66.44	14.87	1.83	0.68	39	2	87.4	
B CE311	−63.80	22	−40.60	−6.07	3.04	2.06	174	2	87.4	8 9/GR7
B CE312	−44.80	22	−40.26	−6.06	3.44	2.09	174	2	87.4	8 9/GR9
B CE411	−63.80	22	−50.97	−15.26	3.86	1.38	49	2	87.4	8 9/GR7
B CE412	−44.80	22	−50.71	−15.30	3.57	1.56	52	2	87.4	8 9/GR9
B CE511	−63.80	22	−53.11	−2.98	2.42	2.15	107	2	87.4	8 9/GR7
B NO611	−73.80	22	−59.60	−11.62	2.86	1.69	165	1	87.4	8 9/GR8
B NO711	−73.80	22	−60.70	−1.78	3.54	1.78	126	1	87.4	8 9/GR8
B NO811	−73.80	22	−68.75	−4.71	2.37	1.65	73	1	87.4	8 9/GR8
B SE911	−101.80	22	−45.99	−19.09	2.22	0.79	62	2	87.4	8
B SU111	−80.80	22	−51.10	−25.64	2.76	1.06	50	2	87.4	8 9/GR6
B SU112	−44.80	22	−50.76	−25.62	2.47	1.48	56	2	87.4	8 9/GR9
B SU211	−80.80	22	−44.51	−16.94	3.22	1.37	60	2	87.4	8 9/GR6
B SU212	−44.80	22	−43.99	−16.97	3.27	1.92	59	2	87.4	8 9/GR9
BLZ00001	−115.80	22	−88.68	17.27	0.62	0.62	90	2	87.4	
CAN01101	−137.80	22	−125.60	57.24	3.45	1.27	157	2	87.4	9/GR10
CAN01201	−137.80	22	−111.92	55.89	3.33	0.98	151	2	87.4	9/GR10
CAN01202	−72.30	22	−107.64	55.62	2.75	1.11	32	2	87.4	
CAN01203	−128.80	22	−111.43	55.56	3.07	1.15	151	2	87.4	9/GR12
CAN01303	−128.80	22	−102.39	57.12	3.54	0.92	154	2	87.4	9/GR12
CAN01304	−90.80	22	−99.00	57.33	1.96	1.73	1	2	87.4	9/GR13
CAN01403	−128.80	22	−89.70	52.02	4.67	0.79	148	2	87.4	9/GR12
CAN01404	−90.80	22	−84.78	52.41	3.09	2.06	153	2	87.4	9/GR13
CAN01405	−81.80	22	−84.02	52.34	2.82	2.30	172	2	87.4	9/GR14
CAN01504	−90.80	22	−72.68	53.78	3.57	1.67	157	2	87.4	9/GR13
CAN01505	−81.80	22	−71.76	53.76	3.30	1.89	162	2	87.4	9/GR14
CAN01605	−81.80	22	−61.54	49.50	2.66	1.39	144	2	87.4	9/GR14
CAN01606	−70.30	22	−61.32	49.51	2.41	1.65	148	2	87.4	
CHLCONT4	−105.80	22	−69.59	−23.20	2.21	0.69	68	2	87.4	9/GR16
CHLCONT6	−105.80	22	−73.52	−55.52	3.65	1.31	39	2	87.4	9/GR16
CRBBAH01	−92.30	22	−76.09	24.13	1.83	0.68	141	1	87.4	9/GR18
CRBBER01	−92.30	22	−64.76	32.13	0.60	0.60	90	1	87.4	9/GR18
CRBBLZ01	−92.30	22	−88.61	17.26	0.64	0.64	90	1	87.4	9/GR18
CRBEC001	−92.30	22	−60.07	8.26	4.20	0.86	115	1	87.4	9/GR18
CRBJMC01	−92.30	22	−79.45	17.97	0.99	0.68	151	1	87.4	9/GR18
CTR00201	−130.80	22	−84.33	9.67	0.82	0.68	119	2	87.4	
DMAIFRB1	−79.30	22	−61.30	15.35	0.60	0.60	90	2	87.4	
EQAC0001	−94.80	22	−78.31	−1.52	1.48	1.15	65	1	87.4	9/GR19
EQAG0001	−94.80	22	−90.36	−0.57	0.94	0.89	99	1	87.4	9/GR19
HWA00002	−165.80	22	−165.79	23.32	4.20	0.68	160	2	87.4	9/GR1
HWA00003	−174.80	22	−166.10	23.42	4.25	0.68	159	2	87.4	9/GR2
MEX01NTE	−77.80	22	−105.80	25.99	2.88	2.07	155	2	87.4	1
MEX02NTE	−135.80	22	−107.36	26.32	3.80	1.57	149	2	87.4	1
MEX02SUR	−126.80	22	−96.39	19.88	3.19	1.87	158	2	87.4	1
NCG00003	−107.30	22	−84.99	12.90	1.05	1.01	176	1	87.4	
PRU00004	−85.80	22	−74.19	−8.39	3.74	2.45	112	2	87.4	
PTRVIR01	−100.80	22	−93.85	36.31	8.26	3.55	171	2	87.4	1 6 9/GR20
PTRVIR02	−109.80	22	−95.47	36.38	8.10	3.45	168	2	87.4	1 6 9/GR21
USAEH001	−61.30	22	−87.53	36.18	6.41	3.49	12	2	87.4	1 5 6
USAEH002	−100.80	22	−93.85	36.31	8.26	3.55	171	2	87.4	1 6 9/GR20
USAEH003	−109.80	22	−95.47	36.38	8.10	3.45	168	2	87.4	1 6 9/GR21
USAEH004	−118.80	22	−96.42	36.21	8.20	3.12	165	2	87.4	1 5 6
USAPSA02	−165.80	22	−109.83	36.82	6.03	1.12	137	2	87.4	9/GR1
USAPSA03	−174.80	22	−116.10	37.47	5.60	0.76	132	2	87.4	9/GR2
USAWH101	−147.80	22	−111.01	40.67	4.38	2.15	162	2	87.4	
USAWH102	−156.80	22	−113.01	40.71	3.74	1.79	149	2	87.4	
VEN11VEN	−103.80	22	−66.79	6.90	2.50	1.77	122	2	87.4	

17 644.76 MHz (23)

1	2	3	4		5		6	7	8	9
ALS00002	−166.20	23	−109.94	36.86	6.04	1.11	137	1	87.4	9/GR1
ALS00003	−175.20	23	−116.23	37.50	5.60	0.75	132	1	87.4	9/GR2
ARGINSU4	−94.20	23	−52.98	−59.81	3.40	0.68	19	1	87.4	9/GR3
ARGINSU5	−55.20	23	−44.17	−59.91	3.77	0.70	13	1	87.4	9/GR4
ARGSUR04	−94.20	23	−65.04	−43.33	3.32	1.50	40	1	87.4	9/GR3
ARGSUR05	−55.20	23	−63.68	−43.01	2.54	2.38	152	1	87.4	9/GR4
B CE311	−64.20	23	−40.60	−6.07	3.04	2.06	174	1	87.4	8 9/GR7
B CE312	−45.20	23	−40.27	−6.06	3.44	2.09	174	1	87.4	8 9/GR9
B CE411	−64.20	23	−50.97	−15.27	3.86	1.38	49	1	87.4	8 9/GR7
B CE412	−45.20	23	−50.71	−15.30	3.57	1.56	52	1	87.4	8 9/GR9
B CE511	−64.20	23	−53.10	−2.90	2.44	2.13	104	1	87.4	8 9/GR7
B NO611	−74.20	23	−59.60	−11.62	2.85	1.69	165	2	87.4	8 9/GR8
B NO711	−74.20	23	−60.70	−1.78	3.54	1.78	126	2	87.4	8 9/GR8
B NO811	−74.20	23	−68.76	−4.71	2.37	1.65	73	2	87.4	8 9/GR8
B SU111	−81.20	23	−51.12	−25.63	2.76	1.05	50	1	87.4	8 9/GR6
B SU112	−45.20	23	−50.75	−25.62	2.47	1.48	56	1	87.4	8 9/GR9
B SU211	−81.20	23	−44.51	−16.95	3.22	1.36	60	1	87.4	8 9/GR6
B SU212	−45.20	23	−44.00	−16.87	3.20	1.96	58	1	87.4	8 9/GR9
BERBERMU	−96.20	23	−64.77	32.32	0.60	0.60	90	2	87.4	
BOLAND01	−115.20	23	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
BOL00001	−87.20	23	−64.61	−16.71	2.52	2.19	85	1	87.4	
BRB00001	−92.70	23	−59.85	12.93	0.60	0.60	90	2	87.4	
CAN01101	−138.20	23	−125.63	57.24	3.45	1.27	157	1	87.4	9/GR10
CAN01201	−138.20	23	−112.04	55.95	3.35	0.97	151	1	87.4	9/GR10
CAN01202	−72.70	23	−107.70	55.63	2.74	1.12	32	1	87.4	
CAN01203	−129.20	23	−111.48	55.61	3.08	1.15	151	1	87.4	9/GR12
CAN01303	−129.20	23	−102.42	57.12	3.54	0.91	154	1	87.4	9/GR12
CAN01304	−91.20	23	−99.12	57.36	1.98	1.72	2	1	87.4	9/GR13
CAN01403	−129.20	23	−89.75	52.02	4.68	0.78	148	1	87.4	9/GR12
CAN01404	−91.20	23	−84.82	52.42	3.10	2.05	152	1	87.4	9/GR13
CAN01405	−82.20	23	−84.00	52.39	2.84	2.29	172	1	87.4	9/GR14
CAN01504	−91.20	23	−72.66	53.77	3.57	1.67	156	1	87.4	9/GR13
CAN01505	−82.20	23	−71.77	53.79	3.30	1.89	162	1	87.4	9/GR14
CAN01605	−82.20	23	−61.50	49.55	2.65	1.40	143	1	87.4	9/GR14
CAN01606	−70.70	23	−61.30	49.55	2.40	1.65	148	1	87.4	
CHLCONT5	−106.20	23	−72.23	−35.57	2.60	0.68	55	1	87.4	9/GR17
CHLPAC02	−106.20	23	−80.06	−30.06	1.36	0.68	69	1	87.4	9/GR17
CLMAND01	−115.20	23	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
CLM00001	−103.20	23	−74.50	5.87	3.98	1.96	118	1	87.4	
CUB00001	−89.20	23	−79.81	21.62	2.24	0.68	168	1	87.4	
EQACAND1	−115.20	23	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
EQAGAND1	−115.20	23	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
GRD00059	−57.20	23	−61.58	12.29	0.60	0.60	90	1	87.4	
GRLDNK01	−53.20	23	−44.89	66.56	2.70	0.82	173	1	87.4	2
GUY00201	−84.70	23	−59.19	4.78	1.44	0.85	95	1	87.4	
HWA00002	−166.20	23	−165.79	23.42	4.20	0.68	160	1	87.4	9/GR1
HWA00003	−175.20	23	−166.10	23.42	4.25	0.68	159	1	87.4	9/GR2
MEX01NTE	−78.20	23	−105.81	26.01	2.89	2.08	155	1	87.4	1
MEX01SUR	−69.20	23	−94.84	19.82	3.05	2.09	4	1	87.4	1
MEX02NTE	−136.20	23	−107.21	26.31	3.84	1.55	148	1	87.4	1
MEX02SUR	−127.20	23	−96.39	19.88	3.18	1.87	157	1	87.4	1
MSR00001	−79.70	23	−61.73	16.75	0.60	0.60	90	1	87.4	4
PAQPAC01	−106.20	23	−109.18	−27.53	0.60	0.60	90	1	87.4	9/GR17
PRG00002	−99.20	23	−58.66	−23.32	1.45	1.04	76	1	87.4	
PRUAND02	−115.20	23	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
PTRVIR01	−101.20	23	−93.94	36.32	8.24	3.56	171	1	87.4	1 6 9/GR20
PTRVIR02	−110.20	23	−95.23	36.29	8.27	3.37	168	1	87.4	1 6 9/GR21
URG00001	−71.70	23	−56.22	−32.52	1.02	0.89	11	1	87.4	
USAEH001	−61.70	23	−87.57	36.17	6.42	3.49	12	1	87.4	1 5 6
USAEH002	−101.20	23	−93.94	36.32	8.24	3.56	171	1	87.4	1 6 9/GR20
USAEH003	−110.20	23	−95.23	36.29	8.27	3.37	168	1	87.4	1 6 9/GR21
USAEH004	−119.20	23	−96.45	36.21	8.20	3.12	165	1	87.4	1 5 6
USAPSA02	−166.20	23	−109.94	36.86	6.04	1.11	137	1	87.4	9/GR1
USAPSA03	−175.20	23	−116.23	37.50	5.60	0.75	132	1	87.4	9/GR2
USAWH101	−148.20	23	−111.02	40.68	4.36	2.15	162	1	87.4	
USAWH102	−157.20	23	−113.07	40.74	3.72	1.78	149	1	87.4	
VENAND03	−115.20	23	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5

17 659.34 MHz (24)

1	2	3	4		5		6	7	8	9
ALS00002	−165.80	24	−109.83	36.82	6.03	1.12	137	2	87.4	9/GR1
ALS00003	−174.80	24	−116.10	37.47	5.60	0.76	132	2	87.4	9/GR2
ARGNORT4	−93.80	24	−63.96	−30.01	3.86	1.99	48	2	87.4	
ARGNORT5	−54.80	24	−62.85	−29.80	3.24	2.89	47	2	87.4	
B CE311	−63.80	24	−40.60	−6.07	3.04	2.06	174	2	87.4	8 9/GR7
B CE312	−44.80	24	−40.26	−6.06	3.44	2.09	174	2	87.4	8 9/GR9
B CE411	−63.80	24	−50.97	−15.26	3.86	1.38	49	2	87.4	8 9/GR7
B CE412	−44.80	24	−50.71	−15.30	3.57	1.56	52	2	87.4	8 9/GR9
B CE511	−63.80	24	−53.11	−2.98	2.42	2.15	107	2	87.4	8 9/GR7
B NO611	−73.80	24	−59.60	−11.62	2.86	1.69	165	1	87.4	8 9/GR8
B NO711	−73.80	24	−60.70	−1.78	3.54	1.78	126	1	87.4	8 9/GR8
B NO811	−73.80	24	−68.75	−4.71	2.37	1.65	73	1	87.4	8 9/GR8
B SE911	−101.80	24	−45.99	−19.09	2.22	0.79	62	2	87.4	8
B SU111	−80.80	24	−51.10	−25.64	2.76	1.06	50	2	87.4	8 9/GR6
B SU112	−44.80	24	−50.76	−25.62	2.47	1.48	56	2	87.4	8 9/GR9
B SU211	−80.80	24	−44.51	−16.94	3.22	1.37	60	2	87.4	8 9/GR6
B SU212	−44.80	24	−43.99	−16.97	3.27	1.92	59	2	87.4	8 9/GR9
CAN01101	−137.80	24	−125.60	57.24	3.45	1.27	157	2	87.4	9/GR10
CAN01201	−137.80	24	−111.92	55.89	3.33	0.98	151	2	87.4	9/GR10
CAN01202	−72.30	24	−107.64	55.62	2.75	1.11	32	2	87.4	
CAN01203	−128.80	24	−111.43	55.56	3.07	1.15	151	2	87.4	9/GR12
CAN01303	−128.80	24	−102.39	57.12	3.54	0.92	154	2	87.4	9/GR12
CAN01304	−90.80	24	−99.00	57.33	1.96	1.73	1	2	87.4	9/GR13
CAN01403	−128.80	24	−89.70	52.02	4.67	0.79	148	2	87.4	9/GR12
CAN01404	−90.80	24	−84.78	52.41	3.09	2.06	153	2	87.4	9/GR13
CAN01405	−81.80	24	−84.02	52.34	2.82	2.30	172	2	87.4	9/GR14
CAN01504	−90.80	24	−72.68	53.78	3.57	1.67	157	2	87.4	9/GR13
CAN01505	−81.80	24	−71.76	53.76	3.30	1.89	162	2	87.4	9/GR14
CAN01605	−81.80	24	−61.54	49.50	2.66	1.39	144	2	87.4	9/GR14
CAN01606	−70.30	24	−61.32	49.51	2.41	1.65	148	2	87.4	
CHLCONT4	−105.80	24	−69.59	−23.20	2.21	0.69	68	2	87.4	9/GR16
CHLCONT6	−105.80	24	−73.52	−55.52	3.65	1.31	39	2	87.4	9/GR16
CRBBAH01	−92.30	24	−76.09	24.13	1.83	0.68	141	1	87.4	9/GR18
CRBBER01	−92.30	24	−64.76	32.13	0.60	0.60	90	1	87.4	9/GR18
CRBBLZ01	−92.30	24	−88.61	17.26	0.64	0.64	90	1	87.4	9/GR18
CRBEC001	−92.30	24	−60.07	8.26	4.20	0.86	115	1	87.4	9/GR18
CRBJMC01	−92.30	24	−79.45	17.97	0.99	0.68	151	1	87.4	9/GR18
EQAC0001	−94.80	24	−78.31	−1.52	1.48	1.15	65	1	87.4	9/GR19
EQAG0001	−94.80	24	−90.36	−0.57	0.94	0.89	99	1	87.4	9/GR19
GRD00003	−79.30	24	−61.62	12.34	0.60	0.60	90	2	87.4	
GTMIFRB2	−107.30	24	−90.50	15.64	1.03	0.74	84	1	87.4	
GUFMGG02	−52.80	24	−56.42	8.47	4.16	0.81	123	2	87.4	2 7
HWA00002	−165.80	24	−165.79	23.32	4.20	0.68	160	2	87.4	9/GR1
HWA00003	−174.80	24	−166.10	23.42	4.25	0.68	159	2	87.4	9/GR2
MEX01NTE	−77.80	24	−105.80	25.99	2.88	2.07	155	2	87.4	1
MEX02NTE	−135.80	24	−107.36	26.32	3.80	1.57	149	2	87.4	1
MEX02SUR	−126.80	24	−96.39	19.88	3.19	1.87	158	2	87.4	1
PNRIFRB2	−121.00	24	−80.15	8.46	1.01	0.73	170	1	87.4	
PRU00004	−85.80	24	−74.19	−8.39	3.74	2.45	112	2	87.4	
PTRVIR01	−100.80	24	−93.85	36.31	8.26	3.55	171	2	87.4	1 6 9/GR20
PTRVIR02	−109.80	24	−95.47	36.38	8.10	3.45	168	2	87.4	1 6 9/GR21
USAEH001	−61.30	24	−87.53	36.18	6.41	3.49	12	2	87.4	1 5 6
USAEH002	−100.80	24	−93.85	36.31	8.26	3.55	171	2	87.4	1 6 9/GR20
USAEH003	−109.80	24	−95.47	36.38	8.10	3.45	168	2	87.4	1 6 9/GR21
USAEH004	−118.80	24	−96.42	36.21	8.20	3.12	165	2	87.4	1 5 6
USAPSA02	−165.80	24	−109.83	36.82	6.03	1.12	137	2	87.4	9/GR1
USAPSA03	−174.80	24	−116.10	37.47	5.60	0.76	132	2	87.4	9/GR2
USAWH101	−147.80	24	−111.01	40.67	4.38	2.15	162	2	87.4	
USAWH102	−156.80	24	−113.01	40.71	3.74	1.79	149	2	87.4	
VEN02VEN	−103.80	24	−66.79	6.90	2.50	1.77	122	2	87.4	9/GR22
VEN11VEN	−103.80	24	−66.79	6.90	2.50	1.77	122	2	87.4	9/GR22

17 673.92 MHz (25)

1	2	3	4		5		6	7	8	9
ALS00002	−166.20	25	−109.94	36.86	6.04	1.11	137	1	87.4	9/GR1
ALS00003	−175.20	25	−116.23	37.50	5.60	0.75	132	1	87.4	9/GR2
ARGINSU4	−94.20	25	−52.98	−59.81	3.40	0.68	19	1	87.4	9/GR3
ARGINSU5	−55.20	25	−44.17	−59.91	3.77	0.70	13	1	87.4	9/GR4
ARGSUR04	−94.20	25	−65.04	−43.33	3.32	1.50	40	1	87.4	9/GR3
ARGSUR05	−55.20	25	−63.68	−43.01	2.54	2.38	152	1	87.4	9/GR4
B CE311	−64.20	25	−40.60	−6.07	3.04	2.06	174	1	87.4	8 9/GR7
B CE312	−45.20	25	−40.27	−6.06	3.44	2.09	174	1	87.4	8 9/GR9
B CE411	−64.20	25	−50.97	−15.27	3.86	1.38	49	1	87.4	8 9/GR7
B CE412	−45.20	25	−50.71	−15.30	3.57	1.56	52	1	87.4	8 9/GR9
B CE511	−64.20	25	−53.10	−2.90	2.44	2.13	104	1	87.4	8 9/GR7
B NO611	−74.20	25	−59.60	−11.62	2.85	1.69	165	2	87.4	8 9/GR8
B NO711	−74.20	25	−60.70	−1.78	3.54	1.78	126	2	87.4	8 9/GR8
B NO811	−74.20	25	−68.76	−4.71	2.37	1.65	73	2	87.4	8 9/GR8
B SU111	−81.20	25	−51.12	−25.63	2.76	1.05	50	1	87.4	8 9/GR6
B SU112	−45.20	25	−50.75	−25.62	2.47	1.48	56	1	87.4	8 9/GR9
B SU211	−81.20	25	−44.51	−16.95	3.22	1.36	60	1	87.4	8 9/GR6
B SU212	−45.20	25	−44.00	−16.87	3.20	1.96	58	1	87.4	8 9/GR9
BERBERMU	−96.20	25	−64.77	32.32	0.60	0.60	90	2	87.4	
BOLAND01	−115.20	25	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
CAN01101	−138.20	25	−125.63	57.24	3.45	1.27	157	1	87.4	9/GR10
CAN01201	−138.20	25	−112.04	55.95	3.35	0.97	151	1	87.4	9/GR10
CAN01202	−72.70	25	−107.70	55.63	2.74	1.12	32	1	87.4	
CAN01203	−129.20	25	−111.48	55.61	3.08	1.15	151	1	87.4	9/GR12
CAN01303	−129.20	25	−102.42	57.12	3.54	0.91	154	1	87.4	9/GR12
CAN01304	−91.20	25	−99.12	57.36	1.98	1.72	2	1	87.4	9/GR13
CAN01403	−129.20	25	−89.75	52.02	4.68	0.78	148	1	87.4	9/GR12
CAN01404	−91.20	25	−84.82	52.42	3.10	2.05	152	1	87.4	9/GR13
CAN01405	−82.20	25	−84.00	52.39	2.84	2.29	172	1	87.4	9/GR14
CAN01504	−91.20	25	−72.66	53.77	3.57	1.67	156	1	87.4	9/GR13
CAN01505	−82.20	25	−71.77	53.79	3.30	1.89	162	1	87.4	9/GR14
CAN01605	−82.20	25	−61.50	49.55	2.65	1.40	143	1	87.4	9/GR14
CAN01606	−70.70	25	−61.30	49.55	2.40	1.65	148	1	87.4	
CHLCONT5	−106.20	25	−72.23	−35.57	2.60	0.68	55	1	87.4	9/GR17
CHLPAC02	−106.20	25	−80.06	−30.06	1.36	0.68	69	1	87.4	9/GR17
CLMAND01	−115.20	25	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
CLM00001	−103.20	25	−74.50	5.87	3.98	1.96	118	1	87.4	
EQACAND1	−115.20	25	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
EQAGAND1	−115.20	25	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
HWA00002	−166.20	25	−165.79	23.42	4.20	0.68	160	1	87.4	9/GR1
HWA00003	−175.20	25	−166.10	23.42	4.25	0.68	159	1	87.4	9/GR2
JMC00002	−92.70	25	−77.30	18.12	0.62	0.62	90	2	87.4	
KNA00001	−79.70	25	−62.46	17.44	0.60	0.60	90	1	87.4	
MEX01NTE	−78.20	25	−105.81	26.01	2.89	2.08	155	1	87.4	1
MEX01SUR	−69.20	25	−94.84	19.82	3.05	2.09	4	1	87.4	1
MEX02NTE	−136.20	25	−107.21	26.31	3.84	1.55	148	1	87.4	1
MEX02SUR	−127.20	25	−96.39	19.88	3.18	1.87	157	1	87.4	1
PAQPAC01	−106.20	25	−109.18	−27.53	0.60	0.60	90	1	87.4	9/GR17
PRG00002	−99.20	25	−58.66	−23.32	1.45	1.04	76	1	87.4	
PRUAND02	−115.20	25	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
PTRVIR01	−101.20	25	−93.94	36.32	8.24	3.56	171	1	87.4	1 6 9/GR20
PTRVIR02	−110.20	25	−95.23	36.29	8.27	3.37	168	1	87.4	1 6 9/GR21
SPMFRAN3	−53.20	25	−67.24	47.51	3.16	0.79	7	1	87.4	2 7
SURINAM2	−84.70	25	−55.69	4.35	1.00	0.69	86	1	87.4	
URG00001	−71.70	25	−56.22	−32.52	1.02	0.89	11	1	87.4	
USAEH001	−61.70	25	−87.57	36.17	6.42	3.49	12	1	87.4	1 5 6
USAEH002	−101.20	25	−93.94	36.32	8.24	3.56	171	1	87.4	1 6 9/GR20
USAEH003	−110.20	25	−95.23	36.29	8.27	3.37	168	1	87.4	1 6 9/GR21
USAEH004	−119.20	25	−96.45	36.21	8.20	3.12	165	1	87.4	1 5 6
USAPSA02	−166.20	25	−109.94	36.86	6.04	1.11	137	1	87.4	9/GR1
USAPSA03	−175.20	25	−116.23	37.50	5.60	0.75	132	1	87.4	9/GR2
USAWH101	−148.20	25	−111.02	40.68	4.36	2.15	162	1	87.4	
USAWH102	−157.20	25	−113.07	40.74	3.72	1.78	149	1	87.4	
VENAND03	−115.20	25	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5

17 688.50 MHz (26)

1	2	3	4		5		6	7	8	9
ALS00002	−165.80	26	−109.83	36.82	6.03	1.12	137	2	87.4	9/GR1
ALS00003	−174.80	26	−116.10	37.47	5.60	0.76	132	2	87.4	9/GR2
ARGNORT4	−93.80	26	−63.96	−30.01	3.86	1.99	48	2	87.4	
ARGNORT5	−54.80	26	−62.85	−29.80	3.24	2.89	47	2	87.4	
ATNBEAM1	−52.80	26	−66.44	14.87	1.83	0.68	39	2	87.4	
B CE311	−63.80	26	−40.60	−6.07	3.04	2.06	174	2	87.4	8 9/GR7
B CE312	−44.80	26	−40.26	−6.06	3.44	2.09	174	2	87.4	8 9/GR9
B CE411	−63.80	26	−50.97	−15.26	3.86	1.38	49	2	87.4	8 9/GR7
B CE412	−44.80	26	−50.71	−15.30	3.57	1.56	52	2	87.4	8 9/GR9
B CE511	−63.80	26	−53.11	−2.98	2.42	2.15	107	2	87.4	8 9/GR7
B NO611	−73.80	26	−59.60	−11.62	2.86	1.69	165	1	87.4	8 9/GR8
B NO711	−73.80	26	−60.70	−1.78	3.54	1.78	126	1	87.4	8 9/GR8
B NO811	−73.80	26	−68.75	−4.71	2.37	1.65	73	1	87.4	8 9/GR8
B SE911	−101.80	26	−45.99	−19.09	2.22	0.79	62	2	87.4	8
B SU111	−80.80	26	−51.10	−25.64	2.76	1.06	50	2	87.4	8 9/GR6
B SU112	−44.80	26	−50.76	−25.62	2.47	1.48	56	2	87.4	8 9/GR9
B SU211	−80.80	26	−44.51	−16.94	3.22	1.37	60	2	87.4	8 9/GR6
B SU212	−44.80	26	−43.99	−16.97	3.27	1.92	59	2	87.4	8 9/GR9
BLZ00001	−115.80	26	−88.68	17.27	0.62	0.62	90	2	87.4	
CAN01101	−137.80	26	−125.60	57.24	3.45	1.27	157	2	87.4	9/GR10
CAN01201	−137.80	26	−111.92	55.89	3.33	0.98	151	2	87.4	9/GR10
CAN01202	−72.30	26	−107.64	55.62	2.75	1.11	32	2	87.4	
CAN01203	−128.80	26	−111.43	55.56	3.07	1.15	151	2	87.4	9/GR12
CAN01303	−128.80	26	−102.39	57.12	3.54	0.92	154	2	87.4	9/GR12
CAN01304	−90.80	26	−99.00	57.33	1.96	1.73	1	2	87.4	9/GR13
CAN01403	−128.80	26	−89.70	52.02	4.67	0.79	148	2	87.4	9/GR12
CAN01404	−90.80	26	−84.78	52.41	3.09	2.06	153	2	87.4	9/GR13
CAN01405	−81.80	26	−84.02	52.34	2.82	2.30	172	2	87.4	9/GR14
CAN01504	−90.80	26	−72.68	53.78	3.57	1.67	157	2	87.4	9/GR13
CAN01505	−81.80	26	−71.76	53.76	3.30	1.89	162	2	87.4	9/GR14
CAN01605	−81.80	26	−61.54	49.50	2.66	1.39	144	2	87.4	9/GR14
CAN01606	−70.30	26	−61.32	49.51	2.41	1.65	148	2	87.4	
CHLCONT4	−105.80	26	−69.59	−23.20	2.21	0.69	68	2	87.4	9/GR16
CHLCONT6	−105.80	26	−73.52	−55.52	3.65	1.31	39	2	87.4	9/GR16
CRBBAH01	−92.30	26	−76.09	24.13	1.83	0.68	141	1	87.4	9/GR18
CRBBER01	−92.30	26	−64.76	32.13	0.60	0.60	90	1	87.4	9/GR18
CRBBLZ01	−92.30	26	−88.61	17.26	0.64	0.64	90	1	87.4	9/GR18
CRBEC001	−92.30	26	−60.07	8.26	4.20	0.86	115	1	87.4	9/GR18
CRBJMC01	−92.30	26	−79.45	17.97	0.99	0.68	151	1	87.4	9/GR18
CTR00201	−130.80	26	−84.33	9.67	0.82	0.68	119	2	87.4	
DMAIFRB1	−79.30	26	−61.30	15.35	0.60	0.60	90	2	87.4	
EQAC0001	−94.80	26	−78.31	−1.52	1.48	1.15	65	1	87.4	9/GR19
EQAG0001	−94.80	26	−90.36	−0.57	0.94	0.89	99	1	87.4	9/GR19
HWA00002	−165.80	26	−165.79	23.32	4.20	0.68	160	2	87.4	9/GR1
HWA00003	−174.80	26	−166.10	23.42	4.25	0.68	159	2	87.4	9/GR2
MEX01NTE	−77.80	26	−105.80	25.99	2.88	2.07	155	2	87.4	1
MEX02NTE	−135.80	26	−107.36	26.32	3.80	1.57	149	2	87.4	1
MEX02SUR	−126.80	26	−96.39	19.88	3.19	1.87	158	2	87.4	1
NCG00003	−107.30	26	−84.99	12.90	1.05	1.01	176	1	87.4	
PRU00004	−85.80	26	−74.19	−8.39	3.74	2.45	112	2	87.4	
PTRVIR01	−100.80	26	−93.85	36.31	8.26	3.55	171	2	87.4	1 6 9/GR20
PTRVIR02	−109.80	26	−95.47	36.38	8.10	3.45	168	2	87.4	1 6 9/GR21
USAEH001	−61.30	26	−87.53	36.18	6.41	3.49	12	2	87.4	1 5 6
USAEH002	−100.80	26	−93.85	36.31	8.26	3.55	171	2	87.4	1 6 9/GR20
USAEH003	−109.80	26	−95.47	36.38	8.10	3.45	168	2	87.4	1 6 9/GR21
USAEH004	−118.80	26	−96.42	36.21	8.20	3.12	165	2	87.4	1 5 6
USAPSA02	−165.80	26	−109.83	36.82	6.03	1.12	137	2	87.4	9/GR1
USAPSA03	−174.80	26	−116.10	37.47	5.60	0.76	132	2	87.4	9/GR2
USAWH101	−147.80	26	−111.01	40.67	4.38	2.15	162	2	87.4	
USAWH102	−156.80	26	−113.01	40.71	3.74	1.79	149	2	87.4	
VEN11VEN	−103.80	26	−66.79	6.90	2.50	1.77	122	2	87.4	

17 703.08 MHz (27)

1	2	3	4		5		6	7	8	9
ALS00002	−166.20	27	−109.94	36.86	6.04	1.11	137	1	87.4	9/GR1
ALS00003	−175.20	27	−116.23	37.50	5.60	0.75	132	1	87.4	9/GR2
ARGINSU4	−94.20	27	−52.98	−59.81	3.40	0.68	19	1	87.4	9/GR3
ARGINSU5	−55.20	27	−44.17	−59.91	3.77	0.70	13	1	87.4	9/GR4
ARGSUR04	−94.20	27	−65.04	−43.33	3.32	1.50	40	1	87.4	9/GR3
ARGSUR05	−55.20	27	−63.68	−43.01	2.54	2.38	152	1	87.4	9/GR4
B CE311	−64.20	27	−40.60	−6.07	3.04	2.06	174	1	87.4	8 9/GR7
B CE312	−45.20	27	−40.27	−6.06	3.44	2.09	174	1	87.4	8 9/GR9
B CE411	−64.20	27	−50.97	−15.27	3.86	1.38	49	1	87.4	8 9/GR7
B CE412	−45.20	27	−50.71	−15.30	3.57	1.56	52	1	87.4	8 9/GR9
B CE511	−64.20	27	−53.10	−2.90	2.44	2.13	104	1	87.4	8 9/GR7
B NO611	−74.20	27	−59.60	−11.62	2.85	1.69	165	2	87.4	8 9/GR8
B NO711	−74.20	27	−60.70	−1.78	3.54	1.78	126	2	87.4	8 9/GR8
B NO811	−74.20	27	−68.76	−4.71	2.37	1.65	73	2	87.4	8 9/GR8
B SU111	−81.20	27	−51.12	−25.63	2.76	1.05	50	1	87.4	8 9/GR6
B SU112	−45.20	27	−50.75	−25.62	2.47	1.48	56	1	87.4	8 9/GR9
B SU211	−81.20	27	−44.51	−16.95	3.22	1.36	60	1	87.4	8 9/GR6
B SU212	−45.20	27	−44.00	−16.87	3.20	1.96	58	1	87.4	8 9/GR9
BERBERMU	−96.20	27	−64.77	32.32	0.60	0.60	90	2	87.4	
BOLAND01	−115.20	27	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
BOL00001	−87.20	27	−64.61	−16.71	2.52	2.19	85	1	87.4	
BRB00001	−92.70	27	−59.85	12.93	0.60	0.60	90	2	87.4	
CAN01101	−138.20	27	−125.63	57.24	3.45	1.27	157	1	87.4	9/GR10
CAN01201	−138.20	27	−112.04	55..95	3.35	0.97	151	1	87.4	9/GR10
CAN01202	−72.70	27	−107.70	55.63	2.74	1.12	32	1	87.4	
CAN01203	−129.20	27	−111.48	55.61	3.08	1.15	151	1	87.4	9/GR12
CAN01303	−129.20	27	−102.42	57.12	3.54	0.91	154	1	87.4	9/GR12
CAN01304	−91.20	27	−99.12	57.36	1.98	1.72	2	1	87.4	9/GR13
CAN01403	−129.20	27	−89.75	52.02	4.68	0.78	148	1	87.4	9/GR12
CAN01404	−91.20	27	−84.82	52.42	3.10	2.05	152	1	87.4	9/GR13
CAN01405	−82.20	27	−84.00	52.39	2.84	2.29	172	1	87.4	9/GR14
CAN01504	−91.20	27	−72.66	53.77	3.57	1.67	156	1	87.4	9/GR13
CAN01505	−82.20	27	−71.77	53.79	3.30	1.89	162	1	87.4	9/GR14
CAN01605	−82.20	27	−61.50	49.55	2.65	1.40	143	1	87.4	9/GR14
CAN01606	−70.70	27	−61.30	49.55	2.40	1.65	148	1	87.4	
CHLCONT5	−106.20	27	−72.23	−35.57	2.60	0.68	55	1	87.4	9/GR17
CHLPAC02	−106.20	27	−80.06	−30.06	1.36	0.68	69	1	87.4	9/GR17
CLMAND01	−115.20	27	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
CLM00001	−103.20	27	−74.50	5.87	3.98	1.96	118	1	87.4	
CUB00001	−89.20	27	−79.81	21.62	2.24	0.68	168	1	87.4	
EQACAND1	−115.20	27	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
EQAGAND1	−115.20	27	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
GRD00059	−57.20	27	−61.58	12.29	0.60	0.60	90	1	87.4	
GRLDNK01	−53.20	27	−44.89	66.56	2.70	0.82	173	1	87.4	2
GUY00201	−84.70	27	−59.19	4.78	1.44	0.85	95	1	87.4	
HWA00002	−166.20	27	−165.79	23.42	4.20	0.68	160	1	87.4	9/GR1
HWA00003	−175.20	27	−166.10	23.42	4.25	0.68	159	1	87.4	9/GR2
MEX01NTE	−78.20	27	−105.81	26.01	2.89	2.08	155	1	87.4	1
MEX01SUR	−69.20	27	−94.84	19.82	3.05	2.09	4	1	87.4	1
MEX02NTE	−136.20	27	−107.21	26.31	3.84	1.55	148	1	87.4	1
MEX02SUR	−127.20	27	−96.39	19.88	3.18	1.87	157	1	87.4	1
MSR00001	−79.70	27	−61.73	16.75	0.60	0.60	90	1	87.4	4
PAQPAC01	−106.20	27	−109.18	−27.53	0.60	0.60	90	1	87.4	9/GR17
PRG00002	−99.20	27	−58.66	−23.32	1.45	1.04	76	1	87.4	
PRUAND02	−115.20	27	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
PTRVIR01	−101.20	27	−93.94	36.32	8.24	3.56	171	1	87.4	1 6 9/GR20
PTRVIR02	−110.20	27	−95.23	36.29	8.27	3.37	168	1	87.4	1 6 9/GR21
URG00001	−71.70	27	−56.22	−32.52	1.02	0.89	11	1	87.4	
USAEH001	−61.70	27	−87.57	36.17	6.42	3.49	12	1	87.4	1 5 6
USAEH002	−101.20	27	−93.94	36.32	8.24	3.56	171	1	87.4	1 6 9/GR20
USAEH003	−110.20	27	−95.23	36.29	8.27	3.37	168	1	87.4	1 6 9/GR21
USAEH004	−119.20	27	−96.45	36.21	8.20	3.12	165	1	87.4	1 5 6
USAPSA02	−166.20	27	−109.94	36.86	6.04	1.11	137	1	87.4	9/GR1
USAPSA03	−175.20	27	−116.23	37.50	5.60	0.75	132	1	87.4	9/GR2
USAWH101	−148.20	27	−111.02	40.68	4.36	2.15	162	1	87.4	
USAWH102	−157.20	27	−113.07	40.74	3.72	1.78	149	1	87.4	
VENAND03	−115.20	27	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5

17 717.66 MHz (28)

1	2	3	4		5		6	7	8	9
ALS00002	−165.80	28	−109.83	36.82	6.03	1.12	137	2	87.4	9/GR1
ALS00003	−174.80	28	−116.10	37.47	5.60	0.76	132	2	87.4	9/GR2
ARGNORT4	−93.80	28	−63.96	−30.01	3.86	1.99	48	2	87.4	
ARGNORT5	−54.80	28	−62.85	−29.80	3.24	2.89	47	2	87.4	
B CE311	−63.80	28	−40.60	−6.07	3.04	2.06	174	2	87.4	8 9/GR7
B CE312	−44.80	28	−40.26	−6.06	3.44	2.09	174	2	87.4	8 9/GR9
B CE411	−63.80	28	−50.97	−15.26	3.86	1.38	49	2	87.4	8 9/GR7
B CE412	−44.80	28	−50.71	−15.30	3.57	1.56	52	2	87.4	8 9/GR9
B CE511	−63.80	28	−53.11	−2.98	2.42	2.15	107	2	87.4	8 9/GR7
B NO611	−73.80	28	−59.60	−11.62	2.86	1.69	165	1	87.4	8 9/GR8
B NO711	−73.80	28	−60.70	−1.78	3.54	1.78	126	1	87.4	8 9/GR8
B NO811	−73.80	28	−68.75	−4.71	2.37	1.65	73	1	87.4	8 9/GR8
B SE911	−101.80	28	−45.99	−19.09	2.22	0.79	62	2	87.4	8
B SU111	−80.80	28	−51.10	−25.64	2.76	1.06	50	2	87.4	8 9/GR6
B SU112	−44.80	28	−50.76	−25.62	2.47	1.48	56	2	87.4	8 9/GR9
B SU211	−80.80	28	−44.51	−16.94	3.22	1.37	60	2	87.4	8 9/GR6
B SU212	−44.80	28	−43.99	−16.97	3.27	1.92	59	2	87.4	8 9/GR9
CAN01101	−137.80	28	−125.60	57.24	3.45	1.27	157	2	87.4	9/GR10
CAN01201	−137.80	28	−111.92	55.89	3.33	0.98	151	2	87.4	9/GR10
CAN01202	−72.30	28	−107.64	55.62	2.75	1.11	32	2	87.4	
CAN01203	−128.80	28	−111.43	55.56	3.07	1.15	151	2	87.4	9/GR12
CAN01303	−128.80	28	−102.39	57.12	3.54	0.92	154	2	87.4	9/GR12
CAN01304	−90.80	28	−99.00	57.33	1.96	1.73	1	2	87.4	9/GR13
CAN01403	−128.80	28	−89.70	52.02	4.67	0.79	148	2	87.4	9/GR12
CAN01404	−90.80	28	−84.78	52.41	3.09	2.06	153	2	87.4	9/GR13
CAN01405	−81.80	28	−84.02	52.34	2.82	2.30	172	2	87.4	9/GR14
CAN01504	−90.80	28	−72.68	53.78	3.57	1.67	157	2	87.4	9/GR13
CAN01505	−81.80	28	−71.76	53.76	3.30	1.89	162	2	87.4	9/GR14
CAN01605	−81.80	28	−61.54	49.50	2.66	1.39	144	2	87.4	9/GR14
CAN01606	−70.30	28	−61.32	49.51	2.41	1.65	148	2	87.4	
CHLCONT4	−105.80	28	−69.59	−23.20	2.21	0.69	68	2	87.4	9/GR16
CHLCONT6	−105.80	28	−73.52	−55.52	3.65	1.31	39	2	87.4	9/GR16
CRBBAH01	−92.30	28	−76.09	24.13	1.83	0.68	141	1	87.4	9/GR18
CRBBER01	−92.30	28	−64.76	32.13	0.60	0.60	90	1	87.4	9/GR18
CRBBLZ01	−92.30	28	−88.61	17.26	0.64	0.64	90	1	87.4	9/GR18
CRBEC001	−92.30	28	−60.07	8.26	4.20	0.86	115	1	87.4	9/GR18
CRBJMC01	−92.30	28	−79.45	17.97	0.99	0.68	151	1	87.4	9/GR18
EQAC0001	−94.80	28	−78.31	−1.52	1.48	1.15	65	1	87.4	9/GR19
EQAG0001	−94.80	28	−90.36	−0.57	0.94	0.89	99	1	87.4	9/GR19
GRD00003	−79.30	28	−61.62	12.34	0.60	0.60	90	2	87.4	
GTMIFRB2	−107.30	28	−90.50	15.64	1.03	0.74	84	1	87.4	
GUFMGG02	−52.80	28	−56.42	8.47	4.16	0.81	123	2	87.4	2 7
HWA00002	−165.80	28	−165.79	23.32	4.20	0.68	160	2	87.4	9/GR1
HWA00003	−174.80	28	−166.10	23.42	4.25	0.68	159	2	87.4	9/GR2
MEX01NTE	−77.80	28	−105.80	25.99	2.88	2.07	155	2	87.4	1
MEX02NTE	−135.80	28	−107.36	26.32	3.80	1.57	149	2	87.4	1
MEX02SUR	−126.80	28	−96.39	19.88	3.19	1.87	158	2	87.4	1
PNRIFRB2	−121.00	28	−80.15	8.46	1.01	0.73	170	1	87.4	
PRU00004	−85.80	28	−74.19	−8.39	3.74	2.45	112	2	87.4	
PTRVIR01	−100.80	28	−93.85	36.31	8.26	3.55	171	2	87.4	1 6 9/GR20
PTRVIR02	−109.80	28	−95.47	36.38	8.10	3.45	168	2	87.4	1 6 9/GR21
USAEH001	−61.30	28	−87.53	36.18	6.41	3.49	12	2	87.4	1 5 6
USAEH002	−100.80	28	−93.85	36.31	8.26	3.55	171	2	87.4	1 6 9/GR20
USAEH003	−109.80	28	−95.47	36.38	8.10	3.45	168	2	87.4	1 6 9/GR21
USAEH004	−118.80	28	−96.42	36.21	8.20	3.12	165	2	87.4	1 5 6
USAPSA02	−165.80	28	−109.83	36.82	6.03	1.12	137	2	87.4	9/GR1
USAPSA03	−174.80	28	−116.10	37.47	5.60	0.76	132	2	87.4	9/GR2
USAWH101	−147.80	28	−111.01	40.67	4.38	2.15	162	2	87.4	
USAWH102	−156.80	28	−113.01	40.71	3.74	1.79	149	2	87.4	
VEN02VEN	−103.80	28	−66.79	6.90	2.50	1.77	122	2	87.4	9/GR22
VEN11VEN	−103.80	28	−66.79	6.90	2.50	1.77	122	2	87.4	9/GR22

17 732.24 MHz (29)

1	2	3	4		5		6	7	8	9
ALS00002	−166.20	29	−109.94	36.86	6.04	1.11	137	1	87.4	9/GR1
ALS00003	−175.20	29	−116.23	37.50	5.60	0.75	132	1	87.4	9/GR2
ARGINSU4	−94.20	29	−52.98	−59.81	3.40	0.68	19	1	87.4	9/GR3
ARGINSU5	−55.20	29	−44.17	−59.91	3.77	0.70	13	1	87.4	9/GR4
ARGSUR04	−94.20	29	−65.04	−43.33	3.32	1.50	40	1	87.4	9/GR3
ARGSUR05	−55.20	29	−63.68	−43.01	2.54	2.38	152	1	87.4	9/GR4
B CE311	−64.20	29	−40.60	−6.07	3.04	2.06	174	1	87.4	8 9/GR7
B CE312	−45.20	29	−40.27	−6.06	3.44	2.09	174	1	87.4	8 9/GR9
B CE411	−64.20	29	−50.97	−15.27	3.86	1.38	49	1	87.4	8 9/GR7
B CE412	−45.20	29	−50.71	−15.30	3.57	1.56	52	1	87.4	8 9/GR9
B CE511	−64.20	29	−53.10	−2.90	2.44	2.13	104	1	87.4	8 9/GR7
B NO611	−74.20	29	−59.60	−11.62	2.85	1.69	165	2	87.4	8 9/GR8
B NO711	−74.20	29	−60.70	−1.78	3.54	1.78	126	2	87.4	8 9/GR8
B NO811	−74.20	29	−68.76	−4.71	2.37	1.65	73	2	87.4	8 9/GR8
B SU111	−81.20	29	−51.12	−25.63	2.76	1.05	50	1	87.4	8 9/GR6
B SU112	−45.20	29	−50.75	−25.62	2.47	1.48	56	1	87.4	8 9/GR9
B SU211	−81.20	29	−44.51	−16.95	3.22	1.36	60	1	87.4	8 9/GR6
B SU212	−45.20	29	−44.00	−16.87	3.20	1.96	58	1	87.4	8 9/GR9
BERBERMU	−96.20	29	−64.77	32.32	0.60	0.60	90	2	87.4	
BOLAND01	−115.20	29	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
CAN01101	−138.20	29	−125.63	57.24	3.45	1.27	157	1	87.4	9/GR10
CAN01201	−138.20	29	−112.04	55.95	3.35	0.97	151	1	87.4	9/GR10
CAN01202	−72.70	29	−107.70	55.63	2.74	1.12	32	1	87.4	
CAN01203	−129.20	29	−111.48	55.61	3.08	1.15	151	1	87.4	9/GR12
CAN01303	−129.20	29	−102.42	57.12	3.54	0.91	154	1	87.4	9/GR12
CAN01304	−91.20	29	−99.12	57.36	1.98	1.72	2	1	87.4	9/GR13
CAN01403	−129.20	29	−89.75	52.02	4.68	0.78	148	1	87.4	9/GR12
CAN01404	−91.20	29	−84.82	52.42	3.10	2.05	152	1	87.4	9/GR13
CAN01405	−82.20	29	−84.00	52.39	2.84	2.29	172	1	87.4	9/GR14
CAN01504	−91.20	29	−72.66	53.77	3.57	1.67	156	1	87.4	9/GR13
CAN01505	−82.20	29	−71.77	53.79	3.30	1.89	162	1	87.4	9/GR14
CAN01605	−82.20	29	−61.50	49.55	2.65	1.40	143	1	87.4	9/GR14
CAN01606	−70.70	29	−61.30	49.55	2.40	1.65	148	1	87.4	
CHLCONT5	−106.20	29	−72.23	−35.57	2.60	0.68	55	1	87.4	9/GR17
CHLPAC02	−106.20	29	−80.06	−30.06	1.36	0.68	69	1	87.4	9/GR17
CLMAND01	−115.20	29	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
CLM00001	−103.20	29	−74.50	5.87	3.98	1.96	118	1	87.4	
EQACAND1	−115.20	29	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
EQAGAND1	−115.20	29	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
HWA00002	−166.20	29	−165.79	23.42	4.20	0.68	160	1	87.4	9/GR1
HWA00003	−175.20	29	−166.10	23.42	4.25	0.68	159	1	87.4	9/GR2
JMC00002	−92.70	29	−77.30	18.12	0.62	0.62	90	2	87.4	
KNA00001	−79.70	29	−62.46	17.44	0.60	0.60	90	1	87.4	
MEX01NTE	−78.20	29	−105.81	26.01	2.89	2.08	155	1	87.4	1
MEX01SUR	−69.20	29	−94.84	19.82	3.05	2.09	4	1	87.4	1
MEX02NTE	−136.20	29	−107.21	26.31	3.84	1.55	148	1	87.4	1
MEX02SUR	−127.20	29	−96.39	19.88	3.18	1.87	157	1	87.4	1
PAQPAC01	−106.20	29	−109.18	−27.53	0.60	0.60	90	1	87.4	9/GR17
PRG00002	−99.20	29	−58.66	−23.32	1.45	1.04	76	1	87.4	
PRUAND02	−115.20	29	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
PTRVIR01	−101.20	29	−93.94	36.32	8.24	3.56	171	1	87.4	1 6 9/GR20
PTRVIR02	−110.20	29	−95.23	36.29	8.27	3.37	168	1	87.4	1 6 9/GR21
SPMFRAN3	−53.20	29	−67.24	47.51	3.16	0.79	7	1	87.4	2 7
SURINAM2	−84.70	29	−55.69	4.35	1.00	0.69	86	1	87.4	
URG00001	−71.70	29	−56.22	−32.52	1.02	0.89	11	1	87.4	
USAEH001	−61.70	29	−87.57	36.17	6.42	3.49	12	1	87.4	1 5 6
USAEH002	−101.20	29	−93.94	36.32	8.24	3.56	171	1	87.4	1 6 9/GR20
USAEH003	−110.20	29	−95.23	36.29	8.27	3.37	168	1	87.4	1 6 9/GR21
USAEH004	−119.20	29	−96.45	36.21	8.20	3.12	165	1	87.4	1 5 6
USAPSA02	−166.20	29	−109.94	36.86	6.04	1.11	137	1	87.4	9/GR1
USAPSA03	−175.20	29	−116.23	37.50	5.60	0.75	132	1	87.4	9/GR2
USAWH101	−148.20	29	−111.02	40.68	4.36	2.15	162	1	87.4	
USAWH102	−157.20	29	−113.07	40.74	3.72	1.78	149	1	87.4	
VENAND03	−115.20	29	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5

17 746.82 MHz (30)

1	2	3	4		5		6	7	8	9
ALS00002	−165.80	30	−109.83	36.82	6.03	1.12	137	2	87.4	9/GR1
ALS00003	−174.80	30	−116.10	37.47	5.60	0.76	132	2	87.4	9/GR2
ARGNORT4	−93.80	30	−63.96	−30.01	3.86	1.99	48	2	87.4	
ARGNORT5	−54.80	30	−62.85	−29.80	3.24	2.89	47	2	87.4	
ATNBEAM1	−52.80	30	−66.44	14.87	1.83	0.68	39	2	87.4	
B CE311	−63.80	30	−40.60	−6.07	3.04	2.06	174	2	87.4	8 9/GR7
B CE312	−44.80	30	−40.26	−6.06	3.44	2.09	174	2	87.4	8 9/GR9
B CE411	−63.80	30	−50.97	−15.26	3.86	1.38	49	2	87.4	8 9/GR7
B CE412	−44.80	30	−50.71	−15.30	3.57	1.56	52	2	87.4	8 9/GR9
B CE511	−63.80	30	−53.11	−2.98	2.42	2.15	107	2	87.4	8 9/GR7
B NO611	−73.80	30	−59.60	−11.62	2.86	1.69	165	1	87.4	8 9/GR8
B NO711	−73.80	30	−60.70	−1.78	3.54	1.78	126	1	87.4	8 9/GR8
B NO811	−73.80	30	−68.75	−4.71	2.37	1.65	73	1	87.4	8 9/GR8
B SE911	−101.80	30	−45.99	−19.09	2.22	0.79	62	2	87.4	8
B SU111	−80.80	30	−51.10	−25.64	2.76	1.06	50	2	87.4	8 9/GR6
B SU112	−44.80	30	−50.76	−25.62	2.47	1.48	56	2	87.4	8 9/GR9
B SU211	−80.80	30	−44.51	−16.94	3.22	1.37	60	2	87.4	8 9/GR6
B SU212	−44.80	30	−43.99	−16.97	3.27	1.92	59	2	87.4	8 9/GR9
BLZ00001	−115.80	30	−88.68	17.27	0.62	0.62	90	2	87.4	
CAN01101	−137.80	30	−125.60	57.24	3.45	1.27	157	2	87.4	9/GR10
CAN01201	−137.80	30	−111.92	55.89	3.33	0.98	151	2	87.4	9/GR10
CAN01202	−72.30	30	−107.64	55.62	2.75	1.11	32	2	87.4	
CAN01203	−128.80	30	−111.43	55.56	3.07	1.15	151	2	87.4	9/GR12
CAN01303	−128.80	30	−102.39	57.12	3.54	0.92	154	2	87.4	9/GR12
CAN01304	−90.80	30	−99.00	57.33	1.96	1.73	1	2	87.4	9/GR13
CAN01403	−128.80	30	−89.70	52.02	4.67	0.79	148	2	87.4	9/GR12
CAN01404	−90.80	30	−84.78	52.41	3.09	2.06	153	2	87.4	9/GR13
CAN01405	−81.80	30	−84.02	52.34	2.82	2.30	172	2	87.4	9/GR14
CAN01504	−90.80	30	−72.68	53.78	3.57	1.67	157	2	87.4	9/GR13
CAN01505	−81.80	30	−71.76	53.76	3.30	1.89	162	2	87.4	9/GR14
CAN01605	−81.80	30	−61.54	49.50	2.66	1.39	144	2	87.4	9/GR14
CAN01606	−70.30	30	−61.32	49.51	2.41	1.65	148	2	87.4	
CHLCONT4	−105.80	30	−69.59	−23.20	2.21	0.69	68	2	87.4	9/GR16
CHLCONT6	−105.80	30	−73.52	−55.52	3.65	1.31	39	2	87.4	9/GR16
CRBBAH01	−92.30	30	−76.09	24.13	1.83	0.68	141	1	87.4	9/GR18
CRBBER01	−92.30	30	−64.76	32.13	0.60	0.60	90	1	87.4	9/GR18
CRBBLZ01	−92.30	30	−88.61	17.26	0.64	0.64	90	1	87.4	9/GR18
CRBEC001	−92.30	30	−60.07	8.26	4.20	0.86	115	1	87.4	9/GR18
CRBJMC01	−92.30	30	−79.45	17.97	0.99	0.68	151	1	87.4	9/GR18
CTR00201	−130.80	30	−84.33	9.67	0.82	0.68	119	2	87.4	
DMAIFRB1	−79.30	30	−61.30	15.35	0.60	0.60	90	2	87.4	
EQAC0001	−94.80	30	−78.31	−1.52	1.48	1.15	65	1	87.4	9/GR19
EQAG0001	−94.80	30	−90.36	−0.57	0.94	0.89	99	1	87.4	9/GR19
HWA00002	−165.80	30	−165.79	23.32	4.20	0.68	160	2	87.4	9/GR1
HWA00003	−174.80	30	−166.10	23.42	4.25	0.68	159	2	87.4	9/GR2
MEX01NTE	−77.80	30	−105.80	25.99	2.88	2.07	155	2	87.4	1
MEX02NTE	−135.80	30	−107.36	26.32	3.80	1.57	149	2	87.4	1
MEX02SUR	−126.80	30	−96.39	19.88	3.19	1.87	158	2	87.4	1
NCG00003	−107.30	30	−84.99	12.90	1.05	1.01	176	1	87.4	
PRU00004	−85.80	30	−74.19	−8.39	3.74	2.45	112	2	87.4	
PTRVIR01	−100.80	30	−93.85	36.31	8.26	3.55	171	2	87.4	1 6 9/GR20
PTRVIR02	−109.80	30	−95.47	36.38	8.10	3.45	168	2	87.4	1 6 9/GR21
USAEH001	−61.30	30	−87.53	36.18	6.41	3.49	12	2	87.4	1 5 6
USAEH002	−100.80	30	−93.85	36.31	8.26	3.55	171	2	87.4	1 6 9/GR20
USAEH003	−109.80	30	−95.47	36.38	8.10	3.45	168	2	87.4	1 6 9/GR21
USAEH004	−118.80	30	−96.42	36.21	8.20	3.12	165	2	87.4	1 5 6
USAPSA02	−165.80	30	−109.83	36.82	6.03	1.12	137	2	87.4	9/GR1
USAPSA03	−174.80	30	−116.10	37.47	5.60	0.76	132	2	87.4	9/GR2
USAWH101	−147.80	30	−111.01	40.67	4.38	2.15	162	2	87.4	
USAWH102	−156.80	30	−113.01	40.71	3.74	1.79	149	2	87.4	
VEN11VEN	−103.80	30	−66.79	6.90	2.50	1.77	122	2	87.4	

17 761.40 MHz (31)

1	2	3	4		5		6	7	8	9
ALS00002	−166.20	31	−109.94	36.86	6.04	1.11	137	1	87.4	9/GR1
ALS00003	−175.20	31	−116.23	37.50	5.60	0.75	132	1	87.4	9/GR2
ARGINSU4	−94.20	31	−52.98	−59.81	3.40	0.68	19	1	87.4	9/GR3
ARGINSU5	−55.20	31	−44.17	−59.91	3.77	0.70	13	1	87.4	9/GR4
ARGSUR04	−94.20	31	−65.04	−43.33	3.32	1.50	40	1	87.4	9/GR3
ARGSUR05	−55.20	31	−63.68	−43.01	2.54	2.38	152	1	87.4	9/GR4
B CE311	−64.20	31	−40.60	−6.07	3.04	2.06	174	1	87.4	8 9/GR7
B CE312	−45.20	31	−40.27	−6.06	3.44	2.09	174	1	87.4	8 9/GR9
B CE411	−64.20	31	−50.97	−15.27	3.86	1.38	49	1	87.4	8 9/GR7
B CE412	−45.20	31	−50.71	−15.30	3.57	1.56	52	1	87.4	8 9/GR9
B CE511	−64.20	31	−53.10	−2.90	2.44	2.13	104	1	87.4	8 9/GR7
B NO611	−74.20	31	−59.60	−11.62	2.85	1.69	165	2	87.4	8 9/GR8
B NO711	−74.20	31	−60.70	−1.78	3.54	1.78	126	2	87.4	8 9/GR8
B NO811	−74.20	31	−68.76	−4.71	2.37	1.65	73	2	87.4	8 9/GR8
B SU111	−81.20	31	−51.12	−25.63	2.76	1.05	50	1	87.4	8 9/GR6
B SU112	−45.20	31	−50.75	−25.62	2.47	1.48	56	1	87.4	8 9/GR9
B SU211	−81.20	31	−44.51	−16.95	3.22	1.36	60	1	87.4	8 9/GR6
B SU212	−45.20	31	−44.00	−16.87	3.20	1.96	58	1	87.4	8 9/GR9
BERBERMU	−96.20	31	−64.77	32.32	0.60	0.60	90	2	87.4	
BOLAND01	−115.20	31	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
BOL00001	−87.20	31	−64.61	−16.71	2.52	2.19	85	1	87.4	
BRB00001	−92.70	31	−59.85	12.93	0.60	0.60	90	2	87.4	
CAN01101	−138.20	31	−125.63	57.24	3.45	1.27	157	1	87.4	9/GR10
CAN01201	−138.20	31	−112.04	55.95	3.35	0.97	151	1	87.4	9/GR10
CAN01202	−72.70	31	−107.70	55.63	2.74	1.12	32	1	87.4	
CAN01203	−129.20	31	−111.48	55.61	3.08	1.15	151	1	87.4	9/GR12
CAN01303	−129.20	31	−102.42	57.12	3.54	0.91	154	1	87.4	9/GR12
CAN01304	−91.20	31	−99.12	57.36	1.98	1.72	2	1	87.4	9/GR13
CAN01403	−129.20	31	−89.75	52.02	4.68	0.78	148	1	87.4	9/GR12
CAN01404	−91.20	31	−84.82	52.42	3.10	2.05	152	1	87.4	9/GR13
CAN01405	−82.20	31	−84.00	52.39	2.84	2.29	172	1	87.4	9/GR14
CAN01504	−91.20	31	−72.66	53.77	3.57	1.67	156	1	87.4	9/GR13
CAN01505	−82.20	31	−71.77	53.79	3.30	1.89	162	1	87.4	9/GR14
CAN01605	−82.20	31	−61.50	49.55	2.65	1.40	143	1	87.4	9/GR14
CAN01606	−70.70	31	−61.30	49.55	2.40	1.65	148	1	87.4	
CHLCONT5	−106.20	31	−72.23	−35.57	2.60	0.68	55	1	87.4	9/GR17
CHLPAC02	−106.20	31	−80.06	−30.06	1.36	0.68	69	1	87.4	9/GR17
CLMAND01	−115.20	31	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
CLM00001	−103.20	31	−74.50	5.87	3.98	1.96	118	1	87.4	
CUB00001	−89.20	31	−79.81	21.62	2.24	0.68	168	1	87.4	
EQACAND1	−115.20	31	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
EQAGAND1	−115.20	31	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
GRD00059	−57.20	31	−61.58	12.29	0.60	0.60	90	1	87.4	
GRLDNK01	−53.20	31	−44.89	66.56	2.70	0.82	173	1	87.4	2
GUY00201	−84.70	31	−59.19	4.78	1.44	0.85	95	1	87.4	
HWA00002	−166.20	31	−165.79	23.42	4.20	0.68	160	1	87.4	9/GR1
HWA00003	−175.20	31	−166.10	23.42	4.25	0.68	159	1	87.4	9/GR2
MEX01NTE	−78.20	31	−105.81	26.01	2.89	2.08	155	1	87.4	1
MEX01SUR	−69.20	31	−94.84	19.82	3.05	2.09	4	1	87.4	1
MEX02NTE	−136.20	31	−107.21	26.31	3.84	1.55	148	1	87.4	1
MEX02SUR	−127.20	31	−96.39	19.88	3.18	1.87	157	1	87.4	1
MSR00001	−79.70	31	−61.73	16.75	0.60	0.60	90	1	87.4	4
PAQPAC01	−106.20	31	−109.18	−27.53	0.60	0.60	90	1	87.4	9/GR17
PRG00002	−99.20	31	−58.66	−23.32	1.45	1.04	76	1	87.4	
PRUAND02	−115.20	31	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5
PTRVIR01	−101.20	31	−93.94	36.32	8.24	3.56	171	1	87.4	1 6 9/GR20
PTRVIR02	−110.20	31	−95.23	36.29	8.27	3.37	168	1	87.4	1 6 9/GR21
URG00001	−71.70	31	−56.22	−32.52	1.02	0.89	11	1	87.4	
USAEH001	−61.70	31	−87.57	36.17	6.42	3.49	12	1	87.4	1 5 6
USAEH002	−101.20	31	−93.94	36.32	8.24	3.56	171	1	87.4	1 6 9/GR20
USAEH003	−110.20	31	−95.23	36.29	8.27	3.37	168	1	87.4	1 6 9/GR21
USAEH004	−119.20	31	−96.45	36.21	8.20	3.12	165	1	87.4	1 5 6
USAPSA02	−166.20	31	−109.94	36.86	6.04	1.11	137	1	87.4	9/GR1
USAPSA03	−175.20	31	−116.23	37.50	5.60	0.75	132	1	87.4	9/GR2
USAWH101	−148.20	31	−111.02	40.68	4.36	2.15	162	1	87.4	
USAWH102	−157.20	31	−113.07	40.74	3.72	1.78	149	1	87.4	
VENAND03	−115.20	31	−71.37	−4.69	6.49	2.57	87	1	87.4	9/GR5

17 775.98 MHz (32)

1	2	3	4		5		6	7	8	9
ALS00002	−165.80	32	−109.83	36.82	6.03	1.12	137	2	87.4	9/GR1
ALS00003	−174.80	32	−116.10	37.47	5.60	0.76	132	2	87.4	9/GR2
ARGNORT4	−93.80	32	−63.96	−30.01	3.86	1.99	48	2	87.4	
ARGNORT5	−54.80	32	−62.85	−29.80	3.24	2.89	47	2	87.4	
B CE311	−63.80	32	−40.60	−6.07	3.04	2.06	174	2	87.4	8 9/GR7
B CE312	−44.80	32	−40.26	−6.06	3.44	2.09	174	2	87.4	8 9/GR9
B CE411	−63.80	32	−50.97	−15.26	3.86	1.38	49	2	87.4	8 9/GR7
B CE412	−44.80	32	−50.71	−15.30	3.57	1.56	52	2	87.4	8 9/GR9
B CE511	−63.80	32	−53.11	−2.98	2.42	2.15	107	2	87.4	8 9/GR7
B NO611	−73.80	32	−59.60	−11.62	2.86	1.69	165	1	87.4	8 9/GR8
B NO711	−73.80	32	−60.70	−1.78	3.54	1.78	126	1	87.4	8 9/GR8
B NO811	−73.80	32	−68.75	−4.71	2.37	1.65	73	1	87.4	8 9/GR8
B SE911	−101.80	32	−45.99	−19.09	2.22	0.79	62	2	87.4	8
B SU111	−80.80	32	−51.10	−25.64	2.76	1.06	50	2	87.4	8 9/GR6
B SU112	−44.80	32	−50.76	−25.62	2.47	1.48	56	2	87.4	8 9/GR9
B SU211	−80.80	32	−44.51	−16.94	3.22	1.37	60	2	87.4	8 9/GR6
B SU212	−44.80	32	−43.99	−16.97	3.27	1.92	59	2	87.4	8 9/GR9
CAN01101	−137.80	32	−125.60	57.24	3.45	1.27	157	2	87.4	9/GR10
CAN01201	−137.80	32	−111.92	55.89	3.33	0.98	151	2	87.4	9/GR10
CAN01202	−72.30	32	−107.64	55.62	2.75	1.11	32	2	87.4	
CAN01203	−128.80	32	−111.43	55.56	3.07	1.15	151	2	87.4	9/GR12
CAN01303	−128.80	32	−102.39	57.12	3.54	0.92	154	2	87.4	9/GR12
CAN01304	−90.80	32	−99.00	57.33	1.96	1.73	1	2	87.4	9/GR13
CAN01403	−128.80	32	−89.70	52.02	4.67	0.79	148	2	87.4	9/GR12
CAN01404	−90.80	32	−84.78	52.41	3.09	2.06	153	2	87.4	9/GR13
CAN01405	−81.80	32	−84.02	52.34	2.82	2.30	172	2	87.4	9/GR14
CAN01504	−90.80	32	−72.68	53.78	3.57	1.67	157	2	87.4	9/GR13
CAN01505	−81.80	32	−71.76	53.76	3.30	1.89	162	2	87.4	9/GR14
CAN01605	−81.80	32	−61.54	49.50	2.66	1.39	144	2	87.4	9/GR14
CAN01606	−70.30	32	−61.32	49.51	2.41	1.65	148	2	87.4	
CHLCONT4	−105.80	32	−69.59	−23.20	2.21	0.69	68	2	87.4	9/GR16
CHLCONT6	−105.80	32	−73.52	−55.52	3.65	1.31	39	2	87.4	9/GR16
CRBBAH01	−92.30	32	−76.09	24.13	1.83	0.68	141	1	87.4	9/GR18
CRBBER01	−92.30	32	−64.76	32.13	0.60	0.60	90	1	87.4	9/GR18
CRBBLZ01	−92.30	32	−88.61	17.26	0.64	0.64	90	1	87.4	9/GR18
CRBEC001	−92.30	32	−60.07	8.26	4.20	0.86	115	1	87.4	9/GR18
CRBJMC01	−92.30	32	−79.45	17.97	0.99	0.68	151	1	87.4	9/GR18
EQAC0001	−94.80	32	−78.31	−1.52	1.48	1.15	65	1	87.4	9/GR19
EQAG0001	−94.80	32	−90.36	−0.57	0.94	0.89	99	1	87.4	9/GR19
GRD00003	−79.30	32	−61.62	12.34	0.60	0.60	90	2	87.4	
GTMIFRB2	−107.30	32	−90.50	15.64	1.03	0.74	84	1	87.4	
GUFMGG02	−52.80	32	−56.42	8.47	4.16	0.81	123	2	87.4	2 7
HWA00002	−165.80	32	−165.79	23.32	4.20	0.68	160	2	87.4	9/GR1
HWA00003	−174.80	32	−166.10	23.42	4.25	0.68	159	2	87.4	9/GR2
MEX01NTE	−77.80	32	−105.80	25.99	2.88	2.07	155	2	87.4	1
MEX02NTE	−135.80	32	−107.36	26.32	3.80	1.57	149	2	87.4	1
MEX02SUR	−126.80	32	−96.39	19.88	3.19	1.87	158	2	87.4	1
PNRIFRB2	−121.00	32	−80.15	8.46	1.01	0.73	170	1	87.4	
PRU00004	−85.80	32	−74.19	−8.39	3.74	2.45	112	2	87.4	
PTRVIR01	−100.80	32	−93.85	36.31	8.26	3.55	171	2	87.4	1 6 9/GR20
PTRVIR02	−109.80	32	−95.47	36.38	8.10	3.45	168	2	87.4	1 6 9/GR21
USAEH001	−61.30	32	−87.53	36.18	6.41	3.49	12	2	87.4	1 5 6
USAEH002	−100.80	32	−93.85	36.31	8.26	3.55	171	2	87.4	1 6 9/GR20
USAEH003	−109.80	32	−95.47	36.38	8.10	3.45	168	2	87.4	1 6 9/GR21
USAEH004	−118.80	32	−96.42	36.21	8.20	3.12	165	2	87.4	1 5 6
USAPSA02	−165.80	32	−109.83	36.82	6.03	1.12	137	2	87.4	9/GR1
USAPSA03	−174.80	32	−116.10	37.47	5.60	0.76	132	2	87.4	9/GR2
USAWH101	−147.80	32	−111.01	40.67	4.38	2.15	162	2	87.4	
USAWH102	−156.80	32	−113.01	40.71	3.74	1.79	149	2	87.4	
VEN02VEN	−103.80	32	−66.79	6.90	2.50	1.77	122	2	87.4	9/GR22
VEN11VEN	−103.80	32	−66.79	6.90	2.50	1.77	122	2	87.4	9/GR22

ARTICLE 9A (REV.WRC-15)

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

9A.1 COLUMN HEADINGS OF THE PLAN

Col. 1 *Notifying administration symbol*.

Col. 2 *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. 3 *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. 4 *Nominal intersection of the beam axis with the Earth* (boresight or aim point in the case of a non-elliptical beam), longitude and latitude, in degrees and hundredths of a degree.

Col. 5 *Space station receiving antenna characteristics* (elliptical beams). This Column contains three numerical values corresponding to the major axis, the minor axis and the major axis orientation respectively of the elliptical cross-section half-power beam, in degrees and hundredths of a degree. Orientation of the ellipse determined as follows: in a plane normal to the beam axis, the direction of a major axis of the ellipse is specified as the angle measured anticlockwise from a line parallel to the equatorial plane to the major axis of the ellipse, to the nearest degree.

Col. 6 S*pace station receiving antenna pattern code*.

The codes used for the antenna pattern of the receiving space station (feeder link) antenna are defined as follows:

R13RSS	Figure B (Curves A, B and C) and § 3.7.3 in Annex 3
R123FR	Figure C and § 3.7.3 in Annex 3
MODRSS	Figure B (Curves A′, B′ and C) and § 3.7.3 in Annex 3 (Recommendation ITU-R BO.1296)

In cases where the “Space station receiving antenna pattern code” field is blank, the necessary antenna pattern data are provided by shaped beam data submitted by the administration. These data are stored in Column 7. A particular shaped beam is identified by the combination of Column 1, Column 7 and Column 14. In such cases the maximum cross-polar gain is given in Column 8, Cross-polar gain field.

In cases where the “Space station receiving antenna pattern code” field contains a code which starts with “CB_” characters, it is a composite beam. Any composite beam consists of two or more elliptical beams. Each composite beam is described in the special composite beam file having the same name plus a GXT extension (e.g. the description of the CB_COMP_BM1 composite beam is stored in the CB_COMP_BM1.GXT file).

Col. 7 *Space station receiving antenna shaped (non-elliptical, non-composite) beam identification.*

Col. 8 *Maximum space station receiving antenna co-polar and cross-polar (in the case of shaped beam) isotropic gain* (dBi).

Col. 9 *Earth station transmitting antenna pattern code and maximum gain* (dBi).

The codes used for transmitting earth station (feeder-link) antenna patterns are defined as follows:

R13TES	Figure A (Curves A and B) and § 3.5.3 in Annex 3
MODTES	Figure A (Curves A′ and B′) and § 3.5.3 in Annex 3 (Recommendation ITU-R BO.1295)

Col. 10 *Polarization* (CL – circular left, CR – circular right, LE – linear referenced to the equatorial plane) and polarization angle in degrees and hundredths of a degree (in the case of linear polarization only).

Col. 11 *e.i.r.p.* in the direction of maximum radiation (dBW).

Col. 12 *Permitted increase in earth station e.i.r.p.* (dB) for the purpose of power control (see § 3.11 of Annex 3). (WRC-15)

Col. 13 *Designation of emission.*

Col. 14 *Identity of the space station.*

Col. 15 *Group code* (an identification code which indicates that all assignments with the same group identification code will be treated as a group).

Group code: if an assignment is part of the group:

a) the equivalent protection margin to be used for the application of Article 4 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*

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– 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.

b) If an administration notifies the same frequency in more than one beam of a group for use at the same time, the aggregate *C*/*I* ratio produced by all emissions from that group shall not exceed the *C*/*I* ratio calculated on the basis of § *a)* above.

Col. 16 *Assignment status*.

The assignment status codes used for beams are defined as follows:

P	Assignment in the Regions 1 and 3 feeder-link Plan which has not been brought into use and/or the date of bringing into use has not been confirmed to the Bureau. For this category of assignments, WRC-2000 protection ratios are applied (27 dB co-channel and 22 dB adjacent channel).
PE	Assignment in the Regions 1 and 3 feeder-link Plan, which is in conformity with Appendix **30A**, has been notified, brought into use and the date of bringing into use has been confirmed to the Bureau before 12 May 2000. For this category of assignments, WRC-97 protection ratios are applied (30 dB co-channel and 22 dB adjacent channel).

Col. 17 *Remarks*.

9A.2 TEXT FOR NOTES IN THE REMARKS COLUMN OF THE REGIONS 1 AND 3 FEEDER-LINK PLAN (WRC-15)

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 (SUP - WRC-12)

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 (WRC-07)

Affected administrations and corresponding networks/beams identified based on Note 5 in § 9A.2 of Article 9A

Beam name	Channels	Affected administrations*	Affected networks/beams*
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

* Administrations and corresponding networks or beams whose assignment(s) may receive interference from the beam shown in the left-hand column.

TABLE 1B (WRC-15)

Affecting administrations and corresponding networks/beams identified based on Notes 6 and 7 in § 9A.2 of Article 9A

Beam name	Channels	Note	Affecting administrations*	Affecting networks/beams*
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

* 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 frequencies[1] 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 frequencies[1] 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	Orien-tation			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		27M0G7W		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		27M0G7W		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		27M0G7W		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		27M0G7W		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		27M0G7W		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		27M0G7W		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		27M0G7W		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		27M0G7W		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		27M0G7W		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		27M0G7W		4F	P	
IND	INDA_101	55.80	76.16	14.72				CB_RSS_INDA		45.66		MODTES	57.00	CR		82.0		27M0G7W		4U	P	
IND	INDA_102	55.80	76.16	14.72				CB_RSS_INDA		45.66		MODTES	57.00	CL		82.0		27M0G7W		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		27M0G7W		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		27M0G7W		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		27M0G7W		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		27M0G7W		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		27M0G7W	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		27M0F8W	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		27M0G7W		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		27M0G7W		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		27M0G7W		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		27M0G7W		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		27M0G7W		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		27M0G7W		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		27M0G7W		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		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							
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 (WRC-15)

Basic characteristics of the Regions 1 and 3 feeder-link Plan in the frequency band 17.3-18.1 GHz (sorted by administration)

1	2	3	4		5			6	7	8		9		10		11	12	13	14	15	16	17
Admin. symbol	Beam identification	Orbital position	Boresight		Space station antenna characteristics			Space station antenna code	Shaped beam	Space station antenna gain		Earth station antenna		Polarization		e.i.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	
AUS	AUS00600	152.00	135.50	−24.20	7.19	5.20	140.00	MODRSS		28.71		MODTES	57.00	CR		87.0		27M0G7W		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		27M0G7W		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		27M0G7W		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		27M0G7W		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		27M0G7W		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		27M0G7W		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		27M0G7W		42	P	

1	2	3	4		5			6	7	8		9		10		11	12	13	14	15	16	17
Admin. symbol	Beam identification	Orbital position	Boresight		Space station antenna characteristics			Space station antenna code	Shaped beam	Space station antenna gain		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							
AUS	AUS00700	164.00	136.00	−23.90	7.26	4.48	132.00	MODRSS		29.32		MODTES	57.00	CR		87.0		27M0G7W		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		27M0G7W		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		27M0G7W		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		27M0G7W		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		27M0G7W		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		27M0G7W		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		27M0G7W		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		27M0G7W		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		27M0G7W		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		27M0G7W		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		27M0G7W		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		27M0G7W		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		27M0G7W		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		27M0G7W		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		27M0G7W		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		27M0G7W		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		27M0G7W		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		27M0G7W		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		27M0G7W		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		27M0G7W		32	P	
AUS	AUS00905	164.00	159.06	−31.52	0.60	0.60	0.00	MODRSS		48.88		MODTES	57.00	CR		87.0		27M0G7W		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		27M0G7W		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		27M0G7W		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		27M0G7W		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		27M0G7W		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		27M0G7W		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		27M0G7W		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		27M0G7W		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		27M0G7W		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		27M0G7W		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		27M0G7W		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		27M0G7W		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		27M0G7W		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		27M0G7W		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		27M0G7W		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		27M0G7W		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		27M0G7W		43	P	

1	2	3	4		5			6	7	8		9		10		11	12	13	14	15	16	17
Admin. symbol	Beam identification	Orbital position	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							
AUT	AUT01600	−18.80	10.31	49.47	1.82	0.92	151.78	MODRSS		42.19		MODTES	57.00	CR		84.0		27M0G7W			P	
AZE	AZE06400	23.20	47.47	40.14	0.93	0.60	158.14	MODRSS		46.98		MODTES	57.00	CL		84.0		27M0G7W			P	
BDI	BDI27000	11.00	29.90	−3.10	0.71	0.60	80.00	MODRSS		48.15		MODTES	57.00	CL		81.0		27M0G7W			P	
BEL	BEL01800	38.20	5.12	51.96	1.00	1.00	0.00	MODRSS		44.44		MODTES	57.00	CR		85.5		27M0G7W			P	
BEN	BEN23300	−19.20	2.20	9.50	1.44	0.68	97.00	MODRSS		44.54		MODTES	57.00	CL		84.0		27M0G7W			P	
BFA	BFA10700	−30.00	−1.50	12.20	1.45	1.14	29.00	MODRSS		42.26		MODTES	57.00	CL		84.0		27M0G7W			P	
BGD	BGD22000	74.00	90.30	23.60	1.46	0.84	135.00	MODRSS		43.56		MODTES	57.00	CR		84.0		27M0G7W			P	
BHR	BHR25500	34.00	50.50	26.10	0.60	0.60	0.00	MODRSS		48.88		MODTES	57.00	CR		83.0		27M0G7W			P	
BIH	BIH14800	56.00	18.22	43.97	0.60	0.60	90.00	MODRSS		48.88		MODTES	57.00	CR		84.0		27M0G7W			P	
BLR	BLR06200	37.80	28.04	53.18	1.17	0.60	9.68	MODRSS		45.96		MODTES	57.00	CL		84.0		27M0G7W			P	
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	

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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							
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	
GNB	GNB30400	−30.00	−15.00	12.00	0.90	0.60	172.00	MODRSS		47.12		MODTES	57.00	CL		84.0		27M0G7W			P	
GNE	GNE30300	−18.80	10.30	1.50	0.68	0.60	10.00	MODRSS		48.34		MODTES	57.00	CR		84.0		27M0G7W			P	
GRC	GRC10500	−1.20	24.52	38.11	1.70	0.95	152.55	MODRSS		42.37		MODTES	57.00	CR		84.0		27M0G7W			P	
GUI	GUI19200	−37.00	−11.00	10.20	1.58	1.04	147.00	MODRSS		42.29		MODTES	57.00	CR		85.0		27M0G7W			P	
HNG	HNG10601	−12.80	16.77	46.78	1.71	0.89	149.15	MODRSS		42.64		MODTES	57.00	CR		84.0		27M0G7W			P	
HNG	HNG10602	−12.80	16.77	46.78	1.71	0.89	149.15	MODRSS		42.64		MODTES	57.00	CL		84.0		27M0G7W			P	
HNG	HNG10603	−12.80	16.77	46.78	1.71	0.89	149.15	MODRSS		42.64		MODTES	57.00	CL		84.0		27M0G7W		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		27M0G7W			P	
HRV	HRV14801	−12.80	16.77	46.78	1.71	0.89	149.15	MODRSS		42.64		MODTES	57.00	CR		84.0		27M0G7W			P	
HRV	HRV14802	−12.80	16.77	46.78	1.71	0.89	149.15	MODRSS		42.64		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 Long.	Boresight Lat.	Space station antenna characteristics Major axis	Minor axis	Orien-tation	Space station antenna code	Shaped beam	Space station antenna gain Co-polar	Cross-polar	Earth station antenna Code	Gain	Polarization Type	Angle	e.i.r.p.	Power control	Designation of emission	Identity of the space station	Group code	Status	Remarks
HRV	HRV14803	-12.80	16.77	46.78	1.71	0.89	149.15	MODRSS		42.64		MODTES	57.00	CL		84.0		27M0G7W		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		27M0G7W			P	
IND	IND03700	68.00	93.00	25.50	1.46	1.13	40.00	MODRSS		42.27		MODTES	57.00	CL		84.0		27M0G7W			P	
IND	IND04701	68.00	93.30	11.10	1.92	0.60	96.00	MODRSS		43.83		MODTES	57.00	CR		84.0		27M0G7W		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		27M0G7W		7E	P	
IND	INDA_101	55.80	76.16	14.72				CB_RSS_INDA		45.66		MODTES	57.00	CR		84.0		27M0G7W		7G	P	
IND	INDA_102	55.80	76.16	14.72				CB_RSS_INDA		45.66		MODTES	57.00	CL		84.0		27M0G7W		7G	P	
IND	INDB_101	55.80	83.67	23.73				CB_RSS_INDB		43.13		MODTES	57.00	CR		84.0		27M0G7W		7H	P	
IND	INDB_102	55.80	83.67	23.73				CB_RSS_INDB		43.13		MODTES	57.00	CL		84.0		27M0G7W		7H	P	
IND	INDD_100	68.00	74.37	29.16				CB_RSS_INDD		41.79		MODTES	57.00	CR		84.0		27M0G7W			P	
INS	INS02800	80.20	113.60	-1.40	6.73	3.33	160.00	MODRSS		30.94		MODTES	57.00	CR		84.0		27M0G7W			P	
INS	INS03501	104.00	115.20	-1.70	9.14	3.43	170.00	MODRSS		29.48		MODTES	57.00	CL		84.0		27M0G7W		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		27M0G7W		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		27M0G7W			P	
IRN	IRN10900	34.00	54.20	32.40	3.82	1.82	149.00	MODRSS		36.03		MODTES	57.00	CL		83.0		27M0G7W			P	
ISL	ISL04900	-33.50	-19.00	64.90	1.00	0.60	177.00	MODRSS		46.67		MODTES	57.00	CL		83.0		27M0G7W			P	
ISL	ISL05000	-33.50	-14.94	63.79	1.52	0.60	168.57	MODRSS		44.86		MODTES	57.00	CR		84.0		27M0G7W			P	
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	

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							
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	
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	
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	
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	

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							
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	
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	
SNG	SNG15100	88.00	103.86	1.42	0.92	0.72	175.12	MODRSS		46.25		MODTES	57.00	CL		84.0		27M0G7W			P	
SRB	SRB14800	−7.00	20.50	43.98	0.91	0.60	145.16	MODRSS		47.07		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	
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	
TLS	TLS00000	128.00	126.03	−8.72	0.66	0.60	13.92	MODRSS		48.50		MODTES	57.00	CR		84.0		27M0G7W			P	
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	

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							
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	

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												
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

TABLE 3B2

Minimum equivalent protection margin in the Regions 1 and 3 feeder-link Plan in the frequency band 17.3-18.1 GHz (sorted by orbital position)

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																																							
−178.00	FJI	FJI19300	CR	3.3		3.3		3.3		3.3		3.3		3.3		3.3		3.3		3.3		3.3		3.3		3.3																	
−178.00	SMO	SMO05700	CL	12.2		12.2		12.2		12.2		12.2		12.2		12.2		12.2		12.2		12.2		12.2		12.2																	
−160.00	F	OCE10100	CL		999.9		999.9		999.9		999.9		999.9		999.9		999.9		999.9		999.9		999.9		999.9		999.9																
−37.20	GMB	GMB30200	CL																					1.3		3.2		3.2		3.2		3.2		3.2		3.2		3.2		3.2		3.2	
−37.20	IRL	IRL21100	CR																					9.2		10.2		10.2		10.2		10.2		10.3		10.2		10.2		10.3		10.3	
−37.20	NGR	NGR11500	CL	1.8		−0.4		−0.4		−0.4		−0.4		−0.4		−0.4		−0.4		−0.4		−0.4																					
−37.00	AND	AND34100	CL																						10.6		10.6		10.6		10.6		10.6		10.6		10.6		10.6		10.6		13.3
−37.00	GUI	GUI19200	CR		0.8		0.8		0.8		0.8		0.8		0.8		0.8		0.8		0.8		1.5																				
−37.00	POR	POR__100	CR	2.4		0.0		−0.1		0.0		−0.1		0.0		−0.1		0.0		−0.1		0.0																					
−36.80	MTN	MTN__100	CR																						0.3		0.3		0.3		0.3		0.3		0.3		0.3		0.3		0.3		2.0
−36.80	SMR	SMR31100	CL		10.6		10.6		10.6		10.6		10.6		10.6		10.6		10.6		10.6		12.0																				
−33.50	CPV	CPV30100	CL		14.3		14.3		14.3		14.3		14.3		14.3		14.3		14.3		14.3		11.6																				
−33.50	DNK	DNK09000	CR																												5.1						5.1						
−33.50	DNK	DNK09100	CR																																1.1				1.1				
−33.50	G	G 02700	CR		6.4		6.4		6.4		6.4		6.4		6.4		6.4		6.4		6.4		4.2																				
−33.50	ISL	ISL04900	CL																					1.5		−0.1		−0.1		1.8		7.5		2.8		1.8		1.8		2.8		14.1	
−33.50	ISL	ISL05000	CR																						1.1		1.1		1.1														
−33.50	LBR	LBR24400	CR	10.6		7.7		7.7		7.7		7.7		7.7		7.7		7.7		7.7		7.7																					
−33.50	SRL	SRL25900	CR																					9.7		11.8		11.8		11.4		13.1		13.7		11.4		11.4		13.7		17.1	
−30.00	BFA	BFA10700	CL																						12.0		12.0		12.0		12.0		12.0		12.0		12.0		12.0		12.0		14.9
−30.00	E	E___100	CR	7.9		7.6		7.6		7.6		7.6		7.6		7.6		7.6		7.6		7.6																					
−30.00	E	HISP27D4	CR	10.2				10.1				10.1				10.1				10.1																							
−30.00	E	HISP27D6	CR	11.2				11.1				11.1				11.1				11.1																							
−30.00	E	HISP33D4	CR	10.1				10.1				10.1				10.1				10.1																							
−30.00	E	HISP33D6	CR	11.1				11.1				11.1				11.1				11.1																							
−30.00	E	HISPASA4	CR	10.2				10.1				10.1				10.1				10.1																							

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																																							
−30.00	E	HISPASA6	CR	11.2				11.1				11.1				11.1				11.1																							
−30.00	GNB	GNB30400	CL	15.6		16.9		15.2		16.9		15.2		16.9		15.2		16.9		15.2		16.9																					
−25.20	DNK	DNK__100	CL	1.2		−0.6		−0.6		−0.6		−0.6		−0.6		−0.6		−0.6		−0.6		−0.9																					
−25.20	MRC	MRC20900	CR		1.1		1.1		1.1		1.1		1.1		1.1		1.1		1.1		1.1		−1.1																				
−25.20	TUN	TUN15000	CR																						−0.4		−0.4		−0.4		−0.4		−0.4		−0.4		−0.4		−0.4		−0.4		−0.2
−25.20	TUN	TUN27200	CR																																		−1.2				−1.2		
−24.80	AGL	AGL29500	CR	9.2		6.8		6.8		6.8		6.8		6.8		6.8		6.8		6.8		6.8																					
−24.80	ALG	ALG25152	CL																						−1.0		−1.0		−1.0		−1.0		−1.0		−1.0		−1.1		−1.0		−1.1		0.0
−24.80	CTI	CTI23700	CR																					6.5		5.5		5.5		5.5		5.5		5.5		5.3		5.2		5.3		5.2	
−24.80	LBY	LBY28021	CL		−0.9		−0.9		−0.9		−0.9		−0.9		−0.9		−0.9		−0.9		−0.9		0.6																				
−19.20	BEN	BEN23300	CL																					4.4		9.4		9.4		9.4		9.4		9.4		9.4		9.4		9.4		9.4	
−19.20	COD	COD__100	CL	4.5		2.1		2.1		2.1		2.1		2.1		2.1		2.1		2.1		2.1																					
−19.20	MLI	MLI__100	CR		4.2		4.2		4.2		4.2		4.2		4.2		4.2		4.2		4.2		2.4																				
−18.80	AUT	AUT01600	CR																					−0.3		−0.2		−0.2		−0.2		−0.2		−0.2		−0.2		−0.2		−0.2		−0.2	
−18.80	D	D 08700	CR	2.5		−0.4		−0.4		−0.4		−0.4		−0.4		−0.4		−0.4		−0.4		−0.4																					
−18.80	GNE	GNE30300	CR																						13.0		13.0		13.0		13.0		13.0		13.0		13.0		13.0		13.0		14.7
−18.80	LIE	LIE25300	CL																						0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		2.5
−18.80	SUI	SUI14000	CL		0.3		0.3		0.3		0.3		0.3		0.3		0.3		0.3		0.3		0.3																				
−13.20	CAF	CAF25800	CR		1.1		−0.4		1.1		−0.4		1.1		−0.4		1.1		−0.4		1.1		1.0																				
−13.20	COG	COG23500	CR																						9.8		9.8		9.8		9.8		9.8		9.8		9.8		9.8		9.8		11.7
−13.20	GAB	GAB26000	CL	4.9		1.7		1.7		1.7		1.7		1.7		1.7		1.7		1.7		1.7																					
−13.20	PSE	YYY00001	CL																					8.6		10.1		10.1		10.1		10.1		10.1		10.1		10.1		10.1		10.1	
−12.80	CZE	CZE14401	CR	2.8								0.8								0.8								0.0								0.0							
−12.80	CZE	CZE14402	CL														0.1														−0.7								−0.7				
−12.80	CZE	CZE14403	CL		0.1*																				−0.7*		−0.7*																
−12.80	HNG	HNG10601	CR			0.8								0.8								0.8								0.0								0.0					
−12.80	HNG	HNG10602	CL						0.1																								−0.7								−0.7		
−12.80	HNG	HNG10603	CL		0.1*																				−0.7*		−0.7*																
−12.80	HRV	HRV14801	CR					0.8								0.8								0.8								0.0								0.0			

* 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.

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																						−0.7								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
−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	SRB	SRB14800	CL																						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		14.1
−4.00	ISR	ISR11000	CR																						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	
−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
−0.80	BOT	BOT29700	CL																					3.2		−0.4		0.8		−0.4		0.8		−0.4		0.8		−0.4		0.8		−0.4	
−0.80	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																								4.4				4.4												
−0.80	ZMB	ZMB31400	CR																						0.2		−1.0		0.2		−1.0		0.2		−1.0		0.2		−1.0		0.2		0.7
−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		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		7.2		8.2		7.2		8.2		7.2	
5.00	S	S 13900	CL																														9.8										

* 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.

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																						12.2		12.0		12.2		11.6		11.1		11.2		11.2		11.2		11.2		11.4
11.00	BDI	BDI27000	CL	3.2		0.4		0.4		0.4		0.4		0.4		0.4		0.4		0.4		0.4																					
11.00	JOR	JOR22400	CL																						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	
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		6.8
17.00	ARS	ARS34000	CL																																				6.8
17.00	TCD	TCD14300	CR	4.3		4.0		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	
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		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		1.7
22.80	FIN	FIN10300	CL																						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																																				0.2				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	
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	
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	
29.00	MAU	MAU__100	CL																						2.6		2.6		2.6		2.6		2.6		2.6		2.6		2.6		2.6		5.6
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																					
33.80	SVN	SVN14800	CR		5.9		5.9		5.9		5.9		5.9		5.9		5.9		6.0		6.0		6.1																				

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	UZB	UZB07100	CR																						0.3		2.5		5.8		4.7		5.8		4.7		5.8		4.7		5.8		5.0
34.00	BHR	BHR25500	CR		6.6		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																											−0.8				−0.8				−0.8				−0.8	
36.00	RUS	RSTREA12	CL																												−1.2				−1.2				−1.2				−0.4
36.00	RUS	RSTRED11	CR																											−0.8				−0.8				−0.8				−0.8	
36.00	RUS	RSTRED12	CL																												−1.2				−1.2				−1.2				−0.4
36.00	RUS	RSTRSD11	CR																									−0.5		−0.5		−0.5		−0.5		−0.5		−0.5		−0.5		−0.5	
36.00	RUS	RSTRSD12	CL																										−0.7		−0.7		−0.7		−0.7		−0.7		−0.7		−0.7		0.2
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																						−1.2		0.6		1.3		1.3		1.3		1.3		1.3		1.3		1.3		4.2
38.20	HOL	HOL21300	CL																					−0.1		−0.8		1.3		1.3		1.3		1.3		1.3		1.3		1.3		1.3	
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																						19.9		20.1		20.2		20.2		20.2		20.2		20.2		20.2		20.2		21.0
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																													1.5		1.5		1.5		1.5		1.5		1.5	
50.00	AFG	AFG24502	CR																														1.5		1.5		1.5		1.5		1.5		4.0
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																					3.2		0.8		1.0		1.0		0.7		0.5		0.5		0.5		0.5		0.5	
50.00	MLD	MLD30600	CR	5.5		5.3		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																					
50.00	ROU	ROU13600	CL																						0.4		0.5		0.7		−0.1		−0.9		−0.9		−0.9		−0.9		−0.9		2.0
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																					28.1		28.6		34.6		35.0		26.8		26.2		26.2		26.2		26.2		26.2	
55.80	IND	INDA_101	CR													0.5		4.7		4.7		4.7		15.0		15.0																	
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		5.3																													

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	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		12.6		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	
56.00	RUS	RSTRSD22	CL																										17.7		17.6		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		1.2		3.1		6.0		6.0		6.0																					
62.00	ALB	ALB29600	CL																						12.8		14.1		46.6		46.5		46.3		46.3		46.3		46.3		46.3		47.4
62.00	CHN	CHN15400	CR		13.5		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		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		5.2		8.2																
68.00	IND	IND04701	CR																													40.8		40.8		40.8		40.8		40.8		40.8	
68.00	IND	IND04702	CL																														44.2		44.2		44.2		44.2		44.2		47.1
68.00	IND	INDD_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																	
74.00	BGD	BGD22000	CR	4.7		1.7		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		12.1		11.7		11.3		13.6																
74.00	MNG	MNG24800	CL																					8.1		8.1		15.8		999.9		48.6		48.1		48.1		48.1		48.1		48.1	
80.20	INS	INS02800	CR	16.0		14.6		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		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		2.1		4.0																
86.00	RUS	RSTRSD31	CR																									1.9		999.9		999.9		999.9		999.9		999.9		999.9		999.9	
86.00	RUS	RSTRSD32	CL																										999.9		999.9		999.9		999.9		999.9		999.9		999.9		999.9
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		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		11.1		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		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																													36.4		37.0		37.0		37.0		37.0		37.0	
104.00	INS	INS03502	CR																														42.1		42.1		42.1		42.1		42.1		45.1
107.00	VTN	VTN32500	CR		14.2		14.2		14.2		14.2		14.2		14.2		14.2		14.2		14.2		14.3		14.4		17.1																
109.85	J	000BS−3N	CR	21.6		19.4		19.2		19.2		19.2		19.2		19.9		21.0																									

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																																							
109.85	J	J 10985	CR	23.9		21.6		21.4		21.4		21.4		21.4		22.1		23.1		21.7		21.4		21.4		21.4																	
110.00	J	J 11100	CR	23.7		21.4		21.2		21.2		21.2		21.2		22.0		23.0		21.6		21.2		21.3		21.3																	
110.00	J	J 1110E	CR	21.4		19.2		19.0		19.0		19.0		19.0		19.8		20.8																									
110.00	RUS	RUS00401	CR																									29.2		999.9		14.1		13.2		13.2		13.2		13.2		13.2	
110.00	RUS	RUS00402	CL																										999.9		20.8												
116.00	KOR	KOR11201	CL																													28.2		29.2		29.2		29.2		29.2		29.2	
116.00	KOR	KOR11202	CR																														31.8		31.8		31.8		31.8		31.8		34.7
121.80	USA	MRA33200	CR	3.2		0.2		0.2		0.2		0.2		0.2		0.2		0.2		0.2		0.2		0.2		0.2																	
122.00	CHN	CHN20000	CL		13.8		13.8		13.8		13.8		13.8		13.8		13.9		13.9		13.8		13.8		13.8		15.9																
122.00	USA	GUM33101	CR																													29.3		28.6		28.6		28.6		28.6		28.6	
122.00	USA	GUM33102	CL																														28.6		28.6		28.6		28.6		28.6		29.3
122.20	LAO	LAO28400	CR		0.3		0.3		0.3		0.3		0.3		0.3		0.3		0.3		0.3		0.4		0.4		1.6																
128.00	SLM	SLM00000	CL	16.4		13.4		13.4		13.4		13.4		13.4		13.4		13.4		13.4		13.4		13.4		13.4																	
128.00	TLS	TLS00000	CR		19.6		19.6		19.6		19.6		19.6		19.6		19.6		19.6		19.6		19.6		19.6		22.6																
134.00	CHN	CHN15800	CL		0.6		0.6		0.6		0.6		0.6		0.6		0.6		0.6		0.6		0.6		0.6		3.6																
134.00	CHN	CHN15900	CR	2.0		2.0		2.0		2.0		2.0		2.0		2.0		2.0		2.0		2.0		2.0		2.0																	
134.00	NRU	NRU30900	CL	18.8		17.6		17.6		17.6		17.6		17.6		17.6		17.6		17.6		17.6		17.6		17.6																	
140.00	F	F____200	CL		10.2		10.2		10.2		10.2		10.2		10.2		10.2		10.2		10.2		10.2		10.2		11.2																
140.00	F	F____300	CR	8.5		6.7		6.7		6.7		6.7		6.7		6.7		6.7		6.7		6.7		6.7		6.7																	
140.00	KRE	KRE28600	CL	13.6		12.2		12.2		12.2		12.2		12.2		12.2		12.2		12.2		12.2		12.2		12.2																	
140.00	PLW	PLW00000	CR		9.7		9.7		9.7		9.7		9.7		9.7		9.7		9.7		9.7		9.7		9.7		7.9																
140.00	RUS	RSTRSD51	CR																									0.1		999.9		3.0		1.6		1.6		1.6		1.6		1.6	
140.00	RUS	RSTRSD52	CL																										999.9		7.3		1.6		1.6		1.6		1.6		1.6		3.0
140.00	VUT	VUT12801	CL																													8.9		8.9		8.9		8.9		8.9		8.9	
140.00	VUT	VUT12802	CR																														8.9		8.9		8.9		8.9		8.9		10.4
146.00	MHL	MHL00000	CR		41.3		40.8		41.3		40.8		41.3		41.1		41.6		41.1		41.6		41.1		41.6		41.8																
152.00	AUS	AUS00400	CL			−0.3				−0.3				−0.3				−0.3				−0.3				−0.3																	
152.00	AUS	AUS00401	CL			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																	
152.00	AUS	AUS00403	CL			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																	

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	AUS00405	CL			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																	
152.00	AUS	AUS0040A	CL			−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																
152.00	AUS	AUS00501	CR				3.0				3.0				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																
152.00	AUS	AUS00503	CR				3.0				3.0				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																
152.00	AUS	AUS00505	CR				3.0				3.0				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																
152.00	AUS	AUS00600	CR																										999.9		999.9		999.9		999.9				999.9				999.9
152.00	AUS	AUS00601	CR																										999.9		999.9		999.9		999.9				999.9				999.9
152.00	AUS	AUS00602	CR																										999.9		999.9		999.9		999.9				999.9				999.9
152.00	AUS	AUS00603	CR																										999.9		999.9		999.9		999.9				999.9				999.9
152.00	AUS	AUS00604	CR																										999.9		999.9		999.9		999.9				999.9				999.9
152.00	AUS	AUS00605	CR																										999.9		999.9		999.9		999.9				999.9				999.9
152.00	AUS	AUS00606	CR																										999.9		999.9		999.9		999.9				999.9				999.9
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																															
152.00	AUS	AUSA0004	CL	53.4				6.0				6.0																															
152.00	AUS	AUSA0005	CL	55.9				6.0				6.0																															
152.00	AUS	AUSA0006	CL	48.3				6.0				6.0																															
158.00	FSM	FSM00000	CR	8.8		5.7		5.7		5.7		5.7		5.7		5.7		5.7		5.7		5.7		5.7		5.7																	
158.00	NZL	NZL__100	CL		8.5		8.4		8.5		8.4		8.5		8.4		8.6		8.6		8.6		8.6		8.6		11.2																
164.00	AUS	AUS00700	CR			−2.9				−2.9				−2.9				0.1				0.1				0.1																	
164.00	AUS	AUS00701	CR			3.0				3.0				3.0				6.0				6.0				6.0																	
164.00	AUS	AUS00702	CR			3.0				3.0				3.0				6.0				6.0				6.0																	
164.00	AUS	AUS00703	CR			3.0				3.0				3.0				6.0				6.0				6.0																	
164.00	AUS	AUS00704	CR			3.0				3.0				3.0				6.0				6.0				6.0																	

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																																							
164.00	AUS	AUS00705	CR			3.0				3.0				3.0				6.0				6.0				6.0																	
164.00	AUS	AUS00706	CR			3.0				3.0				3.0				6.0				6.0				6.0																	
164.00	AUS	AUS0070A	CR			−3.1				−3.1				−3.1				−0.1				−0.1				−0.1																	
164.00	AUS	AUS00800	CL		0.2				0.2				0.2				0.2				0.2				0.2																		
164.00	AUS	AUS00801	CL		6.0				6.0				6.0				6.0				6.0				6.0																		
164.00	AUS	AUS00802	CL		6.0				6.0				6.0				6.0				6.0				6.0																		
164.00	AUS	AUS00803	CL		6.0				6.0				6.0				6.0				6.0				6.0																		
164.00	AUS	AUS00804	CL		6.0				6.0				6.0				6.0				6.0				6.0																		
164.00	AUS	AUS00805	CL		6.0				6.0				6.0				6.0				6.0				6.0																		
164.00	AUS	AUS00806	CL		6.0				6.0				6.0				6.0				6.0				6.0																		
164.00	AUS	AUS00900	CR																									31.9		999.9		38.1		36.8				36.8				36.8	
164.00	AUS	AUS00901	CR																									65.2		999.9		63.1		61.7				61.7				61.7	
164.00	AUS	AUS00902	CR																									65.4		999.9		63.3		61.9				61.9				61.9	
164.00	AUS	AUS00903	CR																									60.5		999.9		62.1		60.8				60.8				60.8	
164.00	AUS	AUS00904	CR																									50.2		999.9		60.8		59.5				59.5				59.5	
164.00	AUS	AUS00905	CR																									56.4		999.9		59.4		58.1				58.1				58.1	
164.00	AUS	AUS00906	CR																									48.1		999.9		57.0		55.8				55.8				55.8	
164.00	AUS	AUS0090A	CR																									42.0		999.9		40.3		38.9				38.9				38.9	
164.00	AUS	AUSB0000	CL				−0.1				−0.1				−0.1																												
164.00	AUS	AUSB0001	CL				6.0				6.0				6.0																												
164.00	AUS	AUSB0002	CL				6.0				6.0				6.0																												
164.00	AUS	AUSB0003	CL				6.0				6.0				6.0																												
164.00	AUS	AUSB0004	CL				6.0				6.0				6.0																												
164.00	AUS	AUSB0005	CL				6.0				6.0				6.0																												
164.00	AUS	AUSB0006	CL				6.0				6.0				6.0																												
170.00	USA	PLM33200	CL		10.2		10.2		10.2		10.2		10.2		10.2		10.2		10.2		10.2		10.2		10.2		10.2																
170.00	USA	USAA_101	CR																													45.5		45.5		999.9		45.5		999.9		45.5	
170.00	USA	USAA_102	CL																														45.5		48.5		48.5		48.5		48.5		48.5
170.75	TON	TON21500	CR		11.6		11.6		11.6		11.6		11.6		11.6		11.6		11.6		11.6		11.6		11.6		11.6																
176.00	KIR	KIR__100	CL	4.2		1.2		1.2		1.2		1.2		1.2		1.2		1.2		1.2		1.2		1.2		1.2																	
176.00	TUV	TUV00000	CR		4.7		4.7		4.7		4.7		4.7		4.7		4.7		4.7		4.7		4.7		4.7		7.7																

ARTICLE 10

Interference

10.1 The Member States shall endeavour to agree on the action required to reduce harmful interference which might be caused by the application of these provisions and the associated Plans.

ARTICLE 11

Period of validity of the provisions and associated Plans

11.1 The provisions and associated Plans have been prepared in order to meet the requirements for feeder-links for the broadcasting-satellite service in the bands concerned for a period extending until at least 1 January 1994.

11.2 In any event, the provisions and associated Plans shall remain in force until their revision by a competent administrative radio conference convened in accordance with the relevant provisions of the Convention in force.

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 (Rev.WRC-03)

1 (SUP - WRC-2000)

2 (SUP - WRC-2000)

3 Limits to the change in the overall equivalent protection margin with respect to frequency assignments in conformity with the Region 2 feeder-link Plan[33] (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

[33] With respect to § 3 the limit specified relates to the overall equivalent protection margin calculated in accordance with § 1.12 of Annex 3.

* *Note by the Secretariat*: This Resolution was revised by WRC-12 and WRC-15.

equivalent protection margin[34] 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)

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 dB(W/(m^2 · 27 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 margin[35] 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)

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[34] For the definition of the overall equivalent protection margin, see § 1.11 of Annex 5 to Appendix **30**.

* *Note by the Secretariat*: This Resolution was revised by WRC-12 and WRC-15.

[35] For the definition of the equivalent protection margin, see § 1.7 of Annex 3.

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)

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)

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) or a frequency assignment in the frequency bands 14.5-14.75 GHz (in countries listed in Resolution 163 (WRC-15)) and 14.5-14.8 GHz (in countries listed in Resolution 164 (WRC-15)) to a receiving space station in the fixed-satellite service (Earth-to-space) not subject to a Plan (WRC-15)

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 or the receiving space station of the fixed-satellite service uplinks not subject to a Plan in all Regions of that administration would cause an increase in the noise temperature of the receiving uplink 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-15)

* *Note by the Secretariat*: This Resolution was revised by WRC-12 and WRC-15.

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**.

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 application[36] (Rev.WRC-03)

1 Definitions

1.1 Feeder link

The term feeder link, as defined in No. **1.115**, is further qualified to indicate a fixed-satellite service link in the frequency band 17.3-17.8 GHz in the Region 2 broadcasting-satellite service Plan and in the frequency bands 14.5-14.8 GHz for countries outside Europe, and 17.3-18.1 GHz in the Regions 1 and 3 Plan, from any earth station within the feeder-link service area to the associated space station in the broadcasting-satellite service.

1.2 Feeder-link beam area

The area delineated by the intersection of the half-power beam of the satellite receiving antenna with the surface of the Earth.

1.3 Feeder-link service area

The area on the surface of the Earth within the feeder-link beam area within which the administration responsible for the service has the right to locate transmitting earth stations for the purpose of providing feeder-links to broadcasting-satellite space stations.

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[36] In revising this Annex at WRC-97 and at WRC-2000, no changes were made to the technical data applicable to the Region 2 feeder-link Plan. However, for all three Regions it should be noted that some of the parameters of networks proposed as modifications to the Region 2 feeder-link Plan and the Regions 1 and 3 feeder-link Lists may differ from the technical data presented herein. (WRC-2000)

1.4 Nominal orbital position

The longitude of a position in the geostationary-satellite orbit associated with a frequency assignment to a space station in a space radiocommunication service. The position is given in degrees from the Greenwich meridian.

1.5 Adjacent channel

The RF channel in the broadcasting-satellite service frequency Plan, or in the associated feeder-link frequency Plan, which is situated immediately higher or lower in frequency with respect to the reference channel.

1.6 Second adjacent channel

The RF channel in the broadcasting-satellite service frequency Plan, or in the associated feeder-link frequency Plan, which is situated immediately beyond either of the adjacent channels, with respect to the reference channel.

1.7 Feeder-link equivalent protection margin for Regions 1 and 3[37] (WRC-2000)

The feeder-link equivalent protection margin (M_u) is given by the formula:

$$M_u = -10 \log \left(10^{-M_1/10} + 10^{-M_2/10} + 10^{-M_3/10}\right) \qquad \text{dB}$$

where:

M_1: is the value in dB of the protection margin for the same channel, i.e.:

$$M_1 = \left[\frac{\text{wanted power}}{\text{sum of the co-channel interfering powers}} \right] - \text{co-channel protection ratio}$$

[37] This quantity is used in the alternative formula for the overall equivalent protection margin given in § 1.12. However, in certain cases (e.g. when the channel spacing and/or bandwidth are different from the values given in § 3.5 and 3.8 of Annex 5 to Appendix **30**) the Bureau will use the worst-case approach until a relevant ITU-R Recommendation is incorporated in this Annex by reference. (WRC-2000)

M_2 and M_3: are the values in dB of the protection margin for the upper and lower adjacent channels, respectively, i.e.:

$$M_2 = \left[\frac{\text{wanted power}}{\text{sum of the upper adjacent channel interfering powers}} \right] - \text{adjacent channel protection ratio}$$

$$M_3 = \left[\frac{\text{wanted power}}{\text{sum of the lower adjacent channel interfering powers}} \right] - \text{adjacent channel protection ratio}$$

All powers are evaluated at the receiver input. All protection ratios are given in § 3.3.

1.8 Overall carrier-to-interference (*C/I*) ratio

The overall *C/I* ratio is the ratio of the wanted carrier power to the sum of all interfering RF powers in a given channel including both feeder-links and downlinks. The overall *C/I* ratio due to interference from the given channel is calculated as the reciprocal of the sum of the reciprocals of the feeder-link *C/I* ratio and the downlink *C/I* ratio referred to the satellite receiver input and earth station receiver input, respectively[38].

1.9 Overall co-channel protection margin

The overall co-channel protection margin in a given channel is the difference (dB) between the overall co-channel *C/I* ratio and the co-channel protection ratio.

1.10 Overall adjacent channel protection margin

The overall adjacent channel protection margin is the difference (dB) between the overall adjacent channel *C/I* ratio and the adjacent channel protection ratio.

1.11 Overall second adjacent channel protection margin

The overall second adjacent channel protection margin is the difference (dB) between the overall second adjacent channel *C/I* ratio and the second adjacent channel protection ratio.

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[38] In Region 2, there are a total of five overall *C/I* ratios used in the analysis of the Plan, namely, co-channel, upper and lower adjacent channels and upper and lower second adjacent channels. In Regions 1 and 3, three ratios are used, namely, co-channel and upper and lower adjacent channels.

1.12 Overall equivalent protection margin

The overall equivalent protection margin M is given in dB by the expression[39]:

$$M = -10 \log \left(\sum_{i=1}^{n} 10^{\left(-M_i/10\right)} \right)$$

where:

n: is generally equal to 3 for Regions 1 and 3, n is equal to 5 for Region 2

M_1: overall co-channel protection margin (dB) (as defined in § 1.9)

M_2, M_3: overall adjacent channel protection margins for the upper and lower adjacent channels, respectively (dB) (as defined in § 1.10)

M_4, M_5: overall second adjacent channel protection margins for the upper and lower second adjacent channels, respectively (dB) as defined in § 1.11).[40]

The adjective "equivalent" indicates that the protection margins for all interference sources from the adjacent and second adjacent as well as co-channel interference sources have been included.

The following alternative formula for overall equivalent protection margin was used at the 1988 Conference (WARC Orb-88) in developing the original feeder-link Plan for Regions 1 and 3. It may be used as a tool to assess the relative contributions of the feeder link and downlink to the overall equivalent protection margin defined above.

$$M = -10 \log \left(10^{-\left(M_u + R_{cu}\right)/10} + 10^{-\left(M_d + R_{cd}\right)/10} \right) - R_{co}$$

where:

M_u: equivalent protection margin for the feeder link (as defined in § 1.7)

M_d: equivalent protection margin for the downlink (as defined in § 3.4, Annex 5 to Appendix **30**

R_{cu}: co-channel feeder-link protection ratio

R_{cd}: co-channel downlink protection ratio

R_{co}: co-channel overall protection ratio.

The values of the protection ratios used for the 1988 feeder-link Plan were as follows:

R_{cu} = 40 dB

R_{cd} = 31 dB

R_{co} = 30 dB

---

39 This formula is also used to calculate the overall equivalent protection margin of 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.

40 M_4 and M_5 are applicable only for Region 2. (WRC-2000)

The adjective "equivalent" indicates that the protection margins for all interference sources from the adjacent channels as well as co-channel interference sources have been included.

The corresponding values for analysing the 1997 feeder-link Plan are:

R_{cu} = 30 dB

R_{cd} = 24 dB

R_{co} = 23 dB

However, the latter values are restricted to the case of channels having the standard channel spacing and necessary bandwidth given in § 3.5 and 3.8, respectively, of Annex 5 to Appendix **30**.

WRC-2000 generally applied the following protection ratio values for development of the WRC-2000 Regions 1 and 3 feeder-link Plan:

R_{cu} = 27 dB

R_{cd} = 21 dB (WRC-2000)

These values were used for all assignments in WRC-2000 planning except those for which WRC-2000 adopted different values (see § 3.3). The planning at WRC-2000 was based on use of the equivalent protection margin criterion. (WRC-2000)

2 Radio propagation factors

The propagation loss on an Earth-to-space path is equal to the free-space path loss plus the atmospheric absorption loss plus the rain attenuation exceeded for 1% of the worst month in Region 2. In Regions 1 and 3, the atmospheric absorption loss is not included.

2.1 Atmospheric absorption

For Region 2 (see Fig. 2)

The loss due to atmospheric absorption (i.e. clear-sky attenuation) is given by:

$$A_a = \frac{92.20}{\cos\theta}\left(0.020F_o + 0.008\rho F_w\right) \qquad \text{dB} \qquad \text{for } \theta < 5°$$

where:

$$F_o = \left\{24.88\tan\theta + 0.339\sqrt{1\,416.77\tan^2\theta + 5.51}\right\}^{-1}$$

$$F_w = \left\{40.01\tan\theta + 0.339\sqrt{3\,663.79\tan^2\theta + 5.51}\right\}^{-1}$$

and:

$$A_a = \frac{0.0478 + 0.0118\rho}{\sin\theta} \quad \text{dB} \qquad \text{for } \theta \geq 5°$$

where:

θ: elevation angle (degrees)

ρ: surface water vapour concentration, g/m^3, with

ρ = 10 g/m^3 for rain climatic zones A to K and

ρ = 20 g/m^3 for rain climatic zones M to P.

For Regions 1 and 3 (see Figs. 1 and 3 taken from Recommendation ITU-R P.837-1)

In the Regions 1 and 3 feeder-link Plan, the atmospheric absorption loss is not included for the calculation of margins.

2.2 Rain attenuation

The propagation model for feeder links using circularly polarized signals is based on the value of rain attenuation for 1% of the worst month.

Figures 1, 2 and 3 give the rain climatic zones for Regions 1, 2 and 3.

Figure 4 presents a plot of rain attenuation of circularly polarized signals exceeded for 1% of the worst month at 17.5 GHz as a function of earth station latitude and elevation angle for each of the rain climatic zones in Region 2.

For calculation, the following data are needed:

$R_{0.01}$: point rainfall rate for the location exceeded for 0.01% of an average year (mm/h)

h_0: height above mean sea level of the earth station (km)

θ: elevation angle (degrees)

f: frequency (GHz)

ζ: latitude of earth station (degrees).

Mean frequencies will be used for calculations for the frequency bands, i.e. 17.7 GHz and 14.65 GHz for Regions 1 and 3, 17.5 GHz for Region 2.

The calculation procedure used for the Region 2 feeder-link Plan and for the original 1988 Regions 1 and 3 feeder-link Plan consists of the following seven steps:

Step 1: the mean zero-degree isotherm height h_F is:

$$h_F = 5.1 - 2.15 \log \left[1 + 10^{\frac{(|\zeta| - 27)}{25}} \right] \quad \text{km}$$

Step 2: the rain height h_R is:

$$h_R = C \cdot h_F \qquad \text{km}$$

where:

$C = 0.6$	for	$0° \leq$	$\lvert\zeta\rvert < 20°$
$C = 0.6 + 0.02\,(\lvert\zeta\rvert - 20)$	for	$20° \leq$	$\lvert\zeta\rvert < 40°$
$C = 1$	for		$\lvert\zeta\rvert \geq 40°$

Step 3: the slant-path length, L_s, below the rain height is:

$$L_s = \frac{2(h_R - h_0)}{\left[\sin^2\theta + 2\dfrac{(h_R - h_0)}{R_e}\right]^{1/2} + \sin\theta} \qquad \text{km}$$

where R_e is the effective radius of the Earth (8 500 km).

Step 4: the horizontal projection, L_G, of the slant-path is:

$$L_G = L_s \cos\theta \qquad \text{km}$$

Step 5: the rain path reduction factor $r_{0.01}$, for 0.01% of the time is:

$$r_{0.01} = \frac{90}{90 + 4L_G}$$

Step 6: the specific attenuation γ_R is determined from:

$$\gamma_R = k(R_{0.01})^{\alpha} \qquad \text{dB/km}$$

where $R_{0.01}$ is given in Table 1 for each rain climatic zone. The frequency dependent coefficients k and α are given in Table 2 and the rain climatic zones are given in Figs. 1, 2 and 3 for Regions 1, 2 and 3.

TABLE 1

Rainfall intensity (R) for the rain climatic zones (exceeded for 0.01% of an average year)

Rain climatic zone	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**J**	**K**	**L**	**M**	**N**	**P**	**Q**
Rainfall intensity (mm/h)	8	12	15	19	22	28	30	32	35	42	60	63	95	145	115

TABLE 2

Frequency dependent coefficients

Frequency (GHz)	k	α	
14.65	0.0327	1.149	For Regions 1 and 3
17.5	0.0521	1.114	For Region 2
17.7	0.0531	1.110	For Regions 1 and 3

Step 7: the attenuation exceeded for 1% of the worst month is:

$A_{1\%} = 0.223\ \gamma_R\ L_s\ r_{0.01}$ dB for Regions 1 and 3

$A_{1\%} = 0.21\ \gamma_R\ L_s\ r_{0.01}$ dB for Region 2.

For calculation of the permissible increase in e.i.r.p. to overcome rain fading (power control, see § 3.11.1) in the Regions 1 and 3 Plan revised by WRC-97, the same calculation procedure is used with the following changes to conform to Recommendation ITU-R P.618-5.

To calculate the rain height h_R, Steps 1 and 2 are replaced by:

$$h_R = \begin{cases} 5 - 0.075(\zeta - 23) & \text{for} \quad \zeta > 23^\circ \quad \text{Northern Hemisphere} \\ 5 & \text{for} \quad 0^\circ \le \zeta \le 23^\circ \quad \text{Northern Hemisphere} \\ 5 & \text{for} \quad 0^\circ \ge \zeta \ge -21^\circ \quad \text{Southern Hemisphere} \\ 5 + 0.1(\zeta + 21) & \text{for} \quad -71^\circ \le \zeta < -21^\circ \quad \text{Southern Hemisphere} \\ 0 & \text{for} \quad \zeta < -71^\circ \quad \text{Southern Hemisphere} \end{cases}$$

Steps 3 and 4 remain the same. However, to calculate the rain path reduction factor $r_{0.01}$, for 0.01% of the time, the equation of Step 5 is replaced by:

$$r_{0.01} = \frac{1}{1 + L_G / L_0}$$

where:

$L_0 = 35 \exp(-0.015\ R_{0.01})$

and $R_{0.01}$ is given in Table 1 for each rain climatic zone.

Step 6 remains the same except the frequency dependent coefficients k and α shall be obtained from Recommendation ITU-R P.838-3. (WRC-07)

Step 7 should be replaced as follows:

$$\frac{A_p}{A_{0.01}} = 0.12\, p^{-(0.546 + 0.043 \log p)}$$

where:

$p\ (\%) = 0.30\ p_w\ (\%)^{1.15}$ (Recommendation ITU-R P.841)

p is the average annual time percentage of excess corresponding to desired worst-month time percentage of excess p_w.

2.3 Rain attenuation limit

In the analysis of the Plan for Region 2, a maximum rain attenuation on the feeder link of 13 dB was considered assuming that other means would be used at the implementation stage to compensate for larger rain attenuation on the feeder link.

In the analysis of the Regions 1 and 3 Plan, no rain attenuation is included in the margins.

2.4 Depolarization

Rain and ice can cause depolarization of radio frequency signals. The level of the co-polar component relative to the depolarized component is given by the cross-polarization discrimination (XPD) ratio. For the feeder link, the XPD ratio (dB) not exceeded for 1% of the worst month, is given by:

$$XPD = 30 \log f - 40 \log (\cos \theta) - V \log A_p \qquad \text{for } 5° \leq \theta \leq 60°$$

where:

$$V = 20 \qquad \text{for 14.5-14.8 GHz}$$

and

$$V = 23 \qquad \text{for 17.3-18.1 GHz}$$

where:

A_p : co-polar rain attenuation exceeded for 1% of the worst month

f : frequency (GHz)

θ : elevation angle (degrees).

To calculate the depolarization value to be used for power control in the Regions 1 and 3 Plan, the following algorithm (Steps 1 to 8), which was obtained from Recommendation ITU-R P.618-5, shall be used.

To calculate long-term statistics of depolarization from rain attenuation statistics the following parameters are needed:

A_p: rain attenuation (dB) exceeded for the required percentage of time, p, for the path in question, commonly called co-polar attenuation (CPA)

τ: tilt angle of the linearly-polarized electric field vector with respect to the horizontal (for circular polarization use $\tau = 45°$)

f: frequency (GHz)

θ: path elevation angle (degrees).

The method described below to calculate XPD statistics from rain attenuation statistics for the same path is valid for 8 GHz $\leq f \leq$ 35 GHz and $\theta \leq 60°$.

Step 1: calculate the frequency-dependent term:

$$C_f = 30 \log f \qquad \text{for} \qquad 8\ \text{GHz} \leq f \leq 35\ \text{GHz}$$

Step 2: calculate the rain attenuation dependent term:

$$C_A = V(f) \log A_p$$

where:

$$V(f) = 12.8 f^{0.19} \qquad \text{for} \qquad 8\ \text{GHz} \leq f \leq 20\ \text{GHz}$$

$$V(f) = 22.6 \qquad \text{for} \qquad 20\ \text{GHz} < f \leq 35\ \text{GHz}$$

Step 3: calculate the polarization improvement factor:

$$C_\tau = -10 \log [1 - 0.484 (1 + \cos 4\tau)]$$

The improvement factor $C_\tau = 0$ for $\tau = 45°$ and reaches a maximum value of 15 dB for $\tau = 0°$ or $90°$.

Step 4: calculate the elevation angle dependent term:

$$C_\theta = -40 \log (\cos \theta) \qquad \text{for} \qquad \theta \leq 60°$$

Step 5: calculate the canting angle dependent term:

$$C_\sigma = 0.0052\, \sigma^2$$

σ is the effective standard deviation of the raindrop canting angle distribution, expressed in degrees; σ takes the value 0°, 5°, 10° and 15° for 1%, 0.1%, 0.01% and 0.001% of the time, respectively.

Step 6: calculate rain XPD not exceeded for *p*% of the time:

$$XPD_{rain} = C_f - C_A + C_\tau + C_\theta + C_\sigma \qquad \text{dB}$$

Step 7: calculate the ice crystal dependent term:

$$C_{ice} = XPD_{rain} (0.3 + 0.1 \log p)/2 \qquad \text{dB}$$

Step 8: calculate the XPD not exceeded for *p*% of the time, including the effects of ice:

$$XPD_p = XPD_{rain} - C_{ice} \qquad \text{dB}$$

For values of θ greater than 60°, use $\theta = 60°$ in the above equations.

FIGURE 1

Rain-climatic zones for Regions 1 and 3 between longitudes 45° W and 105° E

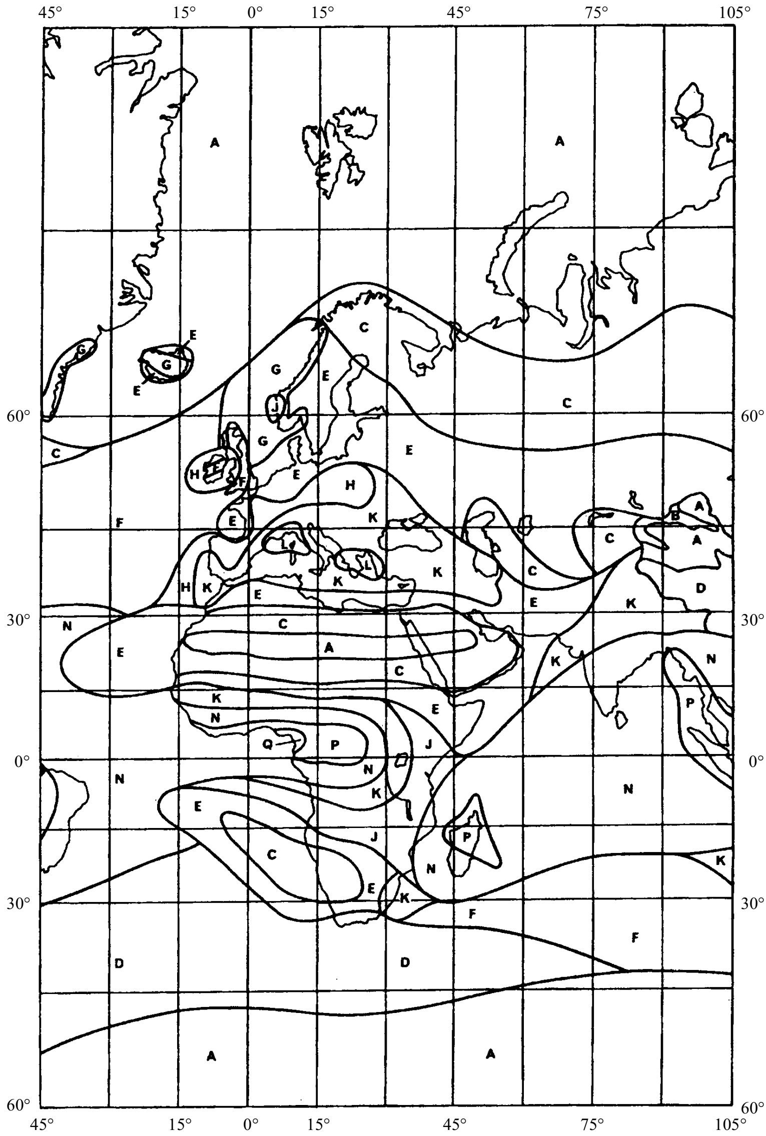

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FIGURE 2

Rain-climatic zones (Region 2)

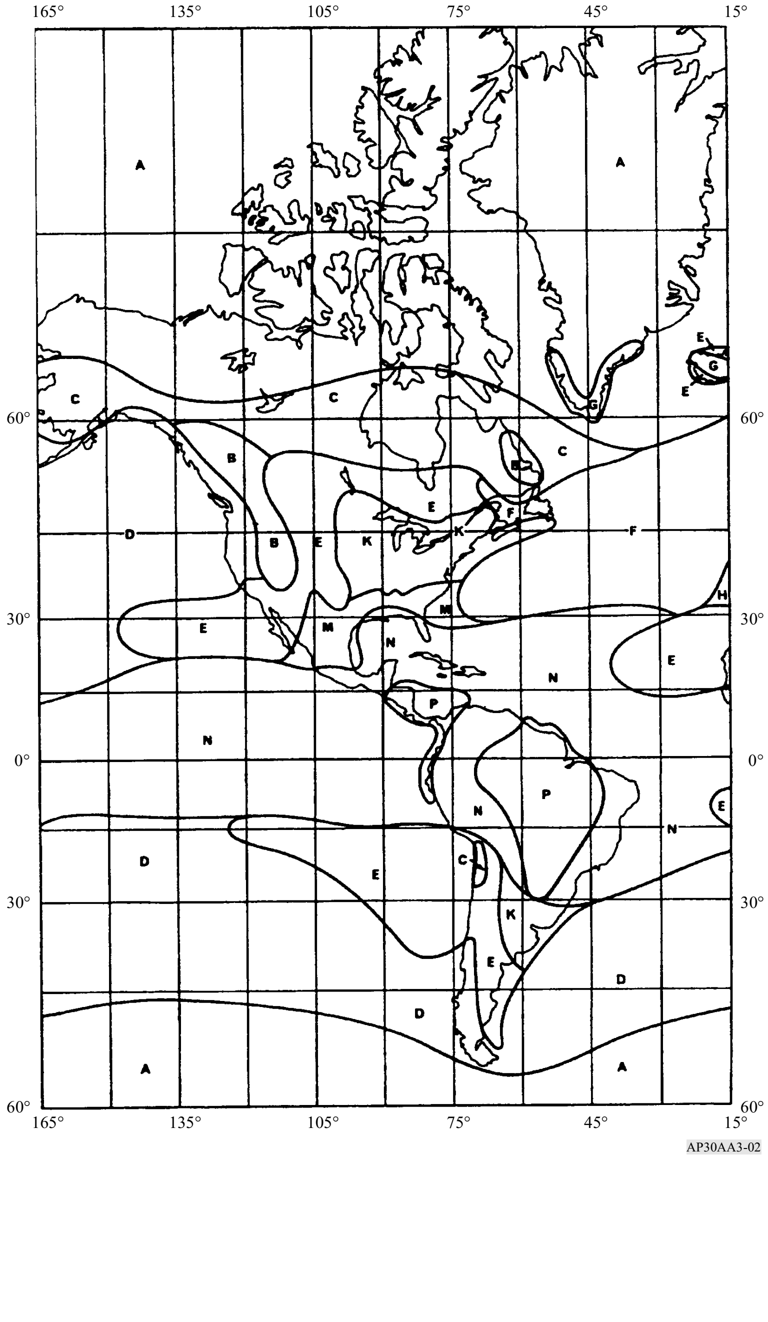

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FIGURE 3

Rain-climatic zones for Regions 1 and 3 between longitudes 60° E and 150° W

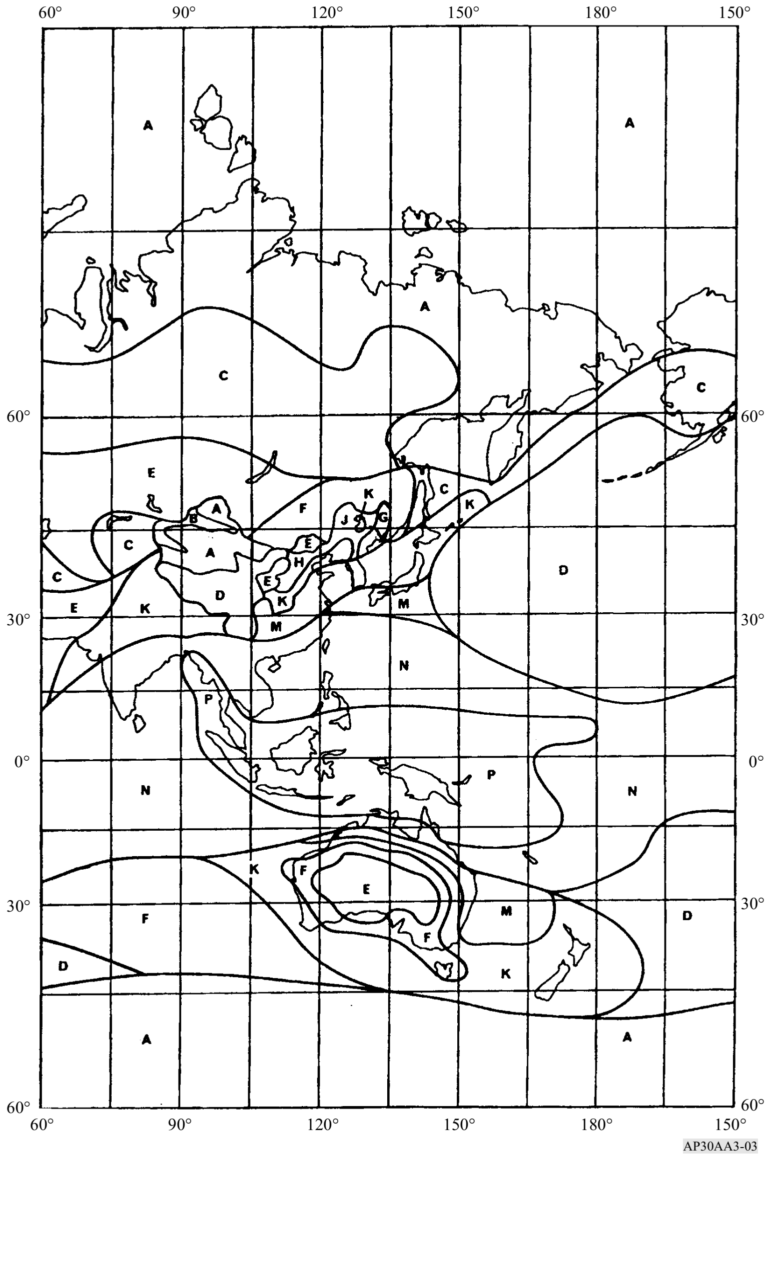
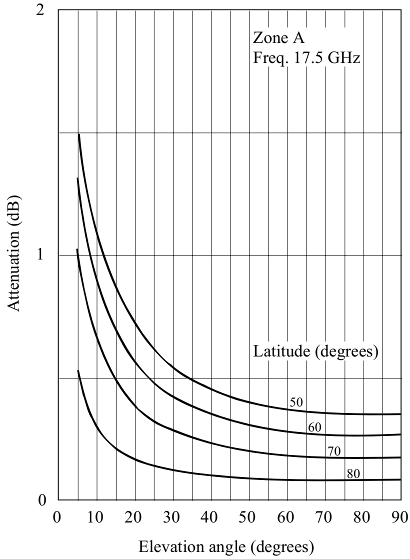
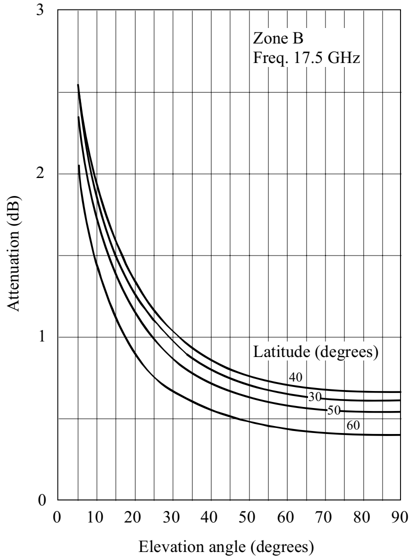


FIGURE 4

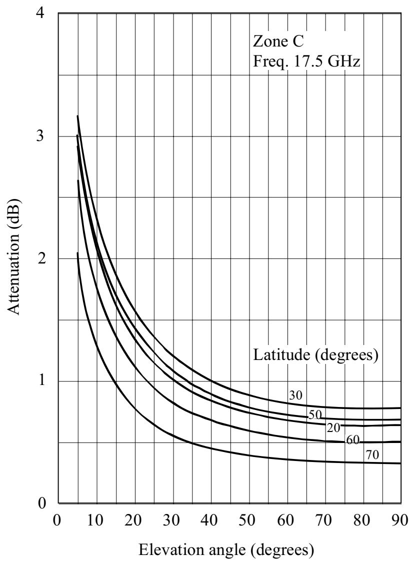
Rain attenuation values exceeded for 1% of the worst month (sea level) for Region 2 rain-climatic zones



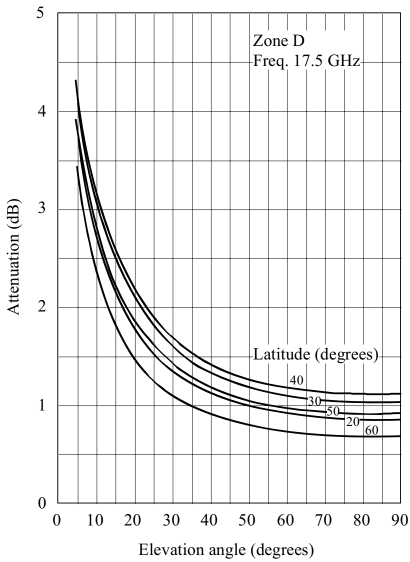
a) Rain-climatic zone A



b) Rain-climatic zone B



c) Rain-climatic zone C



d) Rain-climatic zone D

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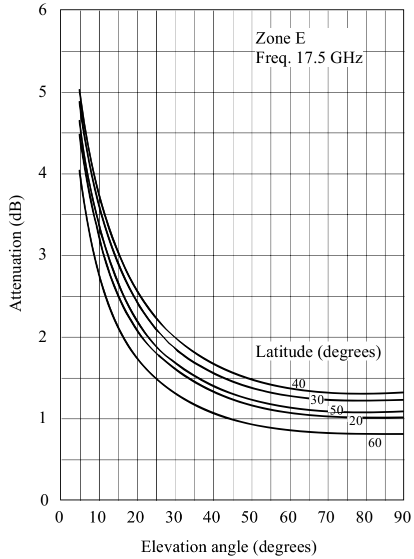
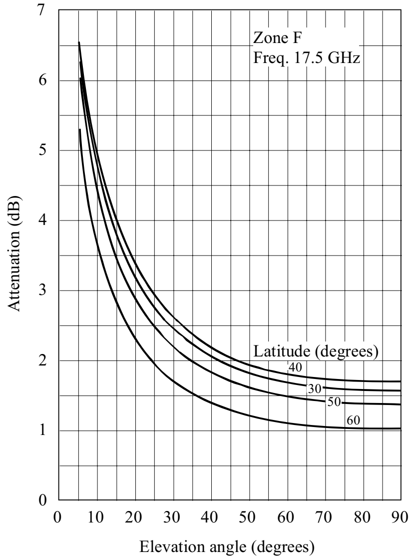
FIGURE 4 (*continued*)

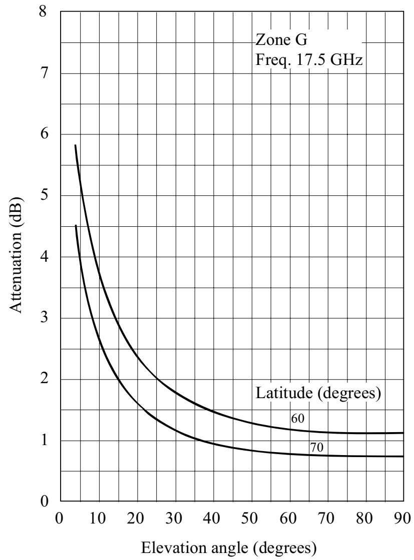
Rain attenuation values exceeded for 1% of the worst month (sea level) for Region 2 rain-climatic zones



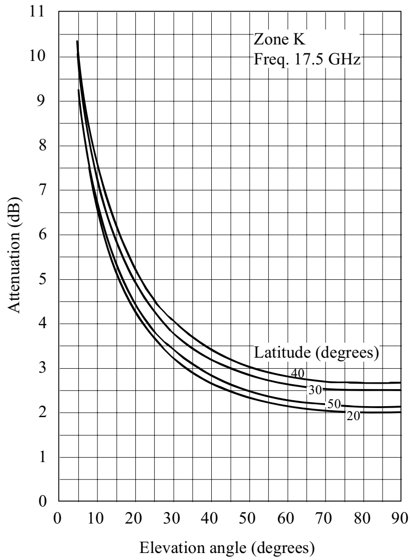
e) Rain-climatic zone E



f) Rain-climatic zone F



g) Rain-climatic zone G



h) Rain-climatic zone K

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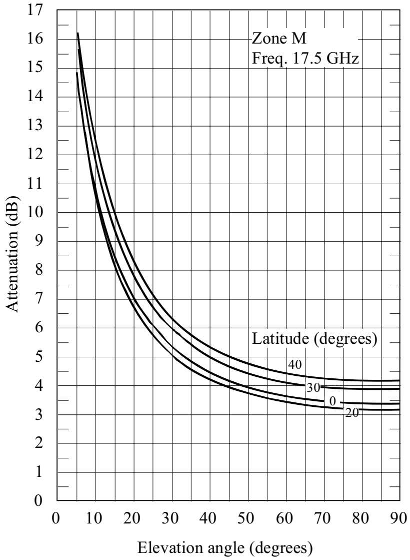
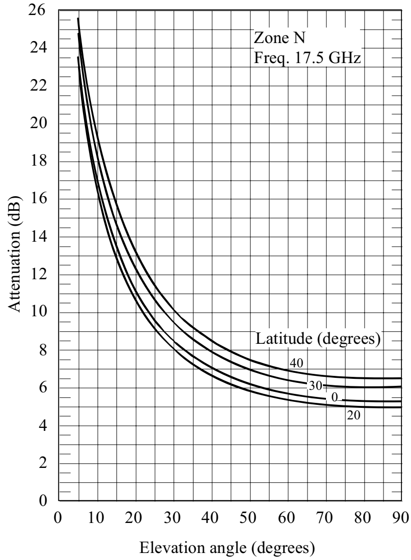
FIGURE 4 (*continued*)

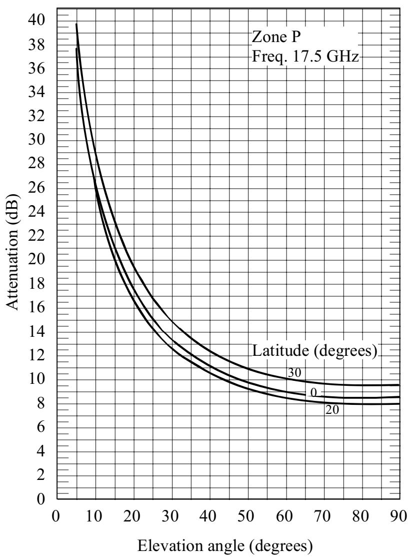
Rain attenuation values exceeded for 1% of the worst month (sea level) for Region 2 rain-climatic zones



i) Rain-climatic zone M



j) Rain-climatic zone N



k) Rain-climatic zone P

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2.5 Procedure for calculating the *C/I* ratio at a space station receiver input

In Region 2, the calculation of the feeder-link *C/I* ratio (exceeded for 99% of the worst month) at a space station receiver input used to obtain the overall equivalent protection margin at a test point assumes a rain attenuation value not exceeded for 99% of the worst month on the wanted feeder-link path. For the interfering feeder-link signal path, clear sky propagation (i.e., including atmospheric absorption only) is assumed.

In Regions 1 and 3, the calculation of the feeder-link *C/I* ratio at a space station receiver input used to obtain the feeder-link equivalent protection margin at a test point assumes free space conditions on the wanted feeder-link path and on the interfering feeder-link path.

3 Basic technical characteristics for Regions 1 and 3

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)

b) 14 GHz feeder-links

As the maximum available bandwidth for the feeder-link band 14.5-14.8 GHz is only 300 MHz divided into fourteen 27 MHz channels, against 800 MHz (40 channels) and 500 MHz (24 channels) in the downlink Plan for Regions 1 and 3, respectively, several translation frequencies must be considered to allow any channel in the Plan to be used. Consequently, a particular feeder-link channel has been assigned to several broadcasting-satellite service Plan channels simultaneously.

Generally, the translation frequencies from the feeder-link channels are:

2 797.82 MHz to downlink broadcasting-satellite service channels 1 to 14;

2 529.30 MHz to downlink broadcasting-satellite service channels 15 to 28;

2 260.78 MHz to downlink broadcasting-satellite service channels 29 to 40.

The guardband bandwidths are 11.80 MHz at the lower band edge and 11.86 MHz at the upper band edge.

c) *Frequency translation rules*

Specific rules for selecting appropriate frequency translations are given in § 6.2.1.2.2 and 6.2.1.3.3 of the 1985 Conference (WARC Orb-85) Report to the 1988 Conference (WARC Orb-88). These rules permit the derivation of simple-to-use tables that define the channel translations that were avoided in revising the Regions 1 and 3 feeder-link Plan for both the 14 GHz and 17 GHz bands (see Tables 3 and 4).

TABLE 3

14.5-14.8 GHz/11.7-12.5 GHz channel translations that should be avoided (as far as possible) according to the 1985 Conference frequency translation rules

14 GHz feeder-link channel number	Downlink channel numbers to be avoided (as far as possible)				
1	7	8	9	19	20
2	8	9	10	20	21
3	9	10	11	21	22
4	10	11	12	22	23
5	11	12	13	23	24
6	12	13	14	24	25
7	13	14	15	25	26
8	14	15	16	26	27
9	15	16	17	27	28
10	16	17	18	28	29
11	17	18	19	29	30
12	18	19	20	30	31
13	19	20	21	31	32
14	20	21	22	32	33

TABLE 4

17.3-18.1 GHz/11.7-12.5 GHz channel translations that should be avoided (as far as possible) according to the 1985 Conference frequency translation rules

17 GHz feeder-link channel number	**Downlink channel numbers to be avoided (as far as possible)**																													
1			10	11	12	13	14	15	16	17	18	19	20	21	22															
2			11	12	13	14	15	16	17	18	19	20	21	22	23															
3			12	13	14	15	16	17	18	19	20	21	22	23	24															
4			13	14	15	16	17	18	19	20	21	22	23	24	25															
5			14	15	16	17	18	19	20	21	22	23	24	25	26															
6			15	16	17	18	19	20	21	22	23	24	25	26	27															
7			16	17	18	19	20	21	22	23	24	25	26	27	28															
8			17	18	19	20	21	22	23	24	25	26	27	28	29															
9			18	19	20	21	22	23	24	25	26	27	28	29	30															
10	1			19	20	21	22	23	24	25	26	27	28	29	30	31														
11	1	2			20	21	22	23	24	25	26	27	28	29	30	31	32													
12	1	2	3			21	22	23	24	25	26	27	28	29	30	31	32	33												
13	1	2	3	4			22	23	24	25	26	27	28	29	30	31	32	33	34											
14	1	2	3	4	5			23	24	25	26	27	28	29	30	31	32	33	34	35										
15	1	2	3	4	5	6			24	25	26	27	28	29	30	31	32	33	34	35	36									
16	1	2	3	4	5	6	7			25	26	27	28	29	30	31	32	33	34	35	36	37								
17	1	2	3	4	5	6	7	8			26	27	28	29	30	31	32	33	34	35	36	37	38							
18	1	2	3	4	5	6	7	8	9			27	28	29	30	31	32	33	34	35	36	37	38	39						
19	1	2	3	4	5	6	7	8	9	10			28	29	30	31	32	33	34	35	36	37	38	39	40					
20	1	2	3	4	5	6	7	8	9	10	11			29	30	31	32	33	34	35	36	37	38	39	40					
21	1	2	3	4	5	6	7	8	9	10	11	12			30	31	32	33	34	35	36	37	38	39	40					
22	1	2	3	4	5	6	7	8	9	10	11	12	13			31	32	33	34	35	36	37	38	39	40					
23	1	2	3	4	5	6	7	8	9	10	11	12	13	14			32	33	34	35	36	37	38	39	40					
24		2	3	4	5	6	7	8	9	10	11	12	13	14	15			33	34	35	36	37	38	39	40					
25			3	4	5	6	7	8	9	10	11	12	13	14	15	16			34	35	36	37	38	39	40					
26				4	5	6	7	8	9	10	11	12	13	14	15	16	17			35	36	37	38	39	40					
27					5	6	7	8	9	10	11	12	13	14	15	16	17	18			36	37	38	39	40					
28						6	7	8	9	10	11	12	13	14	15	16	17	18	19			37	38	39	40					
29							7	8	9	10	11	12	13	14	15	16	17	18	19	20			38	39	40					
30								8	9	10	11	12	13	14	15	16	17	18	19	20	21			39	40					
31									9	10	11	12	13	14	15	16	17	18	19	20	21	22			40					
32										10	11	12	13	14	15	16	17	18	19	20	21	22	23							
33											11	12	13	14	15	16	17	18	19	20	21	22	23	24						
34												12	13	14	15	16	17	18	19	20	21	22	23	24	25					
35													13	14	15	16	17	18	19	20	21	22	23	24	25	26				
36														14	15	16	17	18	19	20	21	22	23	24	25	26	27			
37															15	16	17	18	19	20	21	22	23	24	25	26	27	28		
38																16	17	18	19	20	21	22	23	24	25	26	27	28	29	
39																	17	18	19	20	21	22	23	24	25	26	27	28	29	30
40																		18	19	20	21	22	23	24	25	26	27	28	29	30 31

3.2 Carrier-to-noise ratio

§ 3.3 of Annex 5 to Appendix **30** provides guidance for planning and the basis for the evaluation of the carrier-to-noise (*C*/*N*) ratios of the feeder-link and downlink Plans.

As guidance for planning, the reduction in quality in the downlink due to thermal noise in the feeder-link is taken as equivalent to a degradation in the downlink *C*/*N* ratio of approximately 0.5 dB not exceeded for 99% of the worst month.

For downlinks, as indicated in Appendix **30**, the 1977 Conference (WARC SAT-77) adopted a *C*/*N* value of 14.5 dB for 99% of the worst month at the edge of the service area. The required feeder-link *C*/*N* is 24 dB for 99% of the worst month, at the edge of the service area, to produce an overall *C*/*N* performance of 14 dB.

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 margins[41]:

– 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[42, 43]:

– co-channel protection ratio = 30 dB;

– adjacent channel protection ratio = 22 dB. (WRC-2000)

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[41] These protection ratio values were used 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.

[42] These protection ratio values were used 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 between 27 October 1997 and 12 May 2000. (WRC-2000)

[43] These protection ratio values were used for protection of digital and analogue assignments from analogue emissions. (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 process[44]. (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[45]). (WRC-03)

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[44] For analogue assignments, the protection ratios of WRC-97 (30 dB co-channel, 22 dB adjacent channel) were used. (WRC-2000)

[45] Annex 3 of this Recommendation may be applied only in compatibility analysis for bilateral coordination between administrations. (WRC-03)

3.4 Feeder-link e.i.r.p.

The level of e.i.r.p. of each feeder link is specified in Article 9A.

The level of e.i.r.p. specified in the Plan can only be exceeded under certain conditions explained in § 3.11 of this Annex (see also Article 5, § 5.1.1).

3.5 Transmitting antenna

3.5.1 Antenna diameter

The feeder-link Plan is based on an antenna diameter of 5 m for the band 17.3-18.1 GHz and 6 m for the band 14.5-14.8 GHz.

For all antenna diameters including antennas smaller than 5 m for the 17.3-18.1 GHz band and 6 m for the 14.5-14.8 GHz band, the off-axis e.i.r.p. shall not exceed the limits indicated by Curve A in Fig. A of § 3.5.3 of this Annex 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 and by the Curve A′ of Fig. A for other assignments.

3.5.2 On-axis gain

The on-axis gain for the 5 m antenna at 17.3-18.1 GHz and for the 6 m antenna at 14.5-14.8 GHz is taken as 57 dBi.

3.5.3 Off-axis e.i.r.p. of transmitting antennas

The co-polar and cross-polar off-axis e.i.r.p. values used for the original 1988 feeder-link Plan in Regions 1 and 3 are shown by Curves A and B respectively in Fig. A[46].

The corresponding off-axis e.i.r.p. values used for planning at WRC-97 are shown by Curves A′ and B′ in Fig. A as specified in Recommendation ITU-R BO.1295.

3.5.4 Pointing accuracy

The Plan has been developed to accommodate a loss in gain of 1 dB due to earth station antenna mispointing.

The deviation of the antenna beam from its nominal pointing direction must not exceed a limit of 0.1° in any direction. Moreover, the angular rotation of the receiving beam about its axis must not exceed a limit of ±1°; the limit on rotation is not necessary for beams of circular cross section using circular polarization.

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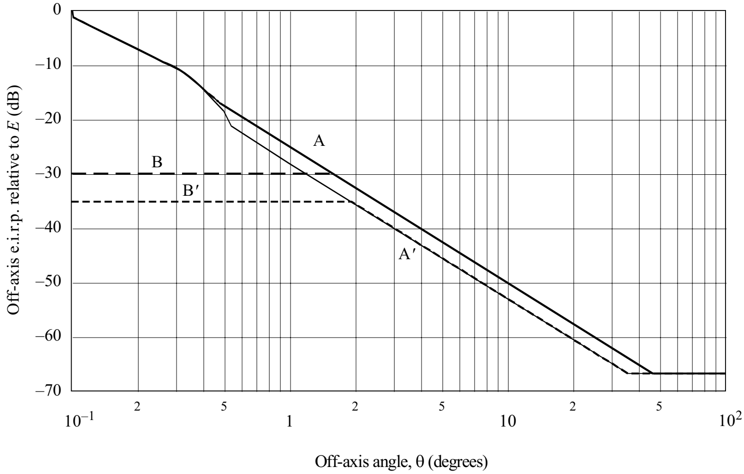
[46] This antenna pattern is used in the revision of the Regions 1 and 3 Plan for assignments notified, which are in conformity with this Appendix, brought into use, and for which the date of bringing into use has been confirmed to the Bureau before 27 October 1997.

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

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Co-polar component (dBW):

Curve A (WARC Orb-88)			*Curve A′* (WRC-97)		
E	for	$0° \leq \theta \leq 0.1°$	E	for	$0° \leq \theta \leq 0.1°$
$E - 21 - 20 \log \theta$	for	$0.1° < \theta \leq 0.32°$	$E - 21 - 20 \log \theta$	for	$0.1° < \theta \leq 0.32°$
$E - 5.7 - 53.2\ \theta^2$	for	$0.32° < \theta \leq 0.44°$	$E - 5.7 - 53.2\ \theta^2$	for	$0.32° < \theta \leq 0.54°$
$E - 25 - 25 \log \theta$	for	$0.44° < \theta \leq 48°$	$E - 28 - 25 \log \theta$	for	$0.54° < \theta \leq 36.31°$
$E - 67$	for	$48° < \theta$	$E - 67$	for	$36.31° < \theta$

Cross-polar component (dBW): (WRC-03)

Curve B (WARC Orb-88)			*Curve B′* (WRC-97)		
$E - 30$	for	$0° \leq \theta \leq 1.6°$	$E - 35$	for	$0° \leq \theta \leq 1.91°$
$E - 25 - 25 \log \theta$	for	$1.6° < \theta \leq 48°$	$E - 28 - 25 \log \theta$	for	$1.91° < \theta \leq 36.31°$
$E - 67$	for	$48° < \theta$	$E - 67$	for	$36.31° < \theta$

where:

E : earth station e.i.r.p. on the antenna axis (dBW);

θ : off-axis angle referred to the main lobe axis (degrees).

3.6 Transmitter power

The maximum transmitter power delivered to the input of the antenna of the feeder-link earth station per 27 MHz television channel shall be such as to ensure that the e.i.r.p. envelope in § 3.5.3 is not exceeded except under certain conditions specified in § 3.11.

3.7 Satellite receiving antenna

3.7.1 Cross-section of receiving antenna beam

Planning has generally been based on beams of elliptical or circular cross-section. When the assignments are implemented, or when the Plan is modified, administrations may use non-elliptical (shaped) beams as described in Annex 2.

For planning purposes at WRC-97, an antenna diameter of 5 m for the band 17.3-18.1 GHz and 6 m for the band 14.5-14.8 GHz were assumed.

The on-axis gain for the 5 m antenna at 17.3-18.1 GHz and for the 6 m antenna at 14.5-14.8 GHz is taken as 57 dBi.

If the cross-section of the receiving antenna beam is elliptical, the effective beamwidth φ_0 is a function of the angle of rotation q between the plane containing the satellite and the major axis of the beam cross-section and the plane in which the beamwidth is required.

The relationship between the maximum gain of an antenna and the half-power beamwidth can be derived from the expression:

$$G_m = 27\,843/ab$$

where:

a and b are the angles (degrees) subtended at the satellite by the major and minor axes of the elliptical cross-section of the beam. An antenna efficiency of 55% is assumed.

3.7.2 Minimum beamwidth

A minimum value of 0.6° for the half-power beamwidth of the receiving antenna has been used for planning.

3.7.3 Reference patterns

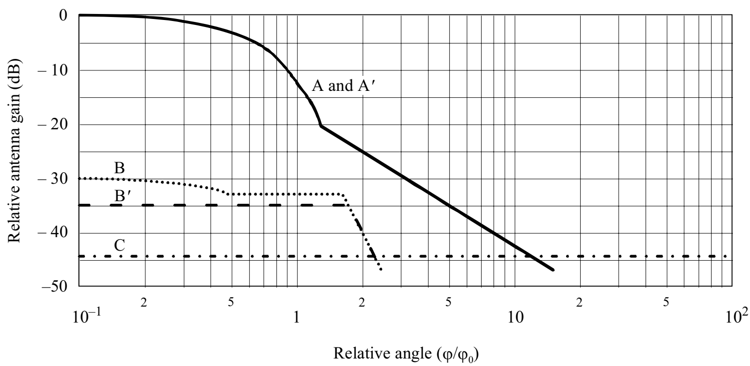
The reference patterns for the co-polar and cross-polar components of the satellite receiving antenna used for planning at the 1988 Conference (WARC Orb-88) are given by Curves A and B respectively in Fig. B[47].

[47] See footnote 46.

The corresponding curves used for replanning at WRC-97 are given by Curves A′ and B′ in Fig. B, as specified in Recommendation ITU-R BO.1296.

FIGURE B

Receiving space station circularly polarized antenna co-polar and cross-polar reference patterns for elliptical beams for planning in Regions 1 and 3



Curves A and A′: WARC Orb-88 and WRC-97 co-polar
B: WARC Orb-88 cross-polar
B′: WRC-97 cross-polar
C: Curve C (minus the on-axis gain)

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Co-polar relative gain (dB):

Curve A (WARC Orb-88) and *Curve A′* (WRC-97):

$G = -12\ (\varphi/\varphi_0)^2$ for $0 \leq \varphi/\varphi_0 < 1.3$

$G = -17.5 - 25 \log (\varphi/\varphi_0)$ for $1.3 \leq \varphi/\varphi_0$

After intersection with Curve C, as Curve C

Cross-polar relative gain (dB):

Curve B (WARC Orb-88)

$G = -30 - 12\ (\varphi/\varphi_0)^2$ for $0 \leq \varphi/\varphi_0 \leq 0.5$

$G = -33$ for $0.5 < \varphi/\varphi_0 \leq 1.67$

$$G = -40 - 40 \log \left(\frac{\varphi}{\varphi_0} - 1 \right) \quad \text{for} \quad 1.67 \leq \varphi/\varphi_0$$

After intersection with Curve C, as Curve C

Curve B′ (WRC-97)

$G = -35$ for $0 \leq \varphi/\varphi_0 < 1.75$

$$G = -40 - 40 \log \left(\frac{\varphi}{\varphi_0} - 1 \right) \quad \text{for} \quad 1.75 \leq \varphi/\varphi_0$$

After intersection with Curve C, as Curve C

Curve C: minus the on-axis gain (Curve C in the above Figure illustrates the particular case of an antenna with an on-axis gain of 44.44 dBi)

where:

φ: off-axis angle (degrees)

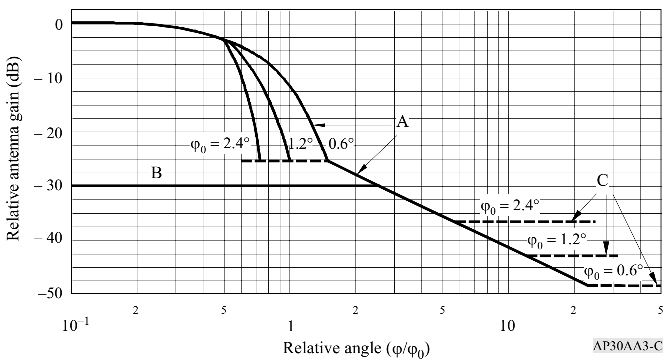
φ_0: cross-sectional half-power beamwidth in the direction of interest (degrees).

The relationship between the maximum gain of an antenna and the half-power beamwidth can be derived from the expression in § 3.7.1.

In some cases, to reduce co-polar interference, the pattern shown in Fig. C is used; this use is indicated in the Plan by note 1. This pattern is derived from an antenna producing an elliptical beam with fast roll-off in the main lobe assuming a "beamlet" beamwidth of 0.6°. Three curves for different values of φ_0 are shown as examples.

FIGURE C

Reference patterns for co-polar and cross-polar components for satellite receiving antennas with fast roll-off in the main beam for Regions 1 and 3



Curve A: co-polar component (dB relative to main beam gain)

$-12\ (\varphi/\varphi_0)^2$	for	$0 \leq \varphi/\varphi_0 \leq 0.5$
$-33.33\ \varphi_0^2 \left(\dfrac{\varphi}{\varphi_0} - x\right)^2$	for	$0.5 < \varphi/\varphi_0 \leq \dfrac{0.87}{\varphi_0} + x$
-25.23	for	$\dfrac{0.87}{\varphi_0} + x < \varphi/\varphi_0 \leq 1.45$
$-(22 + 20 \log (\varphi/\varphi_0))$	for	$\varphi/\varphi_0 > 1.45$

after intersection with Curve C, as Curve C.

Curve B: cross-polar component (dB relative to main beam gain)

-30	for	$0 \leq \varphi/\varphi_0 < 2.51$

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. C. 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);

$$x = 0.5 \left(1 - \frac{0.6}{\varphi_0}\right)$$

3.7.4 Pointing accuracy

The deviation of the receiving antenna beam from its nominal pointing direction must not exceed 0.1° in any direction. Moreover, the angular rotation of the receiving beam about its axis must not exceed ±1°; this limit is not necessary for beams of circular cross-section using circular polarization.

3.7.5 Composite beam (WRC-2000)

A composite beam represents a single beam (i.e. "simulated shaped beam") and is formed by combining two or more elliptical beams at a given orbital position. In general, composite beams were used at WRC-2000 for administrations which had more than one beam at a given orbital position in the WRC-97 Regions 1 and 3 feeder-link Plan. (WRC-2000)

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 GHz[48]. 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)

3.9 Polarization

In Regions 1 and 3, circular polarization was normally used for the purpose of planning the feeder-links.

For the definitions of the terms "direct and indirect polarization", see § 3.2.3 of Annex 5 to Appendix **30**.

For the planning of the broadcasting-satellite service, circular polarization is generally used. However, for implementation of assignments in the Regions 1 and 3 Plan, linear polarization may also be used subject to successful application of the modification procedure of Article 4. Linear polarization is defined in Recommendation ITU-R BO.1212. This Recommendation should be used when analysing linearly polarized signals.

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[48] These system temperature values are still used 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.

3.10 Automatic gain control

The downlink Plan was based on constant satellite output power. However, the feeder-link Plan does not take account of the effect of automatic gain control on board satellites. Up to 15 dB of automatic gain control is permitted, subject to no increase in interference to other satellite systems.

3.11 Power control

In Regions 1 and 3, a permitted increase which may be used to overcome rain fading for each assignment is included in the Plan.

In the calculation, in cases where satellites do not use common or adjacent channels cross-polarized to each other, the maximum permissible e.i.r.p. increase, which must not exceed 10 dB, corresponds to the amount of rain attenuation which occurs on the interfering feeder link.

3.11.1 Method for determination of the increase in e.i.r.p. during rain attenuation for an assignment over the Plan value

Condition to be observed

The increase in e.i.r.p. of the assignment studied must not entail an impairment of more than 0.5 dB of the feeder-link equivalent protection margin of any other assignment of any other administration.

Calculation method

Step 1: compile a list of all assignments of other administrations (A, B, C, . . .) in the same orbital position and positions within ± 6° (or further if no station is found within 6° arc) liable to suffer interference from the assignment studied.

Step 2: calculate the feeder-link equivalent protection margin of assignment A in free-space conditions, taking account of all interference sources affecting A at the worst test points, namely:

– for assignment A: the point corresponding to the minimum C/N ratio;

– for each interference source affecting A: the point corresponding to the maximum interference power affecting A.

Step 3: introduce for the assignment studied the rain attenuation for 0.1% of the worst month and the corresponding rain depolarization value.

Step 4: recalculate the feeder-link equivalent protection margin of assignment A at the worst test points, namely:

– for assignment A: the test point used in Step 2 above;

– for the assignment studied: the test point corresponding to the maximum interference power affecting A.

At this stage, the e.i.r.p. of the assignment studied is that contained in the Plan.

Step 5: increase the e.i.r.p. of the assignment studied by 0.1 dB and recalculate the equivalent uplink margin of A as in Step 4 above.

Step 6: repeat the operation of Step 5 above until the equivalent uplink margin of assignment A is impaired by more than 0.5 dB in relation to the value found under Step 2 above, or until the e.i.r.p. increase exceeds 10 dB or the rain attenuation (see Step 3). Adopt the e.i.r.p. increase in the preceding iteration step.

Step 7: repeat the operations in Step 2 to Step 6 above, considering the assignments B, C, . . .

Step 8: adopt the smallest of the increases in e.i.r.p. found under Step 6 above for the various assignments A, B, C, . . .

3.11.2 Propagation model

For the calculation of rain attenuation for 0.1% of the worst month, the model described in § 2.2 should be used. It shall be assumed that the 0.1% value is 3.3 times the 1% value (dB).

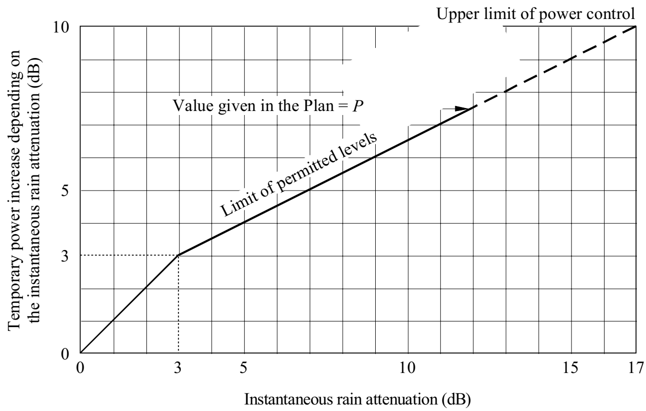
Rain depolarization shall be calculated on the basis of attenuation, using the method described in § 2.4.

3.11.3 Variation of power with rain attenuation

The instantaneous increase in power to overcome rain attenuation must not exceed the bounds given by the characteristics shown in Fig. 5.

FIGURE 5

Characteristic for up-link power control



P: value of permitted increase given in the Plan, or calculated by the BR, which varies for each assignment. The upper limit of this value is 10 dB.

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3.11.4 Procedures

An administration wishing to introduce power control may use a value not exceeding that given in Article 9A or it may request, where this is possible, the use of a higher value for a given earth station location. In this latter case, it shall request the Bureau to calculate the maximum permissible value for that site. The administration shall provide the Bureau with the coordinates of the station, the proposed antenna characteristics, including the off-axis co-polar and cross-polar characteristics, and the rain climatic zone.

The Bureau shall calculate the permissible increase in power using the method described in § 3.11.1.

The Bureau shall communicate the results of the calculations to the requesting administrations as well as to those administrations whose feeder-link equivalent protection margin is reduced.

In any case, the permitted increase in e.i.r.p. above that given in the Plan shall not exceed 10 dB.

In the event of modifications to the Plan, the Bureau shall recalculate the value of power control for the assignment subject to the modification and insert the appropriate value for that assignment in the Plan. A modification to the Plan shall not require the adjustment of the values of permissible power increase of other assignments in the Plan.

3.12 (SUP - WRC-97)

3.13 Depolarization compensation

The Plan is developed without the use of depolarization compensation. Depolarization compensation is permitted only to the extent that interference to other satellites does not increase by more than 0.5 dB[49] relative to that calculated in the feeder-link Plan.

3.14 Amplitude-modulation to phase-modulation conversion

The degradation caused by AM to PM conversion was taken into account when calculating the carrier-to-noise ratio of the feeder link. A value of 2.0 dB was allowed.

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)

3.16 Satellite station-keeping

Space stations in the broadcasting-satellite service must be maintained in position with an accuracy equal to or better than ±0.1° in the E-W direction. For such space stations, the maintenance of the tolerance ±0.1° in the N-S direction is recommended but is not a requirement.

3.17 Orbital separation limit for interference calculation (WRC-2000)

WRC-2000 has adopted the use of an orbital separation limit for interference calculation in Regions 1 and 3. Beyond this limit no interference was taken into account. (WRC-2000)

Initially, the values used for the orbital separation limit were 15° for co-polar and 9° for cross-polar emissions. At a later stage, the unique value of the orbital separation limit of 9° was adopted by WRC-2000. (WRC-2000)

[49] This margin has to be shared between power control effects and depolarization compensation effects when both are involved (see § 3.11).

4 Basic technical characteristics for Region 2

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)

4.2 Carrier-to-noise ratio

Section 3.3 of Annex 5 to Appendix **30** provides guidance for planning and the basis for the evaluation of the carrier-to-noise ratios of the feeder-link and downlink Plans.

As a guidance for planning, the reduction in quality in the downlink due to thermal noise in the feeder link is taken as equivalent to a degradation in the downlink carrier-to-noise ratio of approximately 0.5 dB not exceeded for 99% of the worst month.

4.3 Carrier-to-noise ratio

Section 3.4 of Annex 5 to Appendix **30** provides guidance for planning for the contribution of the feeder-link co-channel interference to the overall co-channel carrier-to-interference ratio. However, the feeder-link and downlink Plans are evaluated on the overall equivalent protection margin which includes the combined downlink and feeder-link contributions. Definitions given in § 1.7, 1.8, 1.9, 1.10 and 1.11 of this Annex and the protection ratios given in Section 3.4 of Annex 5 to Appendix **30** are used in the analysis of the Plans.

For the adjacent channels, the Plan is based on an orbital separation of 0.4° between nominally co-located satellites having cross-polarized adjacent channel assignments.

For the second adjacent channels, the Plan is based on a 10 dB improvement on the feeder-link carrier-to-interference ratio due to the satellite receive filtering.

4.4 Transmitting antenna

4.4.1 Antenna diameter

The feeder-link Plan is based on an antenna diameter of 5 m.

The minimum antenna diameter permitted in the Plan is 2.5 m. However, the feeder-link carrier-to-noise ratio and carrier-to-interference ratio resulting from the use of antennas with diameters smaller than 5 m would generally be less than those calculated in the Plan.

The use of antennas larger than 5 m, with corresponding values of on-axis e.i.r.p. higher than the planned value (indicated in § 4.4.3) but without augmented off-axis e.i.r.p., is permitted if the orbital separation between the assigned orbital location of the administration and the assigned orbital location of any other administration is greater than 0.5°.

Antennas with diameters larger than 5 m can also be implemented if the above orbital separation is less than 0.5° and if the e.i.r.p. of the desired feeder-link earth station does not exceed the planned value of e.i.r.p.

If the above orbital separation is less than 0.5° and if the e.i.r.p. of the desired feeder-link earth station exceeds the planned value, agreement between administrations is required.

4.4.2 Transmitting antenna reference patterns (WRC-03)

The co-polar and cross-polar reference patterns of transmitting antennas used for planning in Region 2 are given in Fig. 6.

4.4.3 Antenna efficiency

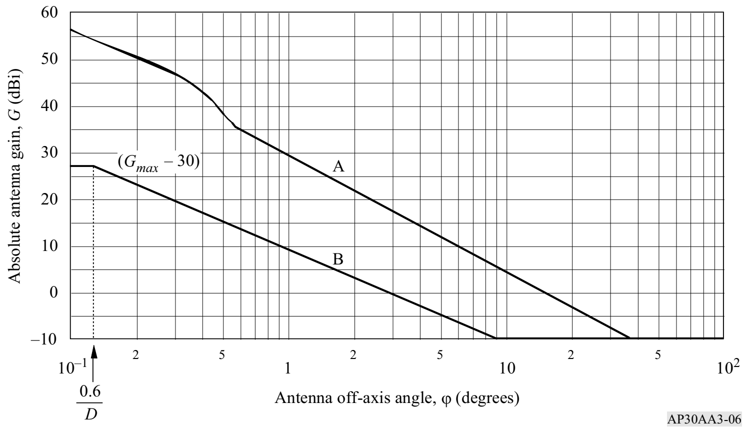
The Plan is based on an antenna efficiency of 65%. The corresponding on-axis gain for an antenna having a 5 m diameter is 57.4 dBi at 17.55 GHz, and the corresponding value of e.i.r.p. used for planning purposes is 87.4 dBW.

4.4.4 Pointing accuracy

The Plan has been developed to accommodate a loss in gain due to earth station antenna mis-pointing of 1 dB. Under no circumstances shall the Plan allow for a mis-pointing angle greater than 0.1°.

FIGURE 6

Reference patterns for co-polar and cross-polar components for transmitting antennas for Region 2



Curve A: co-polar component (dBi)

$G_{co} = G_{max}$ for $0° \leq \varphi < 0.1°$

$G_{co} = 36 - 20 \log \varphi$ for $0.1° \leq \varphi < 0.32°$

$G_{co} = 51.3 - 53.2\ \varphi^2$ for $0.32° \leq \varphi < 0.54°$

$G_{co} = \max\ (29 - 25 \log \varphi, -10)$ for $0.54° \leq \varphi \leq 180°$

If $G_{co} > G_{max}$: $G_{co} = G_{max}$ (WRC-03)

Curve B: cross-polar component (dBi)

$G_{cross} = G_{max} - 30$ for $0° \leq \varphi < (0.6/D)°$

$G_{cross} = \max\ (9 - 20 \log \varphi, -10)$ for $(0.6/D)° \leq \varphi \leq 180°$

If $G_{cross} > G_{max} - 30$: $G_{cross} = G_{max} - 30$ (WRC-03)

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*)°, 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*)° to 1°.

4.5 Transmit power

The maximum transmit power delivered to the input of the antenna of the feeder-link earth station is 1 000 W per 24 MHz television channel. This level of power can only be exceeded under certain conditions specified in § 4.10.

4.6 Receiving antenna

4.6.1 Cross-section of receiving antenna beam

Planning has been based on beams of elliptical or circular cross-section. When the assignments are implemented, or when the Plan is modified, administrations may use non-elliptical or shaped beams.

If the cross-section of the receiving antenna beam is elliptical, the effective beamwidth φ_0 is a function of the angle of rotation q between the plane containing the satellite and the major axis of the beam cross-section and the plane in which the beamwidth is required.

The relationship between the maximum gain of an antenna and the half-power beamwidth can be derived from the expression:

$$G_m = 27\,843/ab$$

or

$$G_m \text{ (dB)} = 44.44 - 10 \log a - 10 \log b$$

where:

a and b are the angles (degrees) subtended at the satellite by the major and minor axes of the elliptical cross-section of the beam.

An antenna efficiency of 55% is assumed.

4.6.2 Minimum beamwidth

A minimum value of 0.6° for the half-power beamwidth of the receiving antenna has been agreed on for planning.

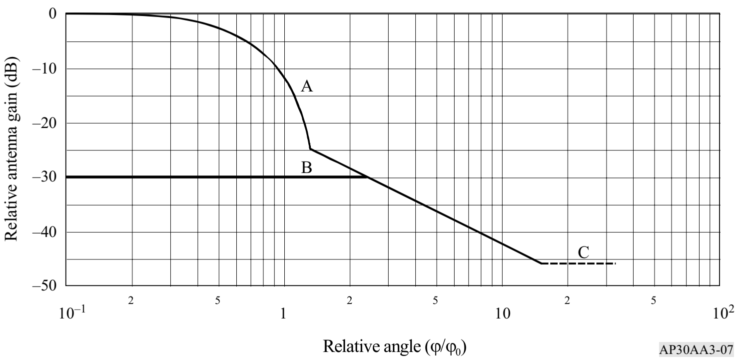
4.6.3 Receiving antenna reference patterns (WRC-03)

The reference patterns for the co-polar and cross-polar components of the satellite receiving antenna used in preparing the Plan are given in Fig. 7.

Where it was necessary to reduce interference, the pattern shown in Fig. 8 was used; this use will be indicated in the Plan by an appropriate symbol. This pattern is derived from an antenna producing an elliptical beam with fast roll-off in the main lobe. Three curves for different values of φ_0 are shown as examples.

FIGURE 7

Reference patterns for co-polar and cross-polar components for satellite receiving antenna in Region 2



Curve A: co-polar component (dB relative to main beam gain)

$-12\ (\varphi/\varphi_0)^2$	for	$0 \leq (\varphi/\varphi_0) \leq 1.45$
$-(22 + 20 \log (\varphi/\varphi_0))$	for	$(\varphi/\varphi_0) > 1.45$

after intersection with Curve C, as Curve C.

Curve B: cross-polar component (dB relative to main beam gain)

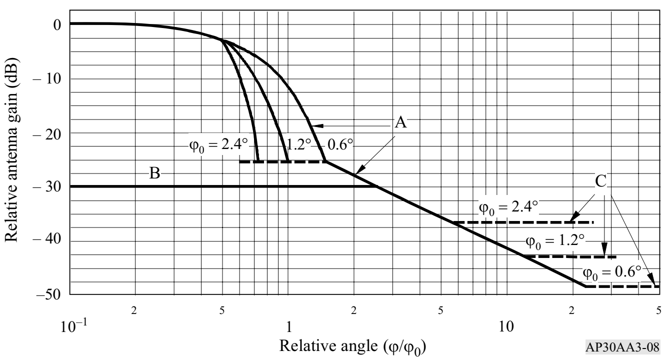
-30	for	$0 \leq (\varphi/\varphi_0) \leq 2.51$

after intersection with Curve A, as Curve A.

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 46 dBi)

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



Curve A: co-polar component (dB relative to main beam gain)

$-12\,(\varphi/\varphi_0)^2$	for	$0 \leq \varphi/\varphi_0 \leq 0.5$
$-33.33\,\varphi_0^2\,(\varphi/\varphi_0 - x)^2$	for	$0.5 < \varphi/\varphi_0 \leq \dfrac{0.87}{\varphi_0} + x$
-25.23	for	$\dfrac{0.87}{\varphi_0} + x < \varphi/\varphi_0 \leq 1.45$
$-(22 + 20\log(\varphi/\varphi_0))$	for	$\varphi/\varphi_0 > 1.45$

after intersection with Curve C, as Curve C. (WRC-03)

Curve B: cross-polar component (dB relative to main beam gain)

-30	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)

$$x = 0.5\left(1 - \frac{0.6}{\varphi_0}\right)$$

4.6.4 Pointing accuracy

The deviation of the receiving antenna beam from its nominal pointing direction must not exceed 0.1° in any direction. Moreover, the angular rotation of the receiving beam about its axis must not exceed ±1°; this latter limit is not necessary for beams of circular cross-section using circular polarization.

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, a value of 600 K (instead of 1 500 K) is used in application of § 5 of Annex 1 and § 1 of Annex 4. For those assignments which have been subsequently modified, the noise temperature value provided in that modification is used. (WRC-03)

4.8 Polarization

4.8.1 In Region 2, for the purpose of planning the feeder links, circular polarization is used.

4.8.2 In the cases where there are polarization constraints, use of polarization other than circular is permitted only upon agreement of administrations that may be affected.

4.9 Automatic gain control

4.9.1 The Plan is based on the use of automatic gain control on board satellites to maintain a constant signal level at the satellite transponder output.

4.9.2 The dynamic range of automatic gain control is limited to 15 dB when satellites are located within 0.4° of each other and operate on cross-polarized adjacent channels serving common or adjacent feeder-link service areas.

4.9.3 The 15 dB limit of automatic gain control does not apply to satellites other than those specified in § 4.9.2 above.

4.10 Power control

The Plan has been developed without the use of power control.

The use of transmit power levels higher than those given in § 4.5 is permitted only when rain attenuation exceeds 5 dB at 17 GHz. In such cases, the transmit power may be increased by the amount that the instantaneous rain attenuation exceeds 5 dB at 17 GHz up to the limit given in Table 5.

TABLE 5

Transmit radio frequency power (delivered to the input of the feeder-link earth station antenna) permitted in excess of 1 000 W as a function of elevation angle

Elevation angle of feeder-link earth station antenna (degrees)	Transmit power permitted in excess of 1 000 W (dB)
0 to 40	0
40 to 50	2
50 to 60	3
60 to 90	5

4.11 Site diversity

Site diversity refers to the alternate use during rain of two or more transmitting earth stations which may be separated by sufficient distance to ensure uncorrelated rainfall conditions.

The use of site diversity is permitted and is considered to be an effective technique for maintaining high carrier-to-noise ratio and carrier-to-interference ratio during periods of moderate to severe rain attenuation. However, the Plan is not based on the use of site diversity.

4.12 Depolarization compensation

The Plan is developed without the use of depolarization compensation. Depolarization compensation is permitted only to the extent that interference to other satellites does not increase by more than 0.5 dB relative to that calculated in the feeder-link Plan.

4.13 Minimum separation between satellites

Figure 9 illustrates two adjacent clusters of satellites separated by 0.9° between the centres of the clusters. Aη identifies a satellite of administration η. A cluster is formed by two or more satellites separated by 0.4° and located at two nominal orbital positions as specified in the Plan; one position for right-hand polarized channels and the other position for left-hand polarized channels.

4.13.1 Satellites of the same cluster

The Plan is based on an orbital separation of 0.4° between satellites having cross-polarized adjacent channels (i.e. satellites located at +0.2° and −0.2° from the centre of the cluster). However, satellites within a cluster may be located at any orbital position within the cluster, requiring only the agreement of the other administrations having satellites sharing the same cluster. Such orbital positioning of satellites within a cluster is illustrated in Fig. 9 by some of the satellites A5, A6 and A7.

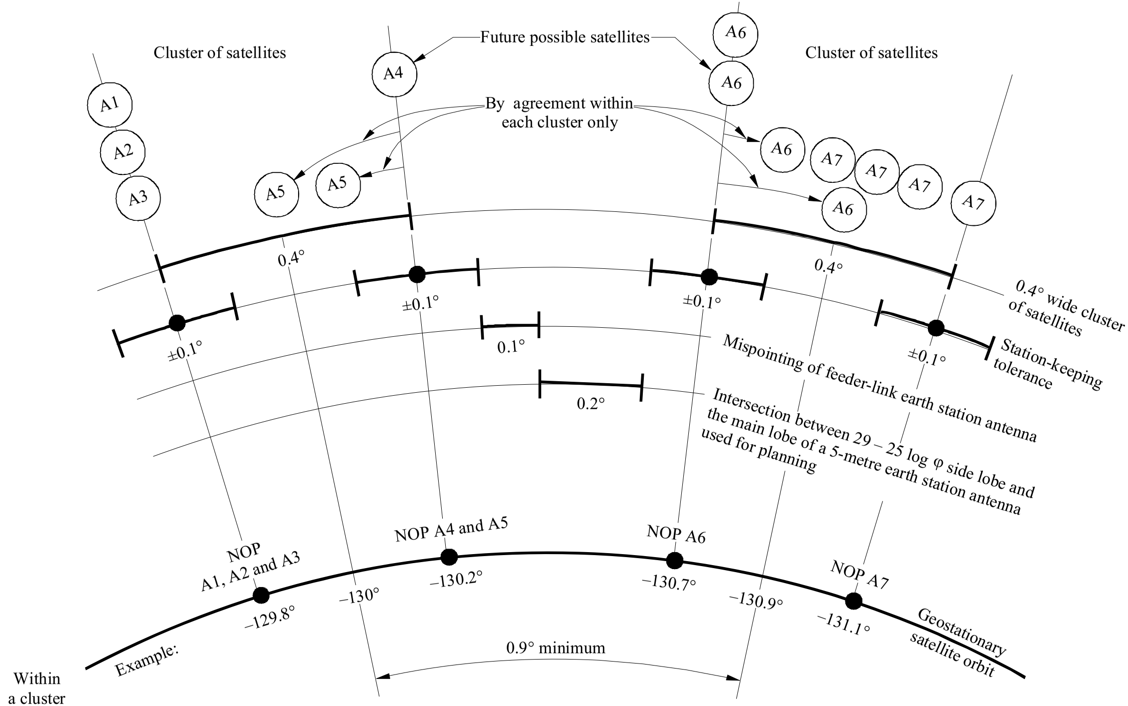
The station-keeping tolerance of ±0.1° indicated in § 3.11 of Annex 5 to Appendix **30** must be applied to satellites located at any position within the 0.4° wide cluster.

4.13.2 Satellites of different clusters

In the Plan, the orbital separation between the centres of adjacent clusters of satellites is at least 0.9°. The value of 0.9° is also the minimum orbital separation to provide flexibility in the implementation of feeder links indicated in § 4.4.1 without the need for an agreement (see § 4.13.1).

FIGURE 9

Exploded view of geostationary satellite orbit



Aη: specific Administration
NOP 1: nominal orbital position, right-hand polarization
NOP 2: nominal orbital position, left-hand polarization

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ANNEX 4 (REV.WRC-15)

Criteria for sharing between services

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)

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)

3 Threshold values for determining when coordination is required between transmitting earth stations in the fixed-satellite service in the frequency band 14.5-14.75 GHz (in countries listed in Resolution 163 (WRC-15)) and 14.5-14.8 GHz (in countries listed in Resolution 164 (WRC-15)) not for feeder links for the broadcasting-satellite service and a receiving space station subject to a Plan in the frequency band 14.5-14.8 GHz (WRC-15)

With respect to § 7.1, Article 7, coordination of a transmitting 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 exceeds the value of:

-197.0 – GRx dB(W/($m^2 \cdot$ Hz)) with regard to the assignment in the Regions 1 and 3 feeder-link Plan or

-193.9 – GRx dB(W/($m^2 \cdot$ Hz)), with regard to the 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,

where GRx is the relative receive antenna gain of the space station subject to a Plan at the location of the transmitting earth station in the fixed-satellite service not for feeder links for the broadcasting-satellite service. (WRC-15)