Z A K O N

O POTVRĐIVANJU ZAVRŠNIH AKATA REGIONALNE KONFERENCIJE O RADIO-KOMUNIKACIJAMA ZA PLANIRANJE DIGITALNE TERESTRIJALNE RADIODIFUZNE SLUŽBE U DELOVIMA REGIONA 1 I 3, U FREKVENCIJSKIM OPSEZIMA 174-230 MHz I 470-862 MHz

(RRC-06)

Član 1.

Potvrđuju se Završna akta Regionalne konferencije o radio-komunikacijama za planiranje digitalne terestrijalne radiodifuzne službe u delovima Regiona 1 i 3, u frekcvencijskim opsezima 174-230 MHz i 470-862 MHz (RRC-06), koja su sačinjena 16. juna 2006. godine u Ženevi, Švajcarska, u originalu na engleskom jeziku.

Član 2.

Tekst Završnih akata Regionalne konferencije o radio-komunikacijama za planiranje digitalne terestrijalne radiodifuzne službe u delovima Regiona 1 i 3, u frekvencijskim opsezima 174-230 MHz i 470-862 MHz (RRC-06) u originalu na engleskom jeziku i u prevodu na srpski jezik, koji se sastoji od Regionalnog sporazuma, glasi:

Preamble

The First Session of the Regional Radiocommunication Conference for planning of the digital terrestrial broadcasting service in parts of Regions 1 and 3, in the frequency bands 174-230 MHz and 470-862 MHz (Geneva, 10-28 May 2004) adopted Resolution COM5/2 (RRC-04), by which it recommended to the Council to modify Resolution 1185 (modified, 2003) with a view to convening the second session of RRC.

At its 2004 session, the Council resolved, by its Resolution 1224, that the Second Session of the RRC be convened in Geneva from 15 May to 16 June 2006, and established its agenda. The agenda, dates and place of the Conference were approved by the required majority of the Member States of the International Telecommunication Union from the Planning Area.

The RRC-06 met in Geneva for the stipulated period and worked on the basis of the agenda approved by the Council. It adopted the *Regional Agreement relating to the planning of the digital terrestrial broadcasting service in Region 1 (parts of Region 1 situated to the west of meridian 170° E and to the north of parallel 40° S, except the territory of Mongolia) and in the Islamic Republic of Iran, in the frequency bands 174-230 MHz and 470-862 MHz (Geneva, 2006)*, as well as associated Resolutions as contained in these Final Acts.

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

REGIONAL AGREEMENT[*]

Relating to the planning of the digital terrestrial broadcasting service in Region 1 (parts of Region 1 situated to the west of meridian 170° E and to the north of parallel 40° S, except the territory of Mongolia) and in the Islamic Republic of Iran, in the frequency bands 174-230 MHz and 470-862 MHz

(Geneva, 2006)

PREAMBLE

The undersigned delegates of the following Member States of the International Telecommunication Union:

Republic of Albania, People's Democratic Republic of Algeria, Federal Republic of Germany, Principality of Andorra, Republic of Angola, Kingdom of Saudi Arabia, Republic of Armenia, Austria, Azerbaijani Republic, Kingdom of Bahrain, Republic of Belarus, Belgium, Bosnia and Herzegovina, Republic of Botswana, Republic of Bulgaria, Burkina Faso, Republic of Burundi, Republic of Cameroon, Republic of Cape Verde, Republic of Cyprus, Vatican City State, Republic of the Congo, Republic of Côte d'Ivoire, Republic of Croatia, Denmark, Republic of Djibouti, Arab Republic of Egypt, United Arab Emirates, Spain, Republic of Estonia, Federation of Russia, Finland, France, Gabonese Republic, Republic of Gambia, Georgia, Ghana, Greece, Republic of Guinea, Republic of Hungary, Islamic Republic of Iran, Republic of Iraq, Ireland, State of Israel, Italy, Hashemite Kingdom of Jordan, Republic of Kazakhstan, Republic of Kenya, State of Kuwait, Kingdom of Lesotho, Republic of Latvia, Former Yugoslav Republic of Macedonia, Lebanon, Principality of Liechtenstein, Republic of Lithuania, Luxembourg, Malawi, Republic of Mali, Malta, Kingdom of Morocco, Islamic Republic of Mauritania, Republic of Moldova, Principality of Monaco, Republic of Mozambique, Republic of Namibia, Republic of Niger, Federal Republic of Nigeria, Norway, Sultanate of Oman, Republic of Uganda, Republic of Uzbekistan, Kingdom of Netherlands, Republic of Poland, Portugal, State of Qatar, Syrian Arab Republic, Kyrgyz Republic, Slovak Republic, Czech Republic, Romania, United Kingdom of Great Britain and Northern Ireland, Republic of Rwanda, Republic of San Marino, Republic of Senegal, Republic of Serbia, Republic of Slovenia, Republic of the Soudan, Republic of South Africa, Sweden, Confederation of Switzerland, Kingdom of Swaziland, Republic of Tajikistan, United Republic of Tanzania, Republic of Chad, Togolese Republic, Tunisia, Turkey, Ukraine, Republic of Yemen, Republic of Zambia, Republic of Zimbabwe,

[*] The provisions of this Agreement shall apply *mutatis mutandis*, to Palestine as referred to in Resolution 99 (Minneapolis, 1998) subject to Palestine notifying the ITU Secretary-General that it accepts the rights and commits to observe the obligations arising therefrom.

meeting in Geneva from 15 May to 16 June 2006 for a Regional Radiocommunication Conference convened under the terms of the ITU *Constitution* and the ITU *Convention*, as referred to in Article 1 of this *Agreement*, have adopted, subject to approval by their competent authorities, the following provisions concerning the terrestrial broadcasting service in the frequency bands 174-230 MHz[1] and 470-862 MHz, together with provisions for *other primary terrestrial services*, as defined in Article 1 of this *Agreement*, in Region 1 (parts of Region 1 situated to the west of meridian 170° E and to the north of parallel 40° S, except the territory of Mongolia) and in the Islamic Republic of Iran.

1 For Morocco, the analogue Plan covers the band 170-230 MHz.

ARTICLES

ARTICLE 1

Definitions

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

1.1 *Union*: The International Telecommunication Union.

1.2 *Secretary-General*: The Secretary-General of the *Union*.

1.3 *Bureau*: The Radiocommunication Bureau.

1.4 *Constitution*: The Constitution of the *Union*.

1.5 *Convention*: The Convention of the *Union*.

1.6 *Radio Regulations*: The Radio Regulations as referred to in No. **31** of the *Constitution*.

1.7 *Conference*: The Regional Radiocommunication Conference 2006 for the planning of the digital terrestrial broadcasting service in Region 1 (parts of Region 1 situated to the west of meridian 170° E and to the north of parallel 40° S, except the territories of Mongolia) and in the Islamic Republic of Iran, in the frequency bands 174-230 MHz and 470-862 MHz (Geneva, 2006) (RRC-06)[1].

1.8 *Planning Area*: Region 1 (those parts of Region 1, as defined in No. **5.3** of the *Radio Regulations*, situated to the west of meridian 170° E and to the north of parallel 40° S, except the territories of Mongolia) and the Islamic Republic of Iran.

1.9 *Agreement*: The Regional Agreement and its Annexes together with its associated *Plans* as drawn up by the *Conference*.

1.10 *Plans*: The analogue Plan and the digital Plan as specified in § 3.1 of Article 3 of this *Agreement* and as subsequently updated through the successful application of the procedure of § 4.1 of Article 4 of this *Agreement*.

1.11 *Contracting Member*: Any Member State from the *Planning Area* which has approved or acceded to the *Agreement*.

1.12 *Administration*: Unless otherwise indicated, the term Administration designates the Administration, as defined in No. **1002** of the *Constitution*, of a *Contracting Member*.

1.13 *MIFR*: Master International Frequency Register.

1.14 *Other primary terrestrial services*: The primary terrestrial services other than the broadcasting service, and the primary radio astronomy service, to which the frequency bands 174-230 MHz and/or 470-862 MHz are allocated in the *Planning Area* in accordance with Article **5** of the *Radio Regulations*.

---

[1] This *Conference* was held in two sessions:

– the first session, responsible for preparing a report to the second session, was held in Geneva from 10 to 28 May 2004;

– the second session, responsible for drawing up an *Agreement* and associated *Plans*, was held in Geneva from 15 May to 16 June 2006.

1.15 *Existing assignments to other primary terrestrial services* (referred to in short as the "*List*"): Assignments to *other primary terrestrial services* contained in Annex 5 to the *Agreement*, as established by the *Conference,* and assignments to *other primary terrestrial services* for which the procedure of § 4.2 of Article 4 of this *Agreement* has been successfully applied.

1.16 *Transition period*: The period following the *Conference* during which the assignments in the analogue Plan (as specified in § 3.1.2 of Article 3 of this *Agreement*) shall be protected (see also Article 12 of this *Agreement*).

1.17 *BR IFIC*: Radiocommunication Bureau International Frequency Information Circular.

ARTICLE 2

Execution of the Agreement

2.1 The *Contracting Members* shall adopt the characteristics specified in the *Plans* for their broadcasting stations in the *Planning Area* operating in the frequency bands referred to in Article 3 of this *Agreement*.

2.2 The *Contracting Members* shall not modify these characteristics or establish stations, except under the relevant provisions of Articles 4 and 5 of this *Agreement*.

2.3 The *Contracting Members* shall undertake to apply the relevant provisions of Articles 4 and 5 of this *Agreement* for the *other primary terrestrial services* to which these bands are also allocated.

ARTICLE 3

Annexes to the Agreement

3.1 *Annex 1*: Frequency Plans[2]

3.1.1 The digital Plan consisting of two parts: the 174-230 MHz band and the 470-862 MHz band (comprising T-DAB Plan assignments, T-DAB Plan allotments, DVB-T Plan assignments, DVB-T Plan allotments).

3.1.2 The analogue Plan consisting of two parts: the 174-230 MHz[3] band and the 470-862 MHz band.

3.2 *Annex 2*: Technical elements and criteria used in the development of the Plan and the implementation of the *Agreement*.

---

[2] After the expiry of the *Transition period*, the *Plans* will only contain the digital Plan.

[3] For Morocco, the analogue Plan covers the band 170-230 MHz.

3.3 *Annex 3*: Basic characteristics to be submitted in application of the *Agreement*.

3.4 *Annex 4*

3.4.1 Section I: Limits and methodology for determining when agreement with another administration is required.

3.4.2 Section II: Examination of conformity with the digital Plan entry.

3.5 *Annex 5*: List of assignments to *other primary terrestrial services* as referred to in § 1.15 of Article 1 of the *Agreement*.

ARTICLE 4

Procedure for modifications to the Plans and procedure for coordination of other primary terrestrial services

4.1 Modifications to the *Plans*

4.1.1 When an administration proposes to make a modification to the digital Plan or the analogue Plan, i.e. in cases where an administration needs:

a) to change the characteristics of an allotment, or of an assignment to a broadcasting station, appearing in the *Plans*; or

b) to add to the *Plans* an allotment, or an assignment to a broadcasting station; or

c) to add to the digital Plan an assignment stemming from an allotment in the digital Plan[4]; or

d) to cancel from the *Plans* an allotment, or an assignment to a broadcasting station,

this administration shall apply the procedure contained in this Article before any notification is made under Article 5.

4.1.2 Initiation of the modification procedure

4.1.2.1 Any administration proposing to change the characteristics of an assignment/allotment appearing in the *Plans*, or to add a new assignment/allotment to the *Plans,* shall seek the agreement of any other administration whose broadcasting service and/or *other primary terrestrial services* are considered to be affected.

4.1.2.2 An administration is considered to be affected in respect of its broadcasting service when the limits given in Section I of Annex 4 are exceeded.

4.1.2.3 An administration is considered to be affected in respect of its *other primary terrestrial services* when the limits given in Section I of Annex 4 are exceeded for any of the following assignments:

a) *existing assignments to other primary terrestrial services*;

[4] If the intention is not to include the assignments into the digital Plan, administrations should directly apply Article 5.

b) assignments to *other primary terrestrial services* for which the procedure for coordination with the broadcasting service under § 4.2 has been initiated, i.e. for which the complete information referred to in § 4.2.2.6 has been received by the *Bureau*.

4.1.2.4 The agreement referred to in § 4.1.2.1 is not required if:

a) none of the corresponding limits in Section I of Annex 4 referred to in § 4.1.2.2 and § 4.1.2.3 are exceeded; or

b) the proposed modification relates to changes in the technical characteristics which do not increase the existing level of interference and do not increase the existing level of protection required.

4.1.2.5 An administration proposing to modify the *Plans* shall communicate to the *Bureau* the relevant characteristics listed in Annex 3, in electronic form, and shall also indicate, if appropriate, the names of any administrations which have already agreed to the proposed modification on the basis of the characteristics communicated to the *Bureau*.

This communication shall also be considered by the *Bureau,* if so requested, as a request to apply the procedure contained in § 4.1.5.3 in the following cases:

– no agreements are required under § 4.1.2.4 and no administration's name is included under § 4.1.3.2; or

– all agreements have been received and no administration's name is removed under § 4.1.2.9 or included under § 4.1.3.2.

4.1.2.6 If the characteristics submitted under § 4.1.2.5 are found to be incomplete, the *Bureau* shall immediately seek from the administration proposing to modify the *Plans* any clarification required and the information not provided.

4.1.2.7 In application of § 4.1.1 *c)*, if the *Bureau* finds that, in the case of a conversion of an allotment into one or several assignments, the conditions in Section II of Annex 4 are met, the provisions of § 4.1.5.3 shall apply[5]. Otherwise, the *Bureau* shall request the administration proposing the modification to the digital Plan to take appropriate action. The proposed modification shall lapse if the administration does not modify within 30 days the characteristics so that they comply with Section II of Annex 4. This 30-day period starts on the date of the dispatch of the *Bureau's* request.

4.1.2.8 On receipt of the complete information referred to in § 4.1.2.5 or § 4.1.2.6, as appropriate, the *Bureau* shall, within 40 days:

a) identify the administrations considered to be affected, in accordance with § 4.1.2.2 and § 4.1.2.3;

b) publish the characteristics received in the Special Section of the *BR IFIC*, together with the names of the administrations identified, indicating those whose agreement has been communicated under § 4.1.2.5 by the administration proposing to modify the *Plans*, if appropriate, and the corresponding assignments to the *other primary terrestrial services* which are considered to be affected, if appropriate;

c) inform the administrations identified in *a)* above.

[5] In the case of assignments stemming from an allotment in the digital Plan which bears remarks in the "remarks" columns of the Plan, these remarks shall be extended to these assignments.

4.1.2.9 An administration whose agreement has been communicated to the *Bureau* under § 4.1.2.5, may, within 40 days from the date of the publication of the *BR IFIC* referred to in § 4.1.2.8 *b)*, request the *Bureau* to remove its name from the list of administrations having given their agreement, as published under § 4.1.2.8 *b)*. A copy of this request shall be sent by the *Bureau* to the administration proposing to modify the *Plans*. In the case of the removal of the name of an administration from the list of administrations having given their agreement, as published under § 4.1.2.8 *b)*, the *Bureau* shall consider that the agreement with that administration has not been obtained.

4.1.3 Request for inclusion in the agreement-seeking process

4.1.3.1 Any administration which considers that it should have been included in the list of administrations considered to be affected may, within 40 days from the date of publication of the *BR IFIC* referred to in § 4.1.2.8 *b)*, request the *Bureau* to include its name in the list of administrations considered to be affected, giving its reasons for doing so based on criteria in Section I of Annex 4.

4.1.3.2 On receipt of this request, the *Bureau* shall examine the matter and, if in accordance with § 4.1.2.2 and § 4.1.2.3, it finds that the name of the administration should have been included in the list of administrations considered to be affected, it shall:

– inform immediately the administration proposing to modify the *Plans* and the administration requesting to be included in the list of administrations considered to be affected; and

– publish, within 30 days from the date of receipt of the request, the name of the administration in an addendum to the Special Section of the *BR IFIC* referred to in § 4.1.2.8 *b)*, and the corresponding assignments to *other primary terrestrial services*, if appropriate.

For the administration whose name has been published in the addendum, the overall period of 75 days specified in § 4.1.4.6, 4.1.4.7, 4.1.4.8, 4.1.4.9, 4.1.4.10 and 4.1.5.1 shall be counted from the date of publication of the addendum to the Special Section of the *BR IFIC* referred to above.

If the *Bureau* finds that the name of the administration should not be included in the list of administrations considered to be affected, it shall inform this administration.

4.1.3.3 The administration proposing to modify the *Plans* shall seek the agreement of the administrations whose agreement has not been obtained (see also § 4.1.2.9) and which are listed in the publication referred to in § 4.1.2.8 *b)* or § 4.1.3.2, as appropriate, by applying the procedure contained in § 4.1.4 below.

4.1.3.4 If all agreements have been received and no administration’s name is removed under § 4.1.2.9 and no administration’s name is included under § 4.1.3.2, the procedure contained in § 4.1.5.3 applies.

4.1.4 Seeking agreement of the administrations which are considered to be affected and whose agreement has yet to be obtained

4.1.4.1 The Special Section of the *BR IFIC* referred to in § 4.1.2.8 *b)* or § 4.1.3.2, as appropriate, constitutes the formal request for coordination addressed to those administrations whose agreement has yet to be obtained.

4.1.4.2 When seeking the agreement of another administration, the administration proposing to modify the *Plans* may also communicate any additional information relating to proposed criteria to be used as well as other details concerning the terrain data, particular propagation conditions, etc.

4.1.4.3 On receipt of the Special Section of the *BR IFIC* referred to in § 4.1.2.8 *b)* or § 4.1.3.2, as appropriate, any administration listed therein shall examine the effect of the proposed modification to the digital Plan or to the analogue Plan on its broadcasting service and on its assignments to *other primary terrestrial services*, taking into account, as far as possible, the additional information referred to in § 4.1.4.2.

4.1.4.4 An administration from which agreement is sought may request the *Bureau* to assist by providing further information to enable the administration to assess the interference from the proposed modification, using the method described in Section I of Annex 4. The *Bureau* shall send this information by the most expeditious means.

4.1.4.5 An administration from which agreement is sought may send its comments to the administration proposing the modification to the *Plans* either directly or through the *Bureau*. In any event, the *Bureau* shall be informed of these comments.

4.1.4.6 An administration which is not in a position to give its agreement to the proposed modification with respect to its broadcasting service shall give its decision, with reasons related to its broadcasting service, within 75 days from the date of publication of the *BR IFIC* referred to in § 4.1.2.8 *b)* or § 4.1.3.2, as appropriate.

4.1.4.7 An administration which is not in a position to give its agreement to the proposed modification with respect to its *other primary terrestrial services* shall give its reasons, based on its own assignments as referred to in § 4.1.2.3 *a)* and *b)*, within 75 days from the date of publication of the *BR IFIC* referred to in § 4.1.2.8 *b)* or § 4.1.3.2, as appropriate.

4.1.4.8 Fifty days after publication of the *BR IFIC* referred to in § 4.1.2.8 *b)* or § 4.1.3.2, as appropriate, the *Bureau* shall request any administration which has not yet given its decision on the matter to do so. After an overall period of 75 days following the date of publication of the *BR IFIC*, the *Bureau* shall immediately inform the administration proposing the modification to the *Plans* that it has sent out the aforementioned requests and provide it with the names of the administrations which have given their agreement and the name of the administrations which have not replied.

4.1.4.9 When an administration has not replied within this 75-day period, it is deemed that this administration has not agreed to the proposed modification to the *Plans*, unless the provisions of § 4.1.4.10 and § 4.1.4.11 are applied.

4.1.4.10 After this 75-day period, the administration proposing to modify the *Plans* may request the *Bureau* to assist by sending a reminder to the administration which has not replied, requesting a decision. This request shall in no way extend the 24-month period mentioned in § 4.1.5.1.

4.1.4.11 If no decision is communicated to the *Bureau* within 40 days after the date of dispatch of the reminder under § 4.1.4.10, it shall be deemed that the administration which has not given a decision has agreed to the proposed modification to the *Plans*.

4.1.4.12 If, at the end of the periods mentioned in § 4.1.4.9 or § 4.1.4.11 above, there is continuing disagreement, the *Bureau* shall conduct any study that may be requested by either the administration proposing the modification to the *Plans* or administrations from which agreement is sought; within 40 days, it 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.

4.1.4.13 An administration may, before applying the procedures in § 4.1, or at any stage during application of the procedure described therein, request the assistance of the *Bureau* without this having any implication on the application of the above-mentioned periods.

4.1.4.14 If, in seeking agreement, an administration modifies its initial proposal, it shall again apply the provisions of § 4.1.

4.1.5 Completion of the modification procedure

4.1.5.1 When an administration has obtained the agreement of all the administrations whose names were published in the *BR IFIC* referred to in § 4.1.2.8 *b)* or § 4.1.3.2, as appropriate, it shall inform the *Bureau* of the final agreed characteristics of the assignment/allotment together with the names of the administrations with which agreement has been reached. If the administration proposing the modification to the *Plans* does not inform the *Bureau* within 24 months after the 75-day period referred to in § 4.1.4.6 to § 4.1.4.10, the proposed modification shall lapse.

4.1.5.2 If the above-mentioned final agreed characteristics result in the identification of new affected administrations, the administration proposing the modification to the *Plans* shall again apply the provisions of § 4.1 with respect to these new administrations.

4.1.5.3 From the receipt of the complete information referred to in § 4.1.5.1, the *Bureau* shall, within 30 days, publish in the Special Section of the *BR IFIC* the characteristics of the assignment/allotment together with the names of the administrations which have agreed to the proposed modification to the *Plans* and include the new or modified assignment/allotment in the *Plans*, as appropriate. With respect to *Contracting Members*, the assignment/allotment concerned shall enjoy the same status as those appearing in the *Plans*. However, in the case of an assignment in the Plan resulting from the conversion of an allotment, this assignment shall remain in accordance with the allotment from which it stems and in conformity with Section II of Annex 4.

4.1.5.4 The agreement of the administration(s) affected may also be obtained in accordance with this Article for a specific period of time. The assignment or allotment, as appropriate, shall be removed from the *Plans* and/or from the *MIFR*, as appropriate, by the *Bureau* at the end of this period of time, after it has informed the administration.

4.1.6 Cancellation of an assignment or an allotment

When an assignment or an allotment in the *Plans* is cancelled either under § 4.1.1 *d)* or § 4.1.5.4, the *Bureau* shall publish this information in a Special Section of the *BR IFIC*.

In the case of the cancellation of an allotment, the *Bureau* shall cancel all assignments stemming from this allotment from the digital Plan and from the *MIFR* after having informed the administration.

4.1.7 Updating of the *Plans*

The *Bureau* shall maintain and publish periodically an up-to-date master copy of the *Plans*, taking account of any changes, additions and deletions made in accordance with the procedure of this Article.

4.2 Coordination of assignments to *other primary terrestrial services* with the broadcasting service

4.2.1 When an administration proposes to change the characteristics of an *existing assignment to other primary terrestrial services*, or to bring into use a new assignment to *other primary terrestrial services*, the procedure contained in this Article shall be applied before any notification is made under the provisions of Article 5.

4.2.2 Initiation of the coordination procedure

4.2.2.1 In application of § 4.2.1, an administration shall seek the agreement of any other administration whose broadcasting service is considered to be affected.

4.2.2.2 An administration is considered to be affected in respect of its broadcasting service when the limits given in Section I of Annex 4 are exceeded.

4.2.2.3 The agreement referred to in § 4.2.2.1 is not required if:

a) none of the corresponding limits in Section I of Annex 4 referred to in § 4.2.2.2 are exceeded; or

b) the proposed modification relates to changes in the technical characteristics which do not increase the existing level of interference and do not increase the existing level of protection required.

4.2.2.4 An administration proposing a new or modified assignment shall communicate to the *Bureau* the relevant characteristics listed in Annex 3, in electronic form, and shall also indicate, if appropriate, the names of any administrations which have already agreed to the proposed new or modified assignment on the basis of the characteristics communicated to the *Bureau*.

This communication shall also be considered by the *Bureau,* if so requested, as a request to apply the procedure contained in § 4.2.5.3 in the following cases:

– no agreements are required under § 4.2.2.3 and no administration's name is included under § 4.2.3.2; or

– all agreements have been received and no administration's name is removed under § 4.2.2.7 or included under § 4.2.3.2.

4.2.2.5 If the characteristics submitted under § 4.2.2.4 are found to be incomplete, the *Bureau* shall immediately seek from this administration any clarification required and the information not provided.

4.2.2.6 On receipt of the complete information referred to in § 4.2.2.4 or § 4.2.2.5, as appropriate, the *Bureau* shall, within 40 days:

a) identify the administrations considered to be affected, in accordance with § 4.2.2.2;

b) publish the characteristics received in the Special Section of the *BR IFIC*, together with the names of the administrations identified, indicating those whose agreement has been communicated under § 4.2.2.4 by the administration seeking the agreement;

c) inform the administrations identified in *a)* above.

4.2.2.7 An administration whose agreement has been communicated to the *Bureau* under § 4.2.2.4 may, within 40 days from the date of the publication of the *BR IFIC* referred to in § 4.2.2.6 *b)*, request the *Bureau* to remove its name from the list of administrations having given their agreement, as published under § 4.2.2.6 *b)*. A copy of this request shall be sent by the *Bureau* to the administration seeking the agreement. In the case of the removal of a name of an administration from the list of administrations having given their agreement, as published under § 4.2.2.6 *b)*, the *Bureau* shall consider that the agreement with that administration has not been obtained.

4.2.3 Request for inclusion in the agreement-seeking process

4.2.3.1 Any administration which considers that it should have been included in the list of administrations considered to be affected may, within 40 days from the date of publication of the *BR IFIC*, request the *Bureau* to include its name in the list of administrations considered to be affected, giving its reasons for doing so based on criteria in Section I of Annex 4.

4.2.3.2 On receipt of this request, the *Bureau* shall examine the matter and, if in accordance with § 4.2.2.2, it finds that the name of the administration should have been included in the list of administrations considered to be affected, it shall:

– inform immediately the administration seeking the agreement and the administration requesting to be included in the list of administrations considered to be affected; and

– publish, within 30 days from the date of receipt of the request, the name of the administration in an addendum to the Special Section of the *BR IFIC* referred to in § 4.2.2.6 *b)*.

For the administration whose name has been published in the addendum, the overall period of 75 days specified in § 4.2.4.6, 4.2.4.7, 4.2.4.8, 4.2.4.9 and 4.2.5.1 shall be counted from the date of publication of the addendum to the Special Section of the *BR IFIC* referred to above.

If the *Bureau* finds that the name of the administration should not be included in the list of administrations considered to be affected, it shall inform this administration.

4.2.3.3 The administration proposing the new or modified assignment shall seek the agreement of the administrations whose agreement has not been obtained (see also § 4.2.2.7) and which are listed in the publication referred to in § 4.2.2.6 *b)* or § 4.2.3.2, as appropriate, by applying the procedure contained in § 4.2.4 below.

4.2.3.4 If all agreements have been received and no administration's name is removed under § 4.2.2.7 and no administration's name is included under § 4.2.3.2, the procedure contained in § 4.2.5.3 applies.

4.2.4 Seeking agreement of the administrations which are considered to be affected and whose agreement has yet to be obtained

4.2.4.1 The Special Section of the *BR IFIC* referred to in § 4.2.2.6 *b)* or § 4.2.3.2, as appropriate, constitutes the formal request for coordination addressed to those administrations whose agreement has yet to be obtained.

4.2.4.2 When seeking the agreement of another administration, the administration proposing the new or modified assignment may also communicate any additional information relating to proposed criteria to be used as well as other details concerning the terrain data, particular propagation conditions, etc.

4.2.4.3 On receipt of the Special Section of the *BR IFIC* referred to in § 4.2.2.6 *b)* or § 4.2.3.2, as appropriate, any administration listed therein shall examine the effect of the proposed new or modified assignment on its broadcasting service, taking into account, as far as possible, the additional information referred to in § 4.2.4.2.

4.2.4.4 An administration from which agreement is sought may request the *Bureau* to assist by providing further information to enable the administration to assess the interference from the proposed new or modified assignment, using the method described in Section I of Annex 4. The *Bureau* shall send this information by the most expeditious means.

4.2.4.5 An administration from which agreement is sought may send its comments to the administration proposing the new or modified assignment, either directly or through the *Bureau*. In any event, the *Bureau* shall be informed of these comments.

4.2.4.6 An administration which is not in a position to give its agreement to the proposed new or modified assignment shall give its decision, with reasons related to its broadcasting service, within 75 days from the date of publication of the *BR IFIC* referred to in § 4.2.2.6 *b)* or § 4.2.3.2, as appropriate.

4.2.4.7 Fifty days after publication of the *BR IFIC* referred to in § 4.2.2.6 *b*) or § 4.2.3.2, as appropriate, the *Bureau* shall request any administration which has not yet given its decision on the matter to do so. After an overall period of 75 days following the date of publication of the *BR IFIC*, the *Bureau* shall immediately inform the administration proposing the new or modified assignment that it has sent out the aforementioned requests and provide it with the names of the administrations which have given their agreement and the name of the administrations which have not replied.

4.2.4.8 When an administration has not replied within this 75-day period, it is deemed that this administration has not agreed to the proposed new or modified assignment, unless the provisions of § 4.2.4.9 and § 4.2.4.10 are applied.

4.2.4.9 After the 75-day period, the administration proposing the new or modified assignment may request the *Bureau* to assist by sending a reminder to the administration which has not replied, requesting a decision. This request shall in no way extend the 24-month period mentioned in § 4.2.5.1.

4.2.4.10 If no decision is communicated to the *Bureau* within 40 days after the date of dispatch of the reminder under § 4.2.4.9, it shall be deemed that the administration which has not given a decision has agreed to the proposed new or modified assignment.

4.2.4.11 If, at the end of the periods mentioned in § 4.2.4.8 or § 4.2.4.10 above, there is continuing disagreement, the *Bureau* shall conduct any study that may be requested by either the administration proposing the new or modified assignment or administrations from which agreement is sought; within 40 days, it 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.

4.2.4.12 An administration may, before applying the procedures in § 4.2, or at any stage during application of the procedure described therein, request the assistance of the *Bureau* without this having any implication on the application of the above-mentioned periods.

4.2.4.13 If, in seeking agreement, an administration modifies its initial proposal, it shall again apply the provisions of § 4.2.

4.2.5 Completion of the coordination procedure

4.2.5.1 When an administration has obtained the agreement of all the administrations whose names were published in the *BR IFIC* referred to in § 4.2.2.6 *b)* or § 4.2.3.2, as appropriate, it shall inform the *Bureau* of the final agreed characteristics of the assignment together with the names of the administrations with which agreement has been reached. If the administration proposing the new or modified assignment does not inform the *Bureau* within 24 months after the 75-day period referred to in § 4.2.4.6 to 4.2.4.9, the proposed modification shall lapse.

4.2.5.2 If the above-mentioned final agreed characteristics result in the identification of new affected administrations, the administration proposing the new or modified assignment shall again apply the provisions of § 4.2 with respect to these new administrations.

4.2.5.3 From the receipt of the complete information referred to in § 4.2.5.1, the *Bureau* shall, within 30 days, publish in the Special Section of the *BR IFIC* the characteristics of the assignment together with the names of the administrations which have agreed to the proposed new or modified assignment and include the new or modified assignment in the *List*.

4.2.5.4 The proposed new or modified assignment shall lapse if it is not notified under Article 5 within 12 months after the publication referred to in § 4.2.5.3.

4.2.5.5 The agreement of the administration(s) affected may also be obtained in accordance with this Article for a specific period of time. The assignment shall be removed from the *List* and/or from the *MIFR*, as appropriate, by the *Bureau* at the end of this period of time, after it has informed the administration.

4.2.6 Updating of the *List*

The *Bureau* shall maintain and publish periodically an up-to-date master copy of the *List*, taking account of any changes, additions and deletions made in accordance with the procedure of this Article.

ARTICLE 5

Notification of frequency assignments

5.1 Notification of frequency assignments to broadcasting stations

5.1.1 When an administration proposes to bring into use an assignment to a broadcasting station, it shall notify to the *Bureau*, in accordance with the provisions of Article **11** of the *Radio Regulations*, the characteristics of this assignment, as specified in Annex 3 of the *Agreement*.

5.1.2 Under the examination by the *Bureau* of the assignment with respect to No. **11.34** of the *Radio Regulations*, i.e. its conformity with the *Plans* and the associated provisions, the finding shall be favourable if:

a) the assignment is contained in the *Plans*[6] and not bearing any remark with respect to assignments in the analogue Plan, to *existing assignments to other primary terrestrial services* or to entries in the digital Plan, and the conditions of Section II of Annex 4 are met; or

b) the assignment is contained in the digital Plan and bearing a remark with respect to:

– assignments in the analogue Plan or to *existing assignments to other primary terrestrial services*, and all the necessary agreements have been obtained, and the conditions of Section II of Annex 4 are met; and/or

– entries in the digital Plan, and the notifying administration states that all conditions associated with the remark are fully met, and the conditions of Section II of Annex 4 are met; or

c) in the case of an assignment stemming from an allotment in the digital Plan, which does not bear any remark with respect to assignments in the analogue Plan, to *existing assignments to other primary terrestrial services*, or to entries in the digital Plan, the conditions of Section II of Annex 4 are met; or

d) in the case of an assignment stemming from an allotment in the digital Plan, which bears a remark with respect to:

– assignments in the analogue Plan or to *existing assignments to other primary terrestrial services*, all the necessary agreements have been obtained and the conditions of Section II of Annex 4 are met; and/or

– entries in the digital Plan, the conditions of Section II of Annex 4 are met and the notifying administration states that all conditions associated with the remark are fully met; or

e) in the case of the use of an entry in the digital Plan, with different characteristics, within the DVB-T or T-DAB systems, the conditions specified in Section II of Annex 4 are met.

5.1.3 A digital entry in the Plan may also be notified with characteristics different from those appearing in the Plan, for transmissions in the broadcasting service or in *other primary terrestrial services* operating in conformity with the *Radio Regulations*, provided that the peak power density in any 4 kHz of the above-mentioned notified assignments shall not exceed the spectral power density in the same 4 kHz of the digital entry in the Plan. Such use shall not claim more protection than that afforded to the above-mentioned digital entry.

5.1.4 If the examination referred to in § 5.1.2, and § 5.1.3 where appropriate, leads to a favourable finding, the assignment shall be recorded in the *MIFR*. In relations between *Contracting Members,* all broadcasting frequency assignments recorded in the *MIFR* and in conformity with the *Agreement* shall be considered to have the same status irrespective of the date of receipt of the notices by the *Bureau* for such frequency assignments or of the date on which they are brought into service.

---

[6] This provision shall not be applicable to the analogue Plan after the end of the *Transition period*.

5.1.5 If the examination referred to in § 5.1.2 or § 5.1.3, as appropriate, leads to an unfavourable finding, the notice shall be returned to the notifying administration with the reasons therefor.

5.1.6 If the administration resubmits the notice and the re-examination by the *Bureau* under § 5.1.2, and § 5.1.3 where appropriate, leads to a favourable finding, the assignment shall be recorded in the *MIFR*.

5.1.7 If the re-examination under § 5.1.2 leads to an unfavourable finding, the assignment shall be recorded with a favourable finding under No. **11.31**, and with an unfavourable finding under No. **11.34** together with the name(s) of the administration(s) with which there is continuing disagreement, indicating that with respect to this (these) administration(s) the recorded assignment shall be operated under the conditions of not causing unacceptable interference to, and not claiming protection from, any station operating in conformity with the *Agreement* and its associated *Plans*.

5.1.8 The notice for resubmission shall also include a signed commitment by the notifying administration, indicating that use of an assignment submitted for recording in the *MIFR* under § 5.1.7 shall not cause unacceptable interference to, nor claim protection from, any station of the administration with which there is continuing disagreement operating in conformity with the *Agreement* and its associated *Plans* and recorded in the *MIFR* with a favourable finding with respect to Nos. **11.31** and **11.34**.

5.1.9 Should unacceptable interference be caused by the use of this assignment to any assignment of the administration with which there is continuing disagreement operating in conformity with the *Agreement* and its associated *Plans* and recorded in the *MIFR* with a favourable finding with respect to Nos. **11.31** and **11.34**, the administration causing unacceptable interference shall, upon receipt of advice thereof, immediately eliminate this interference.

5.2 Notification of frequency assignments to *other primary terrestrial services*

5.2.1 When an administration proposes to bring into use an assignment to *other primary terrestrial services*, it shall notify the assignment to the *Bureau* in accordance with the provisions of Article **11** of the *Radio Regulations*.

5.2.2 Under the examination by the *Bureau* of conformity with the *Agreement*, the *Bureau* shall examine the notice with respect to the successful application of the procedure contained in § 4.2 of the *Agreement*.

5.2.3 If the examination referred to in § 5.2.2 above leads to a favourable finding, the assignment shall be recorded in the *MIFR*. Otherwise, the notice shall be returned to the notifying administration with the reasons therefor.

5.2.4 If the administration resubmits the notice and the re-examination by the *Bureau* under § 5.2.2 above leads to a favourable finding, the assignment shall be recorded in the *MIFR* accordingly.

5.2.5 If the re-examination under § 5.2.2 leads to an unfavourable finding, the assignment shall be recorded with a favourable finding under No. **11.31**, and with an unfavourable finding under No. **11.34** together with the name(s) of the administration(s) with which there is continuing disagreement, indicating that with respect to this (these) administration(s) the recorded assignment shall be operated under the conditions of not causing unacceptable interference to, and not claiming protection from, any station operating in conformity with the *Agreement* and its associated *Plans*.

5.2.6 The notice for resubmission shall also include a signed commitment by the notifying administration, indicating that use of an assignment recorded in the *MIFR* under § 5.2.5 shall not cause unacceptable interference to, nor claim protection from, any station of the administration with which there is continuing disagreement operating in conformity with the *Agreement* and its associated *Plans* and recorded in the *MIFR* with a favourable finding with respect to Nos. **11.31** and **11.34**.

5.2.7 Should unacceptable interference be caused by the use of this assignment to any assignment of the administration with which there is continuing disagreement operating in conformity with the *Agreement* and its associated *Plans* and recorded in the *MIFR* with a favourable finding with respect to Nos. **11.31** and **11.34**, the administration causing unacceptable interference shall, upon receipt of advice thereof, immediately eliminate this interference.

ARTICLE 6

Settlement of disputes

6.1 If, after application of the procedure described in the above articles, the administrations concerned have been unable to reach agreement, they may resort to the procedure described in Article **56** of the *Constitution*. They may also agree to apply the Optional Protocol on the compulsory settlement of disputes relating to the ITU Constitution, the ITU Convention and to the Administrative Regulations.

ARTICLE 7

Accession to the Agreement

7.1 Any Member State in the *Planning Area* which has not signed the *Agreement* may at any time deposit an instrument of accession with the *Secretary-General*, who shall immediately inform the other Member States. Accession to the *Agreement* shall be made without reservations and shall apply to the *Plans* as they stand at the time of accession.

7.2 Accession to the *Agreement* shall become effective on the date on which the instrument of accession is received by the *Secretary-General*.

ARTICLE 8

Scope of application of the Agreement

8.1 The *Agreement* shall bind *Contracting Members* in their relations with one another but shall not bind those members in their relations with non-contracting members.

8.2 If a *Contracting Member* enters reservations with regard to the application of any provision of the *Agreement*, other *Contracting Members* shall be free to disregard such provision in their relations with the member which has made such reservations.

ARTICLE 9

Approval of the Agreement

9.1 Member States signatories to the *Agreement* shall notify their approval of this *Agreement*, as promptly as possible, to the *Secretary-General*, who shall at once inform the other Member States.

ARTICLE 10

Denunciation of the Agreement

10.1 Any *Contracting Member* may denounce the *Agreement* at any time by a notification sent to the *Secretary-General*, who shall inform the other Member States.

10.2 Denunciation shall become effective one year after the date on which the *Secretary-General* receives the notification of denunciation.

10.3 On the date on which the denunciation becomes effective, the *Bureau* shall delete from the *Plans* the assignments and/or the allotments entered in the name of the Member State which has denounced the *Agreement*.

ARTICLE 11

Revision of the Agreement

11.1 No revision of the *Agreement* shall be undertaken except by a competent regional radiocommunication conference convened in accordance with the procedure laid down in the *Constitution* and *Convention*, to which all the Member States in the *Planning Area* shall be invited.

ARTICLE 12

Entry into force, duration and provisional application of the Agreement

12.1 The *Agreement* shall enter into force on 17 June 2007 at 0001 hours UTC.

12.2 The provisions of the *Agreement* shall be provisionally applicable as of 17 June 2006 at 0001 hours UTC.

12.3 As from the date mentioned in § 12.2 above, broadcasting stations in operation with frequency assignments which do not appear in the *Plans* or which are not in conformity with the *Agreement* and its associated *Plans* (see § 5.1.2 of Article 5) may continue to be operated under the conditions of not causing unacceptable interference to, and not claiming protection from, any assignments in conformity with the *Agreement* and its associated *Plans*.

12.4 The *Agreement* shall remain in force until it is revised in accordance with Article 11 of the *Agreement*.

12.5 The *Transition period* shall commence on 17 June 2006 at 0001 hours UTC. During the *Transition period*, assignments in the analogue Plan (as specified in § 3.1.2 of Article 3) shall be protected.

12.6 The *Transition period* shall end on 17 June 2015 at 0001 hours UTC. However, for the countries listed in footnote below[7], for the band 174-230 MHz[8], the *Transition period* shall end on 17 June 2020 at 0001 hours UTC. After the end of the applicable *Transition period*, the corresponding entries in the analogue Plan shall be cancelled by the *Bureau*, and

– the provisions of § 4.1 of Article 4 referring to the modification of the analogue Plan; and

– remarks with respect to analogue assignments

shall cease to apply to the analogue assignments in the corresponding countries.

12.7 After the end of the above-mentioned *Transition period*, the *Bureau* shall review the status of the assignments which were contained in the analogue Plan and recorded in the *MIFR* and invite the administrations to cancel the corresponding entries in the *MIFR*.

---

[7] List of the countries: Algeria (People's Democratic Republic of), Burkina Faso, Cameroon (Republic of), Congo (Republic of the), Côte d'Ivoire (Republic of), Egypt (Arab Republic of), Gabonese Republic, Ghana, Guinea (Republic of), Iran (Islamic Republic of), Jordan (Hashemite Kingdom of), Mali (Republic of), Morocco (Kingdom of), Mauritania (Islamic Republic of), Nigeria (Federal Republic of), Syrian Arab Republic, Sudan (Republic of the), Chad (Republic of), Togolese Republic, Tunisia, Yemen (Republic of).
For the following administrations which were not present at RRC-06, namely Benin (Republic of), Central African Republic, Eritrea, Ethiopia (Federal Democratic Republic of), Guinea-Bissau (Republic of), Equatorial Guinea (Republic of), Liberia (Republic of), Madagascar (Republic of), Niger (Republic of the), Democratic Republic of the Congo, Sao Tome and Principe (Democratic Republic of), Sierra Leone and Somali Democratic Republic, the date of the end of the transition period in the VHF band (174-230 MHz) is 17 June 2020 at 0001 hours UTC, unless any of the aforementioned administrations communicates to the *Bureau* during the 90-day period from the end of RRC-06 that it selects 17 June 2015 at 0001 hours UTC.

[8] 170-230 MHz for Morocco.

12.8 Following the action of the *Bureau* under § 12.7 above, administrations may request the *Bureau* to cancel the corresponding assignments, or continue to operate them, under the conditions that these analogue assignments:

a) were contained in the Plan and already brought into use, and

b) shall not cause unacceptable interference to, and shall not claim protection from, any assignments in conformity with the *Agreement* and its associated *Plans* (see § 5.1.2 of Article 5).

12.9 The *Bureau* shall update the *MIFR* accordingly.

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

Done at Geneva, 16 June 2006

For the Republic of Albania:

Hydajet KOPANI

For the People's Democratic Republic of Algeria:

A. El Kader IBRIR

Mohamed MADOUR

Slimane DJEMATENE

A. El Malek HOUYOU

For the Federal Republic of Germany:

Gerold REICHLE

For the Principality of Andorra:

Xavier JIMENEZ-BELTRAN

For the Republic of Angola:

Domingos Carlos OLIVEIRA

Octávio Domingos MACHADO

For the Kingdom of Saudi Arabia:

Habeeb K. AL-SHANKITI

Riyadh K. NAJM

Sulaiman AL-SAMNAN

Saud AL-RASHEED

Tariq M. AL-AMRI

Wesam A. SHEIKH

For the Republic of Armenia:

Ashot VERDYAN

For Austria:

Franz PRULL

Peter REINDL

For Azerbaijani Republic:

Gulam ABDULLAYEV

For the Kingdom of Bahrain:

A.S. AL-THAWADI

Hesham K. AL-BINKHALIL

For the Republic of Belarus:

Vladimir TESLYUK

For Belgium:

Freddy BAERT

Séverine DYON

Patrick VAN DER GRACHT

For Bosnia and Herzegovina:

Jadranka KALMETA

For the Republic of Botswana:

Cuthbert M. LEKAUKAU

Tshoganetso KEPALETSWE

Kingsley REETSANG

Boipuso KOBEDI

Thapelo MARUPING

Bathopi LUKE

For the Republic of Bulgaria:

Dimitar STANTCHEV

Bozhidar KOZHUHAZOV

Svilen POPOV

Georgi KOLEV

For Burkina Faso:

Souleimane ZABRE

Issa C. Ignace SIMPORE

For the Republic of Burundi:

Joseph NSEGANA

For the Republic of Cameroon:

Guillaume Paul MOUTE

El Hadjar ABDOURAMANE

Hilaire MBEGA

Boniface TAKOU

Awallou MOUHAMADOU

Mue Desire NDONGO

For the Republic of Cape Verde:
David GOMES
Ana Cristina Monteiro LIMA

For the Republic of Cyprus:
Andronikos KAKKOURAS

For the Vatican City State:
Costantino PACIFICI
Giudici PIERVINCENZO

For the Republic of the Congo:
M. AKOUALA
Jean MAKOUNDOU

For the Republic of Côte d'Ivoire:
Claude DASSYS BEKE
Jean-Baptiste YAO KOUAKOU
Alexis KOFFI KOUMAN
Simon KOFFI
Affou AKAFFOU

For the Republic of Croatia:
Drazen BREGLEC
Kreso ANTONOVIC
Zeljko TABAKOVIC
Gasper GACINA

For Denmark:
Jorgen Lang NIELSEN
Peter Marlau KNUDSEN
Henning ANDERSEN

For the Republic of Djibouti:
Mourad Hassan BOGOREH

For the Arab Republic of Egypt:
Laila Hussein HAMDALLAH
Esmail ELGHUTTANY

For the United Arab Emirates:
Tariq A. AL-AWADHI
Naser AL-RASHEDI
Mustafa Hamouda ISHAG

For Spain:
Antonio FERNÁNDEZ-PANIAGUA
José Ramón CAMBLOR

For the Republic of Estonia:
Arvo RAMMUS

For the Federation of Russia:
Andrey BESKOROVAYNY
Victor STRELETS

For Finland:
Kirsi KARLAMAA
Kari KANGAS

For France:
Arnaud MIQUEL
François RANCY
Dominique Jean ROLFO

For the Gabonese Republic:
Jacques EDANE NKWELE
William MOUNGALA
Firmin NGOYE
Francis IMOUNGA
Jules LEGNONGO
Jean-Jacques MASSIMA LANDJI

For the Republic of Gambia:
Famara DAMPHA
Bai Baboucar SAN YANG

For Georgia:
Mikheil GOTOSHIA

For Ghana:
Emmanuel OWUSU-ADANSI

For Greece:
Nissim BENMAYOR
George DROSSOS

For the Republic of Guinea:
Abdoul Aziz BARRY
Ibrahima Kenda SOUARE
Habib TALL

For the Republic of Hungary:
Erzsebet BÁNKÚTI
Peter VÁRI

For the Islamic Republic of Iran:
Mahmoud KHOSRAVI
Abdolali ALI ASKARI
Taghi SHAFIEE
Hossein ABEDIAN

For the Republic of Iraq:
Wesall A. ALI

For Ireland:
John A.C. BREEN
Rory A.J. HINCHY
Neil O'BRIEN
Alexander KRASNOJEN

For the State of Israel:
Haim MAZAR

For Italy:
Francesco TROISI
Mario TAGIULLO
Riccardo DE LEONARDIS
Donato MARGARELLA

For the Hashemite Kingdom of Jordan:
M. AL-WATHIQ SHAQRAH

For the Republic of Kazakhstan:
Rizat NURSHABEKOV

For the Republic of Kenya:
Stanley K. KIBE
Leo K. BORUETT
Daniel O. OBAM
Samwel O. OTIENO
Alfred M. AMBANI

For the State of Kuwait:
Nashi AL QAHTANI
Yousef AL-SAAD

For the Kingdom of Lesotho:
Sello LEJAKANE
Tlali MANOSA

For the Republic of Latvia:
Imars JEKABSONS
Juris VALENIEKS
Juris RENCIS

For the Former Yugoslav Republic of Macedonia:
Mile VELJANOV

For Lebanon:
Maurice GHAZAL

For the Principality of Liechtenstein:
Kurt BÜHLER

For the Republic of Lithuania:
V. KISONAS
M. ZILINSKAS

For Luxembourg:
Roland THURMES

For Malawi:
Mike KUNTIYA
Willis D. LIPANDE
Lloyd MOMBA

For the Republic of Mali:
Sékou COULIBALY
Nouhoum TRAORÉ
Bangaly-Fode TRAORÉ
I.B. MAIGA
A.A.M. CISSE
Mohamed AG HAMATI
Amadou DIAO

For Malta:
Saviour F. BORG
Joseph SPITERI
Adrian GALEA

For the Kingdom of Morocco:
Mohammed LOULICHKI
Mohammed HAMMOUDA
Mustapha BESSI
Mohamed Mamoun SBAY
Abderrahim KHAFAJI
Nabila EL MERNISSI
Adil ARAMJA

For the Islamic Republic of Mauritania:
Mohamed Vadel OULD TABOU

For the Republic of Moldova:
Andrei NEMTANU
Teodor CICLICCI
Eughenii SESTACOV

For the Principality of Monaco:
Carole LANTERI

For the Republic of Mozambique:
Hilário Lourino TAMELE
Martins S. LANGA

For the Republic of Namibia:
Barthos HARA-GAEB

For the Republic of Niger:
Abdou SALOU

For the Federal Republic of Nigeria:
Abayomi BOLARINWA
Edward Idris AMANA
Adamu ABDU
Muhammed UMARU

For Norway:
Geir Jan SUNDAL

For the Sultanate of Oman:
Yousuf AL BALUSHI

For the Republic of Uganda:
Jack TURYAMWIJUKA
Jonas M. BANTULAKI

For the Republic of Uzbekistan:
M. KHALMURATOVA

For the Kingdom of Netherlands:
Bart SCHAAP
A. VAN DIJKEN
Ben SMITH

For the Republic of Poland:
Krystyna ROSLAN-KUHN
Pawel KACKI
Dariusz WIECEK
Arkadiusz KUREK
Radoslaw TYNIOW

For Portugal:
Maria F. SANTOS SILVA GIRÃO
Miguel J. DA COSTA M. HENRIQUES

For the State of Qatar:
Yousuf A. AL-KUBAISI

For the Syrian Arab Republic:
Moustafa AJENEH
Mohammad HASAN
Adnan SALHAB

For the Kyrgyz Republic:
Baiysh NURMATOV

For the Slovak Republic:
Milan LUKNAR

For the Czech Republic:
Pavel DVORAK

For Romania:
Florin BEJAN
Catalin M. MARINESCU

For the United Kingdom of Great Britain and Northern Ireland:
Michael GODDARD
Malcolm JOHNSON

For the Republic of Rwanda:
Abraham MAKUZA
Charles NAHAYO
Didier RUBAYIZA KAYITANA

For the Republic of San Marino:
Michele GIRI

For the Republic of Senegal:
Makhtar FALL
Mamadou FATY

For the Republic of Serbia:
Dragana CURCIC
Slavenko RASAJSKI
Petar STEFANOVIC
Marija RAICKOVIC
Natalija VARAGIC

For the Republic of Slovenia:
Matjaz JANSA
Mihael KRISELJ
Igor FUNA
Franc KOVACIC

For the Republic of the Soudan:
Mohamed ABD ELMAGID

For the Republic of South Africa:
Nomacamasu Ingrid PONI

For Sweden:
Anders FREDERICH
Per KJELLIN
Percy PETTERSSON

For the Confederation of Switzerland:
Peter B. PAULI

For the Kingdom of Swaziland:
Austin M. MGABHI

For the Republic of Tajikistan:

S. DUDARAU

For the United Republic of Tanzania:

J.S. NKOMA
J.S. KILONGOLA
N. Habbi GUNYE
A.J. KISAKA
Johannes A.K. MAGESA
T.A. USI
Ali H. Ayub

For the Republic of Chad:

Guirdona MOGALBAYE
Ali Idriss AHMED

For the Togolese Republic:

Massina PALOUKI
Gaba S. MAWOUKO
Lalle KANAKE

For Tunisia:

Mohammed BONGUI
Lilia SOUSSI
Mohsen GHOMMAN M.

For Turkey:

Tayfun ACARER
Ali ZOR
Erkan CAN

For Ukraine:

Vasyl HANDABURA
Olena ULASENKO

For the Republic of Yemen:

Mohamed Ali AL-AZZANI

For the Republic of Zambia:

Kephas MASIYE
Kezias MWALE

For the Republic of Zimbabwe:

Obert MUGANYURA
Matthias CHAKANYUKA

Declarations and Reservations*

List of countries in alphabetical order giving the number(s) of their Declarations and Reservations:

Algeria (People's Democratic Republic of) (37, 42)

Andorra (Principality of) (42, 44)

Angola (Republic of) (24)

Armenia (Republic of) (33)

Austria (8, 42, 44)

Azerbaijani Republic (33, 46)

Bahrain (Kingdom of) (22, 37)

Belarus (Republic of) (33)

Belgium (8, 42, 44)

Bosnia and Herzegovina (42)

Botswana (Republic of) (5)

Bulgaria (Republic of) (8, 42, 44)

Burkina Faso (7, 42)

Burundi (Republic of) (42)

Cameroon (Republic of) (41, 42)

Cape Verde (Republic of) (42)

Chad (Republic of) (42, 58)

Côte d'Ivoire (Republic of) (9, 42, 52)

Croatia (Republic of) (42, 44, 63)

Cyprus (Republic of) (8, 10, 42, 44, 61)

Czech Republic (8, 42, 44)

Denmark (8, 42, 44)

Egypt (Arab Republic of) (48)

Estonia (Republic of) (8, 42, 44, 57)

Finland (8, 42, 44)

---

* *Note by the Secretary-General:* The texts of the Declarations and Reservations are shown in the chronological order of their deposit.

France (8, 42, 44)

Gabonese Republic (17, 42)

Georgia (23, 33)

Germany (Federal Republic of) (8, 42, 44)

Ghana (26)

Greece (8, 42, 44)

Hungary (Republic of) (8, 42, 44)

Iran (Islamic Republic of) (27, 37, 53, 54, 55, 59)

Iraq (Republic of) (62)

Ireland (8, 42, 44)

Israel (State of) (42, 64)

Italy (8, 42, 44, 45)

Jordan (Hashemite Kingdom of) (65)

Kazakhstan (Republic of) (33)

Kenya (Republic of) (25)

Kuwait (State of) (30, 37)

Kyrgyz Republic (33)

Latvia (Republic of) (8, 42, 44)

Lebanon (37)

Lesotho (Kingdom of) (12)

Liechtenstein (Principality of) (42, 44)

Lithuania (Republic of) (8, 39, 42, 44)

Luxembourg (8, 42, 44)

Mali (Republic of) (4, 42)

Malta (3, 8, 42, 44)

Moldova (Republic of) (32, 44)

Monaco (Principality of) (42, 44)

Morroco (Kingdom of) (40, 42)

Mozambique (Republic of) (16)

Namibia (Republic of) (15)

Netherlands (Kingdom of the) (8, 42, 44)

Nigeria (Federal Republic of) (35)

Norway (42, 44)

Oman (Sultanate of) (29)

Poland (Republic of) (8, 42, 44)

Portugal (8, 42, 44)

Qatar (State of) (28, 37)

Romania (8, 42, 44)

Russian Federation (33)

San Marino (Republic of) (42)

Saudi Arabia (Kingdom of) (21, 36, 37)

Senegal (Republic of) (42, 50)

Serbia (42, 44)

Slovak Republic (8, 42, 44)

Slovenia (Republic of) (8, 42, 44, 56)

South Africa (Republic of) (38)

Spain (8, 42, 44, 47)

Sudan (Republic of) (6, 37)

Sweden (8, 42, 44)

Switzerland (Confederation of) (1, 42, 44)

Syrian Arab Republic (34, 37)

Tajikistan (Republic of) (33)

Tanzania (United Republic of) (31)

The Former Yugoslav Republic of Macedonia (42, 44)

Togolese Republic (42)

Tunisia (42, 60)

Turkey (19, 42, 44, 49)

Uganda (Republic of) (14)

At the time of signing the Final Acts of the Regional Radiocommunication Conference for the planning of the digital terrestrial broadcasting service in Region 1 (parts of Region 1 situated to the west of meridian 170° E and to the north of parallel 40° S, except the territory of Mongolia) and in the Islamic Republic of Iran, in the frequency bands 174-230 MHz and 470-862 MHz (Geneva, 2006) (RRC-06), the undersigned delegates take note of the following Declarations and Reservations made by signatory delegations:

1

Original: French

For the Confederation of Switzerland:
The Swiss delegation reserves for the Government of the Confederation of Switzerland the right to take any measures it deems appropriate to safeguard its interests in respect of the broadcasting service and other radiocommunication services should a Contracting Member fail in its obligations resulting from the provisions of this Agreement or should reservations or actions by a State jeopardize the smooth operation of the aforementioned services in Switzerland.

2
Not Used

3

Original: English

For Malta:
In signing the Final Acts of the Regional Radiocommunication Conference (Geneva, 2006), the delegation of Malta declares:

1 that it reserves for its Government the right to take any action it considers necessary to safeguard its interests, should any Member State of the International Telecommunication Union fail in any way to comply with or execute the provisions of the Geneva 2006 (RRC-06) Agreement and its Annexes, the Radio Regulations or the Constitution and Convention of the International Telecommunication Union;

2 that it further reserves the right for its Government to take any action and preservation measures it deems necessary should the consequences of reservations by any Member State jeopardize Malta's radiocommunication services or affects its sovereignty;

3 to express additional declarations or reservations with respect to the Final Acts of the Geneva 2006 (RRC-06) at the time of deposit of the corresponding instrument of ratification with the International Telecommunication Union.

4

Original: French

For the Republic of Mali:

In signing the Final Acts of the Regional Radiocommunication Conference for the planning of the digital terrestrial broadcasting service in Region 1 (parts of Region 1 situated to the west of meridian 170° E and to the north of parallel 40° S, except the territory of Mongolia) and in the Islamic Republic of Iran, in the frequency bands 174-230 MHz and 470-862 MHz, the delegation of the Republic of Mali reserves for its Government the right to take any measures it may deem appropriate to safeguard its interests should Members fail to respect the provisions of these Final Acts and the Annexes thereto, or should reservations entered by other countries cause harmful interference and jeopardize the smooth operation of its telecommunication services, in particular broadcasting.

5

Original: English

For the Republic of Botswana:

In signing the Final Acts of the Regional Radiocommunication Conference for the Planning of the Digital Terrestrial Broadcasting Services in Parts of Regions 1 and 3, in the frequency bands 174-230 MHz and 470-862 MHz (Geneva, 2006), the delegation of the Republic of Botswana declares that its administration will comply with the provisions of the Final Acts without prejudice to the Republic of Botswana's sovereign right to take any measures that the Government of Botswana deems necessary to safeguard its broadcasting services in the event of harmful interference caused to the said services by any Member of the Union failing to comply with the provisions of the Agreement adopted by this conference.

The delegation of Botswana further declares that it reserves for its Government the right to make any statements or reservations when depositing its instruments of ratification of the Final Acts of the Regional Radiocommunication Conference (Geneva, 2006).

6

Original: English

For the Republic of Sudan:

The Sudan delegation expresses that the map used in the planning for digital broadcasting, in the frequency band 174-230 MHz and 470-862 MHz, is not correct. As a result, there are some assignments, assigned for other administration inside Sudan territory.

In signing the Final Acts of this Conference (RRC-06), the Sudan delegation does not recognize any assignments or allotments given to any other administration in the Sudan territory and reserves the right for the Sudan Government to recorrect its map with BR and to recorrect any assignments or allotments given to any other administration inside the Sudan territory.

7

Original: French

For Burkina Faso:

In signing the Final Acts of the Regional Radiocommunication Conference (RRC-06) for the planning of digital terrestrial broadcasting services in parts of Regions 1 and 3, in the frequency bands 174-230 MHz and 470-862 MHz, the Delegation of Burkina Faso declares on behalf of the Government of its country that Burkina Faso reserves the right to take any measures it may deem appropriate to safeguard its own interests should Members of the International Telecommunication Union (ITU) fail to respect the provisions of these Final Acts and the Annexes and/or Protocols thereto.

8

Original: English/ French/ Spanish

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

The delegations of the Member States of the European Union and of the Countries which have signed an Accession Treaty with the European Union declare that the Member States of the European Union as well as the Countries which have signed the Accession Treaty with the European Union will apply the provisions of the Final Acts of the Regional Radiocommunication Conference 2006 (RRC-06) as adopted by this Conference in accordance with their obligations under the EC Treaty.

9

Original: French

For the Republic of Côte d'Ivoire:

In signing the Final Acts of the Regional Radiocommunication Conference for the planning of the digital terrestrial broadcasting service in parts of Regions 1 and 3, in the frequency bands 174-230 MHz and 470-862 MHz, the delegation of the Republic of Côte d'Ivoire declares that it reserves for its Government the right to approve the said Final Acts in accordance with its national laws and to take all necessary measures to safeguard its national interests, should countries which are "parties" to the Regional Agreement or merely signatories fail or refuse to comply with it.

10

Original: English

For the Republic of Cyprus:

The Republic of Cyprus notes that in considering the Final Acts of the Regional Radiocommunication Conference (Geneva, 2006) (RRC-06), may find it necessary to make additional declarations or reservations. Accordingly, the Republic of Cyprus reserves the right to make additional declarations or reservations at the time of deposit of its instruments of ratification of the Final Acts of RRC-06. The Republic of Cyprus shall not be deemed to have consented to be bound by revisions to the Regional Radiocommunication Conference (RRC-06) without specific notification to the International Telecommunication Union by the Republic of Cyprus of its consent to be bound.

Furthermore the Republic of Cyprus declares its right under the Constitution and Convention of ITU:

a) to take any action it deems necessary to protect its interests and to safeguard the operation of its radiocommunication services, should they be affected by the decisions or Resolutions of this Conference or by the reservations made by other Member States,

b) to take any action to safeguard its interests should any Member state fail to comply with the Articles and Annexes and Protocols attached thereto; or should reservations made by other Member States appear to be detrimental to the operation of its radiocommunication services, and

c) to take any measures it deems necessary in case that any harmful interference is received by radiocommunication stations transmitting from Turkey and that in implementing its digital broadcasting networks, it shall not offer any protection to Turkey's assignments in the framework of RRC-06, due to the fact that during the RRC-06 proceedings, Turkey refused to engage in any technical coordination with the Republic of Cyprus.

11

Original: English

For the Republic of Zambia:

The Government of the Republic of Zambia, as a sovereign State, reserves the right to take any steps necessary to protect its broadcasting service and indeed any other services if any Contracting Member State to the Agreement, contravenes any term or condition of the Agreement either in whole or in part.

12

Original: English

For the Kingdom of Lesotho:

The delegation of the Kingdom of Lesotho reserves the right of its Government to take any steps necessary to protect its broadcasting service and indeed any other services if any Contracting Member State to the Agreement, contravenes any terms or provision of the Agreement either in whole or in part.

13

Original: English

For the Republic of Yemen:

In signing the Final Acts of RRC-06 (GE06), the Republic of Yemen delegation reserves for its Government the right to take such measures and actions as it might deem necessary to safeguard its interests should any Member State or States of the ITU fail in any way to respect or comply with the conditions and provisions specified in the Final Acts, or should reservations by other countries jeopardize broadcasting services and primary services in the Republic of Yemen.

14

Original: English

For the Republic of Uganda:

The Government of the Republic of Uganda, as a sovereign State and aware of the importance of the GE06 Agreement in whole, reserves its right by all means, to protect its broadcasting services in the frequency bands 174-230 MHz and 470-862 MHz if any Contracting Member to the Agreement contravenes any provisions of the Agreement either in part or in whole. The Government further observes that use of these bands by other terrestrial services by any administration can only be tolerated on a non-interference basis to the broadcasting services as provided in the Plan.

15

Original: English

For the Republic of Namibia:

The Government of the Republic of Namibia, as a sovereign State, reserves the right to take any action it deems necessary to safeguard its interest in the event of Members failing in any way to comply with the provisions of the Agreement (GE06) of the Regional Radiocommunication Conference (RRC-06) for dealing with frequency allocations in certain parts of the spectrum or should reservations by other countries jeopardize its broadcasting or telecommunication services.

16

Original: English

For the Republic of Mozambique:

The Government of the Republic of Mozambique, as a sovereign State, reserves the right to take any steps necessary to protect its broadcasting services and indeed any other services if any Contracting Member State to the Agreement, contravenes any term or condition of the Agreement either in whole or in part.

17

Original: French

For the Gabonese Republic:

In signing the Final Acts of the Regional Radiocommunication Conference charged for the planning of terrestrial broadcasting frequencies in the Bands III (174-230 MHz), IV and V (470-862 MHz) in Region 1 and part of Region 3, held in Geneva (Switzerland) from 15 May to 16 June 2006, the delegation of the Gabonese Republic reserves for its Government the right:

1 to take any necessary measures to safeguard its interests should any Member States fail, in any way, to respect the provisions of the Agreement adopted by this Regional Radiocommunication Conference or of the Radio Regulations of the International Telecommunication Union, or should reservations entered by other Member States during this Conference be such as to jeopardize the proper functioning of its telecommunication services;

2 to accept or not any financial consequences that might arise from such reservations;

3 to enter any additional reservations it may deem necessary until such time as the instruments of ratification are deposited.

18

Original: English

For the United Arab Emirates:

1 The United Arab Emirates position from the digital broadcasting planning related to the RRC-06:

The Administration of the United Arab Emirates reserves its Government's right to take such steps as it may deem necessary to protect its national interests should Abu Musa Island be shown or claimed to be territory other than ours, and rejects any assignments entered by other than our Administration on this Island or any part of the United Arab Emirates territory as shown in the Final Acts, its Annexes or Protocols.

2 The United Arab Emirates position from the digital broadcasting planning related to the RRC-06:

The Administration of the United Arab Emirates reserve its Government's right to take any steps it may consider necessary to safeguard the interests of the television broadcasting and other telecommunication services, should any Member fail to comply with the relevant provisions of this Agreement or through reservations or other measures that jeopardize the satisfactory operation of the television and telecommunication services of the United Arab Emirates.

19

Original: English

For Turkey:

Resolves 2.1.1 b) of Resolution 1224 indicates that the Regional Radiocommunication Conference will facilitate the establishment of a new digital terrestrial broadcasting Plan and ultimately preparation of a new regional Agreement on digital broadcasting with due regard to the protection of the existing assignments. There is no doubt that for the success of the planning process, which will have an impact on future generations, in our work we should be guided by technical and humanitarian considerations rather than political ones.

The delegation of the Republic of Turkey would like to underline that the frequency requirements submitted by the Greek Cypriot side have been determined in a manner overlooking the frequency requirements of Northern Cyprus by ignoring the present situation on the island – namely the geopolitical reality of bi-zonality.

It is regrettable that efforts made with a view to having the two sides on the Island, discuss and reach an understanding on their frequency requirements, as they had successfully done during the process of the preparation of the Annan Plan, have failed due to the intransigence of the Greek Cypriot side.

Since it was not possible to coordinate and achieve an arrangement which would respect equitable access to the radio-frequency resources, the frequency requirements submitted by the Greek Cypriot Administration are tantamount to depriving the Turkish Cypriot people of their fundamental rights of communication and access to information.

Turkey does not consider that the Greek Cypriot representatives have the right to submit frequency requirements for the island of Cyprus as a whole. The Republic of Cyprus which the Greek Cypriot representatives purport to represent, is not the original partnership State established in 1960. Turkey, therefore, will continue to regard the Greek Cypriot authorities as exercising authority, control and jurisdiction only in the territory south of the UN-controlled buffer zone, as is currently the case, and as not representing the Turkish Cypriot people and will treat the acts performed by them accordingly.

Finally, we wish to put on record that from the standpoint of Turkey, the signature, ratification and implementation of the Regional Agreement will neither amount to any form of recognition by Turkey of the "Republic of Cyprus" referred to in the text of the Agreement, nor prejudice Turkey's rights and obligations emanating from the 1960 international treaties on Cyprus.

We would like this declaration to be put on record *ad verbatim* and be reflected in pertinent Conference documents.

20

Original: English

For the Republic of Zimbabwe:

The Government of Zimbabwe commits itself to observe the provisions of this Agreement and reserves its sovereign right to take any measures it deems necessary to protect the development of Zimbabwe's broadcasting systems and services within its territory.

21

Original: Arabic

For the Kingdom of Saudi Arabia:

In signing the Final Acts of the Second Session of the Regional Radiocommunication Conference for the planning of the digital terrestrial broadcasting service in the frequency bands 174-230 MHz and 470-862 MHz (RRC-06), the delegation of the Kingdom of Saudi Arabia declares, on behalf of its Government, that it reserves its full right to take any action it deems necessary to safeguard its interests should any Member State of the International Telecommunication Union fail to comply with the provisions of the Final Acts of the Conference and associated Agreement and Plans thereto, or should the reservations and declarations made now or in the future by other Members jeopardize the satisfactory operation of the broadcasting service and telecommunication services in the Kingdom of Saudi Arabia.

22

Original: English

For the Kingdom of Bahrain:

The delegation of the Kingdom of Bahrain to the Regional Radiocommunication Conference (GE06) for the planning of radio and television digital terrestrial channels in the bands 174-230 MHz and 470-862 MHz, reserve its Government's right to take any action it may deem necessary to safeguard the interests of the television broadcasting and other telecommunication services, should any Member fail to comply with the relevant provisions of this Final Acts of the Plan or through reservations made or other measures that jeopardize the satisfactory operation of the television and telecommunication services of the Kingdom.

23

Original: English

For Georgia:

In signing the final acts of the Regional Radiocommunication Conference (Geneva, 2006) (RRC-06), the Administration of Georgia would like to contribute comments regarding this Agreement. Namely to the issue regarding consideration of Georgian analogue TV broadcasting stations during the transition period.

The Administration of Georgia has successfully carried out coordination of frequency assignments to analogue TV broadcasting stations of Georgia with Member Administrations of RRC and a total amount of 418 TV notices have been included in the RCC List of analogue TV assignments in the extended planning area of RRC-06.

Unfortunately coordination of some TV stations were not completed and accordingly these stations were not entered in Reference situation for analogue TV stations and demand protection in the transition period.

In view of the above mentioned, the Administration of Georgia doesn't agree with the reference situation for analogue TV broadcasting stations and will reserve the right to protect its existing assignments of TV broadcasting stations.

24

Original: English

For the Republic of Angola:

The Government of the Republic of Angola, as a sovereign State, reserves the right to take any steps necessary to protect its broadcasting services and indeed any other services if any Contracting Member State to the Agreement, contravenes any term or condition of the Agreement either in whole or in part.

25

Original: English

For the Republic of Kenya:

In signing the Final Acts, the delegation of the Republic of Kenya to the Regional Radiocommunication Conference for the planning of the digital terrestrial broadcasting service in the frequency bands 174-230 MHz and 470-862 MHz in Region 1 and parts of Region 3 (RRC-06) reserves the right of the Government of the Republic of Kenya to take any action it deems necessary to safeguard its interests in the event of any Member country failing, in any way, to comply with the provisions, Resolutions or Recommendations contained in the Final Acts of this Conference or in the event of any reservations made by other countries jeopardizing the implementation or operation of radiocommunication services in Kenya.

The delegation of the Republic of Kenya further reserves the right of its Government to adhere to all or some of the provisions contained in the Final Acts and any Annexes thereto of the Regional Radiocommunication Conference for the planning of the digital terrestrial broadcasting service in Region 1 and parts of Region 3 (RRC-06).

26

Original: English

For Ghana:

In signing the Final Agreement of the Second Session of the Regional Radiocommunication Conference (RRC Geneva-06), held in Geneva, Switzerland from 15 May to 16 June 2006, the delegation of Ghana declares that:

1 The Government of Ghana reserves the right to take any such action it may consider necessary to safeguard its interests, should any Member of the Union fail to comply with any of the provisions of the Constitution and the Convention of the International Telecommunication Union, the Radio Regulations of the ITU and the Final Agreement of RRC Geneva-06.

2 The Government of Ghana further reserves the right to express reservations on any provisions of the Final Agreement deemed to be incompatible with the Constitution, Laws, International Agreements and Regulations of the country.

27

Original: English

For the Islamic Republic of Iran:

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

In signing this Regional Agreement (Geneva, 2006), the delegation of the Islamic Republic of Iran reserves for its Government the right:

1 to take action as it may consider necessary to safeguard its interests:

a) should any Member fail in any way to comply with the provisions of this Agreement or its Annexes or the Protocol attached thereto;

b) should reservations by other Members jeopardize telecommunication services particularly broadcasting services of the Islamic Republic of Iran;

2 to make such additional reservations and counter-reservations as may be necessary up to the time of approval of the Agreement;

3 not to accept arbitration as a means of settling disputes with respect to all cases related to this Agreement or its Annexes or the Protocol attached thereto;

4 to reject any dispute that has been or may be raised at any time by any Member of the Agreement concerning the territorial integrity and national sovereignty of the Islamic Republic of Iran over its national territory as a whole.

28

Original: English

For the State of Qatar:

The delegation of the State of Qatar to the Regional Radiocommunication Conference (RRC-06) for the planning of the digital terrestrial broadcasting service in Region 1 (parts of Region 1 situated to the west of meridian 170° E and to the north of parallel 40° S, except the territory of Mongolia) and in the Islamic Republic of Iran, in the frequency bands 174-230 MHz and 470-862 MHz reserves the right of the Government of the State of Qatar to take any action it deems to be necessary to safeguard its interests in the event of any Member country failing, in any way, to comply with the Provisions, Resolutions or Recommendations contained in the Final Acts of this Conference or in the event of any reservations made by other countries jeopardizing the implementation or operation of the provisions contained therein.

29

Original: English

For the Sultanate of Oman:

In signing the Final Acts, the delegation of the Sultanate of Oman to the Regional Radiocommunication Conference (RRC-06) for the planning of digital terrestrial broadcasting service in Region 1 (parts of Region 1 situated to the west of meridian 170° E and to the north of parallel 40° S, except Mongolia) and in the Islamic Republic of Iran, in the frequency bands 174-230 MHz and 470-862 MHz reserves the right of the Government of the Sultanate of Oman to take any action it deems necessary to safeguard its interests in the event of any Member country failing, in any way, to comply with the provisions, Resolutions or Recommendations contained in the Final Acts of this Conference or in the event of any reservations made by other countries jeopardizing the implementation or operation of the provisions contained therein.

The delegation of the Sultanate of Oman further reserves the right of its Government to adhere to all or some of the provisions contained in the Final Acts and any Annexes thereto of the Regional Administrative Conference for the planning of the frequency bands 174-230 MHz and 470-862 MHz.

30

Original: English

For the State of Kuwait:

The delegation of the Administration of the State of Kuwait to the Regional Radiocommunication Conference (RRC-06) for the planning of the digital terrestrial broadcasting service, reserves the State of Kuwait's right to take any action it may deem necessary to safeguard the interests of the terrestrial broadcasting services and other telecommunication services in the State of Kuwait, should any Member fail to comply with the relevant provisions of this Final Act of the Plan or through reservations made or other measures that jeopardize the satisfactory operation of the television and telecommunication services of the State of Kuwait.

31

Original: English

For the United Republic of Tanzania:

The Government of the United Republic of Tanzania, as a sovereign State and being aware of the importance of the GE06 Agreement in whole, reserves its right by all means, and herewith declares to protect its broadcasting services in the frequency bands 174-230 MHz and 470-862 MHz. If any Contracting Member to the Agreement contravenes any provisions of the Agreement either in part or in whole, necessary steps shall be taken in accordance with the Plan.

Further it reserves that use of these bands by other terrestrial services by any Administration can only be tolerated on a non-interference basis to the broadcasting services as provided in the Plan.

32

Original: Russian

For the Republic of Moldova:

The Delegation of the Republic of Moldova reserves for its Government the right to take any measures it may consider necessary to safeguard its interests should any Member of the Union fail to comply with the provisions of the Final Acts of the Regional Radiocommunication Conference (RRC-06), or should reservations made upon signing the Final Acts, or other measures taken by any Member of the Union, jeopardize the normal operation of the Republic of Moldova's telecommunication services.

33

Original: Russian

For the Republic of Armenia, the Azerbaijani Republic, the Republic of Belarus, the Russian Federation, Georgia, the Republic of Kazakhstan, the Republic of Uzbekistan, the Kyrgyz Republic, the Republic of Tajikistan and Ukraine:

The delegations of the above-mentioned countries reserve for their respective Governments the right to take any action they may consider necessary to protect their interests should any Member of the Union fail to comply with the provisions of the Final Acts of this Conference or the bilateral and multilateral coordination agreements on the use of frequencies, signed during the preparation and proceedings of RRC-06, or should reservations made upon signing the Final Acts, or other measures taken by any Member of the Union, jeopardize the normal operation of those countries' telecommunication services.

34

Original: Arabic

For the Syrian Arab Republic:

In signing the Final Acts of this Regional Radiocommunication Conference (RRC-06), the delegation of the Syrian Arab Republic reserves for its country and its Government the following rights at the time of its ratification of these Acts:

1 to confirm all written and oral statements made by this delegation, individually or jointly with other Arab Delegations participating in the Conference, and its right to make additional reservations;

2 to take any measures it deems necessary to safeguard its interests, and particularly its sovereign right to protect its wireless stations within its territories from harmful interference;

3 to refuse to register any assignment allocated by this Conference to any non-Syrian broadcasting station in occupied territories of the Syrian Arab Republic, and in particular the station that has the following geographic coordinates:

35E 39' 00"

32N 48' 21"

4 the signing of these Final Acts shall be effective only in respect of Member States of the Union recognized by the Syrian Arab Republic.

35

Original: English

For the Federal Republic of Nigeria:

In signing the Final Acts of the Regional Radiocommunication Conference (RRC-06) held in Geneva from 15 May to 16 June 2006, the delegation, on behalf of the Administration of the Federal Republic of Nigeria, declares as follows:

a) that, it acknowledges the need for the development of radiocommunications worldwide as a means of enhancing sustainable development in the interest of humanity and the environment;

b) that, however, the Administration of the Federal Republic of Nigeria reserves the right to take any action it considers necessary to safeguard its interest and in particular to protect its existing and planned broadcasting service, telecommunications systems and services, should a Member of the Union not comply with the provisions of these Acts in such a way that affects the proper functioning of the broadcasting stations, telecommunication network systems and services;

c) further, the Administration of the Federal Republic of Nigeria reserves the right to make additional declarations and reservations at the time of its notification to the ITU of its ratification of these Final Acts.

36

Original: Arabic

For the Kingdom of Saudi Arabia:

The delegation of the Kingdom of Saudi Arabia to the Regional Radiocommunication Conference for planning of the terrestrial digital broadcasting service in the frequency bands 174-230 MHz and 470-862 MHz (RRC-06) declare that the only authorized definitions of the geographical Zones C and D are as follows:

Zone C: is the maritime zone of the Arabian Gulf within the area extending from Shatt-Al-Arab up to and including the Gulf of Oman.

Zone D: is the coastal land area of the Arabian Gulf surrounding Zone C defined above.

37

Original: English

For the People's Democratic Republic of Algeria, the Kingdom of Saudi Arabia, the Kingdom of Bahrain, the United Arab Emirates, the Islamic Republic of Iran, the State of Kuwait, Lebanon, the State of Qatar, the Syrian Arab Republic and the Republic of the Sudan:

The delegations of the above-mentioned countries to the Regional Radio Conference (Geneva, 2006) (RRC-06), declare that the signature and possible approval by their respective Governments of the Final Acts resulting from this Conference, shall not be valid for the ITU Member under the name of "Israel", and in no way whatsoever imply its recognition by these Governments.

38

Original: English

For the Republic of South Africa:

The delegation of the Republic of South Africa, in signing the Final Acts of RRC-06, reserves its Government's right to take any such action as it may consider necessary:

1 to safeguard its interests should any Member of the Union, in any way, fail to comply with the provisions of the Constitution and Convention of the International Telecommunication Union, the Radio Regulations of the ITU and the Final Acts of the Regional Radiocommunication Conference (Geneva, 2006);

2 should any reservation by a Member of the Union, directly or indirectly, affect the operation of its broadcasting and/or other services;

3 to protect its broadcasting service and/or any other services, if any Contracting Member State to the Agreement contravenes any term or condition of the Agreement either in whole or in part;

4 to make any such additional declarations and reservations as may be necessary up to, and including, the time of ratification of the Final Acts of the Regional Radiocommunication Conference (Geneva, 2006).

39

Original: English

For the Republic of Lithuania:

At the time of signing of the Final Acts of the Regional Radiocommunication Conference for the planning of the digital terrestrial broadcasting service in parts of Regions 1 and 3, in the frequency bands 174-230 MHz and 470-862 MHz (Geneva, 2006), the delegation of the Republic of Lithuania formally reserves its position regarding Article 12, § 12.3 in the Final Acts. As long as analogue assignments in neighbouring countries are used on television channels assigned in the digital Plan to the Republic of Lithuania thus preventing the implementation of digital assignments and allotments on these channels, the Republic of Lithuania is forced to use digital assignments, coordinated with those neighbouring countries under the conditions set by the Stockholm Agreement 1961 and registered in the updated Plan associated with that Agreement.

40

Original: French

For the Kingdom of Morocco:

Declaration 1:

In signing the Final Acts of the 2006 Regional Radiocommunication Conference for the planning of digital broadcasting, the delegation of the Kingdom of Morocco reserves for its Government the right to take any measure deemed necessary to safeguard its interests should any Member of the Union fail, in any way, to respect the provisions of this Agreement and the associated Plans.

Declaration 2:

The towns of Sebta (Ceuta) and Melillia (Melilla), together with their areas, are an integral part of the territory of the Kingdom of Morocco. Consequently, the Moroccan Administration enters reservations with respect to the entry of broadcasting assignments in the aforementioned territories on behalf of Spain in the Plans of the 2006 Regional Radiocommunication Conference. The signature of the Final Acts of this Conference in no way implies recognition of Spanish sovereignty over those territories.

41

Original:
French

For the Republic of Cameroon:

In signing the Final Acts of the Regional Radiocommunication Conference (RRC-06) for the planning of the digital terrestrial broadcasting service in parts of Regions 1 and 3, in the frequency bands 174-230 MHz and 470-862 MHz (Geneva, 2006), the Cameroonian delegation, following the policy of its Government, which is to contribute fully to the development of the information society and of international cooperation, in a spirit of peace and mutual respect, undertakes to fulfil its commitments under these Final Acts.

It reserves for its Government the right to approve these Final Acts and to take any measures it may deem necessary to safeguard national interests should any member fail in any way to respect the provisions of the Agreement and the associated Plans contained in these Final Acts.

42

Original: English/Spanish/ French/Russian

For the People's Democratic Republic of Algeria, the Federal Republic of Germany, the Principality of Andorra, Austria, Belgium, Bosnia and Herzegovina, the Republic of Bulgaria, Burkina Faso, the Republic of Burundi, the Republic of Cameroon, the Republic of Cape Verde, the Republic of Cyprus, the Vatican City State, the Republic of Côte d'Ivoire, the Republic of Croatia, Denmark, Spain, the Republic of Estonia, Finland, France, the Gabonese Republic, Greece, the Republic of Hungary, Ireland, Italy, the Republic of Latvia, The Former Yugoslav Republic of Macedonia, the Principality of Liechtenstein, the Republic of Lithuania, Luxembourg, the Republic of Mali, Malta, the Kingdom of Morocco, the Principality of Monaco, Norway, the Kingdom of the Netherlands, the Republic of Poland, Portugal, the Slovak Republic, the Czech Republic, Romania, the United Kingdom of Great Britain and Northern Ireland, the Republic of San Marino, the Republic of Senegal, Serbia, the Republic of Slovenia, Sweden, the Confederation of Switzerland, the Republic of Chad, the Togolese Republic, Tunisia, Turkey and Ukraine:

At the time of signing the Final Acts of the Regional Radiocommunication Conference for planning of the digital terrestrial broadcasting service in parts of Regions 1 and 3, in the frequency bands 174-230 MHz and 470-862 MHz (Geneva, 2006), the delegations of the above-mentioned countries formally declare that their Administrations may use their digital Plan entries for broadcasting or other terrestrial applications with characteristics that may be different from those appearing in the Plan within the envelope of their digital Plan entries under the provisions of the GE06 Agreement and the Radio Regulations, and that their administrations agree that any such use will be afforded protection to the levels defined by the interfering field strengths as arising from their digital Plan entries, taking into account any relevant bilateral agreements.

43

Original: English

For the State of Israel:

1 The Government of the State of Israel hereby declares its right to take any action it deems necessary, subject to the Constitution and the Convention of the ITU, as amended from time to time, in order to protect its interests and to safeguard the operation of its telecommunication services, should they be adversely affected by a Member State of the ITU failing to comply with the Constitution and Convention, the Radio Regulations or the Final Acts of RRC-06 or should they be adversely affected as a result of a declaration or reservation to the Final Acts made by another Member State.

2 The Government of the State of Israel refers to the footnote to the title of the Agreement as found in the Final Acts (notably: "The provisions of this Agreement shall apply *mutatis mutandis*, to Palestine as referred to in Resolution 99 (Minneapolis, 1998) subject to Palestine notifying the ITU Secretary-General that it accepts the rights and commits to observe the obligations arising therefrom.") and states its position in respect thereof as follows:

a) the interpretation and application of this footnote by all concerned must be in accordance with and subject to any existing or future bilateral Israeli-Palestinian agreements or arrangements, including the Israeli-Palestinian Interim Agreement on the West Bank and the Gaza Strip, signed in Washington, on September 28, 1995. Furthermore, Israel shall interpret and apply this footnote in accordance with and subject to applicable Israeli law. In this context Israel reiterates its reservation to Resolution 99 (Minneapolis PP-1998);

b) these declarations and reservations shall apply, *mutatis mutandis*, to the Palestinian observer, referred to in the said footnote in the event that the Palestine observer notifies the ITU Secretary-General that it undertakes to observe the obligations arising from the Final Acts or makes a substantially similar notification.

3 With reference to the notification of stations in the Golan Heights by the Syrian Administration and the inclusion of such stations in the Plan as found in the Final Acts: Israel notes that this area is not administered by Syria, nor are the said stations administered or operated by Syria. Therefore, the notification and registration of the said stations contravene Resolution 1 (Rev.WRC-97) and the RRB Rule of Procedure relating thereto entitled "Rules concerning Resolution 1 (Rev.WRC-97) - Notification of frequency assignments" in respect of "Terrestrial services" therein, and such registrations are devoid of legal validity. The State of Israel will proceed on the assumption that the registrations have no bearing whatsoever with respect to the rights and duties of any Member State of the ITU and reserves its right to take any action it deems necessary to protect its interests and to safeguard the operation of its telecommunication services.

4 The Government of the State of Israel notes that: The great majority of stations situated in the West Bank and operated by the Palestinian observer, which the Palestinian observer submitted to RRC-06 for inclusion in the Plan, have been registered therein. On the other hand, only 2 stations operated by Israel in the West Bank, which Israel submitted to RRC-06 for inclusion in the Plan, have been registered therein. Israel protests this disparity, which is likewise inconsistent with Resolution 1 (Rev.WRC-97) and the RRB Rule of Procedure relating thereto, and refers in this context to § 2a) above.

Israel notes and protests the fact that the above-mentioned stations registered by the Palestinian observer were registered according to administration code PSE, while the above-mentioned stations registered by Israel were registered according to administration code XYZ and not code ISR. In the light of the use of code XYZ, and given the applicability of Resolution 1 (Rev.WRC-97) and the RRB Rule of Procedure relating thereto in this situation, Israel reserves its right to relate to the former stations according to a code other than PSE.

5 The Government of the State of Israel reserves the right to amend the foregoing reservations and declarations and to make any further reservations and declarations it may consider necessary up to the time of depositing its instrument of ratification of the Final Acts of RRC-06.

44

Original:
English/Spanish/
French/Russian

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

At the time of signing the Final Acts of the Regional Radiocommunication Conference for planning of the digital terrestrial broadcasting service in parts of Regions 1 and 3, in the frequency bands 174-230 MHz and 470-862 MHz (Geneva, 2006), the delegations of the above-mentioned countries formally declare that they maintain the declarations and reservations made by their countries when signing the Final Acts of previous treaty-making conferences of the Union as if they were made in full at this Regional Radiocommunication Conference.

45

Original: English

For Italy:

The Italian delegation, in signing the Final Acts of the Regional Radiocommunication Conference (Geneva, 2006), reserves for its Government the right to provide further declarations or reservations, at any time it considers proper between the date of the signature and the date of depositing instrument of ratification or approval, that may be required or to take any action consistent with its national and international law that it may consider or deem necessary or useful to protect and safeguard its sovereign and inalienable rights and legitimate interests, should any Member of the International Telecommunication Union fail in any way to comply with or apply this Agreement, or should the acts of other entities or third parties affect its national sovereignty or the proper operation of its electronic communication services, or should possible reservations made by other countries jeopardize the efficient operation of its electronic communication services.

The Italian delegation considers also necessary to inform the other Contracting Administrations that in Italy, because of the geographical particularities of the country, it has been necessary to set up broadcasting networks which consist of a high number of stations to cover the entire territory with intense use of the spectrum and changes in the characteristics of broadcasting stations already in use would be a matter of serious technical difficulty.

46

Original: English

For the Azerbaijani Republic:

The Communications Administration of the Republic of Azerbaijan does not agree with the reference situation and reserves the right to protect its existing assignments of TV broadcasting and other primary services (which have been registered in the MIFR) and to resolve outstanding issues on the basis of bilateral and multilateral agreements and protocols.

Additional Declarations and Reservations

47

Original: Spanish

For Spain:

With respect to Declaration 40-2 entered by the Kingdom of Morocco, which makes reference to the Autonomous Cities of Ceuta and Melilla, the Spanish Government affirms that they are an integral part of the territory of the Kingdom of Spain, which exercises its full and complete sovereignty over those territories. Accordingly, the Kingdom of Spain, in the exercise of its legitimate rights, reiterates that broadcasting assignments in the territories of Ceuta and Melilla must continue to be entered on behalf of Spain in the Plans of the 2006 Regional Radiocommunication Conference.

48

Original: English

For the Arab Republic of Egypt:

The Egyptian delegation refuses the incorrect declaration mentioned in Document 174(Rev.1) dated 15 June 2006 by the Sudan delegation.

Furthermore, the Egyptian delegation would like to emphasis the following facts:

1 The triangle of Halayeb is a part of the Egyptian territory and is always under the sovereignty of Egypt and it has never been other than that.

2 The Egyptian delegation reserves their rights towards their assigned channels in the triangle of Halayeb, knowing that the (IDWM) has been approved as it exists now since May 2005.

3 Bearing in mind that Egypt has analogue assignments recorded in the Plan GE89 inside the triangle of Halayeb (Halayeb site and Marsa Shaab site).

4 Since 1989 and until now, Egypt has TV transmitters operating on air in Halayeb site.

5 There are declarations between Egypt and Sudan (**All to All**) for the four iterations of the Conference RRC-06 in the period 15 May 2006 to 16 June 2006.

Furthermore after reviewing other declarations contained in Document 174(Rev.1), the Egyptian Administration reserves the right to take any steps necessary to protect its broadcasting service and indeed any other services if any Contracting Member State to the Agreement, contravenes any term or condition of the Agreement either in whole or in part.

The Egyptian delegation insists that this additional declaration appears in the Final Acts of RRC-06.

49

Original: English

For Turkey:

In reviewing the declarations contained in Document 174(Rev.1):

1 The delegation of the Republic of Turkey declares its right to make further declarations or reservations at the time of the deposit of its instruments of ratification of the Final Acts of RRC-06.

2 Furthermore, the delegation of the Republic of Turkey reserves the right for its Government under the Constitution and Convention of ITU, to take any action it deems necessary, to protect its interests and to safeguard the operation of its telecommunication services, should a member of the ITU fail to respect or comply with the Constitution and Convention of the ITU, the Radio Regulations or the Final Acts of RRC-06 or should a declaration or reservation to the Final Acts of RRC-06 or any action of another Member jeopardize the smooth operation of the telecommunication services in Turkey.

50

Original: French

For the Republic of Senegal:

Taking note of the declarations contained in Document 174(Rev.1), the delegation of the Republic of Senegal, in signing the Final Acts of the Regional Radiocommunication Conference for the planning of the digital terrestrial broadcasting service in parts of Regions 1 and 3, in the frequency bands 174-230 MHz and 470-862 MHz (Geneva, 2006), declares that it reserves for its Government the right to approve them in accordance with the domestic laws in force, and to take all necessary measures to safeguard its national interests should any country fail or refuse to comply with them.

51

Not Used

52

Original: French

For the Republic of Côte d'Ivoire:

The delegation of the Republic of Côte d'Ivoire further declares that it reserves for its Government the right:

– to enter additional declarations or reservations at the time of depositing its instruments of ratification of this Agreement;

– to take any measures necessary to safeguard its national interests should any State that is party to the Agreement or merely a signatory neglect or fail to respect the provisions of these Final Acts or to comply with them, or should reservations entered by any other country jeopardize the smooth operation of its telecommunication services.

53

Original: English

For the Islamic Republic of Iran:

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

The delegation of the Islamic Republic of Iran to the Regional Radiocommunication Conference for the planning of the digital terrestrial broadcasting service in Region 1 (parts of Region 1 situated to the west of meridian 170º E and to the north of parallel 40º S, except the territory of Mongolia) and in the Islamic Republic of Iran, in the frequency bands 174-230 MHz and 470-862 MHz (Geneva, RRC-06), having noted the declaration made by the delegation of the Kingdom of the Saudi Arabia as mentioned in No. 36, declares the following:

1 The United Nations adopted geographical designations should in principle predominate in any references made, in internationally agreed documents, reports, etc., in respect of international and regional territories and waterways. Based on the United Nations Secretary directive ST/cs/ser.A/29/Rev.1, dated 14 May 1999, the full term "Persian Gulf" is the standard geographical designation for the sea area between the Arabian Peninsula and the Islamic Republic of Iran and is always used to designate that sea area.

2 Accordingly, the maritime zone referred to as Zone C in § 2.2.2 of the Chapter 2 of the Agreement, shall be termed as Persian Gulf and the land strip referred to as Zone D in the same section, shall be termed as Persian Gulf Coast Line.

54

Original: English

For the Islamic Republic of Iran:

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

At the time of signing the Final Acts of the Regional Radiocommunication Conference for the planning of the digital terrestrial broadcasting service in Region 1 (parts of Region 1 situated to the west of meridian 170º E and to the north of parallel 40º S, except the territory of Mongolia) and in the Islamic Republic of Iran, in the frequency bands 174-230 MHz and 470-862 MHz (RRC-06, Geneva), the delegation of the Islamic Republic of Iran having noted the declaration made by some delegations as mentioned in No. 42, declares that the above-mentioned declaration is in contradiction with the provision 5.1.7 of Article 5 of the Agreement and is not therefore acceptable to this Administration. This Administration further declares that any bilateral or multilateral agreement concluded between any administrations shall, in no way, have any impact, whatsoever, on any other administration which is not party to that bilateral or multilateral agreement.

55

Original: English

For the Islamic Republic of Iran:

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

The delegation of the Islamic Republic of Iran to the Regional Radiocommunication Conference for the planning of the digital terrestrial broadcasting service in Region 1 (parts of Region 1 situated to the west of meridian 170º E and to the north of parallel 40º S, except the territory of Mongolia) and in the Islamic Republic of Iran, in the frequency bands 174-230 MHz and 470-862 MHz (RRC-06, Geneva), having noted the declaration made by one delegation as mentioned in No. 18, declares that Abu Musa Island in the Persian Gulf Region is an integral part of the territory of the Islamic Republic of Iran. It is, therefore, the sovereign right of the Islamic Republic of Iran to establish any telecommunication and broadcasting services, as deemed necessary, for its nationals within the above-mentioned Island. No reservation in this regard is therefore acceptable.

56

Original: English

For the Republic of Slovenia:

Referring to the declarations and reservations presented in Document 174(Rev.1) the Slovenian delegation declares the following statement:

The Slovenian delegation reserves for the Government of the Republic of Slovenia the right to take any measures it deems appropriate to safeguard its interests in respect of the broadcasting service and other radiocommunication services should a Contracting Member fail in its obligations resulting from the provisions of the Geneva 2006 (RRC-06) Agreement and its Annexes, the Radio Regulations or the Constitution and Convention of the International Telecommunication Union, or should reservations or actions by a State jeopardize the satisfactory operation of the broadcasting service and other telecommunication services in Slovenia.

57

Original: English

For the Republic of Estonia:

In response to declarations and reservations made at the signing of the Final Acts of the Regional Radiocommunication Conference (Geneva, 2006), the delegation of the Republic of Estonia reserves for the Government of the Republic of Estonia the right to take any action they may consider necessary to protect their interests should any member of the Union fail to comply with the provisions of the Final Acts of this Conference or the bilateral and multilateral coordination agreements on the use of frequencies, signed during the preparation and proceedings of RRC-06, or should reservations made upon signing the Final Acts, or other measures taken by any Member of the Union, jeopardize the normal operation of those countries' telecommunication services.

58

Original: French

For the Republic of Chad:

In examining Document 174(Rev.1) of the Regional Radiocommunication Conference (RRC-06) for the planning of the digital terrestrial broadcasting service in parts of Regions 1 and 3, in the frequency bands 174-230 MHz and 470-862 MHz (Geneva, 2006), the delegation of Chad, following the policy of its Government, which is to contribute fully to the development of information and communication technology, undertakes to fulfil its commitments under these Final Acts.

It reserves for its Government the right to take any measures it may deem appropriate to safeguard its interests should any Members fail to respect the provisions of these Final Acts and the Annexes thereto, or should the reservations entered by other countries cause harmful interference or jeopardize the smooth operation of its telecommunication services, particularly its broadcasting service.

59

Original: English

For the Islamic Republic of Iran:

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

At the time of signing the Final Acts of the Regional Radiocommunication Conference for the planning of the digital terrestrial broadcasting service in Region 1 (parts of Region 1 situated to the west of meridian 170° E and to the north of parallel 40° S, except the territory of Mongolia) and in the Islamic Republic of Iran, in the frequency bands 174-230 MHz and 470-862 MHz (RRC-06, Geneva), the delegation of the Islamic Republic of Iran having noted Declaration/Reservation 46, declares that:

1 The RRC-06 conference established on the basis of the criteria as contained in § 1.7 of the Report of the First Session, the "Reference situation" of assignments to analogue television stations and assignments to other primary terrestrial services and approved them.

2 All four planning iterations carried out by the Conference were based on that approved “Reference situation”.

3 Consequently any assignments to analogue stations or assignments to other primary terrestrial stations recorded in the MIFR to being brought into use but were not included in that approved “Reference situation” are not legitimate and shall not be eligible to any protection on 17 June 2006, at 0001 UTC hours.

4 Based on the clear decision of the Conference, assignments referred to in § 3 above shall not be protected at all.

5 The operation of any non-coordinated assignments referred to in 3 above which were not in the “Reference situation” are not in conformity with the Agreement and shall cease operation as of 17 June 2006, 0001 UTC hours and must be removed from the MIFR by the Bureau.

60

Original: French

For Tunisia:

Taking note of the declarations contained in Document 174(Rev.1) of the GE06 Agreement, the delegation of Tunisia, in signing the Final Acts of the Regional Radiocommunication Conference for the planning of the digital terrestrial broadcasting service in parts of Regions 1 and 3, in the frequency bands 174-230 MHz and 470-862 MHz (Geneva, 2006), declares:

1 that it reserves the right to enter additional declarations or reservations at the time of depositing the instrument of ratification of this Agreement;

2 that it reserves fully for its Government the right to take all measures that it might deem necessary to safeguard its interests:

– should a Member State of the International Telecommunication Union fail to respect or comply with the provisions of these Final Acts and their associated Agreements and Plans;

– should the consequences of existing or future reservations by any other Member State jeopardize the smooth operation of its radiocommunication and telecommunication services, or threaten its sovereignty.

61

Original: English

For the Republic of Cyprus:

In reference to Document 174(Rev.1), it is regrettable that the Government of Turkey refused to engage in any technical coordination with the Republic of Cyprus during the Regional Radiocommunication Conference 2006 and has chosen to politicize a purely technical issue. The Republic of Cyprus, a Member State of the United Nations and of the European Union (EU), has been a victim of military brutal aggression and occupation of 36.4% of its territory by Turkey since 1974. In November 1983, the illegal regime in the occupied area of Cyprus purportedly self-proclaimed a separate pseudostate under the name “Turkish Republic of Northern Cyprus”. The Security Council of the United Nations, in its resolutions 541 (1983) and 550 (1984), *inter alia*, condemned the purported secession of part of the Republic of Cyprus’ territory, considered its “unilateral declaration of independence” as “legally invalid” and “called for its withdrawal”, and moreover, “called upon all States not to recognize any Cypriot State other than the Republic of Cyprus” and “not to facilitate or in any way assist the aforesaid secessionist entity”. It should also be noted that the illegal entity, set up in the occupied part of Cyprus, is not recognized by any international organization or country, with the sole exception of the occupying power, Turkey.

The EU in which Cyprus is a Member States and Turkey aspires to become a member, calls on Turkey to fulfill its obligations to all EU Member States under Turkey’s association agreement, and take concrete steps for the normalization of bilateral relations between Turkey and all EU Member States, including the Republic of Cyprus, as soon as possible.

It is therefore necessary for Turkey to start cooperating with the Republic of Cyprus in the frame of the Constitution and Convention of the ITU.

62

Original: English

For the Republic of Iraq:

In making reference to Declaration 42, contained in Document 174(Rev.1), the delegation of the Administration of the Republic of Iraq to the Regional Radiocommunication Conference (RRC-06) for the planning of the digital terrestrial broadcasting service, reserves the Republic of Iraq’s right to take any action it may deem necessary to safeguard the interests of the terrestrial broadcasting services and other telecommunication services in the Republic of Iraq should any member fail to comply with the relevant provisions of this Final Acts of the Plan or through reservations made or other measures that jeopardize the satisfactory operation of the television and telecommunication services of the Republic of Iraq.

63

Original: English

For the Republic of Croatia:

In reviewing the declarations and reservations made by Member States and contained in Document 174(Rev.1), the delegation of Croatia on behalf of its Government declares the additional declaration as follows:

The delegation of Croatia reserves for its Government the right to enter further declarations or reservations upon depositing its instruments of ratification of this Agreement.

In signing the Final Acts of the Regional Radiocommunication Conference for the planning of the digital terrestrial broadcasting service in parts of Regions 1 and 3, in the frequency bands 174-230 MHz and 470-862 MHz (Geneva, 2006), the Croatian delegation assumes that all co-signatory delegations and their Governments will comply with this Agreement and corresponding Plans, regardless of their national specific situations.

In signing the Final Acts of the Regional Radiocommunication Conference (RRC-06) the Croatian delegation reserves for the Government of the Republic of Croatia the right to take any steps it may consider necessary to safeguard the interests of its broadcasting and other electronic communication services, should any Member fail to comply with the relevant provisions of this Agreement or should reservations or measures by other countries jeopardize the satisfactory operation of the electronic communication services of Croatia.

64

Original: English

For the State of Israel:

1 Declaration 34, made by the Syrian Arab Republic and Declaration 37 made by certain additional Member States in respect of the Final Acts, contravene the principles and purposes of ITU and the work of RRC-06, and are therefore devoid of legal validity. Israel rejects the aforesaid declarations, which politicize and undermine the work of ITU and will assume that they have no bearing whatsoever with respect to the rights and duties of any Member State of ITU.

2 Should any of the Member States that have made the foregoing declarations violate Israel's right as a Member State of ITU, or breach such Member State's obligations towards Israel as such, Israel reserves the right to act toward such Member State in a reciprocal fashion and to take any action it deems necessary to protect its interests and to safeguard the operation of its telecommunication services.

3 Israel protests the relatively low number of digital TV stations it is assigned in the Plan because of the refusal of the Syrian Arab Republic, Lebanon and the Kingdom of Saudi Arabia to conduct technical coordination with it.

4 The State of Israel reiterates its unreserved right to protect its wireless stations and telecommunication services from harmful interference.

5 Israel refers to Declaration 34 made by the Syrian Arab Republic: the station cited (geographic coordinates: WGS84: 35E 39' 00", 32N 48' 21" is registered within the territory of the State of Israel and Israel reiterates the Declaration, which it has made in respect of the Final Acts, in respect of the said station.

6 Israel notes that the footnote approved in Corrigendum 1 to Addendum 1 to Document 161 does not appear on page 37 of the printed Final Acts. Furthermore, the text of the footnote does not accurately reflect the registration status of stations registered under the “administration” code “XYZ”. The footnote should read “This entry was made by the Administration of Israel. The final “administration” symbol for the entry is pending further developments regarding the administration responsible for it.”

65

Original: English

For the Hashemite Kingdom of Jordan:

In reviewing Document 174(Rev.1) and in signing the Final Acts of the Regional Radiocommunication Conference for the planning of the digital terrestrial broadcasting service in the bands 174-230 MHz and 470-862 MHz (Geneva, 2006):

The Jordan delegation reserves for the Government of the Hashemite Kingdom of Jordan the right to take any measures it deems appropriate to safeguard its interests in respect of the broadcasting service and other primary services, in case a Contracting Member fails in its obligations resulting from the provisions of this Agreement or a reservation or actions taken by a State jeopardize the smooth operation of the aforementioned services in Jordan. Moreover, the delegation of Jordan reserves for its Government the right to enter further declarations or reservations upon depositing its instruments for ratification for this Agreement.

ANNEXES

ANNEX 1

Frequency Plans

1.1 T-DAB Plan assignments

No.	Data item
1	ITU serial number
2	ITU symbol for administration responsible for the T-DAB assignment
3	Unique identification code given by the administration for the assignment (AdminRefId)
4	Plan entry code (1 – Assignment, 2 – SFN, 3 – Allotment, 4 – Allotment with linked assignment(s) and SFN_id, 5 – Allotment with a single linked assignment and no SFN_id)
5	Assignment Code (L – Linked, or C – Converted, or S – Standalone)
6	Unique identification code for the associated allotment
7	ITU symbol for country or geographical area
8	Name of the location of the transmitting station
9	Geographical coordinates of the transmitting antenna
	9a latitude (±DDMMSS)
	9b longitude (±DDDMMSS)
10	Altitude of site above sea level (m)
11	Reference planning configuration (RPC 4, RPC 5)
12	Assigned frequency (MHz)
13	Frequency block
14	Frequency offset between the centre frequency of the emission and the centre frequency of the channel (kHz)
15	Polarization (H – Horizontal, V – Vertical, M – Mixed, U – Unspecified)
16	Maximum effective radiated power of the horizontally polarized component in the horizontal plane (dBW)
17	Maximum effective radiated power of the vertically polarized component in the horizontal plane (dBW)
18	Antenna directivity (D – Directional, ND – Non-directional)
19	Height of transmitting antenna above ground level (m)
20	Maximum effective antenna height (m)
21	Effective antenna height (m), at 36 different azimuths in 10° intervals, measured in the horizontal plane from True North in a clockwise direction
22	Antenna attenuation (dB) – horizontal: value of attenuation of the horizontally polarized component, normalized to 0 dB, at 36 different azimuths in 10° intervals, measured in the horizontal plane from True North in a clockwise direction
23	Antenna attenuation (dB) – vertical: value of attenuation of the vertically polarized component, normalized to 0 dB, at 36 different azimuths in 10° intervals, measured in the horizontal plane from True North in a clockwise direction
24	Spectrum mask (1, 2, 3 – see § 3.6.1 of Chapter 3 of Annex 2 of this Agreement)

No.	Data item
25	Identification code for an SFN
26	Remarks
26-1	Remarks with respect to assignments in the analogue Plan of the following administrations (ITU symbol)
26-2	Remarks with respect to entries to the digital Plan of the following administrations (ITU symbol)
26-3	Remarks with respect to *existing assignments to other primary terrestrial services* of the following administrations (ITU symbol)

1.2 T-DAB Plan allotments

No.	Data item
1	ITU serial number
2	ITU symbol for administration responsible for the T-DAB allotment
3	Unique identification code given by the administration for the allotment (AdminRefId)
4	Plan entry code (1 – Assignment, 2 – SFN, 3 – Allotment, 4 – Allotment with linked assignment(s) and SFN_id, 5 – Allotment with a single linked assignment and no SFN_id)
5	ITU symbol for country or geographical area
6	Digital broadcasting allotment name
7	ITU symbol for country or geographical area if all the test points for the allotment are on country or geographical area boundary
8	Number of subareas (up to 9) within the allotment if not all the test points for the allotment are on the country boundary; if there is no subdivision of the allotment, number = 1
9	For each subarea within the allotment:
	9a a unique contour number (1 to 9)
	9b the number of subarea boundary test points (up to 99)
	9c the geographical coordinates of each subarea boundary test point consisting of:
	9c1 latitude (±DDMMSS)
	9c2 longitude (±DDDMMSS)
10	Reference planning configuration (RPC 4, RPC 5)
11	Assigned frequency (MHz)
12	Frequency block
13	Frequency offset between the centre frequency of the emission and the centre frequency of the channel (kHz)
14	Polarization (H – Horizontal, V – Vertical, M – Mixed, U – Unspecified)
15	Spectrum mask (1, 2, 3 – see § 3.6.1 of Chapter 3 of Annex 2 of this Agreement)
16	Identification code for an SFN
17	Remarks
17-1	Remarks with respect to assignments in the analogue Plan of the following administrations (ITU symbol)
17-2	Remarks with respect to entries to the digital Plan of the following administrations (ITU symbol)
17-3	Remarks with respect to *existing assignments to other primary terrestrial services* of the following administrations (ITU symbol)

1.3 DVB-T Plan assignments

No.	Data item
1	ITU serial number
2	ITU symbol for administration responsible for the DVB-T assignment
3	Unique identification code given by the administration for the assignment (AdminRefId)
4	Plan entry code (1 – Assignment, 2 – SFN, 3 – Allotment, 4 – Allotment with linked assignment(s) and SFN_id, 5 – Allotment with a single linked assignment and no SFN_id)
5	Assignment Code (L – Linked, or C – Converted, or S – Standalone)
6	Unique identification code for the associated allotment
7	ITU symbol for country or geographical area
8	Name of the location of the transmitting station
9	Geographical coordinates of the transmitting antenna:
	9a latitude (±DDMMSS)
	9b longitude (±DDDMMSS)
10	Altitude of site above sea level (m)
	Either 11 and 12, or 13
11	Digital television system (A, B, C, D, E, F and 1, 2, 3, 5, 7)
12	Reception mode (FX, PO, PI, MO)
13	Reference planning configuration (RPC 1, RPC 2, RPC 3)
14	Assigned frequency (MHz)
15	Channel number
16	Frequency offset between the centre frequency of the emission and the centre frequency of the channel (kHz)
17	Polarization (H – Horizontal, V – Vertical, M – Mixed, U – Unspecified)
18	Maximum effective radiated power of the horizontally polarized component in the horizontal plane (dBW)
19	Maximum effective radiated power of the vertically polarized component in the horizontal plane (dBW)
20	Antenna directivity (D – Directional, ND – Non-directional)
21	Height of transmitting antenna above ground level (m)
22	Maximum effective antenna height (m)
23	Effective antenna height (m), at 36 different azimuths in 10° intervals, measured in the horizontal plane from True North in a clockwise direction
24	Antenna attenuation (dB) – horizontal: value of attenuation of the horizontally polarized component, normalized to 0 dB, at 36 different azimuths in 10° intervals, measured in the horizontal plane from True North in a clockwise direction
25	Antenna attenuation (dB) – vertical: value of attenuation of the vertically polarized component, normalized to 0 dB, at 36 different azimuths in 10° intervals, measured in the horizontal plane from True North in a clockwise direction
26	Spectrum mask (N = Non-critical, S = Sensitive)
27	Identification code for an SFN

No.	Data item
28	Remarks
28-1	Remarks with respect to assignments in the analogue Plan of the following administrations (ITU symbol)
28-2	Remarks with respect to entries to the digital Plan of the following administrations (ITU symbol)
28-3	Remarks with respect to *existing assignments to other primary terrestrial services* of the following administrations (ITU symbol)

1.4 DVB-T Plan allotments

No.	Data item
1	ITU serial number
2	ITU symbol for administration responsible for the DVB-T allotment
3	Unique identification code given by the administration for the allotment (AdminRefId)
4	Plan entry code (1 – Assignment, 2 – SFN, 3 – Allotment, 4 – Allotment with linked assignment(s) and SFN_id, 5 – Allotment with a single linked assignment and no SFN_id)
5	ITU symbol for country or geographical area
6	Digital broadcasting allotment name
7	ITU symbol for country or geographical area if all the test points for the allotment are on the country or geographical area boundary
8	Number of subareas (up to 9) within the allotment if not all the test points for the allotment are on the country boundary; if there is no subdivision of the allotment, number = 1
9	For each subarea within the allotment:
	9a a unique contour number (1 to 9)
	9b the number of subarea boundary test points (up to 99)
	9c the geographical coordinates of each subarea boundary test point consisting of:
	9c1 latitude (±DDMMSS)
	9c2 longitude (±DDDMMSS)
10	Reference planning configuration (RPC 1, RPC 2, RPC 3)
11	Type of reference network (RN1, RN2, RN3, RN4)
12	Assigned frequency (MHz)
13	Channel number
14	Frequency offset between the centre frequency of the emission and the centre frequency of the channel (kHz)
15	Polarization (H – Horizontal, V – Vertical, M – Mixed, U – Unspecified)
16	Spectrum mask (N = Non-critical, S = Sensitive)
17	Identification code for an SFN
18	Remarks
18-1	Remarks with respect to assignments in the analogue Plan of the following administrations (ITU symbol)
18-2	Remarks with respect to entries to the digital Plan of the following administrations (ITU symbol)
18-3	Remarks with respect to *existing assignments to other primary terrestrial services* of the following administrations (ITU symbol)

1.5 Frequency Assignment Plan for Analogue Television Broadcasting in the frequency bands 174-230 MHz (for Morocco 170-230 MHz) and 470-862 MHz in the transition period (see Article 12 of the Agreement)

Information included in the data items of the Plan

No.	Data item
1	ITU serial number
2	ITU symbol for administration responsible for the analogue assignment
3	Unique identification code given by the administration for the assignment (AdminRefId)
4	Channel number
5	Assigned frequency (MHz)
6	Vision carrier frequency offset (positive or negative multiples of 1/12 line frequency or kHz)
7	Sound carrier frequency offset (positive or negative multiples of 1/12 line frequency or kHz)
8	Frequency stability indicator (RELAXED, NORMAL or PRECISION)
9	Television system (B, B1, D, D1, G, H, I, K, K1, L, or M)
10	Colour system (P = PAL, S = SECAM)
11	Name of the location of the transmitting station
12	ITU symbol for country or geographical area
13	Geographical coordinates of the transmitting antenna:
	13a latitude (±DDMMSS)
	13b longitude (±DDDMMSS)
14	Altitude of site above sea level (m)
15	Height of transmitting antenna above ground level (m)
16	Maximum effective antenna height (m)
17	Effective antenna height (m) at 36 different azimuths in 10° intervals, measured in the horizontal plane from True North in a clockwise direction; if not provided, the value of the maximum effective antenna height is used for all 36 values
18	Polarization (H, V, M)
19	Maximum effective radiated power of the horizontally polarized component (dBW)
20	Maximum effective radiated power of the vertically polarized component (dBW)
21	Vision to sound carrier power ratio
22	Antenna directivity (D, ND)
23	Antenna attenuation (dB) – horizontal. The value of attenuation of the horizontally polarized component, at 36 different azimuths in 10° intervals, measured in the horizontal plane from True North in a clockwise direction, relative to the maximum gain of the transmitting antenna
24	Antenna attenuation (dB) – vertical. The value of attenuation of the vertically polarized component, at 36 different azimuths in 10° intervals, measured in the horizontal plane from True North in a clockwise direction, relative to the maximum gain of the transmitting antenna
25	Remarks

Note – The analogue television broadcasting plan is published in electronic format in the CD-ROM attached to these Final Acts. The recapitulative list of the number of analogue television assignments, per administration, is provided in Table 1-1.

TABLE 1-1

Recapitulative list of number of analogue television assignments as they appear in the Frequency Assignment Plan for Analogue Television Broadcasting in the frequency bands 174-230 MHz (for Morocco 170-230 MHz) and 470-862 MHz in the transition period (see Article 12 of the Agreement)

Member State	ITU symbol	No. of analogue television assignments included in the analogue television Plan
Albania (Republic of)	ALB	4
Algeria (People's Democratic Republic of)	ALG	1 009
Germany (Federal Republic of)	D	9 590
Andorra (Principality of)	AND	4
Angola (Republic of)	AGL	193
Saudi Arabia (Kingdom of)	ARS	412
Armenia (Republic of)	ARM	12
Austria	AUT	1 736
Azerbaijani Republic	AZE	52
Bahrain (Kingdom of)	BHR	3
Belarus (Republic of)	BLR	314
Belgium	BEL	66
Benin (Republic of)	BEN	55
Bosnia and Herzegovina	BIH	660
Botswana (Republic of)	BOT	221
Bulgaria (Republic of)	BUL	1 594
Burkina Faso	BFA	195
Burundi (Republic of)	BDI	32
Cameroon (Republic of)	CME	244
Cape Verde (Republic of)	CPV	35
Central African Republic	CAF	329
Cyprus (Republic of)	CYP	59
Vatican City State	CVA	4
Comoros (Union of the)	COM	40
Congo (Republic of the)	COG	326
Côte d'Ivoire (Republic of)	CTI	200
Croatia (Republic of)	HRV	1 422
Denmark	DNK	260
Djibouti (Republic of)	DJI	12
Egypt (Arab Republic of)	EGY	308
United Arab Emirates	UAE	58
Eritrea	ERI	12
Spain	E	8 410
Estonia (Republic of)	EST	68
Ethiopia (Federal Democratic Republic of)	ETH	111
Russian Federation	RUS	6 681
Finland	FIN	818
France	F	13 125
Gabonese Republic	GAB	224
Gambia (Republic of the)	GMB	12
Georgia	GEO	94

TABLE 1-1 (*continued*)

Member State	ITU symbol	No. of analogue television assignments included in the analogue television Plan
Ghana	GHA	39
Greece	GRC	2 105
Guinea (Republic of)	GUI	103
Guinea-Bissau (Republic of)	GNB	28
Equatorial Guinea (Republic of)	GNE	25
Hungary (Republic of)	HNG	714
Iran (Islamic Republic of)	IRN	2 096
Iraq (Republic of)	IRQ	345
Ireland	IRL	781
Iceland	ISL	4
Israel (State of)	ISR	15
Italy	I	3 677
Socialist People's Libyan Arab Jamahiriya	LBY	322
Jordan (Hashemite Kingdom of)	JOR	140
Kazakhstan (Republic of)	KAZ	1 837
Kenya (Republic of)	KEN	497
Kuwait (State of)	KWT	22
Lesotho (Kingdom of)	LSO	22
Latvia (Republic of)	LVA	106
The Former Yugoslav Republic of Macedonia	MKD	472
Lebanon	LBN	21
Liberia (Republic of)	LBR	41
Liechtenstein (Principality of)	LIE	12
Lithuania (Republic of)	LTU	154
Luxembourg	LUX	11
Madagascar (Republic of)	MDG	117
Malawi	MWI	51
Mali (Republic of)	MLI	287
Malta	MLT	11
Montenegro (Republic of)	MNE	265
Morocco (Kingdom of)	MRC	356
Mauritius (Republic of)	MAU	29
Mauritania (Islamic Republic of)	MTN	132
Moldova (Republic of)	MDA	298
Monaco (Principality of)	MCO	3
Mozambique (Republic of)	MOZ	242
Namibia (Republic of)	NMB	309
Niger (Republic of the)	NGR	159
Nigeria (Federal Republic of)	NIG	225
Norway	NOR	3 979
Oman (Sultanate of)	OMA	255
Uganda (Republic of)	UGA	36
Uzbekistan (Republic of)	UZB	1 213
Netherlands (Kingdom of the)	HOL	71
Poland (Republic of)	POL	802
Portugal	POR	694

TABLE 1-1 (*end*)

Member State	ITU symbol	No. of analogue television assignments included in the analogue television Plan
Qatar (State of)	QAT	17
Syrian Arab Republic	SYR	56
Democratic Republic of the Congo	COD	362
Kyrgyz Republic	KGZ	670
Slovak Republic	SVK	918
Czech Republic	CZE	1 660
Romania	ROU	323
United Kingdom of Great Britain and Northern Ireland	G	6 344
Rwanda (Republic of)	RRW	56
San Marino (Republic of)	SMR	1
Sao Tome and Principe (Democratic Republic of)	STP	3
Senegal (Republic of)	SEN	39
Serbia (Republic of)	SRB	889
Seychelles (Republic of)	SEY	11
Sierra Leone	SRL	14
Slovenia (Republic of)	SVN	867
Somali Democratic Republic	SOM	114
Sudan (Republic of the)	SDN	224
South Africa (Republic of)	AFS	712
Sweden	S	1 551
Switzerland (Confederation of)	SUI	2 581
Swaziland (Kingdom of)	SWZ	20
Tajikistan (Republic of)	TJK	672
Tanzania (United Republic of)	TZA	183
Chad (Republic of)	TCD	189
Togolese Republic	TGO	29
Tunisia	TUN	224
Turkmenistan	TKM	115
Turkey	TUR	539
Ukraine	UKR	1 551
Yemen (Republic of)	YEM	1 066
Zambia (Republic of)	ZMB	205
Zimbabwe (Republic of)	ZWE	200

Note by the Secretariat: This table reflects the partition of the analogue assignments of the former ITU Member State “Serbia and Montenegro” to the two independent States, namely the Republic of Serbia as continuator of “Serbia and Montenegro” and the Republic of Montenegro, using the geographical principles, as decided by RRC-06.

ANNEX 2
Technical elements and criteria used in the development of the Plan and the implementation of the Agreement

CHAPTER 1
To Annex 2

Definitions

TABLE OF CONTENTS

Page

1.1 Digital terrestrial broadcasting systems

1.1.1 Digital terrestrial television broadcasting (DTTB)

Digital television systems in the terrestrial broadcasting service which are described in Recommendation ITU-R BT.1306-3. DVB-T (Terrestrial Digital Video Broadcasting) corresponds to the DVB system, which is designated as “System B”.

1.1.2 Digital terrestrial sound broadcasting (DTSB)

Digital sound systems in the terrestrial broadcasting service which are described in Recommendation ITU-R BS.1114-5. T-DAB (Terrestrial Digital Audio Broadcasting) corresponds to the Eureka 147 DAB system, which is designated as “Digital System A”.

1.2 Frequency management

1.2.1 Frequency bands

Band III

Frequency range: 174-230 MHz.

Band IV

Frequency range: 470-582 MHz.

Band V

Frequency range: 582-862 MHz.

1.2.2 Coverage area

The coverage area of a broadcasting station, or a group of broadcasting stations, in the case of a single-frequency network (SFN, see definition in § 1.3.15 to this Chapter), is the area within which the wanted field strength is equal to or exceeds the usable field strength defined for specified reception conditions and for an envisaged percentage of covered receiving locations.

In defining the coverage area for each reception condition, a three-level approach is taken:

– *Level 1: Receiving location*

The smallest unit is a receiving location; optimal receiving conditions will be found by moving the antenna up to 0.5 m in any direction.

A receiving location is regarded as being covered if the level of the wanted signal is high enough to overcome noise and interference for a given percentage of the time.

– *Level 2: Small area coverage*

The second level is a “small area” (typically 100 m by 100 m).

In this small area the percentage of covered receiving locations is indicated.

– *Level 3: Coverage area*

The coverage area of a broadcasting station, or a group of broadcasting stations, is made up of the sum of the individual small areas in which a given percentage (e.g. 70% to 99%) of coverage is achieved.

1.2.3 Service area

The area within which the administration has the right to demand that the agreed protection conditions be provided.

1.3 Network planning

1.3.1 Allotment planning

In allotment planning, a specific channel is "given" to an administration to provide coverage over a defined area within its service area, called the allotment area. Transmitter sites and their characteristics are unknown at the planning stage and should be defined at the time of the conversion of the allotment into one or more assignments.

1.3.2 Assignment planning

In assignment planning, a specific channel is assigned to an individual transmitter location with defined transmission characteristics (for example, radiated power, antenna height, etc.).

1.3.3 Test points

A test point is a geographically defined location at which specified calculations are carried out.

1.3.4 Nuisance field strength

The nuisance field strength (E_n), expressed in dB(μV/m), is the field strength, for 50% of locations and for a given percentage of the time, of an unwanted signal from any potential interfering source, to which has been added the relevant protection ratio in decibels.

NOTE 1 – Where relevant, the appropriate value in decibels of receiving antenna directivity or polarization discrimination must be taken into account.

NOTE 2 – Where there are several unwanted signals, a method for combination of individual nuisance field strengths shall be applied, such as the power sum method or some other appropriate method for signal summation, in order to obtain the resultant nuisance field strength.

1.3.5 Minimum usable field strength/minimum field strength to be protected

Minimum value of the field strength necessary to permit a desired reception quality, under specified receiving conditions, in the presence of natural and man-made noise, but in the absence of interference from other transmitters.

NOTE 1 – The term "minimum usable field strength" corresponds to the term "minimum field strength to be protected" which appears in many ITU texts and it also corresponds to the term "minimum median field strength", which appears in § 1.3.9 to this Chapter as E_{med} used for coverage by a single transmitter only.

1.3.6 Usable field strength

Minimum value of the field strength necessary to permit a desired reception quality, under specified receiving conditions, in the presence of natural and man-made noise and of interference, either in an existing situation or as determined by agreements or frequency plans.

NOTE 1 – The term “usable field strength” corresponds to the term “necessary field strength” which appears in many ITU texts.

NOTE 2 – The usable field strength is calculated by combining the individual nuisance field strengths (E_n) and the combined location correction factor. One of the individual nuisance field-strength contributions is the minimum median field strength (E_{med}), which represents the noise level.

1.3.7 Reference field strength

The agreed value of the field strength that can serve as a reference or basis for frequency planning.

NOTE 1 – Depending on the receiving conditions and the quality required, there may be several reference field-strength values for the same service.

1.3.8 Minimum power flux-density φ_{min} (dB(W/m^2))

The minimum value of power flux-density at a particular receiving antenna location which is required to ensure that the minimum signal level is achieved for the receiver to successfully decode the signal.

NOTE 1 – φ_{min} is equal to the minimum required value of receiver input power (dBW) from which is subtracted the effective antenna aperture (dBm^2) and to which is added, when necessary, the feeder loss (dB).

1.3.9 Minimum median field strength E_{med} (dB(μV/m))

The appropriate value of minimum usable field strength to be used for coverage by a single transmitter only, being a value for 50% of locations and for 50% of the time at 10 m above ground level.

NOTE 1 – E_{med} depends on the median value of the minimum field strength (E_{min}) at the receiving place which is required for a given percentage of locations and percentage of the time to ensure that the minimum signal level necessary for the receiver to successfully decode the signal is achieved.

NOTE 2 – E_{med} is calculated from the minimum field strength (E_{min}) by adding, where relevant, appropriate correction factors as described in Appendix 3.4 to Chapter 3 of Annex 2 of the Agreement.

NOTE 3 – In the case of wideband signals where the spectral power density may not be constant across the occupied bandwidth, the term “field strength” is often replaced by the term “equivalent field strength”. The equivalent field strength is the field strength of a single unmodulated RF carrier radiated with the same power as the total radiated power of the wideband signal.

1.3.10 Coordination trigger field strength

Field-strength level which, when exceeded, determines that coordination is required (also referred to as trigger field strength).

1.3.11 Fixed reception

Fixed reception is defined as reception where a directional receiving antenna mounted at roof level is used.

It is assumed that near-optimal reception conditions (within a relatively small volume on the roof) are found when the antenna is installed.

In calculating the field strength for fixed antenna reception, a receiving antenna height of 10 m above ground level is considered to be representative for the broadcasting service. Other heights might be used for other services.

1.3.12 Portable reception

Portable reception is defined as:

– class A (outdoor), which means reception where a portable receiver with an attached or built-in antenna is used outdoors at no less than 1.5 m above ground level;

– class B (ground floor, indoor), which means reception where a portable receiver with an attached or built-in antenna is used indoors at no less than 1.5 m above floor level in rooms with the following characteristics:

  a) on the ground floor;

  b) with a window in an external wall.

Portable indoor reception on the higher floors will be regarded as class B reception with signal level corrections applied, although indoor ground floor reception is likely to be the most common case.

In both classes A and B, it is assumed that:

– optimal receiving conditions will be found by moving the antenna up to 0.5 m in any direction;

– the portable receiver is not moved during reception and large objects near the receiver are also not moved;

– extreme cases, such as reception in completely shielded rooms, are disregarded.

1.3.13 Mobile reception

Mobile reception is defined as reception by a receiver in motion with an antenna situated at no less than 1.5 m above ground level. This could for example be a car receiver or handheld equipment.

The dominant factor with regard to local reception effects is thought to be due to fading in a Rayleigh channel. Fade margins are intended to offset these effects. Fade margins depend on the frequency and the velocity.

1.3.14 Multifrequency network (MFN)

A network of transmitting stations using several RF channels.

1.3.15 Single-frequency network (SFN)

A network of synchronized transmitting stations radiating identical signals in the same RF channel.

1.3.16 Reference planning configuration (RPC)

A representative combination of criteria and parameters to be used for frequency planning purposes.

1.3.17 Reference network (RN)

A generic network structure representing a real network, as yet unknown, for the purposes of a compatibility analysis. The main purpose is to determine the potential for and susceptibility to interference of typical digital broadcasting networks.

1.3.18 Digital Plan entry

An assignment, or an allotment, or a combination of assignments that may or may not be linked to a single allotment and that, for the purposes of the implementation of the *Plan* and its modifications, is treated as a single entity.

APPENDIX 1.1

Definitions given in the Radio Regulations (RR) (Edition of 2004) and complemented by explanations in some relevant ITU-R Recommendations

Accepted interference (RR No. 1.168)

Administration (RR No. 1.2)

Aeronautical mobile service (RR No. 1.32)

Aeronautical mobile-satellite service (RR No. 1.35)

Aeronautical radionavigation service (RR No. 1.46)

African Broadcasting Area (RR Nos 5.10 to 5.13)

Allotment (of a radio frequency or radio-frequency channel) (RR No. 1.17)

Assigned frequency (RR No. 1.148)

Assignment (of a radio frequency or radio-frequency channel) (RR No. 1.18)

Broadcasting service (RR No. 1.38)

Broadcasting station (RR No. 1.85)

Broadcasting-satellite service (RR No. 1.39)

Carrier power (of a radio transmitter) (RR No. 1.159, Recommendation ITU-R V.573-4)

Coordination contour (RR No. 1.172)

Effective radiated power (e.r.p.) (in a given direction) (RR No. 1.162, Recommendation ITU-R V.573-4)

Emission (RR No. 1.138)

Equivalent isotropically radiated power (e.i.r.p.) (RR No. 1.161, Recommendation ITU-R V.573-4)

European Broadcasting Area (RR No. 5.14)

Fixed service (RR No. 1.20)

Gain of an antenna (RR No. 1.160)

Interference (RR No. 1.166)

Land mobile service (RR No. 1.26)

Mean power (of a radio transmitter) (RR No. 1.158)

Mobile service (RR No. 1.24)

Mobile-satellite service (RR No. 1.25)

Necessary bandwidth (RR. No. 1.152)

Out-of-band emission (RR No. 1.144)

Peak envelope power (of a radio transmitter) (RR No. 1.157)

Permissible interference (RR No. 1.167)

Power (RR No. 1.156)

Protection ratio (R.F.) (RR No. 1.170)

Radiation (RR No. 1.137)

Radio astronomy service (RR No. 1.58)

Radionavigation service (RR No. 1.42)

Spurious emission (RR No. 1.145)

Station (RR No. 1.61)

Terrestrial station (RR No. 1.62)

Unwanted emissions (RR No. 1.146)

CHAPTER 2
TO ANNEX 2

Propagation information

TABLE OF CONTENTS

Page

2.1 Overview

Recommendation ITU-R P.1546-2 forms the basis of a field-strength prediction method applicable for the broadcasting, land mobile, maritime mobile and certain fixed services (e.g. those using point-to-multipoint systems). The complete description of the prediction method is provided in Appendix 2.1 to this Chapter. The method can be applied using either graphical or automated (computer) procedures.

For the latter, tabulated values of the field-strength curves are provided in Appendix 2.2 to this Chapter, along with detailed instructions for interpolation and extrapolation. Field-strength curves associated with these tabulated values are provided in Appendix 2.3 to this Chapter.

Predictions can be made within the frequency range of the Plan for the following parameter ranges: path distance of 1 to 1 000 km; percentage of time of 1 to 50%; and for various transmitting antenna heights. The method draws a distinction between paths over land, cold seas and warm seas, makes due allowance for location variability for land area-service predictions and takes account of local clutter surrounding the receiving location. It also provides procedures for handling negative effective transmitting antenna heights and mixed-path propagation (i.e. with combinations of land and sea). The predictions are also used for calculating interference from mobile services where the term “base station” is used.

The method can be used with or without a terrain height database, although increased prediction accuracy would be expected when such data are available. However, terrain data were not used in the planning process.

For bilateral or multilateral coordinations, more path-specific propagation prediction methods can be used, for example using terrain height and/or ground cover data to achieve increased prediction accuracy with the prediction method described in Appendix 2.1 to this Chapter, and by calculating corrections for the terrain clearance angle.

For airborne stations of the aeronautical radionavigation service, free-space propagation should be used if there is a line-of-sight path instead of the method in Appendix 2.1 to this Chapter; otherwise, it is assumed that there is no signal. This is because, in general, the exact location of the aircraft is not known.

The source Recommendation ITU-R P.1546-2 applies to antenna heights up to 3 000 m only. For RRC-06 purposes, it is considered that terrestrial transmitter antenna heights greater than 3 000 m are erroneous.

2.2 General description of the methodology

The tabulated values of field strength versus distance in Appendix 2.2 to this Chapter give the predicted field-strength value as a function of frequency and effective antenna height, exceeded for 50% of locations for time percentages of 50%, 10% and 1%. The field-strength values are expressed in decibels relative to 1 μV/m (dB(μV/m)) for an e.r.p. of 1 kW in the direction of the reception point.

Effective transmitting antenna height values should be provided by administrations. Terrain data information could be used to provide a set of effective height values for cases where the relevant administration is not able to supply such information and requests assistance in determining these values. For calculation work in the ITU process, no terrain data is used.

The tabulated data are given for various types of areas and climates, namely, land, cold sea and warm sea, and the method includes a procedure for extrapolating the data to areas subject to extreme superrefractivity. Because of the very significant differences in propagation conditions for land and sea paths, a coastline must be included in the propagation prediction calculations to permit account to be taken of these differences in the calculation of interference levels.

Information on the type of propagation path, such as land, sea or mixed land-sea paths should be derived from digital maps indicating the coastlines, such as the ITU digitized world map (IDWM) available from BR. Information on cold sea/warm sea divisions and geographic data for other propagation areas and path types is given in § 2.2.2 to this Chapter.

The following sections contain a general description of the main aspects of the methodology in Appendix 2.1 to this Chapter and the use of the data in Appendices 2.2 and 2.3 to this Chapter.

2.2.1 Propagation curves

The propagation curves represented in the figures in Appendix 2.3 to this Chapter (and the corresponding tabulated values in Appendix 2.2 to this Chapter) establish the relationship between the field strength and the path length. The curves give the values of the field strength exceeded at 50% of locations and each figure corresponds to time percentages of 50%, 10% and 1% for one of the geographical zones defined below and shown on the map in Fig. 2.2-1.

The set of curves in each figure provide field-strength values for nominal values of the frequency, effective transmitting/base antenna heights and distance. For other values, interpolation/extrapolation formulas are provided in Appendix 2.1 to this Chapter.

All of the curves are given for field-strength values corresponding to a receiving/mobile antenna height of 10 m over neighbouring ground in open area. For other values and other environments, a correction factor is specified in Appendix 2.1 to this Chapter.

2.2.2 Geographical division

The propagation data used for the propagation prediction method are based on different geographic regions and climates, namely land, cold sea, warm sea and geographic regions subject to extreme superrefractivity.

Information on the type of propagation path, such as land, sea or mixed land-sea paths should be derived from digital maps indicating the coastlines, such as the IDWM available from BR. The definitions of the cold sea/warm sea divisions and geographic regions are shown below.

Zone 1: temperate and subtropical regions;

Zone 2: regions displaying propagation conditions characterized by low humidity, low precipitation and small annual variations in climate;

Zone 3: equatorial regions, displaying propagation conditions characteristic of hot and humid climates;

Zone 4: maritime regions, displaying propagation conditions found over warm seas where superrefraction conditions occasionally occur (Caspian Sea, Black Sea and all the seas around the African continent are Zone 4 except Zones A and B designated below);

Zone 5: maritime regions, displaying propagation conditions found over cold seas;

Zone A: maritime zone at low latitudes, frequently displaying superrefractivity;

Zone B: maritime zone at low latitudes, displaying superrefractivity to a lesser extent than Zone A;

Zone C: maritime zone from the junction of the coastline of the Islamic Republic of Iran with its border to Pakistan westward along the coastlines of the Islamic Republic of Iran and of Iraq, through point 48° E, 30° N along the coastline of Kuwait, the eastern coastline of Saudi Arabia, the coastlines of Qatar, the United Arab Emirates and Oman down to the intersection with parallel 22° N;

Zone D: land strip of maximum depth of 100 km surrounding Zone C and the West African land region consisting of two parts. The northerly part extends no more than 50 km inland from the Atlantic Ocean but is limited to the east by a line from 30° N 10° W to 20° N 13° W and to the west by the Atlantic coast. The southerly part is the land area west of two lines, one from 20° N 15° W to 15° N 12° W and the other from 15° N 12° W to 9° N 13° W, but not extending beyond the coastline.

Table 2.2-1 provides all the information on the parameters used to derive the tabulated values (see Appendix 2.2 to this Chapter) and the curves (see Appendix 2.3 to this Chapter) for different propagation zones. The d*N*-values are based on vertical refractivity gradient data in the lowest 65 m of the atmosphere (see Recommendation ITU-R P.453-9).

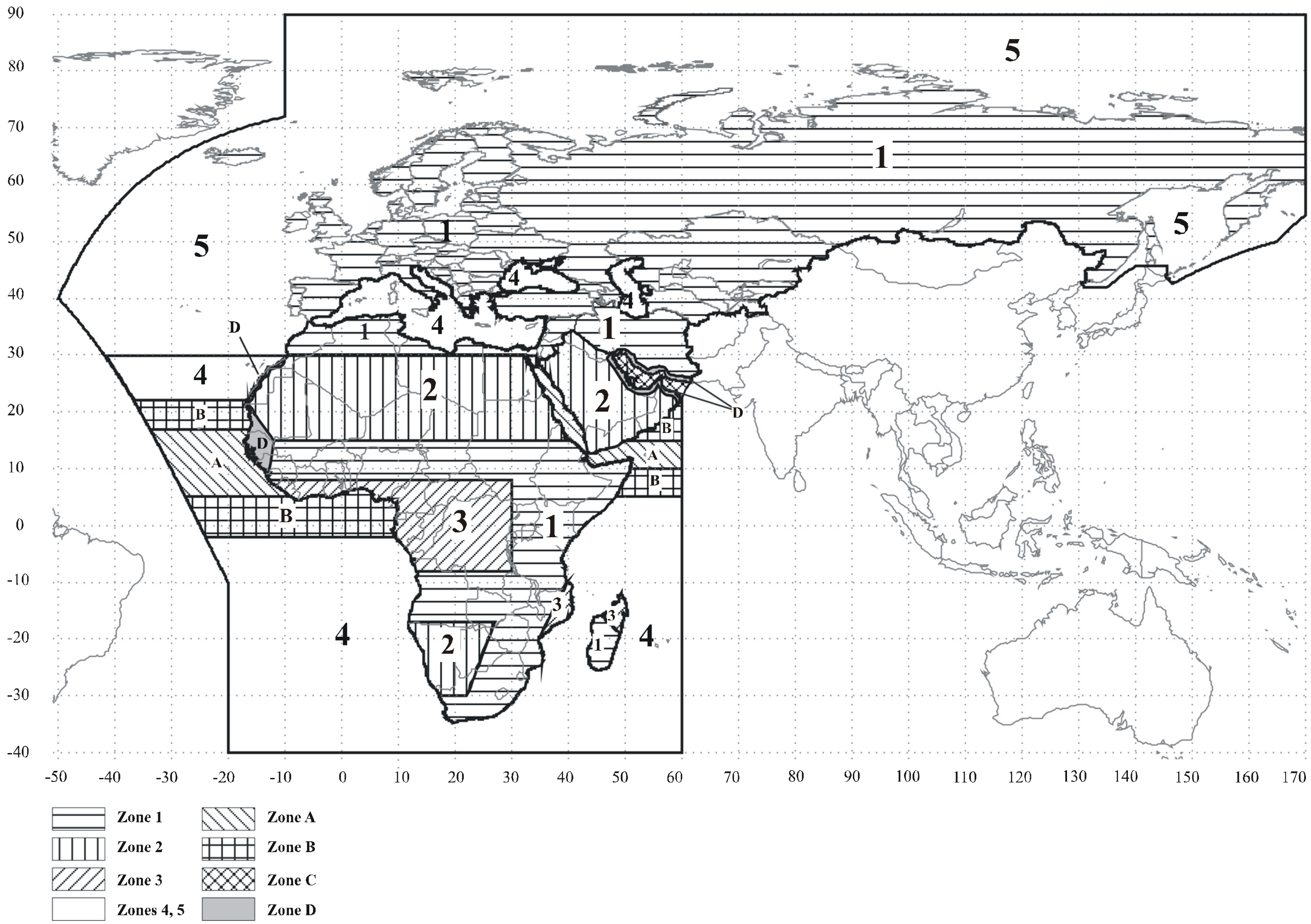
TABLE 2.2-1

Parameters used when deriving curves in Appendix 2.3 to this Chapter

Zone	**Path type**	**Derived from zone type**	**Refractivity gradient, d*N*, not exceeded for**		
			1% time	**10% time**	**50% time**
1	Land		–301.3	–141.9	–43.3
2	Land	1	–200.0	–110.0	–30.0
3	Land	1	–250.0	–130.0	–40.0
4	Sea		–301.3	–141.9	–43.3
5	Sea		–301.3	–141.9	–43.3
A	Sea	4	–1 150.0	–1 000.0	–720.0
B	Sea	4	–680.0	–500.0	–320.0
C	Sea	4	–1 233.0	–850.0	–239.0
D	Land	1	–694.0	–393.0	–120.0

FIGURE 2.2-1

Geographical division of the planning area into propagation zones



RRC06-A2-C2-2-1

Note – Islands in the Mediterranean sea are in Zone 1.

2.2.3 Prediction of wanted field strengths

When predicting wanted field strengths for an individual transmitter-to-receiver path, it is appropriate to use the values for 50% of the time given in Appendix 2.1 to this Chapter, since those values are also applicable to the 99% time requirement for wanted signals. For the short distances involved (up to about 60 km), the difference in the field-strength values for 50% and 99% of the time is negligible. However, there are differences in propagation over the various zones and it is thus necessary to take account of the nature of any individual propagation path.

2.2.4 Prediction of interfering field strengths

During the planning and coordination processes, it is necessary to predict the level of interfering field strength produced in the service area of a assignment/allotment by another assignment/allotment. When calculating the level of interfering field strength, the time percentage curves in Appendix 2.3 to this Chapter for the service area and propagation zone concerned should be used. For interfering field strengths, the percentage of time the field strength is exceeded is normally 1%. However, for specific cases (in particular for other services), other values may be used.

Ideally, the calculation should be made for points defining the service area of the assignment/allotment to be protected. However, in some circumstances, this may not be possible or necessary. The two following cases can be distinguished.

2.2.4.1 Prediction of interfering field strength for a service area

In cases where the assignment/allotment to be protected is represented by a service area, predictions of interfering field strengths would normally be made for points on the periphery of this service area. The points defining the edge of the service area may be specified or calculated. Where they are calculated, this may be achieved on the basis of 36 equally spaced radials from the transmitter site.

2.2.4.2 Prediction of interfering field strength for a specific antenna site

In some cases it may not be possible or necessary to define the service area in the manner described in the preceding paragraph, e.g. a radionavigation land station where the interference would be measured at the radar antenna. An example of this would be where the station to be protected is a broadcasting station with a service area of very small radius. To define the service area and calculate interference levels at many points would involve unnecessary computation. In this case, the location of the transmitting station can be taken as representative of the service area to be protected, and the prediction of interfering field strength can be made for that point.

2.2.5 Correction factors

The accuracy of the propagation prediction model can be improved by the application of a number of correction factors. The requirement for these correction factors and when they are used is explained below.

2.2.5.1 Negative effective transmitting antenna height

For a negative effective transmitting antenna height, for a land or mixed land-sea path, a correction factor must be applied which is a function of the terrain clearance angle (see § A.2.1.4.3 to this Chapter).

2.2.5.2 Receiving antenna height

When the ground cover at the receiver location is not known (for example, during the planning), a receiving antenna at a height of 10 m in open or suburban areas is assumed. To correct the predicted values for different receiving antenna heights above ground level, a correction factor is applied using the method described in § A.2.1.9 to this Chapter.

2.2.5.3 Terrain clearance angle

If greater precision is required for coordination purposes (and the data are available) for predicting the field strength for reception conditions in specific areas, a correction for terrain clearance angle is applied over land paths, or on a land section of a mixed path (see Appendix 2.1 to this Chapter).

2.2.5.4 Location statistics

Within a small area of 100 m × 100 m to 200 m × 200 m, there will be a random variation of field strength with location, which is due to local terrain irregularities and reflection from objects near the receiving location. The statistics of this type of variation may be characterized by a log-normal distribution of the field strengths. Recent measurements for digital signals have shown that for outdoor paths the standard deviation will be about 5.5 dB, depending to some extent on the environment surrounding the receiving location. Any values related to outdoor service in the remainder of this Chapter will be based on a standard deviation of 5.5 dB. For indoor reception, the standard deviation will be larger (see also Chapter 3 to Annex 2 of the Agreement, § 3.2.2.2).

Different percentages of locations can be calculated using the relevant multipliers given in Table A.2.1-2 of Appendix 2.1 to this Chapter. For example, the difference for 50% and 95% of outdoor locations is taken to be 9 dB for cases where the standard deviation is 5.5 dB. This value takes no account of the inherent inaccuracies of any propagation prediction method.

In the case that the wanted signal is composed of several signals from different transmitters, the resulting standard deviation becomes variable, depending on the individual signal strengths. As a consequence, the difference between wanted signals for 50% and 70% or 95% of locations becomes variable. However, it always will be smaller than that of an individual signal.

2.3 Propagation information for assessing compatibility between the broadcasting service and other primary terrestrial services

2.3.1 Compatibility between the broadcasting service and other primary terrestrial services

In the case of interference to or from the broadcasting service, the propagation prediction method and the procedure described in Appendix 2.1 to this Chapter are to be used, taking into account the relevant information on the interfering or affected stations in the other primary terrestrial services.

2.3.2 Compatibility between the broadcasting service and airborne stations in the aeronautical services

In the case of interference to or from airborne stations in the aeronautical mobile or aeronautical radionavigation services:

– the free-space propagation prediction model should be used in cases where there is a line-of-sight path between the transmitting and receiving antennas; and

– zero interference should be assumed in the case where there is no line-of-sight.

The free-space field strength relative to a half-wave dipole for 1 kW e.r.p. is given by:

$$E = 106.9 - 20 \log d$$

where:

E: free-space field strength (dB(μV/m))

d: distance (km) between transmitting and receiving antenna.

APPENDIX 2.1

The propagation prediction method

Terminology used in this Appendix
For the purposes of clarity, the term "*transmitting/base antenna*" used in this Appendix shall be understood to mean "*the transmitting antenna*".
The tabulated values of the propagation curves in Appendix 2.2 to this Chapter are given for certain frequencies, effective transmitting antenna heights, distances and time percentages only. These values are defined as "nominal" throughout the text in Appendix 2.1 to this Chapter.

A.2.1.1 Introduction
This Appendix describes separate stages of the calculation. A step-by-step description of the procedure to be followed for the overall method is given in § A.2.1.15 to this Chapter.

A.2.1.2 Maximum field-strength values
The field strength for any given propagation zone must not exceed a maximum value E_{max} given by the curve indicated as a maximum in each of the figures in Appendix 2.3 to this Chapter. In the case of mixed paths, it will be necessary to calculate the maximum field strength by linear interpolation between the all-land and all-sea values. This is given by:

$$E_{max} = (d_l \, E_{ml} + d_s \, E_{ms}) \, / \, d_{total} \qquad \text{dB}(\mu\text{V/m}) \qquad (1)$$

where:

E_{ml}: maximum value of field strength for relevant all-land path (dB(μV/m))

E_{ms}: maximum value of field strength for relevant all-sea path (dB(μV/m))

d_l: total land distance (km)

d_s: total sea distance (km)

d_{total}: total path distance (km).

Any correction which increases a field strength shall not be allowed to produce values greater than these limits for the relevant family of curves. However, limitation to maximum values shall be applied only where indicated in § A.2.1.15 to this Chapter.

A.2.1.3 Determination of transmitting/base antenna height, h_1
The transmitting/base antenna height, h_1, to be used in calculation depends on the type and length of the path and on various items of height information.
The effective height of the transmitting/base antenna, h_{eff}, is defined as its height in metres over the average level of the ground between the distances of 3 and 15 km from the transmitting/base antenna in the direction of the receiving/mobile antenna.
The value of h_1 to be used in calculation shall be obtained using the method given in § A.2.1.3.1, A.2.1.3.2 or in A.2.1.3.3 to this Chapter, as appropriate.

A.2.1.3.1 Land paths shorter than 15 km

For land paths less than 15 km one of the following two methods shall be used.

A.2.1.3.1.1 Terrain information not available

If no terrain information is available for the purpose of propagation predictions, the value of h_1 is calculated according to path length d, as follows:

$$h_1 = h_a \qquad \text{m} \qquad \text{for} \qquad d \leq 3 \text{ km} \tag{2}$$

$$h_1 = h_a + (h_{eff} - h_a)\,(d - 3)/12 \qquad \text{m} \qquad \text{for} \qquad 3 \text{ km} < d < 15 \text{ km} \tag{3}$$

where h_a is the antenna height above ground (e.g. height of the mast).

A.2.1.3.1.2 Terrain information available

If terrain information is available for the purpose of propagation predictions:

$$h_1 = h_b \qquad \text{m} \tag{4}$$

where h_b is the height of the antenna above terrain height averaged between 0.2d and d km.

A.2.1.3.2 Land paths of 15 km or longer

For these paths:

$$h_1 = h_{eff} \qquad \text{m} \tag{5a}$$

A.2.1.3.3 Sea paths

For these paths:

$$h_1 = h_{eff} \qquad \text{m} \tag{5b}$$

This propagation prediction method shall not be used in the case of an all-sea path for h_1 values less than 1 m.

A.2.1.4 Application of transmitting/base antenna height, h_1

The value of h_1 determines which curve or curves are selected from which to obtain field-strength values, and the interpolation or extrapolation which may be necessary. The following cases are distinguished.

A.2.1.4.1 Transmitting/base antenna height, h_1, in the range 10 to 3 000 m

If the value of h_1 coincides with one of the eight heights for which curves are provided, namely 10, 20, 37.5, 75, 150, 300, 600 or 1 200 m, the required field strength may be obtained directly from the plotted curves or the associated tabulations. Otherwise, the required field strength shall be interpolated or extrapolated from field strengths obtained from two curves using:

$$E = E_{inf} + (E_{sup} - E_{inf}) \log (h_1/h_{inf}) / \log (h_{sup}/h_{inf}) \qquad \text{dB(μV/m)} \tag{6}$$

where:

h_{inf}: 600 m if h_1 > 1 200 m, otherwise the nearest nominal effective height below h_1

h_{sup}: 1 200 m if h_1 > 1 200 m, otherwise the nearest nominal effective height above h_1

E_{inf}: field-strength value for h_{inf} at the required distance (dB(μV/m))

E_{sup}: field-strength value for h_{sup} at the required distance (dB(μV/m)).

The field strength resulting from extrapolation for h_1 > 1 200 m shall be limited, if necessary, such that it does not exceed the maximum defined in § A.2.1.2 to this Chapter.

This propagation prediction method shall not be used for h_1 > 3 000 m.

A.2.1.4.2 Transmitting/base antenna height, h_1, in the range 0 to 10 m

When h_1 is less than 10 m, the method depends on whether the path is over land or sea.

For a land path or a mixed path:

The procedure for extrapolating field strength at a required distance d km for values of h_1 in the range 0 to 10 m is based on smooth-Earth horizon distances (km), written as $d_H(h) = 4.1\sqrt{h}$, where h is the required value of transmitting/base antenna height h_1 (m).

For $d < d_H(h_1)$, the field strength is given by the 10 m height curve at its horizon distance, plus ΔE, where ΔE is the difference between field strengths for the 10 m height curve, at distance d and at the horizon distance for h_1.

For $d \geq d_H(h_1)$, the field strength is given by the 10 m height curve at distance Δd beyond its horizon distance, where Δd is the difference between d and the horizon distance for h_1.

This is expressed in the following formulae, where $E_{10}(d)$ is the field strength (dB(μV/m)) taken from the 10 m height curve for a distance d (km):

$$E = E_{10}(d_H(10)) + E_{10}(d) - E_{10}(d_H(h_1)) \qquad \text{dB(μV/m)} \qquad \text{for } d < d_H(h_1) \qquad (7a)$$

$$E = E_{10}(d_H(10) + d - d_H(h_1)) \qquad \text{dB(μV/m)} \qquad \text{for } d > d_H(h_1) \qquad (7b)$$

If, in equation (7b), $d_H(10) + d - d_H(h_1)$ exceeds 1 000 km, even though $d \leq 1\,000$ km, E shall be found from linear extrapolation for log (distance) of the curve, given by:

$$E = E_{inf} + (E_{sup} - E_{inf}) \log(d / D_{inf}) / \log(D_{sup} / D_{inf}) \qquad \text{dB(μV/m)} \qquad (7c)$$

where:

D_{inf}: penultimate tabulation distance (km)

D_{sup}: final tabulation distance (km)

E_{inf}: field strength at penultimate tabulation distance (dB(μV/m))

E_{sup}: field strength at final tabulation distance (dB(μV/m)).

Note that this propagation prediction method is not to be used for distances greater than 1 000 km. Equation (7c) shall be used only for extrapolating for h_1 < 10 m.

For an all-sea path:

Note that for an all-sea path, h_1 shall not be less than 1 m. The procedure requires that the distance at which the path has 0.6 of the radius of the first Fresnel zone unobstructed by the sea surface be known. This is given by:

$$D_{h_1} = D_{06}(f, h_1, 10) \qquad \text{km} \qquad (8a)$$

where the function D_{06} is defined in § A.2.1.14 to this Chapter and f is the nominal frequency.

If $d > D_{h_1}$ it will be necessary to also calculate the 0.6 Fresnel clearance for a sea path where the transmitting/base antenna height is 20 m, given by:

$$D_{20} = D_{06}(f, 20, 10) \qquad \text{km} \qquad (8b)$$

where f is the nominal frequency.

The field strength for the required distance d and value of h_1 is then given by:

$$E = E_{max} \quad \text{dB}(\mu\text{V/m}) \qquad \text{for} \quad d \le D_{h_1} \qquad (9a)$$

$$E = E_{D_{h_1}} + (E_{D_{20}} - E_{D_{h_1}}) \times \log(d / D_{h_1}) / \log(D_{20} / D_{h_1}) \quad \text{dB}(\mu\text{V/m}) \text{for} \quad D_{h_1} < d < D_{20} \qquad (9b)$$

$$E = E' (1 - F_s) + E'' F_S \qquad \text{dB}(\mu\text{V/m}) \qquad \text{for} \quad d \ge D_{20} \qquad (9c)$$

where:

E_{max}: maximum field strength at the required distance given in § A.2.1.2 to this Chapter

$E_{D_{h_1}}$: E_{max} for distance D_{h_1} as given in § A.2.1.2 to this Chapter

$E_{D_{20}} = E_{10}(D_{20}) + (E_{20}(D_{20}) - E_{10}(D_{20})) \log(h_1 / 10) / \log(20/10)$

$E_{10}(x)$: field strength for $h_1 = 10$ m interpolated for distance x (dB(μV/m))

$E_{20}(x)$: field strength for $h_1 = 20$ m interpolated for distance x (dB(μV/m))

$E' = E_{10}(d) + (E_{20}(d) - E_{10}(d)) \log(h_1/10) / \log(20/10)$ dB(μV/m)

E'': field strength for distance d calculated using the method for land paths given above

$F_S = (d - D_{20}) / d$.

A.2.1.4.3 Negative values of transmitting/base antenna height, h_1

For land paths and mixed paths, it is possible for the effective transmitting/base antenna height h_{eff} to have a negative value, since it is based on the average terrain height at distances from 3 km to 15 km. Thus, h_1 may be negative.

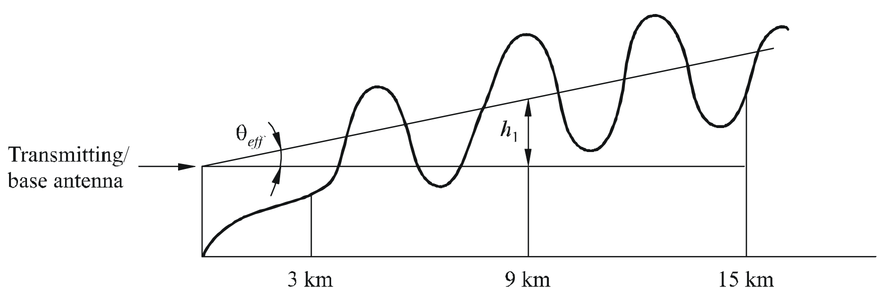
The procedure for negative values of h_1 is to obtain the field strength for $h_1 = 0$, as described in § A.2.1.4.2 to this Chapter, and to calculate a correction based on the terrain clearance angle described in § A.2.1.10 to this Chapter. The clearance angle is calculated for the nominal frequency, as follows:

a) In cases where a terrain database is available, the terrain clearance angle from the transmitting/base antenna shall be calculated as the elevation angle of a line which just clears all terrain obstructions up to 15 km from the transmitting/base antenna in the direction of (but not going beyond) the receiving/mobile antenna. This clearance angle, which will have a positive value, shall be used instead of θ_{tca} in equation (23f) in the terrain clearance angle correction method given in § A.2.1.10 to this Chapter to obtain a correction, C_a, which is added to the field strength obtained for h_1 □ 0. It should be noted that using this method can result in a discontinuity in field strength at the transition around h_1 □ 0.

b) In cases where a terrain database is not available, the (positive) effective terrain clearance angle, θ_{eff}, may be estimated assuming an obstruction of height h_1, calculated as in § A.2.1.3.1.1 to this Chapter, at a distance of 9 km from the transmitting/base antenna. Note that this is used for all path lengths, even when less than 9 km. That is, the irregular ground over the range 3 km to 15 km from the transmitting/base antenna, is approximated by a regular slope whose height at 9 km is $|h_1|$, as indicated in Fig. A.2.1-1. The value of θ_{eff} shall be used instead of θ_{tca} in equation (23f) in the terrain clearance angle-correction method given in § A.2.1.10 to this Chapter to obtain a correction, C_a, which is added to the field strength obtained for h_1 □ 0. This correction is only to be applied if it results in a reduction of the field strength.

FIGURE A.2.1-1

Effective clearance angle for $h_1 < 0$



θ_{eff}: effective terrain clearance angle (positive)
h_1: transmitting/base antenna height used for calculation

RRC06-A2-C2-A2-1-1

The effect of tropospheric loss can be taken into account by a correction, C_t, given by:

$$C_t = \max[C_a, C_{tropo}] \tag{10a}$$

where:

$$C_{tropo} = 30 \log\left[\frac{\theta_e}{\theta_e + \theta_{tca}}\right] \tag{10b}$$

and

$$\theta_e = \frac{180d}{a\pi k} \quad \text{degrees} \tag{10c}$$

with:

d: path length (km)

a: 6 370 km, radius of the Earth

k: 4/3, effective Earth radius factor for median refractivity conditions.

It is assumed that θ_{tca} has the value of 0.0 for an effective height of 0 m.

A.2.1.5 Interpolation of field strength as a function of distance

The figures in Appendix 2.3 to this Chapter show field strength plotted against distance, d, between 1 km and 1 000 km. No interpolation for distance is needed if field strengths are read directly from these curves. For greater precision, and for computer implementation, field strengths should be obtained from the associated tabulations (available from the BR). In this case, unless d coincides with one of the tabulation distances given in Table A.2.1-1, the field strength, E (dB(μV/m)), shall be linearly interpolated for the logarithm of the distance using the following equation:

$$E = E_{inf} + (E_{sup} - E_{inf}) \log (d / d_{inf}) / \log (d_{sup} / d_{inf}) \qquad \text{dB(μV/m)} \qquad (11)$$

where:

d: distance for which the prediction is required (km)

d_{inf}: nearest tabulation distance less than d (km)

d_{sup}: nearest tabulation distance greater than d (km)

E_{inf}: field-strength value for d_{inf} (dB(μV/m))

E_{sup}: field-strength value for d_{sup} (dB(μV/m)).

This propagation prediction method is not valid for values of d less than 1 km or greater than 1 000 km.

TABLE A.2.1-1

Values of distance (km) used in the tables of field strengths

1	14	55	140	375	700
2	15	60	150	400	725
3	16	65	160	425	750
4	17	70	170	450	775
5	18	75	180	475	800
6	19	80	190	500	825
7	20	85	200	525	850
8	25	90	225	550	875
9	30	95	250	575	900
10	35	100	275	600	925
11	40	110	300	625	950
12	45	120	325	650	975
13	50	130	350	675	1 000

A.2.1.6 Interpolation of field strength as a function of frequency

Field-strength values for a given required frequency shall be obtained by interpolating between the values for the nominal frequency values of 100 MHz, 600 MHz and 2 000 MHz. The required field strength, E, shall be calculated using:

$$E = E_{inf} + (E_{sup} - E_{inf}) \log(f / f_{inf}) / \log(f_{sup} / f_{inf}) \qquad \text{dB}(\mu\text{V/m}) \qquad (12)$$

where:

- f: frequency for which the prediction is required (MHz)
- f_{inf}: lower nominal frequency (100 MHz if $f < 600$ MHz, 600 MHz otherwise)
- f_{sup}: higher nominal frequency (600 MHz if $f < 600$ MHz, 2 000 MHz otherwise)
- E_{inf}: field-strength value for f_{inf} (dB(μV/m))
- E_{sup}: field-strength value for f_{sup} (dB(μV/m)).

A.2.1.7 Interpolation of field strength as a function of time percentage

Field-strength values for a required percentage of the time between 1% and 50% shall be calculated by interpolation between the nominal values 1% and 10% or between the nominal values 10% and 50% using:

$$E = E_{sup} (Q_{inf} - Q_t) / (Q_{inf} - Q_{sup}) + E_{inf} (Q_t - Q_{sup}) / (Q_{inf} - Q_{sup}) \qquad \text{dB}(\mu\text{V/m}) \qquad (13)$$

where:

- $Q_t = Q_i(t/100)$
- $Q_{inf} = Q_i(t_{inf}/100)$
- $Q_{sup} = Q_i(t_{sup}/100)$
- E_{inf}: field-strength value for time percentage t_{inf} (dB(μV/m))
- E_{sup}: field-strength value for time percentage t_{sup} (dB(μV/m))
- t: percentage of the time for which the prediction is required
- t_{inf}: lower nominal time percentage
- t_{sup}: upper nominal time percentage

where $Q_i(x)$ is the inverse complementary cumulative normal distribution function.

This propagation prediction method shall be used for field strengths exceeded for time percentages in the range 1% to 50% only. Extrapolation outside the range 1% to 50% time is not valid.

A method for the calculation of $Q_i(x)$ is given in § A.2.1.12 to this Chapter.

A.2.1.8 Mixed paths

When paths occur over different propagation zones, e.g. land, sea, areas of different refractivity, the method given below shall be used for the following conditions:

a) for all frequencies and all percentages of the time and for those combinations of propagation zone which do not involve any land/sea or land/coastal land transitions, the following procedure for calculating the field strength shall be used:

$$E_{m,t} = \sum_i \frac{d_i}{d_T} E_{i,t} \qquad (14)$$

where:

$E_{m,t}$: field strength for mixed path for t% of the time (dB(μV/m))

$E_{i,t}$: field strength for path in zone i equal in length to the mixed path for t% of the time (dB(μV/m))

d_i: length of path in zone i (km)

d_T: length of total path (km);

b) for all frequencies and all percentages of time and for those combinations of propagation zone which involve only a single land propagation category and a single sea or coastal land propagation category, the following procedure for calculating the field strength shall be used:

$$E_{m,t} = (1-A) \cdot E_{l,t} + A \cdot E_{s,t} \tag{15a}$$

where:

$E_{m,t}$: field strength for mixed path for t% of the time (dB(μV/m))

$E_{l,t}$: field strength for land path equal in length to the mixed path for t% of the time (dB(μV/m))

$E_{s,t}$: field strength for sea or coastal land path equal in length to the mixed path for t% of the time (dB(μV/m))

A: interpolation factor as given in § A.2.1.8.1 to this Chapter;

c) for all frequencies and all percentages of time and for those combinations of three or more propagation zones which involve at least one land/sea or land/coastal land boundary, the following procedure for calculating the field strength shall be used:

$$E_{m,t} = \{1-A\} \cdot \frac{\sum_{i=1}^{n_l} d_i E_{li,t}}{d_{lT}} + A \cdot \frac{\sum_{j=1}^{n_s} d_j E_{sj,t}}{d_{sT}} \tag{15b*}$$

where:

$E_{m,t}$: field strength for mixed path for t% of the time (dB(μV/m))

$E_{li,t}$: field strength for land path i equal in length to the mixed path for t% of the time, $i = 1, ..., n_l$; n_l is the number of land zones traversed (dB(μV/m))

$E_{sj,t}$: field strength for sea or coastal land path j equal in length to the mixed path for t% of the time, $j = 1, ..., n_s$, where n_s is the total number of sea and coastal land zones traversed (dB(μV/m))

---

* Note that equation (15b) reduces to equation (15a) in the case of mixed propagation paths which involve only a single land propagation category and a single sea or coastal land propagation category.

A: interpolation factor as given in § A.2.1.8.1 to this Chapter (note that the “fraction of path over sea” is calculated as: d_{sT} / d_T)

d_i, d_j: length of path in zones *i*, *j* (km)

d_{lT}: length of total land path = $\sum_{i=1}^{n_l} d_i$ (km)

d_{sT}: length of total sea and coastal land path = $\sum_{j=1}^{n_s} d_j$ (km)

d_T: length of total propagation path = $d_{lT} + d_{sT}$ (km).

A.2.1.8.1 The mixed path interpolation factor, *A*

The following notation will be used:

N_s: total number of sea zones and coastal land zones

n: sea-path or coastal land-path zone number; $n = 1, 2, ..., N_s$

M_l: total number of land zones

m: land-path zone number; $m = 1, 2, ..., M_l$

d_{sn}: distance traversed in sea or coastal land zone *n* (km)

d_{lm}: distance traversed in land zone *m* (km).

Then:

$$d_{sT} = \sum_{n=1}^{N_s} d_{sn} \quad \text{total length of sea and coastal land paths traversed} \tag{16a}$$

$$d_{lT} = \sum_{m=1}^{M_l} d_{lm} \quad \text{total length of land paths traversed} \tag{16b}$$

$$d_T = d_{sT} + d_{lT} \quad \text{length of the total propagation path.} \tag{16c}$$

The following field-strength values are needed:

$E_{sn}(d_T)$: field-strength value dB(μV/m) for distance d_T, assumed to be all of sea or coastal-land zone type *n*

$E_{lm}(d_T)$: field-strength value dB(μV/m) for distance d_T, assumed to be all of land zone type *m.*

The interpolation factor[1], A, is given by:

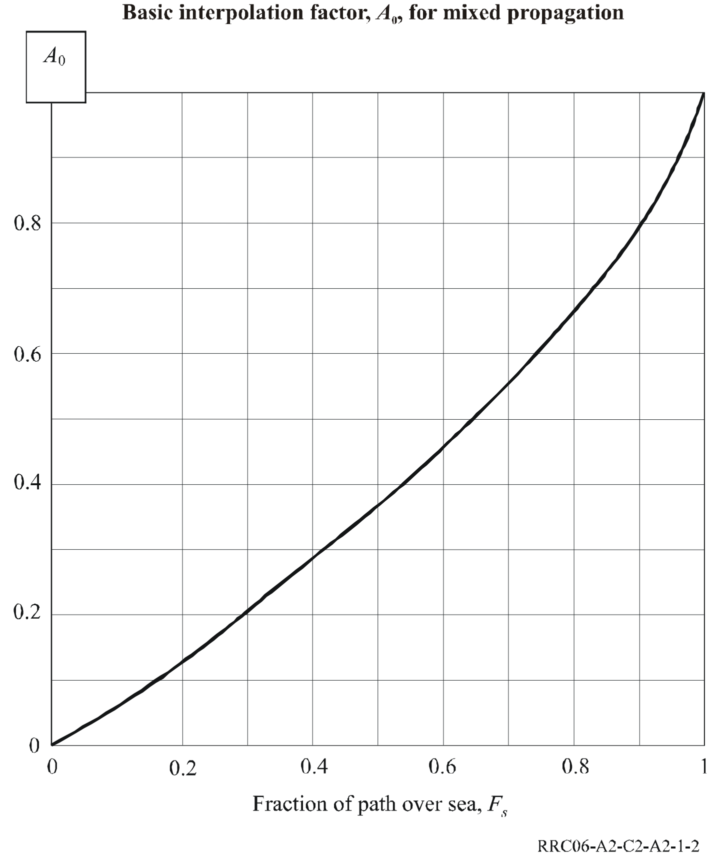
$$A = [A_0(F_s)]^V \tag{17}$$

where:

$A_0(F_s)$: basic interpolation factor as shown in Fig. A.2.1-2.

FIGURE A.2.1-2

Basic interpolation factor, A_0, for mixed propagation



The fraction of path over the sea, F_s, used in Fig. A.2.1-2 is given by:

$$F_s = \frac{d_{sT}}{d_T} \tag{18}$$

[1] The interpolation factor is applied to all frequencies and to all time percentages. It must be noted that the interpolation is only applied to:

- land-sea paths
- land-coastal land paths
- land-(sea and coastal land) paths

and not to:

- land-land paths
- or any combination of sea and/or coastal-land paths.

and V is calculated using the expression:

$$V = \max\left[1.0, 1.0 + \frac{\Delta}{40.0}\right] \qquad (19)$$

with

$$\Delta = \sum_{n=1}^{N_s} E_{sn}(d_T)\frac{d_{sn}}{d_{sT}} - \sum_{m=1}^{M_l} E_{lm}(d_T)\frac{d_{lm}}{d_{lT}} \qquad (20)$$

Figure A.2.1-2 shows $A_0(F_s)$, which is applicable for all time percentages.

A.2.1.9 Correction for receiving/mobile antenna height

The field-strength values given by the land curves and associated tabulations in this propagation prediction method are for a reference receiving/mobile antenna at a height R (m), representative of the height of the ground cover surrounding the receiving/mobile antenna, subject to a minimum height value of 10 m. For open and suburban areas, and also for sea paths, the notional value of R is 10 m.

Where the site of the receiving/mobile antenna is on land, account shall first be taken of the elevation angle of the arriving ray by calculating a modified representative clutter height R' (m), given by:

$$R' = (1\,000\, d\, R - 15\, h_1)/(1\,000\, d - 15) \quad \text{m} \qquad (21)$$

where h_1 and R are given in metres and the distance d is in kilometres.

Note that for $h_1 < 6.5d + R$, $R' \approx R$.

The value of R' must be limited, if necessary, such that it is not less than 1 m.

Where the receiving/mobile antenna is in either a suburban or urban environment, the correction is then given by:

$$\text{Correction} = 6.03 - J(\nu) \quad \text{dB} \quad \text{for } h_2 < R' \qquad (22a)$$

$$= K_{h_2} \log(h_2 / R') \quad \text{dB} \quad \text{for } h_2 \geq R' \qquad (22b)$$

h_2: height of the receiving/mobile antenna above ground (m)

where $J(\nu)$ is given by equation (23d),

and:

$$\nu = K_{nu}\sqrt{h_{dif}\theta_{clut}} \qquad (22c)$$

$$h_{dif} = R' - h_2 \quad \text{m} \qquad (22d)$$

$$\theta_{clut} = \arctan(h_{dif} / 27) \quad \text{degrees} \qquad (22e)$$

$$K_{h_2} = 3.2 + 6.2 \log(f) \qquad (22f)$$

$$K_{nu} = 0.0108\sqrt{f} \qquad (22g)$$

f: required frequency (MHz).

Where the receiving/mobile antenna is on land in a rural or open environment, the correction is given by equation (22b) for all values of h_2.

Where the site of the receiving/mobile antenna is on the sea, for $h_2 \geq 10$ m, the correction shall be calculated using equation (22b), with R' set to 10 m.

Where the site of the receiving/mobile antenna is on the sea, for $h_2 < 10$ m, an alternative method shall be used, based upon the path lengths at which 0.6 of the radius of the first Fresnel zone is clear of obstruction by the sea surface. An approximate method for calculating this distance is given in § A.2.1.14 to this Chapter.

The distance d_{10} at which the path would have 0.6 Fresnel clearance for the required value of h_1 and for $h_2 = 10$ m shall be calculated as $D_{06}(f, h_1, 10)$ in § A.2.1.14 to this Chapter.

If the required distance is equal to or greater than d_{10}, then again the correction for the required value of h_2 shall be calculated using equation (22b), with R' set to 10 m.

If the required distance is less than d_{10}, then the correction to be added to the field strength E shall be calculated using:

$$\text{Correction} = 0.0 \quad \text{dB} \quad \text{for } d \leq d_{h_2} \tag{22h}$$

$$= C_{10} \times \log(d / d_{h_2}) / \log(d_{10} / d_{h_2}) \quad \text{dB} \quad \text{for } d_{h_2} < d < d_{10} \tag{22j}$$

where:

C_{10}: correction for the required value of h_2 at distance d_{10} using equation (22b) with R' set to 10 m

d_{10}: distance at which the path has 0.6 Fresnel clearance for $h_2 = 10$ m calculated as $D_{06}(f, h_1, 10)$ as given in § A.2.1.14 to this Chapter

d_{h_2}: distance at which the path has 0.6 Fresnel clearance for the required value of h_2 calculated as $D_{06}(f, h_1, h_2)$ as given in § A.2.1.14 to this Chapter.

This correction shall not be used for receiving/mobile antenna heights h_2 less than 1 m when the receiving site is on land or less than 3 m when on the sea.

A.2.1.10 Correction for terrain clearance angle

For land paths, and when the receiving/mobile antenna is on a land section of a mixed path, if greater precision is required for predicting the field strength for reception conditions in specific areas, e.g. in a small reception area a correction may be made based on a terrain clearance angle. The terrain clearance angle, θ_{tca}, is given by:

$$\theta_{tca} = \theta - \theta_r \quad \text{degrees} \tag{23a}$$

where θ is measured relative to the line from the receiving/mobile antenna which just clears all terrain obstructions in the direction of the transmitter/base antenna over a distance of up to 16 km but not going beyond the transmitting/base antenna. It is measured relative to the horizontal at the receiving/mobile antenna, being positive if the clearance line is above the horizontal. This is shown in Fig. A.2.1-3.

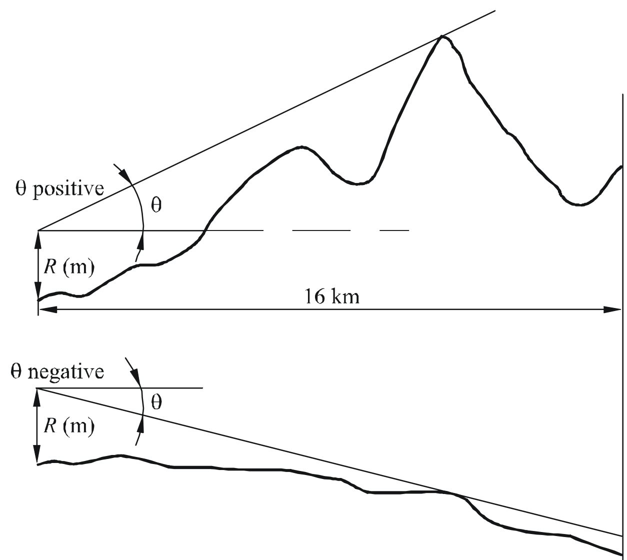
The reference angle θ_r is given by:

$$\theta_r = \arctan\left(\frac{h_{1s} - h_{2s}}{1\,000 d}\right) \qquad \text{degrees} \tag{23b}$$

where h_{1s} and h_{2s} are the height of the transmitting/base and receiving/mobile antennas above sea level, respectively.

FIGURE A.2.1-3

Terrain clearance angle



RRC06-A2-C2-A2-1-3

Where the relevant terrain clearance angle information is available, the correction to be added to the field strength is calculated using:

$$\text{Correction} = J(\nu') - J(\nu) \qquad \text{dB} \tag{23c}$$

where $J(\nu)$ is given by:

$$J(\nu) = \left[6.9 + 20\log\left(\nu - 0.1 + \sqrt{(\nu - 0.1)^2 + 1}\right)\right] \tag{23d}$$

$$\nu' = 0.036\sqrt{f} \tag{23e}$$

$$\nu = 0.065\,\theta_{tca}\sqrt{f} \tag{23f}$$

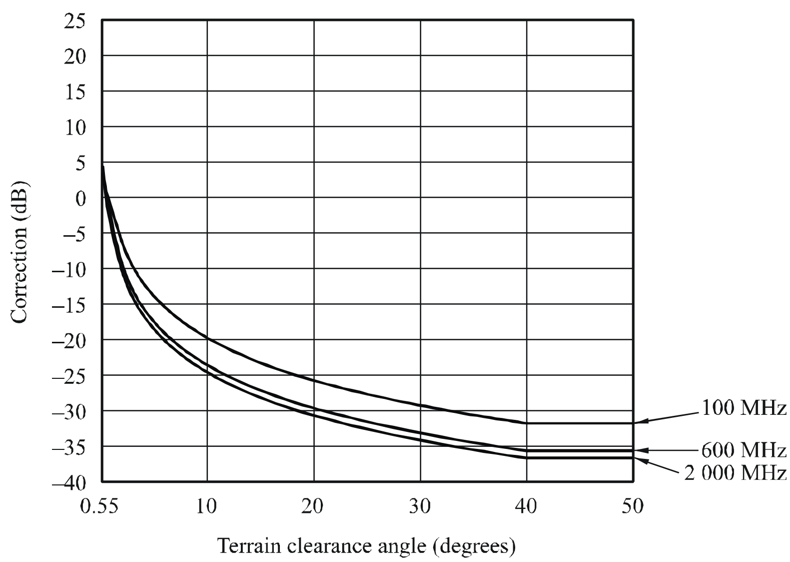
θ_{tca}: terrain clearance angle (degrees)

f: nominal frequency (MHz) when the correction for negative values of transmitting antenna height is calculated; required frequency (MHz) when the terrain clearance angle correction is calculated.

The correction is valid for clearance angle, θ_{tca}, in the range +0.55° to +40°.
The correction for θ_{tca} < +0.55° is the same as for θ_{tca} = +0.55°.
The correction for θ_{tca} > +40° is the same as for θ_{tca} = +40°.
It should be noted that the land field-strength curves take account of losses due to typical shielding of the receiving/mobile antenna by gently rolling terrain. Thus, the terrain clearance angle corrections are zero at a small positive angle typical of receiving/mobile antenna positions.
Figure A.2.1-4 illustrates the terrain clearance angle correction for the nominal frequencies.

FIGURE A.2.1-4

Terrain clearance angle correction



RRC06-A2-C2-A2-1-4

A.2.1.11 Location variability in land area-coverage prediction

For receiving/mobile antenna locations on land, the field strength E which will be exceeded for q% of locations is given by:

$$E(q) = E\,(\text{median}) + Q_i(q\,/\,100)\,\sigma_L(f) \qquad \text{dB}(\mu\text{V/m}) \qquad (24)$$

where:

$Q_i(x)$: inverse complementary cumulative normal distribution as a function of probability

σ_L: standard deviation of the Gaussian distribution of the local mean in the study area.

Values of standard deviation for digital systems having a bandwidth less than 1 MHz and for analogue systems are given as a function of frequency by:

$$\sigma_L = K + 1.6 \log(f) \qquad \text{dB} \tag{25}$$

where:

$K = 2.1$ for mobile systems in urban locations

$= 3.8$ for mobile systems in suburban locations or amongst rolling hills

$= 5.1$ for analogue broadcasting systems

f: required frequency (MHz).

For digital systems having a bandwidth of 1 MHz or greater, a standard deviation of 5.5 dB shall be used at all frequencies.

The percentage of locations q can vary between 1% and 99%. This propagation prediction method shall not be used for percentage locations less than 1% or greater than 99%.

The location variability correction is not to be applied when the receiver/mobile location is on the sea.

A.2.1.12 An approximation to the inverse complementary cumulative normal distribution function

The following approximation to the inverse complementary cumulative normal distribution function, $Q_i(x)$, is valid for $0.01 \le x \le 0.99$:

$$Q_i(x) = T(x) - \xi(x) \qquad \text{if } x \le 0.5 \tag{26a}$$

$$Q_i(x) = -\{ T(1-x) - \xi(1-x) \} \qquad \text{if } x > 0.5 \tag{26b}$$

where:

$$T(x) = \sqrt{[-2\ln(x)]} \tag{26c}$$

$$\xi(x) = \frac{[(C_2 \cdot T(x) + C_1) \cdot T(x)] + C_0}{[(D_3 \cdot T(x) + D_2) \cdot T(x) + D_1] \cdot T(x) + 1} \tag{26d}$$

$C_0 = 2.515517$

$C_1 = 0.802853$

$C_2 = 0.010328$

$D_1 = 1.432788$

$D_2 = 0.189269$

$D_3 = 0.001308$

Values given by the above equations are given in Table A.2.1-2.

TABLE A.2.1-2

Approximate inverse complementary cumulative normal distribution values

q%	Q_i (q/100)	q%	Q_i (q/100)	q%	Q_i (q/100)	q%	Q_i (q/100)
1	2.327	26	0.643	51	–0.025	76	–0.706
2	2.054	27	0.612	52	–0.050	77	–0.739
3	1.881	28	0.582	53	–0.075	78	–0.772
4	1.751	29	0.553	54	–0.100	79	–0.806
5	1.645	30	0.524	55	–0.125	80	–0.841
6	1.555	31	0.495	56	–0.151	81	–0.878
7	1.476	32	0.467	57	–0.176	82	–0.915
8	1.405	33	0.439	58	–0.202	83	–0.954
9	1.341	34	0.412	59	–0.227	84	–0.994
10	1.282	35	0.385	60	–0.253	85	–1.036
11	1.227	36	0.358	61	–0.279	86	–1.080
12	1.175	37	0.331	62	–0.305	87	–1.126
13	1.126	38	0.305	63	–0.331	88	–1.175
14	1.080	39	0.279	64	–0.358	89	–1.227
15	1.036	40	0.253	65	–0.385	90	–1.282
16	0.994	41	0.227	66	–0.412	91	–1.341
17	0.954	42	0.202	67	–0.439	92	–1.405
18	0.915	43	0.176	68	–0.467	93	–1.476
19	0.878	44	0.151	69	–0.495	94	–1.555
20	0.841	45	0.125	70	–0.524	95	–1.645
21	0.806	46	0.100	71	–0.553	96	–1.751
22	0.772	47	0.075	72	–0.582	97	–1.881
23	0.739	48	0.050	73	–0.612	98	–2.054
24	0.706	49	0.025	74	–0.643	99	–2.327
25	0.674	50	0.000	75	–0.674		

A.2.1.13 Equivalent basic transmission loss

When required, the equivalent basic transmission loss for a given field strength is given by:

$$L_b = 139 - E + 20 \log f \qquad \text{dB} \tag{27}$$

where:

L_b: equivalent basic transmission loss (dB)

E: field strength (dB(μV/m)) for 1 kW e.r.p. (dB(μV/m))

f: required frequency (MHz).

A.2.1.14 Approximation of the 0.6 Fresnel clearance path length

The path length which achieves a clearance of 0.6 of the radius of the first Fresnel zone over a smooth curved Earth, for a given frequency and antenna heights h_1 and h_2, is given approximately by:

$$D_{06}(f, h_1, h_2) = \frac{D_f \cdot D_h}{D_f + D_h} \quad \text{km} \tag{28}$$

where:

D_f: frequency-dependent term

$$= 0.0000389\, f\, h_1 h_2 \quad \text{km} \tag{28a}$$

D_h: asymptotic term defined by horizon distances

$$= 4.1(\sqrt{h_1} + \sqrt{h_2}) \quad \text{km} \tag{28b}$$

f: nominal frequency (MHz)

h_1, h_2: antenna heights above smooth Earth (m).

In the above equations, the value of h_1 must be limited, if necessary, such that it is not less than zero. Moreover, the resulting value of D_{06} must be limited, if necessary, such that it is not less than 0.001 km.

A.2.1.15 Procedure for the application of this propagation prediction method

The step-by-step procedure given below is intended to be applied to values derived from the field strength versus distance tables (see Appendix 2.2 to this Chapter). It may, however, also be applied to values obtained from the curves, in which case the distance interpolation procedure of Step 8.1.5 is not needed.

Step 1: Determine the type of the propagation path as land, cold sea or warm sea. If the path is mixed, then determine two path types which are regarded as first and second propagation types. If the path can be represented by a single type, then this is regarded as the first propagation type and the mixed-path method given in Step 11 is not required.

Step 2: For any given percentage of time (in the range 1% to 50%), determine two nominal time percentages as follows:

– if the required percentage of the time is > 1% and < 10%, the lower and higher nominal percentages are 1% and 10%, respectively;

– if the required percentage of the time > 10% and < 50%, the lower and higher nominal percentages are 10% and 50%, respectively.

If the required percentage of time is equal to 1% or 10% or 50%, this value shall be regarded as the lower nominal percentage time and the interpolation process of Step 10 is not required.

Step 3: For any required frequency between 174 and 862 MHz, determine two nominal frequencies as follows:

– where the required frequency < 600 MHz, the lower and higher nominal frequencies are 100 and 600 MHz, respectively;

– where the required frequency > 600 MHz, the lower and higher nominal frequencies are 600 and 2 000 MHz, respectively.

If the required frequency equals 100 or 600 MHz, this value shall be regarded as the lower nominal frequency and the interpolation process of Step 9 is not required.

Step 4: Determine the lower and higher nominal distances from Table A.2.1-1 closest to the required distance. If the required distance coincides with a value in Table A.2.1-1, this shall be regarded as the lower nominal distance and the interpolation process of Step 8.1.5 is not required.

Step 5: For the first propagation type, follow Steps 6 to 10.

Step 6: For the lower nominal time percentage follow, Steps 7 to 9.

Step 7: For the lower nominal frequency follow, Step 8.

Step 8: Obtain the field strength exceeded at 50% locations for a receiving/mobile antenna at the height above ground, R, representative of the surrounding terrain clutter, for the required distance and transmitting/base antenna height, as follows:

Step 8.1: For a transmitting/base antenna height h_1 equal to or greater than 10 m, follow Steps 8.1.1 to 8.1.5:

Step 8.1.1: Determine the lower and higher nominal h_1 values using the method given in § A.2.1.4.1 to this Chapter. If h_1 coincides with one of the nominal values 10, 20, 37.5, 75, 150, 300, 600 or 1 200 m, this shall be regarded as the lower nominal value of h_1 and the interpolation process of Step 8.1.6 is not required.

Step 8.1.2: For the lower nominal value of $h_{1,}$ follow Steps 8.1.3 to 8.1.5.

Step 8.1.3: For the lower nominal value of distance, follow Step 8.1.4.

Step 8.1.4: Obtain the field strength exceeded at 50% locations for a receiving/mobile antenna at height, R, representative of the surrounding terrain clutter, for the required values of distance, d, and transmitting/base antenna height, h_1.

Step 8.1.5: If the required distance does not coincide with the lower nominal distance, repeat Step 8.1.4 for the higher nominal distance and interpolate the two field strengths for the required distance using the method given in § A.2.1.5 to this Chapter.

Step 8.1.6: If the required transmitting/base antenna height, h_1, does not coincide with one of the nominal values, repeat Steps 8.1.3 to 8.1.5 and interpolate/extrapolate for h_1 using the method given in § A.2.1.4.1 to this Chapter. If necessary, limit the result to the maximum value given in § A.2.1.2 to this Chapter.

Step 8.2: For a transmitting/base antenna height h_1 less than 10 m, determine the field strength for the required height and distance using the method given in § A.2.1.4.2 to this Chapter. If h_1 is less than zero, the method given in § A.2.1.4.3 to this Chapter shall also be used.

Step 9: If the required frequency does not coincide with the lower nominal frequency, repeat Step 8 for the higher nominal frequency and interpolate the two field strengths using the method given in § A.2.1.6 to this Chapter. If necessary, limit the result to the maximum field strength as given in § A.2.1.2 to this Chapter.

Step 10: If the required percentage of time does not coincide with the lower nominal time percentage, repeat Steps 7 to 9 for the higher nominal percentage of time and interpolate the two field strengths using the method given in § A.2.1.7 to this Chapter.

Step 11: If the prediction is for a mixed path, follow the procedure given in § A.2.1.8 to this Chapter.

Step 12: Correct the field strength for receiving/mobile antenna height h_2 using the method given in § A.2.1.9 to this Chapter.

Step 13: If information on the terrain clearance angle at a receiving/mobile antenna location on land is available, correct the field strength for the terrain clearance angle at the receiver/mobile using the method given in § A.2.1.10 to this Chapter.

Step 14: If it is necessary to know the field strength at a receiving/mobile antenna location on land that is exceeded at a percentage of locations other than 50%, correct the field strength for the required percentage of locations using the method given in § A.2.1.11 to this Chapter.

Step 15: If necessary, limit the resulting field strength to the maximum given in § A.2.1.2 to this Chapter.

Step 16: If required, convert field strength to equivalent basic transmission loss for the path using the method given in § A.2.1.13 to this Chapter.

APPENDIX 2.2

Tabulated values of field strength

Values of field strength (dB(µV/m)) against distance (km), corresponding to the family of propagation curves given in Appendix 2.3 to this Chapter, are provided in the following tables:

Table A.2.2.2

FS_curves_RRC_04.
txt

The detailed instructions for interpolation of these tabulated values are provided in § A.2.1.5, A.2.1.6 and A.2.1.7 of Appendix 2.1 to this Chapter.

APPENDIX 2.3

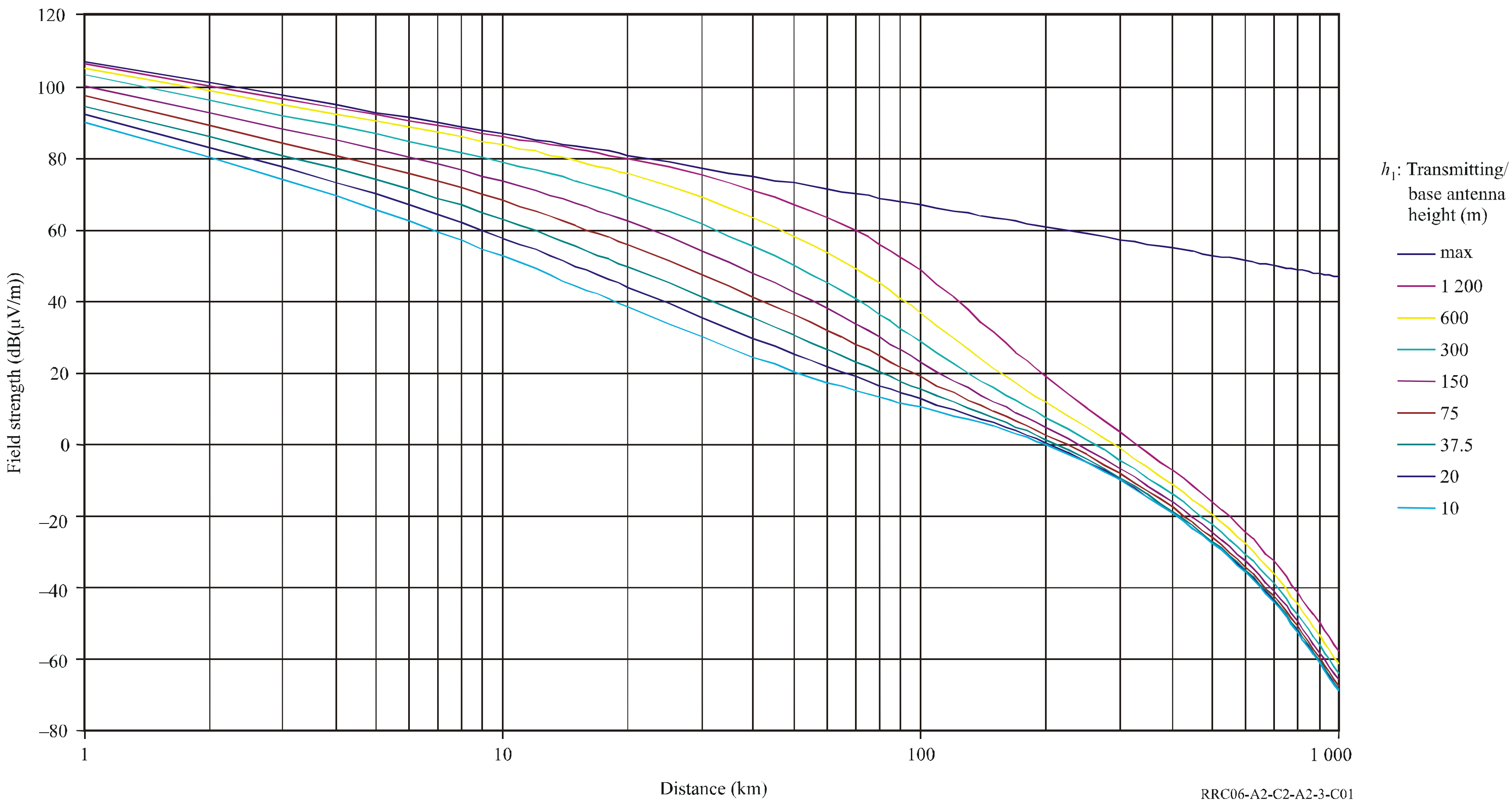
Propagation curves

The propagation curves shown in the figures are used, together with the map shown in § 2.2.2 of Chapter 2 to Annex 2 of the Agreement, for the planning of the broadcasting service. They give, on the basis of statistics derived from measurement results, and also of theoretical considerations, the field-strength value exceeded for 50% of locations for time percentages of 50%, 10% and 1%.

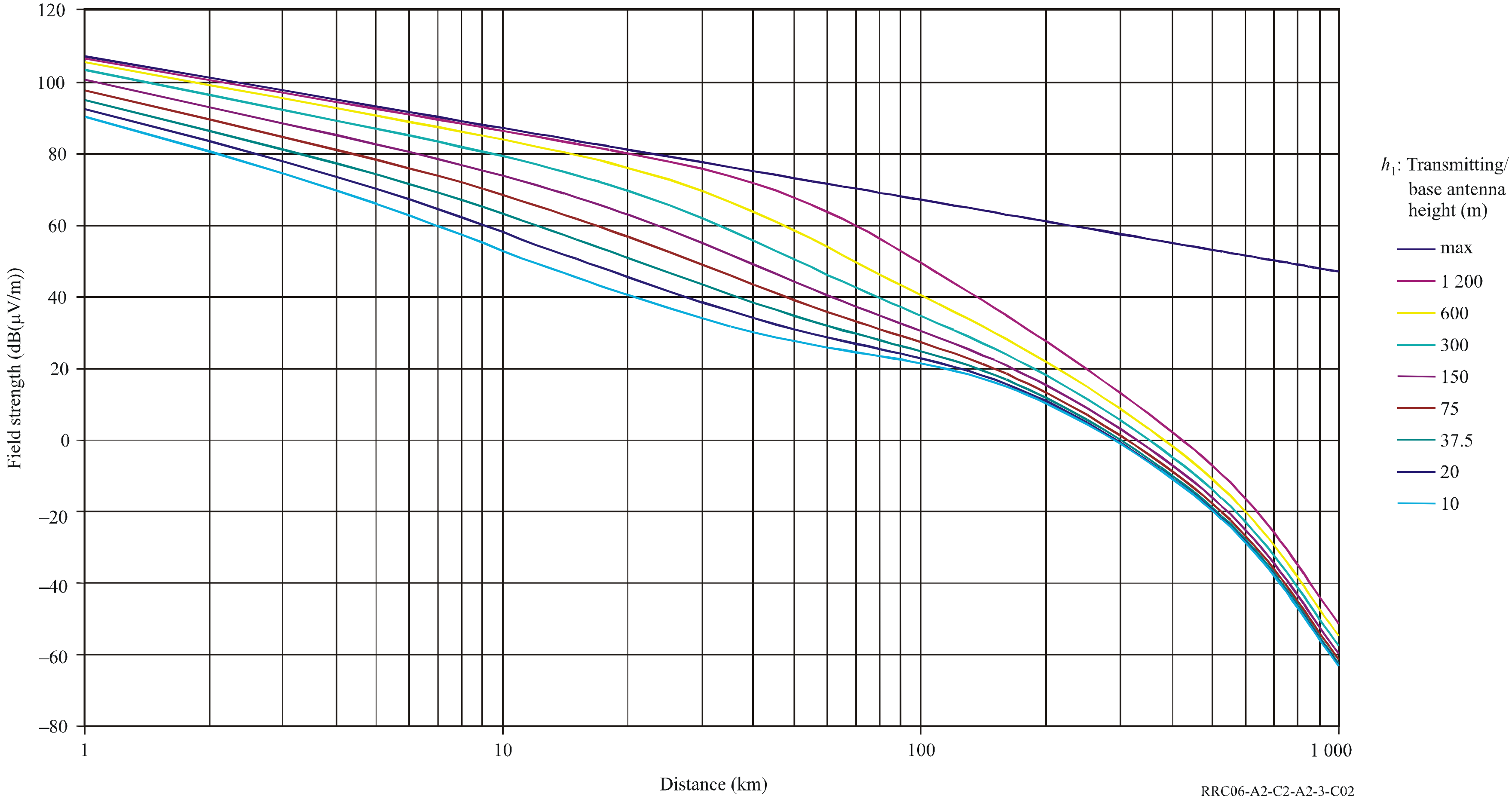
The values obtained correspond to a receiving antenna height of 10 m over neighbouring ground in open area. The values are expressed in decibels relative to 1 μV/m (dB(μV/m)) for an e.r.p. of 1 kW in the direction of the reception point. The curves give the values of the field strength exceeded at 50% of locations and each figure corresponds to time percentages of 50%, 10% and 1% for each of the geographical zones.

The data are given for various types of areas and climates (see § 2.2.2 of Chapter 2 to Annex 2 of the Agreement).

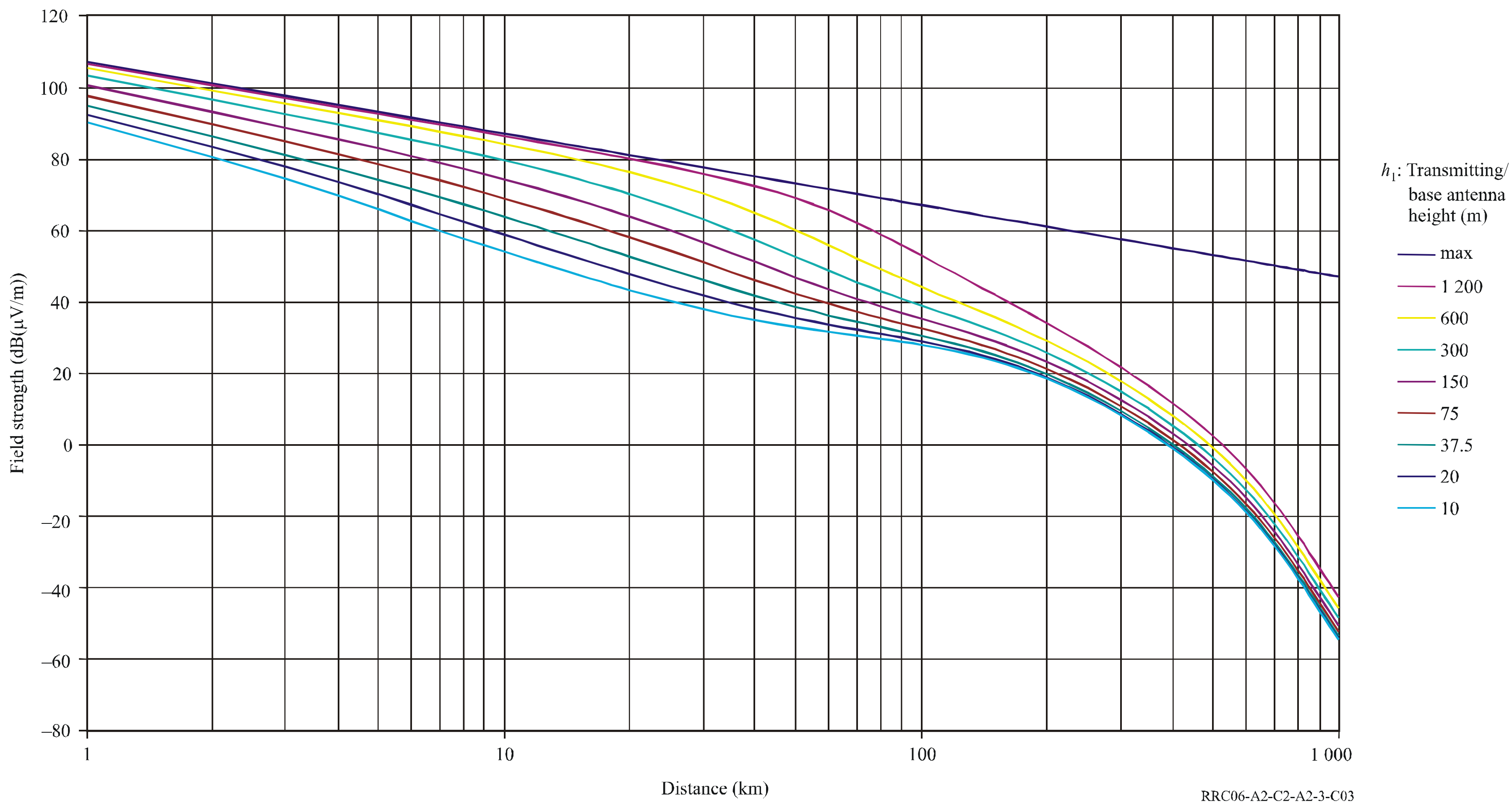
100 MHz at 50% time in Zone 1



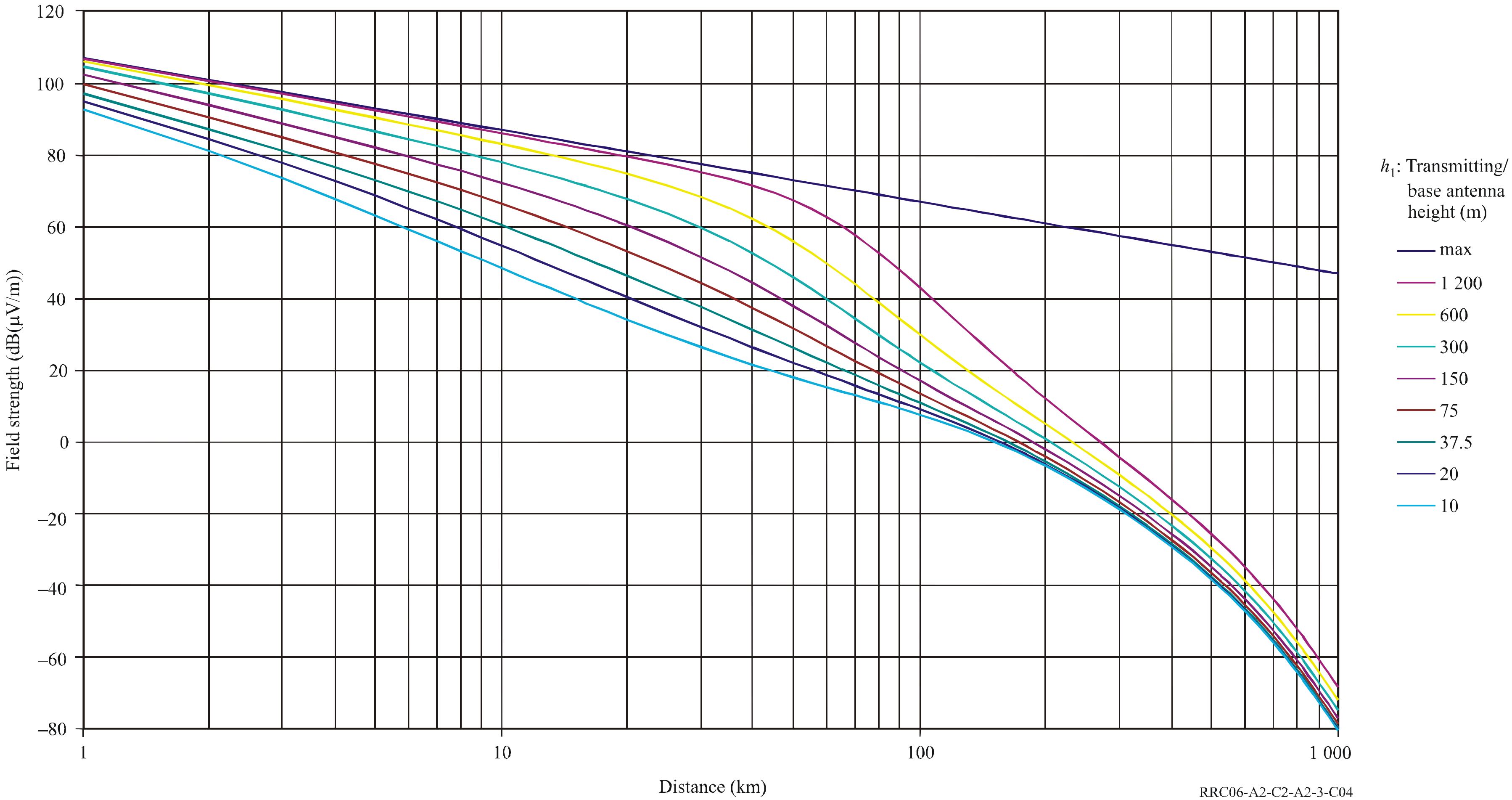
100 MHz at 10% time in Zone 1

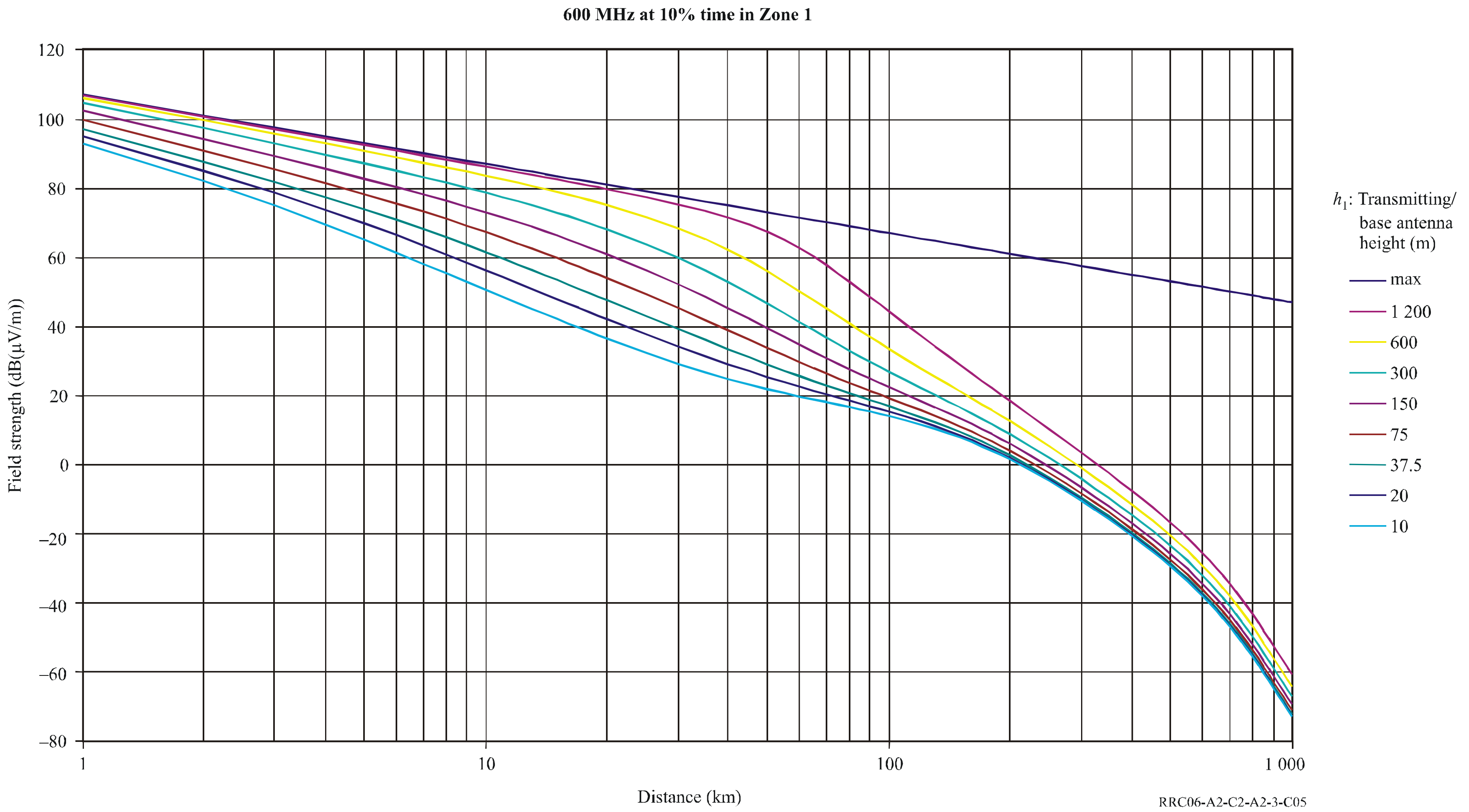


100 MHz at 1% time in Zone 1

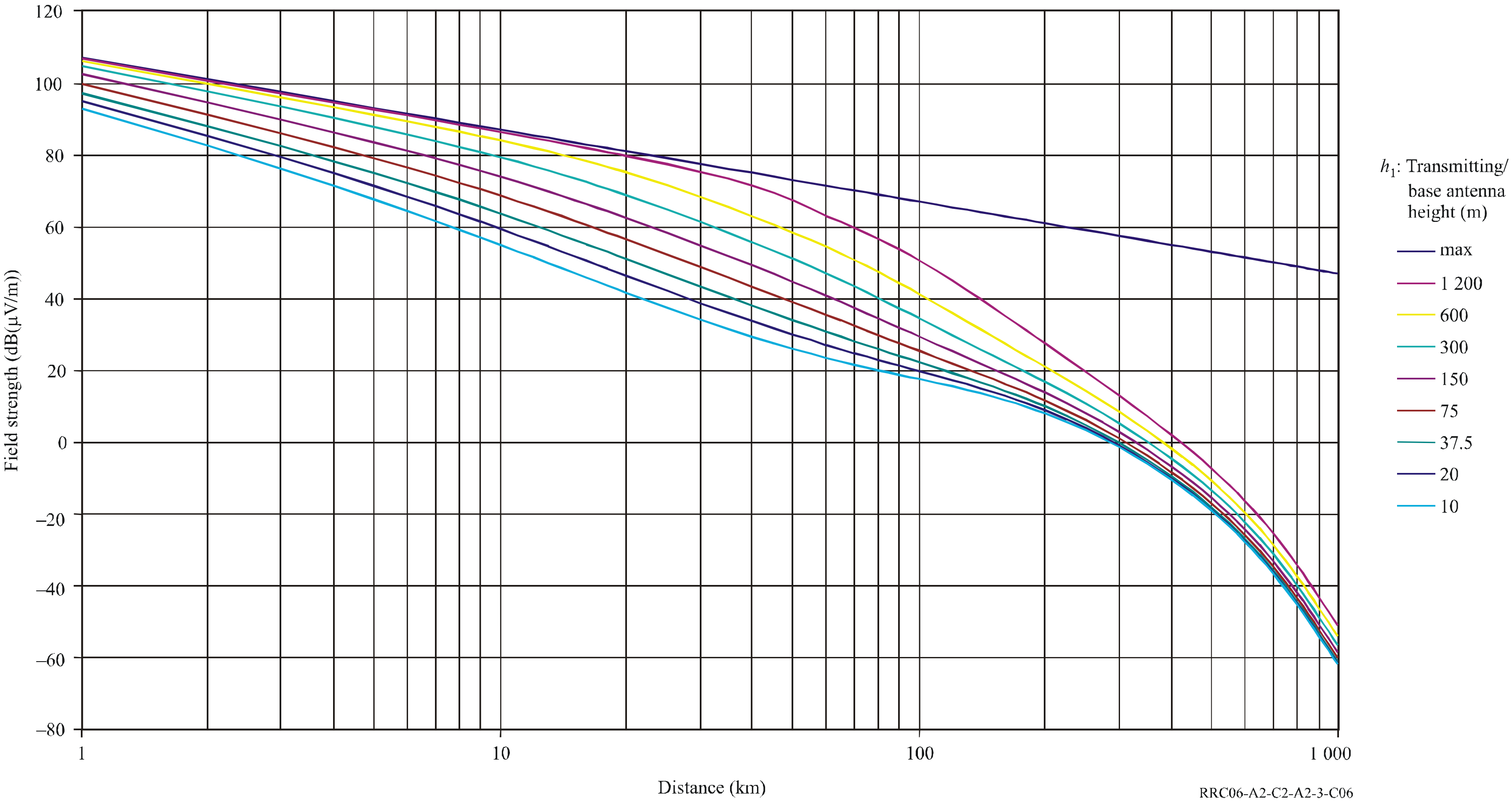


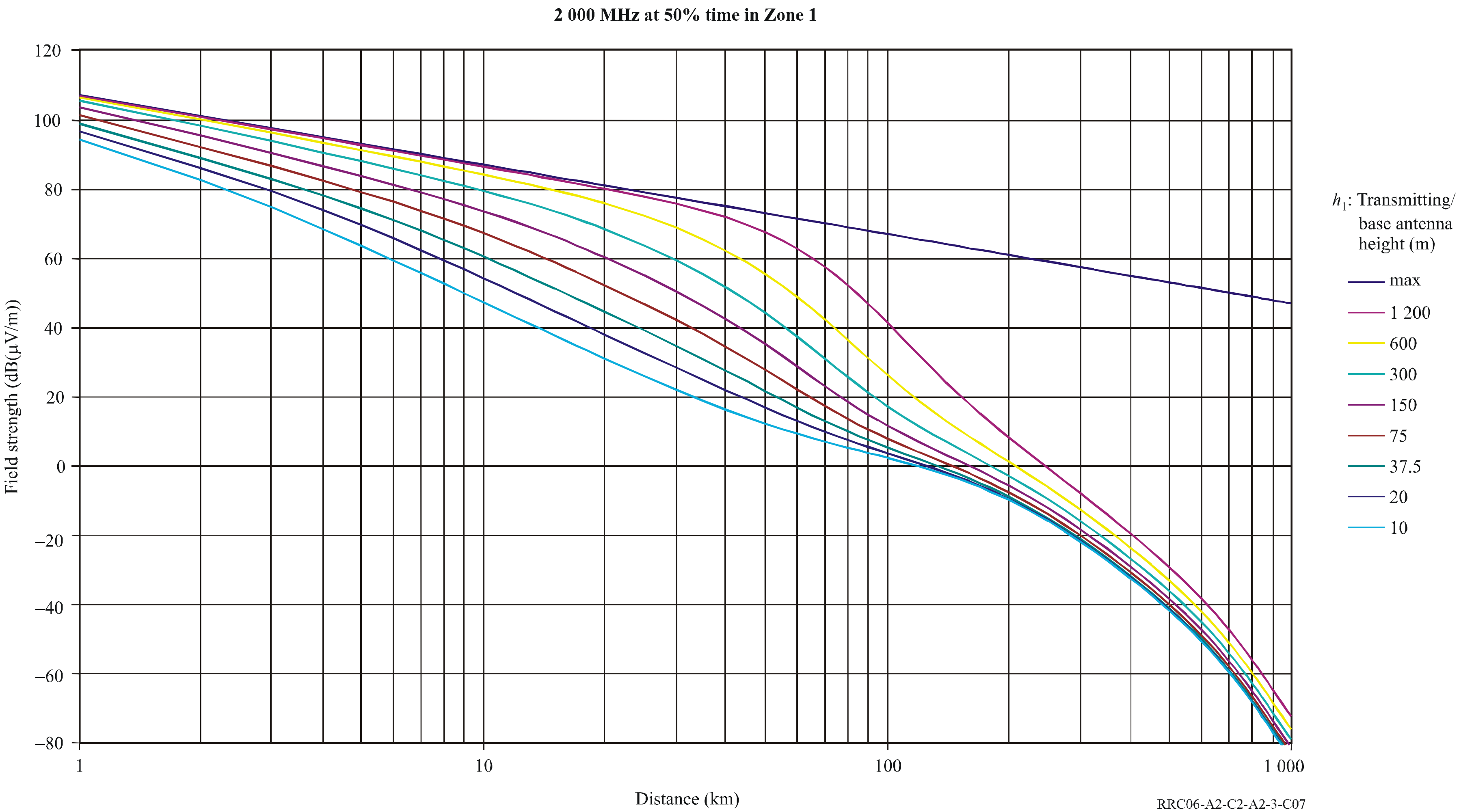
600 MHz at 50% time in Zone 1

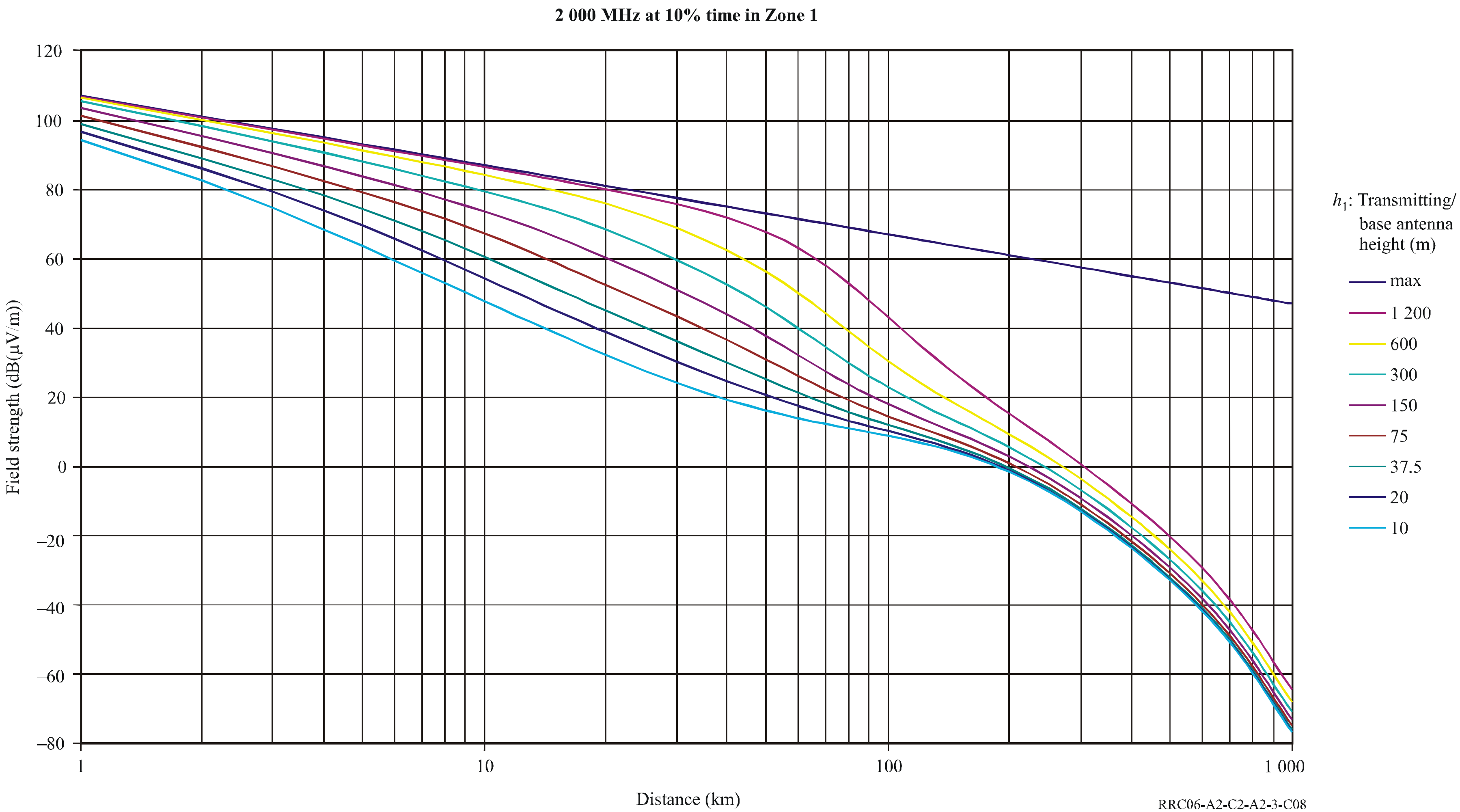



600 MHz at 10% time in Zone 1
Field strength (dB(μV/m))
120
100
80
60
40
20
0
–20
–40
–60
–80
1
10
100
1 000
Distance (km)
h_1: Transmitting/ base antenna height (m)
max
1 200
600
300
150
75
37.5
20
10
RRC06-A2-C2-A2-3-C05

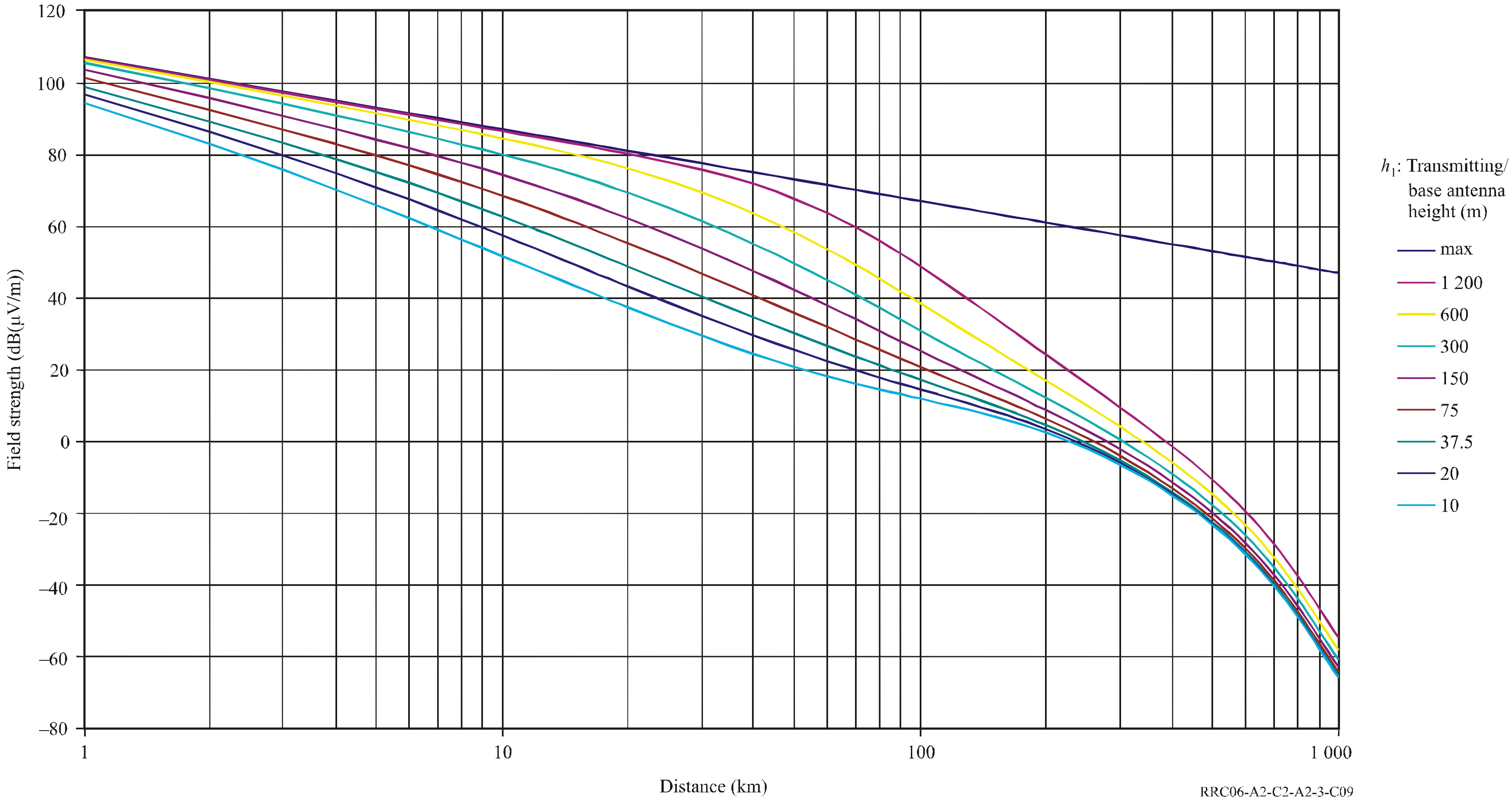
600 MHz at 1% time in Zone 1

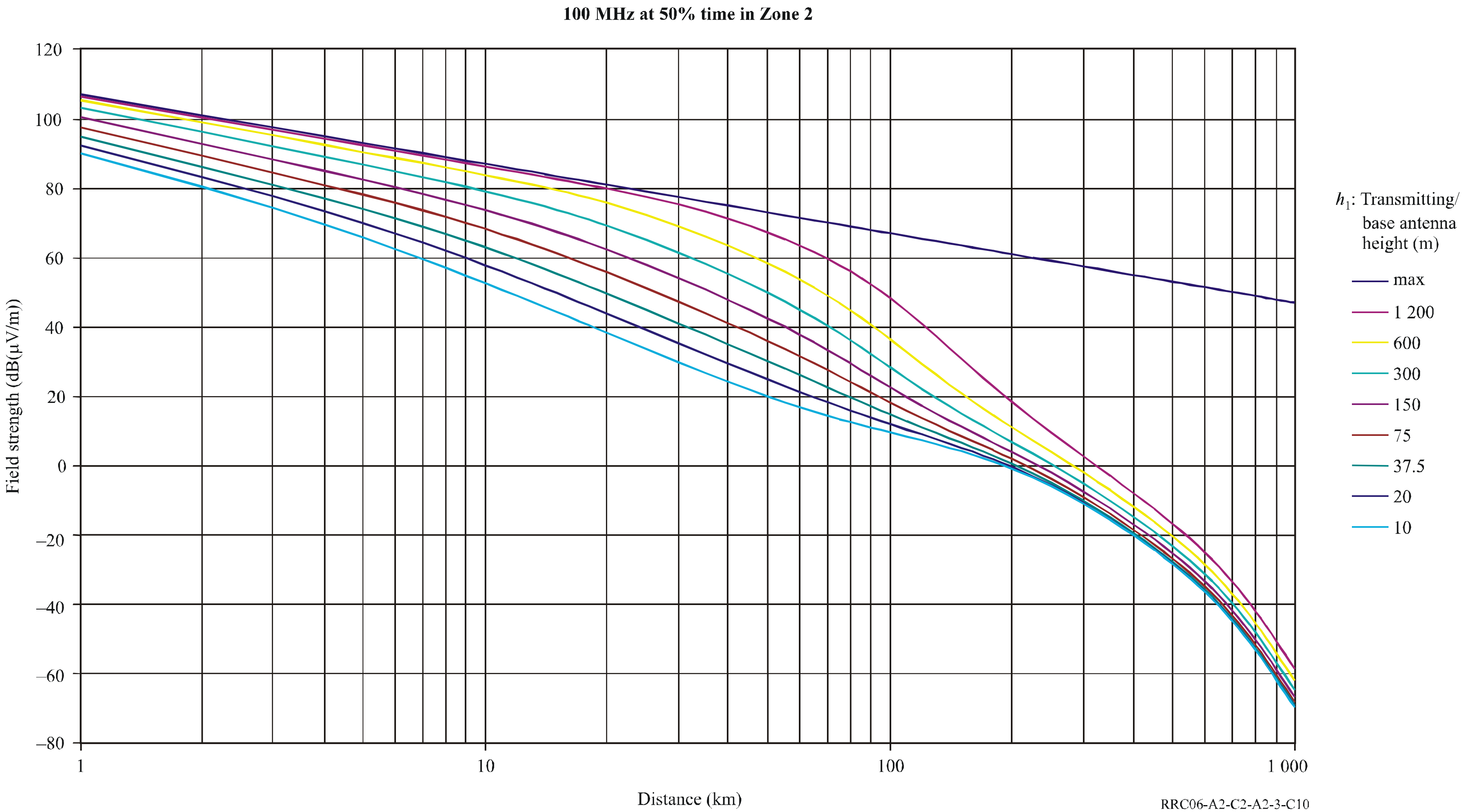



2 000 MHz at 50% time in Zone 1
120
100
80
60
40
20
0
–20
–40
–60
–80
Field strength (dB(μV/m))
1
10
100
1 000
Distance (km)
RRC06-A2-C2-A2-3-C07
h_1: Transmitting/
base antenna
height (m)
max
1 200
600
300
150
75
37.5
20
10

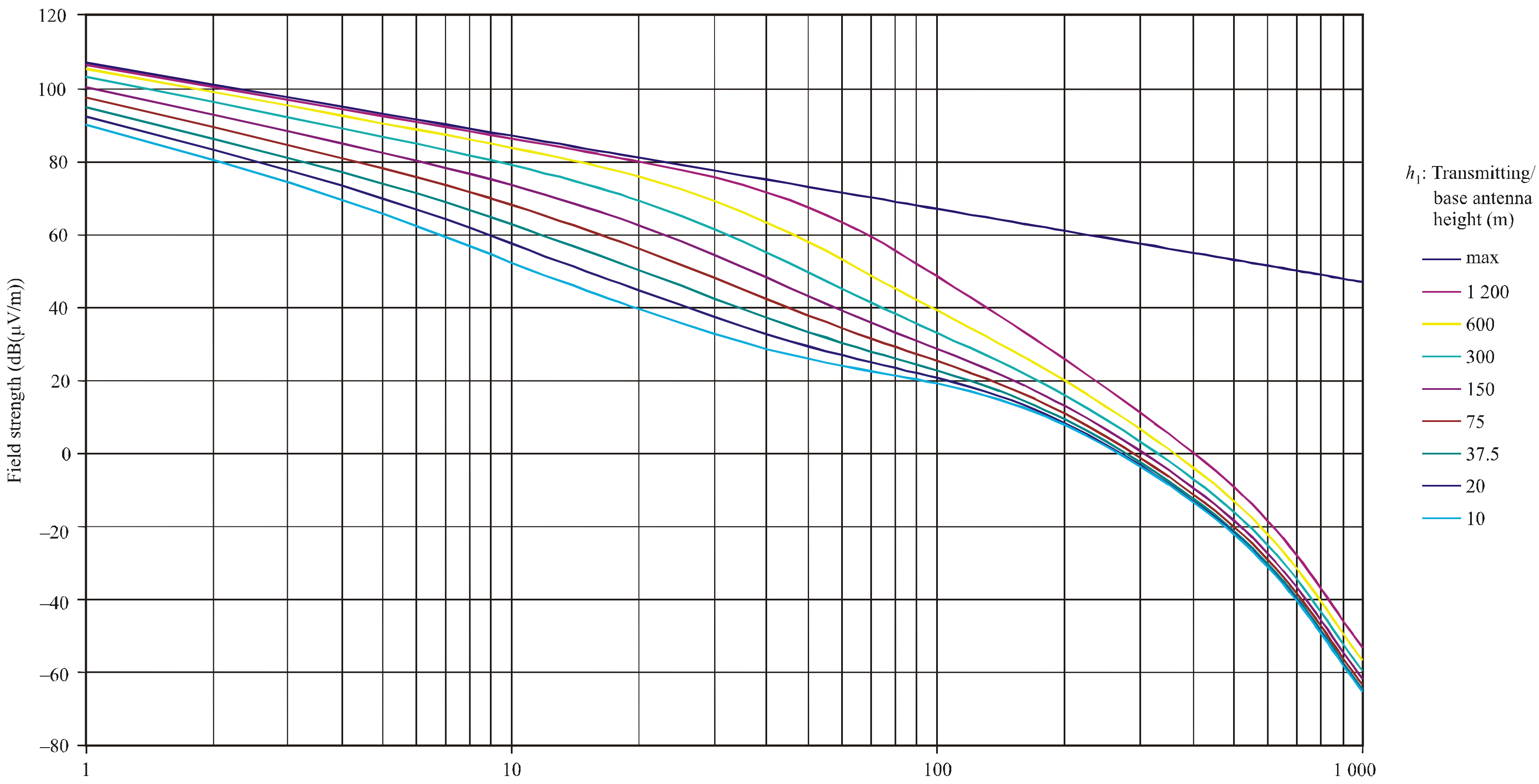

2 000 MHz at 10% time in Zone 1
Field strength (dB(µV/m))
120
100
80
60
40
20
0
–20
–40
–60
–80
1
10
100
1 000
Distance (km)
h_1: Transmitting/ base antenna height (m)
max
1 200
600
300
150
75
37.5
20
10
RRC06-A2-C2-A2-3-C08

2 000 MHz at 1% time in Zone 1



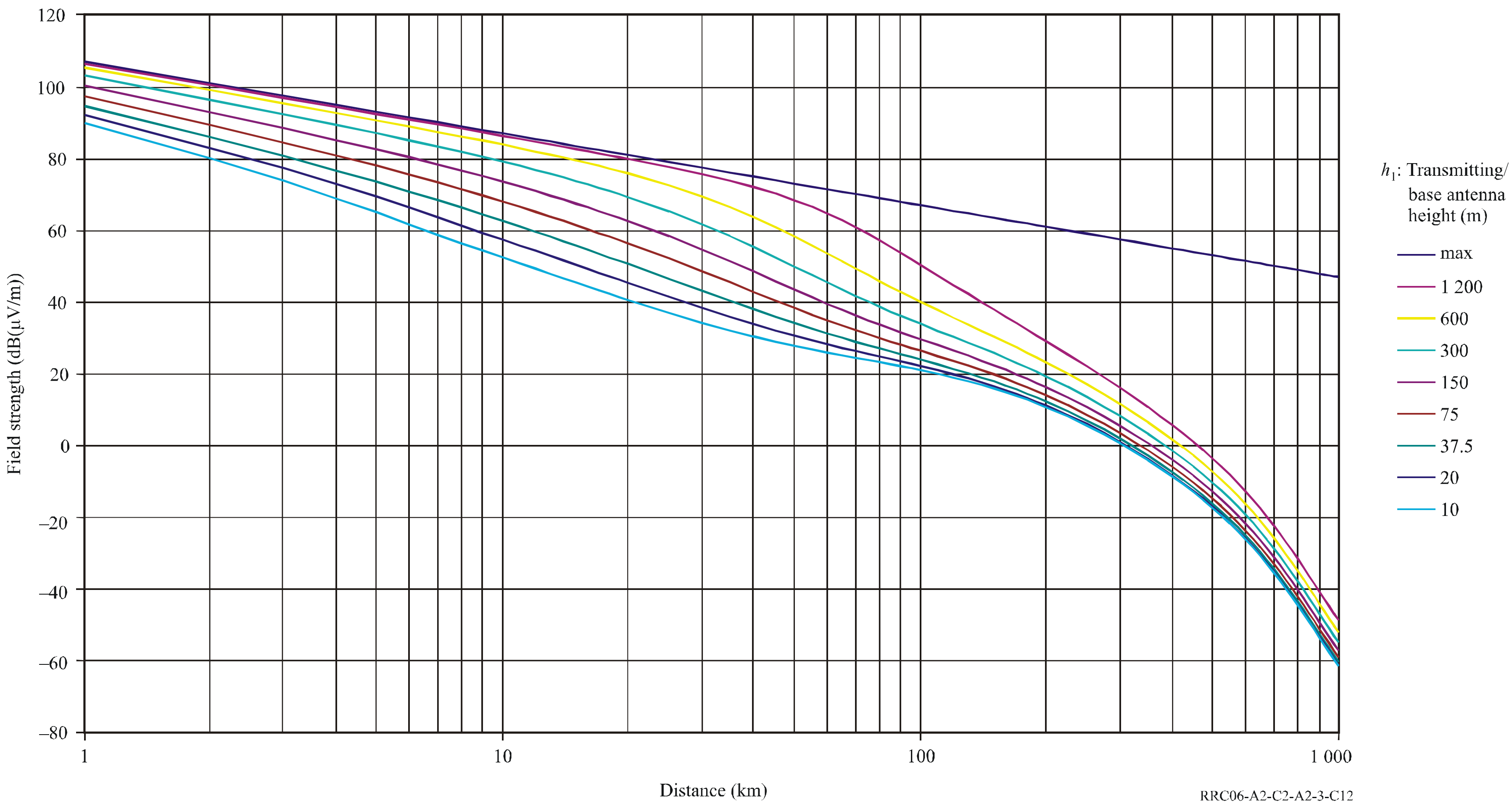

100 MHz at 50% time in Zone 2
120
100
80
60
40
20
0
–20
–40
–60
–80
Field strength (dB(μV/m))
1
10
100
1 000
Distance (km)
h_1: Transmitting/ base antenna height (m)
max
1 200
600
300
150
75
37.5
20
10
RRC06-A2-C2-A2-3-C10

100 MHz at 10% time in Zone 2

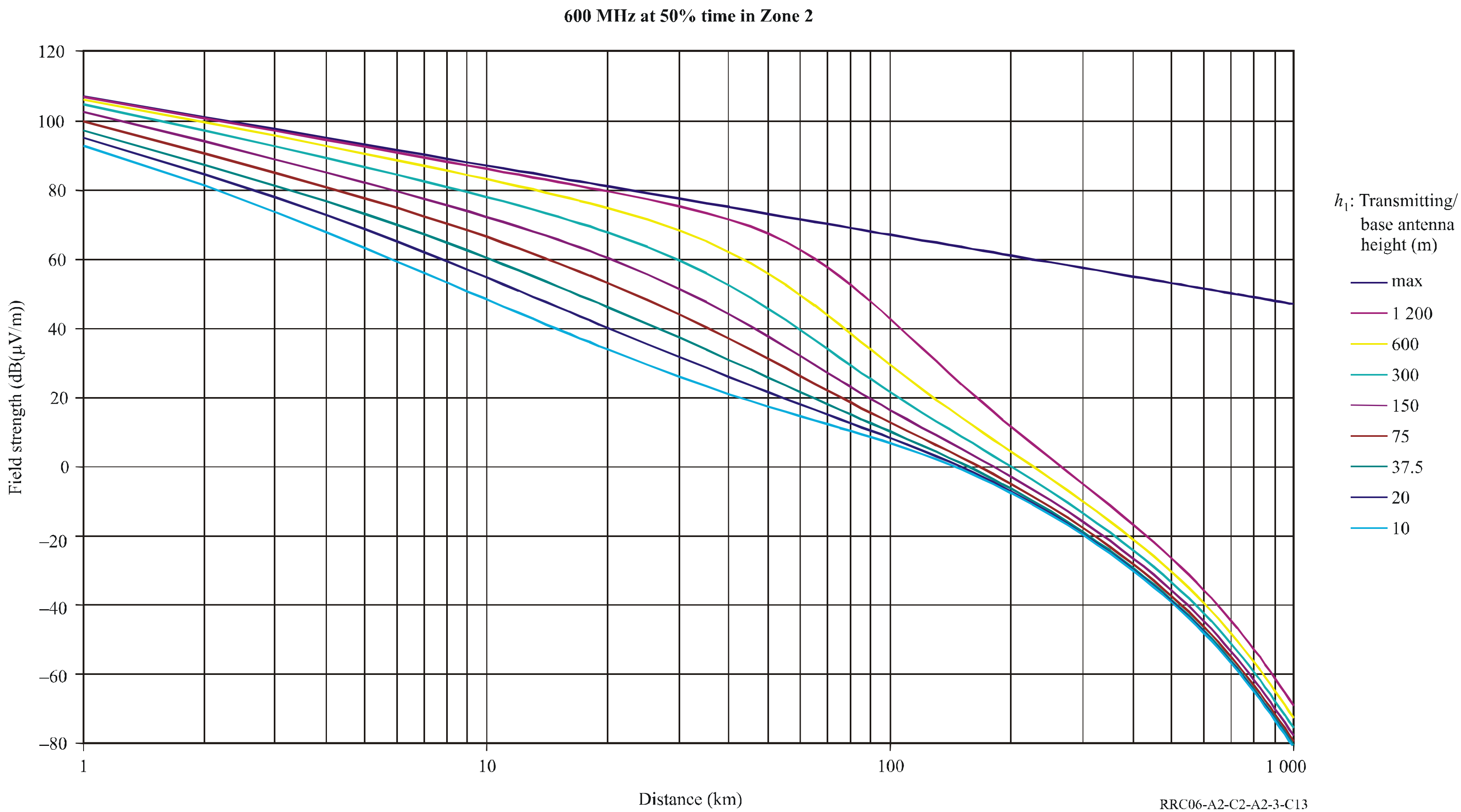


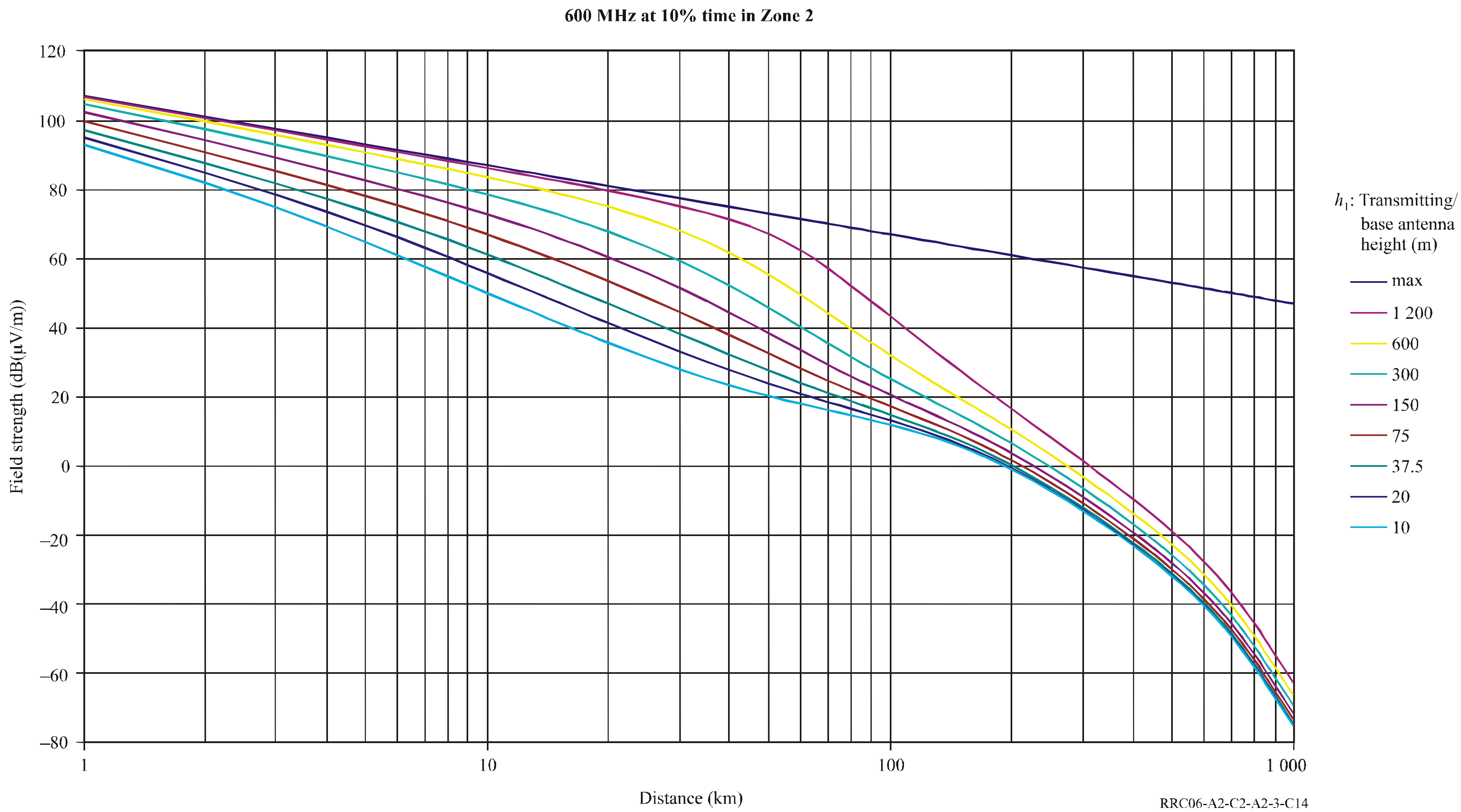
RRC06-A2-C2-A2-3-C11

100 MHz at 1% time in Zone 2

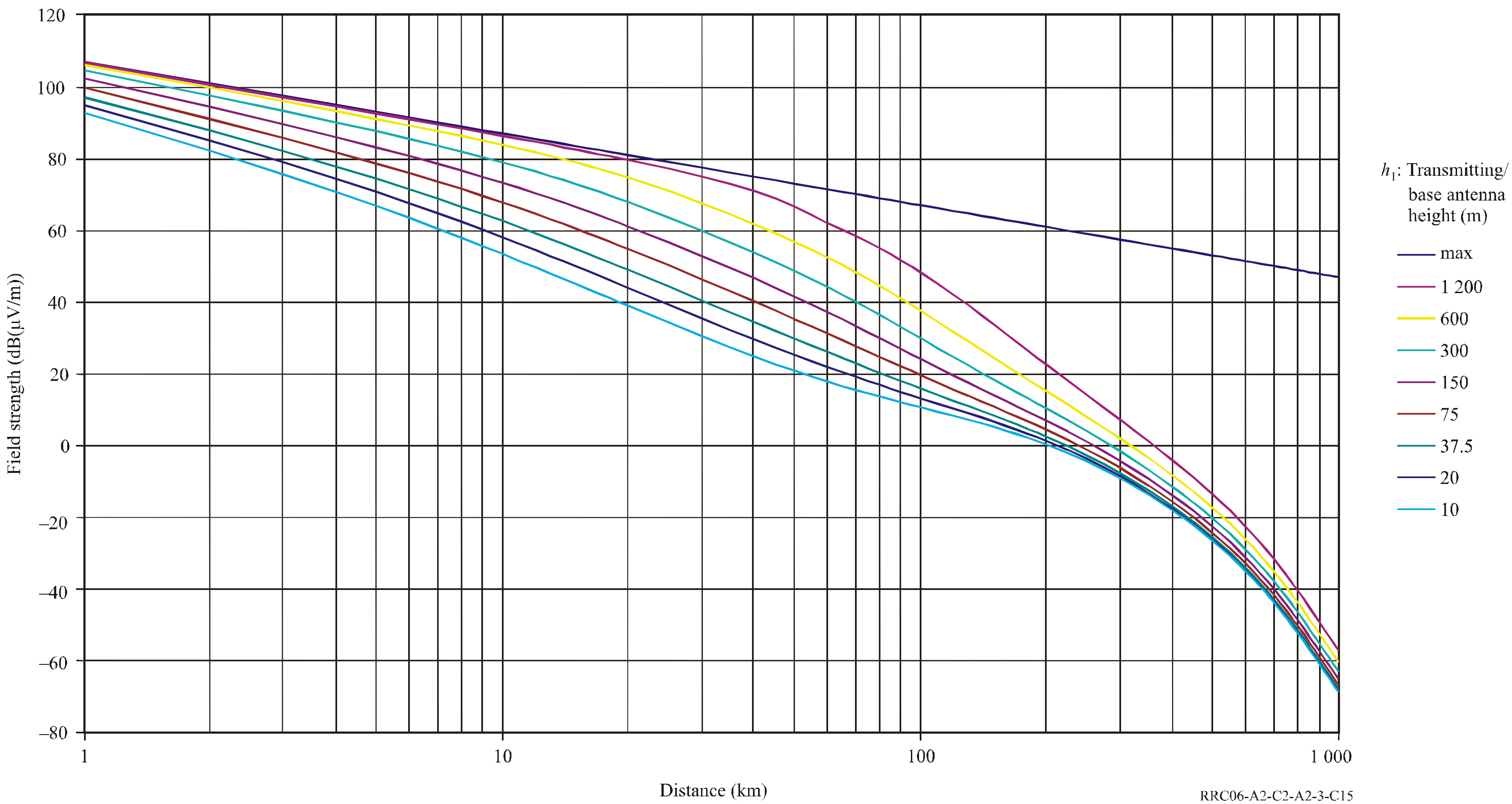


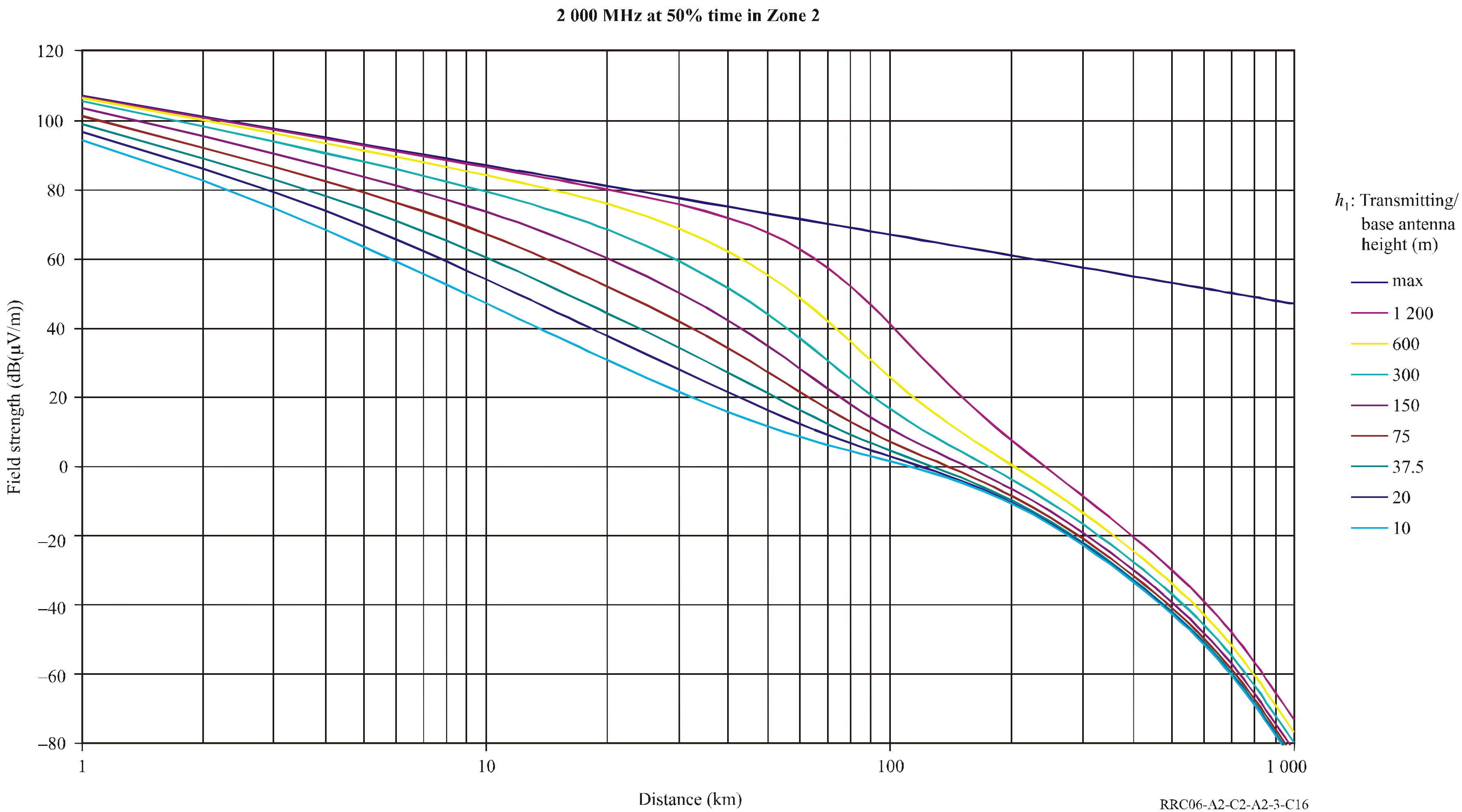
RRC06-A2-C2-A2-3-C12


600 MHz at 50% time in Zone 2
Field strength (dB(μV/m))
120
100
80
60
40
20
0
–20
–40
–60
–80
1
10
100
1 000
Distance (km)
h_1: Transmitting/ base antenna height (m)
max
1 200
600
300
150
75
37.5
20
10
RRC06-A2-C2-A2-3-C13

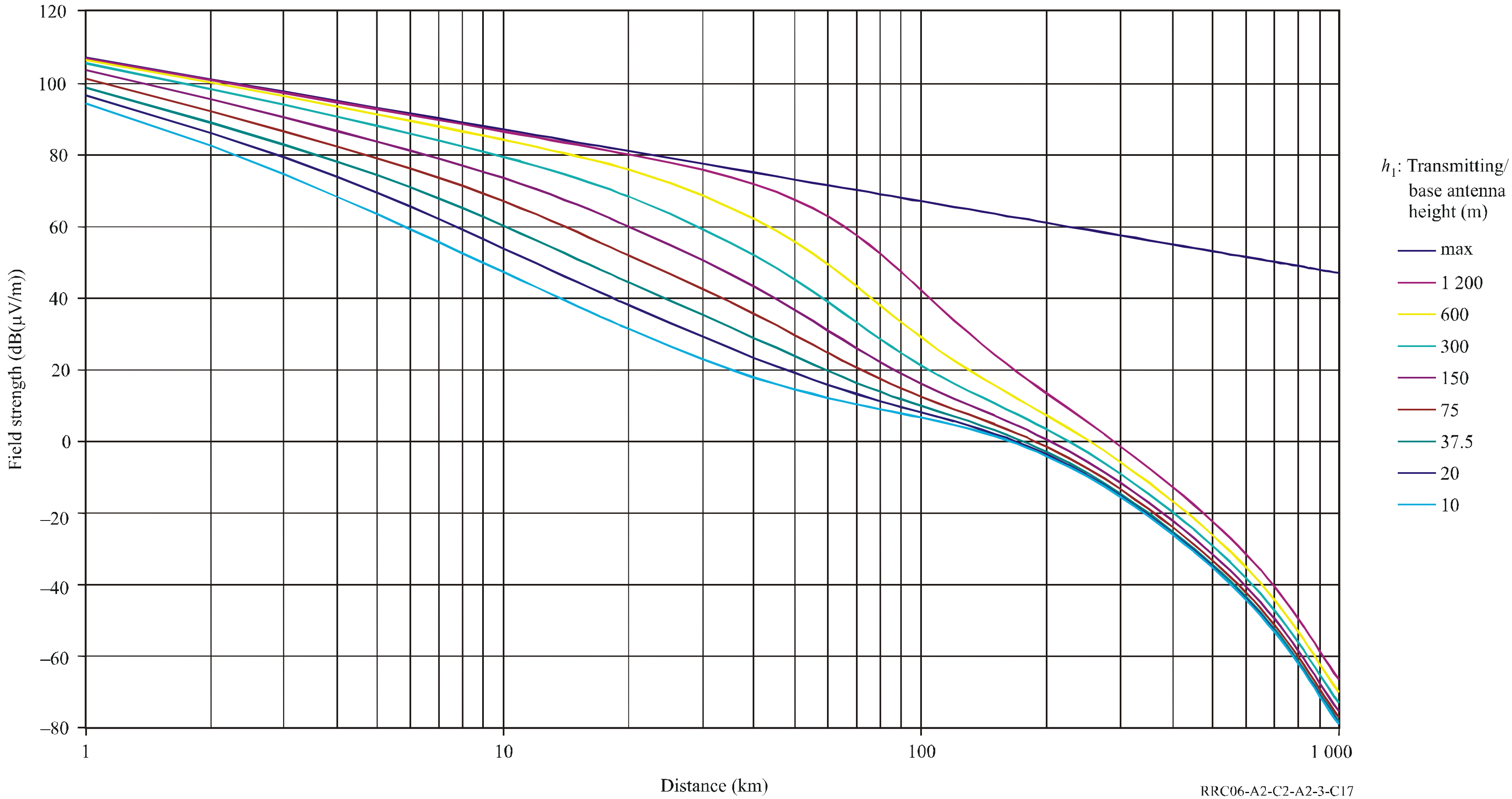

600 MHz at 10% time in Zone 2
120
100
80
60
40
20
0
–20
–40
–60
–80
Field strength (dB(μV/m))
1
10
100
1 000
Distance (km)
h_1: Transmitting/ base antenna height (m)
max
1 200
600
300
150
75
37.5
20
10
RRC06-A2-C2-A2-3-C14

600 MHz at 1% time in Zone 2

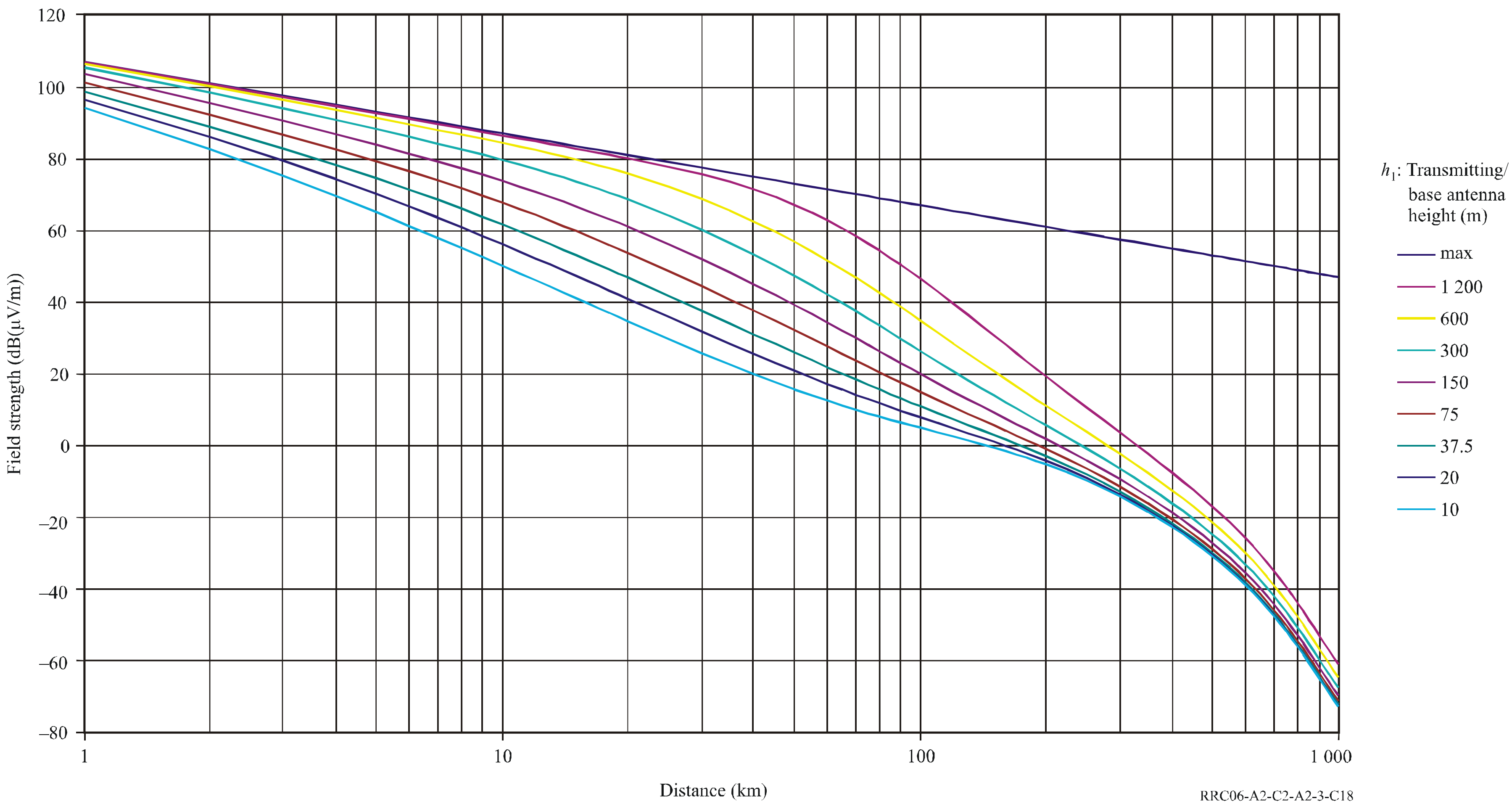



2 000 MHz at 50% time in Zone 2
Field strength (dB(μV/m))
120
100
80
60
40
20
0
–20
–40
–60
–80
1
10
100
1 000
Distance (km)
h1: Transmitting/
base antenna
height (m)
max
1 200
600
300
150
75
37.5
20
10
RRC06-A2-C2-A2-3-C16

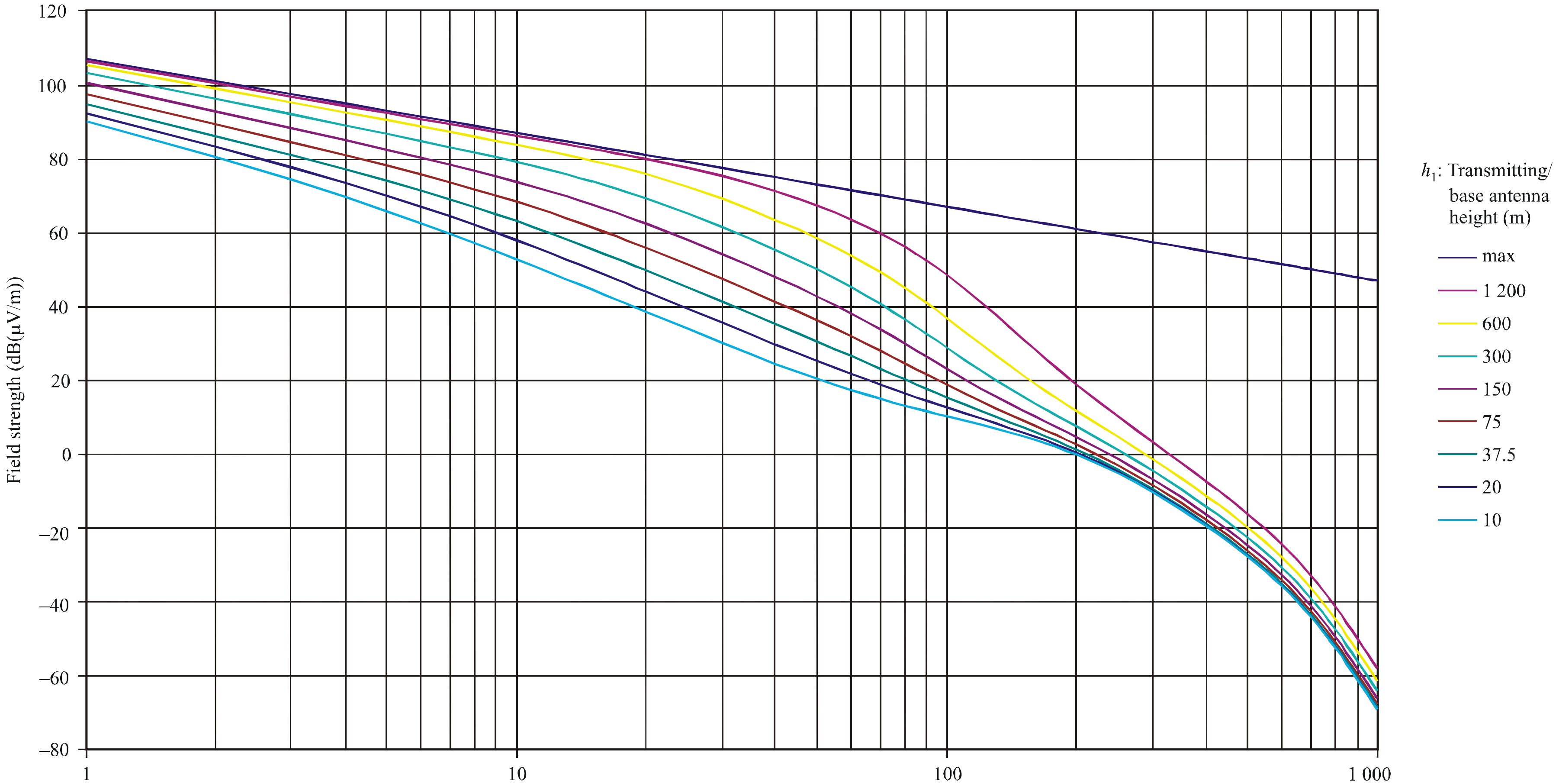
2 000 MHz at 10% time in Zone 2



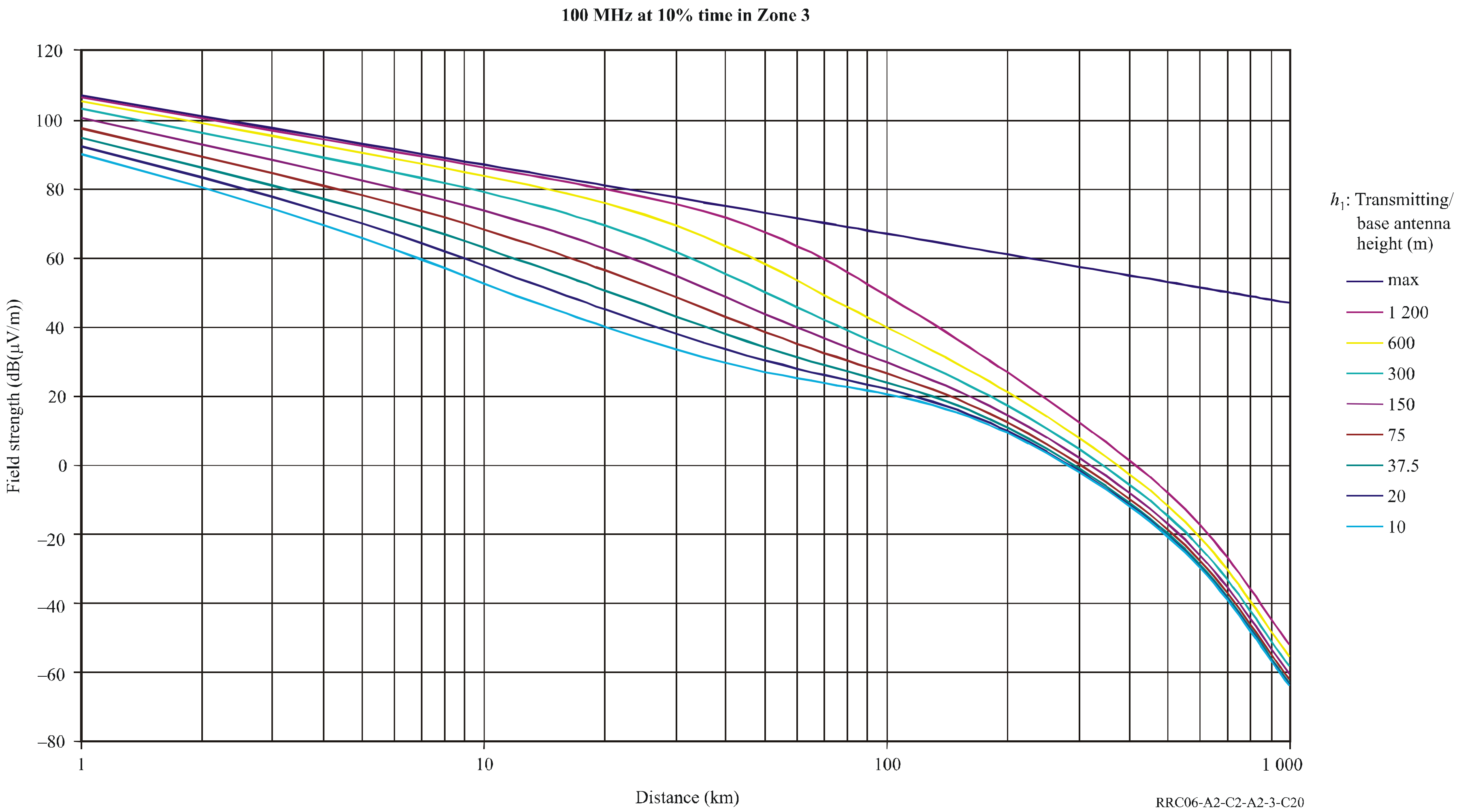
2 000 MHz at 1% time in Zone 2

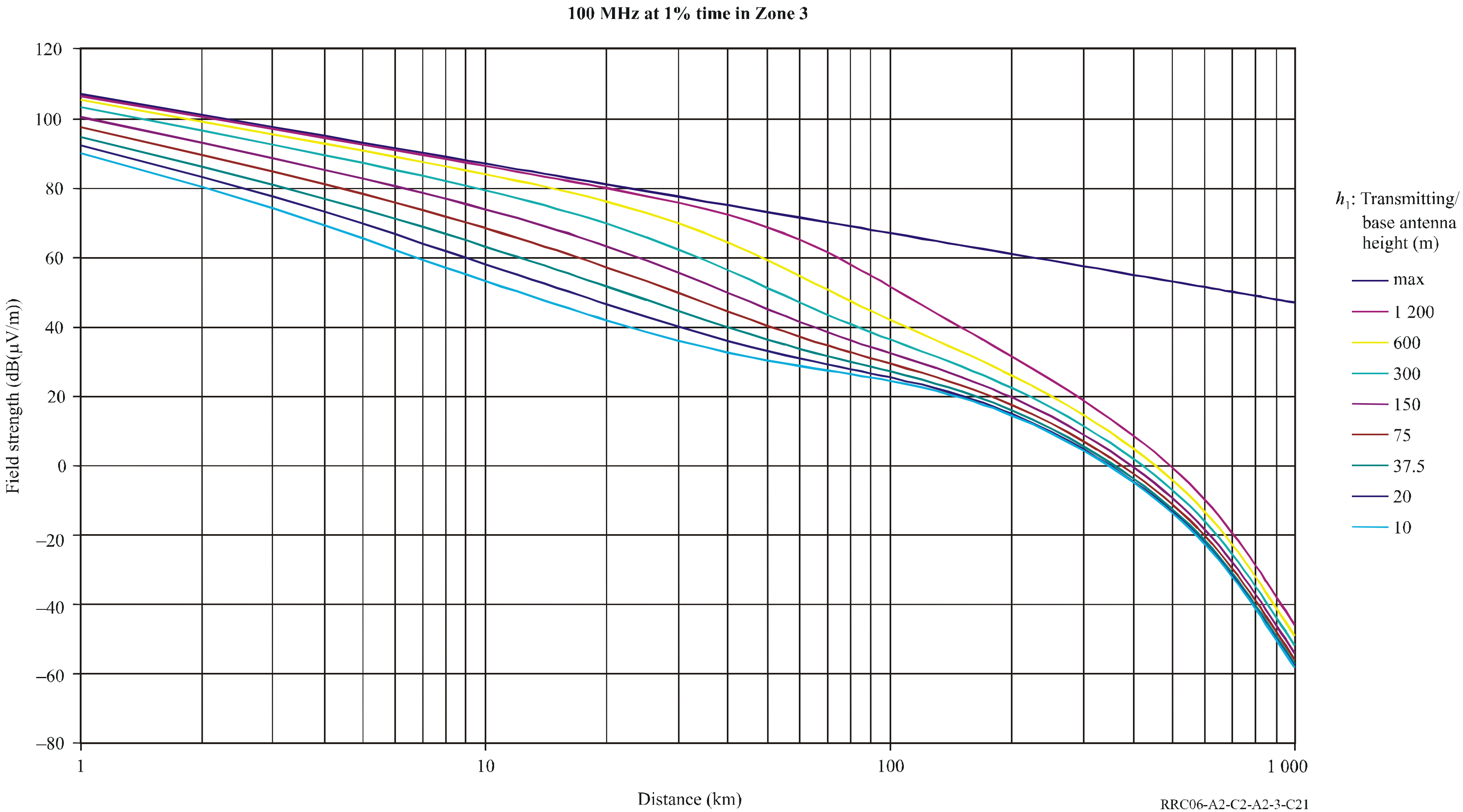


100 MHz at 50% time in Zone 3

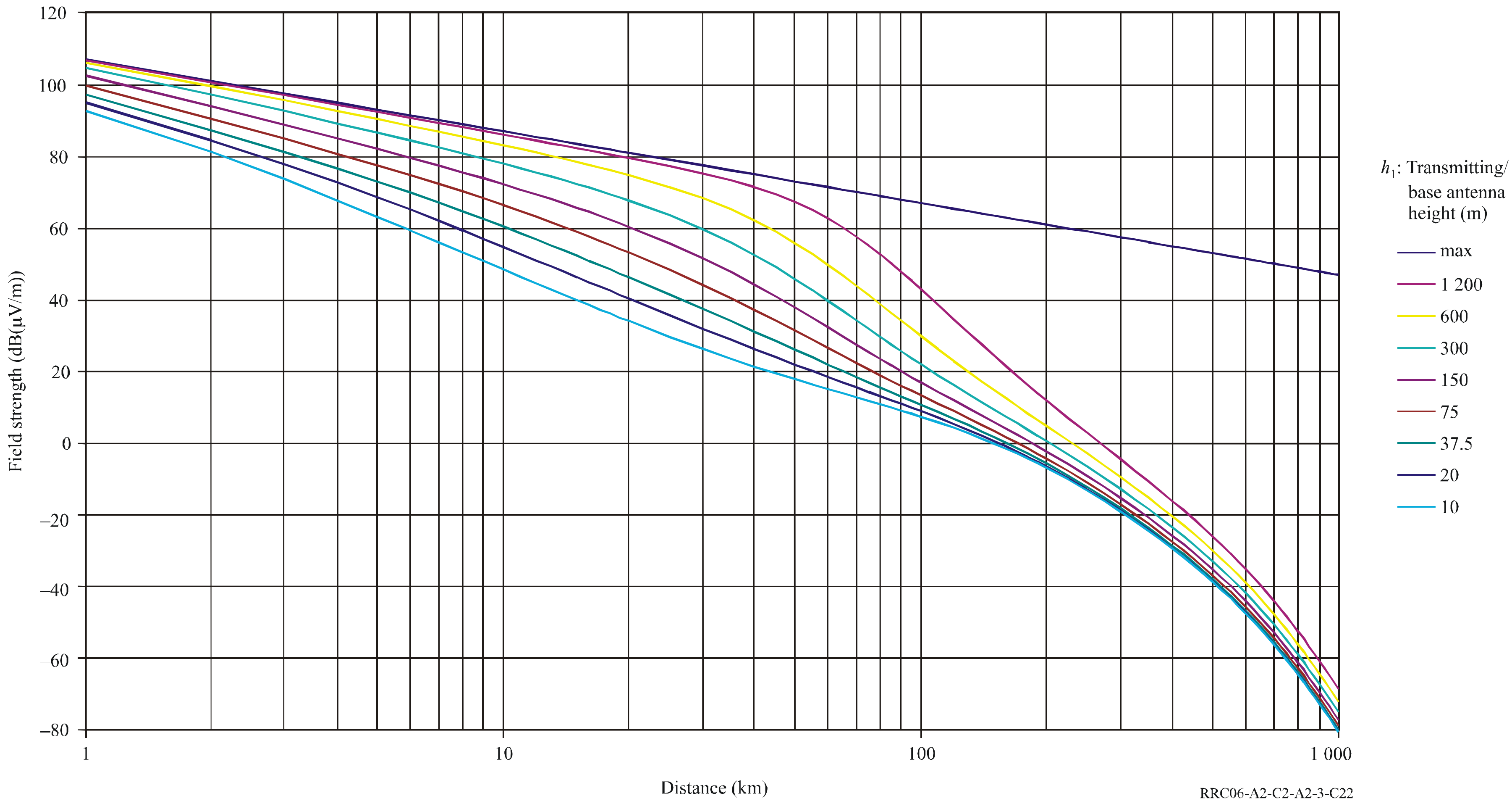


RRC06-A2-C2-A2-3-C19

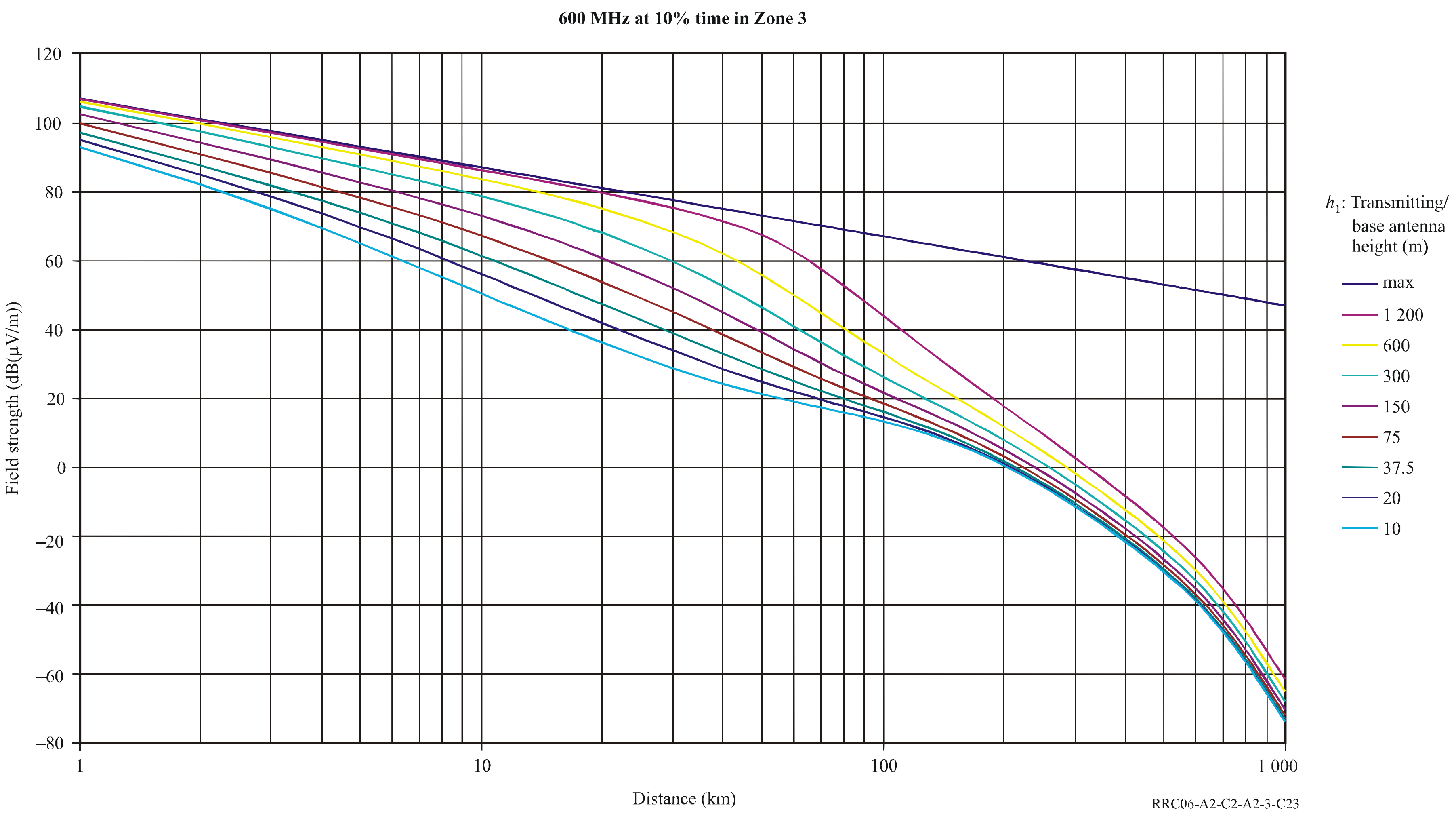

100 MHz at 10% time in Zone 3
120
100
80
60
40
20
0
–20
–40
–60
–80
Field strength (dB(μV/m))
1
10
100
1 000
Distance (km)
h1: Transmitting/ base antenna height (m)
max
1 200
600
300
150
75
37.5
20
10
RRC06-A2-C2-A2-3-C20


100 MHz at 1% time in Zone 3
Field strength (dB(μV/m))
120
100
80
60
40
20
0
–20
–40
–60
–80
1
10
100
1 000
Distance (km)
h_1: Transmitting/ base antenna height (m)
max
1 200
600
300
150
75
37.5
20
10
RRC06-A2-C2-A2-3-C21

600 MHz at 50% time in Zone 3

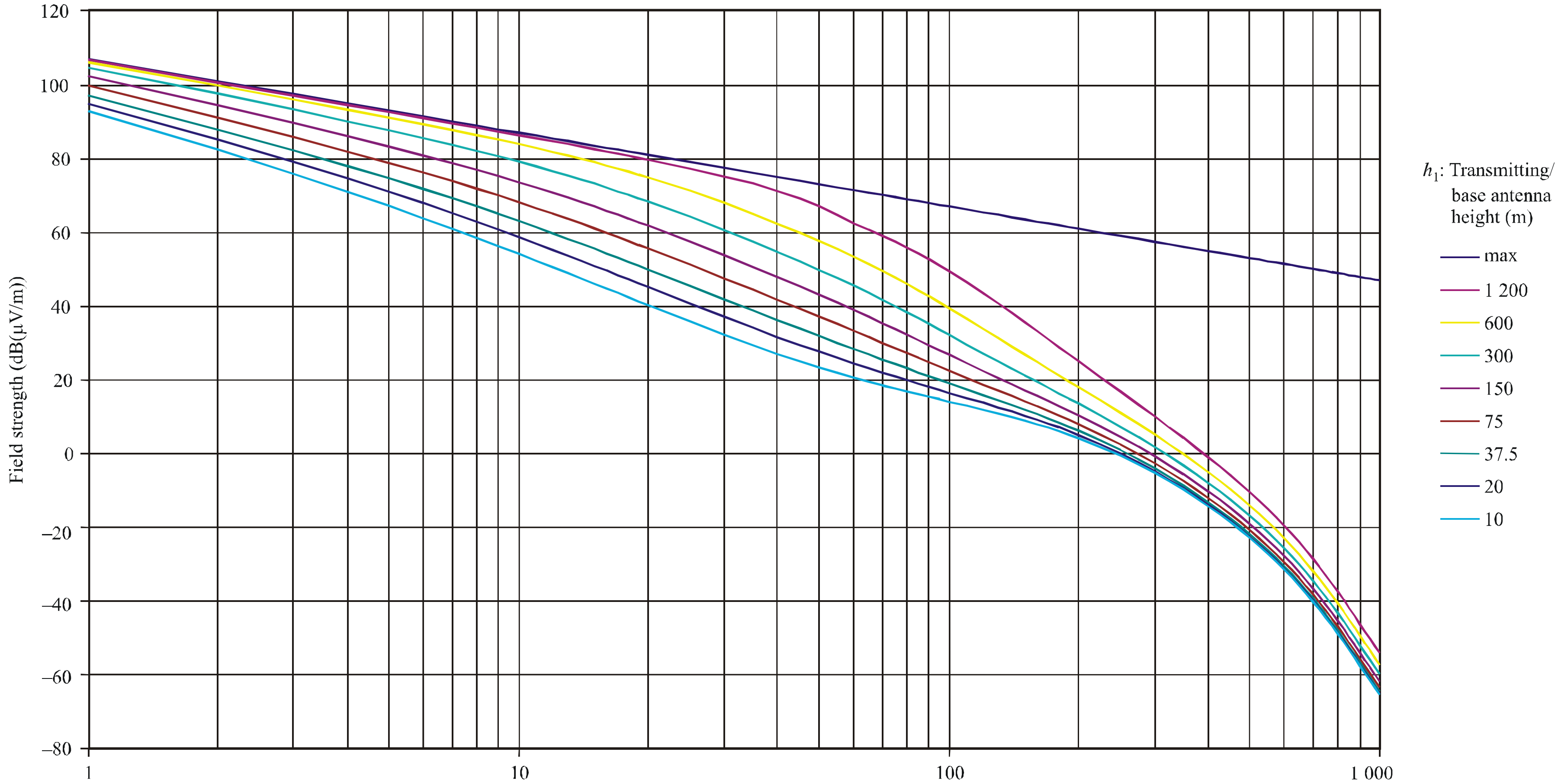


RRC06-A2-C2-A2-3-C22



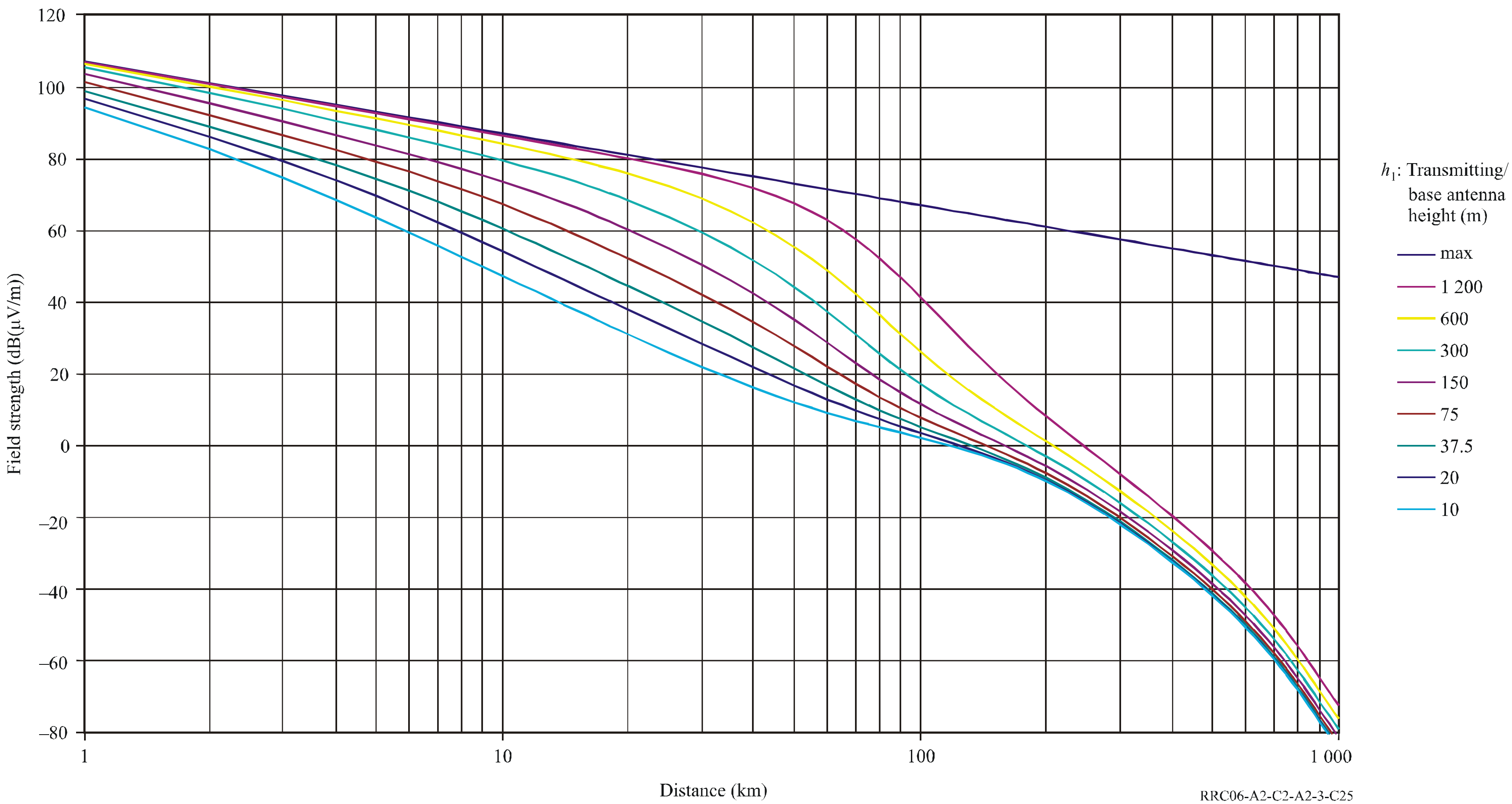
600 MHz at 10% time in Zone 3
120
100
80
60
40
20
0
–20
–40
–60
–80
Field strength (dB(μV/m))
1
10
100
1 000
Distance (km)
h_1: Transmitting/ base antenna height (m)
max
1 200
600
300
150
75
37.5
20
10
RRC06-A2-C2-A2-3-C23

600 MHz at 1% time in Zone 3

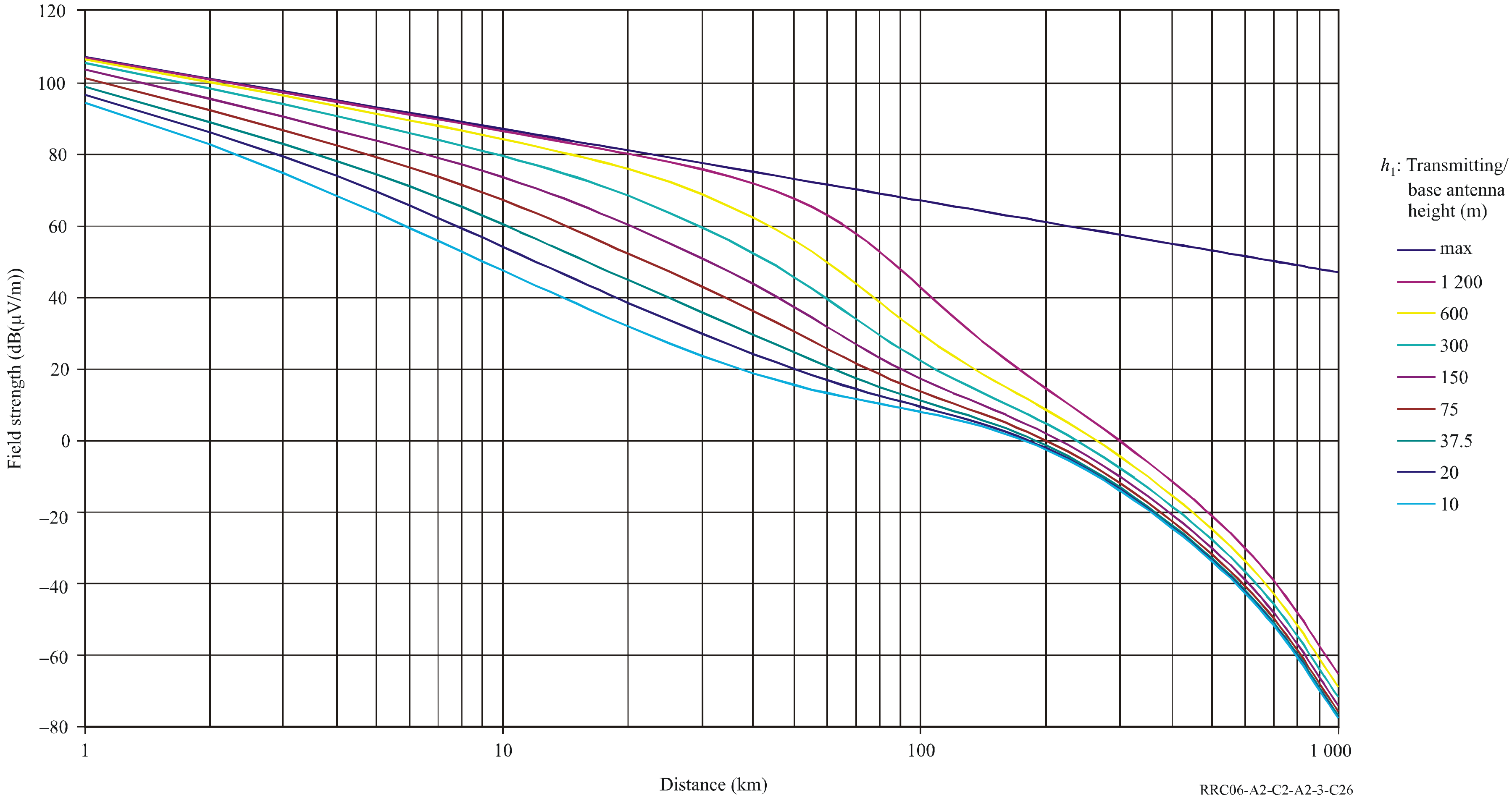


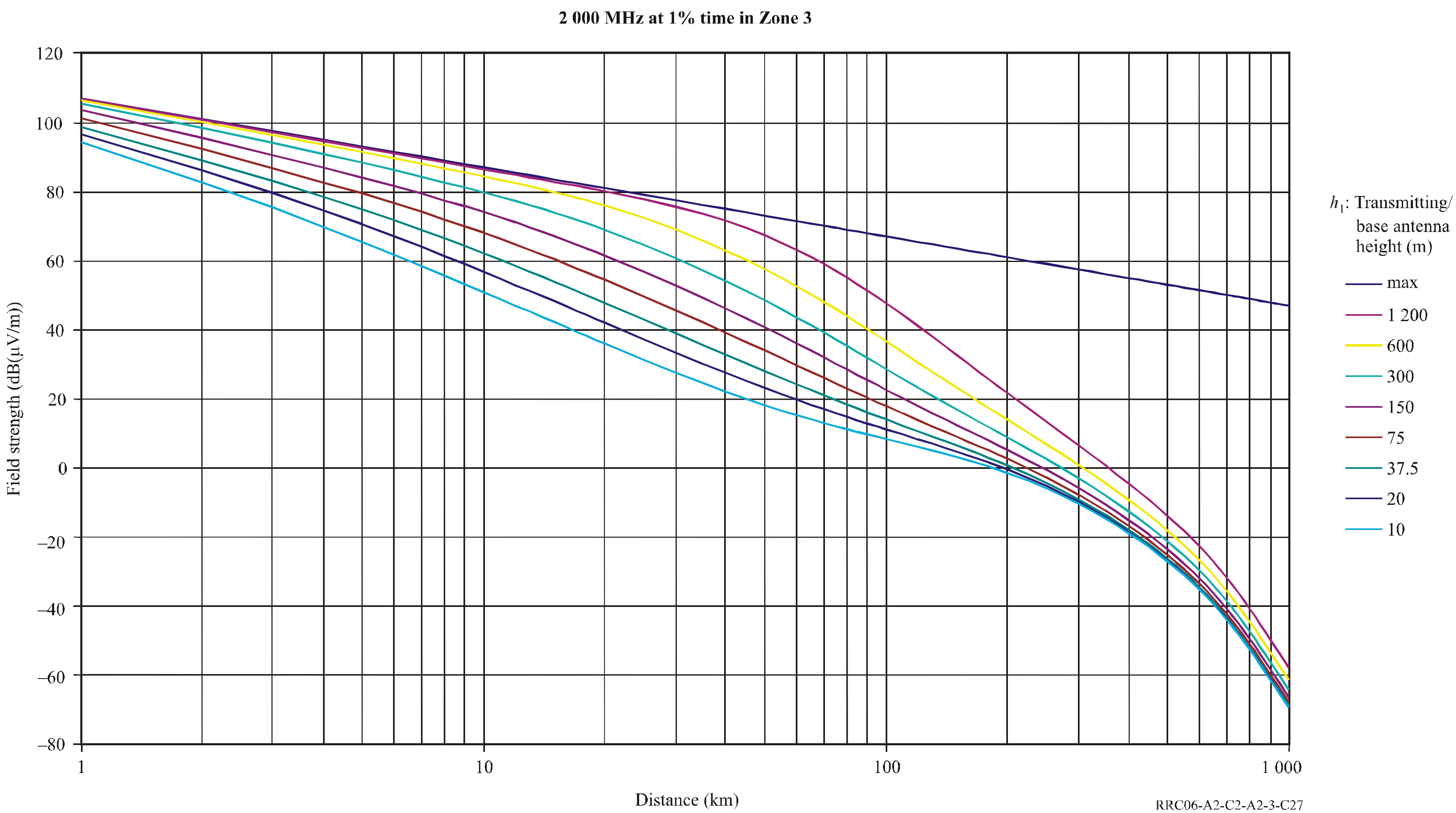
RRC06-A2-C2-A2-3-C24

2 000 MHz at 50% time in Zone 3

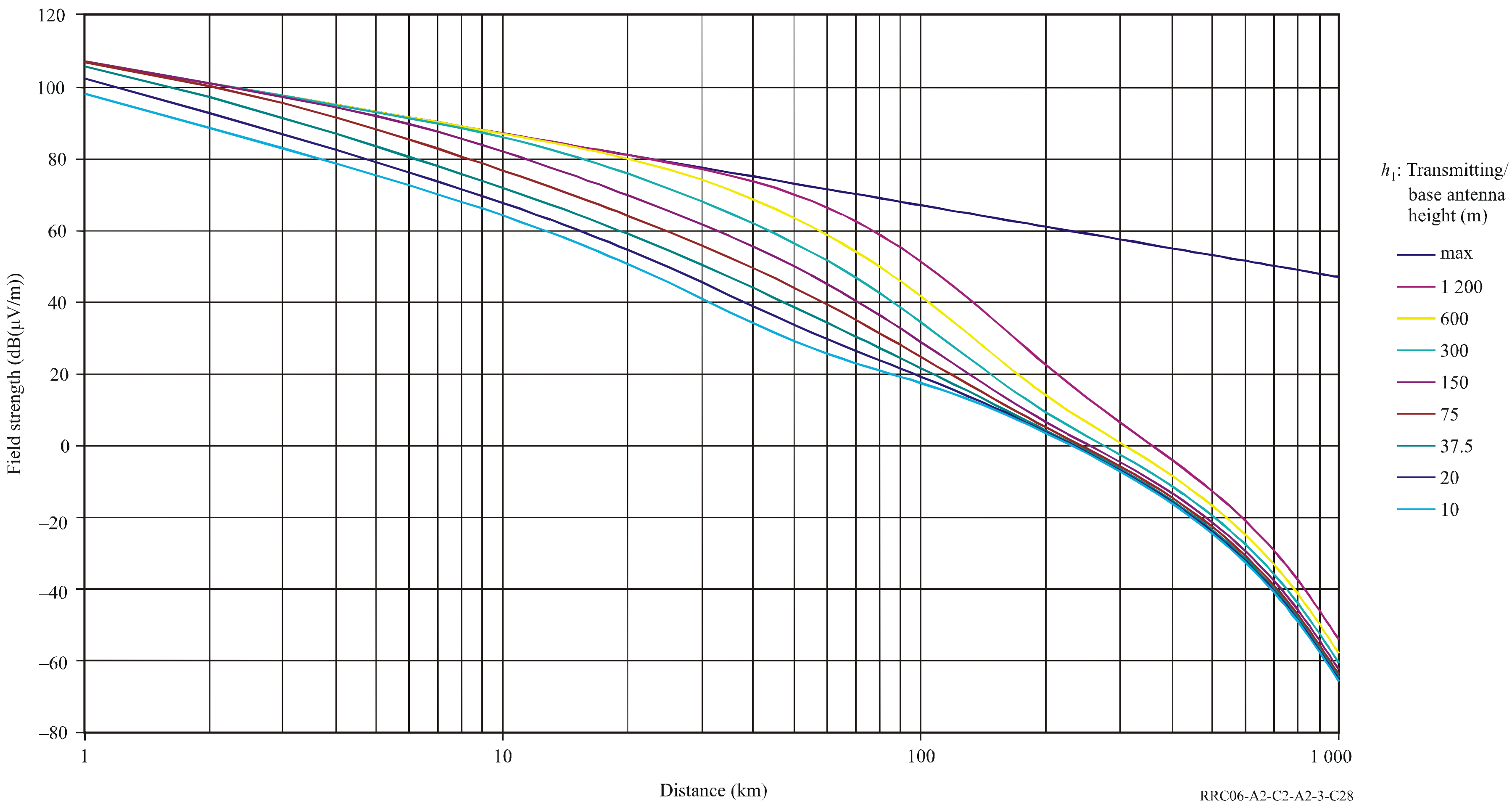


2 000 MHz at 10% time in Zone 3



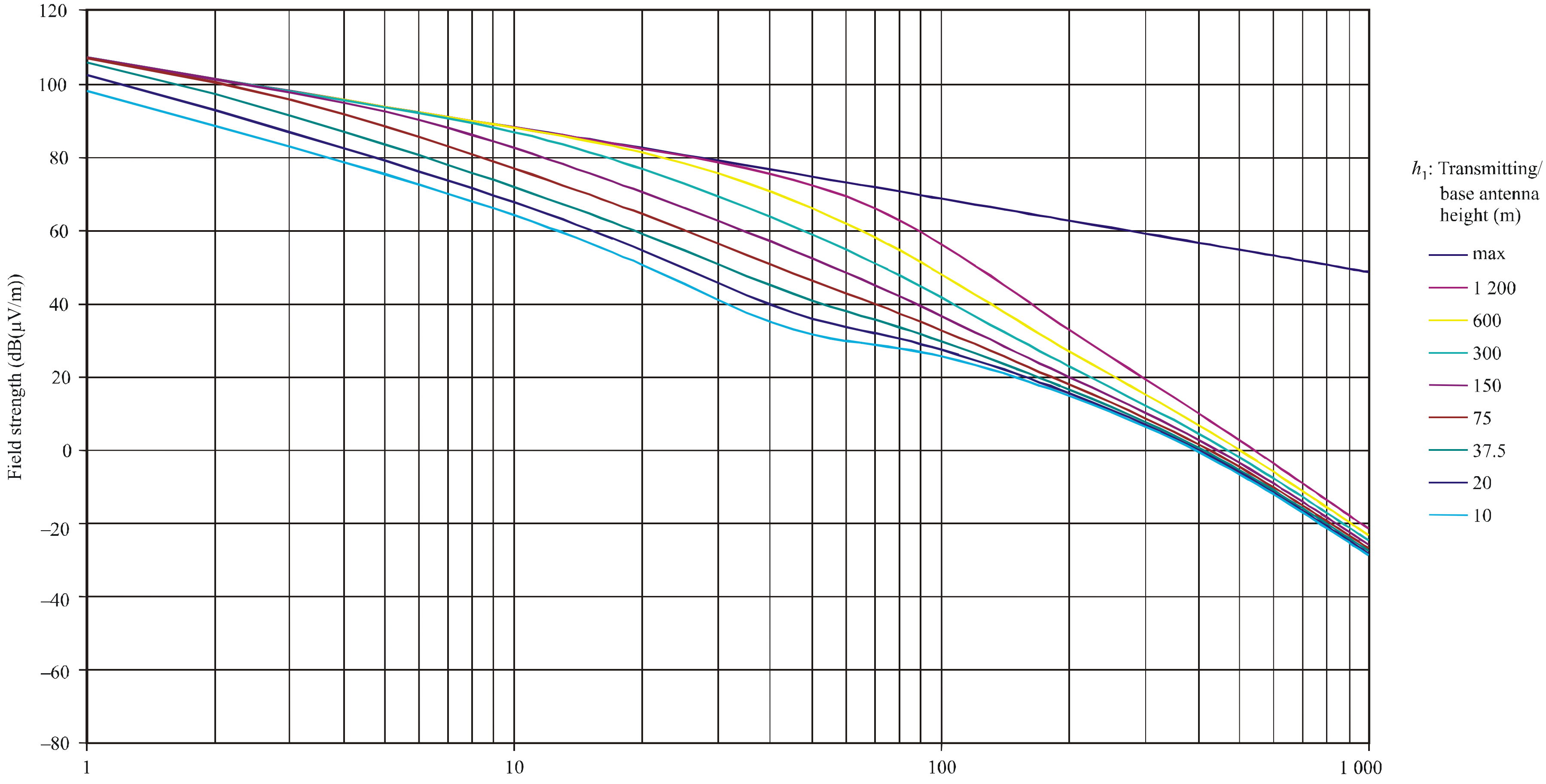

2 000 MHz at 1% time in Zone 3
120
100
80
60
40
20
0
–20
–40
–60
–80
Field strength (dB(μV/m))
1
10
100
1 000
Distance (km)
h_1: Transmitting/ base antenna height (m)
max
1 200
600
300
150
75
37.5
20
10
RRC06-A2-C2-A2-3-C27

100 MHz at 50% time in Zone 4



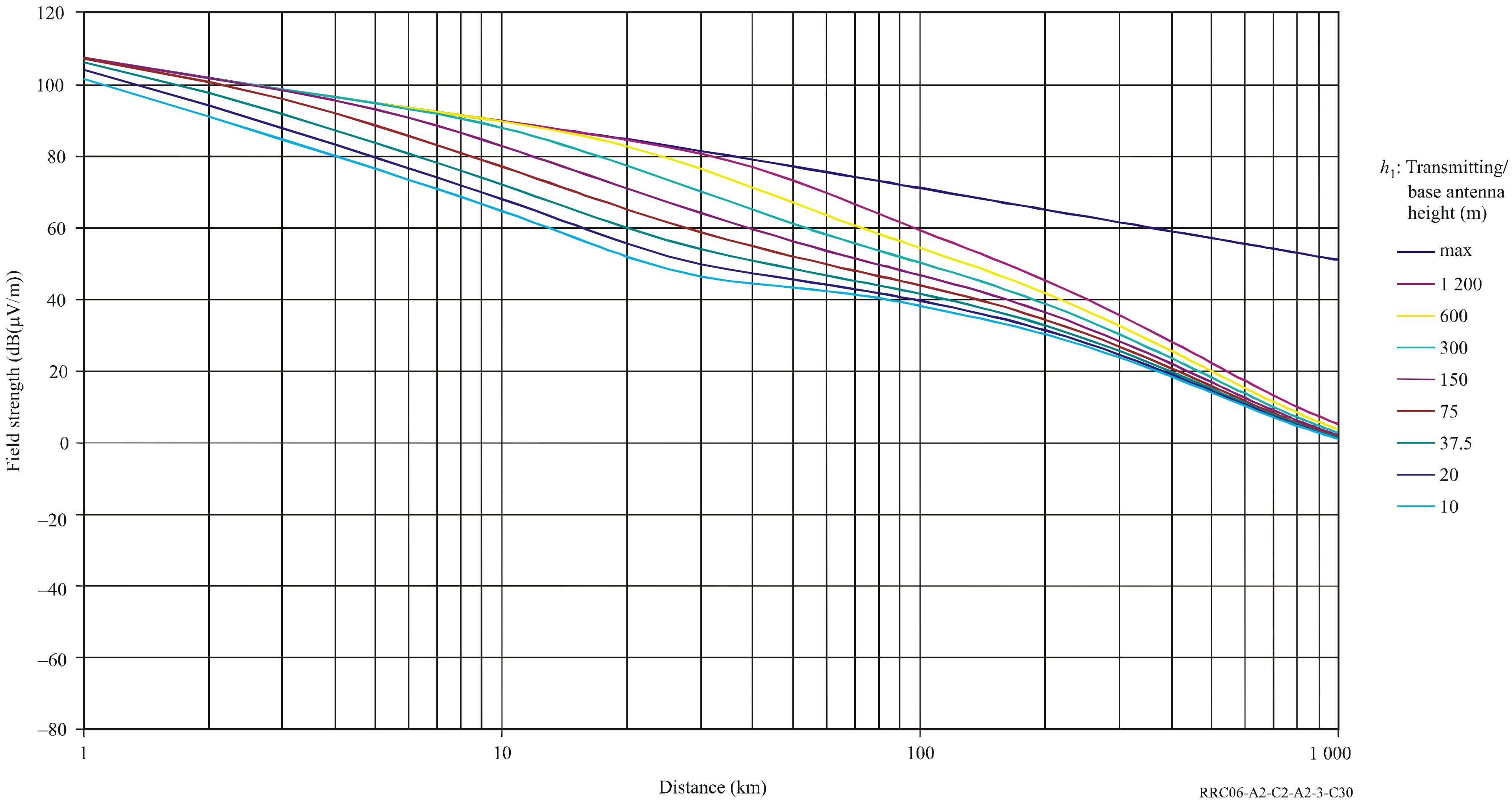
RRC06-A2-C2-A2-3-C28

100 MHz at 10% time in Zone 4

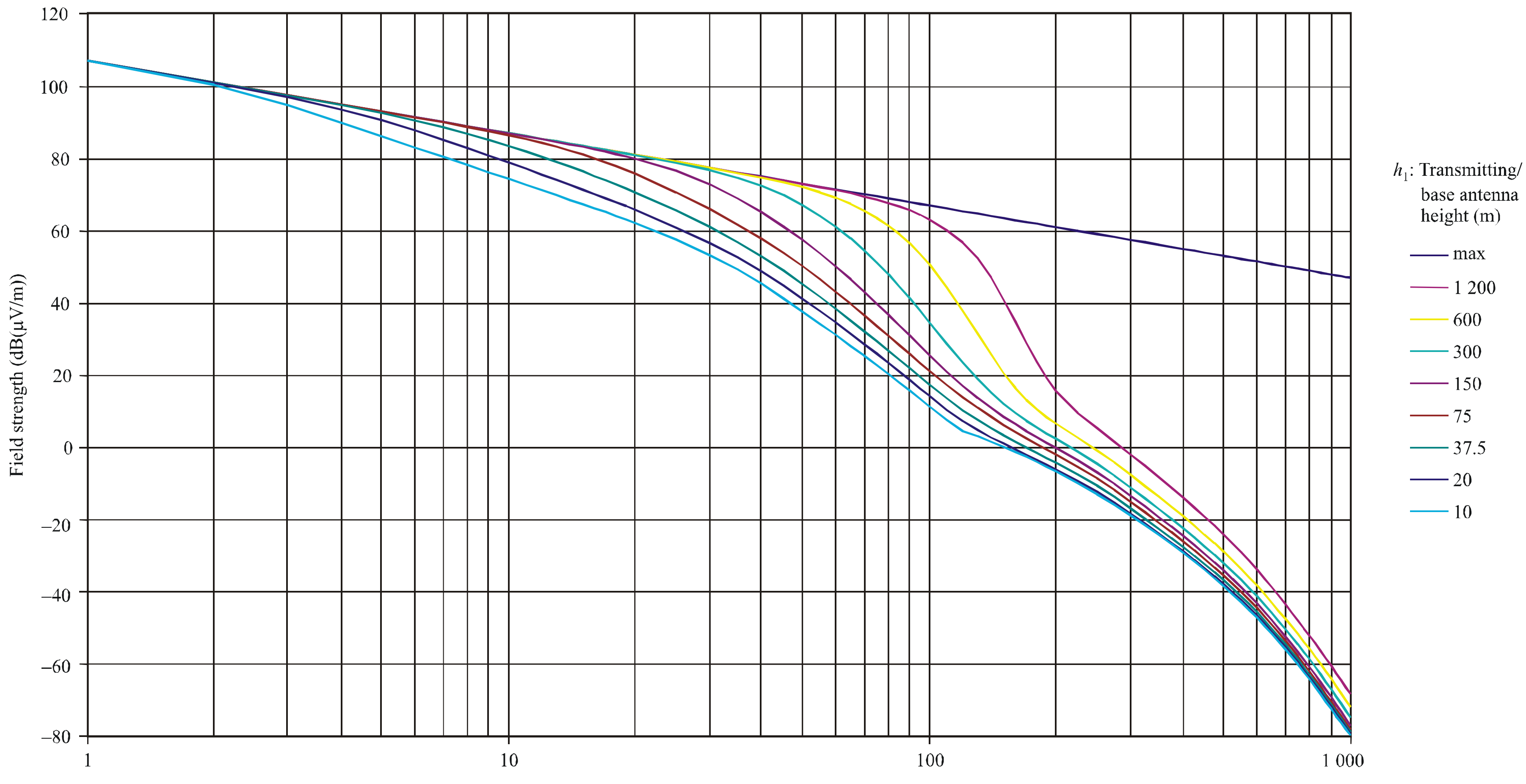


RRC06-A2-C2-A2-3-C29

100 MHz at 1% time in Zone 4

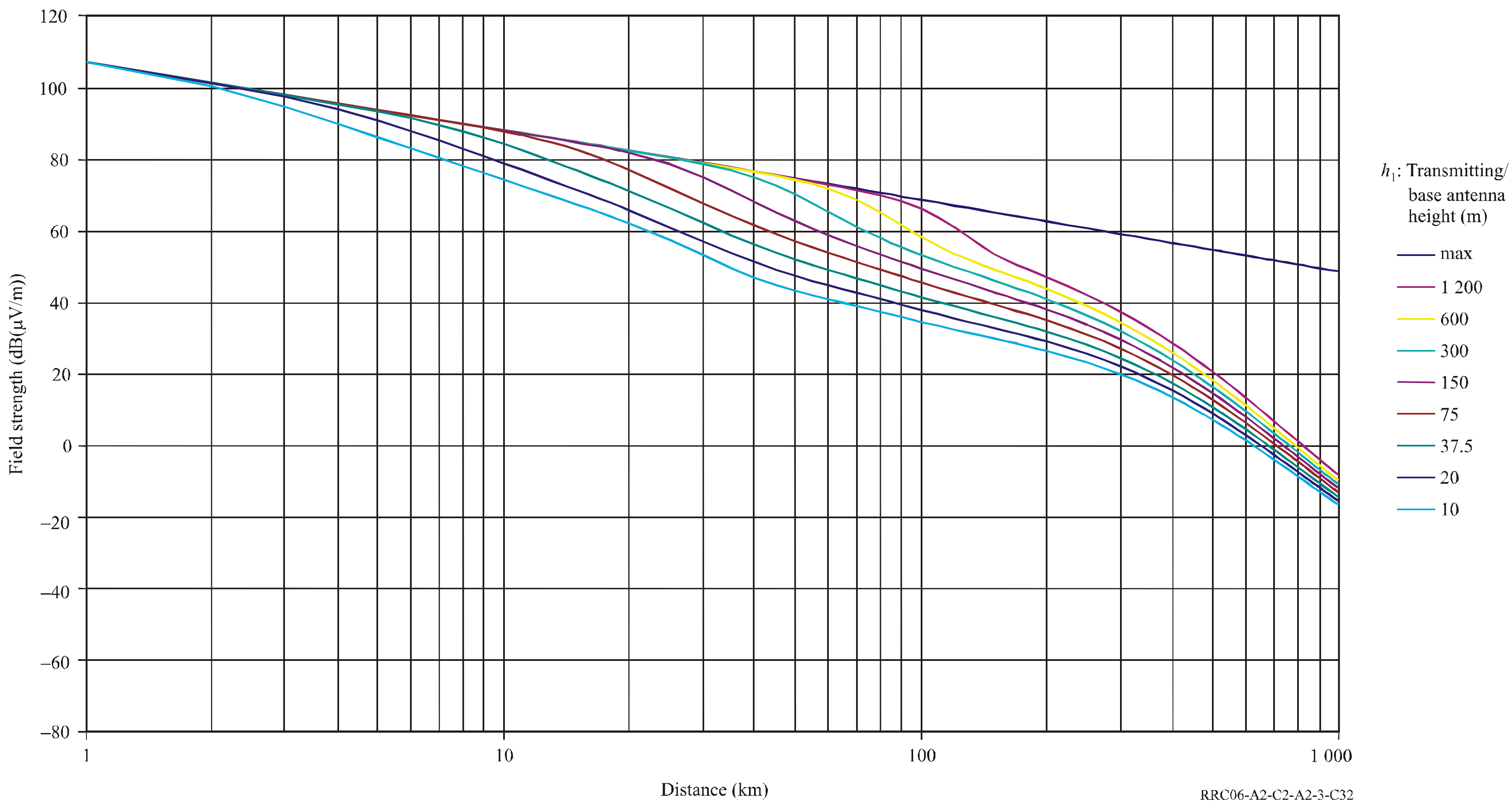


600 MHz at 50% time in Zone 4

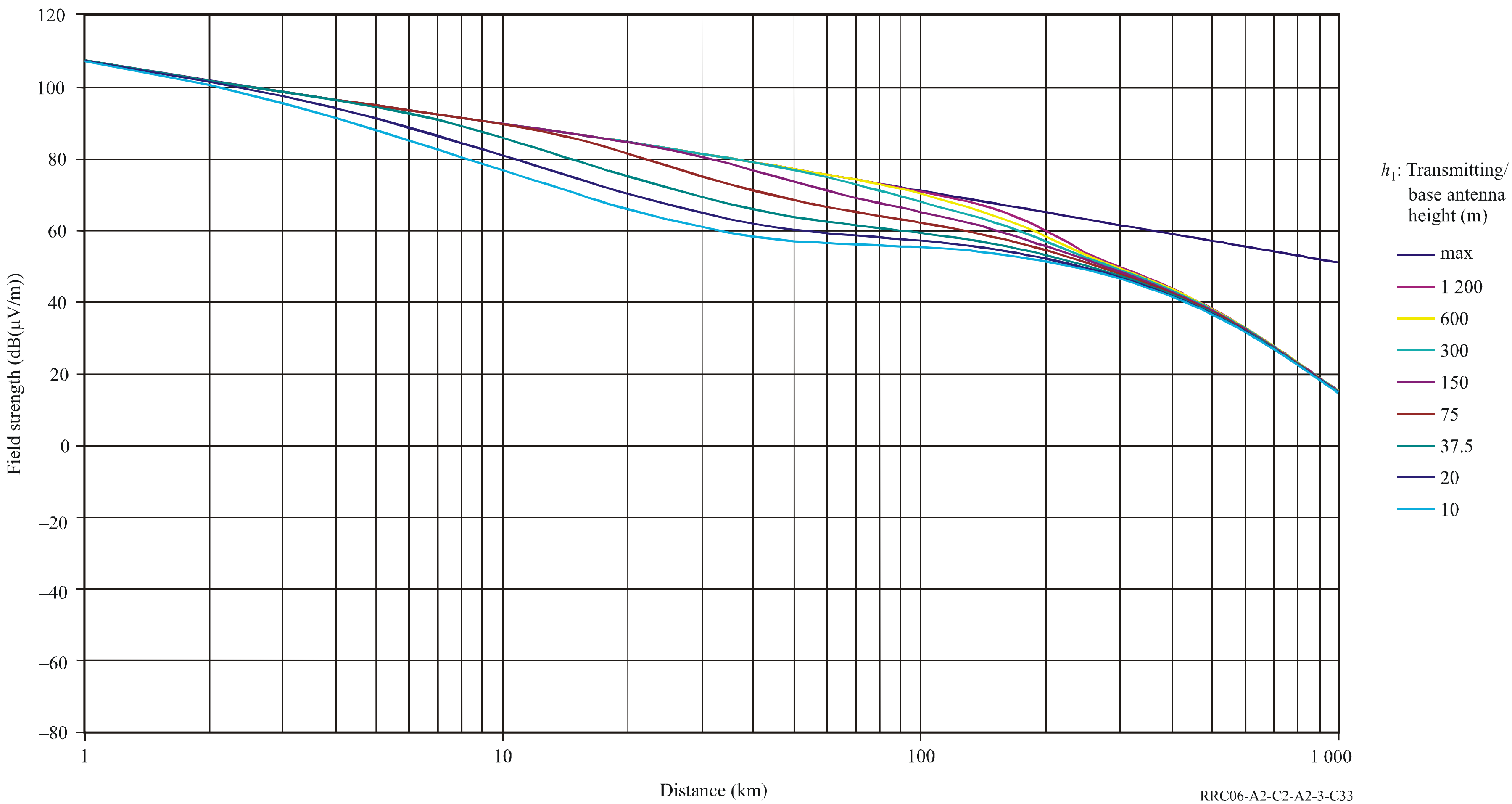


RRC06-A2-C2-A2-3-C31

600 MHz at 10% time in Zone 4

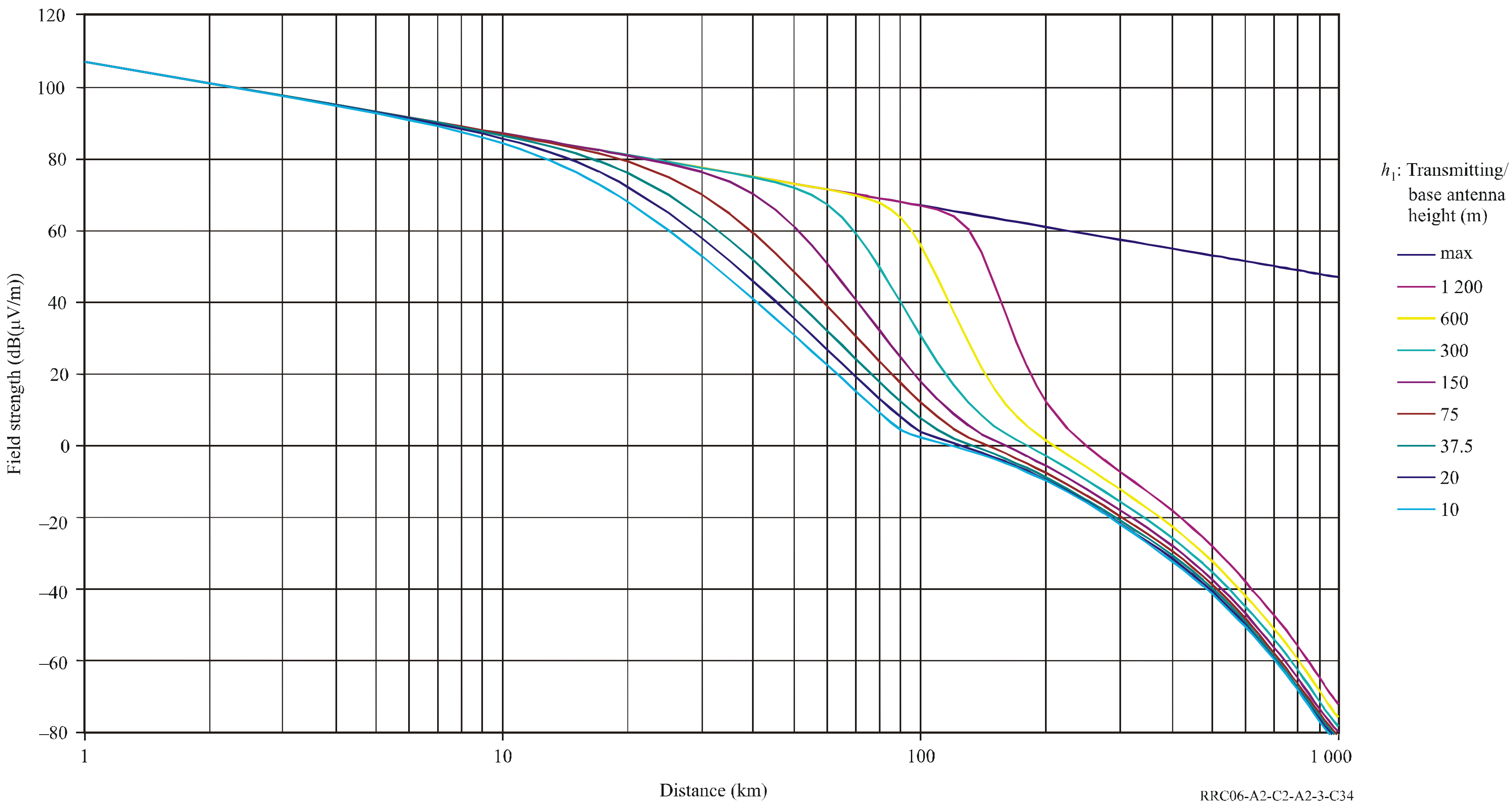


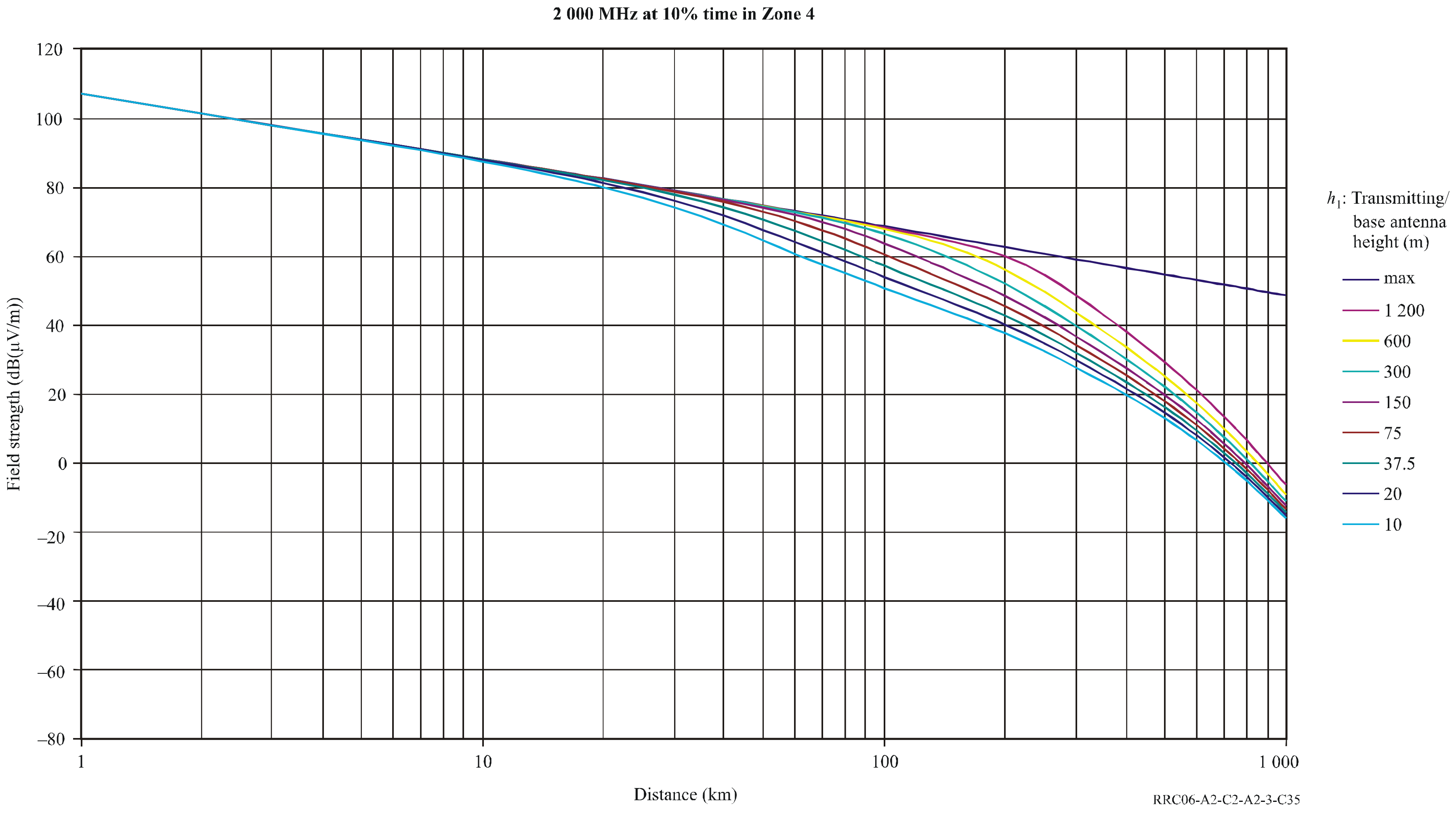
600 MHz at 1% time in Zone 4



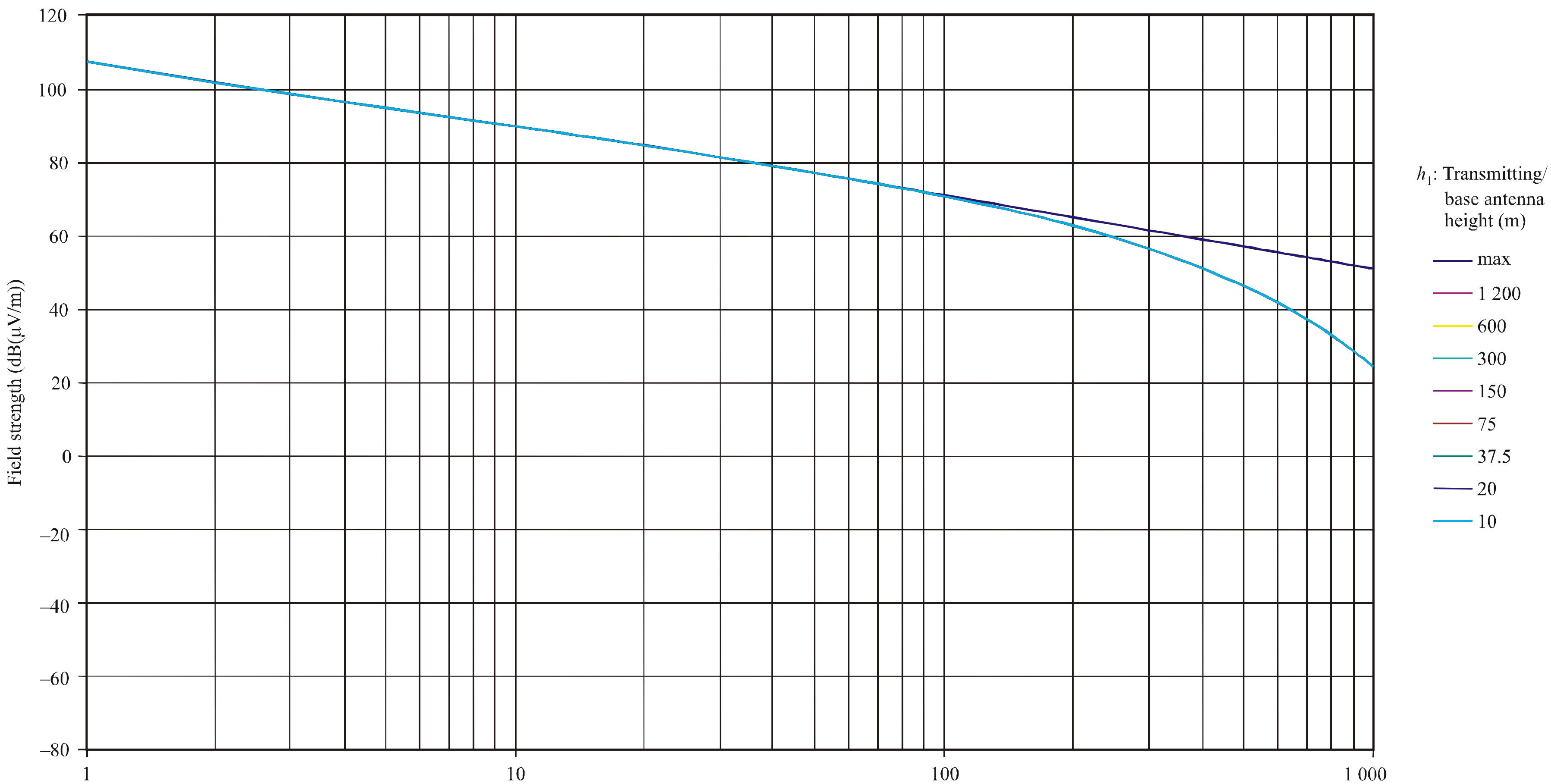
RRC06-A2-C2-A2-3-C33

2 000 MHz at 50% time in Zone 4



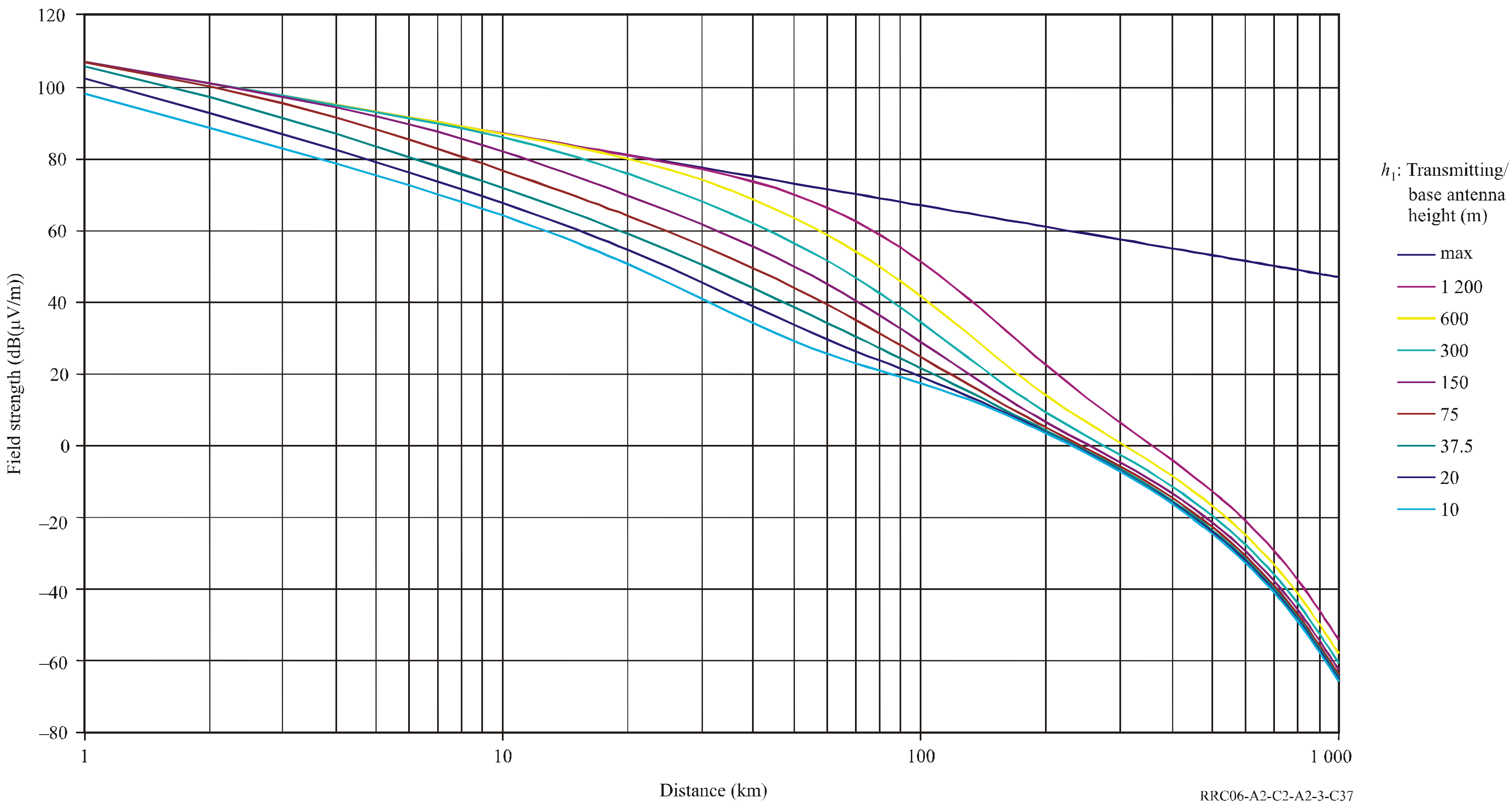

2 000 MHz at 10% time in Zone 4
120
100
80
60
40
20
0
–20
–40
–60
–80
Field strength (dB(μV/m))
1
10
100
1 000
Distance (km)
RRC06-A2-C2-A2-3-C35
h_1: Transmitting/ base antenna height (m)
max
1 200
600
300
150
75
37.5
20
10

2 000 MHz at 1% time in Zone 4

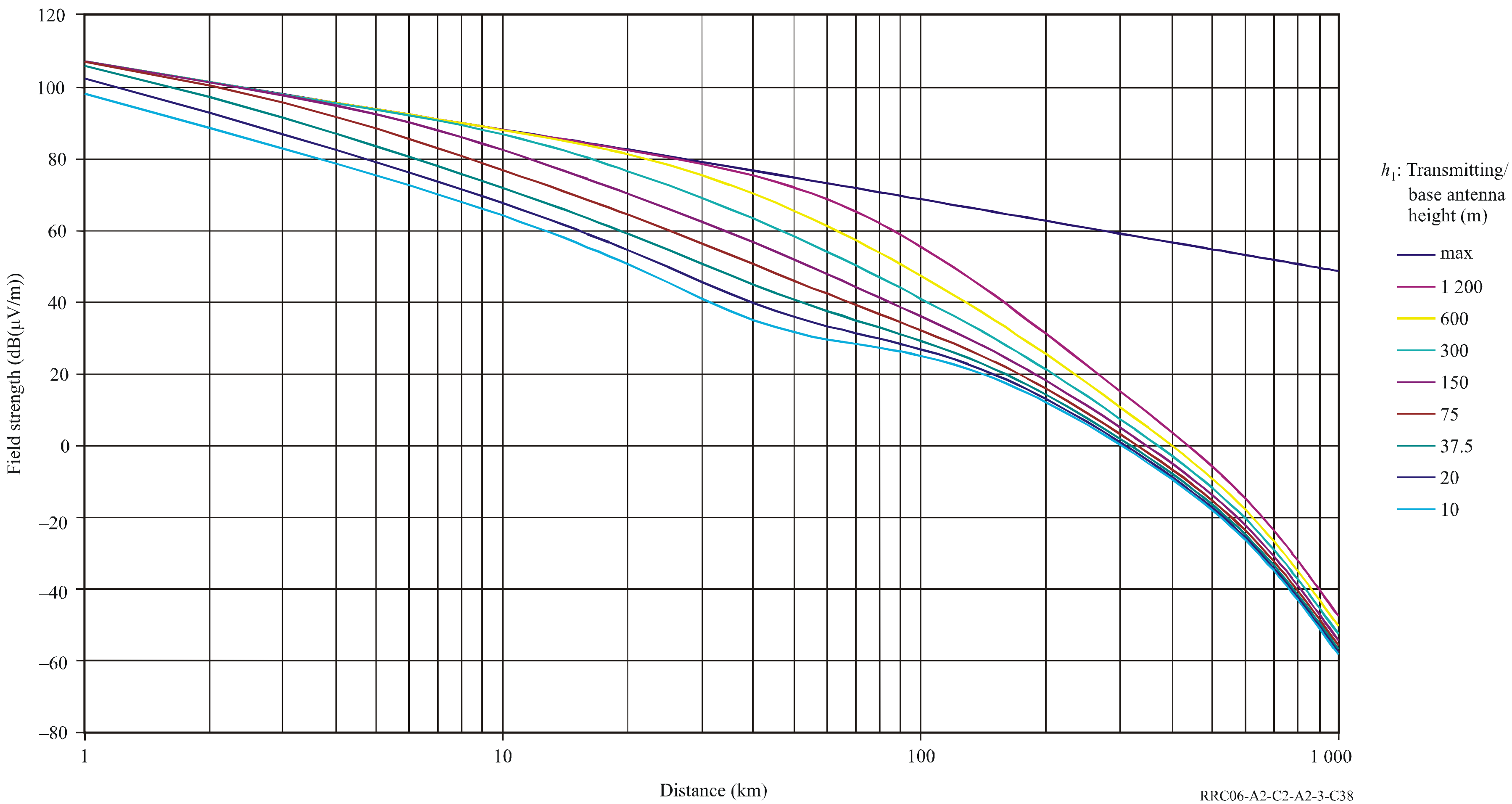


RRC06-A2-C2-A2-3-C36

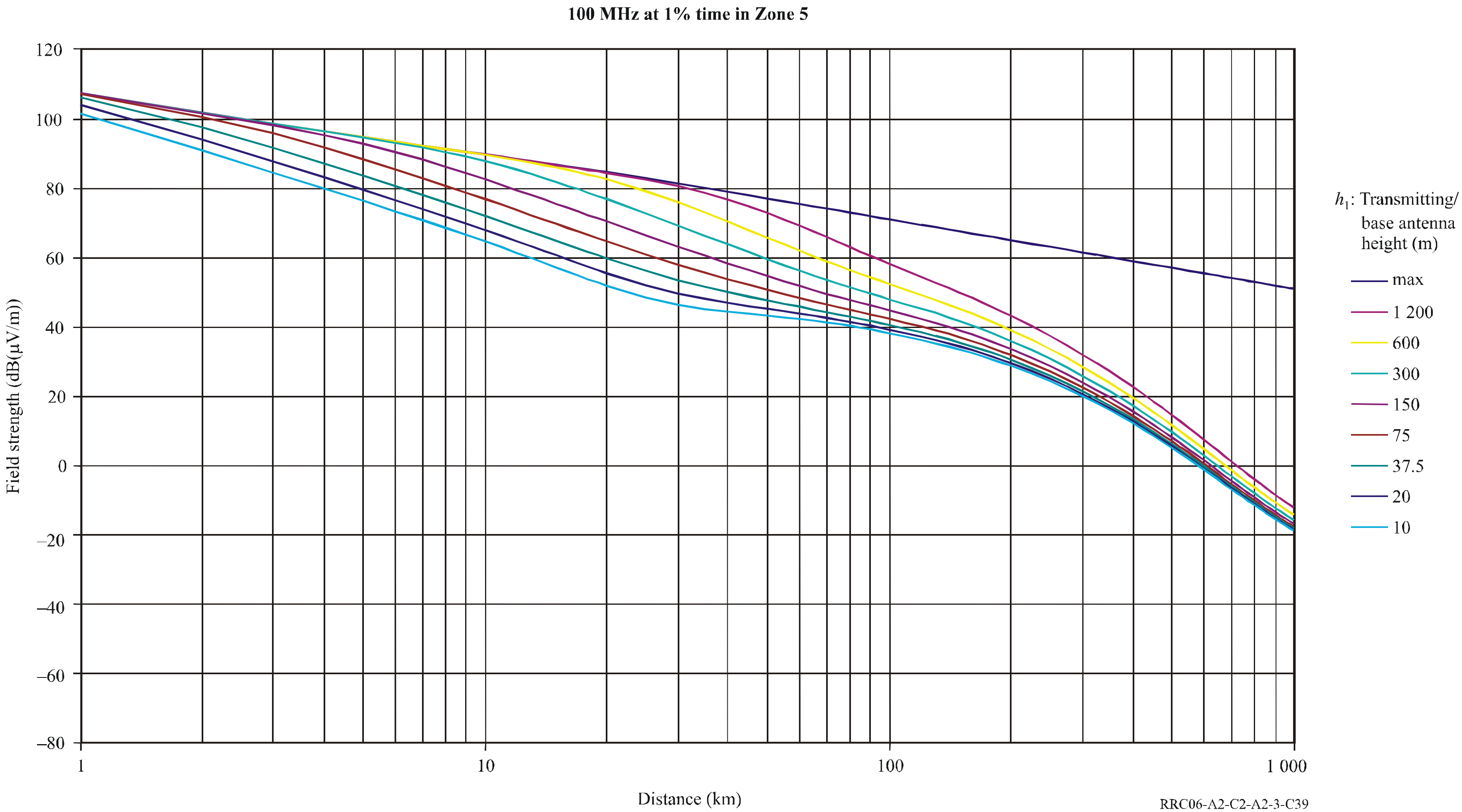
100 MHz at 50% time in Zone 5



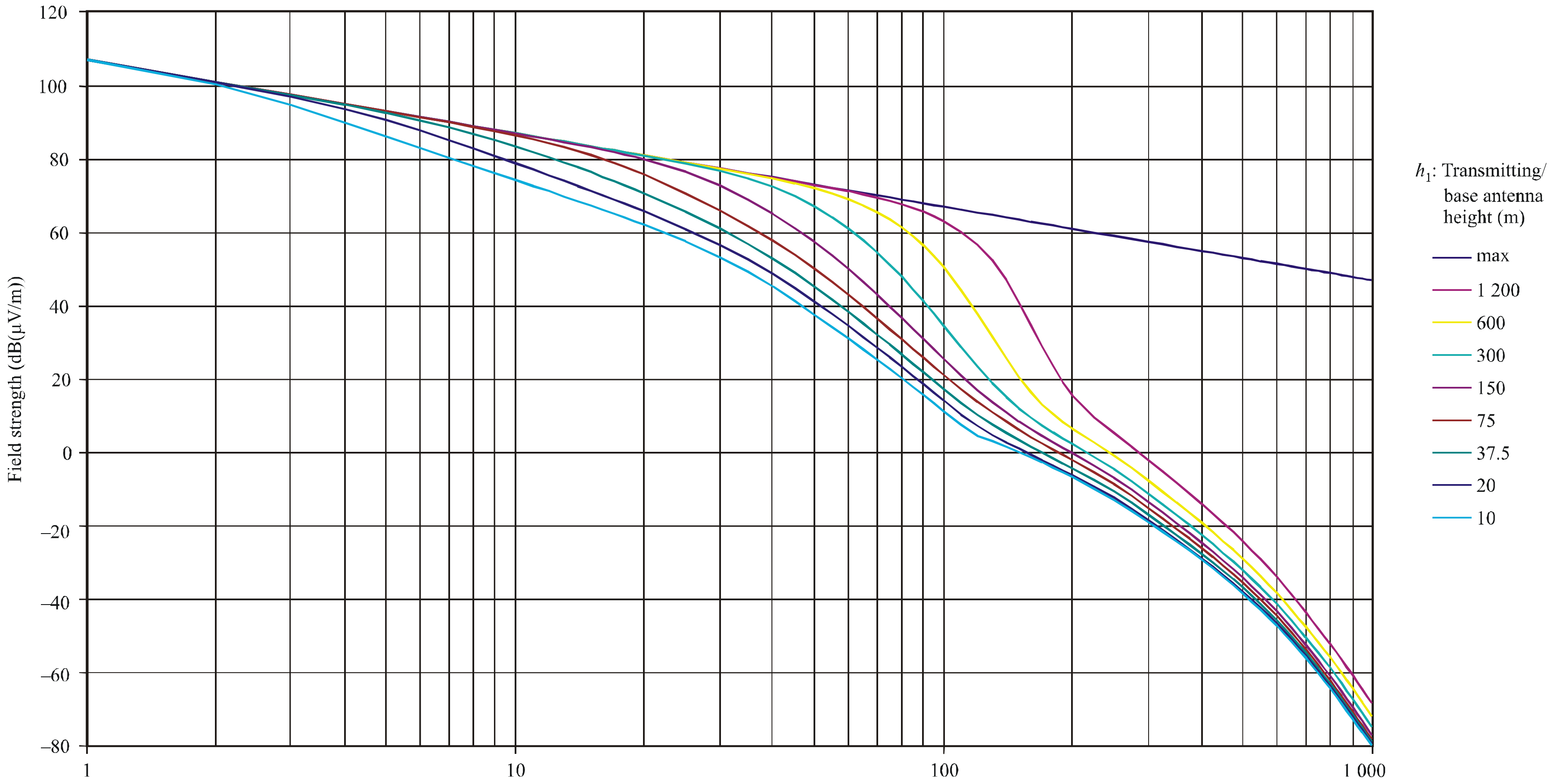
100 MHz at 10% time in Zone 5



RRC06-A2-C2-A2-3-C38

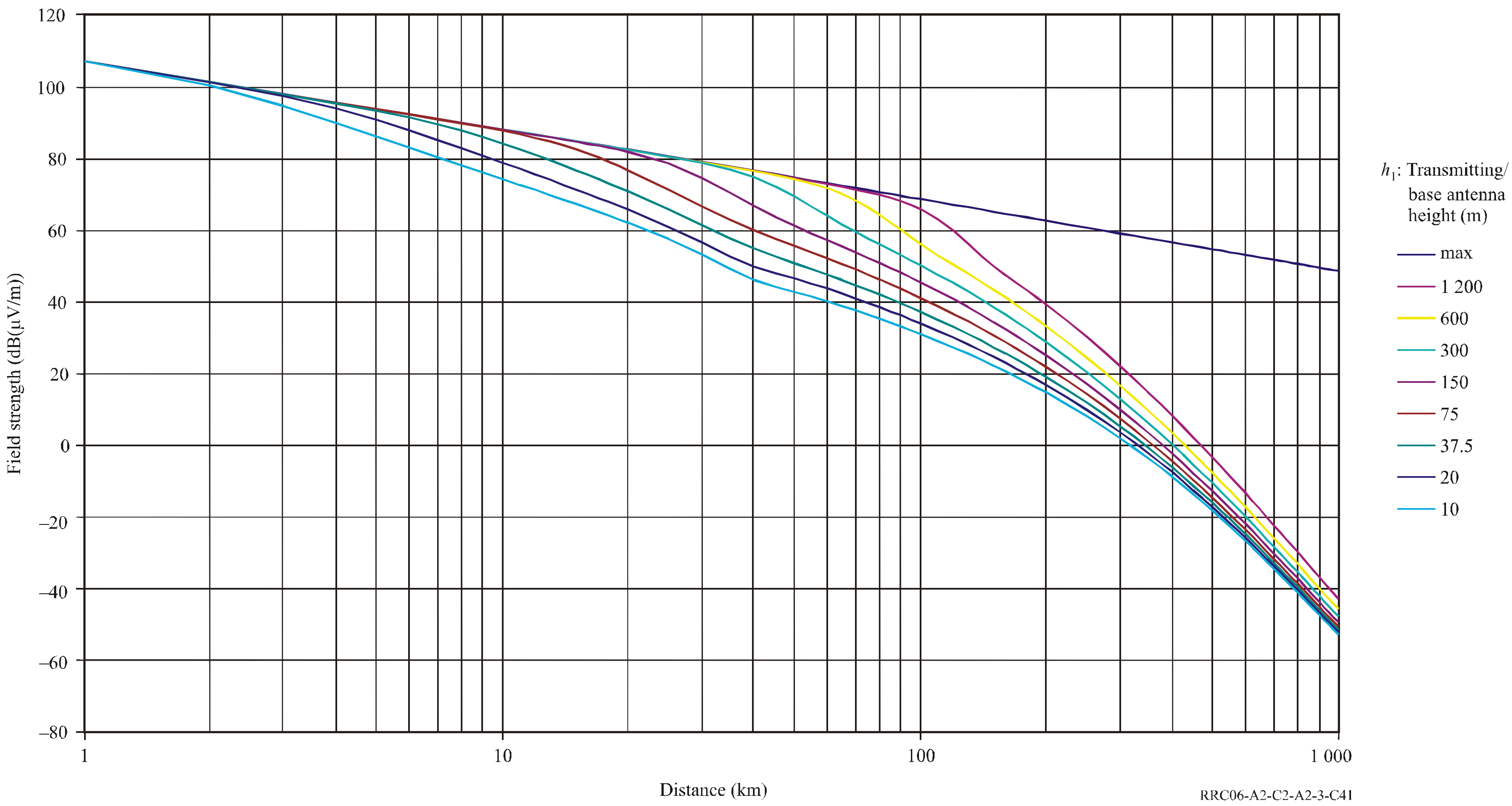

100 MHz at 1% time in Zone 5
Field strength (dB(μV/m))
120
100
80
60
40
20
0
–20
–40
–60
–80
1
10
100
1 000
Distance (km)
h_1: Transmitting/ base antenna height (m)
max
1 200
600
300
150
75
37.5
20
10
RRC06-A2-C2-A2-3-C39

600 MHz at 50% time in Zone 5

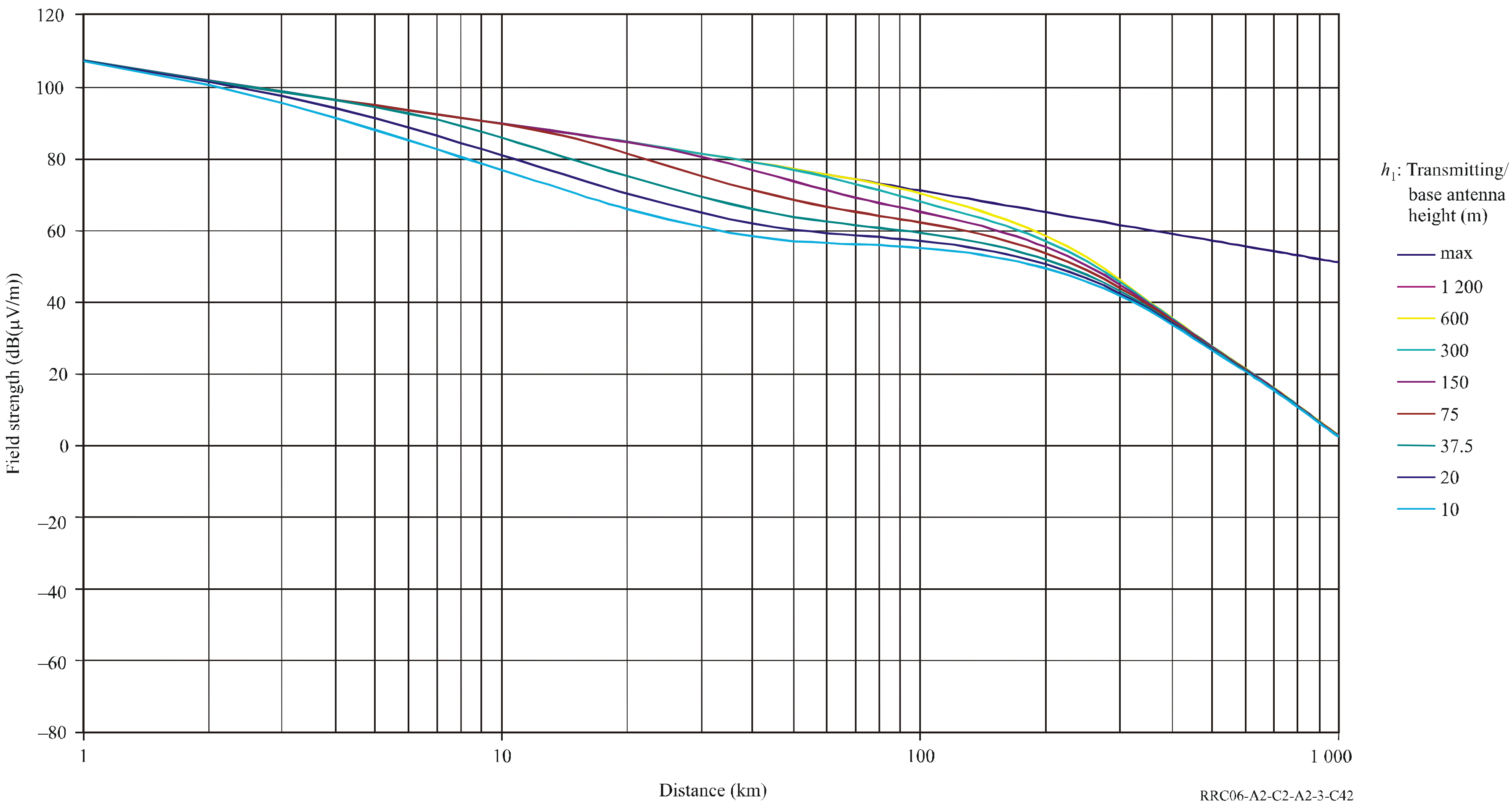


RRC06-A2-C2-A2-3-C40

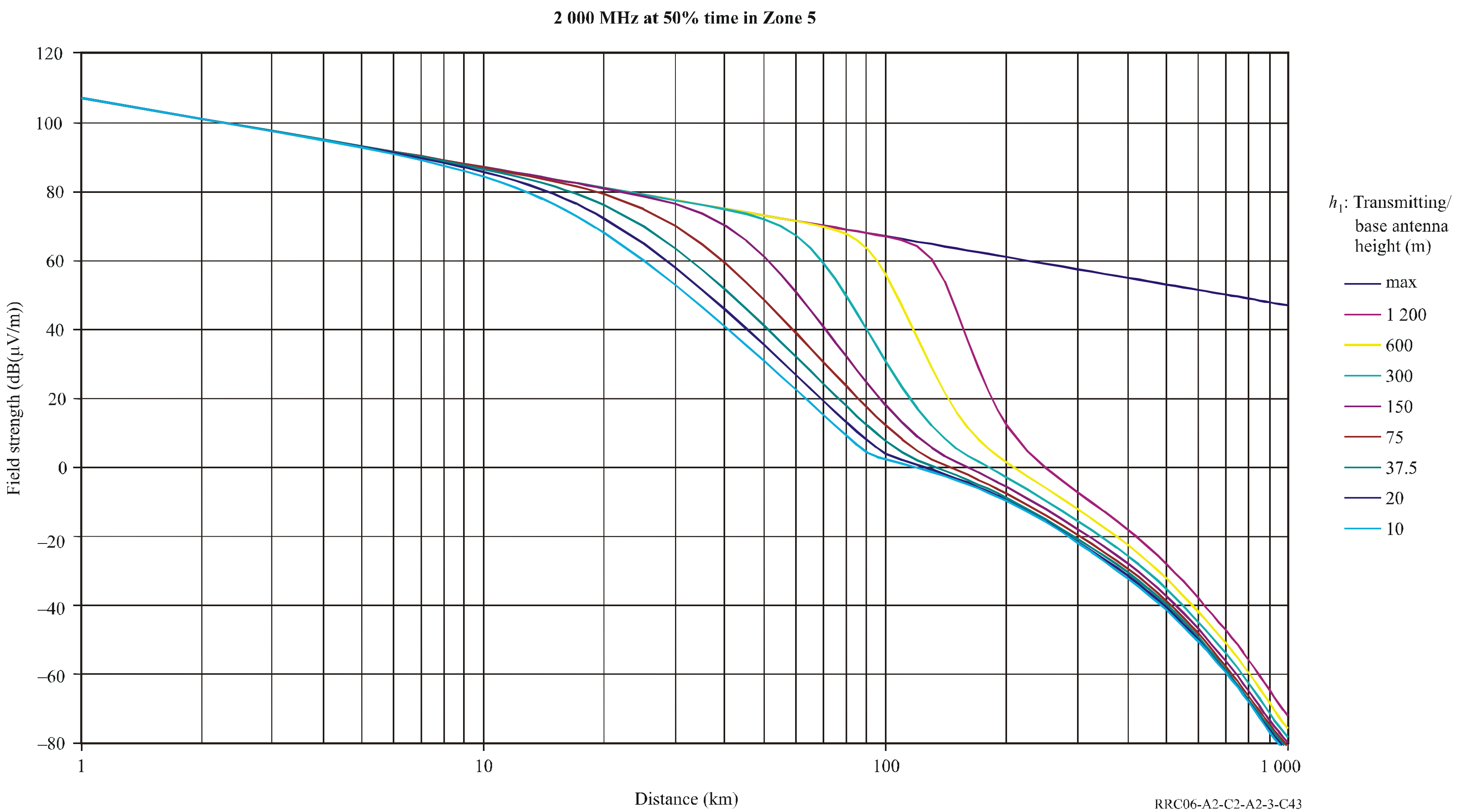
600 MHz at 10% time in Zone 5

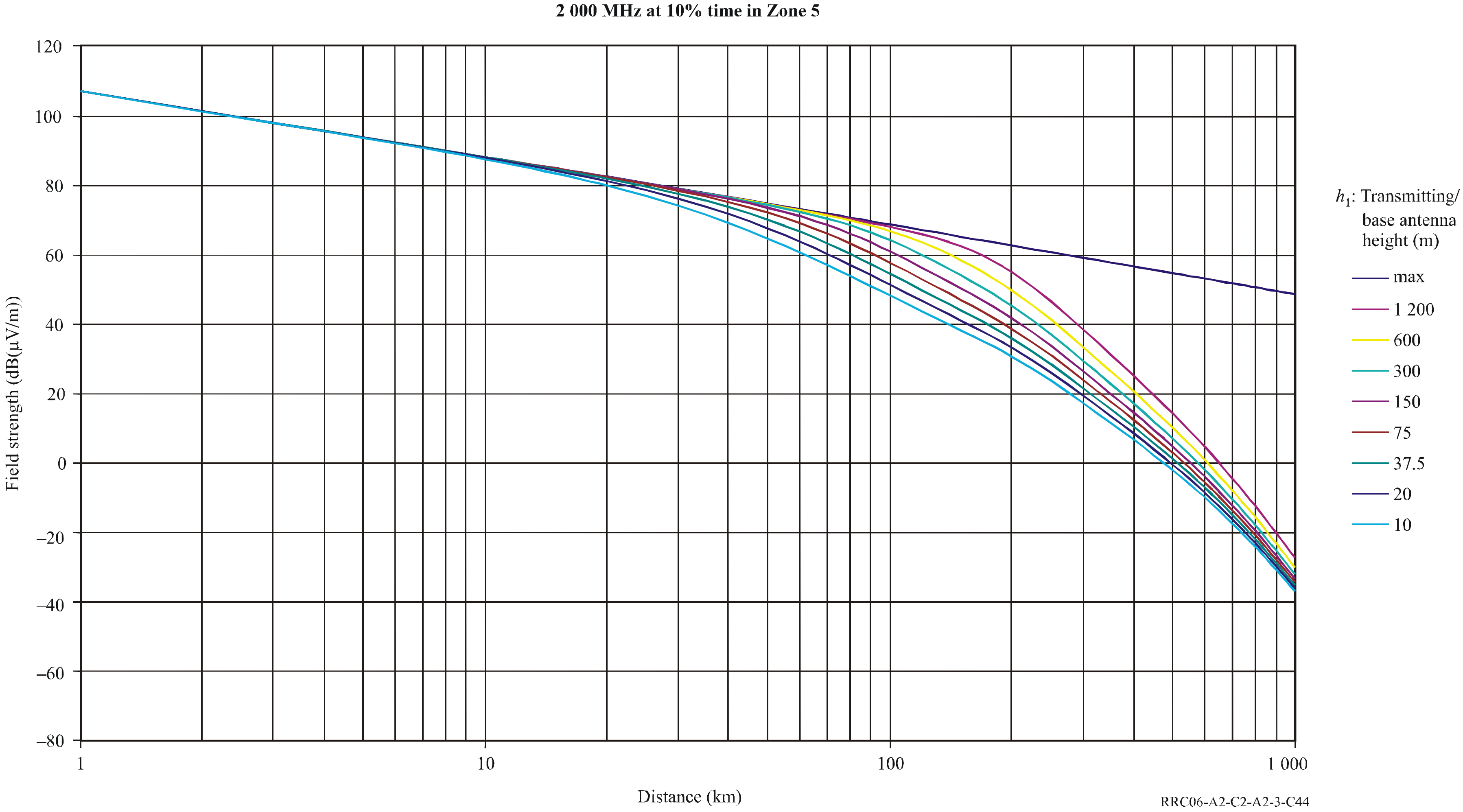


600 MHz at 1% time in Zone 5

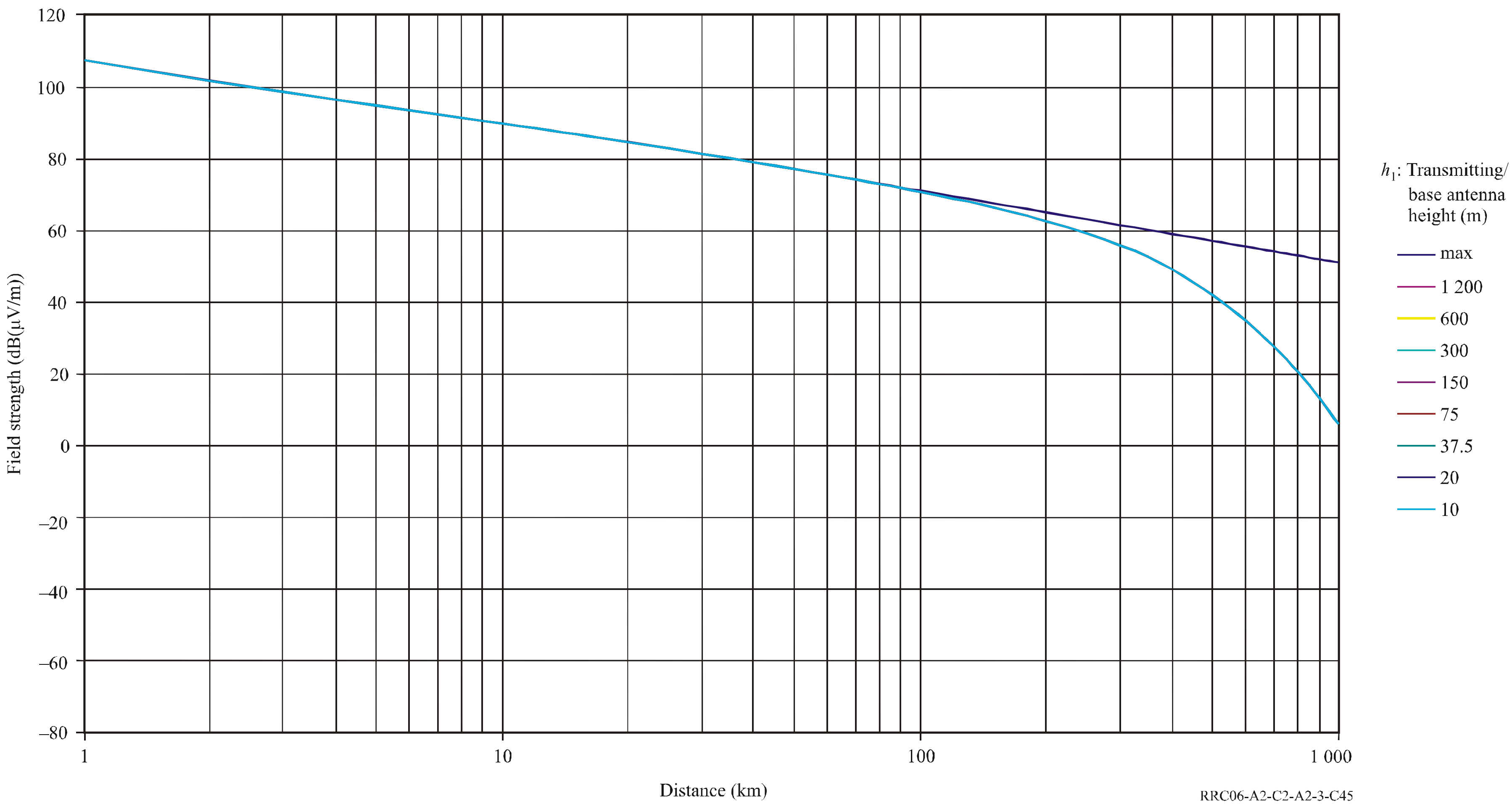


RRC06-A2-C2-A2-3-C42

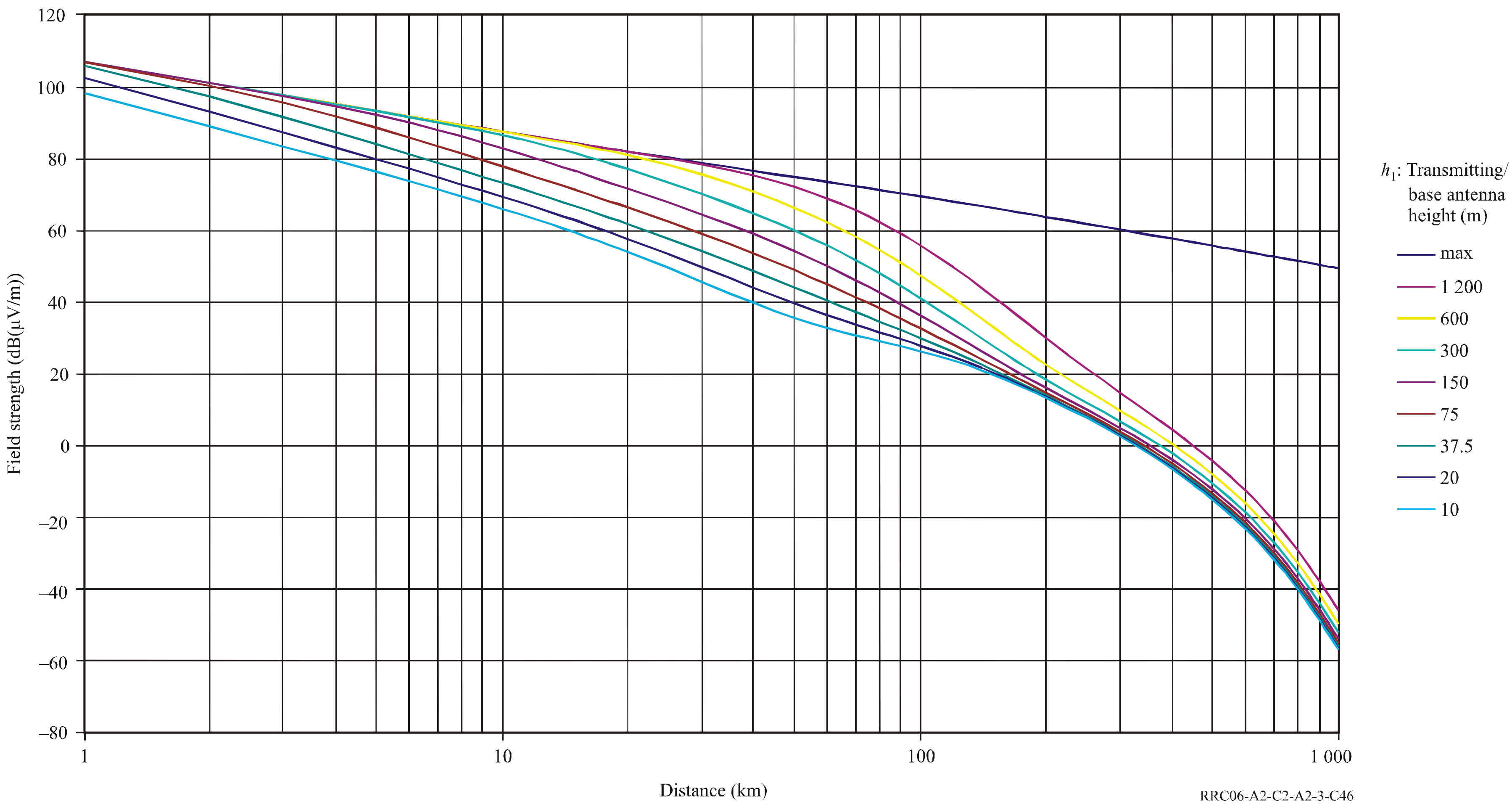

2 000 MHz at 50% time in Zone 5
Field strength (dB(μV/m))
120
100
80
60
40
20
0
–20
–40
–60
–80
1
10
100
1 000
Distance (km)
h_1: Transmitting/ base antenna height (m)
max
1 200
600
300
150
75
37.5
20
10
RRC06-A2-C2-A2-3-C43

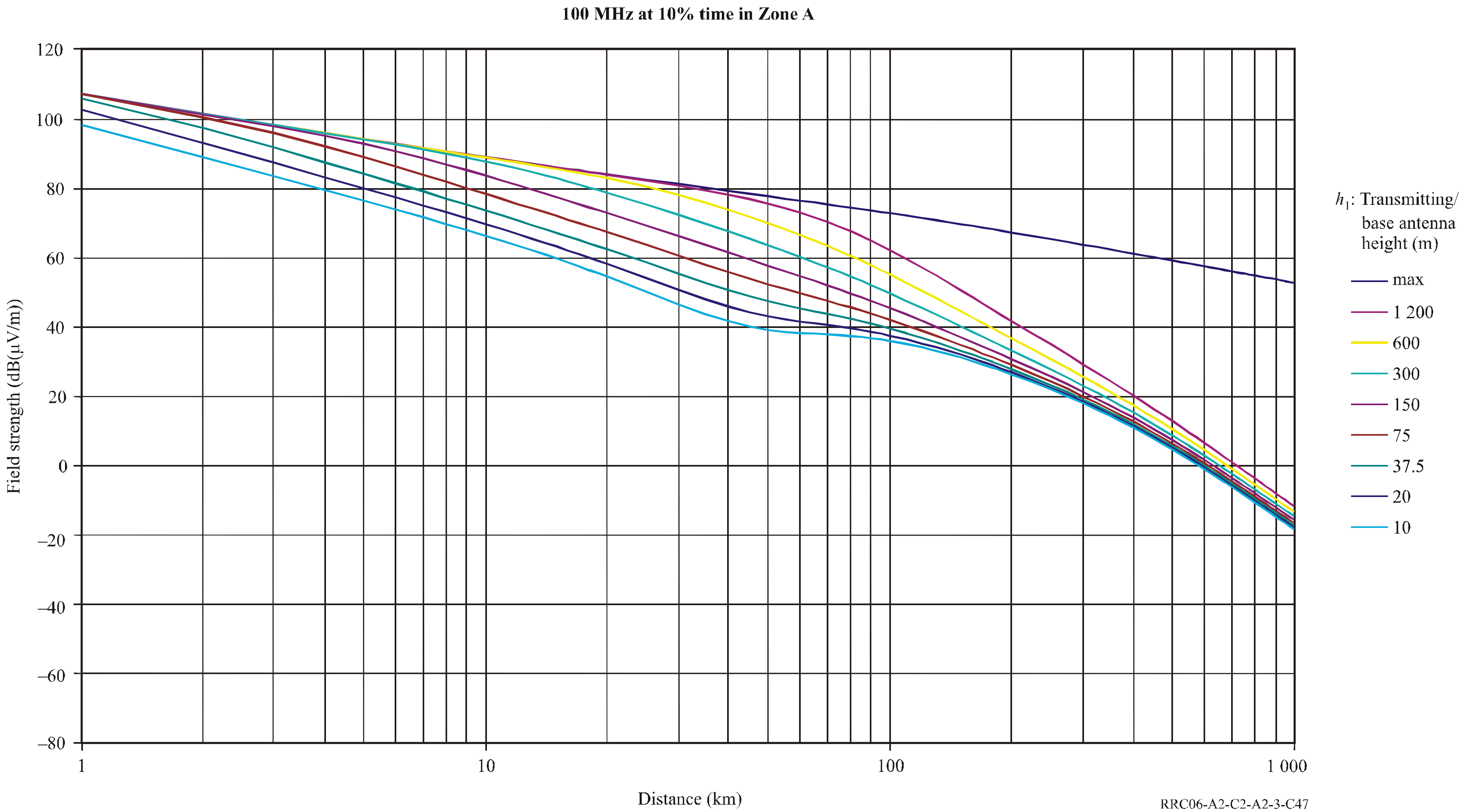

2 000 MHz at 10% time in Zone 5
120
100
80
60
40
20
0
–20
–40
–60
–80
Field strength (dB(μV/m))
1
10
100
1 000
Distance (km)
RRC06-A2-C2-A2-3-C44
h1: Transmitting/ base antenna height (m)
max
1 200
600
300
150
75
37.5
20
10

2 000 MHz at 1% time in Zone 5

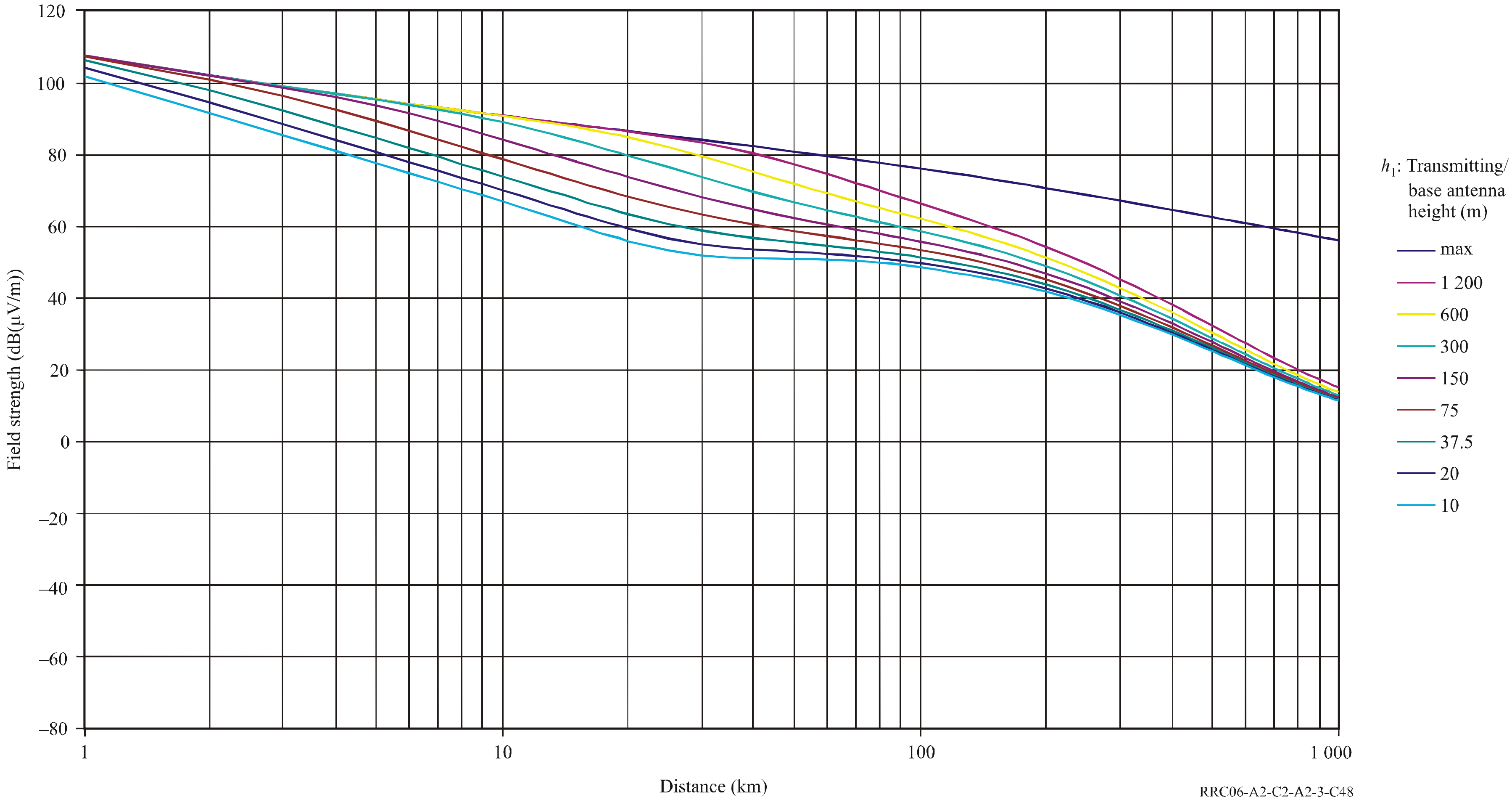


100 MHz at 50% time in Zone A

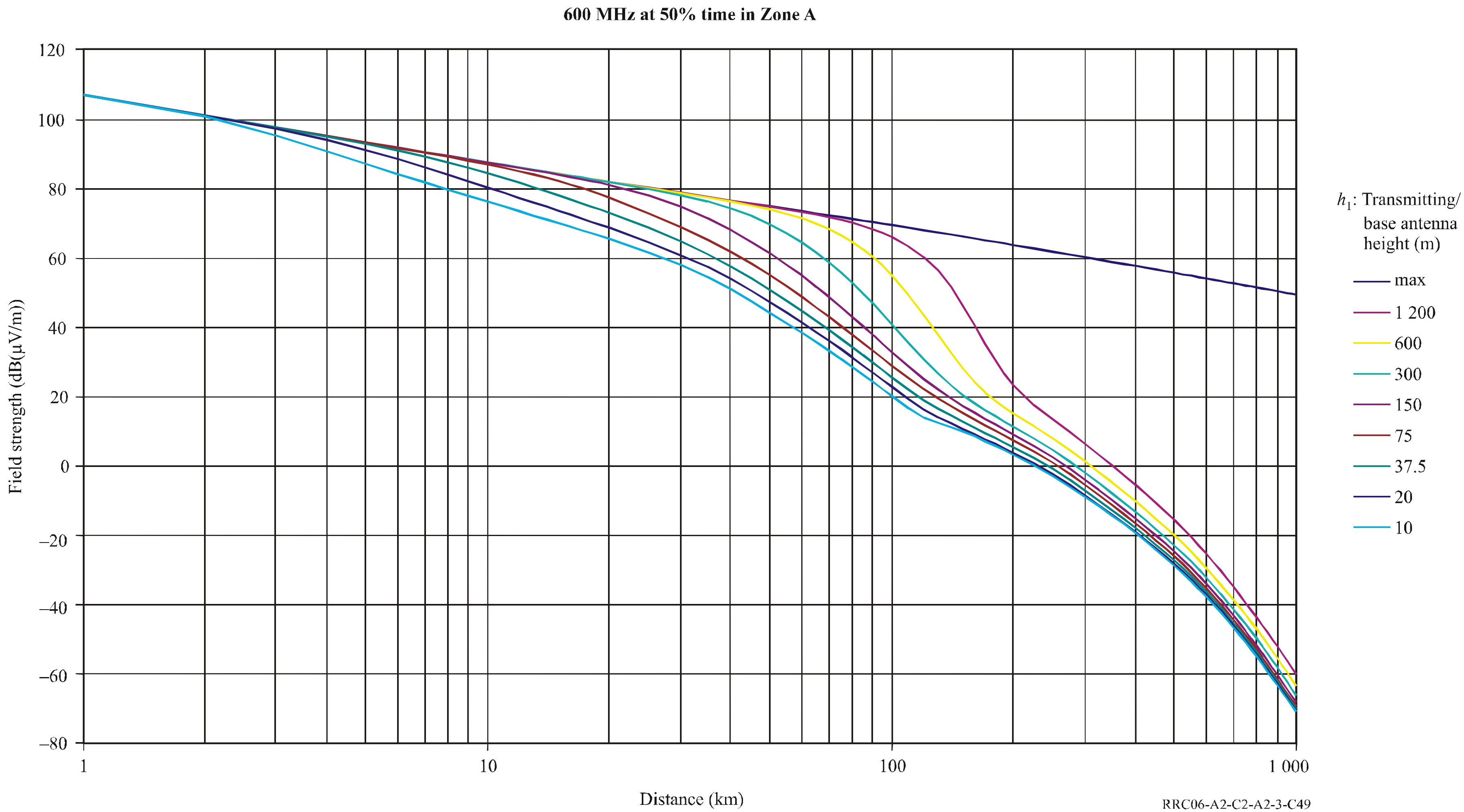



100 MHz at 10% time in Zone A
120
100
80
60
40
20
0
–20
–40
–60
–80
Field strength (dB(μV/m))
1
10
100
1 000
Distance (km)
h_1: Transmitting/ base antenna height (m)
max
1 200
600
300
150
75
37.5
20
10
RRC06-A2-C2-A2-3-C47

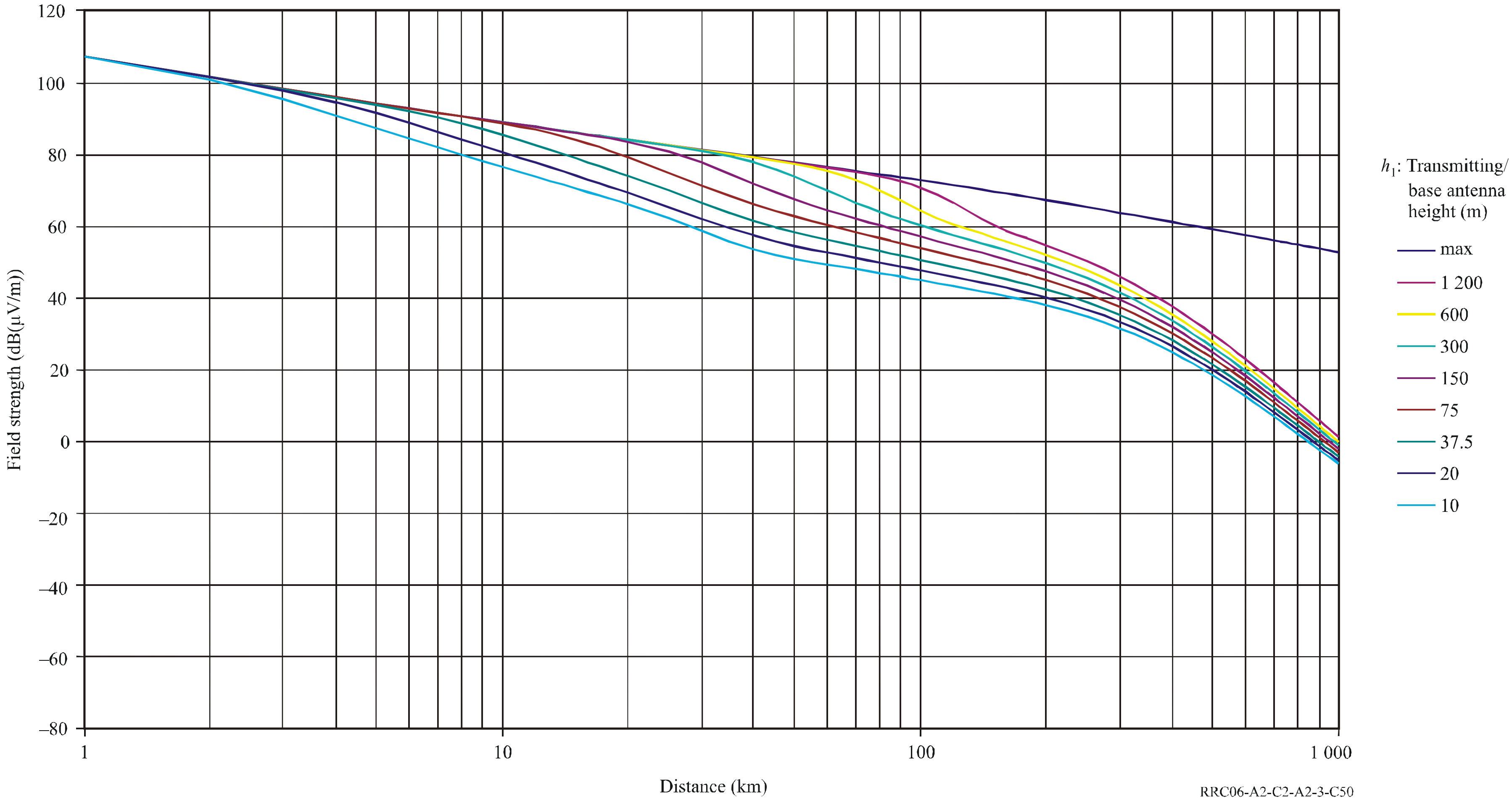
100 MHz at 1% time in Zone A



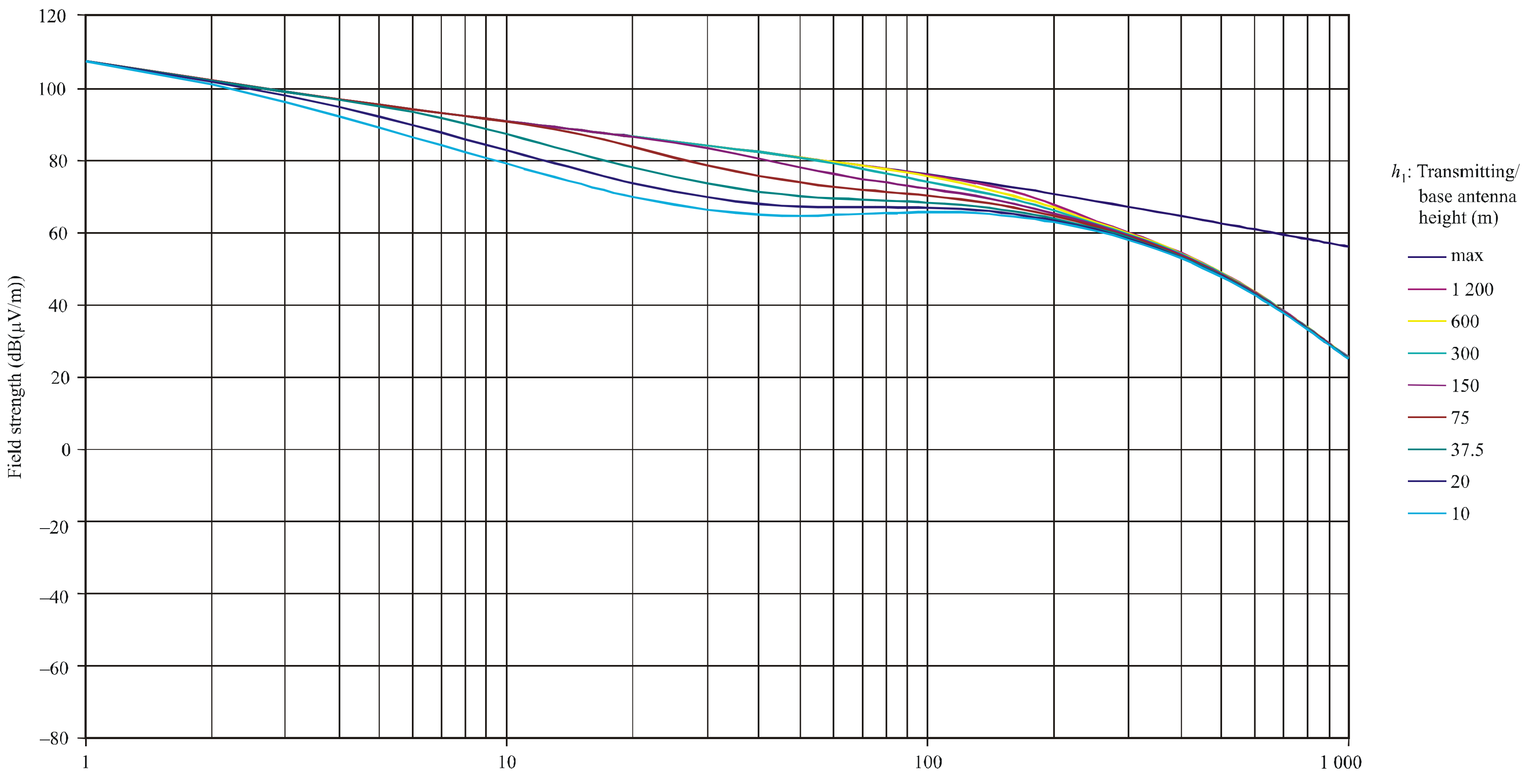
RRC06-A2-C2-A2-3-C48


600 MHz at 50% time in Zone A
120
100
80
60
40
20
0
–20
–40
–60
–80
Field strength (dB(μV/m))
1
10
100
1 000
Distance (km)
h1: Transmitting/ base antenna height (m)
max
1 200
600
300
150
75
37.5
20
10
RRC06-A2-C2-A2-3-C49

600 MHz at 10% time in Zone A

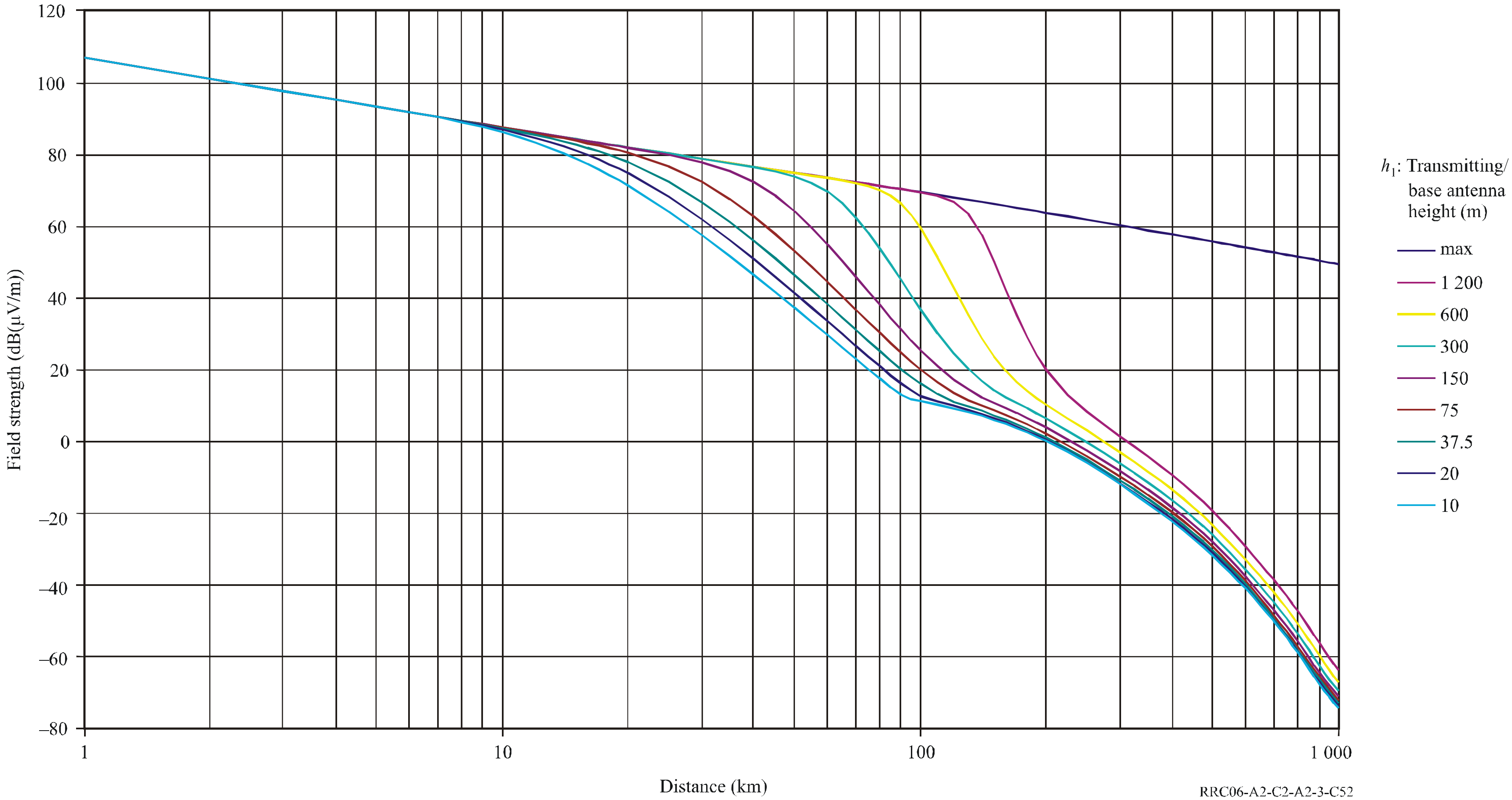


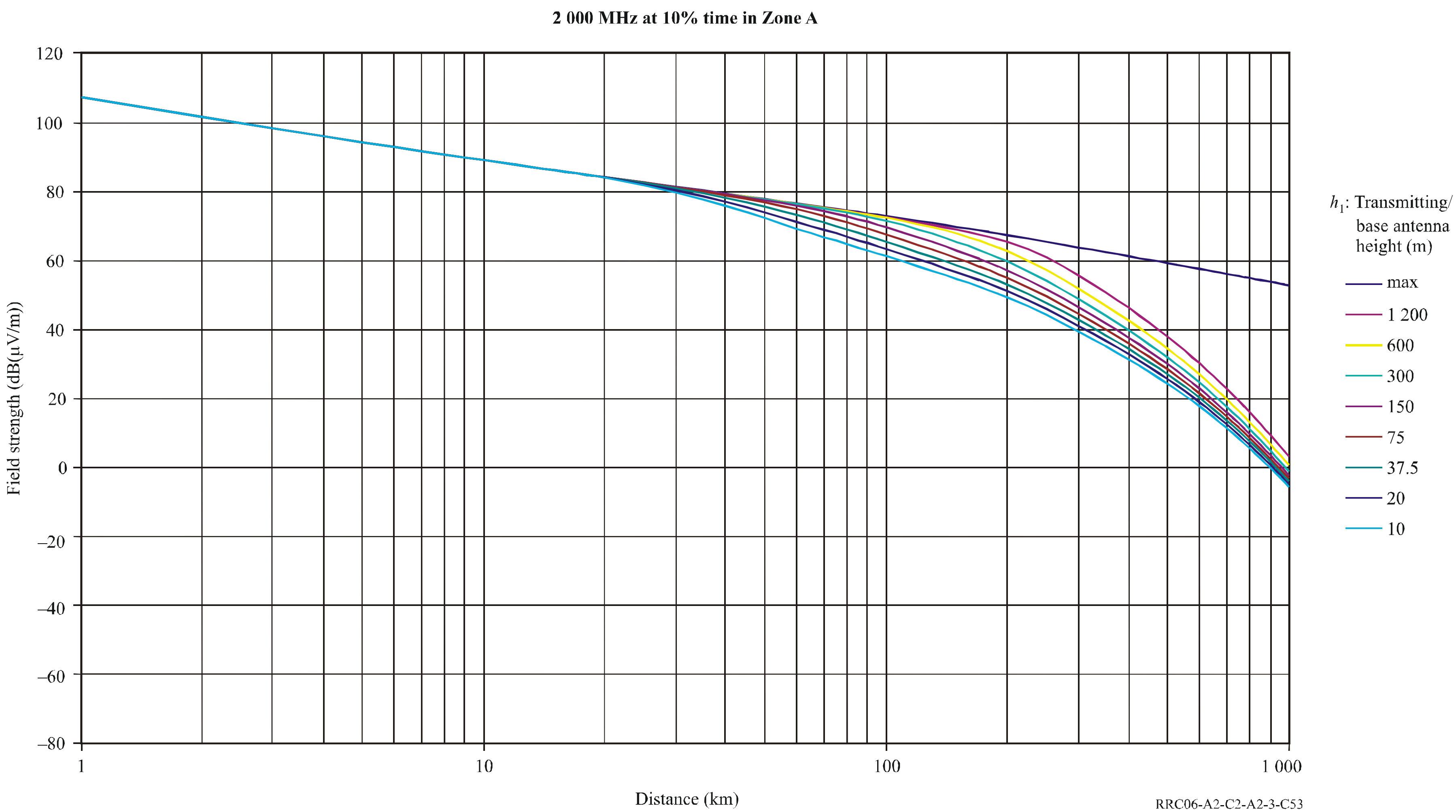
600 MHz at 1% time in Zone A



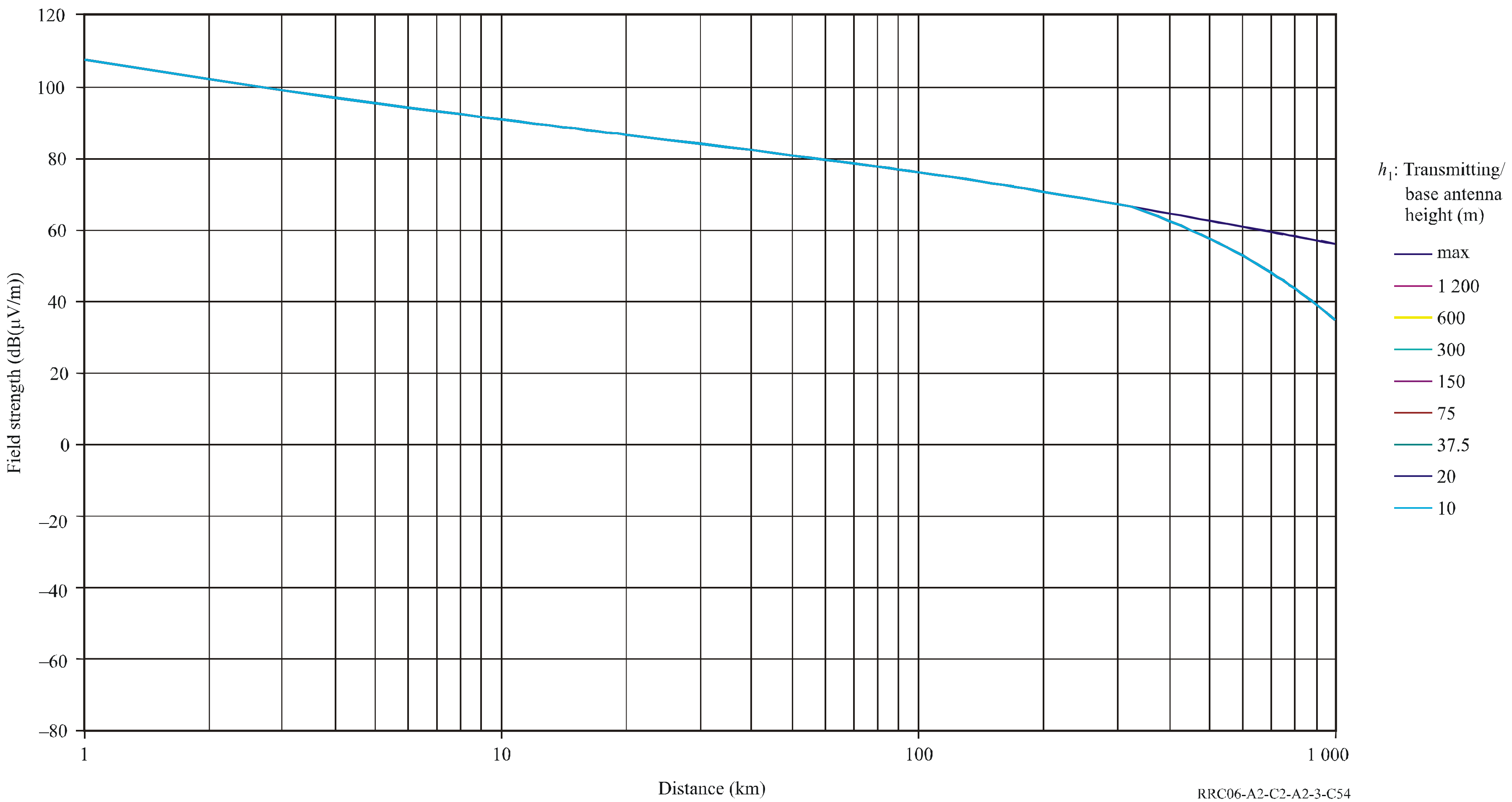
RRC06-A2-C2-A2-3-C51

2 000 MHz at 50% time in Zone A

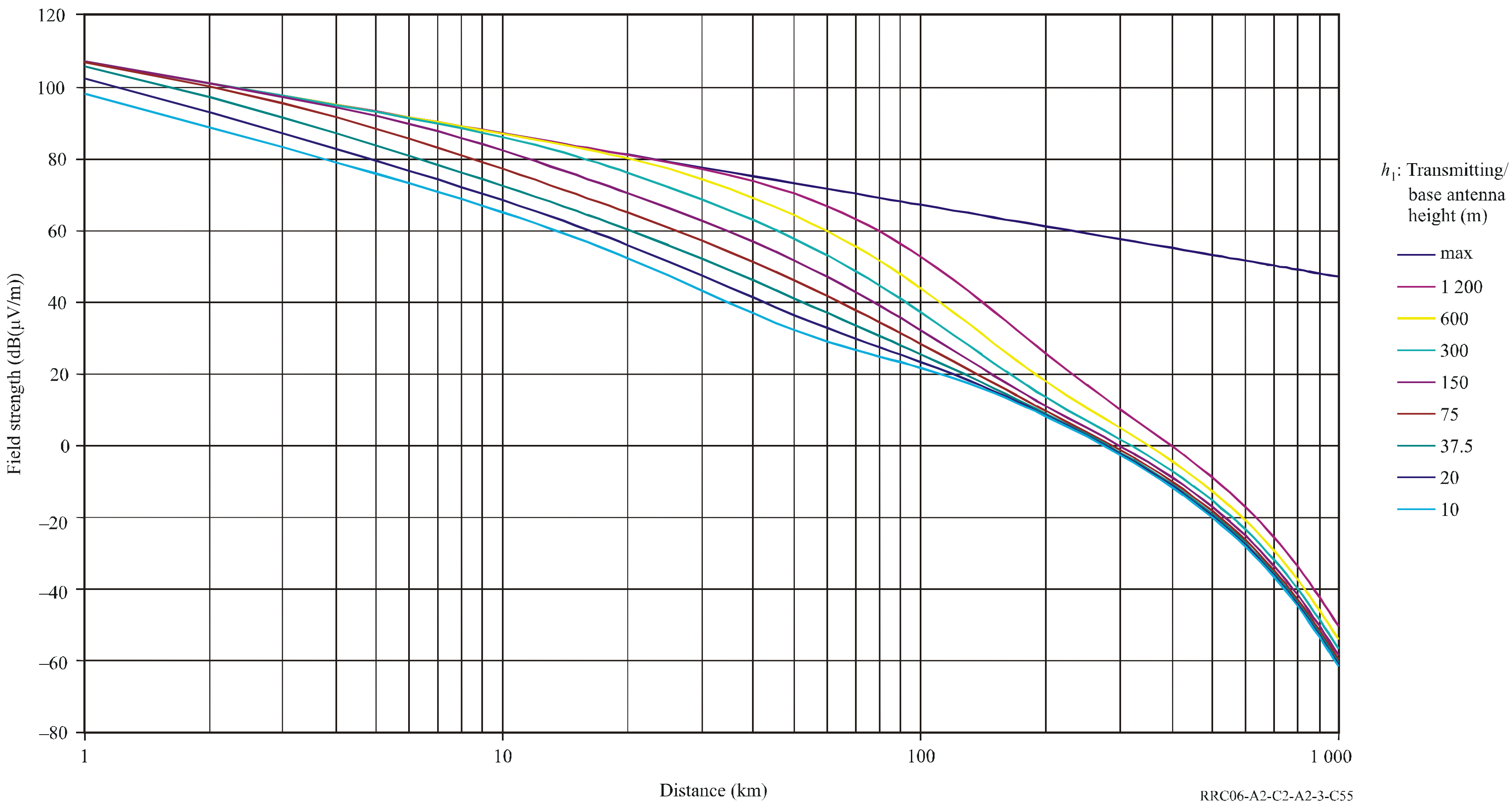



2 000 MHz at 10% time in Zone A
120
100
80
60
40
20
0
–20
–40
–60
–80
Field strength (dB(μV/m))
1
10
100
1 000
Distance (km)
h1: Transmitting/
base antenna
height (m)
max
1 200
600
300
150
75
37.5
20
10
RRC06-A2-C2-A2-3-C53

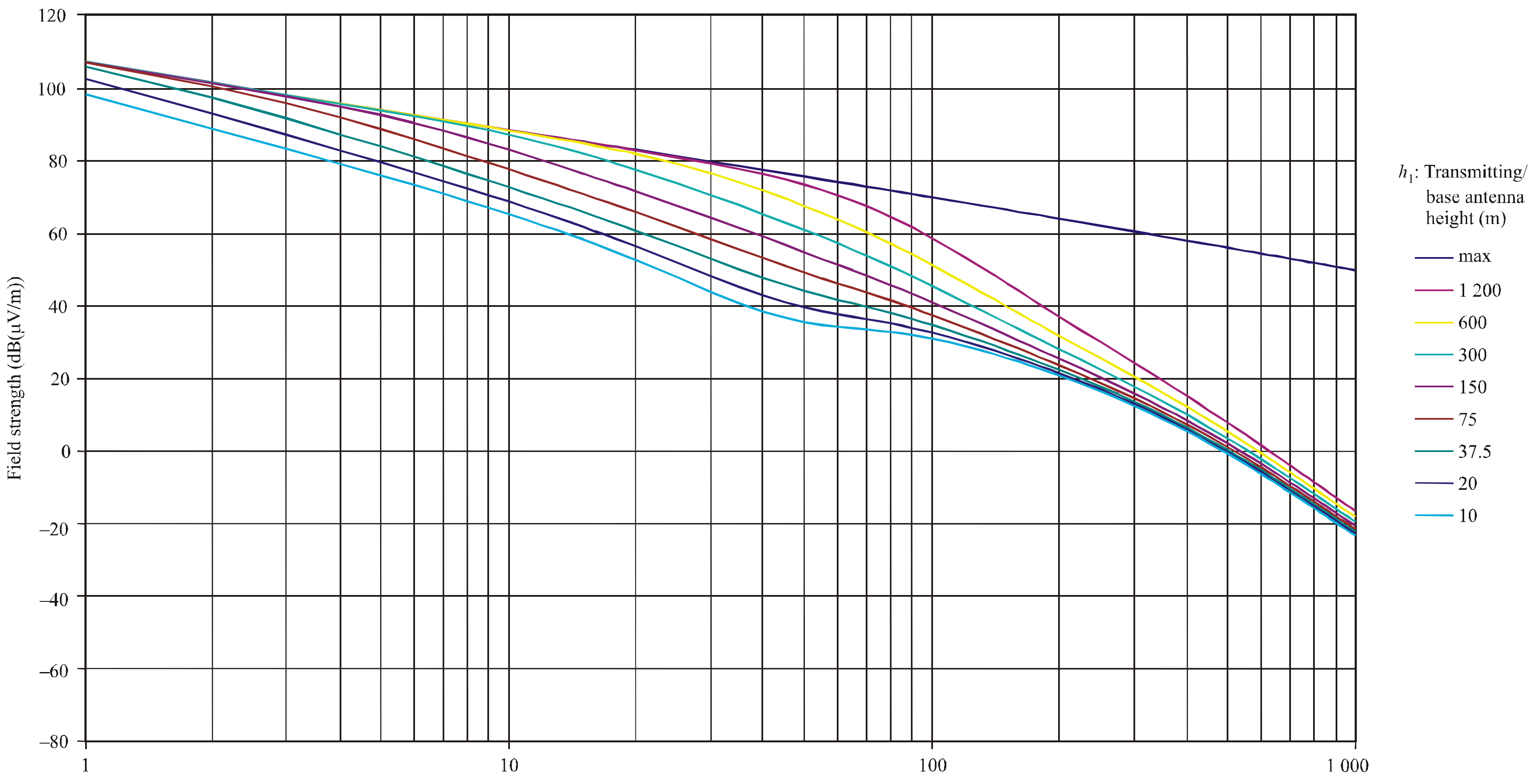
2 000 MHz at 1% time in Zone A



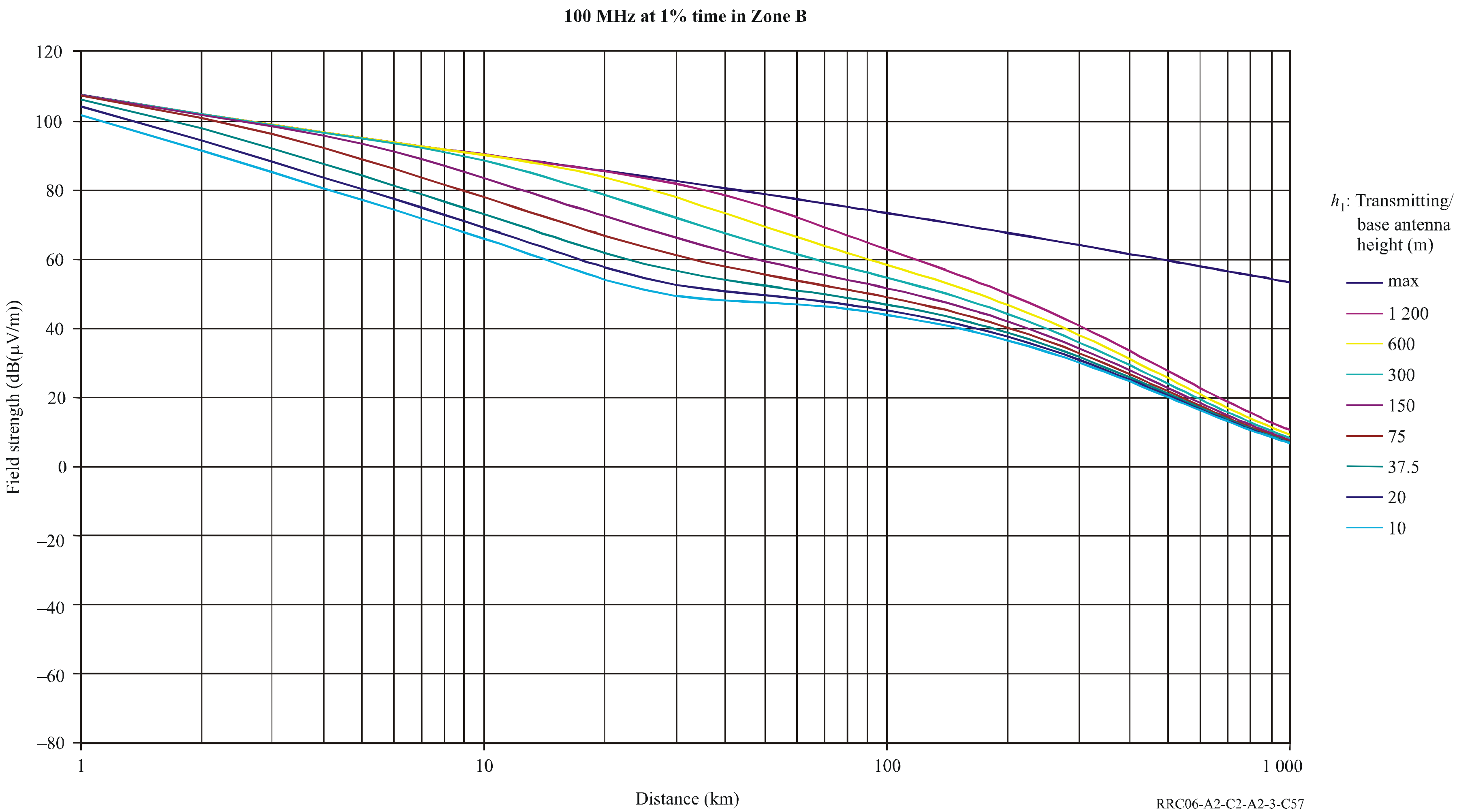
100 MHz at 50% time in Zone B

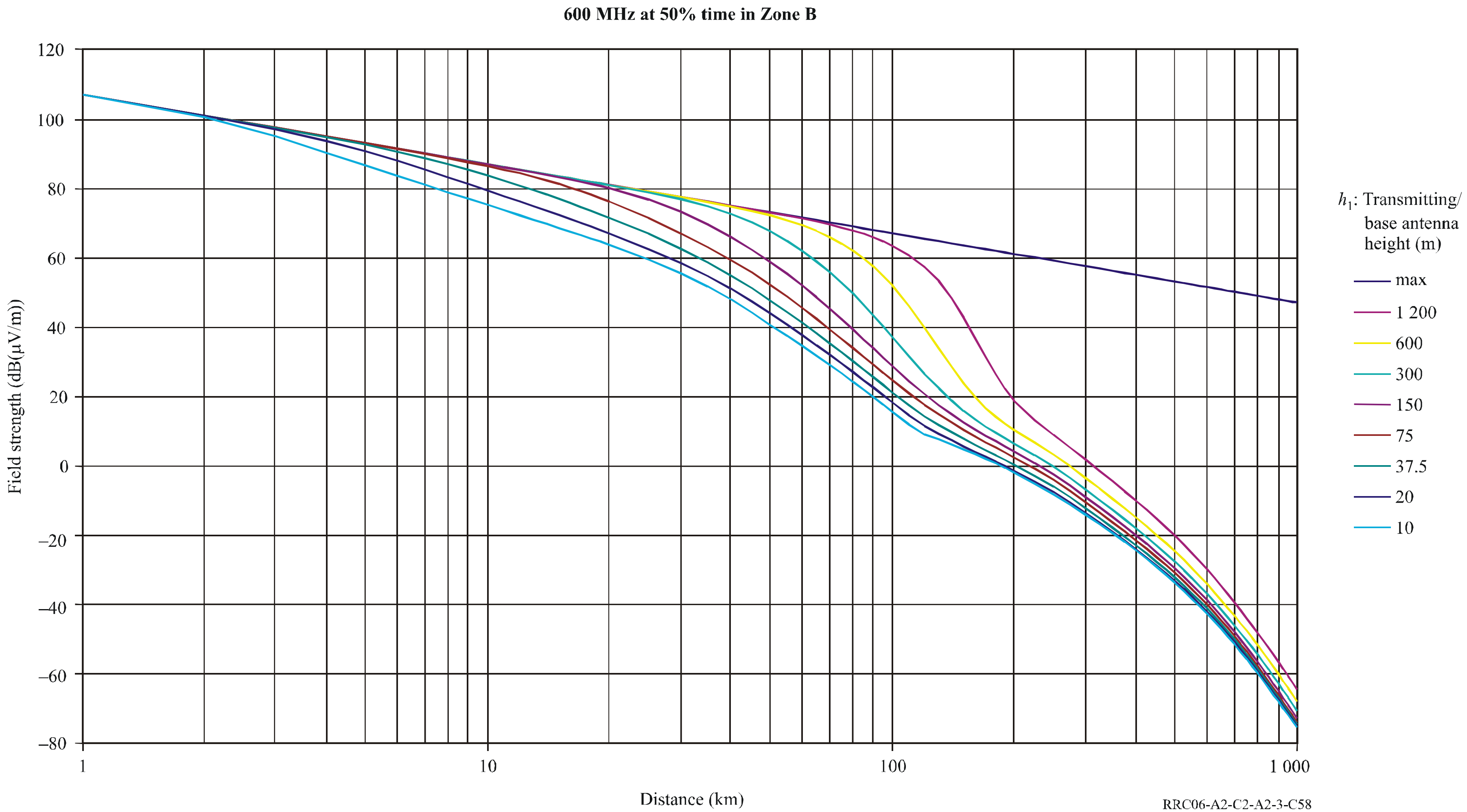


100 MHz at 10% time in Zone B

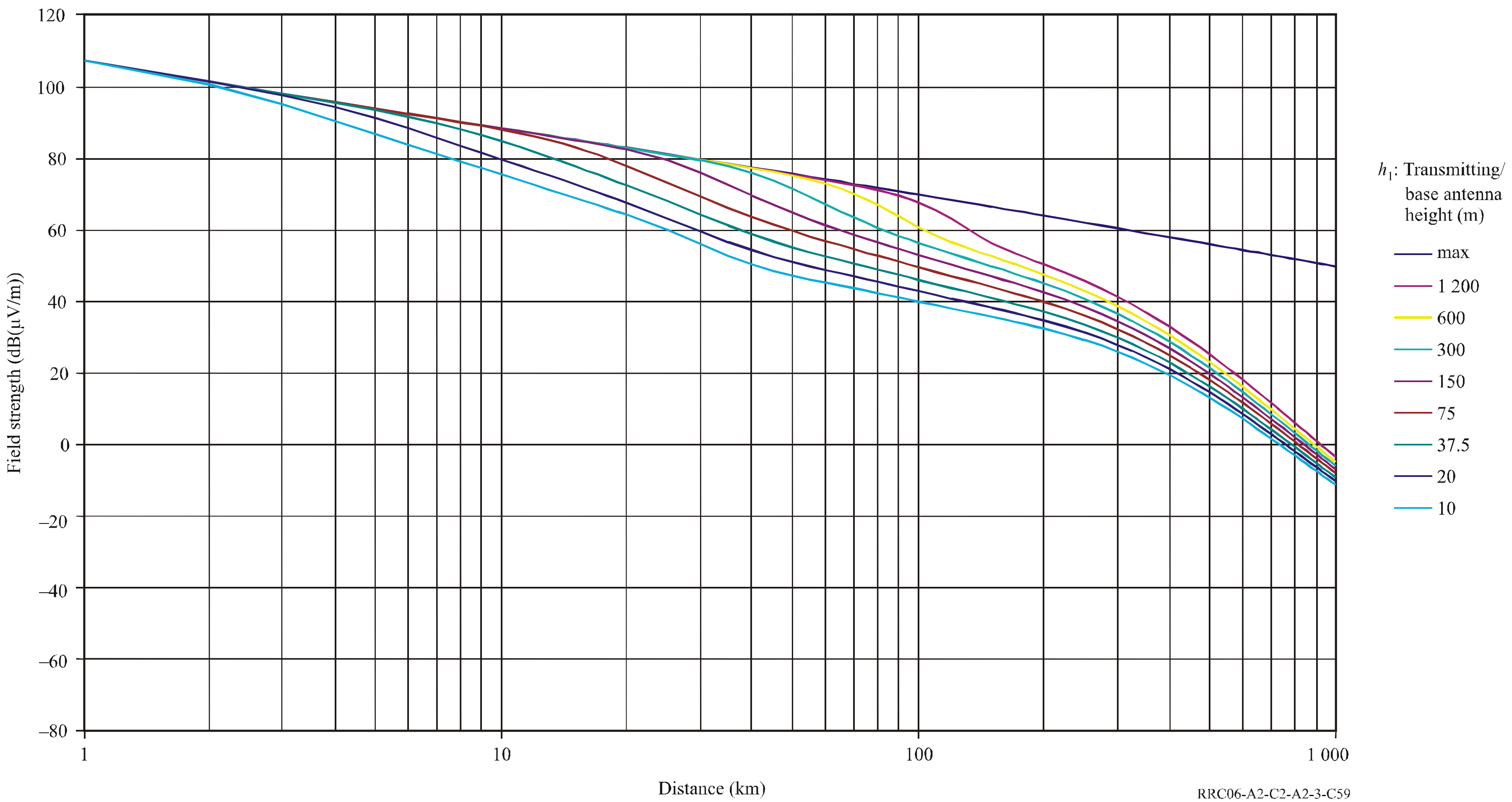


RRC06-A2-C2-A2-3-C56


100 MHz at 1% time in Zone B
120
100
80
60
40
20
0
–20
–40
–60
–80
Field strength (dB(μV/m))
1
10
100
1 000
Distance (km)
RRC06-A2-C2-A2-3-C57
h_1: Transmitting/ base antenna height (m)
max
1 200
600
300
150
75
37.5
20
10

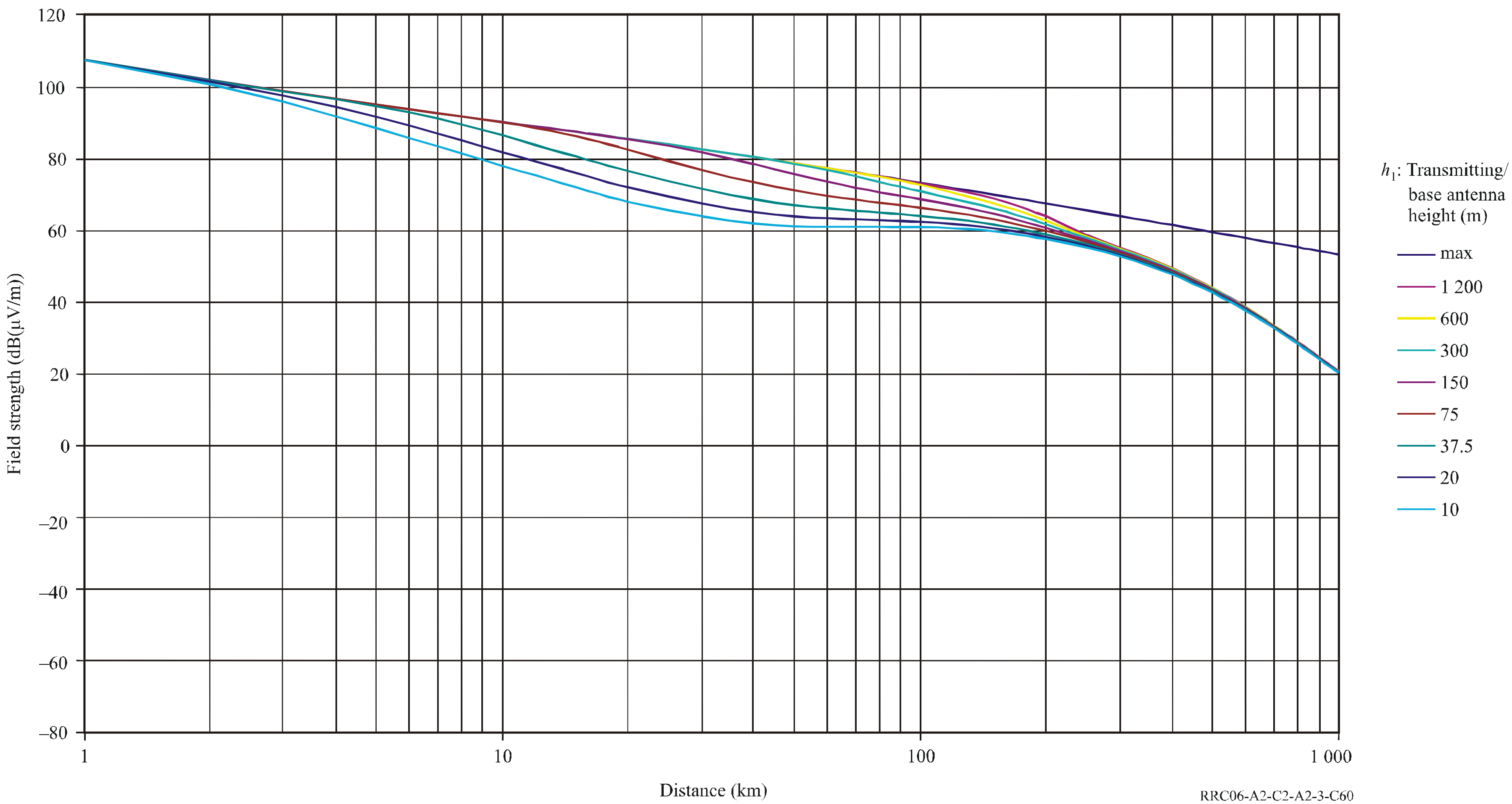

600 MHz at 50% time in Zone B
Field strength (dB(μV/m))
120
100
80
60
40
20
0
–20
–40
–60
–80
1
10
100
1 000
Distance (km)
h_1: Transmitting/ base antenna height (m)
max
1 200
600
300
150
75
37.5
20
10
RRC06-A2-C2-A2-3-C58

600 MHz at 10% time in Zone B

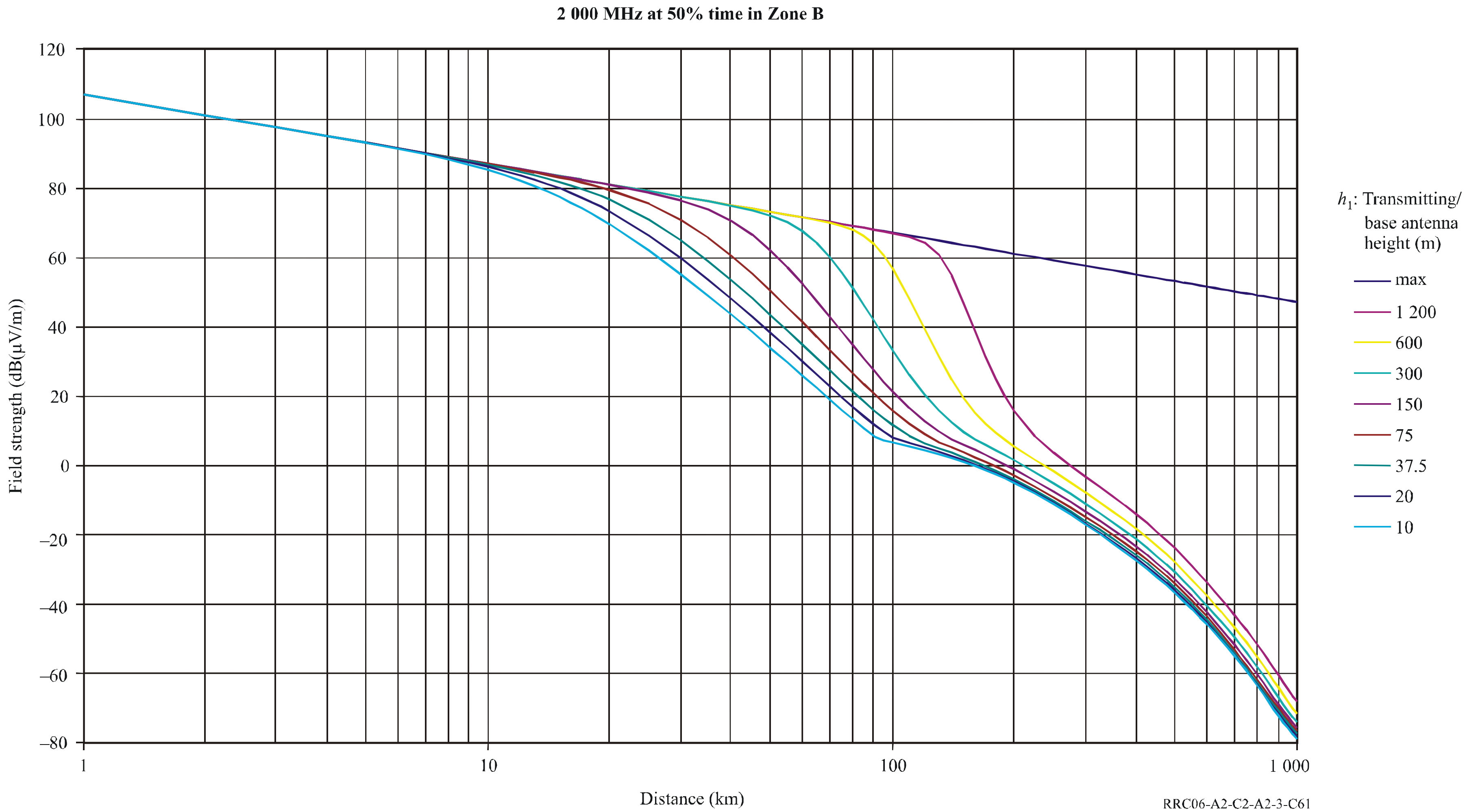


RRC06-A2-C2-A2-3-C59

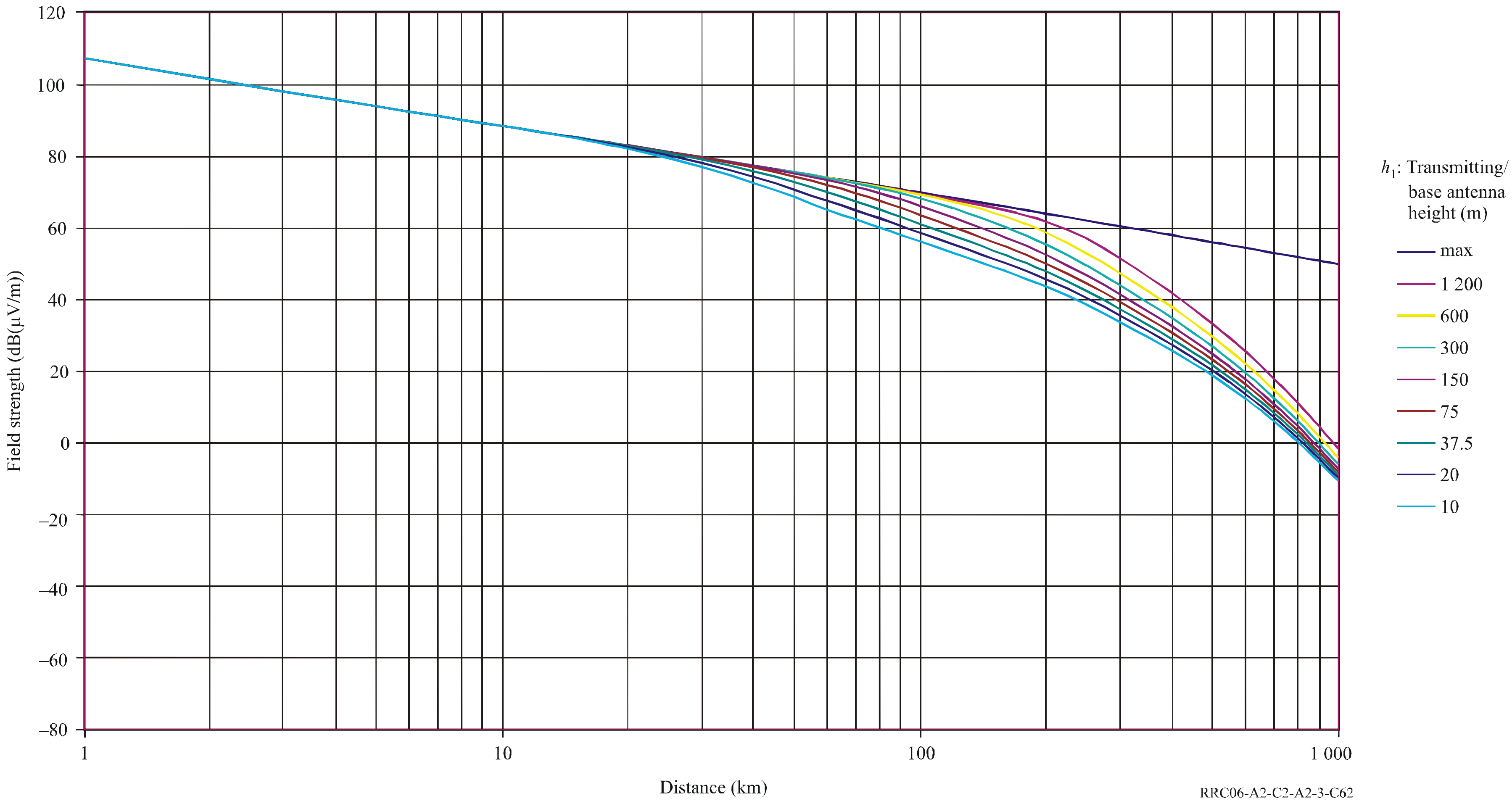
600 MHz at 1% time in Zone B



RRC06-A2-C2-A2-3-C60

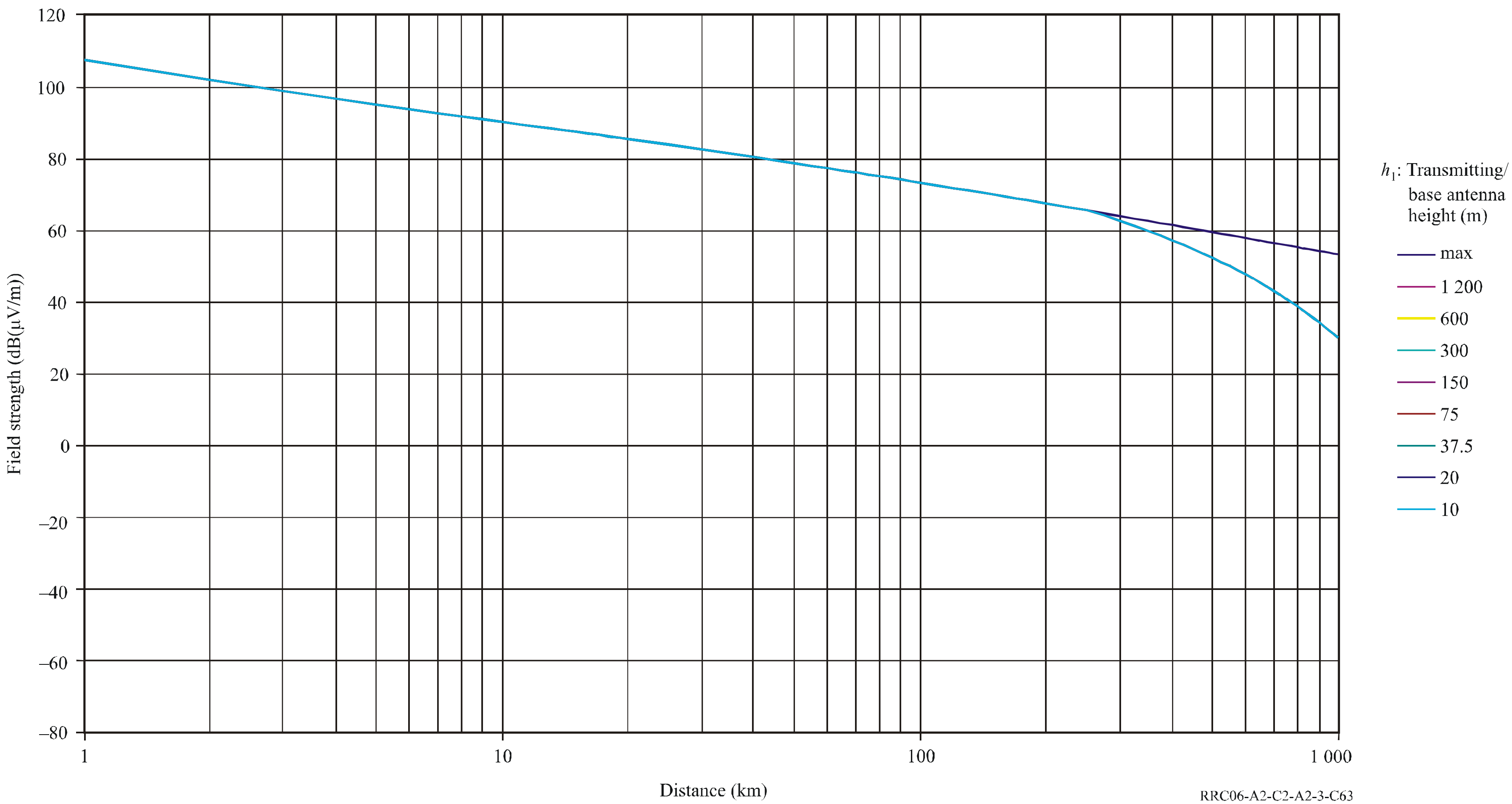

2 000 MHz at 50% time in Zone B
120
100
80
60
40
20
0
–20
–40
–60
–80
Field strength (dB(μV/m))
1
10
100
1 000
Distance (km)
h_1: Transmitting/ base antenna height (m)
max
1 200
600
300
150
75
37.5
20
10
RRC06-A2-C2-A2-3-C61

2 000 MHz at 10% time in Zone B

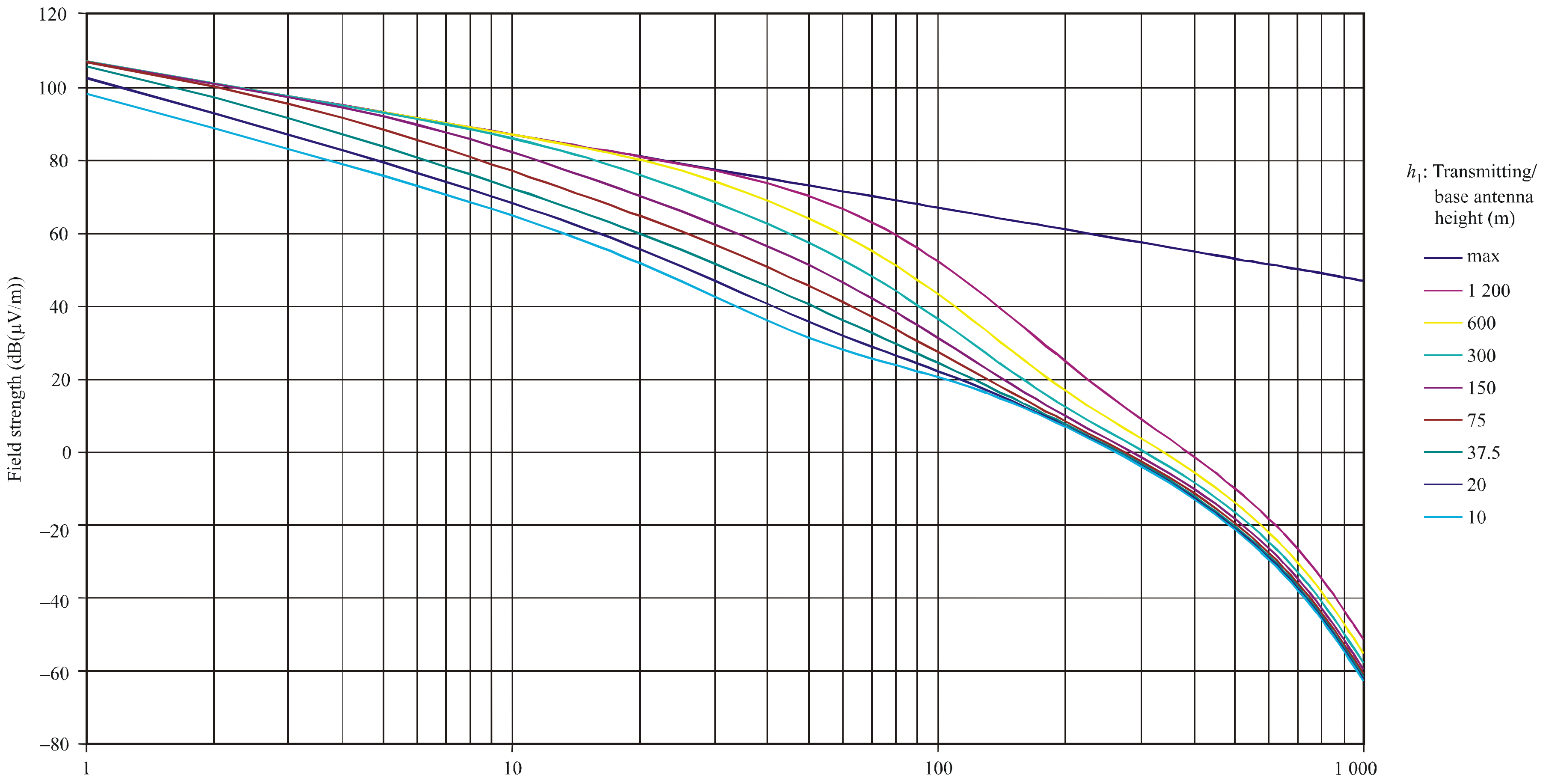


RRC06-A2-C2-A2-3-C62

2 000 MHz at 1% time in Zone B

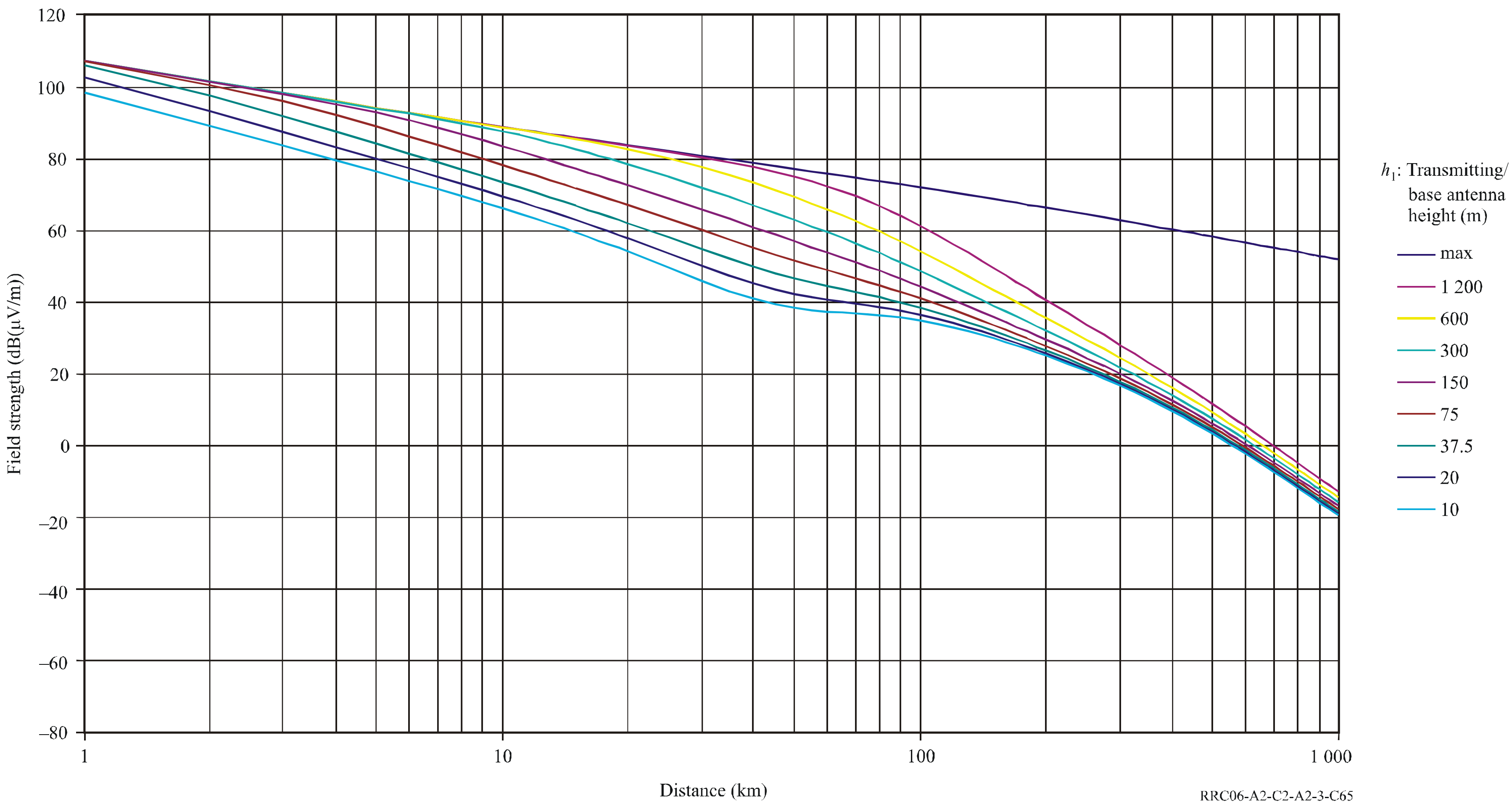


100 MHz at 50% time in Zone C

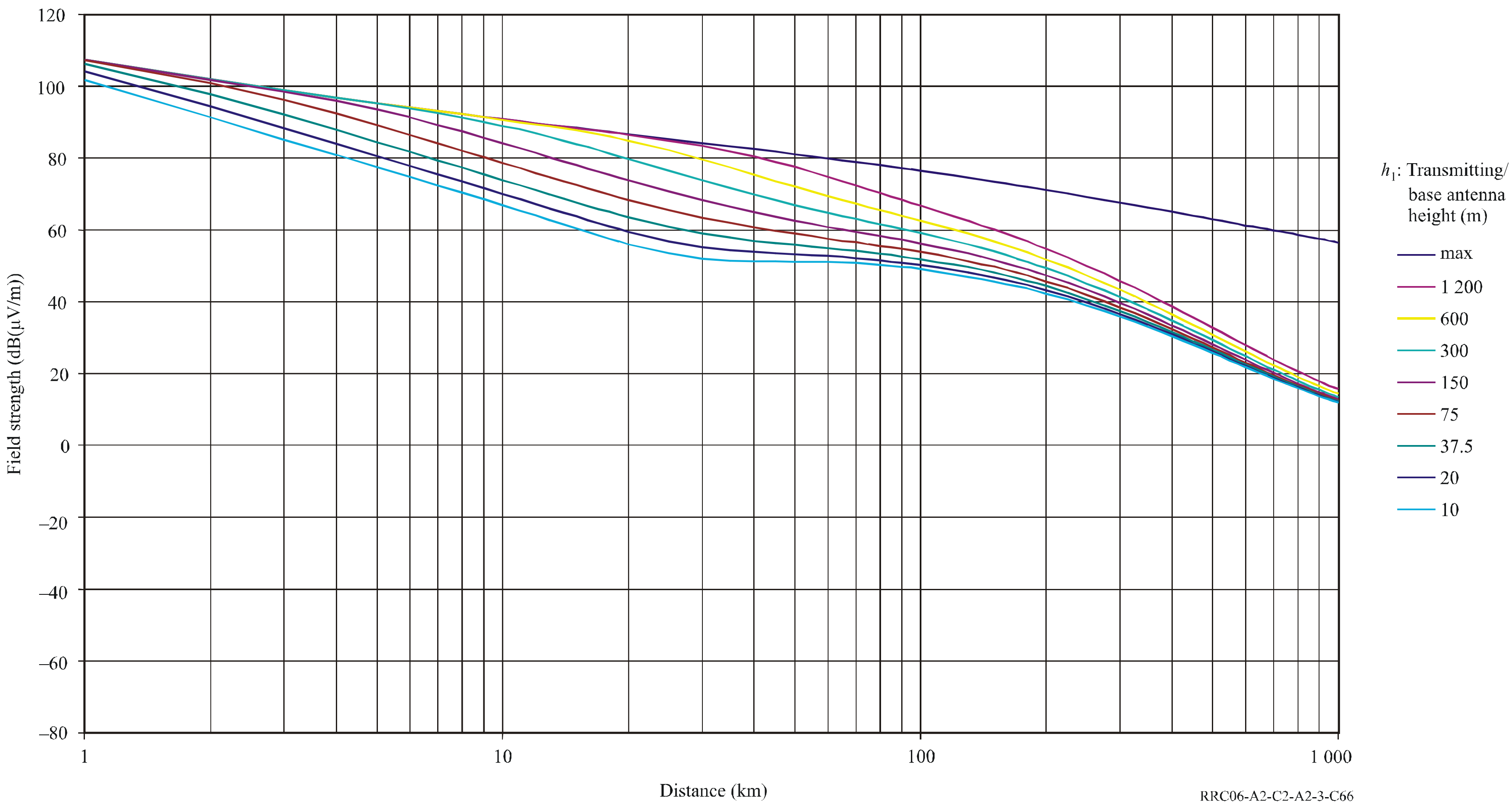


RRC06-A2-C2-A2-3-C64

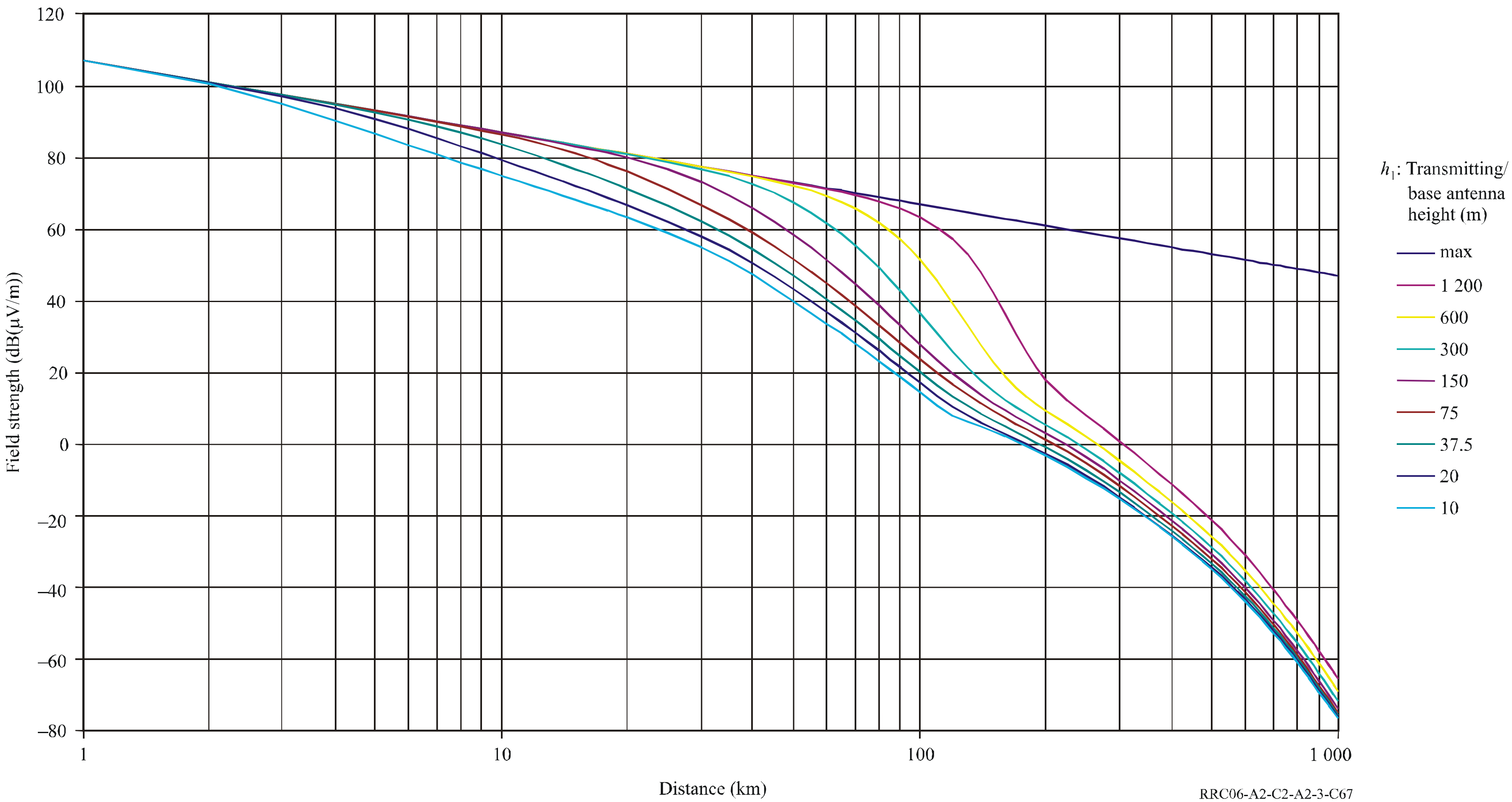
100 MHz at 10% time in Zone C



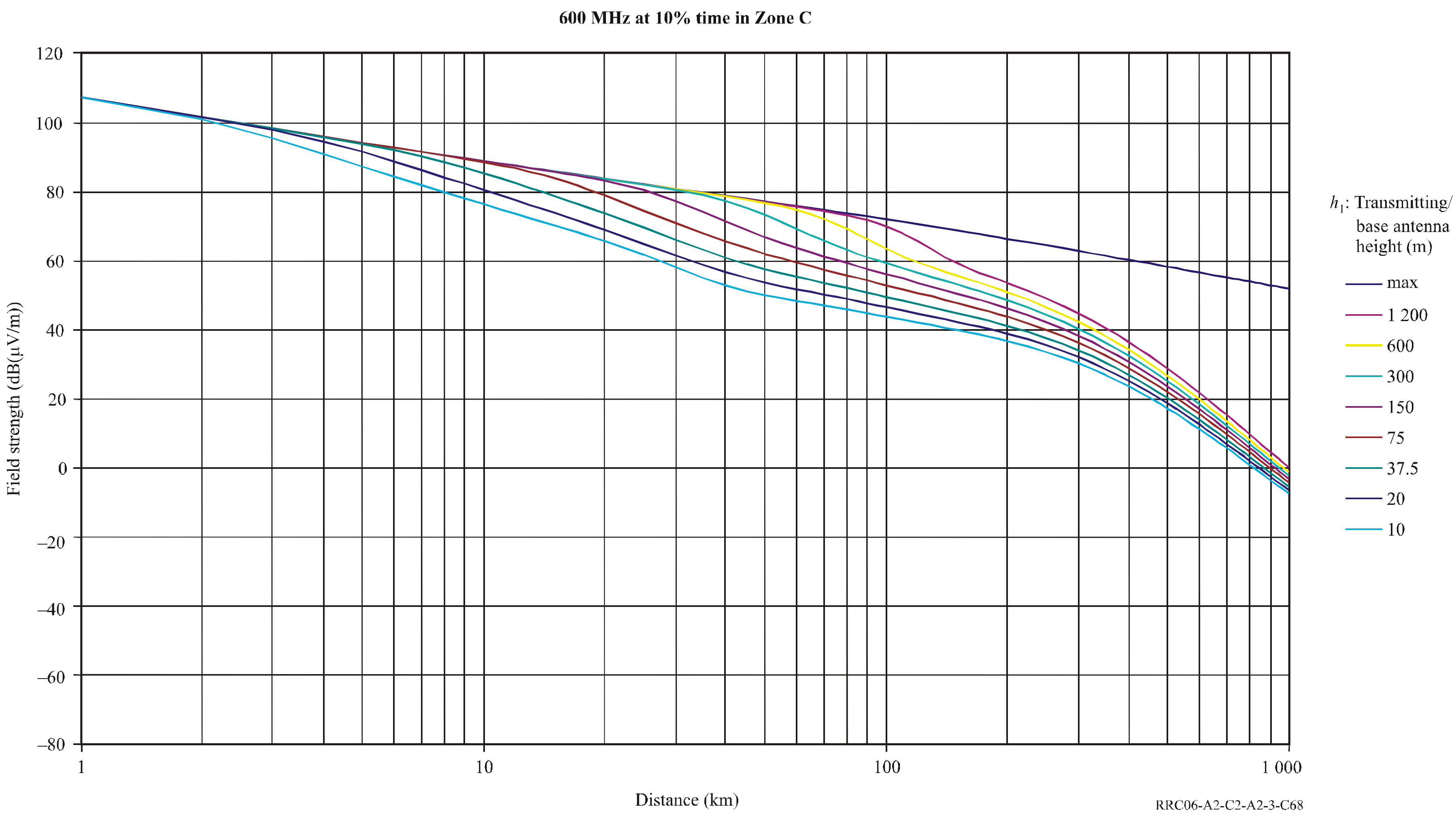
100 MHz at 1% time in Zone C



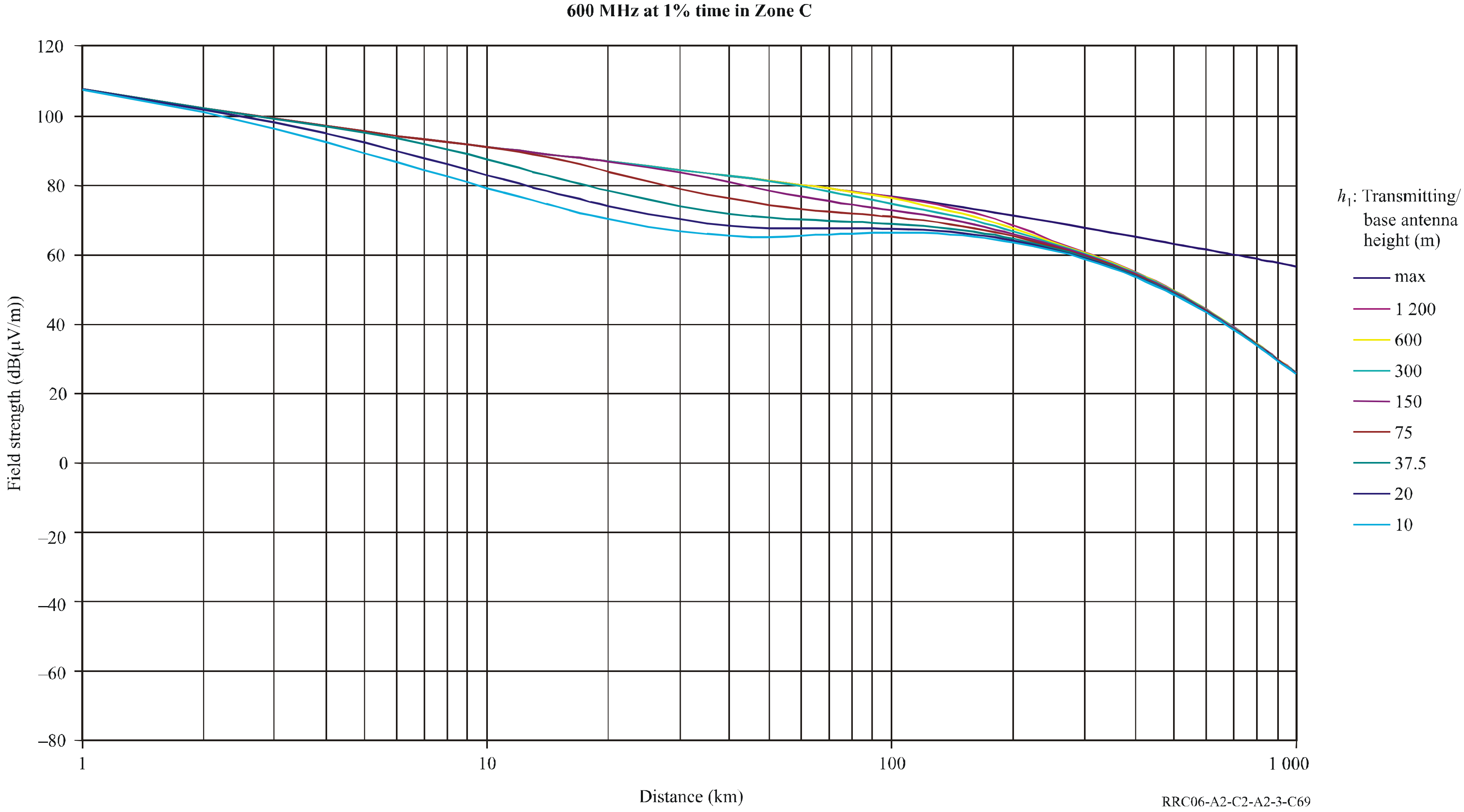
600 MHz at 50% time in Zone C



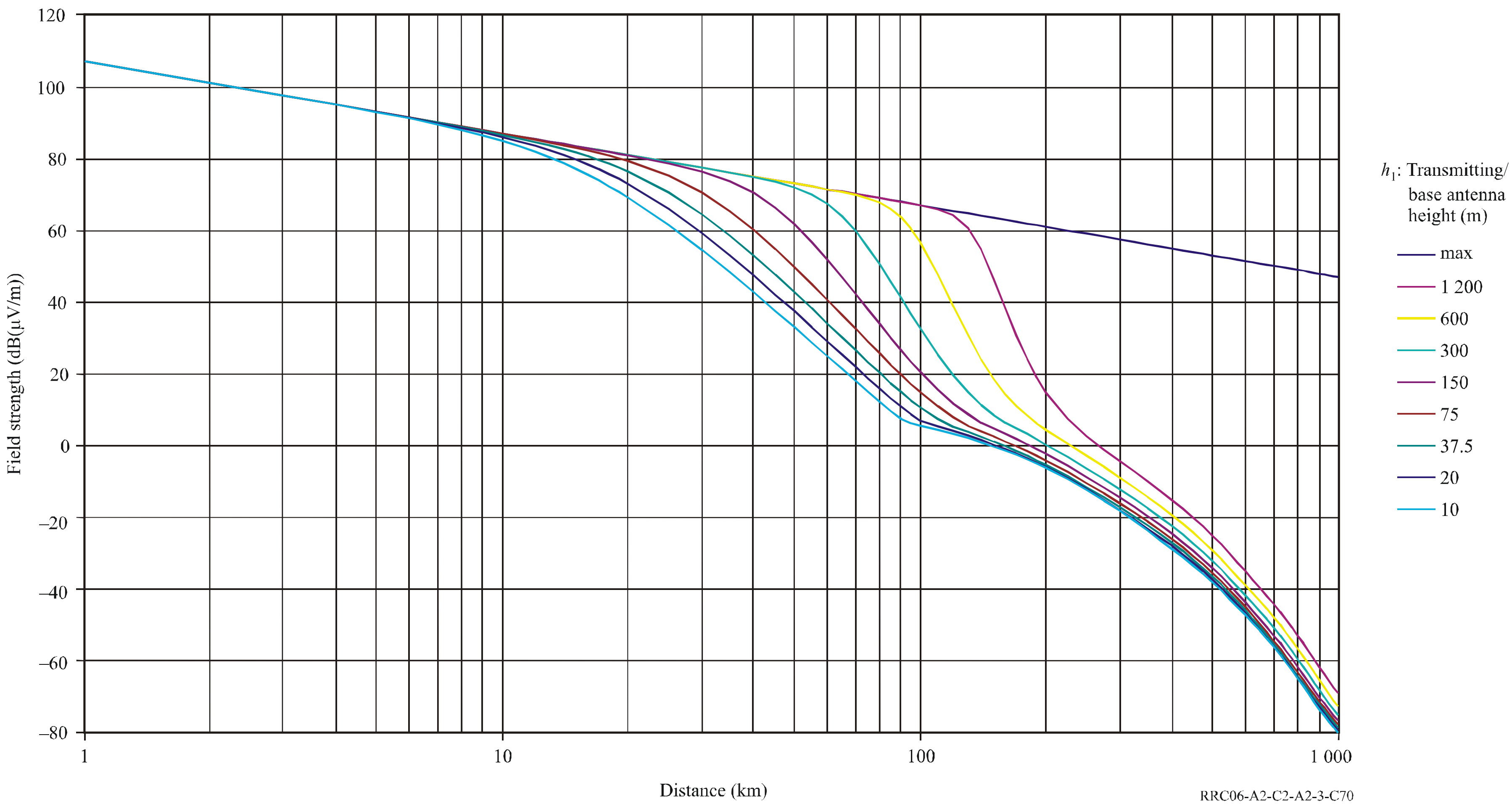
RRC06-A2-C2-A2-3-C67



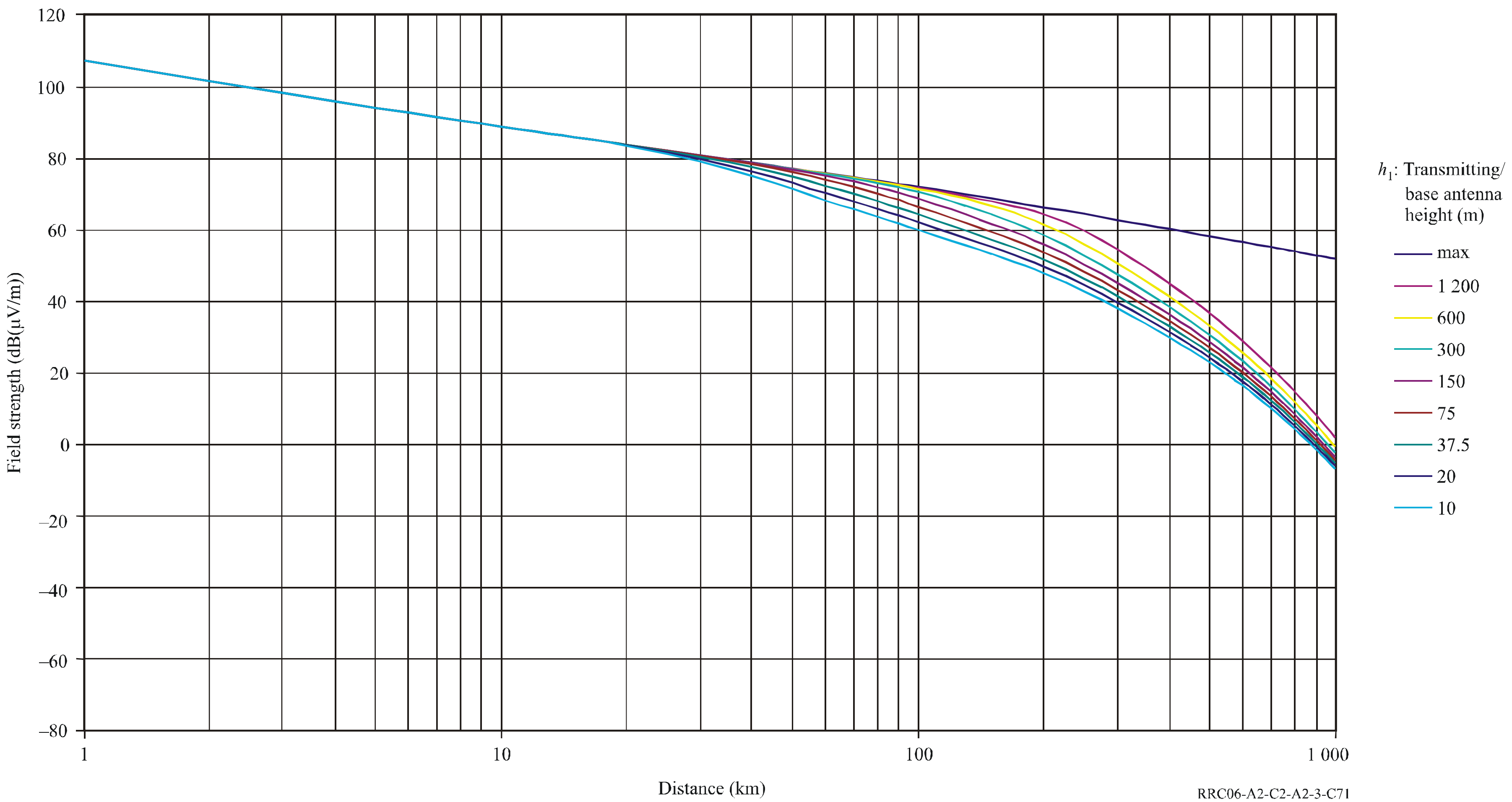
600 MHz at 10% time in Zone C
120
100
80
60
40
20
0
–20
–40
–60
–80
Field strength (dB(μV/m))
1
10
100
1 000
Distance (km)
h_1: Transmitting/ base antenna height (m)
max
1 200
600
300
150
75
37.5
20
10
RRC06-A2-C2-A2-3-C68


600 MHz at 1% time in Zone C
Field strength (dB(μV/m))
120
100
80
60
40
20
0
–20
–40
–60
–80
1
10
100
1 000
Distance (km)
h1: Transmitting/ base antenna height (m)
max
1 200
600
300
150
75
37.5
20
10
RRC06-A2-C2-A2-3-C69

2 000 MHz at 50% time in Zone C

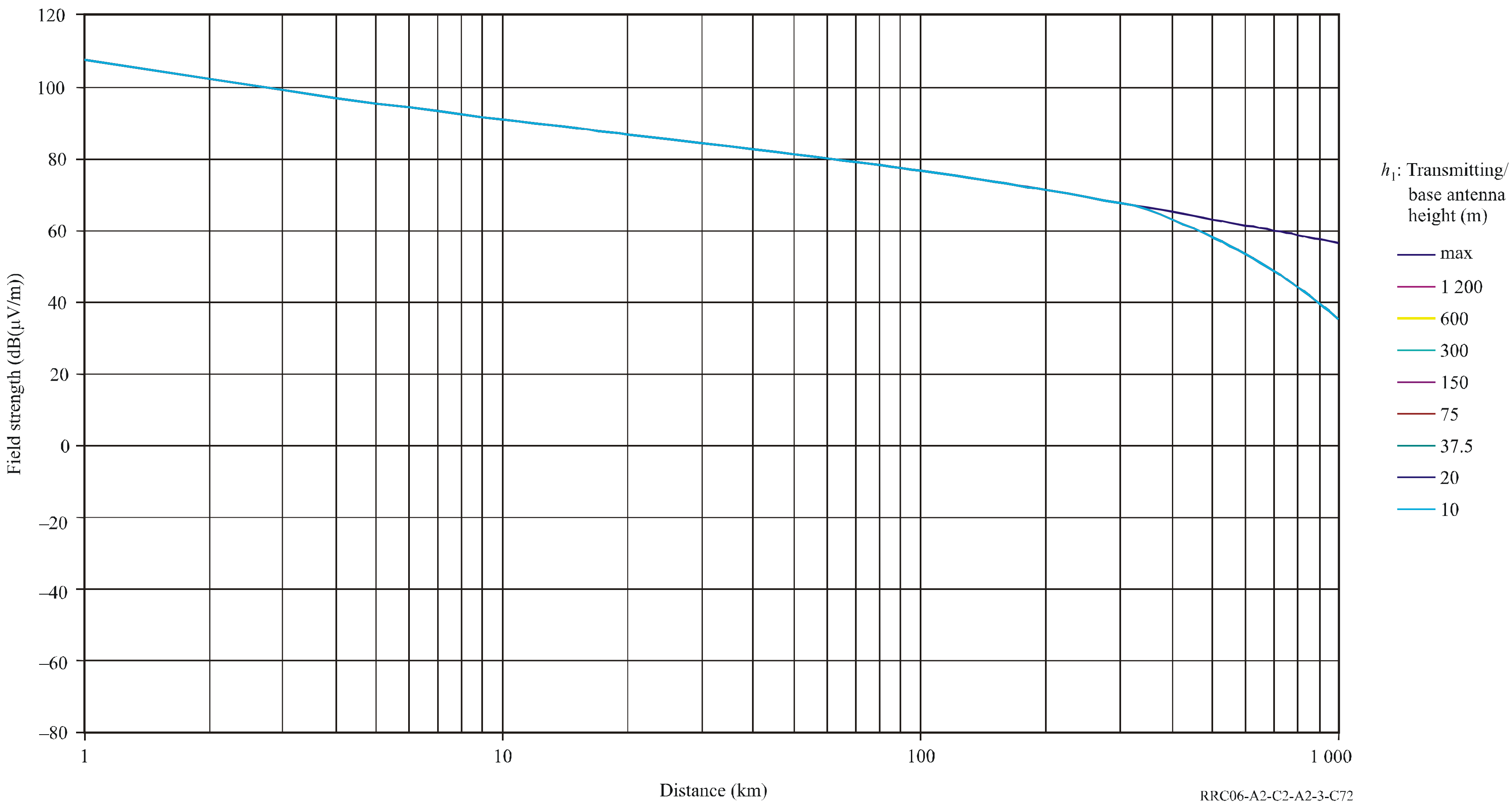


2 000 MHz at 10% time in Zone C

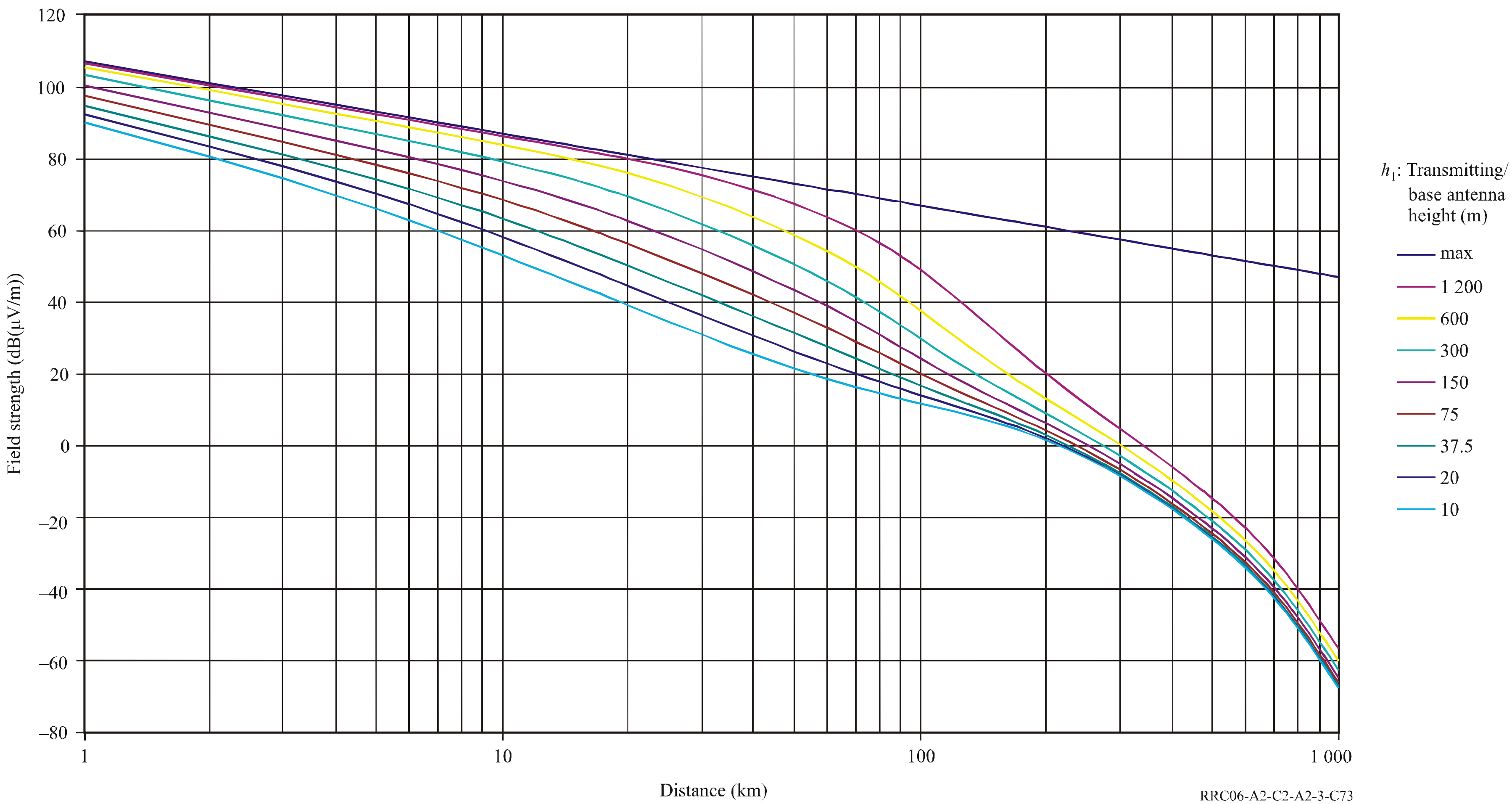


RRC06-A2-C2-A2-3-C71

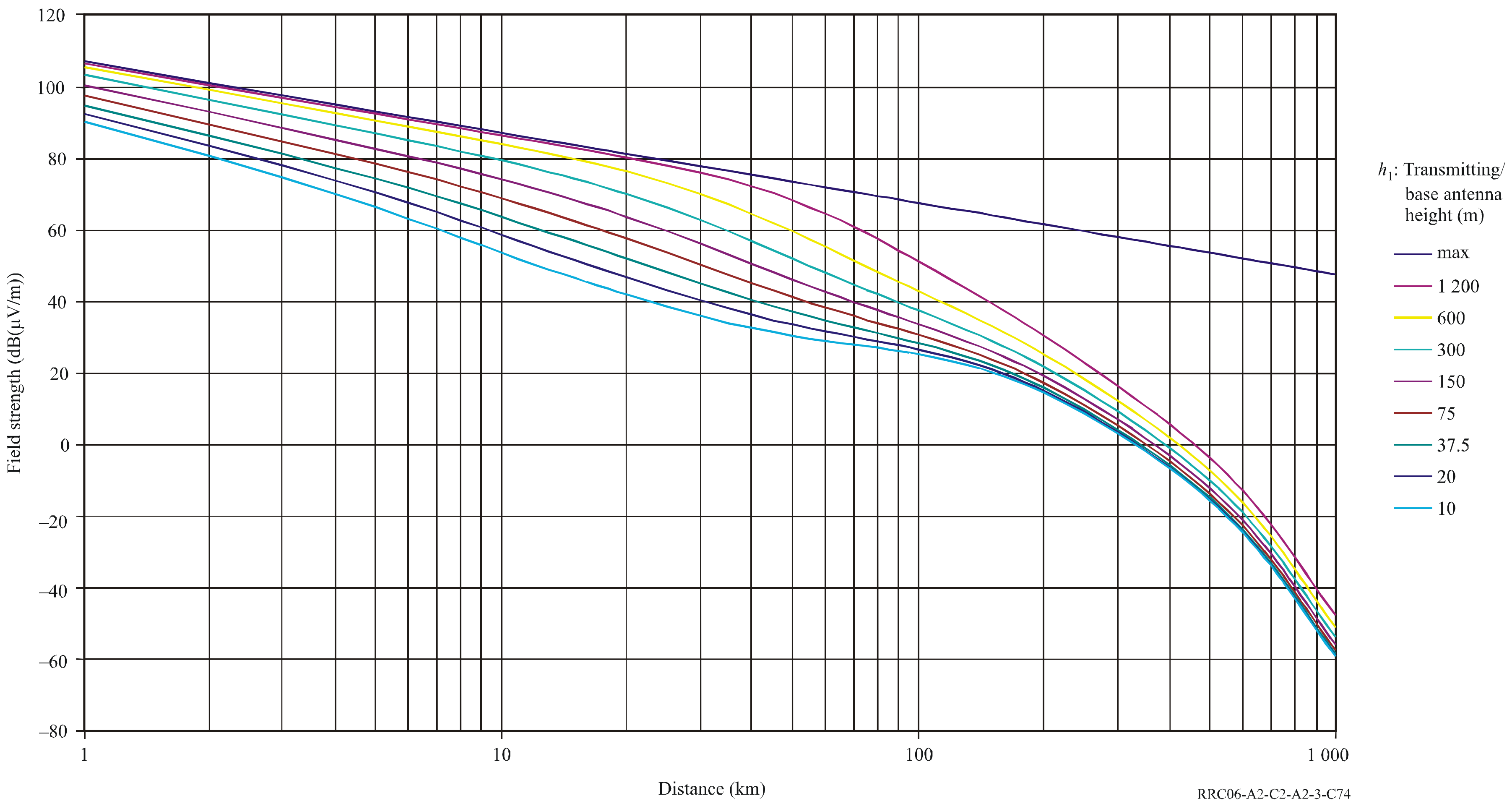
2 000 MHz at 1% time in Zone C



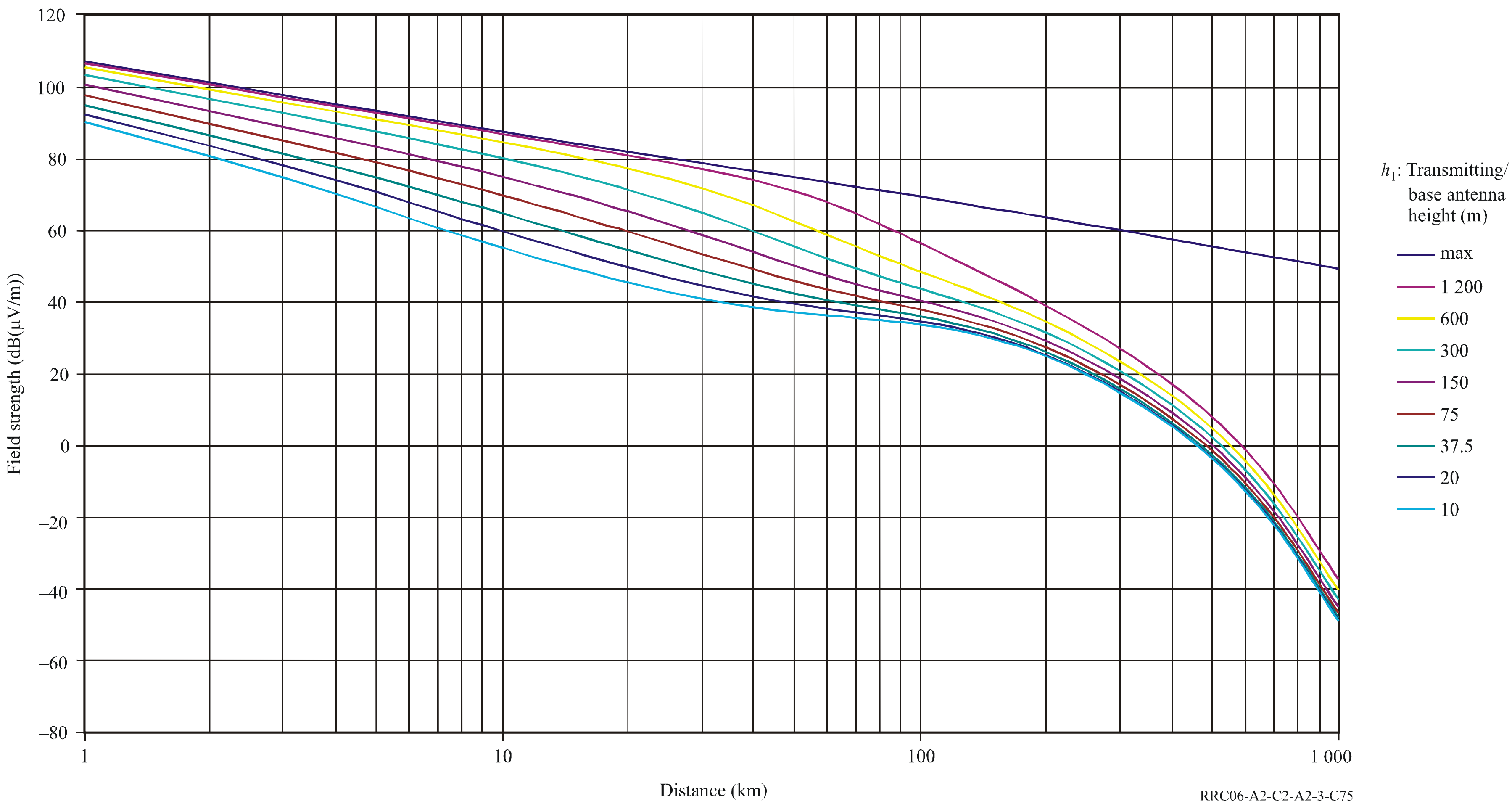
100 MHz at 50% time in Zone D



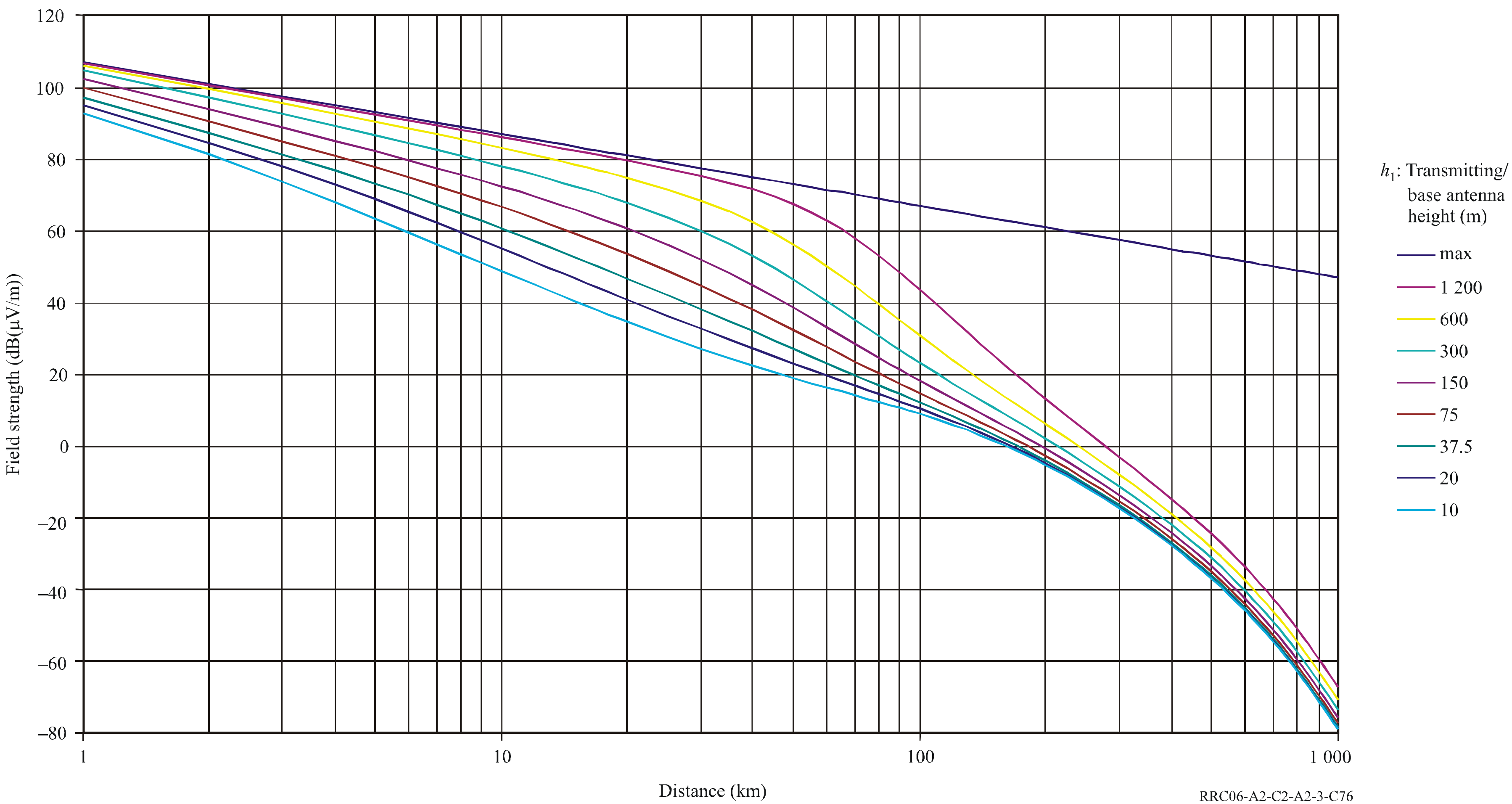
100 MHz at 10% time in Zone D



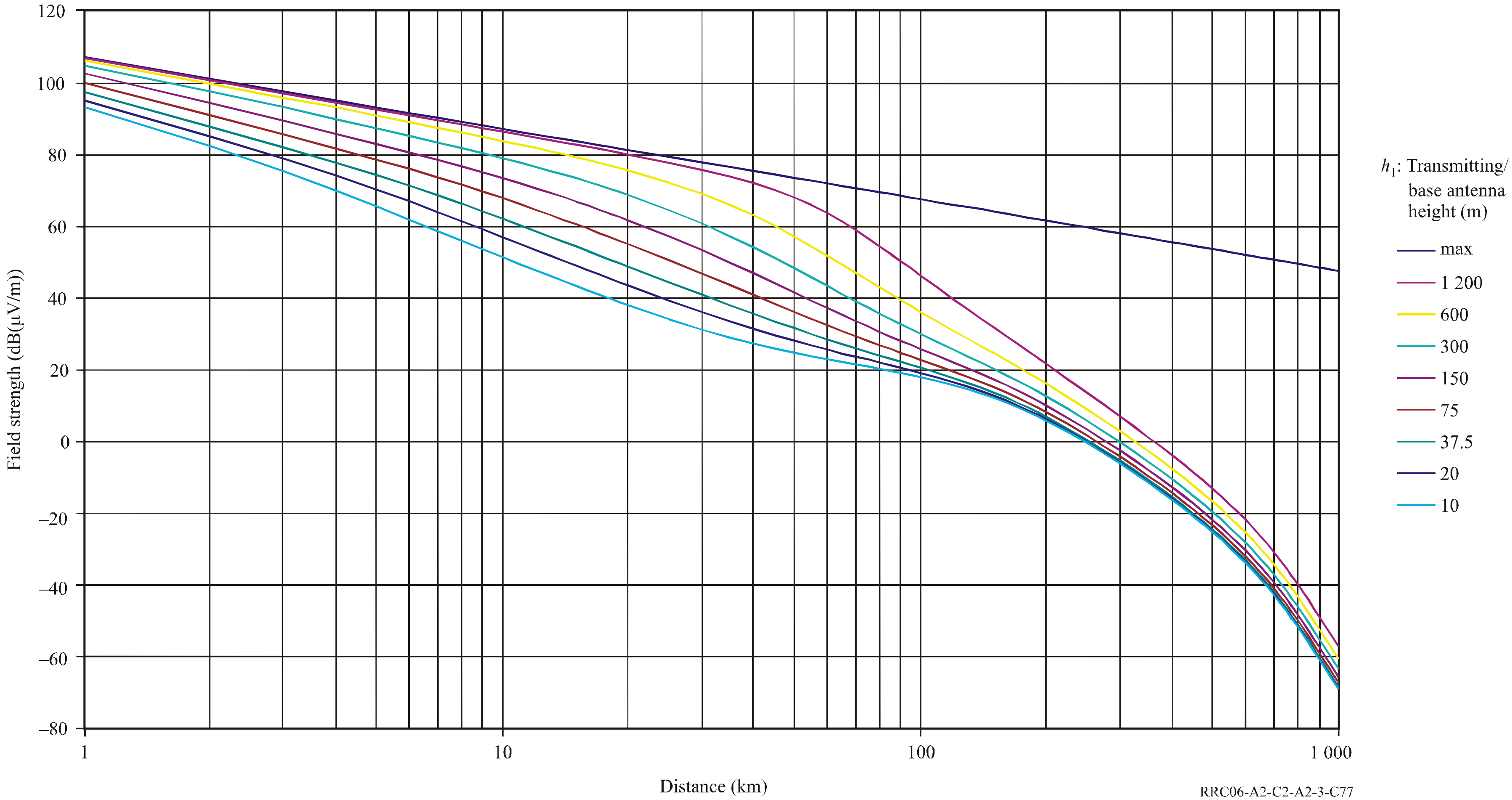
100 MHz at 1% time in Zone D



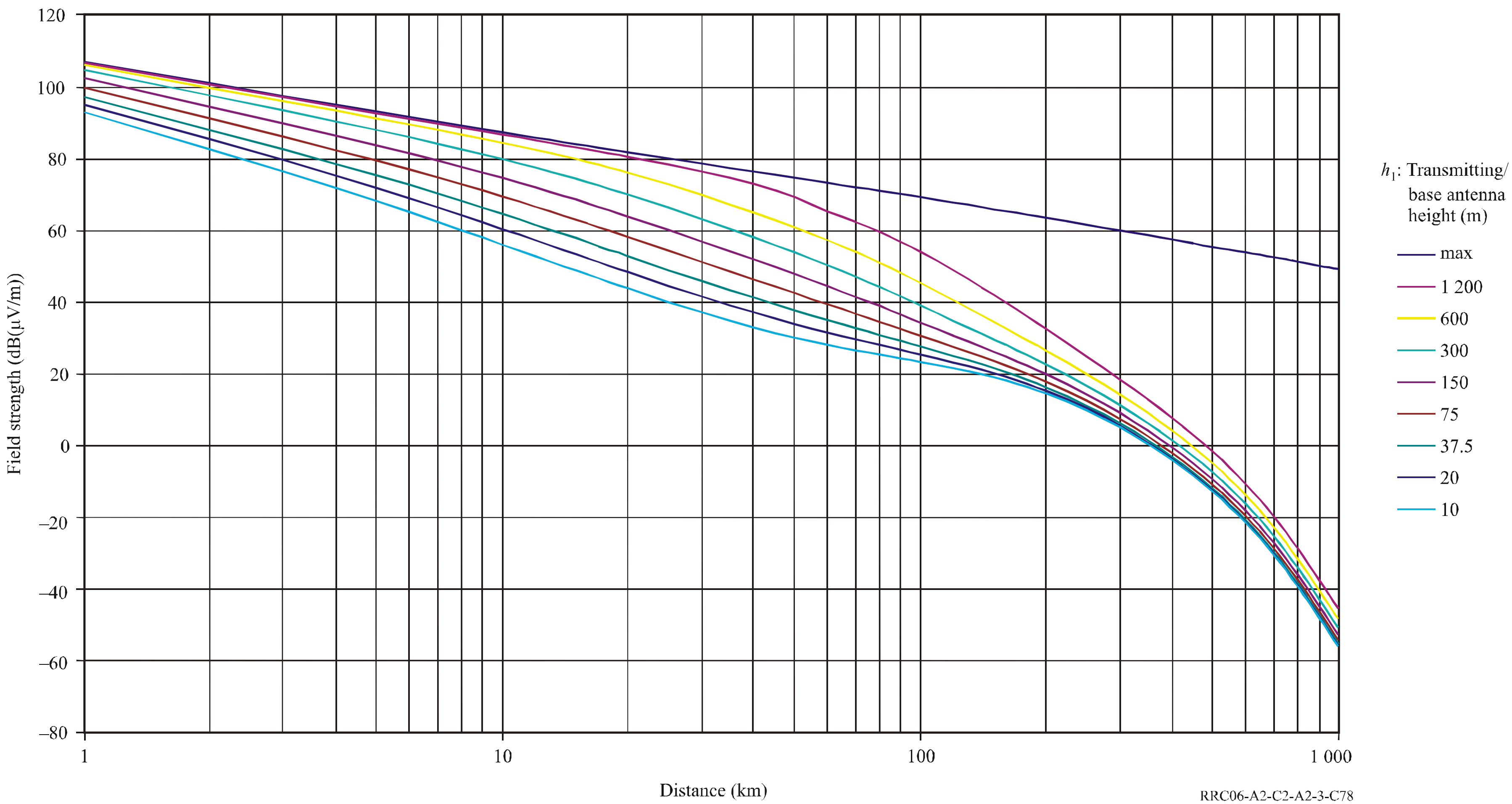
600 MHz at 50% time in Zone D



600 MHz at 10% time in Zone D

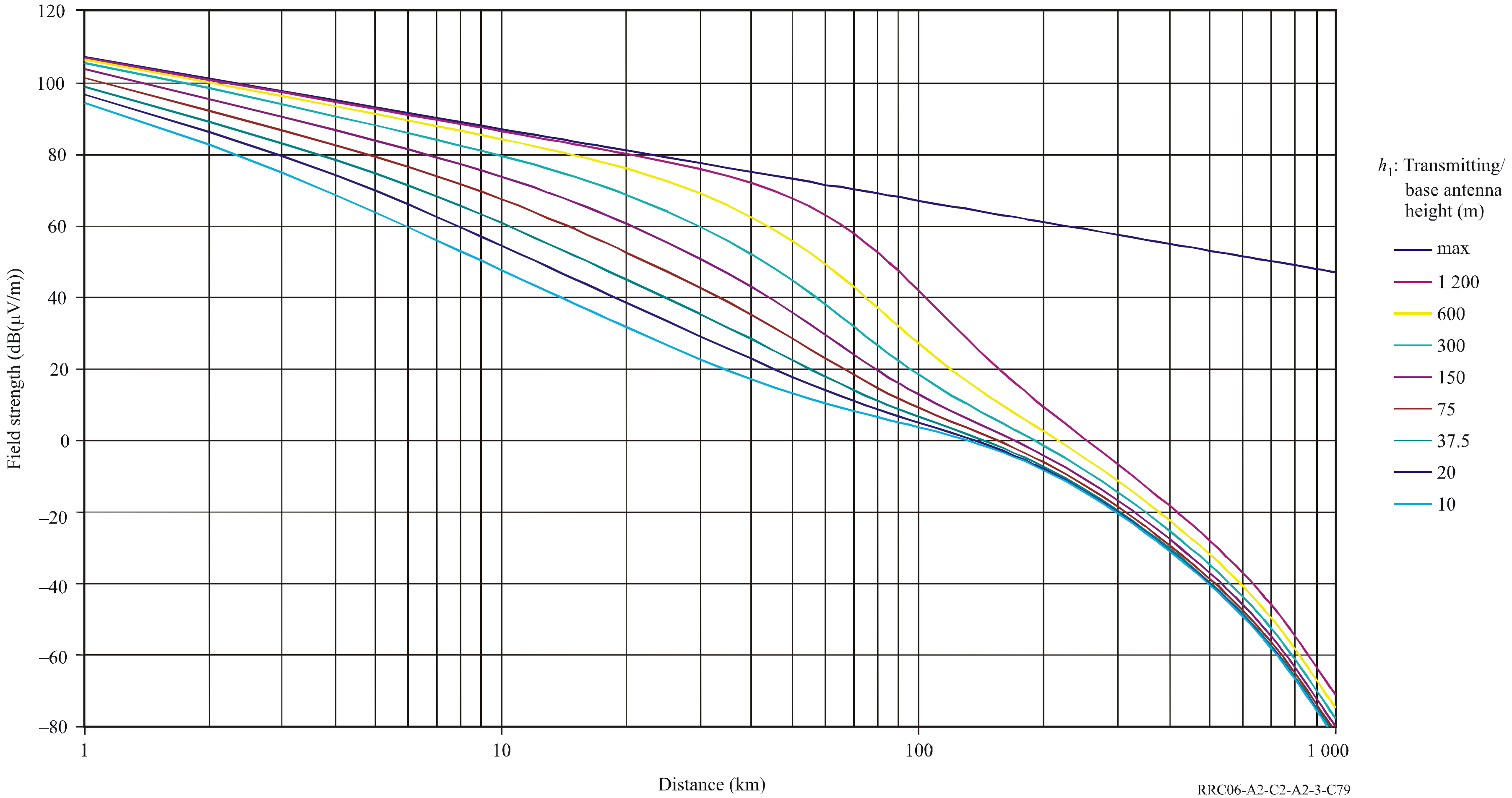


600 MHz at 1% time in Zone D



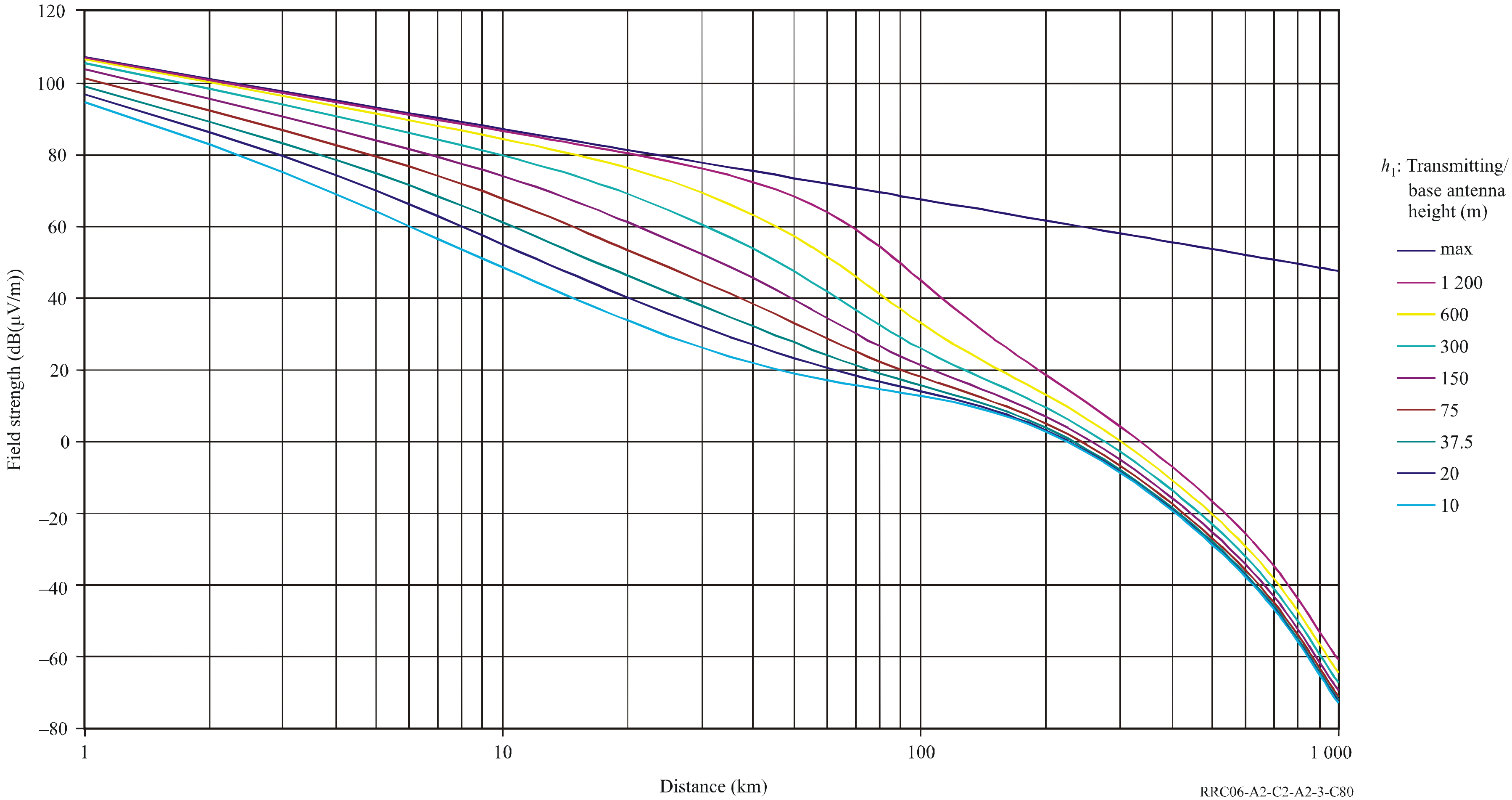
RRC06-A2-C2-A2-3-C78

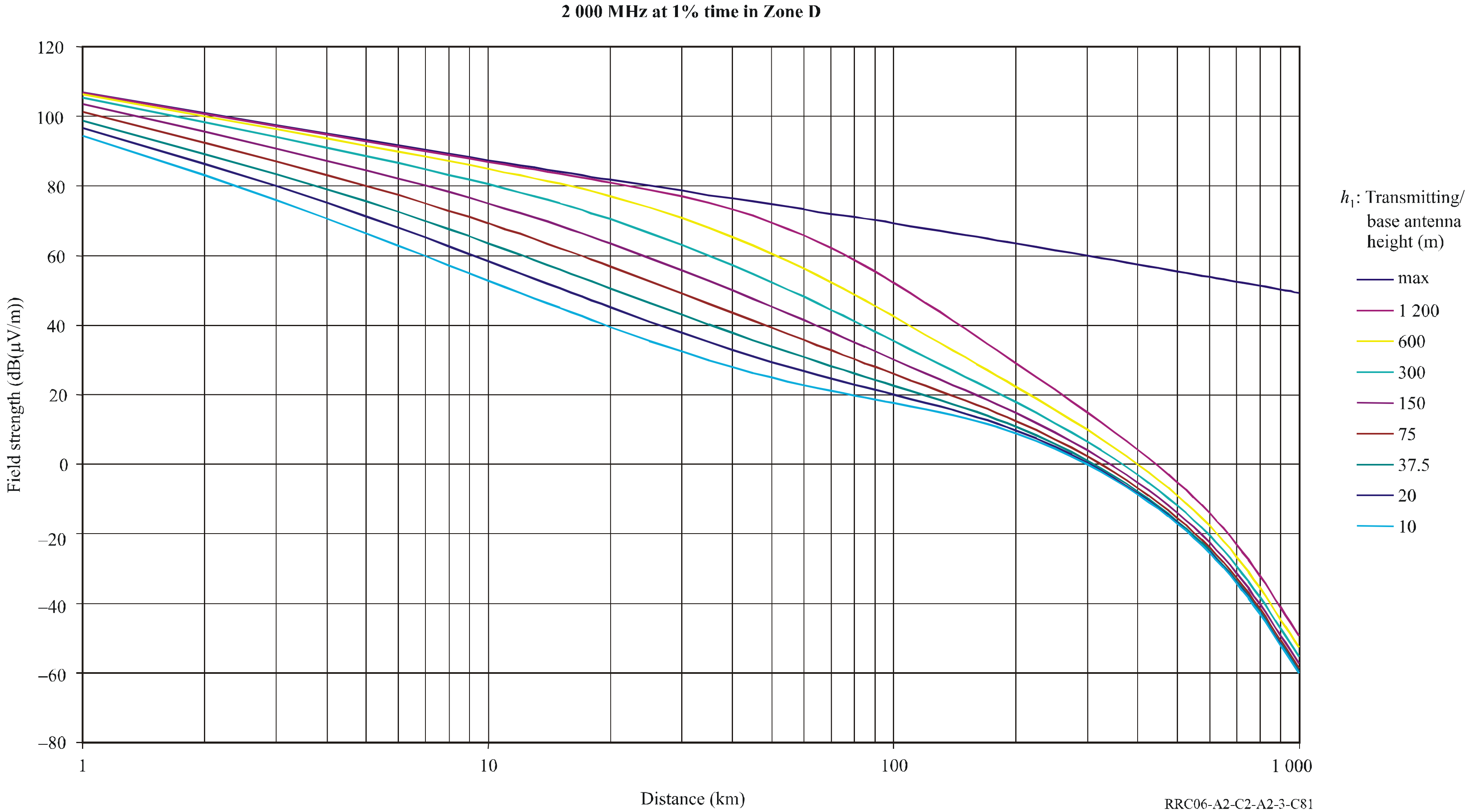
2 000 MHz at 50% time in Zone D



RRC06-A2-C2-A2-3-C79

2 000 MHz at 10% time in Zone D




2 000 MHz at 1% time in Zone D
120
100
80
60
40
20
0
–20
–40
–60
–80
Field strength (dB(μV/m))
1
10
100
1 000
Distance (km)
h_1: Transmitting/ base antenna height (m)
max
1 200
600
300
150
75
37.5
20
10
RRC06-A2-C2-A2-3-C81

CHAPTER 3
TO ANNEX 2

Technical basis for the terrestrial broadcasting service

3.1 Terrestrial broadcasting systems, frequency bands, channel spacing and channel distribution

3.1.1 Terrestrial broadcasting systems in Bands III, IV and V

The digital Plan contains T-DAB and DVB-T entries defined by the set of characteristics listed in Annex 1 to the Agreement.

Band III contains plan entries for DVB-T, for T-DAB and for analogue television assignments to be protected during the transition period.

Bands IV and V contain plan entries for DVB-T and for analogue television assignments to be protected during the transition period.

Recommendation ITU-R BT.470-7 contains detailed technical information on conventional analogue television systems.

Recommendations ITU-R BT.1306-3 and ITU-R BT.1368-6 contain detailed technical information on DVB-T. Table A.3.1-1 in Appendix 3.1 to this Chapter gives information about the designators and net bit rates associated with the DVB-T system variants.

Recommendations ITU-R BS.1114-5 and ITU-R BS.1660-2 contain detailed technical information on T-DAB.

The values and parameters given in this Chapter have been used in the development of the Plan and shall be used for its modification.

3.1.2 Frequency bands, channel spacing and channel distribution

In Band III, different television channel spacings are used across the planning area. The relationships between the channel spacing and the channel distribution for DVB-T for the administrations from the planning area are contained in the Tables A.3.1-3 to A.3.1-5 of Appendix 3.1 to this Chapter.

In Bands IV and V, a single channel spacing of 8 MHz, with the upper and lower edges of each channel being the same for all countries in the planning area, is used.

In Bands IV and V, the same channel spacing and channel distribution is used for digital and analogue television. For digital television, the assigned frequency is given as the centre frequency. Table A.3.1-2 contains the relevant channel information.

Information on channel spacing and channel distribution for analogue television systems with respect to vision carrier and sound carrier is given in the Tables A.3.1-6 to A.3.1-14 of Appendix 3.1 to this Chapter.

For T-DAB in Band III, all administrations of the planning area use the same frequency blocks and block distribution. The assigned frequencies and block bandwidth in Band III for T-DAB are given in Table A.3.1-15 of Appendix 3.1 to this Chapter.

3.2 Reception modes for DVB-T and T-DAB

DVB-T was planned for a number of different reception modes, namely, fixed reception, portable (outdoor and indoor) reception and mobile reception, using a number of appropriate system variants and location probabilities.

T-DAB was planned for mobile reception and portable indoor reception.

3.2.1 Fixed reception

The reference receiving antenna height considered to be representative in calculating the field strength for fixed reception is 10 m above ground level. In order to derive the minimum median field-strength levels for Bands III, IV and V, the receiving antenna gain and feeder-loss values are given in § 3.2.1.2 and 3.2.1.3 to this Chapter for reference frequencies. Minimum median field-strength levels for other frequencies are derived by interpolation as described in Appendix 3.3 to this Chapter.

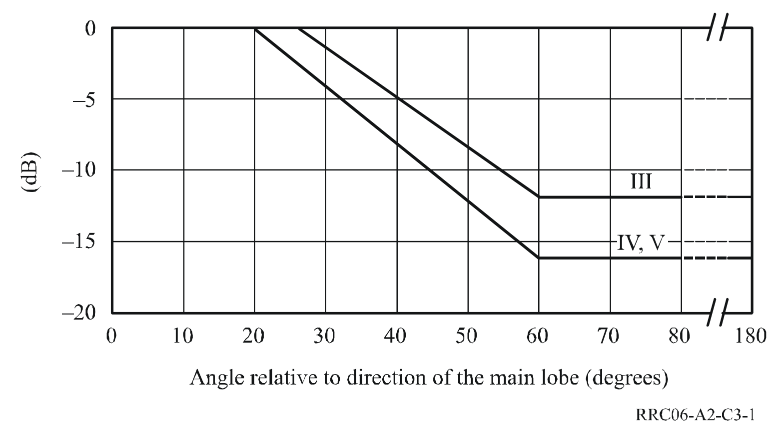
3.2.1.1 Radiation patterns for fixed receiving antennas at roof level

Standard radiation patterns for receiving antennas for Bands III, IV and V are given in Recommendation ITU-R BT.419-3 (see Fig. 3-1).

FIGURE 3-1

Directivity of receiving antennas for Bands III, IV and V

(The number of the broadcasting band is shown on the curve)



3.2.1.2 Antenna gain

The antenna gain values (relative to a half-wave dipole) used in the derivation of the minimum median equivalent field-strength values are given in Table 3-1.

TABLE 3-1

Antenna gain (relative to a half-wave dipole) in Bands III, IV and V

Frequency (MHz)	200	500	800
Antenna gain (dBd)	7	10	12

3.2.1.3 Feeder loss

The feeder-loss values used in the derivation of the minimum median wanted signal levels are given in Table 3-2.

TABLE 3-2

Feeder loss in Bands III, IV and V

Frequency (MHz)	200	500	800
Feeder loss (dB)	2	3	5

3.2.1.4 Location probability for fixed reception

For fixed reception, a location probability of 95% shall be used.

3.2.1.5 Polarization discrimination for fixed reception

It is possible to take advantage of polarization discrimination for fixed reception. However, in the case of orthogonal polarization, the combined discrimination provided by directivity and orthogonality cannot be calculated by adding together the separate discrimination values. A combined discrimination value of 16 dB shall be applied for all angles of azimuth in Bands III to V.

3.2.2 Portable and mobile reception

3.2.2.1 Considerations on height loss

For portable (indoor and outdoor) reception, a receiving antenna height of 1.5 m above ground level is used. The same receiving antenna height is also used for mobile reception. Since all field-strength calculations are for a receiving antenna height of 10 m, a height loss correction factor for an antenna height of 1.5 m shall be used in the calculation of minimum median field-strength levels.

For planning purposes, the height-loss values for portable and for mobile reception for reference frequencies are given in Table 3-3. Minimum median field-strength levels for other frequencies are derived by interpolation, as described in Appendix 3.3 to this Chapter.

TABLE 3-3

Height loss in Bands III, IV and V

Frequency (MHz)	200	500	800
Height loss (dB)	12	16	18

These values are those obtained for suburban coverage.

3.2.2.2 Building entry loss

Table 3-4 contains the mean values for building entry loss and the corresponding standard deviation at VHF and UHF.

TABLE 3-4

Building entry loss in Bands III, IV and V

	Building entry loss	Standard deviation
VHF	9 dB	3 dB
UHF	8 dB	5.5 dB

3.2.2.3 Antenna gain for portable reception

Recommendation ITU-R BT.1368-6 gives in its Annex 4, § 4.1, information on antennas for portable reception. For portable reception, an omnidirectional antenna shall be applied. The antenna gain (relative to a half-wave dipole) is as given in Table 3-5.

TABLE 3-5

Antenna gain (dBd) for portable reception

Band	Gain (dBd)
Band III (VHF)	–2
Band IV (UHF)	0
Band V (UHF)	0

3.2.2.4 Location probability for portable reception

For portable indoor and outdoor reception, a location probability of 95% shall be used.

3.2.2.5 Polarization discrimination for portable reception

Polarization discrimination shall not be taken into account in frequency planning for portable reception.

3.2.2.6 Antenna gain for mobile reception

The values of antenna gain given in Table 3-6 shall be used for mobile reception.

TABLE 3-6

Antenna gain (dBd) for mobile reception

Band	Gain (dBd)
Band III (VHF)	–2
Band IV (UHF)	0
Band V (UHF)	0

3.2.2.7 Location probability for mobile reception

For mobile reception of DVB-T, a location probability of 95% shall be used; for mobile reception of T-DAB, a location probability of 99% shall be used.

3.2.2.8 Polarization discrimination for mobile reception

Polarization discrimination shall not be taken into account for mobile reception.

3.2.3 Reference planning configurations

A planning configuration describes relevant technical aspects of a broadcasting service implementation. The various aspects of a planning configuration, for the example of DVB-T, are summarized in Table 3-7.

TABLE 3-7

Aspects of DVB-T planning configurations

Aspect	Element
Reception mode	Fixed Portable outdoor Portable indoor Mobile
Coverage quality (in terms of percentage of locations)	70% 95% 99%
Network structure	MFN (single transmitter) SFN Dense SFN
DVB-T system variant	From QPSK 1/2 to 64-QAM 7/8
Frequency band	Band III Band IV Band V

Further information on reference planning configurations is given in Appendix 3.5 to this Chapter.

3.3 T-DAB and DVB-T receiver noise figure

A receiver noise figure of 7 dB shall be used for both DVB-T and T-DAB.

3.4 Planning criteria

For the development of the Plan in Bands III, IV and V, the following planning criteria have been used; they shall also be used for the modification of the Plan:

– minimum median field strengths;

– nuisance field strengths;

based on:

– *C*/*N* values;

– protection ratios;

– building entry loss for indoor reception;

– location correction factors and the percentage time;

– possibly, the constraints of the spectrum mask applied to a digital transmission.

3.4.1 *C*/*N* values for planning

For DVB-T, the *C*/*N* values are based on current DVB-T receivers in non-hierarchical modes. These *C*/*N* values, for different DVB-T system variants and for different reception conditions, are indicated in Table A.3.2-1 in Appendix 3.2 to this Chapter.

The *C*/*N* values given for the Ricean channel shall be used for the fixed reception case, and those for the Rayleigh channel shall be used for the portable and mobile reception cases.

In addition, the reference *C*/*N* values for the three DVB-T reference planning configurations (RPCs) are found in Table A.3.5-1 in Appendix 3.5 to this Chapter.

For T-DAB, a *C*/*N* value of 15 dB is derived from Recommendation ITU-R BS.1660-2.

In the case of T-DAB, portable indoor and mobile reception modes are relevant for planning purposes. A unique reference *C*/*N* value of 15 dB is considered for both T-DAB reception modes, as indicated in Table A.3.5-2 in Appendix 3.5 to this Chapter for the RPCs.

3.4.2 Protection ratios

The protection ratios are summarized in the tables in Appendix 3.3 to this Chapter.

For DVB-T (vis-à-vis DVB-T, T-DAB and analogue television, and conversely), the protection ratios given in Appendix 3.3 to this Chapter are based on those developed in Recommendation ITU-R BT.1368-6, especially Annex 2 thereto – Planning criteria for DVB-T digital television system in the VHF/UHF bands.

In cases of a partial overlap between T-DAB and DVB-T (8 MHz), the protection ratio of complete overlap shall be used.

For T-DAB vis-à-vis T-DAB, the protection ratio of 15 dB shall be used.

For T-DAB interfered with by DVB-T or analogue television, the protection ratios in Appendix 3.3 to this Chapter shall be used. These protection ratios are based on Recommendation ITU-R BS.1660-2.

For analogue television interfered with by T-DAB or analogue television, the protection ratios in Recommendation ITU-R BT.655-7 shall be used.

3.4.3 Minimum signal levels for digital broadcasting systems

For the different reception modes, the field strengths required to provide the desired location probability for reception of the wanted signal can best be compared by using a reference receiving antenna height, location probability and percentage time, as follows:

– Receiving antenna height: 10 m above ground level

– Location probability: 50%

– Percentage time: 50%.

The field strengths corresponding to these conditions are termed the “minimum median field strengths”, referred to as E_{med} in Appendices 3.2, 3.4 and 3.5 to this Chapter. These field strengths correspond to the minimum signal levels needed to overcome natural and man-made noise (in the absence of interference from other transmitters) known also as the “minimum usable field strengths”.

3.4.4 Minimum signal levels for analogue broadcasting systems

For analogue TV, the minimum field strength and the reference parameters for field-strength representation in Recommendation ITU-R BT.417-5 shall be used.

3.4.5 Location correction factors and percentage time

Due to the sharp degradation of quality that occurs when the required carrier-to-interference ratio or the required carrier-to-noise ratio is not attained, a higher percentage of location probability is required for the wanted field strengths (and lower percentage for the interfering signals). Therefore, a correction to the value derived from the tables and curves in Chapter 2 to Annex 2 of the Agreement is required, termed location correction factor.

Compatibility calculations for the digital broadcasting systems are based on propagation curves for 50% time for the wanted field strength, and 1% for the unwanted field strength, as given in Chapter 2 of Annex 2 of the Agreement.

Compatibility calculations for analogue television systems are based on propagation curves as given in Chapter 2 of Annex 2 of the Agreement. Tropospheric or continuous interference is treated as described in Annex 2 to Recommendation ITU-R BT.655-7.

3.4.5.1 Signal variations at outdoor locations

Recommendation ITU-R P.1546-2 gives a standard deviation macro-scale of 5.5 dB for wideband signals. This value shall be used to determine the field-strength variation at outdoor locations, which is taken into account by means of the "location correction factor".

The location correction factors for macro-scale variations (see formulas in Appendix 3.4 to this Chapter) are given in Table 3-8.

TABLE 3-8

Coverage target (location probability) (%)	Location correction factor (VHF and UHF) (dB)
99	13
95	9
70	3

3.4.5.2 Signal variations at indoor locations

The field-strength variation at indoor locations is the combined result of the outdoor variation and the variation due to building attenuation. For VHF, where the signal standard deviations are 5.5 dB and 3 dB respectively, the combined value is 6.3 dB. For UHF, where both signal standard deviations are 5.5 dB, the combined value is 7.8 dB.

The location correction factor for macro-scale variations at indoor locations given in Table 3-9 shall be used.

TABLE 3-9

Coverage target (location probability) (%)	Location correction factor (VHF) (dB)	Location correction factor (UHF) (dB)
95	10	13
70	3	4

3.4.5.3 Combined location correction factor

The combined location correction factor is used to convert the wanted and nuisance field strengths which refer to 50% of location, to the value corresponding to the percentage of location needed for the wanted service.

The combined location correction factor shall be calculated as follows:

$$CF = \mu \sqrt{\sigma_w^2 + \sigma_n^2} \qquad \text{dB}$$

where:

σ_w: standard deviation of location variation for the wanted signal (dB)

σ_n: standard deviation of location variation for the nuisance signal (dB)

μ: distribution factor being 0.52 for 70% locations, 1.64 for 95% locations and 2.33 for 99% locations and can be calculated as follows:

$$\mu = Q_i(1 - x/100)$$

where:

Q_i: multiplying factor given in § 2.1.12 of Appendix 2.1 to Chapter 2 of Annex 2 of the Agreement

x: percentage of location for which protection is required.

3.5 Power-sum method

The power sum is the logarithmic value of the sum of the individual field strengths expressed as arithmetic powers:

$$\text{Sum} = 10 \log\left(\sum 10^{\frac{E_i}{10}}\right)$$

where E_i represents the individual field strengths (dB(μV/m)).

3.6 Spectrum mask

For modifications to the Plan, a spectrum mask with a performance at least equivalent to that of the non-critical mask for both T-DAB and DVB-T shall be used.

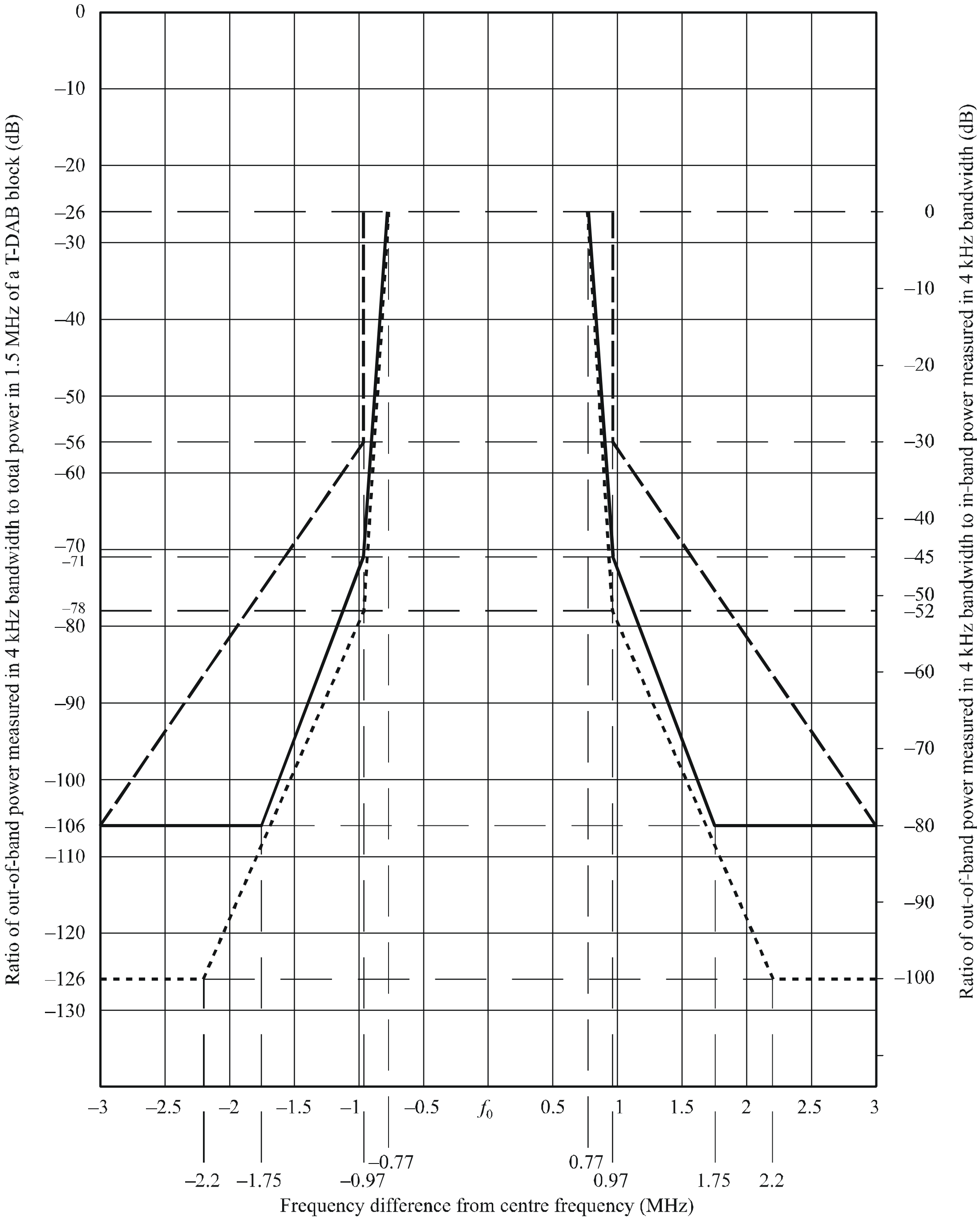
The spectrum masks for sensitive cases may be used to facilitate coordination between administrations.

3.6.1 Spectrum mask for T-DAB

The out-of-band radiated signal spectrum in any 4 kHz band shall be constrained by one of the masks defined in Fig. 3-2 and the associated Table 3-10.

FIGURE 3-2

Out-of-band spectrum masks for a T-DAB transmission signal



Spectrum mask 1 for T-DAB transmitters operating in non critical cases

Spectrum mask 2 for T-DAB transmitters operating in sensitive cases

Spectrum mask 3 for T-DAB transmitters operating in sensitive cases in certain areas where frequency block 12D is used

RRC06-A2-C3-2

TABLE 3-10

Out-of-band spectrum table for a T-DAB transmission signal

	Frequency relative to the centre of the 1.54 MHz channel (MHz)	Relative level (dB)
Spectrum mask for T-DAB transmitters operating in non-critical cases	±0.97	–26
	±0.97	–56
	±3.0	–106
Spectrum mask for T-DAB transmitters operating in sensitive cases	±0.77	–26
	±0.97	–71
	±1.75	–106
	±3.0	–106
Spectrum mask for T-DAB transmitters operating in sensitive cases in certain areas where frequency block 12D is used	±0.77	–26
	±0.97	–78
	±2.2	–126
	±3.0	–126

The dashed line defines the spectrum mask for T-DAB transmitters operating in non-critical cases (spectrum mask 1). The solid line defines the spectrum mask for T-DAB transmitters operating in sensitive cases (spectrum mask 2) and the dotted line mask defines the spectrum mask for T-DAB transmitters operating in sensitive cases in certain areas where frequency block 12D is used (spectrum mask 3)[2].

3.6.2 Spectrum mask for DVB-T in 8 MHz and 7 MHz channels

Two spectrum masks are specified in Fig. 3-3 and the associated Table 3-11. The upper curve defines the spectrum mask for the non-critical cases and the lower curve defines the spectrum mask for the sensitive cases.

[2] This mask may be used for other frequency blocks, where there is a bilateral/multilateral agreement to do so.

FIGURE 3-3

Symmetrical spectrum masks for non-critical and sensitive cases

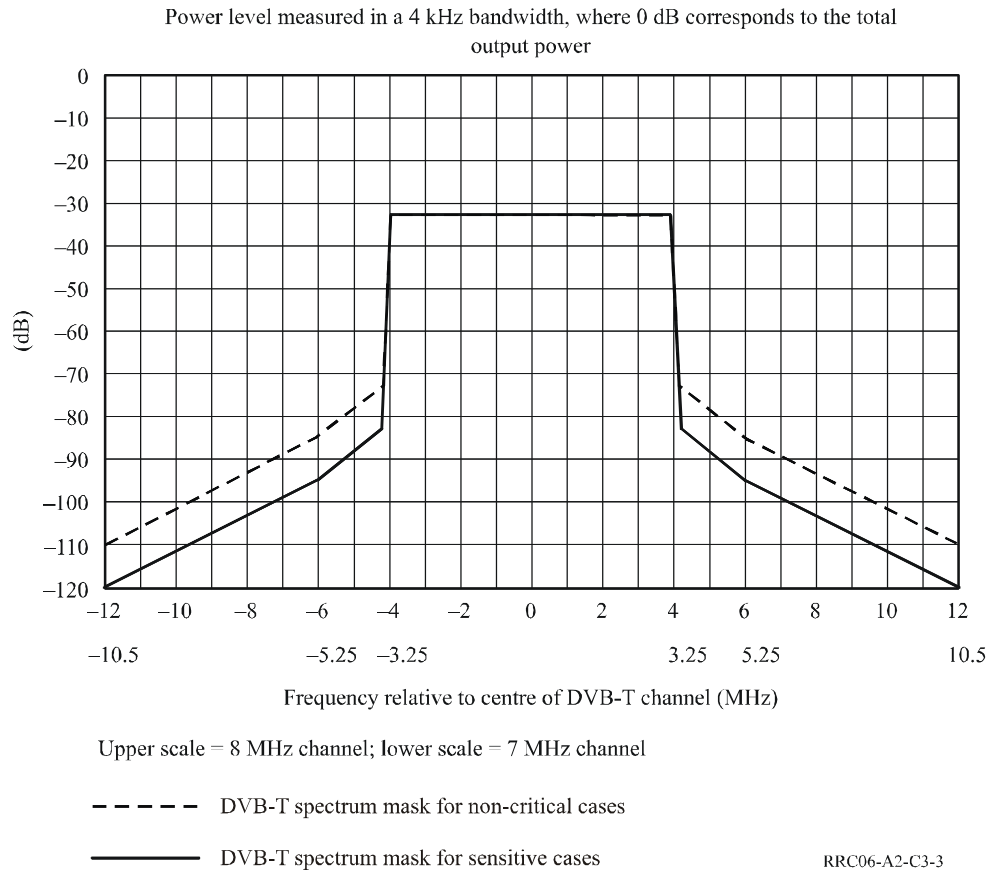


TABLE 3-11

Symmetrical spectrum masks for non-critical and sensitive cases

Breakpoints					
8 MHz channels			7 MHz channels		
	Non-critical cases	Sensitive cases		Non-critical cases	Sensitive cases
Relative frequency (MHz)	Relative level (dB)	Relative level (dB)	Relative frequency (MHz)	Relative level (dB)	Relative level (dB)
–12	–110	–120	–10.5	–110	–120
–6	–85	–95	–5.25	–85	–95
–4.2	–73	–83	–3.7	–73	–83
–3.9	–32.8	–32.8	–3.35	–32.8	–32.8
+3.9	–32.8	–32.8	+3.35	–32.8	–32.8
+4.2	–73	–83	+3.7	–73	–83
+6	–85	–95	+5.25	–85	–95
+12	–110	–120	+10.5	–110	–120

APPENDIX 3.1

DVB-T system variants

TABLE A.3.1-1

DVB-T system variants and net bit rate values (Mbit/s)

System variant designator	Modulation	Code rate	Net bit rate (Mbit/s) For different guard intervals (GI)			
			GI = 1/4	GI = 1/8	GI = 1/16	GI = 1/32
8 MHz variants						
A1	QPSK	1/2	4.98	5.53	5.85	6.03
A2	QPSK	2/3	6.64	7.37	7.81	8.04
A3	QPSK	3/4	7.46	8.29	8.78	9.05
A5	QPSK	5/6	8.29	9.22	9.76	10.05
A7	QPSK	7/8	8.71	9.68	10.25	10.56
B1	16-QAM	1/2	9.95	11.06	11.71	12.06
B2	16-QAM	2/3	13.27	14.75	15.61	16.09
B3	16-QAM	3/4	14.93	16.59	17.56	18.10
B5	16-QAM	5/6	16.59	18.43	19.52	20.11
B7	16-QAM	7/8	17.42	19.35	20.49	21.11
C1	64-QAM	1/2	14.93	16.59	17.56	18.10
C2	64-QAM	2/3	19.91	22.12	23.42	24.13
C3	64-QAM	3/4	22.39	24.88	26.35	27.14
C5	64-QAM	5/6	24.88	27.65	29.27	30.16
C7	64-QAM	7/8	26.13	29.03	30.74	31.67
7 MHz variants						
D1	QPSK	1/2	4.35	4.84	5.12	5.28
D2	QPSK	2/3	5.81	6.45	6.83	7.04
D3	QPSK	3/4	6.53	7.26	7.68	7.92
D5	QPSK	5/6	7.26	8.06	8.54	8.80
D7	QPSK	7/8	7.62	8.47	8.97	9.24
E1	16-QAM	1/2	8.71	9.68	10.25	10.56
E2	16-QAM	2/3	11.61	12.90	13.66	14.08
E3	16-QAM	3/4	13.06	14.52	15.37	15.83
E5	16-QAM	5/6	14.52	16.13	17.08	17.59
E7	16-QAM	7/8	15.24	16.93	17.93	18.47
F1	64-QAM	1/2	13.06	14.51	15.37	15.83
F2	64-QAM	2/3	17.42	19.35	20.49	21.11
F3	64-QAM	3/4	19.60	21.77	23.05	23.75
F5	64-QAM	5/6	21.77	24.19	25.61	26.39
F7	64-QAM	7/8	22.86	25.40	26.90	27.71

Channel numbering and channel boundaries

TABLE A.3.1-2

DVB-T channel arrangement in Bands IV and V

Channel number	Channel boundaries (MHz)		Assigned frequency (MHz)
Band IV			
21	470	478	474
22	478	486	482
23	486	494	490
24	494	502	498
25	502	510	506
26	510	518	514
27	518	526	522
28	526	534	530
29	534	542	538
30	542	550	546
31	550	558	554
32	558	566	562
33	566	574	570
34	574	582	578
Band V			
35	582	590	586
36	590	598	594
37	598	606	602
38	606	614	610
39	614	622	618
40	622	630	626
41	630	638	634
42	638	646	642
43	646	654	650
44	654	662	658
45	662	670	666
46	670	678	674
47	678	686	682
48	686	694	690
49	694	702	698

TABLE A.3.1-2 (*end*)

Channel number	Channel boundaries (MHz)		Assigned frequency (MHz)
50	702	710	706
51	710	718	714
52	718	726	722
53	726	734	730
54	734	742	738
55	742	750	746
56	750	758	754
57	758	766	762
58	766	774	770
59	774	782	778
60	782	790	786
61	790	798	794
62	798	806	802
63	806	814	810
64	814	822	818
65	822	830	826
66	830	838	834
67	838	846	842
68	846	854	850
69	854	862	858

TABLE A.3.1-3

DVB-T channel arrangement in Band III

(Applicable for the following geographical areas: ALB, ALG, AND, ARS, AUT, BEL, BHR, BIH, BUL, CME, CNR, CVA, CYP, CZE, D, DJI, DNK, E, EGY, ERI, EST, ETH, F, FIN, FRO, GHA, GIB, GNB, GNE, GRC, HNG, HOL, HRV, I, IRL, IRN, IRQ, ISL, ISR, JOR, KEN, KWT, LBN, LBR, LBY, LIE, LTU, LUX, LVA, MAU, MDA, MDR, MKD, MLI, MLT, MNE, MRC, MTN, NIG, NOR, OMA, POL, POR, QAT, ROU, RRW, S, SDN, SEY, SMR, SOM, SRB, SRL, STP, SUI, SVK, SVN, SYR, TCD, TUN, TUR, UAE, UGA, UKR, YEM, ZMB)

Channel number	Channel boundaries (MHz)		Assigned frequency (MHz)
5	174	181	177.50
6	181	188	184.50
7	188	195	191.50
8	195	202	198.50
9	202	209	205.50
10	209	216	212.50
11	216	223	219.50
12	223	230	226.50

TABLE A.3.1-4

DVB-T channel arrangement in Band III

(Applicable for the following geographical areas: ARM, AZE, BLR, GEO, KAZ, KGZ, RUS, TJK, TKM, UZB)

Channel number	Channel boundaries (MHz)		Assigned frequency (MHz)
6	174	182	178
7	182	190	186
8	190	198	194
9	198	206	202
10	206	214	210
11	214	222	218
12	222	230	226

TABLE A.3.1-5

DVB-T channel arrangement in Band III

(Applicable for the following geographical areas: BDI, BEN, BFA, CAF, COD, COG, COM, CPV, CTI, GAB, GUI, MDG, MYT, NGR, REU, SEN, TGO)

and

(Applicable for the following geographical areas: AFS, AGL, ASC, BOT, G, GMB, LSO, MWI, NMB, SHN, TRC, TZA)

and

(Applicable for the following geographical areas: MOZ, SWZ, ZWE)

Channel number	Channel number*	Channel boundaries (MHz)		Assigned frequency (MHz)
5	4	174	182	178
6	5	182	190	186
7	6	190	198	194
8	7	198	206	202
9	8	206	214	210
10	9	214	222	218
11	10	222	230	226

* In MYT and REU.

TABLE A.3.1-6

Analogue TV System B in Band III

Used in the following geographical areas:

ALB, ALG, ARS, AUT, BEL, BHR, BIH, CME, CNR, CVA, CYP, D, DJI, DNK, E, EGY, ERI, ETH, FIN, FRO, GHA, GIB, GNB, GNE, GRC, HOL, HRV, IRN, IRQ, ISL, ISR, JOR, KEN, KWT, LBN, LBR, LBY, LIE, LUX, MAU, MDR, MKD, MLI, MLT, MNE, MTN, NIG, NOR, OMA, POR, QAT, RRW, S, SDN, SEY, SOM, SRB, SRL, STP, SUI, SVN, SYR, TCD, TUN, TUR, UAE, UGA, YEM, ZMB

Channel number	Channel boundaries (MHz)		Assigned frequency (MHz)	Vision carrier (MHz)	Sound carrier (MHz)	Dual FM second sound carrier (MHz)	NICAM carrier (MHz)
5	174	181	177.50	175.25	180.75	180.99	181.1
6	181	188	184.50	182.25	187.75	187.99	188.1
7	188	195	191.50	189.25	194.75	194.99	195.1
8	195	202	198.50	196.25	201.75	201.99	202.1
9	202	209	205.50	203.25	208.75	208.99	209.1
10	209	216	212.50	210.25	215.75	215.99	216.1
11	216	223	219.50	217.25	222.75	222.99	223.1
12	223	230	226.50	224.25	229.75	229.99	230.1
13*	230	237	233.50	231.25	236.75	236.99	237.1
14*	246.18	253.18	249.68	247.43	252.63	252.87	252.98

* Used in ZMB only (outside the planned bands for RRC-06).

TABLE A.3.1-7

Analogue TV System B in Band III

Used in the following geographical areas:

I, SMR

Channel number	Channel boundaries (MHz)		Assigned frequency (MHz)	Vision carrier (MHz)	Sound carrier (MHz)	Dual FMsecond sound carrier (MHz)
D	174.00	181.00	177.50	175.25	180.75	180.99
E	182.50	189.50	186.00	183.75	189.25	188.49
F	191.00	198.00	194.50	192.25	197.75	197.99
G	200.00	207.00	203.50	201.25	206.75	206.99
H	209.00	216.00	212.50	210.25	215.75	215.99
H1	216.00	223.00	219.50	217.25	222.75	222.99
H2	223.00	230.00	226.50	224.25	229.75	229.99

TABLE A.3.1-8

Analogue TV System B in Band III

Used in the following geographical area:

MRC

Channel number	Channel boundaries (MHz)		Assigned frequency (MHz)	Vision carrier (MHz)	Sound carrier (MHz)
4*	162	169	165.50	163.25	168.75
5*	170	177	173.50	171.25	176.75
6	178	185	181.50	179.25	184.75
7	186	193	189.50	187.25	192.75
8	194	201	197.50	195.25	200.75
9	202	209	205.50	203.25	208.75
10	210	217	213.50	211.25	216.75
11	216	223	219.50	217.25	222.75
12	223	230	226.50	224.25	229.75

* Outside the planned bands (or partially outside) for RRC-06.

TABLE A.3.1-9

Analogue TV System B1 in Band III

Used in the following geographical areas:

EST, SVK

Channel number	Channel boundaries (MHz)		Assigned frequency (MHz)	Vision carrier (MHz)	Sound carrier (MHz)	Dual FM second sound carrier (MHz)	NICAM carrier (MHz)
6	174	182	178.00	175.25	180.75	180.99	181.1
7	182	190	186.00	183.25	188.75	188.99	189.1
8	190	198	194.00	191.25	196.75	196.99	197.1
9	198	206	202.00	199.25	204.75	204.99	205.1
10	206	214	210.00	207.25	212.75	212.99	213.1
11	214	222	218.00	215.25	220.75	220.99	221.1
12	222	230	226.00	223.25	228.75	228.99	229.1

TABLE A.3.1-10

Analogue TV System D in Band III

Used in the following geographical areas:

ARM, AZE, BLR, BUL, CZE, GEO, HNG, KAZ, KGZ, LTU, LVA, MDA, ROU, RUS, SVK, TJK, TKM, UKR, UZB

Analogue TV System D1 in Band III

Used in the following geographical areas:

LTU, LVA, POL

Analogue TV System K1 in Band III

Used in the following geographical areas:

BDI, BEN, BFA, CAF, COD, COG, COM, CPV, CTI, GAB, GUI, MDG, MYT, NGR, REU, SEN, TGO

Channel number System K1	Channel number Systems D and D1	Channel boundaries (MHz)		Assigned frequency (MHz)	Vision carrier (MHz)	Sound carrier (MHz)	NICAM carrier (MHz)
	6A*	173	181	177.00	174.25	180.75	180.10
5	6	174	182	178.00	175.25	181.75	181.10
6	7	182	190	186.00	183.25	189.75	189.10
7	8	190	198	194.00	191.25	197.75	197.10
8	9	198	206	202.00	199.25	205.75	205.10
9	10	206	214	210.00	207.25	213.75	213.10
10	11	214	222	218.00	215.25	221.75	221.10
11	12	222	230	226.00	223.25	229.75	229.10

* System D only.

TABLE A.3.1-11

Analogue TV System I in Band III

Used in the following geographical areas:

AFS, AGL, ASC, BOT, G, GMB, IRL, LSO, MWI, NMB, SHN, TRC, TZA

Channel number GE89	Channel number ST61	Channel boundaries (MHz)		Assigned frequency (MHz)	Vision carrier (MHz)	Sound carrier (MHz)	NICAM carrier (MHz)
5	D	174	182	178.00	175.25	181.25	181.80
6	E	182	190	186.00	183.25	189.25	189.80
7	F	190	198	194.00	191.25	197.25	197.80
8	G	198	206	202.00	199.25	205.25	205.80
9	H	206	214	210.00	207.25	213.25	213.80
10	J	214	222	218.00	215.25	221.25	221.80
11	K	222	230	226.00	223.25	229.25	229.80
12*	–	230	238	234.00	231.25	237.25	237.80
13*	–	246.18	254.18	250.18	247.43	253.43	253.98

* Used in AFS, BOT, MWI, NMB only (outside the planned bands for RRC-06).

TABLE A.3.1-12

Analogue TV System L in Band III

Used in the following geographical area:

F

Channel number	Channel boundaries (MHz)		Assigned frequency (MHz)	Vision carrier (MHz)	Sound carrier (MHz)	NICAM carrier (MHz)
5	174.75	182.75	178.75	176.00	182.50	181.85
6	182.75	190.75	186.75	184.00	190.50	189.85
7	190.75	198.75	194.75	192.00	198.50	197.85
8	198.75	206.75	202.75	200.00	206.50	205.85
9	206.75	214.75	210.75	208.00	214.50	213.85
10	214.75	222.75	218.75	216.00	222.50	221.85

TABLE A.3.1-13

Analogue TV System G in Band III

Used in the following geographical areas:

MOZ, SWZ, ZWE

Channel number	Channel boundaries (MHz)		Assigned frequency (MHz)	Vision carrier (MHz)	Sound carrier (MHz)
5	174.00	182.00	178.00	175.25	180.75
6	182.00	190.00	186.00	183.25	188.75
7	190.00	198.00	194.00	191.25	196.75
8	198.00	206.00	202.00	199.25	204.75
9	206.00	214.00	210.00	207.25	212.75
10	214.00	222.00	218.00	215.25	220.75
11	222.00	230.00	226.00	223.25	228.75
12*	230.00	238.00	234.00	231.25	236.75
13*	246.18	254.18	250.18	247.43	252.93

* Used in MOZ and ZWE only (outside the planned bands for RRC-06).

TABLE A.3.1-14

Analogue TV Systems D1, G, H, I, I1, K, K1 and L in Bands IV and V

Channel number	Channel boundaries (MHz)		Vision carrier (MHz)	System G, H sound carrier (MHz)	System G dual FM second sound carrier (MHz)	System G System L System D1 NICAM carrier (MHz)	System I System I1 sound carrier (MHz)	System K System K1 System L System D1 sound carrier (MHz)	System I System I1 NICAM carrier (MHz)
21	470	478	471.25	476.75	476.99	477.1	477.25	477.75	477.8
22	478	486	479.25	484.75	484.99	485.1	485.25	485.75	485.8
23	486	494	487.25	492.75	492.99	493.1	493.25	493.75	493.8
24	494	502	495.25	500.75	500.99	501.1	501.25	501.75	501.8
25	502	510	503.25	508.75	508.99	509.1	509.25	509.75	509.8
26	510	518	511.25	516.75	516.99	517.1	517.25	517.75	517.8
27	518	526	519.25	524.75	524.99	525.1	525.25	525.75	525.8
28	526	534	527.25	532.75	532.99	533.1	533.25	533.75	533.8
29	534	542	535.25	540.75	540.99	541.1	541.25	541.75	541.8
30	542	550	543.25	548.75	548.99	549.1	549.25	549.75	549.8
31	550	558	551.25	556.75	556.99	557.1	557.25	557.75	557.8
32	558	566	559.25	564.75	564.99	565.1	565.25	565.75	565.8
33	566	574	567.25	572.75	572.99	573.1	573.25	573.75	573.8
34	574	582	575.25	580.75	580.99	581.1	581.25	581.75	581.8
35	582	590	583.25	588.75	588.99	589.1	589.25	589.75	589.8

TABLE A.3.1-14 (*end*)

Channel number	Channel boundaries (MHz)		Vision carrier (MHz)	System G, H sound carrier (MHz)	System G dual FM second sound carrier (MHz)	System G System L System D1 NICAM carrier (MHz)	System I System I1 sound carrier (MHz)	System K System K1 System L System D1 sound carrier (MHz)	System I System I1 NICAM carrier (MHz)
36	590	598	591.25	596.75	596.99	597.1	597.25	597.75	597.8
37	598	606	599.25	604.75	604.99	605.1	605.25	605.75	605.8
38	606	614	607.25	612.75	612.99	613.1	613.25	613.75	613.8
39	614	622	615.25	620.75	620.99	621.1	621.25	621.75	621.8
40	622	630	623.25	628.75	628.99	629.1	629.25	629.75	629.8
41	630	638	631.25	636.75	636.99	637.1	637.25	637.75	637.8
42	638	646	639.25	644.75	644.99	645.1	645.25	645.75	645.8
43	646	654	647.25	652.75	652.99	653.1	653.25	653.75	653.8
44	654	662	655.25	660.75	660.99	661.1	661.25	661.75	661.8
45	662	670	663.25	668.75	668.99	669.1	669.25	669.75	669.8
46	670	678	671.25	676.75	676.99	677.1	677.25	677.75	677.8
47	678	686	679.25	684.75	684.99	685.1	685.25	685.75	685.8
48	686	694	687.25	692.75	692.99	693.1	693.25	693.75	693.8
49	694	702	695.25	700.75	700.99	701.1	701.25	701.75	701.8
50	702	710	703.25	708.75	708.99	709.1	709.25	709.75	709.8
51	710	718	711.25	716.75	716.99	717.1	717.25	717.75	717.8
52	718	726	719.25	724.75	724.99	725.1	725.25	725.75	725.8
53	726	734	727.25	732.75	732.99	733.1	733.25	733.75	733.8
54	734	742	735.25	740.75	740.99	741.1	741.25	741.75	741.8
55	742	750	743.25	748.75	748.99	749.1	749.25	749.75	749.8
56	750	758	751.25	756.75	756.99	757.1	757.25	757.75	757.8
57	758	766	759.25	764.75	764.99	765.1	765.25	765.75	765.8
58	766	774	767.25	772.75	772.99	773.1	773.25	773.75	773.8
59	774	782	775.25	780.75	780.99	781.1	781.25	781.75	781.8
60	782	790	783.25	788.75	788.99	789.1	789.25	789.75	789.8
61	790	798	791.25	796.75	796.99	797.1	797.25	797.75	797.8
62	798	806	799.25	804.75	804.99	805.1	805.25	805.75	805.8
63	806	814	807.25	812.75	812.99	813.1	813.25	813.75	813.8
64	814	822	815.25	820.75	820.99	821.1	821.25	821.75	821.8
65	822	830	823.25	828.75	828.99	829.1	829.25	829.75	829.8
66	830	838	831.25	836.75	836.99	837.1	837.25	837.75	837.8
67	838	846	839.25	844.75	844.99	845.1	845.25	845.75	845.8
68	846	854	847.25	852.75	852.99	853.1	853.25	853.75	853.8
69	854	862	855.25	860.75	860.99	861.1	861.25	861.75	861.8

TABLE A.3.1-15

T-DAB frequency blocks in Band III

T-DAB frequency block	Assigned frequency (MHz)	Frequency block bandwidth (MHz)	Lower guardband (kHz)	Upper guardband (kHz)	Frequency range* (MHz)
5A	174.928	174.160-175.696	–	176	174.0-181.0
5B	176.640	175.872-177.408	176	176	
5C	178.352	177.584-179.120	176	176	
5D	180.064	179.296-180.832	176	336	
6A	181.936	181.168-182.704	336	176	181.0-188.0
6B	183.648	182.880-184.416	176	176	
6C	185.360	184.592-186.128	176	176	
6D	187.072	186.304-187.840	176	320	
7A	188.928	188.160-189.696	320	176	188.0-195.0
7B	190.640	189.872-191.408	176	176	
7C	192.352	191.584-193.120	176	176	
7D	194.064	193.296-194.832	176	336	
8A	195.936	195.168-196.704	336	176	195.0-202.0
8B	197.648	196.880-198.416	176	176	
8C	199.360	198.592-200.128	176	176	
8D	201.072	200.304-201.840	176	320	
9A	202.928	202.160-203.696	320	176	202.0-209.0
9B	204.640	203.872-205.408	176	176	
9C	206.352	205.584-207.120	176	176	
9D	208.064	207.296-208.832	176	336	
10A	209.936	209.168-210.704	336	176	209.0-216.0
10B	211.648	210.880-212.416	176	176	
10C	213.360	212.592-214.128	176	176	
10D	215.072	214.304-215.840	176	320	
11A	216.928	216.160-217.696	320	176	216.0-223.0
11B	218.640	217.872-219.408	176	176	
11C	220.352	219.584-221.120	176	176	
11D	222.064	221.296-222.832	176	336	
12A	223.936	223.168-224.704	336	176	223.0-230.0
12B	225.648	224.880-226.416	176	176	
12C	227.360	226.592-228.128	176	176	
12D	229.072	228.304-229.840	176	–	

* The frequency ranges given correspond to the channels for System B/PAL, which are 7 MHz wide. They have no other significance.

APPENDIX 3.2

C/*N* values and minimum median field-strength values of different DVB-T system variants for different reception conditions

TABLE A.3.2-1

***C*/*N* (dB) values of different DVB-T system variants for the Gaussian, Ricean and Rayleigh channels and the corresponding values for the case of fixed reception (FX), portable outdoor reception (PO), portable indoor reception (PI) and mobile reception (MO)**

System variants	Modulation	Code rate	Gauss	Rice	Rayleigh		
				FX	PO	PI	MO
A1, D1	QPSK	1/2	4.9	5.9	8.1	8.1	11.1
A2, D2	QPSK	2/3	6.8	7.9	10.2	10.2	13.2
A3, D3	QPSK	3/4	7.9	9.1	11.5	11.5	14.5
A5, D5	QPSK	5/6	9.0	10.3	12.8	12.8	15.8
A7, D7	QPSK	7/8	9.9	11.3	13.9	13.9	16.9
B1, E1	16-QAM	1/2	10.6	11.6	13.8	13.8	16.8
B2, E2	16-QAM	2/3	13.0	14.1	16.4	16.4	19.4
B3, E3	16-QAM	3/4	14.5	15.7	18.1	18.1	21.1
B5, E5	16-QAM	5/6	15.6	16.9	19.4	19.4	22.4
B7, E7	16-QAM	7/8	16.1	17.5	20.1	20.1	23.1
C1, F1	64-QAM	1/2	16.2	17.2	19.4	19.4	22.4
C2, F2	64-QAM	2/3	18.4	19.5	21.8	21.8	24.8
C3, F3	64-QAM	3/4	20.0	21.2	23.6	23.6	26.6
C5, F5	64-QAM	5/6	21.4	22.7	25.2	25.2	28.2
C7, F7	64-QAM	7/8	22.3	23.7	26.3	26.3	29.3

TABLE A.3.2-2

Minimum median field-strength values (dB(μV/m)) of different DVB-T system variants for the case of fixed reception (FX), portable outdoor reception (PO), portable indoor reception (PI) and mobile reception (MO) for two reference frequencies, 200 MHz and 500 MHz

System variants	Modulation	Code rate	MHz	FX	PO	PI	MO
A1, D1	QPSK	1/2	200.0	34.90	56.10	66.10	59.10
A2, D2	QPSK	2/3	200.0	36.90	58.20	68.20	61.20
A3, D3	QPSK	3/4	200.0	38.10	59.50	69.50	62.50
A5, D5	QPSK	5/6	200.0	39.30	60.80	70.80	63.80
A7, D7	QPSK	7/8	200.0	40.30	61.90	71.90	64.90
B1, E1	16-QAM	1/2	200.0	40.60	61.80	71.80	64.80
B2, E2	16-QAM	2/3	200.0	43.10	64.40	74.40	67.40
B3, E3	16-QAM	3/4	200.0	44.70	66.10	76.10	69.10
B5, E5	16-QAM	5/6	200.0	45.90	67.40	77.40	70.40
B7, E7	16-QAM	7/8	200.0	46.50	68.10	78.10	71.10
C1, F1	64-QAM	1/2	200.0	46.20	67.40	77.40	70.40
C2, F2	64-QAM	2/3	200.0	48.50	69.80	79.80	72.80
C3, F3	64-QAM	3/4	200.0	50.20	71.60	81.60	74.60
C5, F5	64-QAM	5/6	200.0	51.70	73.20	83.20	76.20
C7, F7	64-QAM	7/8	200.0	52.70	74.30	84.30	77.30
A1, D1	QPSK	1/2	500.0	38.90	64.10	76.10	67.10
A2, D2	QPSK	2/3	500.0	40.90	66.20	78.20	69.20
A3, D3	QPSK	3/4	500.0	42.10	67.50	79.50	70.50
A5, D5	QPSK	5/6	500.0	43.30	68.80	80.80	71.80
A7, D7	QPSK	7/8	500.0	44.30	69.90	81.90	72.90
B1, E1	16-QAM	1/2	500.0	44.60	69.80	81.80	72.80
B2, E2	16-QAM	2/3	500.0	47.10	72.40	84.40	75.40
B3, E3	16-QAM	3/4	500.0	48.70	74.10	86.10	77.10
B5, E5	16-QAM	5/6	500.0	49.90	75.40	87.40	78.40
B7, E7	16-QAM	7/8	500.0	50.50	76.10	88.10	79.10
C1, F1	64-QAM	1/2	500.0	50.20	75.40	87.40	78.40
C2, F2	64-QAM	2/3	500.0	52.50	77.80	89.80	80.80
C3, F3	64-QAM	3/4	500.0	54.20	79.60	91.60	82.60
C5, F5	64-QAM	5/6	500.0	55.70	81.20	93.20	84.20
C7, F7	64-QAM	7/8	500.0	56.70	82.30	94.30	85.30

The minimum median field strengths in Table A.3.2-2 are given for 200 MHz (Band III) and 500 MHz (Bands IV/V). For other frequencies the following interpolation rule shall be used:

– $E_{med}(f) = E_{med}(f_r) + \text{Corr}$;

– for fixed reception, Corr = 20 $\log_{10}(f/f_r)$, where f is the actual frequency and f_r the reference frequency of the relevant band quoted above;

– for portable reception and mobile reception, Corr = 30 $\log_{10}(f/f_r)$ where f is the actual frequency and f_r the reference frequency of the relevant band quoted above.

APPENDIX 3.3

Protection ratios for terrestrial broadcasting systems

A.3.3.1 Overview of tables of protection ratios

Wanted signal	Unwanted signal	Table
DVB-T	Co-channel DVB-T	A.3.3-1
DVB-T	Adjacent channel DVB-T	A.3.3-2
DVB-T	Co-channel analogue TV	A.3.3-3
DVB-T	Lower channel analogue TV	A.3.3-4
DVB-T	Upper channel analogue TV	A.3.3-5
DVB-T (8 MHz)	Overlapping 7 MHz analogue TV	A.3.3-6
DVB-T (7 MHz)	Overlapping 7 MHz analogue TV	A.3.3-7
DVB-T (8 MHz)	Overlapping 8 MHz analogue TV	A.3.3-8
DVB-T (7 MHz)	Overlapping 8 MHz analogue TV	A.3.3-9
DVB-T	Co-channel T-DAB	A.3.3-10
DVB-T (for RPCs)	Co-channel DVB-T	A.3.3-11
DVB-T (for RPCs)	Co-channel T-DAB	A.3.3-12
T-DAB	DVB-T (8 MHz)	A.3.3-13
T-DAB	DVB-T (7 MHz)	A.3.3-14
T-DAB	Analogue TV – I/PAL	A.3.3-15
T-DAB	Analogue TV – B/PAL	A.3.3-16
T-DAB	Analogue TV – D/SECAM	A.3.3-17
T-DAB	Analogue TV – L/SECAM	A.3.3-18
T-DAB	Analogue TV – B/SECAM, B/PAL (T2)	A.3.3-19
T-DAB	Analogue TV – D/PAL	A.3.3-20
T-DAB	Analogue TV – G/PAL	A.3.3-21
T-DAB	Analogue TV – K1/SECAM	A.3.3-22
Analogue TV	Co-channel DVB-T	A.3.3-23
Analogue TV	Overlapping 7 MHz DVB-T	A.3.3-24
Analogue TV	Overlapping 8 MHz DVB-T	A.3.3-25

Notes for all tables:

FX: fixed reception

PO: portable outdoor reception

PI: portable indoor reception

MO: mobile reception

Gauss: gaussian channel (for information only)

A.3.3.2 Protection ratios for DVB-T

A.3.3.2.1 Protection ratios for DVB-T interfered with by DVB-T

TABLE A.3.3-1

**Co-channel protection ratios (dB) for a DVB-T signal interfered with by a DVB-T signal for different DVB-T variants for the case of fixed reception (FX), portable outdoor reception (PO), portable indoor reception (PI)
and mobile reception (MO)**

DVB-T system variant	FX	PO	PI	MO
QPSK 1/2	6.00	8.00	8.00	11.00
QPSK 2/3	8.00	11.00	11.00	14.00
QPSK 3/4	9.30	11.70	11.70	14.70
QPSK 5/6	10.50	13.00	13.00	16.00
QPSK 7/8	11.50	14.10	14.10	17.10
16-QAM 1/2	11.00	13.00	13.00	16.00
16-QAM 2/3	14.00	16.00	16.00	19.00
16-QAM 3/4	15.00	18.00	18.00	21.00
16-QAM 5/6	16.90	19.40	19.40	22.40
16-QAM 7/8	17.50	20.10	20.10	23.10
64-QAM 1/2	17.00	19.00	19.00	22.00
64-QAM 2/3	20.00	23.00	23.00	26.00
64-QAM 3/4	21.00	25.00	25.00	28.00
64-QAM 5/6	23.30	25.80	25.80	28.80
64-QAM 7/8	24.30	26.90	26.90	29.90

A.3.3.2.2 Protection ratios for overlapping and adjacent channel case

The treatment of overlapping and adjacent channel cases (DVB-T vis-à-vis DVB-T) is described in Recommendation ITU-R BT.1368-6. The protection ratios for the adjacent channels in Table A.3.3-2 shall be used.

TABLE A.3.3-2

**Protection ratios (dB) for a DVB-T signal interfered with by a DVB-T signal
in the lower (N – 1) and upper (N + 1) adjacent channels**

Channel	N – 1	N + 1
PR	–30	–30

A.3.3.2.3 Protection ratios for DVB-T interfered with by analogue television

TABLE A.3.3-3

Co-channel protection ratios (dB) for DVB-T signals interfered with by analogue television signals

DVB-T system variant	Gaus s	FX	PO	PI	MO
QPSK 1/2	−12.0	−12.0	−12.0	−12.0	−9.0
QPSK 2/3	−8.0	−8.0	−8.0	−8.0	−5.0
QPSK 3/4	−4.0	−2.8	−0.4	−0.4	2.6
QPSK 5/6	3.0	4.3	6.8	6.8	9.8
QPSK 7/8	9.0	10.4	13.0	13.0	16.0
16-QAM 1/2	−8.0	−8.0	−8.0	−8.0	−5.0
16-QAM 2/3	−3.0	0.0	3.0	3.0	6.0
16-QAM 3/4	0.0	2.5	5.0	5.0	8.0
16-QAM 5/6	9.0	10.3	12.8	12.8	15.8
16-QAM 7/8	16.0	17.4	20.0	20.0	23.0
64-QAM 1/2	−3.0	0.0	3.0	3.0	6.0
64-QAM 2/3	3.0	4.5	6.0	6.0	9.0
64-QAM 3/4	9.0	12.0	15.0	15.0	18.0
64-QAM 5/6	15.0	16.3	18.8	18.8	21.8
64-QAM 7/8	20.0	21.4	24.0	24.0	27.0

TABLE A.3.3-4

Protection ratios (dB) for lower adjacent channel (*N* – 1) interference for DVB-T signals interfered with by analogue television signals including sound

DVB-T system variant	Gauss	FX	PO	PI	MO
QPSK 1/2	−44.0	−44.0	−44.0	−44.0	−41.0
QPSK 2/3	−44.0	−44.0	−44.0	−44.0	−41.0
QPSK 3/4	−42.9	−42.9	−42.9	−42.9	−39.9
QPSK 5/6	−41.8	−41.8	−41.8	−41.8	−38.8
QPSK 7/8	−40.9	−40.9	−40.9	−40.9	−37.9
16-QAM 1/2	−43.0	−43.0	−43.0	−43.0	−40.0
16-QAM 2/3	−42.0	−42.0	−42.0	−42.0	−39.0
16-QAM 3/4	−38.0	−38.0	−38.0	−38.0	−35.0
16-QAM 5/6	−39.4	−39.4	−39.4	−39.4	−36.4
16-QAM 7/8	−38.9	−38.9	−38.9	−38.9	−35.9
64-QAM 1/2	−40.0	−40.0	−40.0	−40.0	−37.0
64-QAM 2/3	−35.0	−35.0	−35.0	−35.0	−32.0
64-QAM 3/4	−32.0	−32.0	−32.0	−32.0	−29.0
64-QAM 5/6	−32.0	−32.0	−32.0	−32.0	−29.0
64-QAM 7/8	−31.1	−31.1	−31.1	−31.1	−28.1

TABLE A.3.3-5

Protection ratios (dB) for upper adjacent channel (*N* + 1) interference for DVB-T signals interfered with by analogue television signals including sound

DVB-T system variant	Gauss	FX	PO	PI	MO
QPSK 1/2	−48.9	−48.9	−48.9	−48.9	−45.9
QPSK 2/3	−47	−47	−47	−47	−44
QPSK 3/4	−45.9	−45.9	−45.9	−45.9	−42.9
QPSK 5/6	−44.8	−44.8	−44.8	−44.8	−41.8
QPSK 7/8	−43.9	−43.9	−43.9	−43.9	−40.9
16-QAM 1/2	−45.4	−45.4	−45.4	−45.4	−42.4
16-QAM 2/3	−43	−43	−43	−43	−40
16-QAM 3/4	−41.5	−41.5	−41.5	−41.5	−38.5
16-QAM 5/6	−40.4	−40.4	−40.4	−40.4	−37.4
16-QAM 7/8	−39.9	−39.9	−39.9	−39.9	−36.9
64-QAM 1/2	−40.2	−40.2	−40.2	−40.2	−37.2
64-QAM 2/3	−38	−38	−38	−38	−35
64-QAM 3/4	−36.4	−36.4	−36.4	−36.4	−33.4
64-QAM 5/6	−35	−35	−35	−35	−32
64-QAM 7/8	−34.1	−34.1	−34.1	−34.1	−31.1

TABLE A.3.3-6

Protection ratios (dB) for a DVB-T 8 MHz signal interfered with by an overlapping 7 MHz analogue television signal including sound for

Δf = 0.75 MHz

DVB-T system variant	Gauss	FX	PO	PI	MO
QPSK 1/2	−10.5	−9.5	−7.3	−7.3	−4.3
QPSK 2/3	−8.6	−7.5	−5.2	−5.2	−2.2
QPSK 3/4	−7.5	−6.3	−3.9	−3.9	−0.9
QPSK 5/6	−6.4	−5.1	−2.6	−2.6	0.4
QPSK 7/8	−5.5	−4.1	−1.5	−1.5	1.5
16-QAM 1/2	−4.8	−3.8	−1.6	−1.6	1.4
16-QAM 2/3	−2.4	−1.3	1.0	1.0	4.0
16-QAM 3/4	−0.9	0.3	2.7	2.7	5.7
16-QAM 5/6	0.2	1.5	4.0	4.0	7.0
16-QAM 7/8	0.7	2.1	4.7	4.7	7.7
64-QAM 1/2	0.8	1.8	4.0	4.0	7.0
64-QAM 2/3	3.0	4.1	6.4	6.4	9.4
64-QAM 3/4	4.6	5.8	8.2	8.2	11.2
64-QAM 5/6	6.0	7.3	9.8	9.8	12.8
64-QAM 7/8	6.9	8.3	10.9	10.9	13.9

Correction factor for other values of Δf relative to Δf = 0.75 MHz													
−9.75	**−9.25**	**−8.75**	**−8.25**	**−6.75**	**−3.95**	**−3.75**	**−2.75**	**−1.75**	**−0.75**	**2.25**	**3.25**	**4.75**	**5.25**
−40	−17	−11	−7	−5	−2	0	0	0	0	−1	−4	−32	−39

Δf: Analogue television vision carrier frequency minus DVB-T centre frequency.

TABLE A.3.3-7

Protection ratios (dB) for a DVB-T 7 MHz signal interfered with by an overlapping 7 MHz analogue television signal including sound for

Δf = 0 MHz

DVB-T system variant	Gauss	FX	PO	PI	MO
QPSK 1/2	−11.5	−10.5	−8.3	–8.3	–5.3
QPSK 2/3	−9.6	−8.5	−6.2	–6.2	–3.2
QPSK 3/4	−8.5	−7.3	−4.9	–4.9	–1.9
QPSK 5/6	−7.4	−6.1	−3.6	–3.6	–0.6
QPSK 7/8	−6.5	−5.1	−2.5	–2.5	0.5
16-QAM 1/2	−5.8	−4.8	−2.6	–2.6	0.4
16-QAM 2/3	−3.4	−2.3	0.0	0.0	3.0
16-QAM 3/4	−1.9	−0.7	1.7	1.7	4.7
16-QAM 5/6	−0.8	0.5	3.0	3.0	6.0
16-QAM 7/8	−0.3	1.1	3.7	3.7	6.7
64-QAM 1/2	−0.2	0.8	3.0	3.0	6.0
64-QAM 2/3	2.0	3.1	5.4	5.4	8.4
64-QAM 3/4	3.6	4.8	7.2	7.2	10.2
64-QAM 5/6	5.0	6.3	8.8	8.8	11.8
64-QAM 7/8	5.9	7.3	9.9	9.9	12.9

Correction factor for other values of Δf relative to Δf = 0 MHz													
−9.25	**−8.75**	**−8.25**	**−7.75**	**−6.25**	**−3.45**	**−3.25**	**−2.25**	**−1.25**	**0.00**	**1.75**	**2.75**	**4.25**	**4.75**
−37	−14	−13	−7	−5	−3	2	−1	−2	0	−7	−7	−38	−40

Δf: Analogue television vision carrier frequency minus DVB-T centre frequency.

TABLE A.3.3-8

Protection ratios (dB) for a DVB-T 8 MHz signal interfered with by an overlapping 8 MHz analogue television signal including sound for

Δf = 0 MHz

DVB-T system variant	Gauss	FX	PO	PI	MO
QPSK 1/2	−11.5	−10.5	−8.3	−8.3	−5.3
QPSK 2/3	−9.6	−8.5	−6.2	−6.2	−3.2
QPSK 3/4	−8.5	−7.3	−4.9	−4.9	−1.9
QPSK 5/6	−7.4	−6.1	−3.6	−3.6	−0.6
QPSK 7/8	−6.5	−5.1	−2.5	−2.5	0.5
16-QAM 1/2	−5.8	−4.8	−2.6	−2.6	0.4
16-QAM 2/3	−3.4	−2.3	0.0	0.0	3.0
16-QAM 3/4	−1.9	−0.7	1.7	1.7	4.7
16-QAM 5/6	−0.8	0.5	3.0	3.0	6.0
16-QAM 7/8	−0.3	1.1	3.7	3.7	6.7
64-QAM 1/2	−0.2	0.8	3.0	3.0	6.0
64-QAM 2/3	2.0	3.1	5.4	5.4	8.4
64-QAM 3/4	3.6	4.8	7.2	7.2	10.2
64-QAM 5/6	5.0	6.3	8.8	8.8	11.8
64-QAM 7/8	5.9	7.3	9.9	9.9	12.9

Correction factor for other values of Δf relative to Δf = 0 MHz													
−10.25	**−9.75**	**−9.25**	**−8.75**	**−7.25**	**−3.45**	**−3.25**	**−2.25**	**−1.25**	**0.00**	**1.75**	**2.75**	**4.25**	**4.75**
−37	−14	−13	−7	−5	−3	2	−1	−2	0	−7	−7	−38	−40

Δf: Analogue television vision carrier frequency minus DVB-T centre frequency.

TABLE A.3.3-9

Protection ratios (dB) for a DVB-T 7 MHz signal interfered with by an overlapping 8 MHz analogue television signal including sound for

Δf = 0 MHz

DVB-T system variant	Gauss	FX	PO	PI	MO
QPSK 1/2	−11.5	−10.5	−8.3	−8.3	−5.3
QPSK 2/3	−9.6	−8.5	−6.2	−6.2	−3.2
QPSK 3/4	−8.5	−7.3	−4.9	−4.9	−1.9
QPSK 5/6	−7.4	−6.1	−3.6	−3.6	−0.6
QPSK 7/8	−6.5	−5.1	−2.5	−2.5	0.5
16-QAM 1/2	−5.8	−4.8	−2.6	−2.6	0.4
16-QAM 2/3	−3.4	−2.3	0.0	0.0	3.0
16-QAM 3/4	−1.9	−0.7	1.7	1.7	4.7
16-QAM 5/6	−0.8	0.5	3.0	3.0	6.0
16-QAM 7/8	−0.3	1.1	3.7	3.7	6.7
64-QAM 1/2	−0.2	0.8	3.0	3.0	6.0
64-QAM 2/3	2.0	3.1	5.4	5.4	8.4
64-QAM 3/4	3.6	4.8	7.2	7.2	10.2
64-QAM 5/6	5.0	6.3	8.8	8.8	11.8
64-QAM 7/8	5.9	7.3	9.9	9.9	12.9

Correction factor for other values of Δf relative to Δf = 0 MHz													
−10.25	**−9.75**	**−9.25**	**−8.75**	**−7.25**	**−3.45**	**−3.25**	**−2.25**	**−1.25**	**0.00**	**1.75**	**2.75**	**4.25**	**4.75**
−37	−14	−13	−7	−5	−3	2	−1	−2	0	−7	−7	−38	−40

Δf: Analogue television vision carrier frequency minus DVB-T centre frequency.

A.3.3.2.4 Protection ratios for DVB-T interfered with by T-DAB

TABLE A.3.3-10

**Co-channel protection ratios (dB) for a DVB-T signal interfered with by a T-DAB signal for different DVB-T variants for the case of fixed reception (FX), portable outdoor reception (PO), portable indoor reception (PI)
and mobile reception (MO)**

DVB-T system variant	FX	PO	PI	MO
QPSK 1/2	11.00	13.20	13.20	16.20
QPSK 2/3	13.10	15.40	15.40	18.40
QPSK 3/4	15.20	17.60	17.60	20.60
QPSK 5/6	15.50	18.00	18.00	21.00
QPSK 7/8	16.50	19.10	19.10	22.10
16-QAM 1/2	16.00	18.20	18.20	21.20
16-QAM 2/3	19.10	21.40	21.40	24.40
16-QAM 3/4	21.20	23.60	23.60	26.60
16-QAM 5/6	21.90	24.40	24.40	27.40
16-QAM 7/8	22.50	25.10	25.10	28.10
64-QAM 1/2	21.00	23.20	23.20	26.20
64-QAM 2/3	25.10	27.40	27.40	30.40
64-QAM 3/4	27.20	29.60	29.60	32.60
64-QAM 5/6	28.30	30.80	30.80	33.80
64-QAM 7/8	32.40	35.00	35.00	38.00

A.3.3.2.5 Protection ratios for RPCs

For a compatibility analysis, protection ratios for the reference planning configurations are also needed. Since the RPCs represent artificial configurations, no measurements exist for the appropriate protection ratios. The following values shall be used:

– for DVB-T interfered with by DVB-T, see Table A.3.3-11;

– for DVB-T interfered with by T-DAB, see Table A.3.3-12;

– for DVB-T interfered with by analogue television:

  – for RPC 1, protection ratio values for DVB-T variant 64-QAM 3/4 – fixed reception, to be found in Tables A.3.3-3 to A.3.3-9;

  – for RPC 2, protection ratio values for DVB-T variant 16-QAM 3/4 – portable outdoor reception, to be found in Tables A.3.3-3 to A.3.3-9;

  – for RPC 3, protection ratio values for DVB-T variant 16-QAM 2/3 – portable indoor reception, to be found in Tables A.3.3-3 to A.3.3-9.

TABLE A.3.3-11

Co-channel protection ratios (dB) for a DVB-T signal interfered with by a DVB-T signal for the RPCs

RPC	PR (dB)
RPC 1	21
RPC 2	19
RPC 3	17

TABLE A.3.3-12

Co-channel protection ratios (dB) for a DVB-T signal interfered with by a T-DAB signal for the RPCs

RPC	PR (dB)
RPC 1	27.2
RPC 2	23.6
RPC 3	21.4

A.3.3.3 Protection ratios for T-DAB

A.3.3.3.1 T-DAB interfered with by DVB-T

TABLE A.3.3-13

Protection ratios for T-DAB interfered with by a DVB-T 8 MHz system

Δf [(1)] (MHz)	−5	−4.2	−4	−3	0	3	4	4.2	5
PR (dB) mobile and portable reception	−43	6	7	8	8	8	7	6	−43
PR (dB) Gaussian channel	−50	−1	0	1	1	1	0	−1	−50

(1) Δf: Centre frequency of the DVB-T signal minus centre frequency of the T-DAB signal.

TABLE A.3.3-14

Protection ratios for T-DAB interfered with by a DVB-T 7 MHz system

Δf [(1)] (MHz)	−4.5	−3.7	−3.5	−2.5	0	2.5	3.5	3.7	4.5
PR (dB) mobile and portable reception	−42	7	8	9	9	9	8	7	−42
PR (dB) Gaussian channel	−49	0	1	2	2	2	1	0	−49

(1) Δf: Centre frequency of the DVB-T signal minus centre frequency of the T-DAB signal.

A.3.3.3.2 Protection ratios for T-DAB interfered with by analogue television signals

Protection ratios for T-DAB interfered with by analogue terrestrial television in Tables A.3.3-15 to A.3.3-22 shall be used.

TABLE A.3.3-15

Protection ratios for T-DAB interfered with by analogue television system I/PAL (Band III)

I/PAL (Band III)											
Δ*f* (MHz)	−8.0	−7.5	−7.0	−6.5	−6.0	−5.5	−5.0	−4.5	−4.0	−3.5	−3.0
PR (dB)	−42.0	−23.5	−10.0	−3.0	−2.0	−3.0	−24.0	−21.0	−23.0	−31.0	−31.5
Δ*f* (MHz)	−2.5	−2.0	−1.5	−1.0	−0.9	−0.8	−0.7	−0.6	0.0	0.6	0.7
PR (dB)	−30.0	−28.5	−25.0	−19.5	−17.5	−11.0	−7.0	−1.5	−1.5	−4.0	−5.5
Δ*f* (MHz)	0.8	0.9	1.0	2.0	3.0						
PR (dB)	−13.5	−17.0	−20.0	−33.0	−47.5						

Δ*f:* Analogue system vision carrier frequency minus T-DAB centre frequency.

TABLE A.3.3-16

Protection ratios for T-DAB interfered with by analogue television system B/PAL (Band III)

B/PAL (Band III)											
Δ*f* (MHz)	−7.0	−6.5	−6.0	−5.5	−5.0	−4.5	−4.0	−3.5	−3.0	−2.5	−2.0
PR (dB)	−47.0	−18.0	−5.0	−3.0	−5.0	−20.0	−22.0	−31.5	−31.5	−29.0	−26.5
Δ*f* (MHz)	−1.5	−1.0	−0.9	−0.8	−0.7	−0.6	0.0	0.6	0.7	0.8	0.9
PR (dB)	−23.0	−18.5	−16.0	−9.0	−5.0	−3.0	−0.5	−3.0	−4.0	−12.0	−16.0
Δ*f* (MHz)	1.0	2.0									
PR (dB)	−19.5	−45.3									

Δ*f:* Analogue system vision carrier frequency minus T-DAB centre frequency.

TABLE A.3.3-17

Protection ratios for T-DAB interfered with by analogue television system D/SECAM (Band III)

D/SECAM (Band III)											
Δ*f* (MHz)	−8.0	−7.5	−7.0	−6.5	−6.0	−5.5	−5.0	−4.5	−4.0	−3.5	−3.0
PR (dB)	−47.0	−42.5	−3.0	−2.5	−3.0	−37.5	−21.5	−18.5	−20.5	−26.5	−33.5
Δ*f* (MHz)	−2.5	−2.0	−1.5	−1.0	−0.9	−0.8	−0.7	−0.6	0.0	0.6	0.7
PR (dB)	−31.5	−29.0	−26.5	−18.5	−16.5	−9.0	−6.0	−3.0	−2.5	−4.0	−4.5
Δ*f* (MHz)	0.8	0.9	1.0	2.0							
PR (dB)	−12.0	−22.0	−25.0	−46.0							

Δ*f:* Analogue system vision carrier frequency minus T-DAB centre frequency.

TABLE A.3.3-18

Protection ratios for T-DAB interfered with by analogue television system L/SECAM (Band III)

L/SECAM (Band III)											
Δ*f* (MHz)	−8.0	−7.5	−7.0	−6.5	−6.0	−5.5	−5.0	−4.5	−4.0	−3.5	−3.0
PR (dB)	−46.5	−42.5	−15.5	−13.0	−15.0	−26.5	−18.5	−17.0	−18.0	−23.0	−31.5
Δ*f* (MHz)	−2.5	−2.0	−1.5	−1.0	−0.9	−0.8	−0.7	−0.6	0.0	0.6	0.7
PR (dB)	−30.5	−27.5	−24.5	−18.0	−16.5	−8.0	−5.0	−1.5	1.5	−2.0	−3.5
Δ*f* (MHz)	0.8	0.9	1.0	2.0	3.0						
PR (dB)	−12.5	−18.5	−19.0	−31.0	−46.8						

Δ*f:* Analogue system vision carrier frequency minus T-DAB centre frequency.

TABLE A.3.3-19

Protection ratios for T-DAB interfered with by analogue television systems B/SECAM, B/PAL (T2) (Band III)

B/SECAM (Band III), B/PAL (T2) data used											
Δ*f* (MHz)	−7.0	−6.5	−6.0	−5.5	−5.0	−4.5	−4.0	−3.5	−3.0	−2.5	−2.0
PR (dB)	−47.0	−18.0	−5.0	−3.0	−5.0	−20.0	−22.0	−31.5	−31.5	−29.0	−26.5
Δ*f* (MHz)	−1.5	−1.0	−0.9	−0.8	−0.7	−0.6	0.0	0.6	0.7	0.8	0.9
PR (dB)	−23.0	−18.5	−16.0	−9.0	−5.0	−3.0	−0.5	−3.0	−4.0	−12.0	−16.0
Δ*f* (MHz)	1.0	2.0									
PR (dB)	−19.5	−45.3									

Δ*f:* Analogue system vision carrier frequency minus T-DAB centre frequency.

TABLE A.3.3-20

Protection ratios for T-DAB interfered with by analogue television system D/PAL (Band III)

D/PAL (Band III)											
Δ*f* (MHz)	−8.0	−7.5	−7.0	−6.5	−6.0	−5.5	−5.0	−4.5	−4.0	−3.5	−3.0
PR (dB)	−47.0	−42.5	−3.0	−2.5	−3.0	−37.5	−21.5	−20.0	−22.0	−31.5	−31.5
Δ*f* (MHz)	−2.5	−2.0	−1.5	−1.0	−0.9	−0.8	−0.7	−0.6	0.0	0.6	0.7
PR (dB)	−29.0	−26.5	−23.0	−18.5	−16.0	−9.0	−5.0	−3.0	−0.5	−3.0	−4.0
Δ*f* (MHz)	0.8	0.9	1.0	2.0							
PR (dB)	−12.0	−16.0	−19.0	−45.3							

Δ*f:* Analogue system vision carrier frequency minus T-DAB centre frequency.

TABLE A.3.3-21

Protection ratios for T-DAB interfered with by analogue television system G/PAL (Band III)

G/PAL (Band III)											
Δ*f* (MHz)	−7.0	−6.5	−6.0	−5.5	−5.0	−4.5	−4.0	−3.5	−3.0	−2.5	−2.0
PR (dB)	−47.0	−18.0	−5.0	−3.0	−5.0	−20.0	−22.0	−31.5	−31.5	−29.0	−26.5
Δ*f* (MHz)	−1.5	−1.0	−0.9	−0.8	−0.7	−0.6	0.0	0.6	0.7	0.8	0.9
PR (dB)	−23.0	−18.5	−16.0	−9.0	−5.0	−3.0	−0.5	−3.0	−4.0	−12.0	−16.0
Δ*f* (MHz)	1.0	2.0									
PR (dB)	−19.5	−45.3									

Δ*f:* Analogue system vision carrier frequency minus T-DAB centre frequency.

TABLE A.3.3-22

Protection ratios for T-DAB interfered with by analogue television system K1/SECAM (Band III)

K1/SECAM (Band III)											
Δ*f* (MHz)	−8.0	−7.5	−7.0	−6.5	−6.0	−5.5	−5.0	−4.5	−4.0	−3.5	−3.0
PR (dB)	−47.0	−42.5	−3.0	−2.5	−3.0	−37.5	−21.5	−18.5	−20.5	−26.5	−33.5
Δ*f* (MHz)	−2.5	−2.0	−1.5	−1.0	−0.9	−0.8	−0.7	−0.6	0.0	0.6	0.7
PR (dB)	−31.5	−29.0	−26.5	−18.5	−16.5	−9.0	−6.0	−3.0	−2.5	−4.0	−4.5
Δ*f* (MHz)	0.8	0.9	1.0	2.0							
PR (dB)	−12.0	−22.0	−25.0	−46.0							

Δ*f:* Analogue system vision carrier frequency minus T-DAB centre frequency.

A.3.3.4 Protection ratios for analogue terrestrial television

A.3.3.4.1 Protection ratios for analogue television signals interfered with by DVB-T

a) The co-channel protection ratio values for all analogue terrestrial television systems interfered with by digital television are assumed to be the same. However, the protection ratio values differ by 1 dB depending on whether the unwanted signal is 8 MHz DVB-T or 7 MHz DVB-T. The protection ratios in Table A.3.3-23 shall be used.

TABLE A.3.3-23

Co-channel protection ratios (dB) for a analogue terrestrial television signal interfered with by co-channel DVB-T signal

	Tropospheric interference	Continuous interference
DVB-T 8 MHz (UHF)	34	40
DVB-T 7 MHz (VHF)	35	41

b) The protection ratios in Tables A.3.3-24 and A.3.3-25 shall be used for overlapping channel cases.

TABLE A.3.3-24

Protection ratios (dB) for analogue B, D, D1, G, H, K/PAL vision signals interfered with by a DVB-T 7 MHz signal (overlapping channels)

Centre frequency of the unwanted DVB-T signal minus the vision carrier frequency of the wanted analogue television signal (MHz)	Protection ratio	
	Tropospheric interference	Continuous interference
−7.75	−16	−11
(*N* − 1) −4.75	−9	−5
−4.25	−3	4
−3.75	13	21
−3.25	25	31
−2.75	30	37
−1.75	34	40
−0.75	35	41
(*N*) 2.25	35	41
4.25	35	40
5.25	31	38
6.25	28	35
7.25	26	33
8.25	6	12
(*N* + 1) 9.25	−8	−5
12.25	−8	−5

For all SECAM systems the same values apply.

TABLE A.3.3-25

Protection ratios (dB) for analogue B, D, D1, G, H, K/PAL vision signals interfered with by a DVB-T 8 MHz signal (overlapping channels)

Centre frequency of the unwanted DVB-T signal minus the vision carrier frequency of the wanted analogue television signal (MHz)	Protection ratio	
	Tropospheric interference[(1)]	Continuous interference[(1)]
−8.25	−16	−11
(*N* − 1) −5.25	−9	−5
−4.75	−4	3
−4.25	12	20
−3.75	24	30
−3.25	29	36
−2.25	33	39
−1.25	34	40
(*N*) 2.75	34	40
4.75	34	39
5.75	30	37
6.75	27	34
7.75	25	32
8.75	5	11
(*N* □ 1) 9.75	−8	−5
12.75	−8	−5

[(1)] The values for tropospheric and continuous interference have been arrived at from Table A.3.3-24 by calculation.

For all SECAM systems the same values apply.

A.3.3.4.2 Protection ratios for analogue television signals interfered with by T-DAB and analogue television signals

For analogue television interfered with by T-DAB and interfered with by analogue television, the protection ratios in Recommendation ITU-R BT.655-7 shall be used.

APPENDIX 3.4

Calculation of minimum median field strengths

The minimum median field-strength values shall be calculated using the following formulas:

$P_n = F + 10 \log_{10} (k\, T_0\, B)$

$P_{s\,min} = C/N + P_n$

$A_a = G + 10 \log_{10} (1.64\lambda^2/4\pi)$

$\varphi_{min} = P_{s\,min} - A_a + L_f$

$E_{min} = \varphi_{min} + 120 + 10 \log_{10} (120\pi)$

$= \varphi_{min} + 145.8$

$E_{med} = E_{min} + P_{mmn} + C_l$ for fixed reception

$E_{med} = E_{min} + P_{mmn} + C_l + L_h$ for portable outdoor and mobile reception

$E_{med} = E_{min} + P_{mmn} + C_l + L_h + L_b$ for portable indoor reception

$C_l = \mu \cdot \sigma_C$

$\sigma_C = \sqrt{\sigma_b^2 + \sigma_m^2}$

where:

P_n : receiver noise input power (dBW)

F : receiver noise figure (dB)

k : Boltzmann's constant ($k = 1.38 \times 10^{-23}$ J/K)

T_0 : absolute temperature ($T_0 = 290$ K)

B : receiver noise bandwidth
(6.66 × 10^6 Hz for a 7 MHz DVB-T channel,
7.61 × 10^6 Hz for a 8 MHz DVB-T channel and
1.54 × 10^6 Hz for a T-DAB frequency block)

$P_{s\,min}$: minimum receiver input power (dBW)

C/N : RF signal-to-noise ratio at the receiver input required by the system (dB)

A_a : effective antenna aperture (dBm^2)

G : antenna gain related to half dipole (dBd)

λ : wavelength of the signal (m)

φ_{min} : minimum power flux-density at receiving place (dB(W/m^2))

L_f : feeder loss (dB)

E_{min} : minimum field strength at the location of the receiving antenna (dB(μV/m))

E_{med} : minimum median field strength (dB(μV/m))

P_{mmn} : allowance for man-made noise (dB)

L_h : height loss correction factor (location of the receiving antenna at 1.5 m above ground level) (dB)

L_b : mean building entry loss (dB)

C_l : location correction factor (dB)

σ_c : combined standard deviation (dB)

σ_m : standard deviation macro-scale (dB) (σ_m = 5.5 dB)

σ_b : standard deviation building entry loss (dB)

μ: distribution factor (0.52 for 70%, 1.64 for 95% and 2.33 for 99%).

APPENDIX 3.5

Reference planning configurations

A.3.5.1 Reference planning configurations for DVB-T

In order to define reference planning configurations (RPCs) for DVB-T, the planning configurations can be grouped according to reception mode and frequency band.

The reception modes have been grouped as follows:

– fixed reception;

– portable outdoor reception, mobile reception and lower coverage quality portable indoor reception;

– higher coverage-quality portable indoor reception.

For reference frequencies:

– 200 MHz (VHF);

– 650 MHz (UHF).

The reference planning configurations for DVB-T that shall be used are summarized in Table A.3.5-1.

TABLE A.3.5-1

RPCs for DVB-T

RPC	RPC 1	RPC 2	RPC 3
Reference location probability	95%	95%	95%
Reference C/N (dB)	21	19	17
Reference $(E_{med})_{ref}$ (dB(μV/m)) at f_r = 200 MHz	50	67	76
Reference $(E_{med})_{ref}$ (dB(μV/m)) at f_r = 650 MHz	56	78	88

$(E_{med})_{ref}$: Reference value for minimum median field strength

RPC 1: RPC for fixed reception

RPC 2: RPC for portable outdoor reception or lower coverage quality portable indoor reception or mobile reception

RPC 3: RPC for higher coverage quality for portable indoor reception

For other frequencies, the reference field-strength values in Table A.3.5-1 shall be adjusted by adding the correction factor defined according to the following rule:

– $(E_{med})_{ref}(f) = (E_{med})_{ref}(f_r)$ + Corr;

– for fixed reception, Corr = 20 $\log_{10}$ (f/f_r), where f is the actual frequency and f_r the reference frequency of the relevant band quoted in Table A.3.5-1;

– for portable reception and mobile reception, Corr = 30 $\log_{10}$ (f/f_r) where f is the actual frequency and f_r the reference frequency of the relevant band quoted in Table A.3.5-1.

The reference parameters of the RPC that are given in Table A.3.5-1 (location probability, C/N, minimum median field strength) are not associated with a particular DVB-T system variant or a real DVB-T network implementation; rather, they stand for a large number of different real implementations. For instance, a DVB-T service for mobile reception might use as real implementation parameters a location probability of 99% and a rugged DVB-T variant with a C/N of 14 dB. Nevertheless, this service will be represented by RPC 2 with a reference location probability of 95% and a reference C/N of 19 dB without restricting the possibilities for the implementation of the "real" service for mobile DVB-T reception.

The standard deviation used for the calculation of the location correction factor (see § 3.4.5 of this Chapter) of each RPC shall be as follows:

– for RPC 1 and RPC 2: 5.5 dB in VHF and UHF,

– for RPC 3: 6.3 dB in VHF and 7.8 dB in UHF.

Protection ratios for the RPCs provided in Appendix 3.3 to this Chapter shall be used.

A.3.5.2 Reference planning configurations for T-DAB

The two RPCs defined in Table A.3.5-2 for T-DAB in Band III shall be used:

TABLE A.3.5-2

RPCs for T-DAB

Reference planning configuration	RPC 4	RPC 5
Location probability	99%	95%
Reference C/N (dB)	15	15
Reference $(E_{med})_{ref}$ (dB(μV/m)) at f_r = 200 MHz	60	66

$(E_{med})_{ref}$: Reference value for minimum median field strength

RPC 4: RPC for mobile reception

RPC 5: RPC for portable indoor reception

For other frequencies, the reference field-strength values in Table A.3.5-2 shall be adjusted by adding the correction factor defined according to the following rule:

– $(E_{med})_{ref}(f) = (E_{med})_{ref}(f_r)$ + Corr;

– Corr = 30 $\log_{10}$ (f/f_r) where f is the actual frequency and f_r the reference frequency of the relevant band quoted in Table A.3.5-2.

The relevant protection ratios for compatibility calculations in Appendix 3.3 to this Chapter shall be used.

APPENDIX 3.6

Reference networks

A.3.6.1 Reference networks for DVB-T

A.3.6.1.1 General considerations

Four reference networks (RNs) have been designed in order to cover the different implementation requirements for DVB-T networks.

For the determination of the power budget of the reference networks, antenna heights and powers are adjusted in such a way that the desired coverage probability is achieved at each location of the service area.

The method of adjusting the power budget of the network uses a noise-limited basis, which is known to be not very frequency-efficient. To overcome this drawback, the powers of the transmitters in the reference networks are increased by a value of 3 dB. (See Tables A.3.6-1 to A.3.6-4.)

For the effective antenna heights of the transmitter in the reference networks, 150 m shall be used as an average value.

An open network structure has been chosen for the reference networks, since it is assumed that real network implementations will normally resemble this network type. The service area is defined as a hexagon about 15% larger than the hexagon formed by the peripheral transmitters. However, in order to allow for network implementations with very low interference potentials, a reference network with a semi-closed network structure is also introduced. (See reference network 4 in § A.3.6.1.5 of this Appendix.)

In some cases, the interference potentials of reference networks significantly overestimate the interference potential of real network implementations, for example, where the standard geometry of a reference network differs considerably from the particular shape of the real service area. In these cases, administrations may adopt an appropriate method, agreed on bilateral basis, to better model the interference potential of the reference network.

A.3.6.1.2 Reference network 1 (large service-area SFN)

The network consists of seven transmitters situated at the centre and at the vertices of a hexagonal lattice. An open network type has been chosen, i.e. the transmitters have non-directional antenna patterns and the service area is assumed to exceed the transmitter hexagon by about 15%. The geometry of the network is given in Fig. A.3.6-1.

This reference network (RN 1) is applied to different cases: fixed (RPC 1), outdoor/mobile (RPC 2) and indoor (RPC 3) reception, for both Band III and Bands IV/V.

RN 1 is intended for large service area SFN coverage. It is assumed that main transmitter sites with an appropriate effective antenna height are used as a backbone for this type of network. For portable and mobile reception, the size of the real service areas for this type of SFN coverage is restricted to 150 to 200 km in diameter because of self-interference degradation, unless very rugged DVB-T system variants are used or the concept of dense networks is employed.

FIGURE A.3.6-1

RN 1 (large service area SFN)

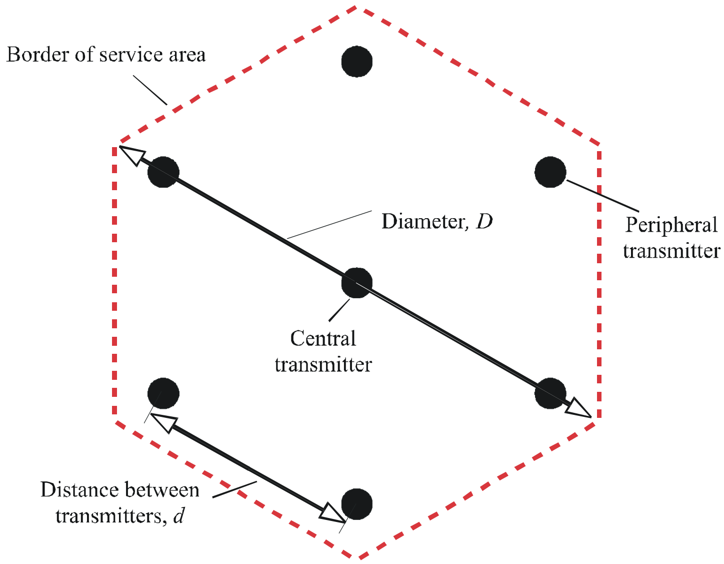


TABLE A.3.6-1

Parameters of RN 1 (large service area SFN)

RPC and reception type		RPC 1 Fixed antenna	RPC 2 Portable outdoor and mobile	RPC 3 Portable indoor
Type of network		Open	Open	Open
Geometry of service area		Hexagon	Hexagon	Hexagon
Number of transmitters		7	7	7
Geometry of transmitter lattice		Hexagon	Hexagon	Hexagon
Distance between transmitters *d* (km)		70	50	40
Service area diameter *D* (km)		161	115	92
Tx effective antenna height (m)		150	150	150
Tx antenna pattern		Non-directional	Non-directional	Non-directional
e.r.p.* (dBW)	Band III	34.1	36.2	40.0
	Bands IV/V	42.8	49.7	52.4

The e.r.p. is given for 200 MHz in Band III and 650 MHz in Bands IV/V; for other frequencies (f in MHz) the frequency correction factor to be added is: 20 $\log_{10}$ (f/200 or f/650) for RPC 1 and 30 $\log_{10}$ (f/200 or f/650) for RPC 2 and RPC 3.

* The e.r.p. values indicated in this table incorporate an additional power margin of 3 dB.

For the guard interval length, the maximum value 1/4 T_u of the 8k FFT mode is assumed. The distance between transmitters in an SFN should not significantly exceed the distance equivalent to the guard interval duration. In this case, the guard interval duration is 224 μs, which corresponds to a distance of 67 km. The distance between transmitters for RPC 1 is taken as 70 km. For RPC 2 and RPC 3, 70 km is too large a distance from a power budget point of view. Therefore, smaller values for the distance between transmitters have been selected, 50 km for RPC 2 and 40 km for RPC 3.

The parameters and the power budgets of RN 1 given in Table A.3.6-1 shall be used.

A.3.6.1.3 Reference network 2 (small service area SFN, dense SFN)

The network consists of three transmitters situated at the vertices of an equilateral triangle. An open network type has been chosen, i.e. the transmitters have non-directional antenna patterns. The service area is assumed to be hexagonal, as indicated in Fig. A.3.6-2.

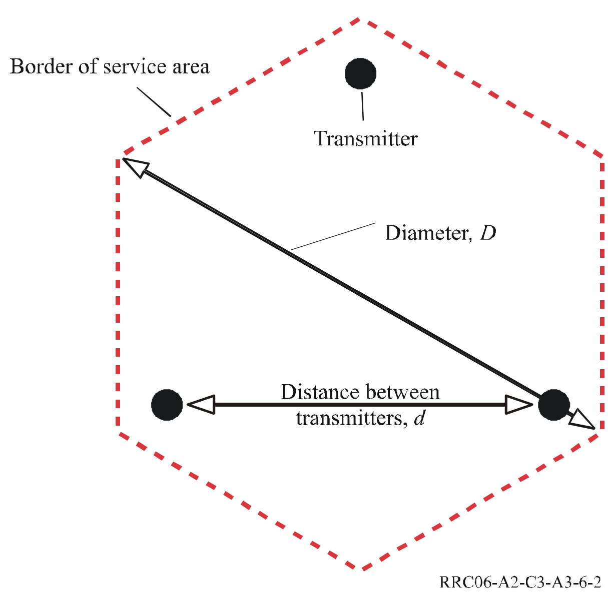
This reference network (RN 2) is applied to different cases: fixed (RPC 1), outdoor/mobile (RPC 2) and indoor (RPC 3) reception, for both Band III and Bands IV/V.

RN 2 is intended for small service area SFN coverage. Transmitter sites with appropriate effective antenna heights are assumed to be available for this type of network and self-interference restrictions are expected to be small. Typical service area diameters may be from 30 to 50 km.

It is also possible to cover large service areas with this kind of dense SFN. However, a very large number of transmitters is then necessary. It therefore seems reasonable to have large service areas being represented by RN 1, even if a dense network structure is envisaged.

FIGURE A.3.6-2

RN 2 (small service area SFN)



In RN 2 the inter-transmitter distance is 25 km in the case of RPCs 2 and 3. It is therefore possible to use a value of 1/8 T_u (8k FFT) for the guard interval, which would increase the available data capacity as compared to the use of a guard interval of 1/4 T_u. The same guard interval value might also be feasible for RPC 1, with its greater distance between transmitters of 40 km, since fixed roof-level reception is less sensitive to self-interference because of the directional properties of the receiving antenna.
The parameters and the power budgets of the RN 2 given in Table A.3.6-2 shall be used.

TABLE A.3.6-2

Parameters of RN 2 (small service area SFN)

RPC and reception type		**RPC 1 Fixed antenna**	**RPC 2 Portable outdoor and mobile**	**RPC 3 Portable indoor**
Type of network		Open	Open	Open
Geometry of service area		Hexagon	Hexagon	Hexagon
Number of transmitters		3	3	3
Geometry of transmitter lattice		Triangle	Triangle	Triangle
Distance between transmitters *d* (km)		40	25	25
Service area diameter *D* (km)		53	33	33
Tx effective antenna height (m)		150	150	150
Tx antenna pattern		Non-directional	Non-directional	Non-directional
e.r.p.* (dBW)	Band III	24.1	26.6	34.1
	Bands IV/V	31.8	39.0	46.3

The e.r.p. is given for 200 MHz in Band III and 650 MHz in Bands IV/V; for other frequencies (f in MHz) the frequency correction factor to be added is: 20 $\log_{10}$ (f/200 or f/650) for RPC 1 and 30 $\log_{10}$ (f/200 or f/650) for RPC 2 and RPC 3.

* The e.r.p. values indicated in this table incorporate an additional power margin of 3 dB.

A.3.6.1.4 Reference network 3 (small service area SFN for urban environment)

The geometry of the transmitter lattice of reference network 3 (RN 3) and the service area are identical to those of RN 2. (See Fig. A.3.6-2.)
RN 3 is applied to different cases: fixed (RPC 1), outdoor/mobile (RPC 2) and indoor (RPC 3) reception, for both Band III and Bands IV/V.
RN 3 is intended for small service area SFN coverage in an urban environment. It is identical to RN 2, apart from the fact that urban-type height loss figures are used. This increases the required power of the SFN transmitters by about 5 dB for RPC 2 and RPC 3.
The parameters and the power budgets of the RN 3 given in Table A.3.6-3 shall be used.

TABLE A.3.6-3

Parameters of RN 3 (small service area SFN for urban environment)

RPC and reception type		**RPC 1 Fixed antenna**	**RPC 2 Portable outdoor and mobile**	**RPC 3 Portable indoor**
Type of network		Open	Open	Open
Geometry of service area		Hexagon	Hexagon	hexagon
Number of transmitters		3	3	3
Geometry of transmitter lattice		Triangle	Triangle	Triangle
Distance *d* (km)		40	25	25
Service area diameter *D* (km)		53	33	33
Tx effective antenna height (m)		150	150	150
Tx antenna pattern		Non-directional	Non-directional	Non-directional
e.r.p.* (dBW)	Band III	24.1	32.5	40.1
	Bands IV/V	31.8	44.9	52.2

The e.r.p. is given for 200 MHz in Band III and 650 MHz in Bands IV/V; for other frequencies (f in MHz) the frequency correction factor to be added is: 20 $\log_{10}$ (*f*/200 or *f*/650) for RPC 1 and 30 $\log_{10}$ (*f*/200 or *f*/650) for RPC 2 and RPC 3.

* The e.r.p. values indicated in this table incorporate an additional power margin of 3 dB.

A.3.6.1.5 Reference network 4 (semi-closed small service area SFN)

This reference network (RN 4) is intended for cases in which increased implementation efforts regarding transmitter locations and antenna patterns are undertaken in order to reduce the outgoing interference of the network.

The geometry for RN 4 is identical to that for RN 2, except for the antenna patterns of the transmitters, which have a reduction of the outgoing field strength of 6 dB over 240° (i.e. it is a semi-closed RN). The service area of this RN is shown in Fig. A.3.6-3. A sharp transition from 0 dB to 6 dB reduction is assumed at the indicated bearings.

RN 4 is applied to different cases: fixed (RPC 1), outdoor/mobile (RPC 2) and indoor (RPC 3) reception, for both Band III and Bands IV/V.

FIGURE A.3.6-3

RN4 (semi-closed small service area SFN)

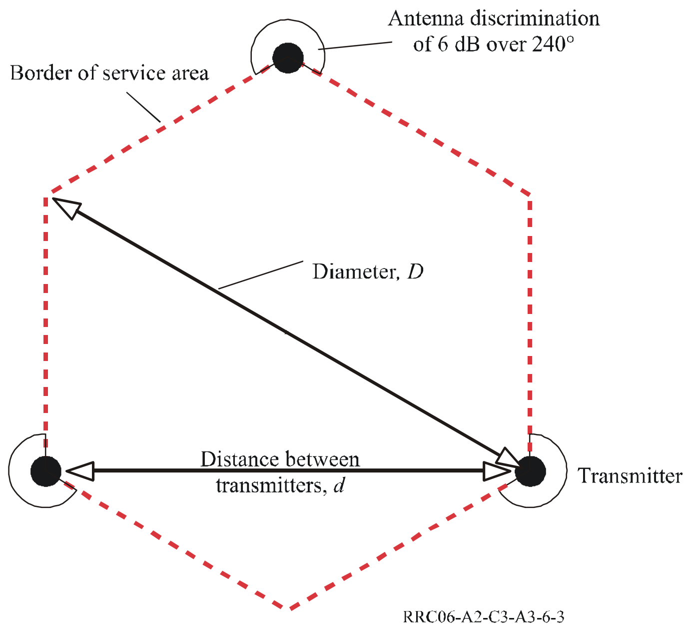


TABLE A.3.6-4

Parameters of RN 4 (semi-closed small service area SFN)

RPC		RPC 1	RPC 2	RPC 3
Type of network and reception type		Semi-closed Fixed antenna	Semi-closed Portable outdoor and mobile	Semi-closed Portable indoor
Geometry of service area		Hexagon	Hexagon	Hexagon
Number of transmitters		3	3	3
Geometry of transmitter lattice		Triangle	Triangle	Triangle
Distance between transmitters *d* (km)		40	25	25
Service area diameter *D* (km)		46	29	29
Tx effective antenna height (m)		150	150	150
Tx antenna pattern		Directional 6 dB reduction over 240°	Directional 6 dB reduction over 240°	Directional 6 dB reduction over 240°
e.r.p.* (dBW)	Band III	22.0	24.0	32.5
	Bands IV/V	29.4	37.2	44.8

The e.r.p. is given for 200 MHz in Band III and 650 MHz in Bands IV/V; for other frequencies (*f* in MHz) the frequency correction factor to be added is: 20 $\log_{10}$ (*f*/200 or *f*/650) for RPC 1 and 30 $\log_{10}$ (*f*/200 or *f*/650) for RPC 2 and RPC 3.

* The e.r.p. values indicated in this table incorporate an additional power margin of 3 dB.

The difference between RN 4 and RN 2 is the outgoing interference (interference potential). RN 4 has a lower interference potential as compared to that of RN 2. Because of this, the distance at which the same frequency can be reused is smaller when two allotments are both planned with RN 4.
There is a trade-off between this lower interference potential and the increased implementation costs to achieve the directional antennas. This should be kept in mind when choosing this RN for planning. There is also a reduction in the diameters of the service areas compared to those for RN 2.
The parameters and the power budgets of the RN 4 given in Table A.3.6-4 shall be used.

A.3.6.2 Reference networks for T-DAB

For T-DAB, two RPCs have been defined, RPC 4 for the mobile reception case and RPC 5 for the portable indoor reception case. Two corresponding reference networks have been designed which are identical apart from their power budget. They are directly connected to the two RPCs.
For RPC 4, the mobile reception case, the reference network consists of seven transmitters located at the centre and the vertices of a hexagon and is of the closed network type. The power of the central transmitter is reduced by 10 dB with respect to the peripheral transmitters, which have a power of 1 kW. The antenna patterns of the peripheral transmitters have a reduction of the outgoing field strength of 12 dB over 240°. A sharp transition from 0 dB to 12 dB reduction is assumed at the indicated bearings.

TABLE A.3.6-5

Parameters of RN 5 for RPC 4 and RN 6 for RPC 5

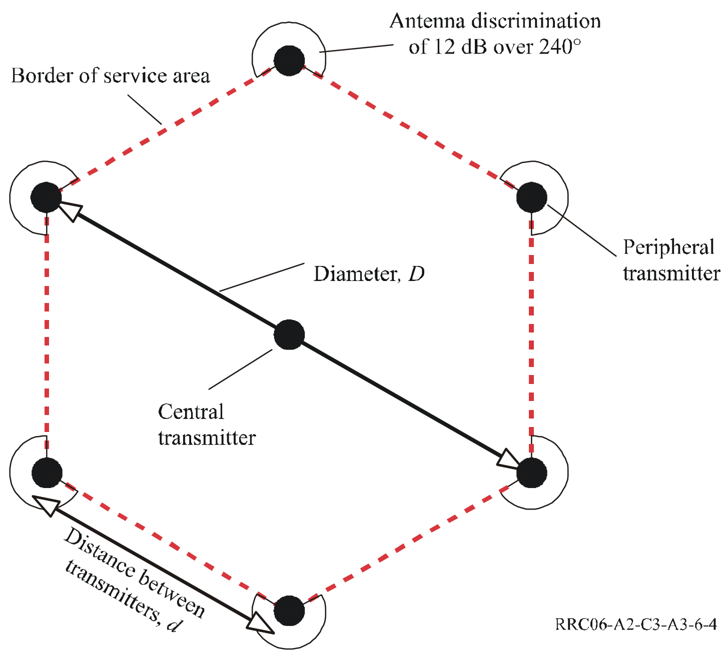
RPC	RPC 4	RPC 5
Reception type	Mobile	Portable indoor
Type of network	Closed	closed
Geometry of service area	Hexagon	Hexagon
Number of transmitters	7	7
Geometry of transmitter lattice	Hexagon	Hexagon
Distance between transmitters *d* (km)	60	60
Service area diameter *D* (km)	120	120
Tx effective antenna height (m)	150	150
Peripheral Tx antenna pattern	Directional 12 dB reduction over 240°	Directional 12 dB reduction over 240°
Central Tx antenna pattern	Non-directional	Non-directional
Peripheral Tx e.r.p. (dBW)	30.0	39.0
Central Tx e.r.p. (dBW)	20.0	29.0

The e.r.p. is given for 200 MHz; for other frequencies (*f* in MHz) the frequency correction factor to be added is: $30 \log_{10}(f/200)$ for RPC 4 and RPC 5.

For RPC 5, the portable indoor reception case, the same reference network characteristics are used as for RPC 4, apart from the transmitter powers which are increased by 9 dB, corresponding to the higher minimum field strength needed for this reception mode.
The parameters and the power budgets of the RN 5 for RPC 4 and RN 6 for RPC 5 given in Table A.3.6-5 shall be used. Fig. A.3.6-4 shows the geometry of the RNs.

FIGURE A.3.6-4

Geometry of the RNs for T-DAB



APPENDIX 3.7

Calculation of interference for single-frequency networks and allotments

The interference for single-frequency networks (SFNs) and allotments is aggregated, in order to ensure equitable treatment between the different combinations of allotment and assignments. The following calculation methods shall be used by BR and by the administrations unless otherwise mutually agreed by the concerned administrations for the different cases of allotment and assignments as shown in the table below.

Case	Description	Calculation methods
1	A number of digital assignments that make up a SFN, notified with the same SFN-ID.	Separate coverage contours are calculated for each individual digital assignment. No overall contour enclosing all these digital assignments will be established. Incompatibilities between these digital assignments are not taken into account. Incompatibilities with other digital requirements are calculated as the power sum of the individual digital assignments. Interference to assignments within the SFN is calculated to their individual coverage contours.
2	One or many digital assignments linked to an allotment. All digital assignments are notified with the same allotment ID and the same SFN-ID.	Interference from the requirement is the higher value of either: – the power sum of interference from the individual digital assignments; or – the interference from the reference network associated with the allotment (the latter being treated as in case 4, below). Interference to the allotment is calculated at the test points that define the allotment area of the allotment (see also case 4).
3	A single digital assignment linked to an allotment with no SFN identification. It is not possible to add another assignment to the allotment unless the allotment is modified.	Interference from the requirement is that from the digital assignment. Interference to the allotment is calculated at the test points that define the allotment area of the allotment.
4	An allotment with no linked assignments notified.	Interference from the allotment is calculated using the reference network associated with the allotment and located at the test points that define the allotment area of the allotment. Interference to the allotment is calculated at the test points that define the allotment area of the allotment.

CHAPTER 4
TO ANNEX 2

Compatibility with other primary services

4 Introduction

This Chapter contains technical parameters and protection criteria for the compatibility analysis of other primary services with broadcasting services, which were used in the development of the Plan and shall be used for its implementation.

These technical parameters and protection criteria could be used during the coordination process in respect to the new or modified assignments/allotments, if no other mutual Agreements covering this issue between administrations concerned exists.

Additional technical parameters and protection criteria, which were not used in the development of the Plan, are also contained in appendices to this Chapter. These technical parameters and protection criteria may be used during the coordination process in respect to the new or modified assignments/allotments, if no other mutual Agreements covering this issue between administrations concerned exist.

With regard to other services, the GE06 Agreement only deals with other primary terrestrial services. Sharing between broadcasting and space services is subject to the relevant provisions of the Radio Regulations (RR).

4.1 Compatibility with other primary terrestrial services in the planned bands

4.1.1 Other primary services and sharing situations in the bands 174-230 MHz and 470-862 MHz

Most countries from the planning area use the broadcasting service in the bands 174-230 MHz and 470-862 MHz; however, the broadcasting service does not have exclusive access to these bands. At the time when this Agreement was prepared the following sharing situations exist.

4.1.1.1 Sharing situations with other terrestrial primary services

In the VHF band, the following primary allocations exist for other services in the Planning Area in the band 174-230 MHz:

– the **fixed service** in the Islamic Republic of Iran, in the band 174-230 MHz;

– the **mobile service** in the Islamic Republic of Iran, in the band 174-230 MHz;

– the **aeronautical radionavigation service** in the Islamic Republic of Iran and in the countries of Region 1 listed in RR No. 5.247, in the band 223-230 MHz;

– the **land mobile service** in the band 174-223 MHz, allocated to countries listed in RR No. 5.235. Protection is required only between the countries mentioned in that provision.

In the UHF band, the following primary allocations exist in the Planning Area in the band 470-862 MHz:

– the **fixed service** in Region 1 and in the Islamic Republic of Iran in the band 790-862 MHz, and in the Islamic Republic of Iran in the band 470-790 MHz;

– the **mobile service** in the Islamic Republic of Iran, in the band 470-862 MHz;

– the **mobile, except aeronautical mobile, service** in the band 790-862 MHz, allocated to the countries of Region 1 listed in RR No. 5.316. Protection is required only between countries mentioned in that provision;

– the **radionavigation service** in the Islamic Republic of Iran, in the band 585-610 MHz;

– the **aeronautical radionavigation service** in the United Kingdom in the band 590-598 MHz according to RR No. 5.302 and in the countries of Region 1 listed in RR No. 5.312 in the band 645-862 MHz;

– the **radio astronomy service**, which could be used in the whole of the African Broadcasting Area, in the band 606-614 MHz, according to RR No. 5.304.

4.1.2 Protection of terrestrial services, including aeronautical stations of other primary terrestrial services, against transmissions of digital terrestrial broadcasting

4.1.2.1 Protection criteria for other primary services interfered with by digital terrestrial broadcasting

Protection criteria for other primary services are given in Appendices 4.1 and 4.2 to this Chapter. This includes some generic information as well as default values for field strengths to be protected, protection ratios (PR) as a function of frequency separation, and receiving antenna heights for some typical systems.

Appendix 4.1 to this Chapter supplies protection criteria for other primary services interfered with by digital terrestrial sound broadcasting (T-DAB), and Appendix 4.2 to this Chapter supplies protection criteria for other primary services interfered with by digital terrestrial television broadcasting (DVB-T).

4.1.2.2 Calculations required to protect other primary terrestrial services from digital terrestrial broadcasting

When preparing the Plan, a calculation was made for all fixed locations and all test points defining the boundary of the service area of the other primary service using the following steps:

Calculate the interfering field strength (50% of the location value and the appropriate percentage time value) caused by the digital terrestrial broadcasting assignment or allotment, taking into account the directivity of the transmitting antenna if relevant.

Calculate from this the nuisance field strength caused by the digital terrestrial broadcasting assignment or allotment, taking into account the protection ratio and, if relevant, receiving antenna discrimination (directivity, polarization).

Subtract the nuisance field strength (caused by the broadcasting assignment or allotment) and the combined location correction factor from the minimum field strength (50% of the location value), to give the protection margin which was used for the coordination process.

Information on the propagation models used for the calculations can be found in Chapter 2 of Annex 2 of the Agreement.

Additional assumptions concerning other services, e.g. antenna heights, which have been used in the calculations are provided in Appendix 4.5 to this Chapter.

An allowance has been made for interference in the preparation of the Plan. For this purpose a concept of limiting margin has been introduced. The term "limiting margin" is to be interpreted in the sense that any calculated margin which is less than the relevant limiting margin indicates a compatible situation. For the development of the Plan in the case of wanted other primary terrestrial assignments, the limiting value of the margin has been taken to be 1.0 dB. This 1 dB limiting margin will result in a 6 dB difference between the minimum median field strength and the nuisance field strength.

However, in many cases administrative declarations allowing a higher level of interference have been agreed during the development of the Plan.

4.1.3 Protection of digital terrestrial broadcasting against transmissions of stations of other primary terrestrial services

4.1.3.1 Protection criteria for digital terrestrial broadcasting interfered with by other primary terrestrial services

In Appendices 4.3 and 4.4 to this Chapter, protection criteria for digital terrestrial broadcasting are given, such as minimum field strength to be protected and protection ratios as a function of frequency separation.

Appendix 4.3 to this Chapter supplies protection criteria for T-DAB interfered with by other primary services, and Appendix 4.4 to this Chapter supplies protection criteria for DVB-T interfered with by other primary services.

4.1.3.2 Calculations required to protect digital terrestrial broadcasting from other primary terrestrial services

When preparing the Plan, a calculation was made for each of the test points defining the coverage area of a digital terrestrial broadcasting requirement using the following steps:

Calculate the interfering field strength (50% of the location value and the appropriate time percentage value) caused by the other primary service, taking into account the directivity of the transmitting antennas if relevant.

Calculate from this the nuisance field strength caused by the other primary service, taking into account the protection ratio and, if relevant, receiving antenna discrimination (directivity, polarization).

Subtract the nuisance field strength (caused by the other primary service) and the combined location correction factor from the minimum field strength to be protected (50% of the location value) to give the protection margin which was used for the coordination process.

Information on the propagation models to be used for the calculations can be found in Chapter 2 to Annex 2 of the Agreement.

Additional assumptions concerning other services, e.g. antenna heights, which have been used in the calculations are provided in Appendix 4.5 to this Chapter.

An allowance has been made for multiple interference in the preparation of the Plan. For this purpose a concept of limiting margin has been introduced. The term "limiting margin" is to be interpreted in the sense that any calculated margin which is less than the relevant limiting margin indicates a compatible situation. For the development of the Plan in the case of wanted digital terrestrial broadcasting, the limiting value of the margin has been taken to be 1.25 dB. The value of 1.25 dB is based on the assumption that there can be six separate interfering sources, each producing the same value of nuisance field strength. This 1.25 dB limiting margin will result in 4.771 dB more stringent criteria for the single-entry interference.

However, in many cases administrative declarations allowing a higher level of interference have been agreed during the development of the Plan, as well as for the case of planning between broadcasting applications.

4.2 Sharing situations with primary space services

In the UHF band there are primary allocations to the mobile-satellite service (MSS) and the broadcasting-satellite service (BSS):

– the **broadcasting-satellite service** in the band 620-790 MHz (see RR No. 5.311* (WRC-03));

– the **mobile-satellite, except aeronautical mobile-satellite (R), service** in the bands 806-840 MHz (Earth-to-space) and 856-862 MHz (space-to-Earth) used only by countries listed in RR No. 5.319.

Relationships between broadcasting and space services are subject to the relevant provisions of the RR.

Note to Appendices 4.1-4.5 to this Chapter – The term “system type code” corresponds to the term “service type code” used for other primary services in the development of the digital Plan.

---

* See also Resolution 1 (RRC-06).

APPENDIX 4.1

Protection criteria for other primary services interfered with by T-DAB

Values for field strength to be protected for other primary services interfered with by T-DAB are provided in Table A.4.1-1, and the related protection ratio tables for these other services are provided in Tables A.4.1-2 to A.4.1-12.

TABLE A.4.1-1

System type code	**Type of system**	**Field strength to be protected (dB(μV/m))**	**Receiver height (m)**	**Protection ratio table**
AL**	Aeronautical mobile (OR) system AL	26	10 000	A.4.1-2
CA**	Fixed system CA	15	10	A.4.1-5
DA**	Aeronautical mobile (OR) system DA	26	10 000	A.4.1-11
DB**	Aeronautical mobile (OR) system DB	26	10 000	A.4.1-12
IA**	Fixed system IA	48	10	A.4.1-6
MA	Land mobile system MA	4	10	A.4.1-3
MT	Mobile and fixed systems MT (transportable)	20	10	A.4.1-4
MU**	Mobile system MU (low power)	54	10	A.4.1-7
M1	Mobile system M1 (narrow-band FM, 12.5 kHz) interfered with by a single T-DAB block[(1)] (private mobile radio)	15	10	A.4.1-5
M2**	Mobile system M2 (narrow-band), interfered with by two or more T-DAB blocks	36	10	A.4.1-5
RA1**	Mobile system RA1 (narrow-band FM, 12.5 kHz) interfered with by a single T-DAB block[(1)]	15.0	1.5	A.4.1-5
RA2**	Mobile system RA2 (narrow-band FM, 12.5 kHz) interfered with by a single T-DAB block[(1)]	7.0	20.0	A.4.1-5
R1**	Land mobile system R1 (medical telemetry)	32.0	10.0	A.4.1-8
R3**	Mobile system R3 (remote control)	30.0	10.0	A.4.1-7
R4**	Mobile system R4 (remote control)	30.0	10.0	A.4.1-7
XA**	Land mobile system XA (private mobile radio)	15.0	10.0	A.4.1-5
XB**	Fixed system XB (alarm system)	37.0	10.0	A.4.1-9
XE**	Aeronautical mobile (OR) system XE	0.0	0.0	A.4.1-10
XM**	Land mobile system XM (radio microphones, VHF)	48.0	10.0	A.4.1-6

** The protection criteria for this system were not used during the development of the Plan due to the absence of corresponding assignments in the reference situation (see also the introduction to this Chapter).

(1) The T-DAB frequency is assumed to be always higher than the private mobile radio frequency.

Notes to Table A.4.1-1:

1. For systems AL, DA and DB a separation distance of 1 000 m between the AL receiver and the T-DAB transmitter was assumed.
2. In the following tables:

   Δf: frequency difference (MHz), i.e. interfering T-DAB block centre frequency minus centre frequency of interfered-with other primary service

   PR 1%: protection ratio (dB) required for tropospheric interference.

TABLE A.4.1-2

AL

Δ*f* (MHz)	–10.000	–9.000	–0.800	–0.600	–0.400	–0.200	0.000	0.200	0.400	0.600	0.800
PR 1% (dB)	–66.0	–6.6	–6.6	2.7	3.2	4.1	6.5	4.1	3.2	2.7	–6.6
Δ*f* (MHz)	9.000	10.000									
PR 1% (dB)	–6.6	–66.0									

TABLE A.4.1-3

MA

Δ*f* (MHz)	–1.000	–0.900	0.000	0.900	1.000
PR 1% (dB)	–60.0	–40.0	12.0	–40.0	–60.0

TABLE A.4.1-4

MT

Δ*f* (MHz)	–2.000	–1.000	0.000	1.000	2.000
PR 1% (dB)	–5.0	15.0	25.0	15.0	–5.0

TABLE A.4.1-5

CA, M1, M2, RA1, RA2, XA

Δ*f* (MHz)	–0.920	–0.870	–0.820	–0.795	–0.782	–0.770	0.00	0.770	0.782	0.795	0.820	0.870	0.920
PR 1% (dB)	–58.0	–49.0	–41.0	–37.0	–34.0	–14.0	–12.0	–14.0	–34.0	–37.0	–41.0	–49.0	–58.0

TABLE A.4.1-6

IA, XM

Δ*f* (MHz)	–1.00	–0.900	–0.800	0.000	0.800	0.900	1.000				
PR 1% (dB)	–22.0	–16.0	18.0	18.0	18.0	–16.0	–22.0				

TABLE A.4.1-7

MU, R3, R4

Δf (MHz)	–1.000	–0.900	–0.800	0.000	0.800	0.900	1.000				
PR 1% (dB)	–12.0	5.0	38.0	38.0	38.0	5.0	–12.0				

TABLE A.4.1-8

R1

Δf (MHz)	–1.800	–1.600	0.000	1.600	1.800						
PR 1% (dB)	–60.0	–6.0	–6.0	–6.0	–60.0						

TABLE A.4.1-9

XB

Δf (MHz)	–0.600	–0.500	0.000	0.500	0.600						
PR 1% (dB)	–60.0	10.0	10.0	10.0	–60.0						

TABLE A.4.1-10

XE

Δf (MHz)	–0.100	0.000	0.100								
PR 1% (dB)	–60.0	–60.0	–60.0								

TABLE A.4.1-11

DA

Δf (MHz)	–10.20	–6.550	–6.350	–6.150	–5.930	–5.770	0.000	10.000			
PR 1% (dB)	–56.0	–56.0	–54.0	–49.0	–33.0	6.0	6.0	6.0			

TABLE A.4.1-12

DB

Δf (MHz)	–5.250	–4.470	–4.270	0.000	9.770	9.970	10.750				
PR 1% (dB)	–81.0	–46.0	–1.0	–1.0	–1.0	–46.0	–81.0				

APPENDIX 4.2

Protection criteria for other primary services interfered with by DVB-T

This Appendix contains system-specific protection criteria for certain systems of other primary services operating in the bands 174-230 MHz and 470-862 MHz as well as generic protection criteria for the fixed and mobile services operating in the bands 174-230 MHz and 470-862 MHz. The systems for which protection criteria are provided are listed in Table A.4.2-1.

TABLE A.4.2-1

System type code	**Secondary code implemented in the planning software**	**Type of system**	**Field strength to be protected (dB(μV/m))**	**Receiver height (m)**	**Protection ratio table**
AA8	BL8	Aeronautical radionavigation system BL8 (RSBN, 0.7 or 0.8 MHz)	42.0	10 000.0	A.4.2-24
AA8	BN8	Aeronautical radionavigation system BN8 (RSBN, 3 MHz)	42.0	10.0	A.4.2-24
AA8	BY8	Aeronautical radionavigation system BY8 (RSBN, 0.7 MHz)	42.0	10.0	A.4.2-24
AA8	BX8	Aeronautical radionavigation system BX8 (RSBN, 3 MHz)	42.0	10 000.0	A.4.2-24
AB	AB8N	Aeronautical radionavigation system AB8N (RLS 1 Type 1, 6 MHz)	13.0	10.0	A.4.2-16
AB	AB8C	Aeronautical radionavigation system AB8C (RLS 1 Type 1, 6 MHz)	13.0	10.0	A.4.2-17
AB	AC8N	Aeronautical radionavigation system AC8N (RLS 1 Type 2, 3 MHz)	13.0	10.0	A.4.2-18
AB	AC8C	Aeronautical radionavigation system AC8C (RLS 1 Type 2, 3 MHz)	13.0	10.0	A.4.2-19
BA	BA8N	Aeronautical radionavigation system BA8N (RLS 2 Type 1)	29.0	10.0	A.4.2-20
BA	BA8C	Aeronautical radionavigation system BA8C (RLS 2 Type 1)	29.0	10.0	A.4.2-21
AA2	BB8N	Aeronautical radionavigation system BB8N (RLS 2 Type 2, airborne transmission, 8 MHz)	24.0	10.0	A.4.2-22
AA2	BB8C	Aeronautical radionavigation system BB8C (RLS 2 Type 2, airborne transmission, 8 MHz)	24.0	10.0	A.4.2-23

TABLE A.4.2-1 (*continued*)

System type code	Secondary code implemented in the planning software	Type of system	Field strength to be protected (dB(μV/m))	Receiver height (m)	Protection ratio table
BC	BC8N	Aeronautical radionavigation system BC8N (RLS 2 Type 2, ground transmission, 3 MHz)	73.0	10 000.0	A.4.2-18
BC	BC8C	Aeronautical radionavigation system BC8C (RLS 2 Type 2, ground transmission, 3 MHz)	73.0	10 000.0	A.4.2-19
BD	BD8N	Aeronautical radionavigation system BD8N (RLS 2 Type 1, ground transmission, 4 MHz)	52.0	10 000.0	A.4.2-20
BD	BD8C	Aeronautical radionavigation system BD8C (RLS 2 Type 1, ground transmission, 4 MHz)	52.0	10 000.0	A.4.2-21
FF	FF7	Fixed system FF7 (transportable, 7 MHz)	35.0	10.0	A.4.2-2
FF	FF8	Fixed system FF8 (transportable, 8 MHz)	35.0	10.0	A.4.2-3
FH	FH8	Fixed system FH8 (P-MP)	18.0	10.0	A.4.2-4
FK7	FK7N	Generic fixed non-critical mask	–	10.0	(See Note)
FK7	FK7C	Generic fixed sensitive mask	–	10.0	(See Note)
FK8	FK8N	Generic fixed non-critical mask	–	10.0	(See Note)
FK8	FK8C	Generic fixed sensitive mask	–	10.0	(See Note)
NX**	NX8	Land mobile system NX8	27.0	20.0	A.4.2-7
NR**	NR7	Land mobile system NR7 (radio microphone, 7 MHz)	68.0	1.5	A.4.2-8
NR**	NR8	Land mobile system NR8 (radio microphone, 8 MHz)	68.0	1.5	A.4.2-9
NS**	NS7	Mobile system NS7 (OB link, stereo, non-companded)	86.0	10.0	A.4.2-10
NS**	NS8	Mobile system NS8 (OB link, stereo, non-companded)	86.0	10.0	A.4.2-11
NT**	NT7	Mobile system NT7 (talkback, non-companded)	31.0	1.5	A.4.2-12
NT**	NT8	Mobile system NT8 (talkback, non-companded)	31.0	1.5	A.4.2-13
NA	NA8N	Digital land mobile system NA8N (non-critical)	13.0	20.0	A.4.2-14
NA	NA8C	Digital land mobile system NA8C (sensitive)	13.0	20.0	A.4.2-15

** The protection criteria for this system were not used during the development of the Plan due to the absence of corresponding assignments in the reference situation (see also the introduction to this Chapter).

TABLE A.4.2-1 (*end*)

System type code	Secondary code implemented in the planning software	Type of system	Field strength to be protected (dB(μV/m))	Receive r height (m)	Protection ratio table
NB	NB7N	Generic mobile non-critical mask	–	10.0	(See Note)
NB	NB7C	Generic mobile sensitive mask	–	10.0	(See Note)
NB	NB8N	Generic mobile non-critical mask	–	10.0	(See Note)
NB	NB8C	Generic mobile sensitive mask	–	10.0	(See Note)
XG	XG8	Aeronautical radionavigation system XG8 (on channel 36, 4 MHz airport radars, UK)	–12.0	7.0	A.4.2-25
PL	PL8	Aeronautical radionavigation system PL8 (radars, artificial values)	0.0	1.5	A.4.2-25
NY	X7N	Land mobile system X7N (VHF)	28.0	1.5	A.4.2-26
NY	X7C	Land mobile system X7C (VHF)	28.0	1.5	A.4.2-27
NY	X8N	Land mobile system X8N (VHF)	28.0	1.5	A.4.2-28
NY	X8C	Land mobile system X8C (VHF)	28.0	1.5	A.4.2-29
NY	Y8N	Land mobile system Y8N at 480 MHz	31.0	1.5	A.4.2-28
NY	Y8C	Land mobile system Y8C at 480 MHz	31.0	1.5	A.4.2-29
NY	Z8N	Land mobile system Z8C at 620 MHz	33.0	1.5	A.4.2-28
NY	Z8C	Land mobile system Z8C at 620 MHz	33.0	1.5	A.4.2-29
XA8**	ZA8C	Radio astronomy single dish telescope sensitive DVB-T mask	–39.0	50.0	A.4.2-5
XA8**	ZA8N	Radio astronomy single dish telescope non-critical DVB-T mask	–39.0	50.0	A.4.2-6
XB8**	ZB8C	Radio astronomy VLBI sensitive DVB-T mask	2.0	50.0	A.4.2-5
XB8**	ZB8N	Radio astronomy VLBI non-critical DVB-T mask	2.0	50.0	A.4.2-6
	ZC8C**	Radio astronomy interferometry sensitive DVB-T mask	–22.0	50.0	A.4.2-5
	ZC8N**	Radio astronomy interferometry non-critical DVB-T mask	–22.0	50.0	A.4.2-6

** The protection criteria for this system were not used during the development of the Plan due to the absence of corresponding assignments in the reference situation (see also the introduction to this Chapter).

Note to Table A.4.2-1 – See the Attachment to this Appendix for calculations of the field strength (dB(μV/m)) of the allowed interfering television signal for generic cases of the fixed and the mobile services.

TABLE A.4.2-2

Transportable 7 MHz system in Netherlands FF7

Δf (MHz)	–5.5	–4.5	–3.5	0	3.5	4.5	5.5
PR (dB)	–46	–39	7	11	7	–39	–46

TABLE A.4.2-3

Transportable 8 MHz system in Netherlands FF8

Δf (MHz)	–6	–5	–4	0	4	5	6
PR (dB)	–46	–39	7	11	7	–39	–46

TABLE A.4.2-4

P-MP system in Ukraine FH8

Δf (MHz)	–6.0	–4.2	–3.9	–3.4	0.0	3.4	3.9	4.2	6.0
PR (dB)	–65.0	–54.0	–4.0	–1.0	–1.0	–1.0	–4.0	–54.0	–65.0

TABLE A.4.2-5

Radio astronomy sensitive DVB-T mask ZA8C, ZB8C, ZC8C

Abs(Δf) (MHz)	9.0	8.0	7.0	6.0	5.0	4.0	3.0	2.0	1.0	0.0
PR (dB)	–71.0	–66.0	–41.0	–9.0	–6.0	–4.0	–3.0	–2.0	–1.0	–1.0

TABLE A.4.2-6

Radio astronomy non-critical DVB-T mask ZA8N, ZB8N, ZC8N

Abs(Δf) (MHz)	9.0	8.0	7.0	6.0	5.0	4.0	3.0	2.0	1.0	0.0
PR (dB)	–61.0	–56.0	–37.0	–9.0	–6.0	–4.0	–3.0	–2.0	–1.0	–1.0

TABLE A.4.2-7

Land mobile systems – NX8

Abs(Δf) (MHz)	10.0	9.0	8.0	7.0	6.0	5.0	4.0	3.9	3.8	3.7	3.0	1.0	0.0
PR (dB)	–70.5	–67.9	–65.8	–64.3	–63.0	–61.8	–61.2	–52.3	–24.0	–23.2	–23.2	–23.2	–23.2

TABLE A.4.2-8

Radio microphone – NR7

Abs(Δf) (MHz)	10.5	8.8	7.0	5.2	3.7	3.3	3.2	0.0
PR (dB)	–49.0	–49.0	–44.0	–39.0	–34.0	8.0	13.0	13.0

TABLE A.4.2-9

Radio microphone – NR8

Abs(Δ*f*) (MHz)	12.0	10.0	8.0	6.0	4.2	3.8	3.6	0.0
PR (dB)	–50.0	–50.0	–45.0	–40.0	–35.0	7.0	12.0	12.0

TABLE A.4.2-10

OB link (stereo, non-companded) – NS7

Abs(Δ*f*) (MHz)	10.5	8.8	7.0	5.2	3.7	3.3	3.2	0.0
PR (dB)	–17.0	–16.0	–11.0	–8.0	–4.0	37.0	44.0	44.0

TABLE A.4.2-11

OB link (stereo, non-companded) – NS8

Abs(Δ*f*) (MHz)	12.0	10.0	8.0	6.0	4.2	3.8	3.6	0.0
PR (dB)	–18.0	–17.0	–12.0	–9.0	–5.0	36.0	43.0	43.0

TABLE A.4.2-12

Talkback – NT7

Abs(Δ*f*) (MHz)	10.5	8.8	7.0	5.2	3.7	3.3	3.2	0.0
PR (dB)	–96.0	–91.0	–84.0	–79.0	–69.0	–19.0	–13.0	–13.0

TABLE A.4.2-13

Talkback – NT8

Abs(Δ*f*) (MHz)	12.0	10.0	8.0	6.0	4.2	3.8	3.6	0.0
PR (dB)	–97.0	–92.0	–85.0	–80.0	–70.0	–20.0	–14.0	–14.0

TABLE A.4.2-14

Digital land mobile NA8N (non-critical)

Abs(Δ*f*) (MHz)	7.5	6.2	5.0	3.8	2.5	1.2	0.0
PR (dB)	–63.0	–57.0	–50.0	–7.0	–5.0	–5.0	–5.0

TABLE A.4.2-15

Digital land mobile NA8C (sensitive)

Abs(Δ*f*) (MHz)	7.5	6.2	5.0	3.8	2.5	1.2	0.0
PR (dB)	–73.0	–67.0	–60.0	–7.0	–5.0	–5.0	–5.0

TABLE A.4.2-16

RLS 1 Type 1 AB8N (non-critical)

Abs(Δ*f*) (MHz)	17	15	9	7.5	6.5	6	4	1	0
PR 10% (dB)	–80.6	–63.79	–47.1	–44.4	–11.7	–8.8	–4.1	–1.1	–1

TABLE A.4.2-17

RLS 1 Type 1 AB8C (sensitive)

Abs(Δ*f*) (MHz)	17	15	9	7.5	6.5	6	4	1	0
PR 10% (dB)	–90.66	–63.9	–47.3	–45.4	–11.8	–8.8	–4.1	–1.1	–1

TABLE A.4.2-18

RLS 1 Type 2 AC8N (non-critical)
RLS 2 Type 2 BC8N (non-critical)

Abs(Δ*f*) (MHz)	16	14	8	6.5	6	5	4	2	0
PR 10% (dB)	–82.8	–64	–49.2	–45.8	–45.39	–12.1	–7.25	–4	–4

TABLE A.4.2-19

RLS 1 Type 2 AC8C (sensitive)
RLS 2 Type 2 BC8C (sensitive)

Abs(Δ*f*) (MHz)	16	14	8	6.5	6	5	4	2	0
PR 10% (dB)	–92.4	–64.3	–49.4	–46.28	–46.26	–12.2	–7.27	–4	–4

TABLE A.4.2-20

RLS 2 Type 1 BA8N (non-critical)
RLS 2 Type 1 BD8N (non-critical)

Abs(Δ*f*) (MHz)	16	15	6.5	6	5.5	5	4	2.5	0
PR 10% (dB)	–81.3	–66.4	–44.1	–34	–12	–9	–5.9	–3.5	–2.8

TABLE A.4.2-21

RLS 2 Type 1 BA8C (sensitive)
RLS 2 Type 1 BD8C (sensitive)

Abs(Δ*f*) (MHz)	16	15	6.5	6	5.5	5	4	2.5	0
PR 10% (dB)	–90.9	–66.5	–44.9	–39	–12	–9	–6	–3.5	–2.8

TABLE A.4.2-22

RLS 2 Type 2 BB8N (non-critical)

Abs(Δ*f*) (MHz)	17	15	10	9	8.5	8	7	4	0
PR 10% (dB)	–79.4	–61.2	–46.3	–43.2	–43	–19.9	–8.7	–2.9	0

TABLE A.4.2-23

RLS 2 Type 2 BB8C (sensitive)

Abs(Δ*f*) (MHz)	17	15	10	9	8.5	8	7	4	0
PR 10% (dB)	–89.4	–61.3	–46.5	–43.4	–43	–20.2	–8.7	–2.9	0

TABLE A.4.2-24

Aeronautical navigation RSBN BL8
Aeronautical navigation RSBN BN8
Aeronautical navigation RSBN BY8
Aeronautical navigation RSBN BX8

Abs(Δ*f*) (MHz)	12.0	10.0	8.0	6.0	4.0	2.0	0.0
PR 10% (dB)	–65.0	–50.0	–27.0	–16.0	–5.0	0.0	0.0

TABLE A.4.2-25

CH36 airport radars (UK) XG8
Radars (POL) artificial values PL8

Abs(Δ*f*) (MHz)	5.0	4.0	3.0	0.0
PR (dB)	–79.0	–40.0	0.0	0.0

TABLE A.4.2-26

Land mobile at VHF X7N

Abs(Δf) (MHz)	3.7	3.3	0.0
PR (dB)	–55.0	–17.0	–10.0

TABLE A.4.2-27

Land mobile at VHF X7C

Abs(Δf) (MHz)	3.7	3.3	0.0
PR (dB)	–65.0	–17.0	–10.0

TABLE A.4.2-28

Land mobile at VHF X8N
Land mobile at 480 MHz Y8N
Land mobile at 620 MHz Z8N

Abs(Δf) (MHz)	4.2	3.8	0.0
PR (dB)	–55.0	–17.0	–10.0

TABLE A.4.2-29

Land mobile at VHF X8C
Land mobile at 480 MHz Y8C
Land mobile at 620 MHz Z8C

Abs(Δf) (MHz)	4.2	3.8	0.0
PR (dB)	–65.0	–17.0	–10.0

ATTACHMENT
TO APPENDIX 4.2

Calculation of field strength of the allowed interfering television signal for generic cases of the fixed and mobile services used for the production of the Plan

The field strength, E, of the allowed interfering television signal for generic cases of the fixed and the mobile services is calculated using the formula:

$$E = -37 + F - G_i + L_F + 10 \log (B_i) + P_o + 20 \log f - K \qquad \text{dB}(\mu\text{V/m}) \qquad (1)$$

where:

F: receiver noise figure land mobile service (LMS) base or mobile station receivers (dB)

B_i: the bandwidth of the terrestrial broadcasting station (MHz)

G_i: the receiver antenna gain (dBi)

L_F: antenna cable feeder loss (dB)

f: centre frequency of the interfering station (MHz)

P_o: man-made noise (dB) (typical value is 1 dB for VHF band and 0 dB for UHF band)

K: overlap correction factor (in DVB-T) given in the Tables AT.4.2-4 and AT.4.2-5 below (dB).

For the generic case of the fixed service, based on the information in Recommendations ITU-R F.758-4, ITU-R F.1670-1 and ITU-R SM.851-1, the following values of F, G_i , L_F and P_o were used:

TABLE AT.4.2-1

Frequency (MHz)	174-230	500	800
F (dB)	5	5	5
G_i (dBi)	9	14	16
L_F (dB)	4	5	5
P_o (dB)	1	0	0
$F - G + L_F + P_o$	1	–4	–6

In the UHF band, the variation of ($F - G + L_F + P_o$) with frequency relative to the value at 500 MHz is given by using the formula: 10 log (f/500).

For the generic case of the land mobile service (base stations), the following values of F, G_i, L_F and P_o were used:

TABLE AT.4.2-2

Frequency (MHz)	174	230	470	790	862
F (dB)	8	8	4	3	3
G_i (dBi)	6	8	12	17	17
L_F (dB)	2	2	2	4	4
P_o (dB)	1	1	0	0	0
$F - G_i + L_F + P_o$	5	3	–6	–10	–10

For the generic case of the land mobile service (mobile stations), the following values of F, G_i, L_F and P_o were used:

TABLE AT.4.2-3

Frequency (MHz)	174	230	470	790	862
F (dB)	11	11	7	7	7
G_i (dBi)	0	0	0	0	0
L_F (dB)	0	0	0	0	0
P_O (dB)	1	1	0	0	0
$F - G_i + L_F + P_o$	12	12	7	7	7

Calculation of the overlap correction factor *K*

The overlap correction factor is K (dB). When calculating interference with the victim receiver this factor must be added in equation (1).

In order to calculate the overlap correction factor K:

– Calculate the overlapped bandwidth B_o

$$B_o = \text{Min}\,(B_v, (B_v + B_i)/2 - \Delta f) \qquad (2)$$

where:

B_V: the bandwidth of the victim receiver

B_i: the bandwidth of the interfering signal

Δf: the difference between the centre frequency of the fixed service system and the centre frequency of the interfering (DVB-T) signal.

TABLE AT.4.2-4

For the DVB-T mask non-critical cases

Overlapped bandwidth, B_o	Overlapping factor, K (dB)
$B_o = B_v$	0
$B_v > B_o > 10^{-4} B_v$	$10 \log_{10} (B_o/B_v)$
$10^{-4} B_v > B_o > -0.5$	–40
$B_o = -1$	–45
$B_o = -2$	–52
$B_o = -4$	–60
$B_o = -8$	–77

TABLE AT.4.2-5

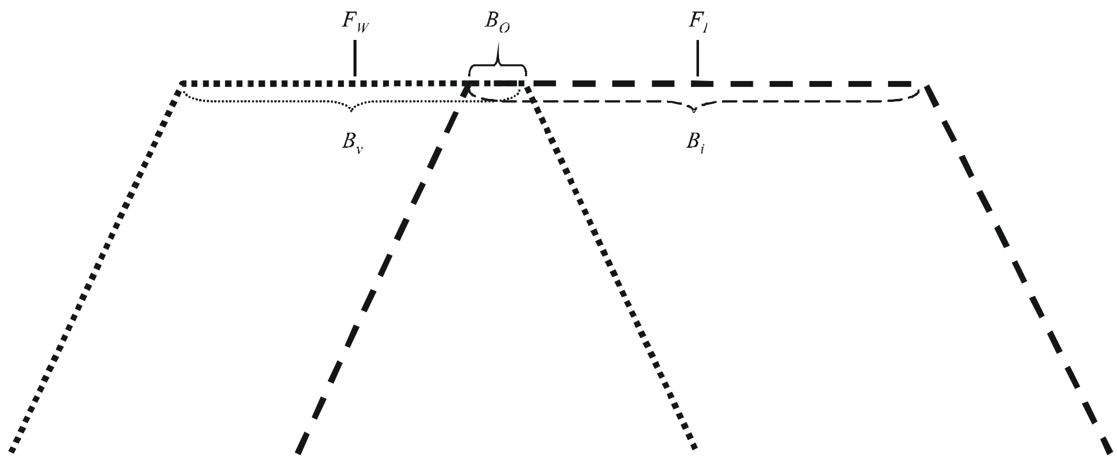
For the DVB-T mask – sensitive cases

Overlapped bandwidth, B_o	Overlapping factor, K (dB)
$B_o = B_v$	0
$B_v > B_o > 10^{-5} B_v$	$10 \log_{10} (B_o/B_v)$
$10^{-5} B_v > B_o > -0.5$	–50
$B_o = -1$	–55
$B_o = -2$	–62
$B_o = -4$	–70
$B_o = -8$	–87

It should be noted that the overlapping factor, K, is calculated taking into account the break points of the DVB-T mask as defined in Chapter 3 of Annex 2 to this Agreement.

Where B_o, B_i and B_v are as shown in the figure below.

FIGURE AT.4.2-1



RRC06-A2-C4-AT4-2-1

F_W: centre frequency of the wanted signal

F_I: centre frequency of the interfering signal

Examples

It is assumed that:

B_v = 0.2 MHz

B_i = 8 MHz

DVB-T case is non-critical

□*f* (MHz)	3.8	4.0	4.1	4.8
B_o (MHz)	0.3	0.1	0	–0.7
K (dB)	0	10 log(0.1/0.2) = 3 dB	–40	See below *K* = –42

Interpolation example

F = 4.8 MHz from example above

Offset = $-B_o$ = 0.7 MHz

From non-critical Table AT.4.2-4:

0.5 MHz –40 dB

1 MHz –45 dB

$K = ((0.7 - 0.5)/(1.0 - 0.5))*(-45 - (-40)) - 40$

$K = -42$ dB

APPENDIX 4.3

Protection criteria for T-DAB interfered with by other primary services

Protection ratios for T-DAB interfered with by the other primary services listed in Table A.4.3-1 are available in Tables A.4.3-2 to A.4.3-5 of this Appendix and have been derived from Recommendation ITU-R BS.1660-2 – Technical basis for planning of terrestrial digital sound broadcasting in the VHF band (§ 3.5 of Appendix 1 to Annex 1 to the Recommendation, T-DAB interfered with by services other than broadcasting).

The field strength to be protected for T-DAB in Band III is 58 dB(μV/m). Additional information on minimum field strength for T-DAB can be found in Chapter 3.

TABLE A.4.3-1**

System type code	Type of system	Protection ratio table
AL**	Aeronautical mobile (OR) system AL	A.4.3-2
CA**	Fixed system CA	A.4.3-3
DA**	Aeronautical mobile (OR) system DA	A.4.3-2
DB**	Aeronautical mobile (OR) system DB	A.4.3-3
IA**	Fixed system IA	A.4.3-3
MA	Land mobile system MA	A.4.3-3
MT	Mobile and fixed systems MT (transportable)	A.4.3-3
MU**	Mobile system MU (low power)	A.4.3-4
M1	Mobile systems M1 (narrow-band FM, 12.5 kHz)(2)	A.4.3-3
M2**	Mobile system M2 (narrow-band)	A.4.3-3
RA1**, RA2**	Mobile systems RA1 and RA2 narrow-band FM (12.5 kHz)(2)	A.4.3-3
R1**	Land mobile system R1 (medical telemetry)	A.4.3-5
R3**	Mobile system R3 (remote control)	A.4.3-3
R4**	Mobile system R4 (remote control)	A.4.3-3
XA**	Land mobile system XA (private mobile radio)	A.4.3-3
XB**	Fixed system XB (alarm)	A.4.3-3
XE**	Aeronautical mobile (OR) system XE	A.4.3-3
XM**	Land mobile system XM (radio microphones VHF)	A.4.3-3

** The protection criteria for this system were not used during the development of the plan due to the absence of corresponding assignments in the reference situation (see also the introduction to this chapter).

(2) The T-DAB frequency is assumed to be always higher than the private mobile radio frequency.

For all the following tables in this Appendix:

Δf: frequency difference (MHz), i.e. interfering other service centre frequency minus centre frequency of interfered-with T-DAB block

PR : required protection ratio (dB).

TABLE A.4.3-2

AL, DA

Δf (MHz)	**–0.9**	**–0.8**	**–0.6**	**–0.4**	**–0.2**	**0**	**0.2**	**0.4**	**0.6**	**0.8**	**0.9**
PR 1% (dB)	–66	–6.6	2.7	3.2	4.1	6.5	4.1	3.2	2.7	–6.6	–66

TABLE A.4.3-3

CA, DB, IA, MA, MT, M1, M2, RA1, RA2, R3, R4, XA, XB, XE, XM

Δf (MHz)	**–0.9**	**–0.8**	**–0.6**	**–0.4**	**–0.2**	**0**	**0.2**	**0.4**	**0.6**	**0.8**	**0.9**
PR 1% (dB)	–60	–6.6	2.7	3.2	4.1	6.5	4.1	3.2	2.7	–6.6	–60

TABLE A.4.3-4

MU

Δf (MHz)		**–2.0**	**–1.9**	**–1.8**	**–1.7**	**–1.6**	**–1.5**	**–1.4**	**–1.3**	**–1.2**	**–1.1**
PR 1% (dB)		–48.0	–47.9	–47.1	–46.7	–46.4	–46.0	–45.4	–45.1	–43.9	–38.4
Δf (MHz)	**–1.0**	**–0.9**	**–0.8**	**–0.8**	**–0.7**	**–0.6**	**–0.5**	**–0.4**	**–0.3**	**–0.2**	**–0.1**
PR 1% (dB)	–37.5	–28.9	–12.9	–4.9	–1.0	2.1	3.5	4.3	4.1	4.4	4.1
Δf (MHz)	**0.0**	**0.1**	**0.2**	**0.3**	**0.4**	**0.5**	**0.6**	**0.7**	**0.8**	**0.8**	**0.9**
PR 1% (dB)	4.0	4.1	4.4	4.1	4.3	3.5	2.1	–1.0	–4.9	–12.9	–28.9
Δf (MHz)	**1.0**	**1.1**	**1.2**	**1.3**	**1.4**	**1.5**	**1.6**	**1.7**	**1.8**	**1.9**	**2.0**
PR 1% (dB)	–37.5	–38.4	–43.9	–45.1	–45.4	–46.0	–46.4	–46.7	–47.1	–47.9	–48.0

TABLE A.4.3-5

R1

Δf (MHz)	–0.8	0	0.8
PR 1% (dB)	–66	–66	–66

APPENDIX 4.4

Protection criteria for DVB-T interfered with by other primary services

Protection ratios for DVB-T (64-QAM 2/3 Gaussian channel) interfered with by the other primary services listed in Table A.4.4-1 are available in Tables A.4.4-2 to A.4.4-14 of this Appendix. They have been derived from Recommendation ITU-R BT.1368-6 (Planning criteria for digital terrestrial television services in the VHF/UHF bands). Information about the values for field strength to be protected for the different DVB-T variants can be found in the above-mentioned Recommendation. In addition, information about values for field strength to be protected and *C*/*N* for the different DVB-T variants and reception modes can be found in Chapter 3.

Table A.4.4-15 provides correction factors for different DVB-T system variants and reception modes relative to a DVB-T 64-QAM 2/3 Gaussian channel. The values provided in Table A.4.4-15 are to be added to the protection ratios for a DVB-T 64-QAM 2/3 Gaussian channel.

TABLE A.4.4-1

Protection criteria for DVB-T interfered with by other primary services

System type code (STC)	Secondary code implemented in the planning software	Type of system	Protection ratio for 64-QAM 2/3 DVB-T Gaussian channel signal: Table
AA2	BB	Aeronautical radionavigation system BB (RLS 2, Type 2, airborne transmission, 8 MHz)	A.4.4-5
AA8	BL	Aeronautical radionavigation system BL (RSBN, ground transmission, 0.7 or 0.8 MHz)	A.4.4-6
AA8	BN	Aeronautical radionavigation system BN (RSBN, airborne transmission, 3 MHz)	A.4.4-3
AA8	BX	Aeronautical radionavigation system BX (RSBN, ground transmission, 3 MHz)	A.4.4-3
AA8	BY	Aeronautical radionavigation system BY (RSBN, airborne transmission, 0.7 MHz)	A.4.4-6
AB	AB	Aeronautical radionavigation system AB (RLS 1, Type 1 ground transmission, 6 MHz)	A.4.4-2
AB	AC	Aeronautical radionavigation system AC (RLS 1, Type 2 ground transmission, 3 MHz)	A.4.4-3
BA	BA	Aeronautical radionavigation system BA (RLS 2, Type 1 airborne transmission, 4 MHz)	A.4.4-4
BC	BC	Aeronautical radionavigation system BC (RLS 2, Type 2 ground transmission, 3 MHz)	A.4.4-3

TABLE A.4.4-1 (*end*)

System type code (STC)	Secondary code implemented in the planning software	Type of system	Protection ratio for 64-QAM 2/3 DVB-T Gaussian channel signal: Table
BD	BD	Aeronautical radionavigation system BD (RLS 2, Type 1 ground transmission, 4 MHz)	A.4.4-4
FF	FF	Fixed system FF (transportable, 1.2 MHz)	A.4.4-9
FI	FI	Fixed system FI (transportable, 2 MHz)	A.4.4-7
FH	FH	Fixed system FH (bandwidth more than 250 kHz)	A.4.4-8, A.4.4-9
FH	FJ	Fixed system FJ (bandwidth up to 250 kHz)	A.4.4-11, A.4.4-12
FK	FK	Generic fixed system FK (bandwidth more than 250 kHz)	A.4.4-8, A.4.4-9
FK	FL	Generic fixed system FL (bandwidth up to 250 kHz)	A.4.4-11, A.4.4-12
NA	NA	Land mobile system NA (digital, 3 MHz)	A.4.4-3
NA	NC	Land mobile system NC (digital, 5 MHz)	A.4.4-10
NB	NB	Generic mobile system NB	A.4.4-11,A.4.4- 12
NY	OX	Land mobile system OX in VHF band	A.4.4-11, A.4.4-12
NY	OY	Land mobile system OY at 480 MHz	A.4.4-12
NY	OZ	Land mobile system OZ at 620 MHz	A.4.4-12
XG	XG	Aeronautical radionavigation system XG (on channel 36, 4 MHz Airport Radars, UK)	A.4.4-4
–	–	Land mobile system (CDMA-1X)	A.4.4-13
–	–	Land mobile system (CDMA-3X)	A.4.4-14

TABLE A.4.4-2

Protection ratios for DVB-T 8 MHz 64-QAM code rate 2/3 Gaussian channel signal interfered with by AB system

Δf (MHz)	**−13**	**−5.5**	**−4.75**	**0**	**4.75**	**5.5**	**13**
PR (dB)	−40	10	11	16	11	10	−40

TABLE A.4.4-3

Protection ratios for DVB-T 8 MHz 64-QAM code rate 2/3 Gaussian channel signal interfered with by AC, BC, BN, BX and NA systems

Δf (MHz)	**−12**	**−4**	**−3.25**	**0**	**3.25**	**4**	**12**
PR (dB)	−37	9	14	19	14	9	−37

TABLE A.4.4-4

Protection ratios for DVB-T 8 MHz 64-QAM code rate 2/3 Gaussian channel signal interfered with by BA, BD and XG systems

Δ*f* (MHz)	**−12**	**−4.5**	**−3.75**	**0**	**3.75**	**4.5**	**12**
PR (dB)	−38	8	13	18	13	8	−38

TABLE A.4.4-5

Protection ratios for DVB-T 8 MHz 64-QAM code rate 2/3 Gaussian channel signal interfered with by BB system

Δ*f* (MHz)	**−14**	**−6.5**	**−5.75**	**0**	**5.75**	**6.5**	**14**
PR (dB)	−41	5	10	15	10	5	−41

TABLE A.4.4-6

Protection ratios for DVB-T 8 MHz 64-QAM code rate 2/3 Gaussian channel signal interfered with by BL and BY systems

Δ*f* (MHz)	**−12**	**−4.5**	**−3.9**	**0**	**3.9**	**4.5**	**12**
PR (dB)	−38	−33	−3	−3	−3	−33	−38

TABLE A.4.4-7

Protection ratios for DVB-T 8 MHz 64-QAM code rate 2/3 Gaussian channel signal interfered with by FI system

Δ*f* (MHz)	**−12**	**−4.5**	**−3.75**	**0**	**3.75**	**4.5**	**12**
PR (dB)	−45	−27	1	4	1	−27	−45

TABLE A.4.4-8

Protection ratios for DVB-T 7 MHz 64-QAM code rate 2/3 Gaussian channel signal interfered with by FH and FK systems

Δ*f* (MHz)	**−10.5**	**−4**	**−3.25**	**0**	**3.25**	**4**	**10.5**
PR (dB)	−44	−26	1	3	1	−26	−44

TABLE A.4.4-9

Protection ratios for DVB-T 8 MHz 64-QAM code rate 2/3 Gaussian channel signal interfered with by FF, FH and FK systems

Δ*f* (MHz)	**12**	**−4.5**	**−3.9**	**0**	**3.9**	**4.5**	**12**
PR (dB)	−45	−27	0	2	0	−27	−45

TABLE A.4.4-10

Protection ratios for DVB-T 8 MHz 64-QAM code rate 2/3 Gaussian channel signal interfered with by NC system

Δ*f* (MHz)	**−12**	**−5**	**−4.25**	**0**	**4.25**	**5**	**12**
PR (dB)	−39	7	12	17	12	7	−39

TABLE A.4.4-11

Protection ratios for DVB-T 7 MHz 64-QAM code rate 2/3 Gaussian channel signal interfered with by OX, FJ, FL and NB systems

Δ*f* (MHz)	**−10.5**	**−4**	**−3.4**	**0**	**3.4**	**4**	**10.5**
PR (dB)	−37	−32	−2	−2	−2	−32	−38

TABLE A.4.4-12

Protection ratios for DVB-T 8 MHz 64-QAM code rate 2/3 Gaussian channel signal interfered with by OX, OY, OZ, FJ, FL and NB systems

Δ*f* (MHz)	**−12**	**−4.5**	**−3.9**	**0**	**3.9**	**4.5**	**12**
PR (dB)	−38	−33	−3	−3	−3	−33	−38

TABLE A.4.4-13

Protection ratios for DVB-T 8 MHz 64-QAM code rate 2/3 Gaussian channel signal interfered with by emissions of CDMA-1X (measured)

Δ*f* (MHz)	–12	–4.5	–3.75	0	3.75	4.5	12
PR (dB)	–38	–20	–3	10	–3	–20	–38

Characteristics of the interfering signal:

Modulation: QPSK

Bandwidth: 1.25 MHz (99%)

TABLE A.4.4-14

Protection ratios for DVB-T 8 MHz 64-QAM code rate 2/3 Gaussian channel signal interfered with by emissions of CDMA-3X (measured)

Δ*f* (MHz)	–12	–4.5	–3.75	0	3.75	4.5	12
PR (dB)	–38	8	13	18	13	8	–38

Characteristics of the interfering signal:

Modulation: QPSK

Bandwidth: 4 MHz (99%)

TABLE A.4.4-15

Correction factors for protection ratios (dB) for different system variants relative to 64-QAM 2/3 DVB-T signal and for different reception conditions interfered with by other primary services

DVB-T system variant	Gaussian channel	Fixed reception	Portable outdoor reception	Portable indoor reception	Mobile reception
QPSK 1/2	−13.5	−12.5	−10.3	−10.3	−7.3
QPSK 2/3	−11.6	−10.5	−8.2	−8.2	−5.2
QPSK 3/4	−10.5	−9.3	−6.9	−6.9	−3.9
QPSK 5/6	−9.4	−8.1	−5.6	−5.6	−2.6
QPSK 7/8	−8.5	−7.1	−4.5	−4.5	−1.5
16-QAM 1/2	−7.8	−6.8	−3.6	−3.6	−1.6
16-QAM 2/3	−5.4	−4.3	−2.0	−2.0	1.0
16-QAM 3/4	−3.9	−2.7	−0.3	−0.3	2.7
16-QAM 5/6	−2.8	−1.5	1.0	1.0	4.0
16-QAM 7/8	−2.3	−0.9	1.7	1.7	4.7
64-QAM 1/2	−2.2	−1.2	1.0	1.0	4.0
64-QAM 2/3	0.0	1.1	3.4	3.4	6.4
64-QAM 3/4	1.6	2.8	5.2	5.2	8.2
64-QAM 5/6	3.0	4.3	6.8	6.8	9.8
64-QAM 7/8	3.9	5.3	7.9	7.9	10.9

APPENDIX 4.5

Working assumptions concerning the other primary terrestrial services used for the development of the GE06 Plan for digital broadcasting

This Appendix is a collection of the working assumptions which were used in the establishment of the GE06 digital Plan.

The following assumptions were used during the establishment of the digital Plan:

1 For planning purposes, it was assumed that transmitting and receiving sites for the aeronautical radionavigation system used in the United Kingdom in the band 590-598 MHz are co-sited, their antennas are non-directional and the receiving antenna is at 7 m above ground.

2 In the absence of notified values of the height above ground level, the following values were assumed as default effective antenna heights for transmitting stations in other primary services:

− aircraft station in the aeronautical radionavigation service: 10 000 m;

− land station in the aeronautical radionavigation service: 37.5 m;

− station in the fixed service: 37.5 m;

− base station in the land mobile service: 37.5 m.

3 In the absence of values in the RRC-04 Report, the following default receiving antenna heights were assumed for stations in other primary services:

− aircraft station in the aeronautical radionavigation service: 10 000 m;

− station in the fixed service: 10 m;

− base station in the mobile service: 20 m;

− mobile station in the mobile service: 1.5 m;

− receiving ground stations in the aeronautical radionavigation service: 10 m.

4 In the absence of notified values of the effective radiated power, the e.r.p. values were calculated as the sum of the power delivered to the antenna and the antenna gain.

5 Since the Master International Frequency Register (MIFR) does not contain information about the receiving antenna directivity for other primary services and the RRC-04 Report did not contain any information in this respect, it was assumed that no directivity discrimination was obtained in the case of receiving antennas, for any angle.

6 When the notified beamwidth was narrower than the calculated beamwidth by more than 10°, then the calculated beamwidth was used.

7 When the notified azimuth of the maximum radiation was different from the calculated azimuth by more than 3°, then the calculated azimuth was used.

8 An antenna was considered as non-directional if the antenna gain was less than 3.7 dB.

9 Polarization “U” (unspecified) was used if no polarization was given.

10 Since typical transmitting stations (using a T14 notice) did not contain information on their associated receivers, no calculation of interference from digital broadcasting requirements into the assignments notified in the form of typical stations and included in the reference situation were performed during the establishment of the Plan.

11 When MIFR did not contain information on the system type codes, a generic system type code was used for such assignments.

12 When the notified service area of a transmitting or a receiving station of other primary services overlapped with the territory of a neighbouring country, the service area of such stations was limited to the national border of the administrations responsible for the considered station.

ANNEX 3*

Basic characteristics to be submitted in application of the Agreement

Key to the symbols used in Tables 1, 2 and 3

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

Reading the tables

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

1 If any data item has a condition attached to it, then it has a "+".

4	if the assignment or allotment is part of a single frequency network, the identification code for the SFN	+

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

	For a specific transmitting station operating at a single fixed location	
7	name of the location of the transmitting station	X

* Once the contents of this Annex is incorporated in Appendix 4 of the *Radio Regulations*, administrations shall use that Appendix when applying the relevant parts of the Agreement in lieu of Annex 3 (see Resolution 2 (RRC-06)).

TABLE 1

Data for a digital broadcasting assignment or allotment

No.	CHARACTERISTICS TO BE SUBMITTED FOR EACH DIGITAL BROADCASTING ALLOTMENT OR ASSIGNMENT	Article 4 T-DAB allotment	Article 4 T-DAB assignment	Article 5 T-DAB assignment	Article 4 DVB-T allotment	Article 4 DVB-T assignment	Article 5 DVB-T assignment
1	**GENERAL INFORMATION AND FREQUENCY CHARACTERISTICS**						
1.1	ITU symbol of the notifying administration (see the Preface)	X	X	X	X	X	X
1.2	Status code (Add, Modify, Suppress)	X	X	X	X	X	X
1.3	Unique identification code given by the administration to the allotment or assignment (AdminRefId)	X	X	X	X	X	X
1.4	Plan entry code (1 – Assignment, 2 – SFN, 3 – Allotment, 4 – Allotment with linked assignment(s) and SFN_id, 5 – Allotment with a single linked assignment and no SFN_id)	X	X	X	X	X	X
1.5	Assignment Code (L – Linked, C – Converted, S – Standalone)		X	X		X	X
1.6	If the assignment is associated with an allotment, the unique identification code for the associated allotment		+	+		+	+
1.7	If the assignment or allotment is part of a single frequency network, the identification code for the SFN	+	+	+	+	+	+
1.8	Call sign or other identification used in accordance with Article **19** of the RR			O			O
1.9	Assigned frequency (MHz)	X	X	X	X	X	X

TABLE 1 (*continued*)

No.	CHARACTERISTICS TO BE SUBMITTED FOR EACH DIGITAL BROADCASTING ALLOTMENT OR ASSIGNMENT	Article 4 T-DAB allotment	Article 4 T-DAB assignment	Article 5 T-DAB assignment	Article 4 DVB-T allotment	Article 4 DVB-T assignment	Article 5 DVB-T assignment
1.10	If the centre frequency of the emission is offset from the assigned frequency, the frequency offset (kHz)	+	+	+	+	+	+
1.11	Date (actual or foreseen, as appropriate) of bringing the frequency assignment (new or modified) into use		C	X		C	X
1.12	If the assignment or allotment is subject to § 4.1.5.4 of Article 4, the expiry date of that period	+	+	+	+	+	+
2	**LOCATION OF THE ANTENNA(S)**						
2.1	Name of the location of the transmitting station		X	X		X	X
2.2	Digital broadcasting allotment name	X			X		
2.3	Symbol for the country or geographical area (see the Preface)	X	X	X	X	X	X
2.4	Geographical coordinates of the transmitting antenna in:						
2.4.1	latitude (±DDMMSS)		X	X		X	X
2.4.2	longitude (±DDDMMSS)		X	X		X	X
2.5	**For an allotment:**						
2.5.1	If all the test points are on the country or geographical area boundary for this allotment, the symbol for the country or geographical area	+			+		
2.5.2	If not all the test points for the allotment are on the country or geographical area boundary, the number (up to 9) of sub-areas within this allotment (if there is no subdivision, enter 1 for the unique contour number)	+			+		

TABLE 1 (*continued*)

No.	CHARACTERISTICS TO BE SUBMITTED FOR EACH DIGITAL BROADCASTING ALLOTMENT OR ASSIGNMENT	Article 4 T-DAB allotment	Article 4 T-DAB assignment	Article 5 T-DAB assignment	Article 4 DVB-T allotment	Article 4 DVB-T assignment	Article 5 DVB-T assignment
2.5.3	**For each sub-area (up to 9):**						
2.5.3.1	A unique contour number	X			X		
2.5.3.2	The number of sub-area boundary test points (up to 99)	X			X		
2.5.3.3	The geographical coordinates of each sub-area boundary test point in:						
2.5.3.3.1	latitude (±DDMMSS)	X			X		
2.5.3.3.2	longitude (±DDDMMSS)	X			X		
3	**DIGITAL BROADCASTING SYSTEM CHARACTERISTICS**						
3.1	If the reference planning configuration is not provided, the digital television system (including DVB-T variant) (A, B, C, D, E, F and 1, 2, 3, 5, 7)					+	+
3.2	If the reference planning configuration is not provided, the reception mode (FX, PO, PI, MO)					+	+
3.3	Reference planning configuration (RPC 1, RPC 2, RPC 3, RPC 4 or RPC 5) In the case of a DVB-T assignment, required if the digital television system and the reception mode are not provided	X	X	X	X	+	+
3.4	Type of reference network (RN1, RN2, RN3 or RN4)				X		
3.5	Type of spectrum mask (for DVB-T: N = Non-critical, S = Sensitive. For T-DAB: 1, 2, 3 (see § 3.6 of this Agreement))	C	X	X	C	X	X

TABLE 1 (*continued*)

No.	CHARACTERISTICS TO BE SUBMITTED FOR EACH DIGITAL BROADCASTING ALLOTMENT OR ASSIGNMENT	Article 4 T-DAB allotment	Article 4 T-DAB assignment	Article 5 T-DAB assignment	Article 4 DVB-T allotment	Article 4 DVB-T assignment	Article 5 DVB-T assignment
3.6	If the polarization is horizontal or mixed, the maximum effective radiated power of the horizontally polarized component in the horizontal plane (dBW)		+	+		+	+
3.7	If the polarization is vertical or mixed, the maximum effective radiated power of the vertically polarized component in the horizontal plane (dBW)		+	+		+	+
3.8	Maximum effective radiated power in the plane defined by the beam tilt angle (dBW)					O	O
4	**ANTENNA CHARACTERISTICS**						
4.1	Antenna directivity (directional (D) or non-directional (ND))		X	X		X	X
4.2	Polarization (H – horizontal, or V – vertical, or M – mixed), or U[(1)] – unspecified, for allotments only	X	X	X	X	X	X
4.3	Height of transmitting antenna above ground level (m)		X	X		X	X
4.4	Altitude of the site above sea level (m) measured at the base of the transmitting antenna		X	X		X	X
4.5	Maximum effective antenna height (m)		X	X		X	X

[(1)] Unspecified – This can be horizontal (H), or vertical (V), or mixed (M). At all times during assessment for the RPC and RN, all the power in the horizontal polarization, or all the power in the vertical polarization, or in the case of mixed polarization the power sum of the horizontal and vertical components, shall remain constant. For the reference network, the same pattern shall be used for both polarizations.

TABLE 1 (*continued*)

No.	CHARACTERISTICS TO BE SUBMITTED FOR EACH DIGITAL BROADCASTING ALLOTMENT OR ASSIGNMENT	Article 4 T-DAB allotment	Article 4 T-DAB assignment	Article 5 T-DAB assignment	Article 4 DVB-T allotment	Article 4 DVB-T assignment	Article 5 DVB-T assignment
4.6	Effective antenna height (m) at 36 different azimuths in 10° intervals, measured in the horizontal plane from True North in a clockwise direction		X	X		X	X
4.7	If the polarization is horizontal or mixed, the value of the antenna attenuation (dB) of the horizontally polarized component, normalized to 0 dB, at 36 different azimuths in 10° intervals, measured in the horizontal plane from True North in a clockwise direction		+	+		+	+
4.8	If the polarization is vertical or mixed, the value of the antenna attenuation (dB) of the vertically polarized component, normalized to 0 dB, at 36 different azimuths in 10° intervals, measured in the horizontal plane from True North in a clockwise direction		+	+		+	+
4.9	Beam tilt angle (degrees)					O	O
5	**HOURS OF OPERATION**						
5.1	Regular hours (UTC) of operation of the frequency assignment:						
5.1.1	start time			X			X
5.1.2	stop time			X			X
6	**COORDINATION AND AGREEMENT**						
6.1	If coordination is necessary and agreement has been obtained:						
6.1.1	the ITU symbol of the administration with which coordination has been effected	**+**	**+**	+	+	+	+

TABLE 1 (*end*)

No.	CHARACTERISTICS TO BE SUBMITTED FOR EACH DIGITAL BROADCASTING ALLOTMENT OR ASSIGNMENT	Article 4 T-DAB allotment	Article 4 T-DAB assignment	Article 5 T-DAB assignment	Article 4 DVB-T allotment	Article 4 DVB-T assignment	Article 5 DVB-T assignment
6.1.2	the provision (No. of the Radio Regulations, regional agreement or other arrangement) requiring such coordination	+	+	+	+	+	+
6.2	If the assignment is subject to § 5.1.2 of Article 5, a declaration by the notifying administration that all conditions associated with the remark are fully met for the submitted assignment for recording in the MIFR			+			+
6.3	If the assignment is subject to § 5.1.8 of Article 5, a signed commitment from the notifying administration that the submitted assignment for recording in the MIFR shall not cause unacceptable interference and shall not claim protection			+			+
7	**OPERATING ADMINISTRATION OR AGENCY**						
7.1	Symbol for the operating agency (see the Preface)			O			O
7.2	Symbol for the address of the administration (see the Preface) responsible for the station and to which communication should be sent on urgent matters regarding interference, quality of emissions and questions referring to the technical operation of the circuit (see Article **15** of the RR)			X			X
8	**REMARKS**						
8.1	Any comment designed to assist the Bureau in processing the notice	O	O	O	O	O	O

TABLE 2

Data for a VHF/UHF analogue television broadcasting assignment
(to be used during the transition period)

No.	CHARACTERISTICS TO BE PROVIDED FOR EACH ANALOGUE BROADCASTING ASSIGNMENT	Article 4 (GE06)	Article 5 (GE06)
1	**GENERAL INFORMATION AND FREQUENCY CHARACTERISTICS**		
1.1	ITU symbol of the notifying administration (see the Preface)	X	X
1.2	Status code (Add, Modify, Suppress)	X	X
1.3	Unique identification code given by the administration to the assignment (AdminRefId)	X	X
1.4	Call sign or other identification used in accordance with Article **19** of the RR		O
1.5	Assigned frequency (MHz)	X	X
1.6	Vision carrier frequency offset, expressed as a multiple of 1/12 of the line frequency of the television system concerned, expressed by a number (positive or negative) or kHz	X	X
1.7	If the sound carrier frequency offset is different from the vision carrier frequency offset, the sound carrier frequency offset expressed as a multiple of 1/12 of the line frequency of the television system concerned, expressed by a number (positive or negative) or kHz	+	+
1.8	Date (actual or foreseen, as appropriate) of bringing the frequency assignment (new or modified) into use	C	X
1.9	If the assignment is subject to § 4.1.5.4 of Article 4, the expiry date of that period	+	+
2	**LOCATION OF THE TRANSMITTING ANTENNA(S)**		
2.1	Name of the location of the transmitting station	X	X
2.2	ITU symbol of the country or the geographical area	X	X
2.3	Geographical coordinates of the transmitting antenna:		
2.3.1	latitude (±DDMMSS)	X	X
2.3.2	longitude (±DDDMMSS)	X	X

TABLE 2 (*continued*)

No.	CHARACTERISTICS TO BE PROVIDED FOR EACH ANALOGUE BROADCASTING ASSIGNMENT	Article 4 (GE06)	Article 5 (GE06)
3	**ANALOGUE BROADCASTING SYSTEM CHARACTERISTICS**		
3.1	Frequency stability indicator (RELAXED, NORMAL or PRECISION)	X	X
3.2	Symbol corresponding to the television system (B, B1, D, D1, G, H, I, K, K1, L or M)	X	X
3.3	Symbol corresponding to the colour system (P = PAL, S = SECAM)	X	X
3.4	If the polarization is horizontal or mixed, the maximum effective radiated power of the horizontally polarized component (dBW)	+	+
3.5	If the polarization is vertical or mixed, the maximum effective radiated power of the vertically polarized component (dBW)	+	+
3.6	Vision/sound carrier power ratio	X	X
4	**ANTENNA CHARACTERISTICS**		
4.1	Antenna directivity (directional (D) or non-directional (ND))	X	X
4.2	Polarization (H – horizontal, or V – vertical, or M – mixed)	X	X
4.3	Height of antenna above ground level (m)	X	X
4.4	Altitude of the site above sea level (m) measured at the base of the transmitting antenna	X	X
4.5	Maximum effective height of the antenna (m)	X	X
4.6	Effective antenna height (m) at 36 different azimuths in 10° intervals, measured in the horizontal plane from True North in a clockwise direction	X	X
4.7	If the polarization is horizontal or mixed, the value of the antenna attenuation (dB) of the horizontally polarized component, at 36 different azimuths in 10° intervals, measured in the horizontal plane from True North in a clockwise direction	+	+
4.8	If the polarization is vertical or mixed, the value of the antenna attenuation (dB) of the vertically polarized component, at 36 different azimuths in 10° intervals, measured in the horizontal plane from True North in a clockwise direction	+	+

TABLE 2 (*end*)

No.	CHARACTERISTICS TO BE PROVIDED FOR EACH ANALOGUE BROADCASTING ASSIGNMENT	Article 4 (GE06)	Article 5 (GE06)
5	**HOURS OF OPERATION**		
5.1	Regular hours (UTC) of operation of the frequency assignment:		
5.1.1	start time	C	X
5.1.2	stop time	C	X
6	**COORDINATION AND AGREEMENT**		
6.1	If coordination is necessary and agreement has been obtained:		
6.1.1	the ITU symbol of the administration with which coordination has been effected	+	+
6.1.2	the provision (No. of the Radio Regulations, regional agreement or other arrangement) requiring such coordination	+	+
6.2	If the assignment is subject to § 5.1.8 of Article 5, a signed commitment from the notifying administration that the submitted assignment for recording in the MIFR shall not cause unacceptable interference and shall not claim protection		+
7	**OPERATING ADMINISTRATION OR AGENCY**		
7.1	Symbol for the operating agency (see the Preface)		O
7.2	Symbol for the address of the administration (see the Preface) responsible for the station and to which communication should be sent on urgent matters regarding interference, quality of emissions and questions referring to the technical operation of the circuit (see Article **15** of the RR)		X
8	**REMARKS**		
8.1	Any comment designed to assist the Bureau in processing the notice	O	O

TABLE 3

Data for assignments to stations of other primary terrestrial service

No.	CHARACTERISTICS TO BE SUBMITTED FOR EACH ASSIGNMENT TO OTHER PRIMARY TERRESTRIAL SERVICE	App. 4 RR	Article 4 (GE06)	Article 5 (GE06)
1	**GENERAL INFORMATION AND FREQUENCY CHARACTERISTICS**			
1.1	ITU symbol of the notifying administration (see the Preface)	B	X	X
1.2	Status code (Add, Modify, Suppress)		X	X
1.3	Unique identification code given by the administration to the assignment (AdminRefId)		X	X
1.4	Call sign or other identification used in accordance with Article **19** of the RR	3A		O
1.5	Assigned frequency (MHz)	1A	X	X
1.6	If the modulation envelope is asymmetric or composite, the reference frequency (MHz)	1B	+	+
1.7	Date of bringing the frequency assignment into use	2C	C	X
1.8	If the assignment is subject to § 4.2.5.5 of Article 4, the expiry date of that period		+	+
2	**LOCATION OF THE TRANSMITTING ANTENNA(S)**			
2.1	**For a specific transmitting station operating at a single fixed location:**			
2.1.1	Name of the location of the transmitting station	4A	X	X
2.1.2	ITU symbol of the country or the geographical area	4B	X	X
2.1.3	Geographical coordinates of the transmitting antenna in:	4C		
2.1.3.1	latitude (±DDMMSS)		X	X
2.1.3.2	longitude (±DDDMMSS)		X	X
2.2	**For a circular or defined area containing either typical transmitting stations or mobile transmitting stations:**			
2.2.1	If the symbol of a country or geographical area is not provided, the geographical coordinates of the centre of the circular area in:	4C		
2.2.1.1	latitude (±DDMMSS)		+	+
2.2.1.2	longitude (±DDDMMSS)		+	+

TABLE 3 (*continued*)

No.	CHARACTERISTICS TO BE SUBMITTED FOR EACH ASSIGNMENT TO OTHER PRIMARY TERRESTRIAL SERVICE	App. 4 RR	Article 4 (GE06)	Article 5 (GE06)
2.2.2	If the symbol of a country or geographical area is not provided, the nominal radius (km) of the circular area	4D	+	+
2.2.3	If geographical coordinates and a nominal radius are not provided, the ITU symbol of the country or geographical area	4E	+	+
3	**LOCATION OF THE RECEIVING ANTENNA**			
3.1	**For a specific receiving station operating at a single fixed location:**			
3.1.1	Name of the location of the receiving station	5A	X	X
3.1.2	ITU symbol of the country or geographical area	5B	X	X
3.1.3	Geographical coordinates of the receiving antenna:	5C		
3.1.3.1	latitude (±DDMMSS)		X	X
3.1.3.2	longitude (±DDDMMSS)		X	X
3.2	**For a defined area of reception associated with a specific transmitting station:**			
3.2.1	If a circular receiving area is not provided, the ITU symbol of the country or geographical area of reception	5D	+	+
3.2.2	If a geographical area is not provided, the geographical coordinates of the centre of the circular receiving area in:	5E		
3.2.2.1	latitude (±DDMMSS)		+	+
3.2.2.2	longitude (±DDDMMSS)		+	+
3.2.3	If a geographical area is not provided, the nominal radius (km) of the circular receiving area	5F	+	+
3.2.4	If a receiving station in the fixed service and the characteristics under 3.1 above are not provided, the geographical coordinates (between 3 and 6 sets) defining the area in which the receiving stations are located in:	5C		
3.2.4.1	latitude (±DDMMSS)		+	+
3.2.4.2	longitude (±DDDMMSS)		+	+
4	**CLASS OF STATION AND NATURE OF SERVICE**			
4.1	Class of station, using the symbols from the Preface	6A	X	X
4.2	Nature of service performed, using the symbols from the Preface	6B	X	X
5	**SYSTEM CHARACTERISTICS**			
5.1	Class of emission, in accordance with Article **2** and Appendix **1** of the RR	7A	X	X

TABLE 3 (*continued*)

No.	CHARACTERISTICS TO BE SUBMITTED FOR EACH ASSIGNMENT TO OTHER PRIMARY TERRESTRIAL SERVICE	App. 4 RR	Article 4 (GE06)	Article 5 (GE06)
5.2	Necessary bandwidth, in accordance with Article **2** and Appendix **1** of the RR	7A	X	X
5.3	System type code		X	X
5.4	If the transmitter output power is supplied, the symbol describing, as appropriate, the type of power (X, Y or Z)	8	+	+
5.5	If the radiated power is not supplied, the transmitter output power (dBW)	8A	+	+
5.6	Maximum power density (dB(W/Hz)) averaged over the worst 4 kHz band supplied to the antenna transmission line	8AB	O	X
5.7	If the transmitter output power is not supplied, the maximum effective radiated power expressed in dBW	8B	+	+
6	**ANTENNA CHARACTERISTICS**			
6.1	If the maximum effective radiated power is not supplied, the maximum antenna gain, relative to a half-wave dipole, in the direction of maximum radiation	9G	+	+
6.2	**For an assignment to a specific transmitting/receiving station operating at a single fixed location (excluding typical stations):**			
6.2.1	Polarization	9D	X	X
6.2.2	Height of antenna above ground level (m)	9E	X	X
6.2.3	Antenna directivity (directional (D) or non-directional (ND))	9	X	X
6.2.4	**For a directional transmitting/receiving antenna operating at a fixed location:**			
6.2.4.1	The total angular width of the radiation main lobe (*beamwidth*) measured horizontally in a plane containing the direction of maximum radiation (degrees), within which the power radiated in any direction does not fall more than 3 dB below the power radiated in the direction of maximum radiation	9C	O	O
6.2.4.2	Antenna gain towards the local horizon		O	O
6.2.5	**For a transmitting antenna operating from a fixed location:**			
6.2.5.1	Altitude of the site above sea level measured at the base of the antenna (m)	9EA	X	X
6.2.5.2	Maximum effective antenna height (m)	9EB	X	X
6.2.5.3	Effective antenna height (m) at 36 different azimuths in 10° intervals, measured in the horizontal plane from True North in a clockwise direction	9EC	X	X

TABLE 3 (*end*)

No.	CHARACTERISTICS TO BE SUBMITTED FOR EACH ASSIGNMENT TO OTHER PRIMARY TERRESTRIAL SERVICE	App. 4 RR	Article 4 (GE06)	Article 5 (GE06)
6.2.5.4	**For a directional transmitting antenna operating at a fixed location:**			
6.2.5.4.1	If the antenna beam is not rotating or swept, the azimuth of maximum radiation of the antenna in degrees (clockwise) from True North	9A	+	+
6.2.5.4.2	If the antenna beam is rotating or swept, the azimuthal sector swept by the antenna's main beam axis:	9AB		
6.2.5.4.2.1	start azimuth, in degrees, clockwise from True North		+	+
6.2.5.4.2.2	end azimuth, in degrees, clockwise from True North		+	+
7	**HOURS OF OPERATION**			
7.1	Regular hours (UTC) of operation of the frequency assignment:	10B		
7.1.1	start time		C	X
7.1.2	stop time		C	X
8	**COORDINATION AND AGREEMENT**			
8.1	If coordination is necessary and agreement has been obtained, the ITU symbol of the administration with which coordination has been successfully effected	11	+	+
8.2	If the assignment is subject to § 5.2.6 of Article 5, a signed commitment from the notifying administration that the submitted assignment for recording in the MIFR shall not cause unacceptable interference and shall not claim protection			+
9	**OPERATING ADMINISTRATION OR AGENCY**			
9.1	Symbol for the operating agency (see the Preface)	12A		O
9.2	Symbol for the address of the administration (see the Preface) responsible for the station and to which communication should be sent on urgent matters regarding interference, quality of emissions and questions referring to the technical operation of the circuit (see Article **15** of the RR)	12B	X	X
10	**REMARKS**			
10.1	Any comment designed to assist the Bureau in processing the notice		O	O

ANNEX 4

Section I
of Annex 4

Limits and methodology for determining when agreement with another administration is required

1 Introduction

If an administration proposes to modify the Plan or to coordinate an assignment to a station in another primary terrestrial service it is necessary to determine if any administration(s) from the planning area might be affected, i.e. identify the administration(s) with which agreement has to be sought. This Annex contains the coordination limits and the appropriate technical methodology that shall be used to identify the administrations with which coordination is required.

The methodology defines an area within which a trigger field-strength value is exceeded. By selecting the appropriate trigger field-strength value in the attached appendices, it is possible to identify the total area within which the relevant trigger field strength is exceeded for a range of services, and hence determine the administration(s) with which coordination is required.

The process of identification of administrations potentially affected is based on the determination of coordination contours associated with the proposed modifications (see § 2 of this Section). Affected administrations are those administrations whose national boundaries, for broadcasting, or service areas of other primary terrestrial services, are intersected by or enclosed within these contours.

2 Method for identifying potentially affected administrations

The total area within which the relevant trigger field strength is exceeded is determined on the basis of known characteristics for the proposed modification. However, the details of operation of the potentially affected stations are unknown, and hence it is necessary to assume worst-case parameters for the propagation path and for the system parameters of the unknown receiving stations.

Although the determination of the area within which coordination is required is based on technical criteria, it is important to note that it represents a regulatory concept, for the purpose of identifying the area within which detailed evaluations of the interference potential needs to be performed.

Hence, the coordination area is not an exclusion zone within which the sharing of frequencies is prohibited, but a means for determining the area within which more detailed calculations need to be performed.

In most cases, a more detailed analysis will show that sharing within the coordination area is possible, since the procedure for the determination of the coordination area is based on unfavourable assumptions with regard to the interference potential.

The methodology allows for the determination of the distance for each azimuth around the proposed new or modified station, or the area within which the station is located, beyond which the interfering field strength is expected to be less than a specific value for all but a specified percentage of the time. When this distance is determined for each azimuth, it defines a field-strength contour, called the coordination contour, which encloses the coordination area. Separate coordination contours are produced for each trigger field strength required.

The determination of the field strength is based on the propagation model in Chapter 2 of Annex 2 to the Agreement. This propagation model is not valid beyond 1 000 km, and therefore the calculation of interference from any transmitter is limited to the 1 000 km maximum distance of the propagation model.

2.1 Identification of administrations potentially affected by modifications to the Plans

In order to identify those administrations potentially affected by a proposed modification to the Plans, it is necessary to identify the relevant trigger field strength(s) to be used in the calculations.

For an intended modification to the Plan, the characteristics of the assignment or allotment are known. In particular, the geographical coordinates defining the allotment area or the location of the transmitter(s) are given. Based on this information, a list of countries within 1 000 km of the allotment area or the transmitter site under consideration is drawn up. This list can be developed by intersecting a corresponding contour with the national boundaries of administrations as given by the IDWM.

The method for identifying potentially affected administrations consists of the five following steps:

Step 1 – Establishment of the 1 000 km contour

In order to identify any potentially affected service, all countries whose boundaries lie inside or are intersected by the 1 000 km contour are taken into consideration.

Step 2 – Selection of administrations whose broadcasting service is potentially affected

A contour is developed, for each frequency range, based on the trigger coordination value corresponding to the type of broadcasting service modifying the Plan, as specified in Table A.1.1 of Appendix 1 to this Section and following the procedure developed in § 3 of this Section.

Step 3 – Selection of assignments of other services located in the 1 000 km contour

In this step, assignments in other primary services are selected, based on the following criteria:

– assignment belongs to an administration within the 1 000 km contour;

– assignment is contained in the List of assignments to other primary terrestrial services given in Annex 5 to this Agreement or for which the procedure of Article 4 of this Agreement has already been initiated.

The result of this selection process will be a list of countries/assignments for which the corresponding trigger values have to be extracted from the Tables of trigger values in Appendix 1 to this Section.

Step 4 – Construction of coordination contours

For each unique trigger value in the above list, a coordination contour is developed. In this way, there will be always one coordination contour for the protection of the broadcasting service identified in Step 2 and, for each frequency range, possibly several coordination contours for every type of other service selected in Step 3.

The methods of calculating coordination contours for different coordination scenarios are described in § 4 of this Section. The technical assumptions to be used are specified in § 5.1 of this Section. The coordination trigger values are given in Appendix 1 to this Section.

Step 5 – Identification of potentially affected administrations

The administrations with which coordination is required are identified by the coordination contours intersecting with or enclosing:

– the national boundaries of those administrations identified in Step 2 in relation to broadcasting;

– the locations of receiving stations/service areas of other primary services identified in Step 3.

2.2 Identification of administrations potentially affected by assignments of other primary terrestrial services

The starting point is the intended modifications or additions to the List in Annex 5 to this Agreement whose characteristics are known. Based on this information, and using the methods described in § 2.1 of this Section, the assignments and the administrations with which coordination is required are identified.

The analysis is finalized by explicitly calculating the field-strength values at the national boundaries of the identified countries.

When an assignment in another primary service is notified, the coordination contours for the transmitting stations and for associated receiving stations at specified locations or service areas are constructed. The larger of the two is to be taken into account for the identification of affected administrations.

The details of calculating coordination contours for different coordination scenarios are described in § 3 and 4 of this Section. The technical assumptions to be used are specified in § 5.2 of this Section. The coordination trigger values are given in Appendix 1 to this Section.

3 Construction of coordination contours

The coordination contour is developed using equally spaced radials 1° apart, over 360° around the allotment/assignment or the service area, centred on a single reference point, the location of which is defined in § 4 of this Section for each coordination scenario.

The coordination contour is calculated for each radial by starting at a distance of 1 000 km from the location of the station or the boundary of the area where it is located as defined in § 4 of this Section for each coordination scenario. Calculation is then performed by moving along the radial towards the reference point in 10 km steps.

In this Annex, the procedures determine for each one degree step in azimuth around the coordinating broadcasting station or station in another terrestrial service, the distance at which the trigger field strength is reached and hence the distance used to create the coordination contour. All field-strength calculations are based on the propagation model described in Chapter 2 of Annex 2 to this Agreement.

However, if the trigger field strength has not been reached at the 1 000 km limit of the propagation model, the coordination contour on that radial/azimuth should have a distance of 1 000 km from the location of the station or the boundary of the area where it is located.

The resulting coordination contours may be drawn on a map in order to facilitate the coordination process.

3.1 Coordination contour requirements

The coordination scenarios and the various procedures contained in this Annex are based on different assumptions. Hence, the size of the coordination contours will depend on the coordination scenario. Separate coordination contours are therefore required for each sharing scenario described in § 4 of this Section. Furthermore, the coordination contour developed for one coordination scenario cannot be used to determine the extent of any impact on the radiocommunication services covered by a different coordination scenario.

3.2 Additional contours

In addition to the coordination contour, administrations may draw additional contours to facilitate more detailed coordination discussions. These additional contours may be based on less onerous sharing criteria (e.g. the inclusion of polarization, antenna discrimination at the affected receiver) than that used for developing the coordination area. These additional contours may be developed by the same method used to determine the coordination contour, or by other methods as agreed on a bilateral basis between administrations.

4 Different coordination scenarios

The following subsections describe the basic assumptions made about interference assessment and the location of the point of reference to be used for the construction of the coordination contours for the various frequency sharing scenarios.

4.1 Individual stations operating from a fixed and determined location

For a broadcasting station or a station in another primary terrestrial service operating from a fixed location, the coordination contours are calculated in all directions of azimuth from the geographical location of the transmitting or receiving antenna and taking into consideration any variation in the antenna gain (if available).

4.2 Typical transmitting stations operating from a fixed location within a specified service area

For typical transmitting stations, the point of reference is the centre of gravity of the specified service area confined to the national territory, if it is located within this service area. If that is not the case, the point of reference is taken at the closest point from the centre of gravity that will be included in the service area. The coordination contour is constructed around the boundaries of the specified service area within which the typical stations are operating.

No allowance is made for antenna discrimination and polarization.

4.3 Broadcasting stations operating in a single-frequency network

For a broadcasting station operating in a single-frequency network (SFN), coordination contours are calculated by using as point of reference, the centre of gravity of the geographical coordinates of all transmitter locations in the SFN. The individual field-strength contributions of the transmitters are combined by means of the power sum method (see Chapter 3 of Annex 2 to the Agreement).

4.4 Broadcasting allotments

In the case of an allotment, the point of reference is the centre of gravity of the allotment area if it is located within this area. If that is not the case, the point of reference is taken at the point closest to the centre of gravity that will be included in the allotment area. The characteristics of the associated reference network (RN) and reference planning configuration (RPC) are used as the source of the interfering field strength. Each boundary test point of the allotment will be considered as a source of potential interference of the allotment (see Appendix 3 to this Section for detailed description). The largest field strength obtained, at each calculation point under consideration, from each allotment boundary test point is taken as the value of field strength to be used.

In the case of an allotment with linked assignments and a SFN identifier, the two calculations described below shall be performed.

– In the first calculation the characteristic properties of the associated reference network and reference planning configuration are used as the source of potential interference as described above.

– In the second calculation the characteristic properties of each of the linked assignments are used to calculate the power sum of the interference potential at the calculation point.

The higher field strength from the two calculations above is taken as the relevant field strength.

For an assignment linked to an allotment with no SFN identifier, the characteristic properties of the assignment will be used to calculate the field strength as described in § 4.1 of this Section.

4.5 Mobile (except aeronautical mobile) stations

For a mobile (except aeronautical mobile) station, the point of reference is the centre of gravity of the specified service area and the coordination contour is constructed around the boundaries of the specified service area, within which the mobile (except aeronautical mobile) stations are operating. In addition, the specified area in which the mobile station operates should be confined to the national territory. No allowance is made for antenna discrimination.

4.6 Aeronautical radionavigation stations

For ground-based aeronautical radionavigation stations, the point of reference is the geographical location of the station.

For air-based aeronautical radionavigation stations, the point of reference is the centre of gravity of the specified service area within which the aeronautical radionavigation stations operates if it is located within this service area. If that is not the case, the point of reference is taken at the point closest to the centre of gravity that will be included in the service area. For the air-based station, no allowance is made for antenna discrimination.

For air-based stations, the specified service area should be confined to the national territory.

5 Determination of the coordination trigger field strength

5.1 Modifications to the Plans

5.1.1 Protection of the broadcasting service

The construction of coordination contours and calculation of the interfering field strength are based on the propagation model described in the Chapter 2 of Annex 2 to the Agreement. The following characteristics for the determination of interference into the broadcasting receiver are used:

– notified values of the radiated power and the effective antenna height;

– coordination trigger field-strength values in Table A.1.1 of Appendix 1 to this Section;

– the propagation curves for the tropospheric case (i.e. 1% time and 50% locations);

– the receiving antenna height of 10 m above ground level.

5.1.2 Protection of other primary terrestrial services

The construction of coordination contours is based on the propagation prediction method included in the Chapter 2 of Annex 2 to the Agreement.

For ground-to-ground calculations, propagation curves for 10% of the time and 50% of locations are used.

For ground-to-air calculations, the free-space model should be used. The coordination contour is limited to a line-of-sight distance of 420 km.

The field strength is calculated for the receiving antenna heights provided in the relevant Tables in § A.2, A.3 or A.4 of Appendix 1 to this Section.

For systems of other primary services the coordination trigger field-strength values are given in Tables A.1.2 to A.1.8 of Appendix 1 to this Section.

5.2 Coordination of an assignment to a station in another primary terrestrial service

5.2.1 Coordination of an assignment to a transmitting station in another primary terrestrial service

Construction of coordination contours and calculation of the interfering field strength are based on the propagation model described in Chapter 2 of Annex 2 to the Agreement.

For ground-to-ground calculations, the propagation curves for 1% of the time and for 50% of locations should be used.

For air-to-ground, the free-space model should be used. The coordination contour is limited to a line-of-sight distance of 420 km.

In the case of aeronautical services for airborne stations the height of the transmitting antenna above the ground is 10 000 m.

For the protection of the Plan, the coordination trigger field-strength values are given in Table A.1.10 of Appendix 1 to this Section.

5.2.2 Coordination of an assignment to a receiving station in another primary terrestrial service

For the coordination of an assignment to a receiving station, it is necessary to assume the following figures for the operation of a broadcasting station:

– total maximum radiated power 53 dBW;

– maximum effective antenna height 600 m and mixed polarization.

If the use of these assumed figures does not result in the identification of an administration operating, or planning to operate, a station that exceeds these values then the administration responsible for the receiving station agrees that there will be no claim for protection from the administration responsible for the broadcasting station, unless otherwise agreed in the coordination process.

The maximum coordination distance for aircraft receivers is set at 500 km.

For the construction of the coordination contours under § 5 of this Section, the point of reference for the construction of the equally-spaced radials is the location of the receiving station or the centre of gravity of the area where the receiving stations operate. The coordination contour is calculated for each radial by placing the broadcasting station referred to above at a distance of 1 000 km from the reference point and determining the field strength at the reference point. If the field strength is below the required threshold for the receiving station, the potential broadcasting station is moved along the radial towards the reference point in 10 km steps until the required threshold value is reached. The distance at which the threshold value is reached is determined for each radial and these distances are joined together to form the coordination contour.

Appendix 1
to Section I

A Coordination trigger field strengths for the protection of the broadcasting and other primary services from a modification to the Plan

A.1 Coordination trigger field strengths for the identification of administrations for the protection of the broadcasting service from modifications to the Plan

This Agreement deals with various broadcasting systems. Therefore, different trigger field-strength values have to be taken into account.

The basis for the determination of these values are given in Appendix 2 to Section I.

Table A.1.1 shows the proposed coordination trigger field strengths to be used for the identification of affected administrations for the protection of broadcasting from modifications of the Plan.

TABLE A.1.1

Coordination trigger field-strength values to protect systems in the broadcasting service from modifications to the Plan

Broadcasting system modifying the Plan	Trigger field strength (dB(μV/m))			
	Band III (174-230 MHz)	Band IV (470-582 MHz)	Band V (582-718 MHz)	Band V (718-862 MHz)
DVB-T	17	21	23	25
T-DAB	12	–	–	–
Analogue TV	10	18	20	22

A.2 Coordination trigger field strengths to protect the mobile service in the bands 174-230 MHz and 470-862 MHz

The trigger field-strength levels to protect systems in the mobile service from T-DAB and DVB-T systems are provided in Tables A.1.2 and A.1.3 respectively, with their corresponding system type codes.

TABLE A.1.2

Coordination trigger field-strength values to protect systems in the mobile service in the band 174-230 MHz from T-DAB

System to be protected	System type code (see Annex 2, Chapter 4)	Trigger field strength (dB(μV/m))(1)	Height of the receiving antenna (m)
Mobile system MU (low power)	MU	16	10
Mobile system M1 (narrow-band FM, 12.5 kHz) (private mobile radio) Mobile systems RA1 and RA2 (narrow-band FM, 12.5 kHz)	M1 and RA	19 (base station) 27 (mobile station)	20 (base station) 1.5 (mobile station)
Mobile system M2 (narrow-band)	M2	48	10
Land mobile system XA (private mobile radio)	XA	27	10
Land mobile system XM (radio microphones VHF)	XM	30	10
Land mobile system MA	MA	21	10
Mobile and fixed systems (transportable)	MT	5	10

(1) The trigger field-strength values are related to 1.5 MHz T-DAB bandwidth.

TABLE A.1.3

Coordination trigger field-strength values to protect systems of the mobile service from DVB-T

System to be protected	System type code (see Annex 2, Chapter 4)	Frequency range	Trigger field strength (dB(μV/m))(1)	Height of the receiving antenna (m)
Analogue private mobile radio, 12.5 kHz	NV	Band III	30 (base stations) 38 (mobile stations)	20 (base station) 1.5 (mobile station)
Land mobile system NR (radio microphone)	NR	790-862 MHz/Band III	58 (UHF)/50 (VHF)	1.5
Mobile system NS (OB link, stereo, non-companded)	NS	790-862 MHz/Band III	45 (UHF)/37 (VHF)	10
Mobile system NT (Talk-back)	NT	790-862 MHz/Band III	47 (UHF)/39 (VHF)	1.5

TABLE A.1.3 (*end*)

System to be protected	**System type code (see Annex 2, Chapter 4)**	**Frequency range**	**Trigger field strength (dB(μV/m))[(1)]**	**Height of the receiving antenna (m)**
Digital land mobile system NA (e.g. CDMA)	NA	470-862 in Region 3, 790-862 MHz in accordance with RR No. 5.316	18 (base station)	20 (base station)
Generic mobile system NB	NB	174-230 MHz/ 470-862 MHz	See equation (A.1.1) and Table A.1.4 (base station) See equation (A.1.1) and Table A.1.5 (mobile station)	20.0 (base station) 1.5 (mobile station)
Land mobile system XN (VHF)	XN	Band III	38	1.5
Land mobile system YN (480 MHz)	YN	480 MHz	41	1.5
Land mobile system ZC (620 MHz)	ZC	620 MHz	43	1.5

(1) The trigger field-strength values are related to the DVB-T bandwidth.

For the generic case (type code NB) in the mobile service, i.e. when there is no value of protection ratio available, the following equation must be used:

$$F_{trigger} = -37 + F - G_i + L_F + 10 \log(B_i) + P_o + 20 \log f + I/N \qquad \text{(A.1.1)}$$

where:

- F: receiver noise figure of the mobile service base or mobile station receivers (dB)
- B_i: the bandwidth of the terrestrial broadcasting station (MHz)
- G_i: the receiver antenna gain of the station in the mobile service (dBi)
- L_F: antenna cable feeder loss (dB)
- f: centre frequency of the interfering station (MHz)
- P_o: man-made noise (dB) (typical value is 1 dB for the VHF band and 0 dB for the UHF band)
- I/N: interference to noise ratio, which must not exceed the threshold (margin) applicable when developing the Plan (I/N = –6 dB).

For the generic case of the land mobile service, the following typical values of F, G_i, L_F and P_o to be used (see Recommendation ITU-R M.1767 as an informative source) are provided in Tables A.1.4 and A.1.5 for the base stations and mobile stations respectively:

TABLE A.1.4

Typical values of the parameters when applying equation (A.1.1) to derive coordination trigger field-strength values to protect the base stations for the generic case (type code NB) of the mobile service from DVB-T

Frequency (MHz)	174	230	470	790	862
F (dB)	8	8	4	3	3
G_i (dBi)	6	8	12	17	17
L_F (dB)	2	2	2	4	4
P_o (dB)	1	1	0	0	0
$F - G_i + L_F + P_o$	5	3	–6	–10	–10

TABLE A.1.5

Typical values of the parameters when applying equation (A.1.1) to derive coordination trigger field-strength values to protect the mobile stations for the generic case (type code NB) of the mobile service from DVB-T

Frequency (MHz)	174	230	470	790	862
F (dB)	11	11	7	7	7
G_i (dBi)	0	0	0	0	0
L_F (dB)	0	0	0	0	0
P_o (dB)	1	1	0	0	0
$F - G_i + L_F + P_o$	12	12	7	7	7

A.3 Coordination trigger field strengths for the aeronautical radionavigation service in the bands 223-230 MHz, 590-598 MHz and 645-862 MHz and the radionavigation service in the band 585-610 MHz

No assignments to stations of the aeronautical radionavigation service operating in the band 223-230 MHz in Region 3 and in some countries of Region 1 in accordance with RR No. 5.247 have been notified to ITU. Therefore, there are no trigger values in that situation.

The trigger field-strength levels to protect the aeronautical radionavigation and the radionavigation services from DVB-T are provided in Table A.1.6.

For the coordination trigger field-strength value to protect the aeronautical radionavigation service in the band 223-230 MHz from T-DAB and DVB-T, the recent ITU-R Recommendations, or values mutually agreed by the administrations concerned, are to be used.

TABLE A.1.6

Coordination trigger field-strength values to protect the radionavigation and the aeronautical radionavigation services from DVB-T[2]

System to be protected	System type code (see Annex 2, Chapter 4)	RR allocation	Application	Frequency (MHz)	Trigger field strength (dB(μV/m))[1]	Height of the receiving antenna (m)
Aeronautical radionavigation system XG (on channel 36, 4 MHz airport radars, UK)	XG	Countries in No. 5.302	Airport radar	590-598	–12	7
Aeronautical radionavigation system AB (RLS 1)	AB	Region 3	Type 1 Ground-to-ground	Appropriate channels in the band 585-610 MHz	13	10
Aeronautical radionavigation system AA8 (RSBN)	AA8	Countries in No. 5.312	Air-to-ground component	Appropriate channels in band 645-862 MHz	36	10
Aeronautical radionavigation system AA8 (RSBN)	AA8	Countries in No. 5.312	Ground-to-air component	Appropriate channels in band 645-862 MHz	42	10 000
Aeronautical radionavigation system AB (RLS)	AB	Countries in No. 5.312	Ground-to-ground	Appropriate channels in band 645-862 MHz	13	10
Aeronautical radionavigation system BD (RLS 2, Type 1, ground transmission, 4 MHz)	BD	Countries in No. 5.312	Ground-to-air component	Appropriate channels in band 645-862 MHz	49	10 000
Aeronautical radionavigation system BA (RLS 2, Type 1, airborne transmission, 4 MHz)	BA	Countries in No. 5.312	Type 1 Air-to-ground component	Appropriate channels in band 645-862 MHz	29	10

TABLE A.1.6 (*end*)

System to be protected	System type code (see Annex 2, Chapter 4)	RR allocation	Application	Frequency (MHz)	Trigger field strength (dB(μV/m))[1]	Height of the receiving antenna (m)
Aeronautical radionavigation system BC (RLS 2, Type 2, ground transmission, 3 MHz)	BC	Countries in No. 5.312	Type 2 Ground-to-air component	Appropriate channels in band 645-862 MHz	71	10 000
Aeronautical radionavigation system BB (RLS 2, Type 2, airborne transmission, 8 MHz)	AA2	Countries in No. 5.312	Type 2 Air-to-ground component	Appropriate channels in band 645-862 MHz	21	10

(1) The trigger field-strength values are related to the DVB-T bandwidth.

(2) See also text in § A.3.

A.4 Coordination trigger field strengths for the fixed service in the bands 174-230 MHz and 470-862 MHz

The trigger field-strength levels to protect systems in the fixed service from T-DAB and DVB-T are provided in Table A.1.7 with their corresponding service type codes.

TABLE A.1.7

Coordination trigger field-strength values to protect systems of the fixed service from T-DAB and DVB-T

Service, system to be protected	System type code (see Annex 2, Chapter 4)	Frequency range (MHz)	Trigger field strength (dB(μV/m))	Height of the receiving antenna (m)
Fixed system FF (transportable, 1.2 MHz)	FF	790-862	24[1]	37.5
Fixed system FH	FH	790-862	13[1]	37.5
Generic fixed system FK	FK	174-230 and 470-862	See equation (A.1.2) and Table A.1.8	37.5

(1) The trigger field-strength values are related to the DVB-T bandwidth.

For the generic case (type code FK), i.e. when there is no value of protection ratio available, the following equation should be used:

$$F_{trigger} = -37 + F - G_i + L_F + 10\ \log(B_i) + P_o + 20\ \log f + I/N \qquad \text{(A.1.2)}$$

where:

F: receiver noise figure of the FS station receiver (dB)

B_i: the bandwidth of the terrestrial broadcasting station (MHz)

G_i: the FS station receiver antenna gain (dBi)

L_F: antenna cable feeder loss (dB)

f: centre frequency of the interfering broadcasting station (MHz)

P_o: man-made noise (dB) (typical value is 1 dB for VHF band and 0 dB for UHF band)

I/N: interference to noise ratio, which must not exceed the threshold (margin) applicable when developing the plan (I/N = –6 dB).

Based on the information in Recommendations ITU-R F.758-4, ITU-R F.1670-1 and ITU-R SM.851-1, the following typical values of F, G_i, L_F and P_o to be used are provided in Table A.1.8:

TABLE A.1.8

Typical values of the parameters when applying equation (A.1.2) to derive trigger field-strength values to protect the stations for the generic case (type code FK) of the fixed service from DVB-T

Frequency (MHz)	174-230	500	800
F (dB)	5	5	5
G_i (dBi)	9	14	16
L_F (dB)	4	5	5
P_o (dB)	1	0	0
$F - G_i + L_F + P_o$	1	–4	–6

For other frequencies in the UHF band, the interpolation should be made by applying a correction of 10 log (f/500).

B Coordination trigger field strengths for the protection of the Plan from stations of other primary terrestrial services

B.1 Representative broadcasting systems

See Appendix 2 to Section I for the broadcasting system variants.

B.2 Derivation of trigger levels

There have been some detailed investigations on protection of DVB-T system against interference from systems in the fixed and mobile services. Their operational frequency range lies either within the bandwidth of the digital television signal or partially overlaps with it. Therefore, a more general case of interference from other services to digital terrestrial broadcasting can be covered by using the trigger criteria for digital broadcasting interfered with by digital broadcasting.

No detailed studies on analogue television interfered with by all systems with which sharing occurs, i.e. ARNS, mobile service, fixed service have been made. Therefore, it is suggested to use the same trigger criteria for analogue television interfered with by terrestrial broadcasting for this purpose.

B.3 Coordination trigger field strengths for the protection of the Plan from stations of other primary terrestrial services

Table A.1.9 gives the trigger field strengths for the representative broadcasting systems as described in Appendix 2 to Section I for the frequencies 200 MHz and 650 MHz.

TABLE A.1.9

Coordination trigger field strengths for representative broadcasting systems

Broadcasting service to be protected	**Trigger field strength (dB(μV/m))[1]**			
	Band III (174-230 MHz)	**Band IV (470-582 MHz)**	**Band V (582-718 MHz)**	**Band V (718-862 MHz)**
DVB-T	17	21	23	25
T-DAB	27	–	–	–
Analogue TV	10	18	20	22

(1) The trigger field-strength values are related to the bandwidth of the system to be protected.

It is proposed to take the most critical case for the wanted systems, since it is *a priori* not known which system may be used by the affected administration. However, analogue television is expected to be switched off after a transition period. Therefore, probably two sets of values need to be kept. Table A.1.10 gives the final result of the proposed trigger field strengths to be used in coordination.

TABLE A.1.10

Coordination trigger field strengths for the protection of the Plan from other primary terrestrial services

Broadcasting system to be protected	**Trigger field strength (dB(μV/m))[1]**			
	Band III (174 -230 MHz)	**Band IV (470-582 MHz)**	**Band V (582-718 MHz)**	**Band V (718-862 MHz)**
Analogue and digital[2]	10	18	20	22
Digital	17	21	23	25

(1) The trigger field-strength values are related to the 7 or 8 MHz bandwidth of the system to be protected.

(2) To be applicable during the transition period.

Appendix 2
to Section I

Basis for the determination of the coordination trigger field strengths for the broadcasting service

The purpose of this Appendix is to provide background information on the derivation of the trigger coordination field strengths to protect the broadcasting service.

1 Representative broadcasting systems

This Appendix deals with various broadcasting systems. Therefore, different trigger field-strength values have to be taken into account. However, for determination of the affected administration, the trigger field strengths are evaluated for the following representative system variants of T-DAB, DVB-T and analogue TV, including the respective reception modes and target location probabilities:

– DVB-T: 64-QAM 3/4, fixed roof-level reception, 95% location probability

– T-DAB: mobile reception, 99% location probability (Mode I, PL 3, see Recommendation ITU-R BS.1114-5)

– Analogue TV: SECAM L, fixed roof-level reception, 50% location probability.

These variants are regarded as the most sensitive variants which will be used in practice.

2 Determination of the coordination trigger field strengths for the protection of the broadcasting service

The coordination trigger field strength $F_{trigger}$ is calculated as follows:

$$F_{trigger} = F_{med} + f_{corr} - PR - CF \qquad \text{(A.2.1)}$$

where:

F_{med}: minimum median field strength of the relevant (victim) broadcasting system

f_{corr}: frequency correction, as described below

PR: relevant protection ratio provided in Chapter 3 of Annex 2 to the Agreement

CF: relevant combined location correction factor as described in Chapter 3 of Annex 2 to the Agreement.

If the protection ratios distinguish between tropospheric and continuous interference, the tropospheric case is to be taken. In order to account for the worst reception case, no receiving antenna discrimination for fixed roof-level reception is taken into account.

In Chapter 3 of Annex 2 to the Agreement, the minimum median field strengths for the reference planning configurations are calculated for 200 MHz (Band III) and 650 MHz (Bands IV/V). For other frequencies the following interpolation rule is used:

– for fixed reception, $f_{corr} = 20 \log_{10} (f/f_r)$, where f is the actual frequency and f_r the reference frequency of the relevant band quoted above;

– for portable reception and mobile reception, $f_{corr} = 30 \log_{10} (f/f_r)$ where f is the actual frequency and f_r the reference frequency of the relevant band quoted above.

3 Coordination trigger field strengths for the broadcasting service

Tables A.2.1 and A.2.2 give the trigger field strengths for the representative broadcasting systems as described above for the frequencies 200 MHz and 650 MHz. The most critical trigger field strengths are indicated in bold in Tables A.2.1 and A.2.2.

TABLE A.2.1

Coordination trigger field strengths(1) for representative broadcasting systems at 200 MHz

	Broadcasting system to be protected		
	DVB-T	**T-DAB**	**Analogue TV**
Minimum median field strength	F_{med} = 51 dB(μV/m)	F_{med} = 60 dB(μV/m)	F_{med} = 55 dB(μV/m)
Interfering system			
DVB-T	*PR* = 21 dB **$F_{trigger}$ = 17 dB(μV/m)**	*PR* = 9 dB $F_{trigger}$ = 33 dB(μV/m)	*PR* = 35 dB $F_{trigger}$ = 20 dB(μV/m)
T-DAB	*PR* = 26 dB **$F_{trigger}$ = 12 dB(μV/m)**	*PR* = 15 dB $F_{trigger}$ = 27 dB(μV/m)	*PR* = 42 dB $F_{trigger}$ = 13 dB(μV/m)
Analogue TV	*PR* = 9 dB $F_{trigger}$ = 29 dB(μV/m)	*PR* = 2 dB $F_{trigger}$ = 40 dB(μV/m)	*PR* = 45 dB **$F_{trigger}$ = 10 dB(μV/m)**

(1) The trigger field-strength values are related to the bandwidth of the system to be protected.

TABLE A.2.2

Coordination trigger field strengths(1) for representative broadcasting systems at 650 MHz

	Broadcasting system to be protected	
	DVB-T	**Analogue TV**
Minimum median field strength	F_{med} = 57 dB(μV/m)	F_{med} = 65 dB(μV/m)
Interfering system		
DVB-T	*PR* = 21 dB **$F_{trigger}$ = 23 dB(μV/m)**	*PR* = 35 dB $F_{trigger}$ = 30 dB(μV/m)
Analogue TV	*PR* = 9 dB $F_{trigger}$ = 35 dB(μV/m)	*PR* = 45 dB **$F_{trigger}$ = 20 dB(μV/m)**

(1) The trigger field-strength values are related to the 8 MHz bandwidth of the system to be protected.

It is proposed to distinguish between the analogue and digital broadcasting systems that are to be coordinated but to take the most critical case for the wanted systems, since it is *a priori* not known which system may be used by the affected administration.

Appendix 3
to Section I

Position and orientation of the reference network for allotment

For the calculation of the outgoing interference of the reference network each boundary test point of the allotment is regarded as a source of outgoing interference. For this calculation it is necessary to know how the reference network is positioned and oriented with regard to the boundary test point.

All reference networks can be characterized by hexagons. One edge (the “starting edge”) of the hexagon is set perpendicular to a line between the boundary test point and the calculation point. The centre of the starting edge is then positioned at the boundary test point.

In this position the other vertices and the centre of the hexagon are further away from the calculation point than the vertices of the starting edge. This fixes the position of the reference network and its transmitters. The field strength is then determined.

The reference network is then moved around the allotment boundary to the next test point, where the field strength is again determined for the same calculation point. This procedure is repeated until the reference network is back in the starting position.

The field strength at the calculation point is evaluated separately for each transmitter of the reference network using the characteristics of the associated reference planning configuration. For this purpose, the e.r.p. for the DVB-T reference networks should include a power margin of 3 dB.

The resulting interfering sum field strength is evaluated by applying the power sum method. Mixed land-sea path propagation is calculated on the basis of Chapter 2 of Annex 2 to the Agreement.

In the case of a 3-transmitter hexagon, the transmitter closest to the boundary test point lies on the right-hand side, looking from the boundary test point to the calculation point.

A sketch of the situation is given for both possible reference network configurations (3 transmitters and 7 transmitters) in Figs A.3-1 and A.3-2.

Due to the movement of a notional hexagon around a national border, it is possible that one or more transmitters of the reference network could lie outside the territory of the administration for whose allotment the calculation is performed.

FIGURE A.3-1

3-transmitter hexagon RN

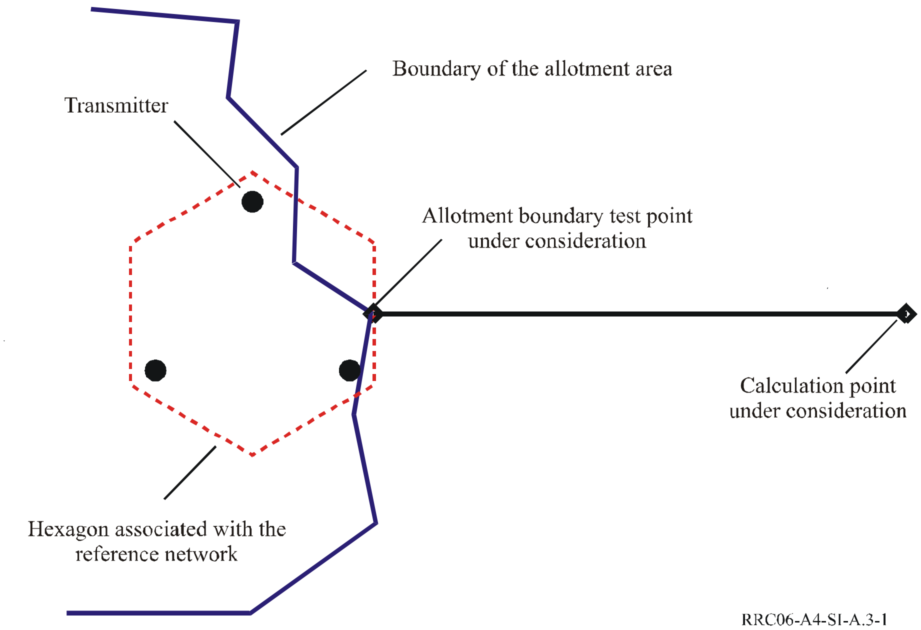
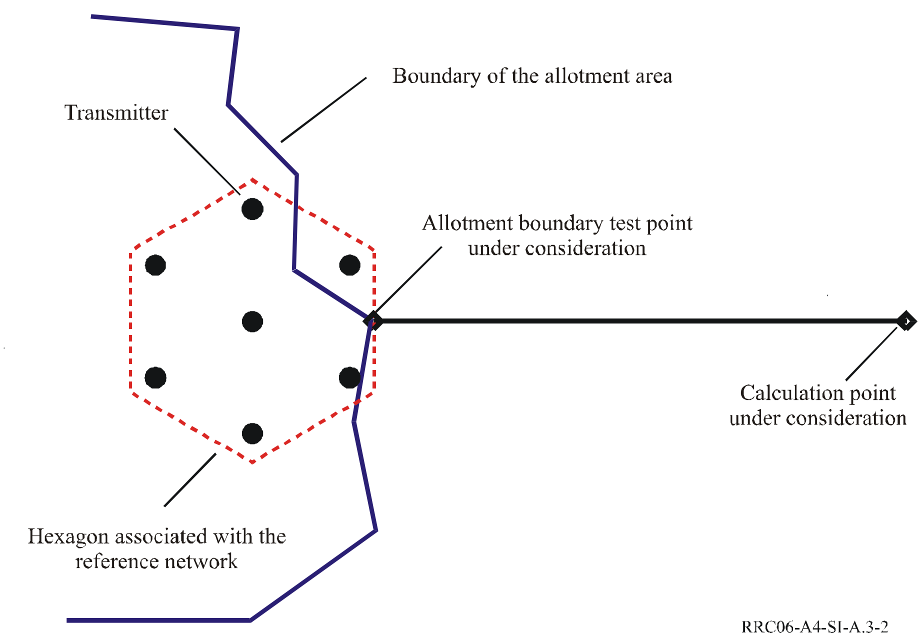


FIGURE A.3-2

7-transmitter hexagon RN



Section II
of Annex 4

Examination of conformity with the digital Plan entry

1 Introduction

This Section describes the method to be used by the Bureau in the application of Articles 4 and 5 of this Agreement.

This method shall be applied in the following cases:

– when one or more assignments are derived from the conversion of a digital Plan entry comprising an allotment or from the conversion of a digital Plan entry comprising an allotment with linked assignments as in § 4.1.2.7 of Article 4 of the Agreement;

– when a digital Plan entry is modified without increasing the level of interference of the digital Plan entry as in § 4.1.2.4 *b)* of Article 4 of the Agreement; and

– when one or several assignments are notified under Article 5 for recording in the MIFR.

The main terms used in this Annex are explained in Appendix 4 to this Section.

2 General principles

In the following, the term “*digital Plan entry implementation*” is used:

– in the application of Article 4, to designate all assignments corresponding to the digital Plan entry which are already included in the Plan or proposed for inclusion in the Plan;

– in the application of Article 5, to designate all assignments corresponding to the digital Plan entry which are already recorded in the MIFR, or proposed for recording in the MIFR.

The conformity examination method comprises the following:

a) verification that the channel or block of the digital Plan entry implementation is the same as that of the associated digital Plan entry and that the geographical location of the digital Plan entry implementation is within the set limits; and

b) comparison of the interference envelope arising from the digital Plan entry with the aggregate interference from the digital Plan entry implementation. The area within which this comparison is performed is bounded by a cut-off field-strength contour on which a final comparison of the total interfering field strengths is performed.

The *digital Plan entry implementation* is in conformity with the Plan when verification by the Bureau under *a)* is confirmed and when under *b)* the interference of the digital Plan entry implementation does not exceed the interference envelope derived from the characteristics of the digital Plan entry at any relevant calculation point.

3 Features of the method applicable to all digital Plan entries

The cut-off field-strength contour provides the mechanism that scales the number of calculation points in the conformity examination to the values of the effective radiated power and trigger field-strength values. The cut-off criterion is the relevant trigger field-strength value under Section I of Annex 4 of the Agreement.

If the proposed assignments are in a frequency band where there is no assignment of another primary terrestrial service within 1 000 km which is recorded in the List or for which the procedure of Article 4 of this Agreement has been initiated, and the cut-off field-strength contour based on the broadcasting trigger field strengths does not extend beyond the national boundary of the notifying administration, the conformity examination is favourable.

If the proposed assignments are in a frequency band where there are assignments of another primary terrestrial service within 1 000 km which are recorded in the List or for which the procedure of Article 4 of this Agreement has been initiated, and the cut-off field-strength contour based on the broadcasting trigger field strengths does not extend beyond the national boundary of the notifying administration, the cut-off field-strength contour is redrawn using the appropriate trigger value field strengths for the assignments of other primary terrestrial services to be protected over the range of azimuths corresponding to the direction of the potentially affected service area, restricted to the national territory of the administration whose other primary terrestrial services may be affected. If the cut-off field-strength contours resulting from this process still do not extend beyond the national boundary of the notifying administration, the conformity examination is favourable.

If the cut-off field-strength contours exceed the limits of the territory of the notifying administration at any location, a series of geometrical contours are created. These contours are created for the purpose of verifying that, at each of their points, the aggregate interference field strength from the proposed conversion of a digital entry in the Plan, and from the assignments in the MIFR (including the linked assignments) which are associated to the digital entry in the Plan, where applicable, does not exceed the interference envelope of the digital entry in the Plan.

On these contours, calculation points are located at 1° steps along the geometrical contours surrounding the allotment area or the assignment(s). Not all points are taken into account: only those calculation points lying outside the territory of the notifying administration and inside the cut-off field-strength contour(s) around the allotment or assignment(s) are used.

A *digital Plan entry implementation* is in conformity when at every calculation point the interference of the *digital Plan entry implementation* does not exceed the interference envelope derived from the characteristics of the digital Plan entry.

3.1 Field-strength calculations

The field-strength calculations are based on the propagation model in Chapter 2 of Annex 2 of the Agreement (propagation curves for the tropospheric case, i.e. 1% of time and 50% of locations, shall be used). The calculation of interference from any transmitter is limited to 1 000 km. The calculated values are rounded to the first decimal place.

In case the field strengths from several signal sources need to be aggregated the power sum method is used. The individual field strengths obtained at the calculation points from all transmitting stations of an allotment are processed in decreasing order. The power sum is obtained as follows:

– starting from the highest, the power values equivalent to the interfering field strengths are added, one after the other;

– at each summation, the result is compared to the previous one;

– if the increase in power is greater than or equal to 0.5 dB, the summation process continues;

– if the increase in power would be less than 0.5 dB, the summation process is stopped and 0.5 dB is added, giving the result of the power sum.

3.2 Construction of the geometrical contours and of the calculation points

The geometrical contours are at distances of 60, 100, 200, 300, 500, 750 and 1 000 km from the location of the station(s) or the boundary of the digital Plan entry.

The construction of the geometrical contours depends on the type of digital Plan entry.

For each type of digital Plan entry a point of reference is defined. From this point of reference 360 radials are developed at 1° steps starting from True North. The point where the radial crosses the cut-off field-strength contour and any geometrical contours lying outside the national boundary of the notifying administration is the location of the calculation points.

4 Application of the method to each type of digital Plan entries

The Plan is built on two fundamental planning objects, namely assignments and allotments. Both assignments and allotments are characterized by the general set of technical characteristics listed in Annex 1 of the Agreement. These two objects can be combined into five different types of Plan entry that can be recorded in the Plan. The features of each of the five different types of digital Plan entry have an impact on the method for the examination of conformity.

4.1 Digital Plan entry that comprises only an allotment

This digital Plan entry is characterized by an allotment boundary, an assigned frequency, a type of reference network (RN) and a reference planning configuration (RPC).

4.1.1 Location of the assignments derived from the digital Plan entry

Such assignments must be located inside the allotment area or not more than 20 km outside the allotment boundary. These locations shall be within the territory of the notifying administration, unless otherwise agreed by the administration concerned (see RR No. 18.2).

4.1.2 Geometrical contours for the digital Plan entry

The point of reference of an allotment Plan entry is the centre of gravity of the allotment polygon(s), and the construction of the geometrical contour is described in Appendix 1 to this Section.

4.1.3 Interference envelope of the digital Plan entry

The characteristics of the reference network associated with the allotment are used as the source for calculating the interference envelope. The reference network located at each allotment boundary point acts as a source of interference. The positioning of the reference network is described in Appendix 2 to this Section. The largest field-strength value obtained, at the calculation point under consideration, from each allotment boundary point is the value of interference field strength to be used.

4.1.4 Interference field strength from *digital Plan entry implementation*

a) Application of Article 4

In the case of the conversion of an allotment Plan entry into an assignment where it is intended to include that assignment in the Plan, the aggregate interference is calculated using the power sum method, as described in § 3.1 above, of the interference contributions from:

– assignments already included in the Plan as a result of the conversion of the allotment; and

– the new assignment(s) resulting from the conversion of the allotment and submitted under Article 4 for inclusion in the Plan.

b) Application of Article 5

In the case of the conversion of an allotment Plan entry into an assignment where it is intended to record that assignment in the MIFR, the aggregate interference is calculated using the power sum method, as described in § 3.1 above, of the interference contributions from:

– assignments already recorded in the MIFR as a result of the conversion of the allotment; and

– the new assignment(s) resulting from the conversion of the allotment and submitted under Article 5 for recording in the MIFR.

4.1.5 Cut-off field-strength contour for the digital Plan entry

The reference point for the construction of the cut-off field-strength contour is the centre of gravity of the allotment polygon(s), and the method for the construction of the contour is described in Appendix 3 to this Section.

4.2 Digital Plan entry comprising one assignment only

The digital Plan entry consists of a single assignment. It is characterized by the required set of technical characteristics described in Annex 1 of the Agreement. Some of the technical characteristics may be described in terms of an RPC.

In the case that the characteristics of the *digital Plan entry implementation* are identical to those of the digital Plan entry, the assignment is automatically considered to be in conformity with the digital Plan entry and therefore it is not necessary to perform the conformity examination.

4.2.1 Location of the notified assignment

The location of the transmitting antenna must not be more than 20 km from the geographical location specified in the corresponding digital Plan entry. This location shall be within the territory of the notifying administration, unless otherwise agreed by the administration concerned (see RR No. 18.2).

4.2.2 Geometrical contours for the digital Plan entry

The point of reference is the geographical location of the transmitting antenna as recorded in the Plan, and the geometrical contours consist of concentric circles, centred around that point.

4.2.3 Interference envelope of the digital Plan entry

The characteristics of the assignment, as listed in the Plan, are used to calculate the digital Plan entry interference envelope.

4.2.4 Interference field strength from a *digital Plan entry implementation*

In the application of Article 5, the interference field strength from the *digital Plan entry implementation* is that produced by the notified assignment.

4.2.5 Cut-off field-strength contour for the digital Plan entry

The reference point for construction of the cut-off field-strength contour is the geographical location of the transmitting antenna as recorded in the Plan, and the method for the construction of the contour is described in Appendix 3 to this Section.

4.3 Digital Plan entry comprising an allotment with linked assignments

The digital Plan entry consists of an allotment and a set of linked assignments. The allotment is characterized by an allotment boundary, an assigned frequency, a type of RN and either an RPC or a system variant together with a reception mode. Each of the linked assignments is characterized by the required set of technical characteristics described in Annex 1 of the Agreement, and the link between the allotment and the assignments is established by the assignments having the same allotment and SFN identifier as the allotment.

4.3.1 Location of the assignments implementing the digital Plan entry

The assignments converted from the allotment must be located inside the allotment area or not more than 20 km outside the allotment area boundary. The location of the transmitting antenna for a linked assignment must not be more than 20 km from the geographical location specified in the digital Plan entry for the corresponding assignment.

These locations shall be within the territory of the notifying administration, unless otherwise agreed by the administration concerned (see RR No. 18.2).

4.3.2 Geometrical contours for the digital Plan entry

The point of reference is the centre of gravity of the allotment polygon, and the construction of the geometrical contours is described in Appendix 1 to this Section.

4.3.3 Interference envelope of the digital Plan entry

The interference envelope of the allotment with linked assignments digital Plan entry is calculated as the higher value, at each individual calculation point, of either:

– the power sum method, as described in § 3.1 above, of the interference from the linked digital assignments; or

– the interference from the reference network associated with the allotment (see Appendix 2 to this Section).

As the allotment is generally intended to be converted into assignments which would have an impact on the available digital Plan entry interference potential, the examination of conformity has to be performed also in the case where the characteristics of the notified linked assignment(s) are identical to those of the corresponding digital Plan entry.

4.3.4 Interference field strength from a *digital Plan entry implementation*

a) Application of Article 4

The interference field strength is calculated using the power sum method, as described in § 3.1 above, of the interference contributions from:

– assignments already included in the Plan as a result of the conversion of the allotment element of the digital Plan entry (i.e. excluding the linked assignments); and

– the new assignment(s) resulting from the conversion of the allotment element of the digital Plan entry and submitted under Article 4 for inclusion in the Plan.

b) Application of Article 5

The aggregate interference is calculated using the power sum method, as described in § 3.1 above, of the interference contributions from:

– assignments already recorded in the MIFR as a result of the conversion of the allotment element; and

– linked assignments corresponding to the digital Plan entry, which have already been recorded in the MIFR under § 5.1.4, 5.1.6 and 5.1.7[1] of Article 5; and

– the new assignments resulting from the conversion of the allotment element of the digital Plan entry and submitted under Article 5 for recording in the MIFR; and

– linked assignments corresponding to the digital Plan entry and submitted under Article 5 for recording in the MIFR.

[1] Inclusion of the assignment in the calculation of interference does not imply recognition or that any protection will be afforded to this assignment.

4.3.5 Cut-off field-strength contour for the digital Plan entry

The point of reference is the centre of gravity of the allotment polygon, and the method for the construction of the cut-off field-strength contour is described in Appendix 3 to this Section.

4.4 Digital Plan entry comprising a set of assignments with a common SFN identifier

The digital Plan entry consists of a set of assignments with a common SFN identifier without an allotment being associated to this set. Each individual assignment is characterized by the technical characteristics in Annex 1 of the Agreement.

The number of assignments implementing the digital Plan entry cannot exceed the number of assignments in the set that comprises the digital Plan entry.

In the case that the characteristics of all the notified assignments are identical to those of the corresponding assignments in the digital Plan entry, it is not necessary to perform the conformity examination.

However, if any assignment is notified with different characteristics than those of the corresponding assignment of the digital Plan entry, then the examination of conformity has to be performed with respect to all the assignments implementing the digital Plan entry.

4.4.1 Location of the notified assignments

The locations of the notified assignments must be not more than 20 km away from the respective geographical locations specified in the digital Plan entry.

4.4.2 Geometrical contours for the digital Plan entry

The point of reference of the digital Plan entry is the centre of gravity of the geographical coordinates of all the locations of the individual transmitting antennas.

For each assignment of the digital Plan entry a series of concentric circles is constructed at the distances defined in § 3.2 above. Those circles at the same distance that intersect are then joined in order to result in one or several contours surrounding the locations of the assignments of the SFN at the corresponding distance.

4.4.3 Interference envelope of the digital Plan entry

The characteristics of each of the assignments, as listed in the Plan, are used in order to calculate the aggregate interference envelope in accordance with the variation of the power sum method in § 3.1 above.

4.4.4 Interference field strength from a *digital Plan entry implementation*

In this case, verification of conformity is only conducted within Article 5. The interference field strength from the *digital Plan entry implementation* is the aggregate interference field strength, as described in § 3.1 above, produced by:

– all the assignments corresponding to the digital Plan entry and already recorded in the MIFR, including those recorded under § 5.1.4, 5.1.6 and 5.1.7[2] of Article 5; and

– all the assignments corresponding to the digital Plan entry and submitted under Article 5 for recording in the MIFR.

4.4.5 Cut-off contour for a set of assignments with common SFN identifier

The reference point for the construction of the cut-off field-strength contour is the centre of

---

[2] Inclusion of the assignment in the calculation of interference does not imply recognition or that any protection will be afforded to this assignment.

gravity of the geographical coordinates of all the locations of the individual transmitting antennas, and the method for the construction of the cut-off field-strength contour is described in Appendix 3 to this Section.

4.5 Digital Plan entry comprising an assignment linked to an allotment with no SFN identifier

The digital Plan entry consists of an allotment with one linked assignment but no SFN identifier. In that case the only source of interference is that from the assignment, and the allotment boundary only defines the area to be protected in the planning during RRC-06. For the latter, either an RPC is specified, or a system variant together with a reception mode. The assignment is characterized by the required set of technical characteristics described in Annex 1 of the Agreement.

It is not possible to convert the allotment into assignment(s) unless this digital Plan entry type is replaced by another type of digital Plan entry. The conversion into assignment(s) would require the allotment to have an SFN identifier, i.e. the assignment linked to an allotment with no SFN identifier digital Plan entry would have to be replaced by an allotment digital Plan entry.

In the case that the characteristics of the *digital Plan entry implementation* are identical to those of the digital Plan entry, the assignment is automatically considered to be in conformity with the digital Plan entry, and therefore it is not necessary to perform the conformity examination.

The method for the examination of conformity of the notified assignment corresponding to the assignment in the assignment linked to an allotment with no SFN identifier digital Plan entry is the same as the method described under § 4.2 above.

Appendix 1
to Section II

Construction of the geometrical contour for allotment Plan entries and allotment with linked assignments Plan entries

The method to construct a set of geometrical contours for a given closed area requires the area to be defined as a set of boundary points, i.e. a polygon.

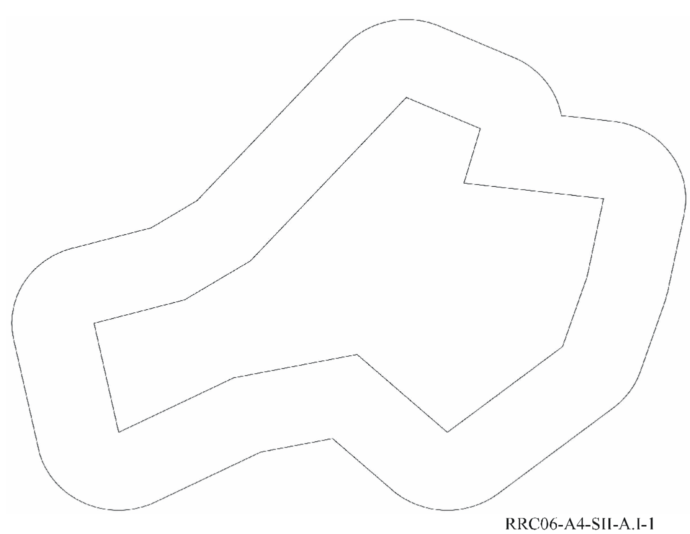
The first step of the geometrical contour construction is to sort the boundary points in a counter clockwise manner. Duplicated boundary points, i.e. boundary points connected by edges of length zero are eliminated. If two adjacent edges have the same direction, then the shared point is omitted.

In the next step the new edges are created which are separated by the distance given in § 3.2 of Annex 4, Section II from the polygon under consideration. These new "edges" are parallel lines and arcs, when convex boundary points are encountered. In the latter case the original boundary points act as centres for the arcs.

The resulting lines and arcs are connected together by calculating the intersection points of two consecutive lines or arcs. The intersection points make part of the set of vertices defining the geometrical contours. Along the remaining arcs additional points have to be located in order to appropriately approximate the arc by a polygon. Figure A.1-1 below shows the result.

FIGURE A.1-1

Geometrical contour for an allotment area



Following this procedure it is possible to develop geometrical contours for any shape of allotment area, including those showing significant indentations. The indentations or concave sections of the polygon will be enclosed so that from any point on the allotment boundary the distance to the contour is equal to one of the required distances given in § 3.2 of Annex 4, Section II.

The above procedure allows the boundary points of the geometrical contour to be identified.

Appendix 2
to Section II

Positioning and orientation of the reference network for calculating the interference envelope of digital Plan entries comprising an allotment or an allotment with linked assignments

For the calculation of the outgoing interference of the reference network each boundary test point of the allotment is regarded as a source of outgoing interference. For this calculation it is necessary to know how the reference network is positioned and oriented with regard to the boundary point.

All reference networks can be characterized by hexagons. One edge (the "starting edge") of the hexagon is set perpendicular to a line between the boundary point and the calculation point. The centre of the starting edge is then positioned at the boundary point.

In this position the other boundary points and the centre of the hexagon are further away from the calculation point than the boundary points of the starting edge. This fixes the position of the reference network and its transmitters. The field strength is then determined.

The reference network is then moved around the allotment boundary to the next boundary point, where the field strength is again determined for the same calculation point. This procedure is repeated until the reference network is back in the starting position.

The field strength at the calculation point is evaluated separately for each transmitter of the reference network using the characteristics of the associated reference planning configuration. For this purpose, the e.r.p. for the DVB-T reference networks includes a power margin of 3 dB.

The resulting interfering sum field strength is evaluated by applying the ordinary power sum method. Mixed land-sea path propagation is calculated on the basis of Chapter 2 of Annex 2 to this Agreement.

In the case of a 3-transmitter hexagon the closest transmitter to the boundary point lies on the right hand side looking from the boundary point to the calculation point.

A sketch of the situation is given for both possible reference network configurations (3 transmitters and 7 transmitters) in Figs A.2-1 and A.2-2 below.

Due to the movement of a notional hexagon around a national border, it is possible that one or more transmitters of the reference network could lie outside the territory of the administration for whose allotment the calculation is performed.

FIGURE A.2-1

3-transmitter hexagon RN

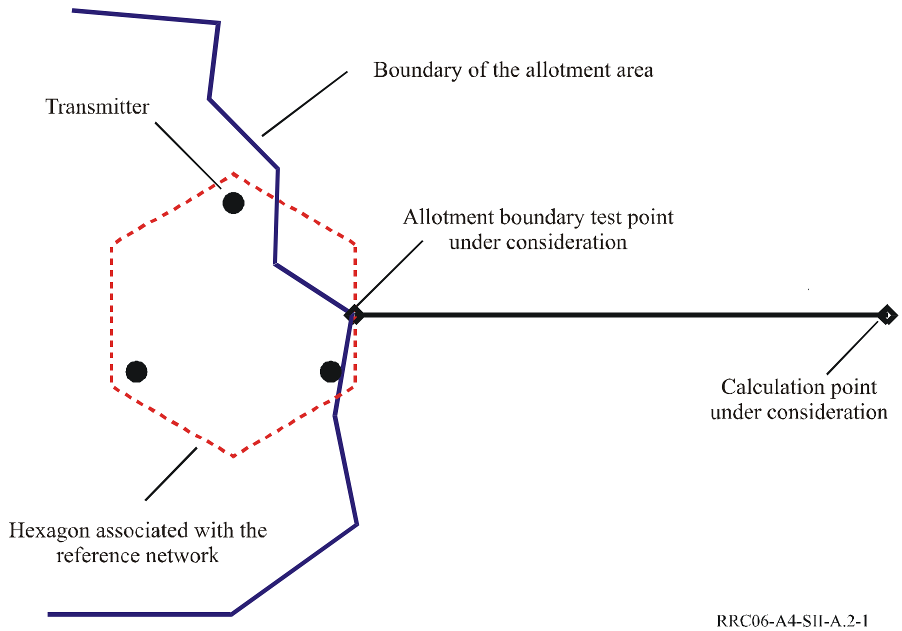
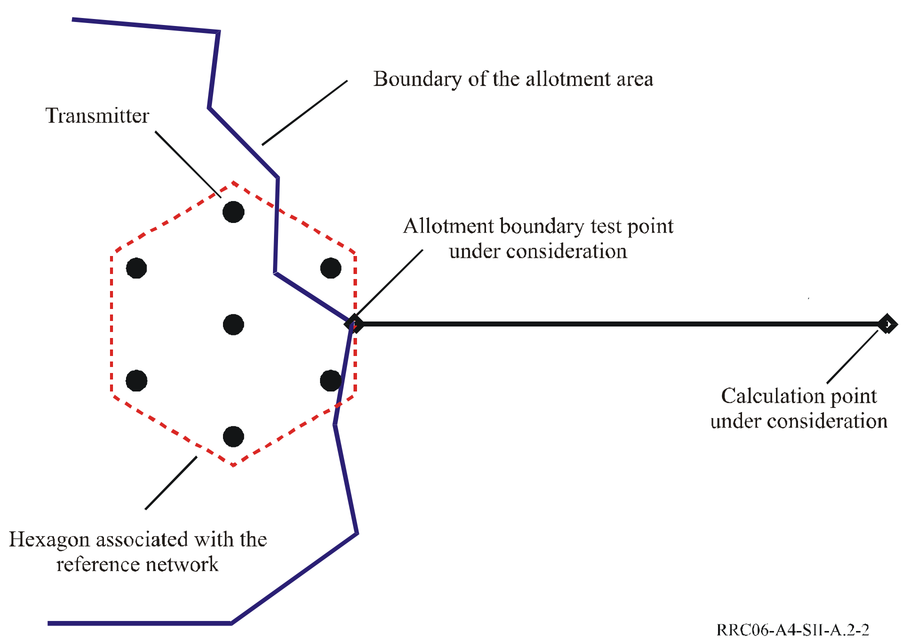


FIGURE A.2-2

7-transmitter hexagon RN



Appendix 3
to Section II

Construction of the cut-off field-strength contour

The cut-off field-strength values are the minimum trigger field-strength values in Annex 4, Section I of this Agreement.

The cut-off field-strength contour is developed using equally spaced radials 1° apart, over 360° centred on a single reference point, the location of which is defined for each type of digital Plan entry in § 4 of Annex 4, Section II.

Along these radials the aggregated field strength of the *digital Plan entry implementation* is calculated as described in § 3.1 of Annex 4, Section II (using values for 1% of time) by starting at a distance of 1 000 km, measured from the nearest transmitter of the *digital Plan entry implementation* or the allotment boundary, and moving towards the reference point until the cut-off field strength is reached.

Joining together the points on each radial where the cut-off field strength is reached forms the cut-off field-strength contour.

In some cases (e.g. areas of anomalous propagation, higher powered transmitters, sensitive coordination trigger value) it is possible that the cut-off field strength may be exceeded at the maximum distance of 1 000 km. In this case the point at 1 000 km will be the position of the cut-off field-strength contour on that radial.

Appendix 4
to Section II

Terms used in this Annex

Calculation point: A point where field-strength calculations are performed.

Geometrical contour: A line at a constant distance from the digital Plan entry.

Cut-off field-strength contour: A line where the field-strength produced by a digital Plan entry implementation is equal to a specified value.

Digital Plan entry: An assignment, or an allotment, or a combination of assignments that may or may not be linked to a single allotment and that, for the purposes of the implementation of the *Plan* and its modifications, is treated as a single entity.

Digital Plan entry interference envelope: The aggregate field-strength level, at a calculation point, calculated based on the digital *Plan* entry characteristics.

Assignment derived (or converted) from an allotment: An assignment, recorded in the digital Plan and/or in the MIFR, that does not change the interference envelope of the associated digital Plan entry.

Linked assignment(s): One or several assignments, associated with an allotment, which appear in the digital Plan and may increase the overall interference envelope of the digital Plan entry beyond that caused by the reference network.

Digital Plan entry implementation:

In the application of Article 4, designates all assignments corresponding to the digital Plan entry which are already included in the Plan or proposed for inclusion in the Plan;

In the application of Article 5, designates all assignments corresponding to the digital Plan entry which are already recorded in the MIFR, or proposed for recording in the MIFR.

ANNEX 5

List of assignments to other primary terrestrial services as referred to in § 1.15 of Article 1 of the Agreement[1]

Information included in the data items of the List

No.	Description
1	ITU serial number
2	ITU symbol for the notifying administration
3	Unique identification code given by the administration for the assignment (AdminRefId)
4	Assigned frequency (MHz)
5	Reference frequency (MHz)
6	Date of entry into the List
7	Name of the location of the transmitting/receiving station
8	ITU symbol of the country or geographical area
9	Geographical coordinates of the site of the transmitting/receiving station:
	9a latitude (±DDMMSS)
	9b longitude (±DDDMMSS)
10	Nominal radius (km) of the circular transmission area
11	ITU symbol of the country or geographical area where transmitting stations are located
12	ITU symbol of the country or geographical area where receiving stations are located
13	Geographical coordinates of the centre of the circular receiving area:
	13a latitude (±DDMMSS)
	13b longitude (±DDDMMSS)
14	Nominal radius (km) of the circular receiving area
15	Class of station
16	Class of emission, in accordance with Article **2** and Appendix **1**
17	Necessary bandwidth, in accordance with Article **2** and Appendix **1**
18	System type code (see Annex 2, Chapter 4 of this Agreement)
19	Type of power (X, Y or Z)
20	Transmitter output power (dBW)
21	Maximum power density (dB(W/Hz)) averaged over the worst 4 kHz band supplied to the antenna transmission line
22	Maximum effective radiated power (dBW)
23	Antenna directivity (D or ND)

[1] A listing of the relevant characteristics for radio astronomy stations is not provided, as currently there are no radio astronomy stations recorded in the *List*. However, if in the future a radio astronomy station is entered into the *List*, the listing of characteristics will be based on parameters contained in Appendix 4 to the Radio Regulations.

No.	Description
1	ITU serial number
2	ITU symbol for the notifying administration
3	Unique identification code given by the administration for the assignment (AdminRefId)
4	Assigned frequency (MHz)
5	Reference frequency (MHz)
6	Date of entry into the List
7	Name of the location of the transmitting/receiving station
8	ITU symbol of the country or geographical area
9	Geographical coordinates of the site of the transmitting/receiving station:
	9a latitude (±DDMMSS)
	9b longitude (±DDDMMSS)
10	Nominal radius (km) of the circular transmission area
11	ITU symbol of the country or geographical area where transmitting stations are located
12	ITU symbol of the country or geographical area where receiving stations are located
13	Geographical coordinates of the centre of the circular receiving area:
	13a latitude (±DDMMSS)
	13b longitude (±DDDMMSS)
14	Nominal radius (km) of the circular receiving area
15	Class of station
16	Class of emission, in accordance with Article **2** and Appendix **1**
17	Necessary bandwidth, in accordance with Article **2** and Appendix **1**
18	System type code (see Annex 2, Chapter 4 of this Agreement)
19	Type of power (X, Y or Z)
20	Transmitter output power (dBW)
21	Maximum power density (dB(W/Hz)) averaged over the worst 4 kHz band supplied to the antenna transmission line
22	Maximum effective radiated power (dBW)
23	Antenna directivity (D or ND)

No.	Description
24	Azimuth of maximum radiation of the transmitting antenna (degrees) clockwise from True North
25	Azimuth of sector for directional antenna or beam axis measured (degrees) clockwise from True North:
	25a Start azimuth
	25b Stop azimuth
26	Polarization
27	Height of antenna above ground level (m)
28	Altitude of site above sea level (m)
29	Maximum effective height of the antenna (m)
30	Effective antenna height (m) at 36 different azimuths in 10° intervals, measured in the horizontal plane from True North in a clockwise direction
31	Maximum antenna gain relative to a half-wave dipole
32	Symbol(s) of the administration with which coordination has been effected
33	Remarks

Note by the Secretariat: This list and its shortend version are included in the CD-ROM attached to these Final Acts. The CD-ROM represents an integral part of the Final Acts. A recapitulative summary of the number of assignments included in this List, per administration, is provided in Table 5.1.

No.	Description
24	Azimuth of maximum radiation of the transmitting antenna (degrees) clockwise from True North
25	Azimuthal sector for the antenna's main beam axis measured (degrees) clockwise from True North:
	25a Start azimuth
	25b Stop azimuth
26	Polarization
27	Height of antenna above ground level (m)
28	Altitude of site above sea level (m)
29	Maximum effective height of the antenna (m)
30	Effective antenna height (m) at 36 different azimuths in 10° intervals, measured in the horizontal plane from True North in a clockwise direction
31	Maximum antenna gain relative to a half-wave dipole
32	Symbol(s) of the administration with which coordination has been effected
33	Remarks

Note by the Secretariat: This list and its shortend version are included in the CD-ROM attached to these Final Acts. The CD-ROM represents an integral part of the Final Acts. A recapitulative summary of the number of assignments included in this List, per administration, is provided in Table 5-1.

TABLE 5-1

Recapitulative summary of the number of assignments to other primary terrestrial services as they appear in the List in the frequency bands 174-230 MHz and 470-862 MHz

Member State	ITU	No. of assignments to other primary
Saudi Arabia (Kingdom of)	ARS	339
Azerbaijani Republic	AZE	3
Belgium	BEL	4
Côte d'Ivoire (Republic of)	CTI	14
Egypt (Arab Republic of)	EGY	474
United Arab Emirates	UAE	4
Russian Federation	RUS	1 420
France	F	250
Georgia	GEO	7
Iran (Islamic Republic of)	IRN	551
Israel (State of)	ISR	372
Jordan (Hashemite Kingdom of)	JOR	2 017
Kazakhstan (Republic of)	KAZ	18
Morocco (Kingdom of)	MRC	70
Uzbekistan (Republic of)	UZB	27
Kyrgyz Republic	KGZ	10
United Kingdom of Great Britain and Northern	G	5 428
Tajikistan (Republic of)	TJK	2

RESOLUTIONS

RESOLUTION 1 (RRC-06)

Broadcasting-satellite service in the band 620-790 MHz

The Regional Radiocommunication Conference for the planning of the digital terrestrial broadcasting service in Region 1 (parts of Region 1 situated to the west of meridian 170° E and to the north of parallel 40° S, except the territory of Mongolia) and in the Islamic Republic of Iran, in the frequency bands 174-230 MHz and 470-862 MHz (Geneva, 2006) (RRC-06),

considering

a) that the first session of the Conference adopted Resolution COM4/1 (RRC-04);

b) that it is necessary to effectively protect, *inter alia*, the terrestrial television broadcasting systems in this band;

c) that geostationary (GSO) broadcasting-satellite service (BSS) networks and non-geostationary (non-GSO) BSS networks or systems are at the stage of advance publication or coordination, or have been notified in the 620-790 MHz frequency band;

d) that the impact of these GSO BSS networks and non-GSO BSS networks or systems on digital and analogue television broadcasting systems has yet to be examined and that the sharing criteria, including the pfd limits required to protect the terrestrial services in this frequency band, are not known and depend on a possible decision of the 2007 World Radiocommunication Conference (WRC-07);

e) that many administrations have extensive infrastructure for the transmission and reception of analogue and digital television signals between 620 MHz and 790 MHz;

f) that this Conference has adopted an Agreement and associated Plans for digital terrestrial broadcasting, *inter alia*, in the band 620-790 MHz, and that it is necessary to effectively protect these Plans,

recognizing

a) that No. **5.311** of the Radio Regulations specifies the conditions under which the band 620-790 MHz may be used for assignments to television stations using frequency modulation in the BSS;

b) that use of the band 620-790 MHz by GSO and non-GSO BSS networks has been suspended by Resolution 545 (WRC-03) pending a decision by WRC-07,

further recognizing

a) that pursuant to *resolves* 3 of Resolution 545 (WRC-03), GSO BSS networks and non-GSO BSS networks or systems in the band 620-790 MHz other than those notified, brought into use and with a date of bringing into use confirmed before the end of the World Radiocommunication Conference (Geneva, 2003) (WRC-03), shall not be brought into use before the end of WRC-07;

b) that pursuant to *resolves* 5 of Resolution 545 (WRC-03), the BSS systems referred to in *resolve*s 1 of that Resolution shall not be taken into account in the application of *resolves* 3.4 of Council Resolution 1185 (modified, 2003)[1],

resolves to invite the 2007 World Radiocommunication Conference

1 to take appropriate and necessary measures to effectively protect the broadcasting Plans adopted by this Conference and their subsequent evolution from the GSO-BSS and/or non-GSO BSS networks/systems which were not brought into use prior to 5 July 2003;

2 to take appropriate and necessary measures in order that the ground terminals of GSO and/or non-GSO BSS networks/systems which were not brought into use prior to 5 July 2003 shall not claim protection from the Plans adopted by this Conference and their subsequent evolution, nor put any constraint on the operation of the assignments of the Plans and their subsequent evolution,

instructs the Secretary-General

to bring this Resolution to the attention of the 2007 World Radiocommunication Conference.

---

[1] Resolution 1185 has been abrogated and superseded by Resolution 1224 adopted by the Council at its 2004 session, whose *resolves* 2.1.2 concerns the sharing with other primary services.

RESOLUTION 2 (RRC-06)

Characteristics for the coordination and the notification of primary terrestrial services in the bands 174-230 MHz and 470-862 MHz in the planning area

The Regional Radiocommunication Conference for the planning of the digital terrestrial broadcasting service in Region 1 (parts of Region 1 situated to the west of meridian 170° E and to the north of parallel 40° S, except the territory of Mongolia) and in the Islamic Republic of Iran, in the frequency bands 174-230 MHz and 470-862 MHz (Geneva, 2006) (RRC-06),

considering

that this Conference has adopted the Regional Agreement (Geneva, 2006), which contains procedures for the coordination and notification of assignments to the broadcasting service and other primary terrestrial services, and whose Annex 3 contains characteristics to be submitted for the application of these procedures,

recognizing

that it may be desirable that all characteristics to be submitted to the Radiocommunication Bureau for the coordination and notification of assignments be included in Appendix **4** of the Radio Regulations,

resolves to invite the 2007 World Radiocommunication Conference

to review, as appropriate, Appendix **4** of the Radio Regulations with a view to incorporating the characteristics of Annex 3 of the Regional Agreement (Geneva 2006),

instructs the Secretary-General

to bring this Resolution to the attention of the 2007 World Radiocommunication Conference.

PREAMBULA

Prvo zasedanje Regionalne konferencije o radio-komunikacijama za planiranje digitalne terestrijalne radiodifuzne službe u delovima Regiona 1 i 3, u frekvencijskim opsezima 174-230 MHz i 470-862 MHz (Ženeva, 10-28. maj 2004.) usvojila je Rezoluciju COM5/2 (RRC-04), kojom su date preporuke Savetu da modifikuje Rezoluciju 1185 (modifikovana, 2003.) u cilju sazivanja drugog zasedanja RRC.
Na zasedanju iz 2004. godine, Savet je doneo odluku, Rezolucijom 1224, da se drugo zasedanje RRC sazove u Ženevi od 15. maja do 16. juna 2006, i utvrdio dnevni red. Dnevni red, datume i mesto održavanja Konferencije odobrila je potrebna većina Država članica Međunarodne unije za telekomunikacije iz Zone planiranja.

RRC06 održan je u Ženevi u predviđenom periodu, na osnovu dnevnog reda koji je odobrio Savet. Usvojen je *Regionalni sporazum koji se odnosi na planiranje digitalne terestrijalne radiodifuzne službe u Regionu 1 (delovi Regiona 1 nalaze se zapadno od meridijana 170° E i severno od paralele 40° S, osim teritorije Mongolije) i u Islamskoj Republici Iran, u frekvencijskim opsezima 174-230 MHz i 470-862 MHz (Ženeva, 2006.)* kao i prateće Rezolucije, koji su sadržani u ovim Završnim aktima.
Delegati koji su potpisali ove Završne akte, u skladu sa odobrenjem nadležnih organa njihovih zemalja, izjavljuju da, ukoliko Država članica Unije izrazi rezerve u vezi sa primenom jedne ili više odredaba Regionalnog sporazuma, nijedna druga Država članica nije u obavezi da poštuje ovu odredbu, odnosno odredbe u svojim odnosima sa datom Državom članicom.

REGIONALNI SPORAZUM*

koji se odnosi na planiranje digitalne terestrijalne radiodifuzne službe u Regionu 1 (delovi Regiona 1 nalaze se zapadno od meridijana 170° E i severno od paralele 40° S, osim teritorije Mongolije) i u Islamskoj Republici Iran, u frekvencijskim opsezima 174-230 MHz i 470-862 MHz.

(Ženeva, 2006.)

PREAMBULA

Dole potpisani delegati sledećih Država članica Međunarodne unije za telekomunikacije:

Republike Albanije, Narodne Demokratske Republike Alžira, Savezne Republike Nemačke, Kneževine Andore, Republike Angole, Kraljevine Saudijske Arabije, Republike Jermenije, Austrije, Republike Azerbejdžana, Kraljevine Bahreina, Republike Belorusije, Belgije, Bosne i Hercegovine, Republike Bocvane, Republike Bugarske, Burkine Faso, Republike Burundi, Republike Kamerun, Republike Kejp Verde, Republike Kipar, Države Grad Vatikan, Republike Kongo, Republike Obale Slonovače, Republike Hrvatske, Danske, Republike Džibuti, Arapske Republike Egipta, Ujedinjenih Arapskih Emirata, Španije, Republike Estonije, Ruske Federacije, Finske, Francuske, Republike Gabon, Republike Gambije, Gruzije, Gane, Grčke, Republike Gvineje, Republike Mađarske, Islamske Republike Irana, Republike Iraka, Irske, Države Izrael, Italije, Hašemitske Kraljevine Jordan, Republike Kazahstana, Republike Kenije, Države Kuvajt, Kraljevine Lesoto, Republike Letonije, Bivše Jugoslovenske Republike Makedonije, Libana, Kneževine Lihtenštajn, Republike Litvanije, Luksemburga, Malavija, Republike Mali, Malte, Kraljevine Maroko, Islamske Republike Mauritanije, Republike Moldavije, Kneževine Monako, Republike Mozambika, Republike Namibije, Republike Niger, Savezne Republike Nigerije, Norveške, Sultanata Omana, Republike Ugande, Republike Uzbekistan, Kraljevine Holandije, Republike Poljske, Portugalije, Države Katar, Sirijske Arapske Republike, Republike Kirgistan, Slovačke Republike, Češke Republike, Rumunije, Ujedinjenog Kraljevstva Velike Britanije i Severne Irske, Republike Ruande, Republike San Marino, Republike Senegal, Republike Srbije, Republike Slovenije, Republike Sudan, Južnoafričke Republike, Švedske, Konfederacije Švajcarske, Kraljevine Svaziland, Republike Tadžikistan, Savezne Republike Tanzanije, Republike Čad, Republike Togo, Tunisa, Turske, Ukrajine, Republike Jemen, Republike Zambije, Republike Zimbabve,

* Odredbe ovog Sporazuma primenjuju se *mutatis mutandis,* na Palestinu kao što je navedeno u Rezoluciji 99 (Mineapolis, 1998.) uz uslov da Palestina uputi notifikaciju Generalnom sekretaru ITU o tome da prihvata prava i da se obavezuje da poštuje obaveze koje proizilaze iz istih.

koji su se sastali u Ženevi od 15. maja 2006. do 16. juna 2006. godine radi Regionalne konferencije o radio-komunikacijama sazvane saglasno sa *Ustavom* ITU i *Konvencijom* ITU, kao što je navedeno u članu 1. ovog *Sporazuma,* usvojili su, u skladu sa odobrenjem svojih nadležnih organa, sledeće odredbe koje se odnose na terestrijalnu radiodifuznu službu u frekvencijskim opsezima 174-230 MHz[1] i 470-862 MHz, zajedno sa odredbama za *druge primarne terestrijalne službe,* kako je definisano u članu 1. ovog *Sporazuma,* u Regionu 1 (delovi Regiona 1 nalaze se zapadno od meridijana 170° E i severno od paralele 40° S, osim teritorije Mongolije) i u Islamskoj Republici Iran.

[1] Za Maroko, analogni plan obuhvata opseg 170-230 MHz

Član 1.

Definicije

1 Za svrhe ovog Sporazuma sledeći termini imaju značenja definisana u nastavku:

1.1 *Unija:* Međunarodna unija za telekomunikacije.

1.2 *Generalni sekretar:* Generalni sekretar *Unije.*

1.3 *Biro:* Biro za radio-komunikacije.

1.4 *Ustav:* Ustav *Unije.*

1.5 *Konvencija:* Konvencija *Unije.*

1.6 *Pravilnik o radio-komunikacijama:* Pravilnik o radio-komunikacijama kako je navedeno u odredbi br. **31** *Ustava.*

1.7 *Konferencija:* Regionalna konferencija o radio-komunikacijama 2006. za planiranje digitalne terestrijalne radiodifuzne službe u Regionu 1 (u delovima Regiona 1 koji se nalaze zapadno od meridijana 170° E i severno od uporednika 40° S, osim teritorije Mongolije) i u Islamskoj Republici Iranu, u frekvencijskim opsezima 174-230 MHz i 470-862 MHz (Ženeva, 2006) (RRC-06)[2].

1.8 *Zona planiranja:* Region 1 (oni delovi Regiona 1, kako je definisano u odredbi br. 5.3 *Pravilnika o radio-komunikacijama,* koji se nalaze zapadno od meridijana 170° E i severno od uporednika 40° S, osim teritorije Mongolije) i u Islamskoj Republici Iranu.

1.9 *Sporazum:* Regionalni Sporazum i njegovi Aneksi zajedno sa pratećim *Planovima* koji su urađeni od strane *Konferencije.*

1.10 *Planovi:* Analogni plan i Digitalni plan kao što je precizirano u stavu 3.1 člana 3. ovog *Sporazuma* koji su naknadno ažurirani uspešnom primenom postupaka iz stava 4.1 člana 4. ovog *Sporazuma.*

1.11 *Ugovorna strana:* Svaka država članica iz *Zone planiranja* koja je odobrila *Sporazum* ili pristupila istom.

1.12 *Administracija:* Ukoliko nije drugačije naznačeno, termin Administracija označava Administraciju, kako je definisano u odredbi br. 1002 *Ustava, Ugovorne strane.*

1.13 *MIFR (Master International Frequency Register):* Glavni međunarodni registar frekvencija.

1.14 *Druge primarne terestrijalne službe:* Primarne terestrijalne službe osim službe radiodifuzije, i primarna radio-astronomska služba, kojima su namenjeni frekvencijski opsezi 174-230 MHz i/ili 470-862 MHz u *Zoni planiranja* u skladu sa članom 5. *Pravilnika o radio-komunikacijama*

1.15 *Postojeće dodele za druge primarne terestrijalne službe (skraćeno navedeno kao „Lista"):* Dodele za *druge primarne terestrijalne službe* sadržane u Aneksu 5

---

[2] Ova *Konferencija* održana je u dve sesije:

- prvo zasedanje, odgovorna za pripremanje izveštaja drugom zasedanju, održana u Ženevi od 10. do 28. maja 2004.
- drugo zasedanje, odgovorna za sastavljanje *Sporazuma* i pratećih *Planova*, održana je u Ženevi od 15. maja do 16. juna 2006.

Sporazuma, kao što je utvrđeno od strane *Konferencije*, i dodele za druge primarne terestrijalne službe za koje je uspešno primenjena procedura iz stava 4.2 člana 4. ovog *Sporazuma*.

1.16 *Prelazni period:* Period posle *Konferencije* za vreme koga će dodele u analognom planu (kako je precizirano u stavu 3.1.2 člana 3. ovog *Sporazuma*) biti zaštićene (videti takođe član 12. ovog *Sporazuma*)

1.17 *BR IFIC (Radiocommunication Bureau International Frequency Information Circular):* Cirkular Međunarodnog Biroa za radio-komunikacije sa informacijama o frekvencijama.

Član 2.

Sprovođenje sporazuma

2.1 *Ugovorne strane* usvajaju karakteristike koje su precizirane u *Planovima* za njihove radiodifuzne stanice u *Zoni planiranja* koje rade u frekvencijskim opsezima navedenim u članu 3. ovog *Sporazuma*.

2.2 *Ugovorne članice* ne modifikuju ove karakteristike niti puštaju u rad stanice, osim prema relevantnim odredbama članova 4. i 5. ovog *Sporazuma*.

2.3 *Ugovorne članice* primenjuju relevantne odredbe članova 4. i 5. ovog *Sporazuma* za *druge primarne terestrijalne službe* kojima su ovi opsezi takođe namenjeni.

Član 3.

Aneksi Sporazuma

3.1 Aneks 1: Frekvencijski planovi[3]

3.1.1 Digitalni Plan se sastoji iz dva dela: opseg 174-230 MHz i opseg 470-862 MHz (koji sadrži Plan dodele T-DAB-a, Plan raspodele T-DAB-a , Plan dodele DVB-T i Plan raspodele DVB-T)

3.1.2 Analogni plan koji se sastoji iz dva dela: opseg 174-230 MHz[4] i opseg 470-862 MHz

3.2 Aneks 2: Tehnički parametri i kriterijumi koji su korišćeni u izradi Plana i primeni *Sporazuma*

3.3 Aneks 3: Osnovne karakteristike koje treba dostaviti u primeni *Sporazuma.*

3.4 Aneks 4

3.4.1 Odeljak I: Ograničenje i metodologija za utvrđivanje kada je potreban sporazum sa drugom adiministracijom.

3.4.2 Odeljak II: Ispitivanje usaglašenosti sa upisom u digitalni plan.

3.5 Aneks 5: Lista dodela *za druge primarne terestrijalne službe* kako je navedeno u stavu 1.15 člana 1. *Sporazuma.*

[3] Po isteku *prelaznog perioda*, *Planovi* će sadržati samo digitalni plan.
[4] Za Maroko, analogni plan obuhvata opseg 170-230 MHz

Član 4.

Procedura za izmenu Planova i procedura za koordinaciju drugih primarnih terestrijalnih službi

4.1 Izmena Planova

4.1.1 Kada jedna administracija predloži izmenu digitalnog plana ili analognog plana, tj. u slučajevima u kojima jedna administracija ima potrebe:

a) da promeni karakteristike jedne raspodele ili jedne dodele radiodifuznoj stanici, koja se pojavljuje u *Planovima; ili*

b) da doda jednu raspodelu *Planovima,* ili jednu dodelu radiodifuznoj stanici; ili

c) da doda digitalnom Planu jednu dodelu koja proizilazi iz jedne raspodele u digitalnom Planu[5]; ili

d) da izbriše jednu raspodelu iz *Planova;* ili jednu dodelu za radiodifuznu stanicu,

ova administracija primenjuje proceduru koju sadrži ovaj član pre upućivanja bilo kakve notifikacije na osnovu člana 5.

4.1.2 Početak procedure izmene

4.1.2.1 Svaka administracija koja predloži izmenu karakteristika jedne dodele/raspodele koja se pojavljuje u *Planovima,* ili dodavanje nove dodele/raspodele *Planovima,* traži saglasnost od svake administracije za koju se smatra da je ovim ugrožena njena radiodifuzna služba i/ili *druge primarne terestrijalne službe.*

4.1.2.2 Smatra se da je administracija ugrožena u smislu svoje radiodifuzne službe kada se premaše granice date u Odeljku I Aneksa 4.

4.1.2.3 Smatra se da je administracija ugrožena u odnosu na svoje *druge primarne terestrijalne službe* kada se premaše granice date u Odeljku I Aneksa 4

za bilo koju od sledećih dodela:

a) *postojeće dodele drugim primarnim terestrijalnim službama;*

b) dodele *drugim primarnim terestrijalnim službama* za koje je započeta procedura koordinacije sa radiodifuznom službom na osnovu stava 4.2, tj. za koje je *Biro* primio kompletne informacije iz stava 4.2.2.6.

4.1.2.4 Saglasnost iz stava 4.1.2.1 nije potrebna ukoliko:

a) nijedna od odgovarajućih granica u Odeljku I Aneksa 4 iz stava 4.1.2.2 i iz stava 4.1.2.3 nije premašena; ili

b) se predložena izmena odnosi na promene tehničkih karakteristika koje ne povećavaju postojeći nivo smetnji i ne povećavaju postojeći nivo zahtevane zaštite.

4.1.2.5 Administracija koja predlaže izmenu Planova dostavlja Birou relevantne karakteristike navedene u Aneksu 3, u elektronskoj formi, i daje, gde je to moguće,

---

[5] Ukoliko nije namera da se dodele uvrste u digitalni plan, administracije odmah primenjuju član 5.

imena administracija koje su se već saglasile sa predloženim izmenama na osnovu karakteristika koje su saopštene Birou.

Biro razmatra ovo saopštenje kao zahtev za primenu procedure sadržane u stavu 4.1.5.3, ukoliko se to od njega zahteva, u sledećim slučajevima:

- nije potrebna saglasnost na osnovu stava 4.1.2.4 i ne sadrži ime ni jedne administracije na osnovu stava 4.1.3.2; ili
- primljene su sve saglasnosti i ne sadrži ime administracije na osnovu stava 4.1.2.9, ili ga sadrži na osnovu stava 4.1.3.2.

4.1.2.6 Ukoliko se ustanovi da su karakteristike dostavljene na osnovu stava 4.1.2.5 nepotpune, *Biro* će odmah zatražiti od administracije koja predlaže modifikaciju *Planova* sva potrebna objašnjenja i informacije koje nisu dostavljene.

4.1.2.7 Prilikom primene stava 4.1.1 c*),* ukoliko *Biro* ustanovi da su, u slučaju konverzije jedne raspodele u jednu ili nekoliko dodela, uslovi iz Odeljka II Aneksa 4 ispunjeni, primenjuju se odredbe iz stava 4.1.5.3.[6] U suprotnom, *Biro* će zatražiti od administracije koja predlaže izmenu digitalnog plana da preduzme odgovarajuće mere. Predložena izmena zastareva ukoliko administracija ne izmeni karakteristike u roku od 30 dana kako bi se ove uskladile sa Odeljkom II Aneksa 4. Ovaj period od 30 dana počinje na dan kada *Biro* pošalje pomenuti zahtev.

4.1.2.8 Po prijemu potpunih informacija iz stava 4.1.2.5 ili stava 4.1.2.6, *Biro,* u roku od 40 dana:

a) identifikuje administracije za koje se smatra da su ugrožene, u skladu sa stavom 4.1.2.2 i stavom 4.1.2.3;

b) objavljuje karakteristike dobijene u Specijalnoj sekciji *BR IFIC-a,* zajedno sa imenima identifikovanih administracija, označavajući one čija je saglasnost dostavljena na osnovu stava 4.1.2.5 od strane administracije koja predlaže izmenu *Planova* i odgovarajuće dodele *drugim* terestrijalnim službama za koje se smatra da su ugrožene, ukoliko je to moguće;

c) obaveštava administracije koje su identifikovane u tački *a).*

4.1.2.9 Administracija čija je saglasnost dostavljena *Birou* na osnovu stava 4.1.2.5, može, u roku od 40 dana od dana objavljivanja *BR IFIC-a* na osnovu stava 4.1.2.8 *b),* da uputi zahtev *Birou* da se njeno ime ukloni sa spiska administracija koje su dale svoju saglasnost, kao što je objavljeno na osnovu stava 4.1.2.8 b*). Biro* šalje kopiju ovog zahteva administraciji koja predlaže modifikaciju *Planova.* U slučaju uklanjanja imena jedne administracije sa spiska administracija koje su dale svoju saglasnost, kao što je objavljeno na osnovu stava 4.1.2.8 *b), Biro* smatra da od ove administracije nije dobijena saglasnost.

4.1.3 Zahtev za uključivanje u postupak traženja saglasnosti

4.1.3.1 Svaka administracija koja smatra da je trebalo da bude uključena u spisak administracija za koje se smatra da su ugrožene može, u roku od 40 dana od dana objavljivanja *BR IFIC-a* iz stava 4.1.2.8 *b),* da uputi zahtev *Birou* da uključi

[6] U slučaju dodela koje proizilaze iz jedne raspodele u digitalnom planu koja sadrži napomene u koloni „napomene“ plana, ove napomene će se primenjivati na ove dodele.

njeno ime u spisak administracija za koje se smatra da su ugrožene, obrazlažući ovaj svoj postupak na osnovu kriterijuma iz Odeljka I Aneksa 4.

4.1.3.2 Po prijemu ovakvog zahteva, *Biro* ispituje slučaj i ukoliko u skladu sa stavovima 4.1.2.2 i 4.1.2.3, ustanovi da je ime ove administracije trebalo da bude uključeno u spisak administracija koje se smatraju ugroženim, on će:

- odmah obavestiti administraciju koja predlaže izmenu *Planova* i administraciju koja zahteva da bude uključena u spisak administracija za koje se smatra da su ugrožene; i
- objaviti, u roku od 30 dana od dana prijema zahteva, ime ove administracije u dodatku Specijalne sekcije *BR IFIC-a* iz stavovima 4.1.2.8 b*),* kao i odgovarajuće dodele za *druge terestrijalne službe,* ukoliko je celishodno.

Za administracije čija su imena objavljena u dodatku, celokupni period od 75 dana naveden u stavovima 4.1.4.6, 4.1.4.7, 4.1.4.8, 4.1.4.9, 4.1.4.10 i 4.1.5.1 nastavlja se od dana objavljivanja gore pomenutog dodatka Specijalne sekcije *BR IFIC-a.*

Ukoliko *Biro* ustanovi da ime ove administracije ne treba da bude uključeno u spisak administracija za koje se smatra da su ugrožene, obaveštava o tome ovu administraciju

4.1.3.3 Administracija koja predlaže izmenu *Planova* tražiće saglasnost od administracija od kojih saglasnost nije dobijena (videti, takođe paragraf 4.1.2.9), a koje se nalaze na spisku publikacije iz paragrafa 4.1.2.8 *b)* odnosno stava 4.1.3.2, primenjujući proceduru sadržanu u stavu 4.1.4 u nastavku.

4.1.3.4 Ako su primljene sve saglasnosti i ime administracije nije uklonjeno na osnovu stava 4.1.2.9 i ime administracije nije uključeno na osnovu stava 4.1.3.2, primenjuje se procedura sadržana u stavu 4.1.5.3.

4.1.4 Traženje saglasnosti od administracija za koje se smatra da su ugrožene a od kojih saglasnost treba da bude dobijena

4.1.4.1 Poseban odeljak *BR IFIC-a* iz stava 4.1.2.8 *b)* odnosno stava 4.1.3.2, predstavlja formalan zahtev za koordinaciju upućen onim administracijama od kojih saglasnost treba da bude dobijena.

4.1.4.2 Prilikom traženja saglasnosti od druge administracije, administracija koja predlaže izmenu *Planova* može, takođe, da dostavi eventualne dodatne informacije vezane za predložene kriterijume koji će se koristiti, kao i druge pojedinosti koje se odnose na podatke o terenu, posebne uslove propagacije, itd.

4.1.4.3 Po prijemu Specijalne sekcije *BR IFIC-a* iz stava 4.1.2.8 *b)* odnosno stava 4.1.3.2, svaka administracija koja se nalazi na spisku istog ispitaće efekat koji predložena izmena digitalnog plana ili analognog plana ima na njenu radiodifuznu službu, na njene dodele za *druge primarne terestrijalne službe,* uzimajući u obzir, u najvećoj mogućoj meri, dodatne informacije iz stava 4.1.4.2.

4.1.4.4 Administracija od koje se traži saglasnost, može zatražiti od *Biroa* da joj pomogne pružajući joj dalje informacije koje će ovoj administraciji omogućiti da proceni smetnju koja proizilazi iz predložene izmene, koristeći metod opisan u Odeljku I Aneksa 4. *Biro* upućuje ove informacije najbržim putem.

4.1.4.5 Administracija od koje se traži saglasnost, može da uputi svoje komentare administraciji koja predlaže izmenu *Planova* direktno ili preko *Biroa.* U svakom slučaju, *Biro* će biti obavešten o ovim komentarima.

4.1.4.6 Administracija koja nije u poziciji da da svoju saglasnost na predloženu izmenu u vezi sa svojom radiodifuznom službom saopštava svoju odluku, zajedno sa obrazloženjima vezanim za njenu radiodifuznu službu, u roku od 75 dana od dana objavljivanja *BR IFIC-a* iz stava 4.1.2.8 b*),* odnosno stava 4.1.3.2.

4.1.4.7 Administracija koja nije u poziciji da da svoju saglasnost na predloženu izmenu u vezi sa svojim *drugim primarnim terestrijalnim službama* daće svoje razloge, na osnovu svojih sopstvenih dodela iz stava 4.1.2.3 *a)* i *b),* u roku od 75 dana od dana objavljivanja *BR IFIC-a,* saglasno stavu 4.1.2.8 *b)* ili stavu 4.1.3.2.

4.1.4.8 Pedeset dana od objavljivanja *BR IFIC-a,* saglasno sa stavu 4.1.2.8 *b)* ili stavu 4.1.3.2, *Biro* će zahtevati od administracije koja nije saopštila svoju odluku o ovom pitanju da to učini. Nakon ukupnog perioda od 75 dana od dana objavljivanja *BR IFIC-a, Biro* odmah obaveštava administraciju koja predlaže izmenu *Planova* o tome da je poslao pomenute zahteve i dostavlja joj imena administracija koje su dale svoju saglasnost i imena administracija koje nisu odgovorile.

4.1.4.9 Ukoliko jedna administracija ne odgovori u periodu od 75 dana, smatra se da ova administracija nije saglasna sa predloženom izmenom *Planova,* osim ukoliko se ne primenjuju odredbe stava 4.1.4.10 i 4.1.4.11.

4.1.4.10 Po isteku ovog perioda od 75 dana, administracija koja predlaže izmenu *Planova* može da zatraži od B*iroa* da joj pomogne tako što će poslati opomenu administraciji koja nije odgovorila, tražeći odluku. Ovaj zahtev ni u kom slučaju ne produžava period od 24 meseca naveden u stavu 4.1.5.1.

4.1.4.11 Ukoliko se u roku od 40 dana od dana slanja opomene iz stava 4.1.4.10 B*irou* ne saopšti nikakva odluka, smatra se da je administracija koja nije saopštila odluku saglasna sa predloženom izmenom *Planova.*

4.1.4.12 Ukoliko na kraju perioda pomenutih u stavu 4.1.4.9 odnosno stavu 4.1.4.11, i dalje postoji nesaglasnost, B*iro* sprovodi proučavanja koja mogu zahtevati ili administracija koja predlaže izmenu *Planova* ili administracija od koje se traži saglasnost; u roku od 40 dana, Biro obaveštava iste o rezultatu proučavanja i daje takve preporuke koje omogućavaju rešenje problema.

4.1.4.13 Administracija može, pre nego što primeni procedure iz stava 4.1, ili u bilo kojoj drugoj fazi primene procedure koja je opisana u istom, da zatraži pomoć od *Biroa* bez uticaja na primenu gore pomenutih rokova.

4.1.4.14 Ukoliko pri traženju saglasnosti, administracija izmeni prvobitni predlog, ponovo se primenjuju odredbe stava 4.1.

4.1.5 Okončanje procedure modifikacije

4.1.5.1 Kada administracija dobije saglasnost od svih administracija čija su imena objavljena u *BR IFIC - u* iz stava 4.1.2.8 b) ili stava 4.1.3.2, obaveštava B*iro* o konačnim dogovorenim karakteristikama dodele/raspodele zajedno sa nazivima administracija sa kojima je postignuta saglasnost. Ukoliko administracija koja predlaže izmenu *Planova* ne obavesti B*iro* u roku od 24 meseca po isteku perioda od 75 dana iz stavova od 4.1.4.6 do 4.1.4.10, predložena izmena zastareva.

4.1.5.2 Ukoliko se kao rezultat gore pomenutih konačnih dogovorenih karakteristika identifikuju nove administracije koje su ugrožene, administracija koja predlaže izmenu *Planova* ponovo primenjuje odredbe tačke 4.1 u odnosu na ove nove administracije.

4.1.5.3 Od prijema kompletnih informacija iz stava 4.1.5.1, *Biro,* u roku od 30 dana objavljuje u Specijalnoj sekciji *BR IFIC - a* karakteristike dodele/raspodele zajedno sa imenima administracija koje su dale saglasnost na predloženu modifikaciju *Planova* i uključuje novu odnosno modifikovanu dodelu/raspodelu u *Planove.* U odnosu na *Ugovorne članove* data dodela/raspodela imaće isti status kao i ona koja se pojavljuje u *Planovima.* Međutim, u slučaju da neka dodela u planu proizilazi iz konverzije neke raspodele, ova dodela ostaje usaglašena sa raspodelom iz koje proizilazi i u skladu sa Odeljkom II Aneksa 4.

4.1.5.4 U skladu sa ovim članom, saglasnost od ugrožene/ih administracije/a takođe se može dobiti za utvrđeni vremenski period. *Biro* uklanja ovu dodelu ili raspodelu iz *Planova* i/ili *MIFR* po isteku ovog vremenskog perioda, pošto je obavestio administraciju.

4.1.6 Brisanje dodele ili raspodele

Ukoliko se neka dodela ili raspodela iz *Planova* izbriše bilo na osnovu stava 4.1.1 *d)* ili stava 4.1.5.4, *Biro* objavljuje ovu informaciju u *Specijalnoj sekciji BR IFIC -a.* U slučaju brisanja neke raspodele, *Biro* briše sve dodele koje proizilaze iz ove raspodele iz digitalnog plana i iz *MIFR* nakon što je o tome obavestio administraciju.

4.1.7 Ažuriranje Planova

Biro periodično ažurira i objavljuje ažurirani original *Planova,* uzimajući u obzir sve izmene, dopune i brisanja izvršena u skladu sa procedurom iz ovog člana.

4.2 Koordinacija dodela za *druge primarne terestrijalne službe* sa radiodifuznom službom

4.2.1 Ukoliko administracija predloži izmenu karakteristika *postojeće dodele za druge primarne terestrijalne službe,* ili uvođenje u upotrebu nove dodele za *druge primarne terestrijalne službe,* procedura sadržana u ovom članu primenjuje se pre upućivanja bilo kakve notifikacije prema odredbama člana 5.

4.2.2 Započinjanje procedure koordinacije

4.2.2.1 Prilikom primene stava 4.2.1, administracija traži saglasnost od svake administracije čija se radiodifuzna služba smatra ugroženom.

4.2.2.2 Smatra se da je administracija ugrožena u odnosu na svoju radiodifuznu službu kada su prevaziđene granice date u Odeljku I Aneksa 4.

4.2.2.3 Saglasnost iz stava 4.2.2.1 nije potrebna ukoliko:

a) nisu prevaziđene nijedne od odgovarajućih granica iz Sekcije I Aneksa 4 koje se nalaze u stavu 4.2.2.2; ili

b) se predložena izmena odnosi na promene u tehničkim karakteristikama koje ne povećavaju postojeći nivo smetnji i ne povećavaju postojeći nivo zahtevane zaštite.

4.2.2.4 Administracija koja predlaže novu ili izmenjenu dodelu dostavlja *Birou* relevantne karakteristike nabrojane u Aneksu 3, u elektronskoj formi, i takođe navodi, ukoliko je podesno, imena svih administracija koje su već dale svoju saglasnost na predloženu novu ili izmenjenu dodelu, na osnovu karakteristika koje su dostavljene *Birou.*

Biro će razmatrati ovaj zahtev, ako se to traži, kao zahtev na koji se primenjuje postupak koji je sadržan u stavu 4.2.5.3 u sledećim slučajevima:

- nije zahtevana saglasnost po stavu 4.2.2.3 i nije uključeno ime administracije u skladu sa stavom 4.2.3.2; ili
- kada su dobijene sve saglasnosti i kada nijedno ime administracije nije izbrisano, u skladu sa stavom 4.2.2.7, ili ubačeno u skladu sa stavom 4.2.3.2

4.2.2.5 Ukoliko se ustanovi da su karakteristike dostavljene na osnovu stava 4.2.2.4 nepotpune, *Biro* će odmah zatražiti od ove administracije sva potrebna objašnjenja i informacije koje nisu dostavljene.

4.2.2.6 Po prijemu potpunih informacija iz stava 4.2.2.4 ili stava 4.2.2.5, *Biro,* u roku od 40 dana:

a) identifikuje administracije za koje se smatra da su ugrožene, u skladu sa stavom 4.2.2.2;

b) objavljuje primljene karakteristike u Specijalnu sekciju *BR IFIC -a,* zajedno sa imenima identifikovanih administracija, označavajući one čija saglasnost je dostavljena na osnovu stava 4.2.2.4 od strane administracije koja traži saglasnost;

c) obaveštava administracije koje su identifikovane u tački *a).*

4.2.2.7 Administracija čija je saglasnost dostavljena *Birou* na osnovu stava 4.2.2.4 može, u roku od 40 dana od dana objavljivanja *BR IFIC -a* iz stava 4.2.2.6 b*),* da uputi zahtev *Birou* da ukloni njeno ime sa spiska administracija koje su dale svoju saglasnost, objavljenog na osnovu stava 4.2.2.6 *b). Biro* šalje kopiju ovog zahteva administraciji koja traži saglasnost. U slučaju uklanjanja imena jedne administracije sa spiska administracija koje su dale svoju saglasnost, objavljenog na osnovu stava 4.2.2.6 *b), Biro* će smatrati da od ove administracije nije dobijena saglasnost.

4.2.3 Zahtev za uključivanje u postupak traženja saglasnosti

4.2.3.1 Svaka administracija koja smatra da je trebalo da bude uključena u spisak administracija za koje se smatra da su ugrožene može, u roku od 40 dana od dana objavljivanja *BR IFIC -a* da uputi zahtev *Birou* da uključi njeno ime u spisak administracija za koje se smatra da su ugrožene, obrazlažući ovaj svoj postupak na osnovu kriterijuma iz Odeljka I Aneksa 4.

4.2.3.2 Po prijemu ovakvog zahteva, *Biro* ispituje slučaj i, ukoliko u skladu sa stavom 4.2.2.2, ustanovi da je ime ove administracije trebalo da bude uključeno u spisak administracija za koje se smatra da su ugrožene, on će:

- odmah obavestiti administraciju koja traži saglasnost i administraciju koja zahteva da bude uključena u spisak administracija za koje se smatra da su ugrožene; i

- objavljuje, u roku od 30 dana od dana prijema zahteva, ime ove administracije u dodatku Specijalne sekcije *BR IFIC -a* iz stava 4.2.2.6 b*).*

Za administracije čija su imena objavljena u dodatku, celokupni period od 75 dana naveden u stavovima 4.2.4.6, 4.2.4.7, 4.2.4.8, 4.2.4.9, i 4.2.5.1 nastavlja se od dana objavljivanja gore pomenutog dodatka Specijalne sekcije *BR IFIC -a.*

Ukoliko *Biro* ustanovi da ime ove administracije ne treba da bude uključeno u spisak administracija za koje se smatra da su ugrožene, obaveštava o tome ovu administraciju.

4.2.3.3 Administracija koja predlaže novu ili izmenjenu dodelu tražiće saglasnost od administracija od kojih saglasnost nije dobijena (videti, takođe stav 4.2.2.7) a koje se nalaze na spisku publikacije iz stava 4.2.2.6 b*)* ili stava 4.2.3.2, primenjujući postupak sadržan u stavu 4.2.4 u nastavku.

4.2.3.4 Ako su dobijene sve saglasnosti i ime administracije nije uklonjeno na osnovu stava 4.2.2.7 i ime administracije nije uključeno na osnovu stava 4.2.3.2, primenjuje se postupak sadržan u stavu 4.2.5.3.

4.2.4 Traženje saglasnosti od administracija za koje se smatra da su ugrožene a od kojih saglasnost još nije dobijena

4.2.4.1 Specijalna sekcija *BR IFIC -a* iz stava 4.2.2.6 b*)* ili stava 4.2.3.2, predstavlja formalan zahtev za koordinaciju upućen onim administracijama od kojih saglasnost još treba da bude dobijena.

4.2.4.2 Prilikom traženja saglasnosti od druge administracije, administracija koja predlaže novu ili izmenjenu dodelu može, takođe, da dostavi eventualne dodatne informacije vezane za predložen kriterijum koji će se koristiti, kao i druge pojedinosti koje se odnose na podatke o terenu, posebne uslove propagacije, itd.

4.2.4.3 Po prijemu Specijalne sekcije *BR IFIC -a* iz stava 4.2.2.6 b*)* ili stava 4.2.3.2, svaka administracija koja se nalazi na spisku istog ispitaće uticaj koji predložena nova ili izmenjena dodela ima na njenu radiodifuznu službu, uzimajući u obzir, u najvećoj mogućoj meri, dodatne informacije iz stava 4.2.4.2.

4.2.4.4 Administracija od koje se traži saglasnost, može zatražiti od *Biroa* da joj pomogne pružajući joj dalje informacije koje će administraciji omogućiti da proceni smetnju od predložene nove ili izmenjene dodele, koristeći metod opisan u Odeljku I Aneksa 4. *Biro* upućuje ovu informaciju najbržim putem.

4.2.4.5 Administracija od koje se traži saglasnost, može da uputi svoje komentare administraciji koja predlaže novu ili izmenjenu dodelu direktno ili preko *Biroa.* U svakom slučaju, *Biro* će biti obavešten o ovim komentarima.

4.2.4.6 Administracija koja nije u poziciji da da svoju saglasnost na predložene nove ili izmenjene dodele saopštava svoju odluku, zajedno sa obrazloženjima vezanim za njenu radiodifuznu službu, u roku od 75 dana od dana objavljivanja *BR IFIC* iz stava 4.2.2.6 *b)* ili stava 4.2.3.2.

4.2.4.7 Pedeset dana od objavljivanja *BR IFIC -a* iz stava 4.2.2.6 b) ili stava 4.2.3.2, *Biro* zahteva od svake administracije koja nije saopštila odluku o ovom pitanju da to učini. Nakon ukupnog perioda od 75 dana od dana objavljivanja *BR IFIC-a, Biro* odmah obaveštava administraciju koja predlaže novu ili izmenjenu dodelu o tome da je poslao pomenute zahteve i dostavlja joj imena administracija koje su dale svoju saglasnost i imena administracija koje nisu odgovorile.

4.2.4.8 Ukoliko jedna administracija ne odgovori u okviru ovog perioda od 75 dana, smatra se da ova administracija nije saglasna sa predloženom novom ili izmenjenom dodelom, osim ukoliko se ne primenjuju odredbe iz paragrafa 4.2.4.9 i 4.2.4.10.

4.2.4.9 Po isteku ovog perioda od 75 dana, administracija koja predlaže novu ili izmenjenu dodelu može da zatraži od *Biroa* da joj pomogne tako što će poslati opomenu administraciji koja nije odgovorila, zahtevajući odluku. Ovaj zahtev ni u kom slučaju ne produžava period od 24 meseca naveden u paragrafu 4.2.5.1.

4.2.4.10 Ukoliko se u roku od 40 dana od dana slanja opomene iz paragrafa 4.2.4.9 *Birou* ne dostavi odluka, smatra se da je administracija koja nije dostavila odluku saglasna sa predloženom novom ili izmenjenom dodelom.

4.2.4.11 Ukoliko na kraju perioda pomenutih u paragrafu 4.2.4.8 ili paragrafu 4.2.4.10 i dalje postoje nesuglasice, *Biro* vrši proučavanje koje može zahtevati ili administracija koja predlaže novu ili izmenjenu dodelu, ili administracija od koje se traži saglasnost; u roku od 40 dana, obaveštava iste o rezultatima proučavanja i daje preporuke koje bi mogle da ponude rešenje problema.

4.2.4.12 Administracija može, pre nego što primeni postupak iz stava 4.2, ili u bilo kojoj drugoj fazi primene procedure koja je opisana u istoj, da zatraži pomoć od *Biroa* a da to nema uticaja na primenu gore pomenutih rokova.

4.2.4.13 Ukoliko pri traženju saglasnosti, administracija izmeni svoj prvobitni predlog, ponovo se primenjuju odredbe iz stava 4.2.

4.2.5 Završetak postupka koordinacije

4.2.5.1 Kada administracija dobije saglasnost od svih administracija čija su imena objavljena u *BR IFIC -u* iz stava 4.2.2.6 *b)* ili stava 4.2.3.2, ona obaveštava *Biro* o konačnim dogovorenim karakteristikama dodele zajedno sa imenima administracija sa kojima je postignuta saglasnost. Ukoliko administracija koja predlaže novu ili izmenjenu dodelu ne obavesti *Biro* u roku od 24 meseca po isteku roka od 75 dana iz stavova od 4.2.4.6 do 4.2.4.9, predložena izmena zastareva.

4.2.5.2 Ukoliko se kao rezultat gore pomenutih konačnih dogovorenih karakteristika identifikuju nove ugrožene administracije, administracija koja predlaže novu ili izmenjenu dodelu ponovo primenjuje odredbe stava 4.2 u odnosu na ove nove administracije.

4.2.5.3 Od prijema kompletnih informacija iz stava 4.2.5.1, *Biro,* u roku od 30 dana, objavljuje u Specijalnoj sekciji *BR IFIC -a* karakteristike dodele zajedno sa imenima administracija koje su dale saglasnost na predloženu novu ili izmenjenu dodelu i uvršćuje novu odnosno izmenjenu dodelu u *Spisak.*

4.2.5.4 Predložena nova ili izmenjena dodela zastareva ukoliko nije notifikovana prema članu 5, u roku od 12 meseci od objavljivanja saglasno stavu 4.2.5.3.

4.2.5.5 Saglasnost ugrožene/ih administracije/a takođe se može dobiti u skladu sa ovim članom za neki određeni vremenski period. *Biro* uklanja ovu dodelu sa *Spiska* i/ili iz *MIFR-a* po isteku ovog vremenskog perioda, nakon što je obavestio administraciju.

4.2.6 Ažuriranje Spiska

Biro ažurira i periodično objavljuje ažurirani original *Spiska,* uzimajući u obzir sve izmene, dopune i brisanja izvršene u skladu sa postupkom iz ovog člana.

Član 5.

Notifikacija dodela frekvencija

5.1 Notifikacija dodela frekvencija radiodifuznim stanicama

5.1.1 Kada jedna administracija predlaže stavljanje u upotrebu jedne dodele za radiodifuznu stanicu, upućuje notifikaciju *Birou,* u skladu sa odredbama člana 11, *Pravilnika o radio-komunikacijama,* karakteristike ove dodele, kako je utvrđeno u Aneksu 3 *Sporazuma.*

5.1.2 Biro ispituje dodelu prema odredbi br. **11.34** *Pravilnika o radio-komunikacijama,* t.j. njenu usklađenost sa *Planovima* i pratećim odredbama, te će zaključak biti povoljan ukoliko:

a) se dodela nalazi u *Planovima*[7] i nema nikakvu napomenu koja se odnosi na dodele u analognom planu, na *postojeće dodele za druge primarne terestrijalne službe* ili na upise u digitalni Plan i ukoliko su uslovi iz Odeljka II Aneksa 4 ispunjeni; ili

b) se dodela nalazi u digitalnom Planu i ima napomenu koja se odnosi na:

- dodele u analognom planu ili na *postojeće dodele za druge primarne terestrijalnee službe,* i ukoliko su dobijene sve potrebne saglasnosti, i svi uslovi iz Odeljka II Aneksa 4 ispunjeni; i/ili
- upise u digitalni Plan, a administracija koja upućuje notifikaciju navodi da su svi uslovi vezani za napomenu u potpunosti ispunjeni, i da su ispunjeni uslovi iz Odeljka II Aneksa 4; ili

c) jedna dodela proizilazi iz jedne raspodele u digitalnom Planu koja nema nikakvu napomenu koja se odnosi na dodele u analognom Planu, ni na *postojeće dodele za druge primarne terestrijalne službe* ili na upise u digitalni Plan, a uslovi iz Odeljka II Dodatka 4 su ispunjeni; ili

d) dodele koja proizilazi iz jedne raspodele u digitalnom Planu, a koja ima napomenu u odnosu na:

- dodele u analognom planu ili na *postojeće dodele za druge primarne terestrijalne službe*, a za koje su dobijene sve potrebne saglasnosti i ispunjeni uslovi iz Odeljka II Aneksa 4 i/ili
- upise u digitalnom Planu, a za koje su ispunjeni uslovi iz Odeljka II Aneksa 4, a administracija koja upućuje notifikaciju navodi da su u potpunosti ispunjeni svi uslovi vezani za napomenu; ili

e) su ispunjeni uslovi utvrđeni u Odeljku II Aneksa 4, u slučaju upotrebe upisa u digitalnom Planu, sa različitim karakteristikama, u okviru DVB-T ili T-DAB sistema.

5.1.3 Digitalni upis u Plan može se, takođe, notifikovati sa karakteristikama koje se razlikuju od onih koje se pojavljuju u Planu, za emisije u radiodifuznoj službi ili u *drugim primarnim terestrijalnim službama* koje rade u skladu sa *Pravilnikom o radio-komunikacijama,* pod uslovom da gustina vršne snage u bilo koja 4 KHz prethodno pomenutih notifikovanih dodela ne premašuje spektralnu gustinu snage u ista 4 KHz digitalnog upisa u Planu. Ovakva upotreba ne traži veću zaštitu od one koja je obezbeđena za gore pomenuti digitalni upis.

5.1.4 Ukoliko ispitivanje iz stava 5.1.2, odnosno stava 5.1.3 dovede do povoljnog zaključka, dodela se upisuje u *MIFR.* U odnosima između *Ugovornih članova,* za sve dodele radiodifuznih frekvencija upisane u MIFR-*u,* a koje su u skladu sa *Sporazumom,* smatra se da imaju isti status bez obzira na datum prijema saopštenja o ovim dodelama frekvencija u *Birou* odnosno bez obzira na datum kada su puštene u rad.

5.1.5 Ukoliko ispitivanje iz stava 5.1.2 ili stava 5.1.3 dovede do nepovoljnih zaključaka, saopštenje se vraća administraciji koja je uputila notifikaciju zajedno sa odgovarajućim razlozima.

5.1.6 Ukoliko administracija ponovo podnese saopštenje, a ponovno ispitivanje od strane *Biroa* na osnovu stava 5.1.2 i stava 5.1.3, dovede do povoljnog rezultata, dodela se upisuje u *MIFR.*

5.1.7 Ukoliko ponovno ispitivanje na osnovu stava 5.1.2 dovede do nepovoljnog zaključka, dodela se upisuje sa povoljnim zaključkom prema odredbi broj **11.31,** i sa nepovoljnim zaključkom prema odredbi broj **11.34,** zajedno sa imenom/ima administracije/a sa kojima i dalje postoji nesaglasnost, uz napomenu da će u odnosu na ovu/e administraciju/e upisana dodela biti u fukciji pod uslovom da ne prouzrokuje neprihvatljivu smetnju, niti zahteva zaštitu u odnosu na bilo koju stanicu koja radi u skladu sa *Sporazumom* i pratećim *Planovima.*

5.1.8 Saopštenje koje se ponovo podnosi takođe uključuje potpisanu obavezu administracije koja upućuje notifikaciju, u kojoj se navodi da korišćenje dodele koja se podnosi za upis u *MIFR* na osnovu stava 5.1.7 neće prouzrokovati neprihvatljivu smetnju, niti zahtevati zaštitu u odnosu na bilo koju stanicu administracije sa kojom i dalje postoji nesaglasnost, a koja radi u skladu sa *Sporazumom* i pratećim *Planovima* i koja je upisana u *MIFR* sa povoljnim zaključkom u odnosu na odredbe broj **11.31** i **11.34.**

5.1.9 Ukoliko upotreba ove dodele prouzrokuje neprihvatljivu smetnju nekoj dodeli administracije sa kojom i dalje postoji nesaglasnost, a koja radi u skladu sa *Sporazumom* i pratećim *Planovima* i koja je upisana u *MIFR* sa povoljnim zaključkom u odnosu na odredbe broj **11.31** i **11.34,** administracija koja prouzrokuje neprihvatljivu smetnju će, po prijemu saopštenja o istoj, odmah ukloniti ovu smetnju.

5.2 Notifikacija dodela frekvencija za druge primarne terestrijalne službe

5.2.1 Ukoliko jedna administracija predloži stavljanje u upotrebu jedne dodele za *druge primarne terestrijalne službe* upućuje *Birou* notifikaciju o ovoj dodeli u skladu sa odredbama člana **11.** *Pravilnika o radio-komunikacijama.*

5.2.2 Na osnovu ispitivanja od strane *Biroa,* u skladu sa *Sporazumom, Biro* ispituje saopštenje u odnosu na uspešnu primenu procedure iz tačke 4.2 *Sporazuma.*

5.2.3 Ukoliko ispitivanje iz stava 5.2.2 dovede do povoljnog zaključka, dodela se upisuje u *MIFR.* U suprotnom, saopštenje se vraća administraciji koja vrši notifikaciju, zajedno sa odgovarajućim razlozima.

5.2.4 Ukoliko data administracija ponovo podnese saopštenje, za ponovno ispitivanje od strane *Biroa* na osnovu stava 5.2.2 dovede do povoljnog zaključka, dodela se, u skladu sa tim, upisuje u *MIFR.*

5.2.5 Ukoliko ponovno ispitivanje na osnovu stava 5.2.2 dovede do nepovoljnog zaključka, dodela se upisuje sa povoljnim zaključkom prema odredbi broj **11.31,** i sa nepovoljnim zaključkom prema odredbi broj **11.34,** zajedno sa imenom/ima administracije/a sa kojom/ima i dalje postoji nesaglasnost, uz napomenu da u odnosu na ovu/e administraciju/e upisana dodela će biti u funkciji pod uslovom da ne prouzrokuje neprihvatljivu smetnju, niti zahteva zaštitu u odnosu na bilo koju stanicu koja radi u skladu sa *Sporazumom* i pratećim *Planovima.*

5.2.6 Saopštenje koje se ponovo podnosi takođe uključuje potpisanu obavezu od strane administracije koja upućuje notifikaciju, u kojoj se navodi da upotreba dodele upisane u *MIFR* na osnovu stava 5.2.5 neće prouzrokovati štetnu smetnju, niti zahtevati zaštitu u odnosu na bilo koju stanicu administracije sa kojom i dalje postoji nesaglasnost, a koja radi u skladu sa *Sporazumom* i pratećim *Planovima* i koja je upisana u *MIFR* sa povoljnim zaključkom u odnosu na odredbe broj **11.31** i **11.34.**

5.2.7 Ukoliko upotreba ove dodele prouzrokuje neprihvatljivu smetnju nekoj dodeli administracije sa kojom i dalje postoji nesaglasnost, a koja radi u skladu sa *Sporazumom* i pratećim *Planovima* i koja je upisana u *MIFR* sa povoljnim zaključkom u odnosu na odredbe broj **11.31** i **11.34,** administracija koja prouzrokuje neprihvatljivu smetnju će, po prijemu saopštenja o istoj, odmah ukloniti ovu smetnju.

Član 6.

Rešavanje sporova

6.1 Ukoliko, nakon primene procedure opisane u gore navedenim članovima, dotične administracije nisu uspele da postignu sporazum, mogu pribeći proceduri opisanoj u članu 56. *Ustava.* Mogu se takođe složiti da primene Fakultativni protokol o obaveznom rešavanju sporova koji su vezani za Ustav ITU, Konvenciju ITU i Administrativne propise.

Član 7.

Pristupanje Sporazumu

7.1 Svaka Država članica u *zoni planiranja* koja nije potpisala *Sporazum* može u bilo kom momentu da položi dokument pristupanja kod *Generalnog sekretara,* koji će odmah obavestiti druge Države članice. Pristupanje *Sporazumu* obavlja se bez rezervi i primenjuje se na *Planove* koji su na snazi u momentu pristupanja.

7.2 Pristupanje *Sporazumu* postaje pravosnažno na dan kada su dokumenti pristupanja primljeni od strane *Generalnog sekretara.*

Član 8.

Oblast primene Sporazuma

8.1 *Sporazum* obavezuje *ugovorne strane* u smislu njihovih međusobnih odnosa, ali ne obavezuje ove države članice u smislu njihovih odnosa sa Državama članicama koje nisu *ugovorne strane.*

8.2 Ukoliko *ugovorne strane* izraze rezerve u odnosu na primenu bilo koje odredbe *Sporazuma,* druge *ugovorne strane* nisu obavezne da poštuju ovu odredbu u odnosima sa članicom koja je izrazila ovakve rezerve.

Član 9.
Prihvatanje Sporazuma

9.1 Države članice potpisnice *Sporazuma* upućuju notifikaciju o svom prihvatanju *Sporazuma* u najkraćem mogućem roku, *Generalnom sekretaru,* koji odmah obaveštava ostale države članice.

Član 10.

Otkazivanje Sporazuma

10.1 Svaka *ugovorna strana* može da otkaže *Sporazum* u bilo kom momentu upućivanjem notifikacije *Generalnom sekretaru,* koji obaveštava ostale Države članice.

10.2 Otkazivanje stupa na snagu godinu dana od dana kada *Generalni sekretar* primi notifikaciju o otkazivanju.

10.3 Na dan kada otkazivanje stupi na snagu, *Biro* briše iz *Planova* dodele i/ili raspodele koje su unete u ime Države članice koja je otkazala *Sporazum.*

Član 11.
Revizija Sporazuma

11.1 Reviziju *Sporazuma* može da vrši samo nadležna regionalna konferencija o radio-komunikacijama sazvana u skladu sa procedurom utvrđenom u *Ustavu* i *Konvenciji,* na koju se pozivaju sve Države članice iz *Zone planiranja.*

Član 12.

Stupanje na snagu, trajanje i privremena primena Sporazuma

12.1 *Sporazum* stupa na snagu 17. juna 2007. godine u 00:01 čas (UTC).

12.2 Odredbe *Sporazuma* privremeno su primenljive od 17. juna 2006. godine u 00:01 časova (UTC)

12.3 Od pomenutog datuma iz tačke 12.2, radiodifuzne stanice koje rade na frekvencijskim dodelama koje se ne pojavljuju u *Planovima* ili nisu usaglašene sa *Sporazumom* i njegovim pratećim *Planovima* (videti član 5. paragraf 5.1.2) mogu da nastave sa radom pod uslovom da ne prouzrokuju neprihvatljivu smetnju, odnosno ne traže zaštitu, u odnosu na bilo koje dodele koje su u skladu sa *Sporazumom* i njegovim pratećim *Planovima.*

12.4 *Sporazum* ostaje na snazi dok se ne izvrši revizija istog u sladu sa članom 11. Sporazuma.

12.5 *Prelazni period* počinje 17. juna 2006. godine u 00:01 časova (UTC). Tokom *Prelaznog perioda,* dodele u analognom planu (kako je precizirano u članu 3. paragrafa 3.1.2) su zaštićene.

12.6 *Prelazni period* se završava 17. juna 2015. godine u 00:01 časova (UTC). Međutim za zemlje koje se nalaze na spisku[7], za opseg 174-230 MHz[8], *prelazni period* se završava 17. juna 2020. godine u 00:01 časova (UTC). Po završetku primenljivog *prelaznog perioda*, *Biro* briše odgovarajuće ulazne podatke iz analognog plana i,

- odredbe iz člana 4. paragrafa 4.1 koje se odnose na izmenu analognog plana; i
- napomene koje se odnose na analogne dodele

prestaju da se primenjuju na analogne dodele u odgovarajućim zemljama.

12.7 Po završetku gore pomenutog *prelaznog perioda, Biro* vrši reviziju statusa dodela koje su sadržane u analognom planu i upisane u *MIFR* i poziva administracije da otkažu odgovarajuće ulazne podatke u *MIFR* -u*.*

12.8 Nakon postupaka *Biroa* iz stava 12.7, administracije mogu da zatraže od *Biroa* da otkažu odgovarajuće dodele, ili da nastave da rade na njima, pod uslovima da su ove analogne dodele:

a) bile sadržane u planu i već stavljene u upotrebu, i

b) ne izazivaju neprihvatljivu smetnju, odnosno ne traže zaštitu u odnosu na bilo koje dodele koje su u skladu sa *Sporazumom* i njegovim pratećim *Planovima* (videti član 5. stav 5.1.2).

12.9 *Biro* ažurira *MIFR* shodno tome.

KAO POTVRDU TOGA dole imenovani delegati država članica Međunarodne unije za telekomunikacije iz *Zone planiranja,* u ime svojih nadležnih organa, potpisali su jedan primerak ovih Završnih akata. U slučaju spora, merodavan je tekst na francuskom jeziku. Ovaj primerak deponuje se u arhivu Unije. Generalni sekretar prosleđuje po jedan overeni primerak veran originalu svakoj državi članici Međunarodne unije za telekomunikacije iz *Zone planiranja.*

Sačinjeno u Ženevi, 16. juna 2006.

---

[7] Spisak zemalja: Alžir (Narodna Republika), Burkina Faso, Kamerun (Republika), Kongo (Republika), Obala Slonovače (Republika), Egipat (Arapska Republika), Republika Gabon, Gana, Gvineja (Republika), Iran (Islamska Republika), Jordan (Hašemitska Kraljevina), Mali (Republika), Maroko (Kraljevina), Mauritanija (Islamska Republika), Nigerija (Federalna Republika), Arapska Republika Sirija, Sudan (Republika), Čad (Republika), Togo (Republika), Tunis, Jemen (Republika).
Za sledeće administracije koje nisu bile prisutne na RRC-06, to jest Benin (Republika), Centralno Afrička Republika, Eritreja, Etiopija (Federalna Demokratska Republika), Gvineja-Bisao (Republika), Ekvatorijalna Gvineja (Republika), Liberija (Republika), Madagaskar (Republika), Niger (Republika), Demokratska Republika Kongo, Sao Tome i Principe (Demokratska Republika), Demokratska Republika Siera Leone i Somalije, datum završetka prelaznog perioda za VHF opseg (174-230 MHz) je 17 juni 2020. u 00:01 časova UTC, mada svaka od gore pomenutih administracija može dostaviti Birou u periodu od 90 dana od završetka RRC-06 da je izabrala datum 17 juni 2015. u 00:01 časova UTC.

[8] 170-230 MHz za Maroko

ANEKSI

ANEKS 1

Frekvencijski planovi

1.1 Planovi dodele za T-DAB

Broj	Podatak
1	ITU serijski broj
2	ITU simbol administracije nadležne za dodele za T-DAB
3	Jedinstveni identifikacioni kod dobijen od administracije nadležne za dodelu frekvencija (AdminID)
4	Kodovi za pristup planu namene (1 – namena, 2 – mreža koja radi na jednoj frekvenciji, 3 – zona raspodele, 4 – Zona raspodele sa izvršenom jednom dodelom i SFN_Id, 5 – Zona raspodele sa izvršenom jednom dodelom i bez SFN_Id
5	Kod dodele (L – povezan, C – pretvoren, S – samostalan)
6	Jedinstveni identifikacioni kod za odgovarajuću zonu raspodele
7	ITU simbol države ili geografske oblasti
8	Naziv lokacije predajne stanice
9	Geografske koordinate predajne stanice
	9a geografska širina (± DDMMSS)
	9b geografska dužina (± DDMMSS)
10	Nadmorska visina pozicije predajne stanice (m)
11	Referentna konfiguracija za planiranje (RPC4, RPC 5)
12	Pridružena frekvencija (KHz)
13	Blok frekvencija
14	Odstupanje centralne frekvencije na kojoj se emituje od centralne frekvencije kanala (MHz)
15	Polarizacija (H – horizontalna, V – vertikalna, K – kosa, N – nije definisana)
16	Maksimalna efektivno izračena snaga horizontalno polarizovane komponente u horizontalnoj ravni (dBW)
17	Maksimalna efektivno izračena snaga vertikalno polarizovane komponente u horizontalnoj ravni (dBW)
18	Usmerenost antene (U – usmerena antena, NU – nije usmerena)
19	Visina predajne antene iznad nivoa zemlje (m)
20	Maksimalna efektivna visina antene (m)
21	Efektivna visina antene (m), merena u horizontalnoj ravni, polazeći od pravca severa u smeru kazaljke na časovniku, za 36 različitih uglova azimuta, sa korakom od 10°
22	Pojačanje antene (dB) - horizontalno: vrednost pojačanja horizontalno polarizovane komponente, normalizovano u odnosu na nivo od 0 dB, mereno u horizontalnoj ravni, polazeći od pravca severa u smeru kazaljke na časovniku, za 36 različitih uglova azimuta, sa korakom od 10°
23	Pojačanje antene (dB) - vertikalno: vrednost pojačanja vertikalno polarizovane komponente, normalizovano u odnosu na nivo od 0 dB, mereno u horizontalnoj ravni, polazeći od pravca severa u smeru kazaljke na časovniku, za 36 različitih uglova azimuta, sa korakom od 10°
24	Spektralna maska (1, 2, 3 – pogledati § 3.6.1 Poglavlja 3 iz Aneksa 2 ovog Sporazuma)
25	Identifikacioni kod mreže koja radi na jednoj frekvenciji

Broj	Podatak
26	Napomena
26-1	Napomena vezana za analogni Plan dodele sledećih administracija (ITU simbol)
26-2	Napomena vezana za digitalni Plan dodele sledećih administracija (ITU simbol)
26-3	Napomena vezana za postojeći Plan dodele za druge primerne terestrijalne servise sledećih administracija (ITU simbol)

1.2 Planovi raspodele za T-DAB

Broj	Podatak
1	ITU serijski broj
2	ITU simbol administracije nadležne za zone raspodele za T-DAB
3	Jedinstveni identifikacioni kod dobijen od administracije nadležne za zone raspodele (AdminID)
4	Kodovi za pristup Planu raspodele (1 – namena, 2 – mreža koja radi na jednoj frekvenciji (SFN), 3 – zona raspodele, 4 – Zona raspodele sa izvršenom jednom dodelom i SFN_Id, 5 – Zona raspodele sa izvršenom jednom dodelom i bez SFN_Id
5	ITU simbol države ili geografske oblasti
6	Naziv zone raspodele za digitalnu radiodifuziju
7	ITU simbol države ili geografske oblasti ako su sve tačke testiranja dodele na tlu ili u pograničnom području
8	Broj podoblasti (najviše 9) u okviru Plana raspodele ako nisu sve tačke testiranja dodele u pograničnom području; ako nema podele na podoblasti u okviru Plana dodele, broj = 1
9	Za svaku od podoblasti u okviru Plana raspodele:
	9a jedinstveni konturni broj
	9b broj tačaka testiranja koje se nalaze na granicama podoblasti
	9c geografske koordinate svaketačke testiranja koja se nalazi na granicama podoblasti i sadrže podatke o:
	9c1 geografskoj širini (± DDMMSS)
	9c2 geografskoj dužini (± DDMMSS)
10	Referentna konfiguracija za planiranje (RPC 4, RPC 5)
11	Dodeljena frekvencija (MHz)
12	Blok frekvencija
13	Odstupanje centralne frekvencije na kojoj se emituje od centralne frekvencije kanala (MHz)
14	Polarizacija (H – horizontalna, V – vertikalna, K – kosa, N – nije definisana)
15	Spektralna maska (1, 2, 3 – pogledati § 3.6.1 Poglavlja 3 iz Aneksa 2 ovog Sporazuma)
16	Identifikacioni kod mreže koja radi na jednoj frekvenciji (SFN)
17	Napomena
17-1	Napomena vezana za analogni Plan raspodele sledećih administracija (ITU simbol)
17-2	Napomena vezana za digitalni Plan raspodele sledećih administracija (ITU simbol)
17-3	Napomena vezana za postojeći Plan raspodele za druge primerne terestrijalne servise sledećih administracija (ITU simbol)

1.3 Planovi dodele za DVB-T

Broj	Podatak
1	ITU serijski broj
2	ITU simbol administracije nadležne za dodele za DVB-T
3	Jedinstveni identifikacioni kod dobijen od administracije nadležne za dodelu frekvencija (AdminID)
4	Kodovi za pristup Planu dodele (1 – dodela, 2 – mreža koja radi na jednoj frekvenciji (SFN), 3 – zona raspodele, 4 – Zona raspodele sa izvršenom jednom dodelom i SFN_Id, 5 – Zona raspodele sa izvršenom jednom dodelom i bez SFN_Id
5	Kod dodele (I – povezan, C – pretvoren, S – samostalan)
6	Jedinstveni identifikacioni kod dodele frekvencije
7	ITU simbol države ili geografske oblasti
8	Naziv lokacije predajne stanice
9	Geografske koordinate predajne stanice
	9a geografska širina (± DDMMSS)
	9b geografska dužina (± DDMMSS)
10	Nadmorska visina pozicije predajne stanice (m)
	Ili 11 i 12, ili 13
11	Digitalni televizijski sistem (A, B, C, D, E, F i 1, 2, 3, 5, 7)
12	Tip prijema (FX, PO, PI, MO)
13	Referentna konfiguracija za planiranje (RPC4, RPC 5)
14	Dodeljena frekvencija (MHz)
15	Redni broj kanala
16	Odstupanje centralne frekvencije na kojoj se emituje od centralne frekvencije kanala (MHz)
17	Polarizacija (H – horizontalna, V – vertikalna, K – kosa, N – nije definisana)
18	Maksimalna efektivno izračena snaga horizontalno polarizovane komponente u horizontalnoj ravni (dBW)
19	Maksimalna efektivno izračena snaga vertikalno polarizovane komponente u horizontalnoj ravni (dBW)
20	Usmerenost antene (U – usmerena antena, NU – nije usmerena)
21	Visina predajne antene iznad nivoa zemlje (m)
22	Maksimalna efektivna visina antene (m)
23	Efektivna visina antene (m), merena u horizontalnoj ravni, polazeći od pravca severa u smeru kazaljke na časovniku, za 36 različitih uglova azimuta, sa korakom od 10°
24	Pojačanje antene (dB) - horizontalno: vrednost pojačanja horizontalno polarizovane komponente, normalizovano u odnosu na nivo od 0 dB, mereno u horizontalnoj ravni, polazeći od pravca severa u smeru kazaljke na časovniku, za 36 različitih uglova azimuta, sa korakom od 10°
25	Pojačanje antene (dB) - vertikalno: vrednost pojačanja vertikalno polarizovane komponente, normalizovano u odnosu na nivo od 0 dB, mereno u horizontalnoj ravni, polazeći od pravca severa u smeru kazaljke na časovniku, za 36 različitih uglova azimuta, sa korakom od 10°
26	Spektralna maska (1, 2, 3 – pogledati § 3.6.1 Poglavlja 3 iz Aneksa 2 ovog Sporazuma)
27	Identifikacioni kod mreže koja radi na jednoj frekvenciji (SFN)

Broj	Podatak
28	Napomena
28-1	Napomena vezana za analogni Plan dodele sledećih administracija (ITU simbol)
28-2	Napomena vezana za digitalni Plan dodele sledećih administracija (ITU simbol)
28-3	Napomena vezana za postojeći Plan dodele za druge primerne terestrijalne servise sledećih administracija (ITU simbol)

1.4 Planovi raspodele za DVB-T

Broj	Podatak
1	ITU serijski broj
2	ITU simbol administracije nadležne za raspodelu za T-DAB
3	Jedinstveni identifikacioni kod dobijen od administracije nadležne za raspodelu (AdminID)
4	Kodovi za pristup Planu raspodele (1 – namena, 2 – mreža koja radi na jednoj frekvenciji (SFN), 3 – raspodela, 4 – Zona raspodele sa izvršenom jednom dodelom i SFN_Id, 5 – Zona raspodele sa izvršenom jednom dodelom i bez SFN_Id
5	ITU simbol države ili geografske oblasti
6	Naziv zone raspodele za digitalnu radiodifuziju
7	ITU simbol države ili geografske oblasti ako su sve tačke za testiranje dodele na zemlji ili u pograničnom području
8	Broj podoblasti (najviše 9) u okviru Plana raspodele ako nisu sve tačke za testiranje dodele u pograničnom području; ako nema podele na podoblasti u okviru Plana raspodele, broj = 1
9	Za svaku od podoblasti u okviru Plana raspodele:
	9a jedinstveni konturni broj
	9b broj tačaka za testiranje koje se nalaze na granicama podoblasti
	9c geografske koordinate svake tačke za testiranje koja se nalazi na granicama podoblasti i sadrže podatke o:
	9c1 geografskoj širini (± DDMMSS)
	9c2 geografskoj dužini (± DDMMSS)
10	Referentna konfiguracija za planiranje (RPC 4, RPC 5)
11	Tip referentne mreže (RN1, RN2, RN3, RN4)
12	Pridružena frekvencija (MHz)
13	Redni broj kanala
14	Odstupanje centralne frekvencije na kojoj se emituje od centralne frekvencije kanala (MHz)
15	Polarizacija (H – horizontalna, V – vertikalna, K – kosa, N – nije definisana)
16	Spektralna maska (1, 2, 3 – pogledati § 3.6.1 Poglavlja 3 iz Aneksa 2 ovog Sporazuma)
17	Identifikacioni kod mreže koja radi na jednoj frekvenciji
18	Napomena
18-1	Napomena vezana za analogni Plan raspodele sledećih administracija (ITU simbol)
18-2	Napomena vezana za digitalni Plan raspodele sledećih administracija (ITU simbol)
18-3	Napomena vezana za postojeći Plan raspodele za druge primerne terestrijalne servise sledećih administracija (ITU simbol)

1.5 Plan dodele za emitovanje analogne televizije u frekvencijskim opsezima 174-230 MHz (za Maroko 170-230 MHz) i 470-862 MHz u prelaznom periodu (Videti član 12. Sporazuma)

Informacije uključene u podatke u okviru Plana

Broj	Podatak
1	ITU serijski broj
2	ITU simbol administracije odgovorne za analogne dodele
3	Jedinstveni identifikacioni kod dobijen od administracije nadležne za dodelu frekvencija (AdminID)
4	Redni broj kanala
5	Dodeljena frekvencija (MHz)
6	Odstupanje od frekvencije nosioca video signala (pozitivna ili negativna vrednost celobrojnog umnoška 1/12 linijske frekvencije)
7	Odstupanje od frekvencije nosioca audio signala (pozitivna ili negativna vrednost celobrojnog umnoška 1/12 linijske frekvencije)
8	Indikator stabilnosti frekvencije (RELAXED, NORMAL ili PRECISION)
9	Televizijski sistem (B, B1, D, D1, G, H, I, K, K1, L ili M)
10	Kolor sistem (P = PAL, S = SECAM)
11	Naziv lokacije predajne antene
12	ITU simbol zemlje ili geografske oblasti
13	Geografske koordinate predajne antene
	13a geografska širina (± DDMMSS)
	13b geografska dužina (± DDMMSS)
14	Nadmorska visina pozicije predajne stanice (m)
15	Visina pozicije predajne antene u odnosu na nivo tla (m)
16	Maksimalna efektivna visina antene (m)
17	Efektivna visina antene (m), merena u horizontalnoj ravni, polazeći od pravca severa u smeru kazaljke na časovniku, za 36 različitih uglova azimuta, sa korakom od 10°
18	Polarizacija (H, V, K)
19	Maksimalna efektivno izračena snaga horizontalno polarizovane komponente u horizontalnoj ravni (dBW)
20	Maksimalna efektivno izračena snaga vertikalno polarizovane komponente u horizontalnoj ravni (dBW)
21	Odnos snaga nosilaca video i audio signala
22	Usmerenost antene (U – usmerena antena, NU – nije usmerena)
23	Pojačanje antene (dB) - horizontalno: vrednost pojačanja horizontalno polarizovane komponente, normalizovano u odnosu na nivo od 0 dB, mereno u horizontalnoj ravni, polazeći od pravca severa u smeru kazaljke na časovniku, za 36 različitih uglova azimuta, sa korakom od 10°
24	Pojačanje antene (dB) - vertikalno: vrednost pojačanja vertikalno polarizovane komponente, normalizovano u odnosu na nivo od 0 dB, mereno u horizontalnoj ravni, polazeći od pravca Severa u smeru kazaljke na časovniku, za 36 različitih uglova azimuta, sa korakom od 10°
25	Napomene

Napomena – Plan emitovanja analogne televizije objavljen je u elektronskom obliku na CD-ROM-u koji je priložen uz ova Završna akta. Lista analognih televizijskih dodela, po svakoj od administracija, ukratko je data u Tabeli 1-1.

TABELA 1-1

Sažeta lista broja analognih televizijskih dodela kako se pojavljuju u Planu dodele frekvencija za analogno emitovanje televizije u frekvencijskim opsezima 174-230 MHz (za Maroko 170-230 MHz) i 470-862 MHz u prelaznom periodu (videti član 12. Sporazuma)

Država članica	**ITU simbol**	**Broj namena analogne televizije uključenih u Plan analogne televizije**
Republika Albanija	ALB	4
Narodna Demokratska Republika Alžir	ALG	1 009
Federalna Republika Nemačka	D	9 590
Republika Gvineja Bisao	AND	4
Republika Angola	AGL	193
Kraljevstvo Sudijske Arabije	ARS	412
Republika Jermenija	ARM	12
Austrija	AUT	1 736
Republika Azerbejdžan	AZE	52
Kraljevina Bahrein	BHR	3
Republika Belorusija	BLR	314
Belgija	BEL	66
Republika Benin	BEN	55
Bosna i Hercegovina	BIH	660
Republika Bocvana	BOT	221
Republika Bugraska	BUL	1 594
Burkina Faso	BFA	195
Republika Burundi	BDI	32
Republika Kamerun	CME	244
Zelenortska Ostrva	CPV	35
Centralnoafrička Republika	CAF	329
Republika Kipar	CYP	59
Država Vatikan	CVA	4
Zajednica Komori	COM	40
Republika Kongo	COG	326
Republika Obala Slonovače	CTI	200
Republika Hrvatska	HRV	1 422
Danska	DNK	260
Republika Džibuti	DJI	12
Arapska Republika Egipat	EGY	308
Ujedinjeni Arapski Emirati	UAE	58
Eritreja	ERI	12
Španija	E	8 410
Republika Estonija	EST	68
Federalna Demokratska Republika Etiopija	ETH	111
Ruska Federacija	RUS	6 681
Finska	FIN	818
Francuska	F	13 125
Republika Gabon	GAB	224
Republika Gambija	GMB	12
Gruzija	GEO	94

TABELA 1-1 (*nastavak*)

Država članica	**ITU simbol**	**Broj namena analogne televizije uključenih u Plan analogne televizije**
Gana	GHA	39
Grčka	GRC	2 105
Republika Gvineja	GUI	103
Republika Gvineja Bisau	GNB	28
Republika Ekvatorijalna Gvineja	GNE	25
Republika Mađarska	HNG	714
Islamska Republika Iran	IRN	2 096
Republika Irak	IRQ	345
Irska	IRL	781
Island	ISL	4
Država Izrael	ISR	15
Italija	I	3 677
Socijalistička Narodna Libijska Arapska Džamahirija	LBY	322
Hašemitska Kraljevina Jordan	JOR	140
Republika Kazahstan	KAZ	1 837
Republika Kenija	KEN	497
Država Kuvajt	KWT	22
Kraljevstvo Lesoto	LSO	22
Republika Latvia	LVA	106
Bivša Jugoslovenska Republika Makedonija	MKD	472
Liban	LBN	21
Republika Liberija	LBR	41
Zajednica Linhenštajn	LIE	12
Republika Litvanija	LTU	154
Luksemburg	LUX	11
Republika Madagaskar	MDG	117
Malavi	MWI	51
Republika Mali	MLI	287
Malta	MLT	11
Republika Crna Gora	MNE	265
Kraljevstvo Maroko	MRC	356
Republika Mauricijus	MAU	29
Islamska Republika Mauritanija	MTN	132
Republika Moldavija	MDA	298
Zajednica Monako	MCO	3
Mozambička Republika	MOZ	242
Republika Namibija	NMB	309
Republika Niger	NGR	159
Federalna Republika Nigerija	NIG	225
Norveška	NOR	3 979
Sultanat Oman	OMA	255
Republika Uganda	UGA	36
Republika Uzbekistan	UZB	1 213
Kraljevstvo Holandija	HOL	71
Republika Poljska	POL	802
Portugalija	POR	694

TABELA 1-1 (*završetak*)

Država članica	**ITU simbol**	**Broj namena analogne televizije uključenih u Plan analogne televizije**
Država Katar	QAT	17
Arapska Republika Sirija	SYR	56
Demokratska Republika Kongo	COD	362
Republika Kirgizija	KGZ	670
Republika Slovačka	SVK	918
Republika Češka	CZE	1 660
Rumunija	ROU	323
Ujedinjeno Kraljevstvo Velike Britanije i Severne Irske	G	6 344
Republika Ruanda	RRW	56
Republika San Marino	SMR	1
Demokratska Republika Sao Tome i Principe	STP	3
Republika Senegal	SEN	39
Republika Srbija	SRB	889
Sejšelska Republika	SEY	11
Sijera Leone	SRL	14
Republika Slovenija	SVN	867
Demokratska Republika Somalija	SOM	114
Republika Sudan	SDN	224
Južnoafrička Republika	AFS	712
Švedska	S	1 551
Švajcarska Konfederacija	SUI	2 581
Kraljevstvo Svazilend	SWZ	20
Republika Tadžikistan	TJK	672
Ujedinjena Republika Tanzanija	TZA	183
Republika Čad	TCD	189
Republika Togo	TGO	29
Tunis	TUN	224
Turkmenistan	TKM	115
Turska	TUR	539
Ukrajina	UKR	1 551
Republika Jemen	YEM	1 066
Republika Zambija	ZMB	205
Republika Zimbabve	ZWE	200

Napomena Sekretarijata: Ova tabela odnosi se na udeo bivše članice ITU, Srbije i Crne Gore, u analognim dodelama sada kao dve nezavisne države, Republike Srbije kao sledbenika Srbije i Crne Gore i Republike Crne Gore, u skladu sa geografskim principima, kao što je donešeno u RRC-06.

ANEKS 2

Tehnički elementi i kriterijumi korišćeni u toku razvoja Plana i implementacije Sporazuma

POGLAVLjE 1
ANEKSA 2

Definicije

SADRŽAJ

1.1 Digitalni terestrijalni radiodifuzni sistemi

1.1.2 Digitalna terestrijalna radiodifuzija televizijskog signala (DTRT)

Digitalni terestrijalni sistemi koji pružaju servise terestrijalne radiodifuzije, opisani u Preporuci ITU-R BT.1306-3. DVB-T (Terestrijalna digitalna radiodifuzija televizijskog signala) odgovaraju DVB sistemu, označenom kao „Sistem B”.

1.1.2 Digitalna terestrijalna radiodifuzija radijskog signala (DTRR)

Digitalni audio sistemi terestrijalne radiodifuzije, opisani u Preporuci ITU-R BS.1114-5. T-DAB (Terestrijalna digitalna radiodifuzija radijskih signala), odgovaraju sistemu Eureka 147 DAB, označenom kao „Digitalni sistem A”.

1.2 Upravljanje frekvencijama

1.2.1 Frekvencijski opsezi

Opseg III

Frekvencijski opseg: 174-230 MHz

Opseg IV

Frekvencijski opseg: 470-582 MHz

Opseg V

Frekvencijski opseg: 582-862 MHz

1.2.2 Zona pokrivanja

Zona pokrivanja radiodifuzne stanice, ili grupe radiodifuznih stanica, u slučaju mreže koja radi na jednoj frekvenciji (videti definiciju u §1.3.15 ovog Poglavlja) je oblast u okviru koje je jednak ili prevazilazi korisnu vrednost intenziteta električnog polja definisanu za određene uslove prijema i za posmatrani procenat pokrivanja prijemnih lokacija.
Prilikom definisanja zone pokrivanja za sve uslove prijema, primenjuje se tronivovski pristup:

- *Nivo 1*: *Lokacija sa koje se vrši prijem*
  Najmanja jedinica je prijemna lokacija; optimalni uslovi prijema mogu se pronaći pomeranjem antene za do 0,5m u bilo kom pravcu.
  Prijemna lokacija se smatra pokrivenom ako je nivo željenog signala dovoljno visok da nadmaši šum i interferenciju u zadatom procentu vremena.
- *Nivo 2*: *Pokrivanje malih zona*
  Drugi nivo je „pokrivanje malih zona” (tipično 100m sa 100m).
  U ovoj maloj zoni označava se procenat pokrivenih prijemnih lokacija.
- *Nivo 3*: *Zona pokrivanja*
  Zona pokrivanja radiodifuzne stanice, ili grupe radiodifuznih stanica sačinjena je iz više individualnih malih zona pokrivanja u kojima je zadati procenat pokrivanja (npr. 70% do 99%) postignut.

1.2.3 Zona pružanja servisa

Oblast u okviru koje administarcija ima pravo da zahteva da dogovoreni uslovi zaštite budu obezbeđeni.

1.3 Planiranje mreže

1.3.1 Planiranje zona raspodele

Kada se planira raspodela, određeni kanal je „zadat” administraciji da obezbedi pokrivanje određene oblasti u okviru zone pružanja servisa, zvane zona raspodele. Pozicije predajnika i njihove karakteristike nisu poznate u fazi planiranja i treba da budu definisane u trenutku kada se zoni raspodele pridružuje jedna ili više dodela.

1.3.2 Planiranje dodela

Kada se planiraju dodele, određeni kanal je namenjen za određenu lokaciju predajnika sa definisanim karakteristikama predajnika (npr. izračena snaga, visina antene itd.)

1.3.3 Tačke testiranja

Tačka testiranja je geografski definisana lokacija za koju su izvršeni određeni proračuni.

1.3.4 Intenzitet štetnog električnog polja

Intenzitet neželjenog električnog polja (E_n), izražen u dB(μV/m), je intenzitet električnog polja neželjenog signala od bilo kog potencijalnog izvora interferencije, za 50% lokacija i za dati procenat vremena, kome je dodat određeni odnos zaštite u decibelima.

NAPOMENA 1 – Tamo gde ima uticaja, odgovarajuća vrednost usmerenosti prijemne antene ili potiskivanja suprotne polarizacije, u decibelima, mora biti uzeta u obzir prilikom proračuna.

NAPOMENA 2 – Tamo gde postoji nekoliko neželjenih signala potrebno je primeniti metodu za kombinovanje pojedinačnih izvora neželjenog električnog polja, kao npr. metodu sumiranja snage ili neku drugu odgovarajuću metodu za sumiranje signala, u cilju određivanja rezultantne vrednosti intenziteta neželjenog električnog polja.

1.3.5 Minimalna korisna vrednost intenziteta električnog polja/minimalna vrednost intenziteta električnog polja koja se štiti

Minimalna vrednost intenziteta električnog polja potrebna da se omogući željeni kvalitet prijema, pod specificiranim uslovima prijema, u prisustvu prirodnog i industrijskog šuma, ali u odsustvu interferencije drugih predajnika.

NAPOMENA 1 – Termin „minimalna korisna vrednost intenziteta električnog polja” odgovara terminu „minimalna vrednost intenziteta električnog polja koja se štiti”, koji se pojavljuje u mnogim tekstovima ITU i takođe odgovara terminu „minimalna medijanska vrednost intenziteta električnog polja”, koji se pojavljuje u § 1.3.9 ovog Poglavlja u oznaci E_{med} koja je korišćena za pokrivanje samo jednim predajnikom.

1.3.6 Intenzitet korisnog električnog polja

Minimalna vrednost intenziteta električnog polja neophodna da se ostvari željeni kvalitet prijema, pod određenim uslovima prijema, u prisustvu prirodnog i industrijskog šuma , kao i interferencije, ili u postojećoj situaciji ili kao što je definisano sporazumima ili frekvencijskim planovima.

NAPOMENA 1 – Termin „intenzitet korisnog električnog polja” odgovara terminu „neophodna vredost intenziteta električnog polja” koji se javlja u mnogim ITU tekstovima.

NAPOMENA 2 –Korisna vrednost intenziteta električnog polja računa se kombinujući pojedinačne intenzitete neželjenog električnog polja (E_n) i korekcioni faktor kombinovanih lokacija. Doprinos jednog od pojedinačnih neželjenih električnih polja predstavlja minimalnu medijansku vrednost intenziteta električnog polja (E_{med}), odnosno, nivo šuma.

1.3.7 Referentna vrednost intenziteta električnog polja

Dogovorena vrednost intenziteta električnog polja koja može služiti kao referenca ili osnova za frekvencijsko planiranje.

NAPOMENA 1 – Zavisno od uslova prijema i zahtevanog kvaliteta postoji nekoliko referentnih vrednosti referentne vrednosti intenziteta električnog polja za isti tip servisa.

1.3.8 Minimalna površinska gustina snage φ_{min} (dB(W/m^2))

Minimalna vrednost fluksa snage na mestu određene prijemne antene koja je zahtevana da bi se prijemniku obezbedio minimalni zahtevani nivo signala potreban za ispravnu detekciju.

NAPOMENA 1 – φ_{min} jednako je minimalnoj zahtevanoj vrednosti snage na ulazu u prijemnik (dBW) od koje je oduzeta efektivna površina antene (dBm^2) i kojoj su dodati, kada je potrebno, gubici kabla koji povezuje prijemnu antenu i prijemnik.

1.3.9 Minimalna medijanska vrednost intenziteta električnog polja E_{med} (dB(μV/m))

Odgovarajuća vrednost minimalne korisne vrednosti intenziteta električnog polja koja se koristi za pokrivanje samo jednim predajnikom, a odnosi se na 50% lokacija i 50% vremena, na visini od 10m iznad nivoa tla.

NAPOMENA 1 – E_{med} zavisi od medijanske vrednosti minimalne vrednosti intenziteta električnog polja (E_{min})na mestu prijema koja je zahtevana za zadati procenat lokacija i procenat vremena kako bi se osigurao minimalni nivo signala na ulazu u prijemnik neophodan da se postigne ispravna detekcija.

NAPOMENA 2 – E_{med} na osnovu minimalne vrednosti intenziteta električnog polja (E_{min}), dodavanjem odgovarajućih korekcionih faktora, tamo gde imaju uticaja, kao što je opisano u Dodatku 3.4 Poglavlja 3 Aneksa 2 Sporazuma.

NAPOMENA 3 – U slučaju širokopojasnih signala gde spektralna gustina snage ne mora biti konstantna u zauzetom opsegu, termin „intenzitet električnog polja” često biva zamenjen terminom „ekvivalentan intenzitet elktričnog polja”. Ekvivalentan intenzitet električnog polja je intenzitet električnog polja jednog nemodulisanog RF nosioca izračenog istom snagom kolika je ukupna snaga širokopojasnog signala.

1.3.10 Granična vrednost intenziteta električnog polja u procesu koordinacije

Nivo električnog polja koji, kada se prevaziđe, ukazuje da je neophodno izvršiti koordinaciju

1.3.11 Prijem na fiksnoj lokaciji

Prijem na fiksnoj lokaciji definisan je kao prijem pri kome se koristi usmerena antena postavljena u nivou krova.

Pretpostavlja se da su postignuti približno optimalni uslovi prijema (u relativno malom prostoru u visini krova) gde je antena postavljena.

U toku proračuna intenziteta električnog polja za prijem sa fiksnom antenom, visina prijemne antene od 10m iznad nivoa tla smatra se reprezentativnom za servise radiodifuzije. Druge vrednosti visine mogu biti korišćene za druge servise.

1.3.12 Portabilni prijem

Portabilni prijem definisan je na sledeći način:

- klasa A (otvoreni prostor), pod kojom se podrazumeva prijem gde se portabilni prijemnik, povezan sa antenom ili sa ugrađenom antenom koristi u otvorenom prostoru, na visini ne manjoj od 1,5m u odnosu na nivo tla;
- klasa B (sprat u nivou tla, zatvoreni prostor), pod kojim se podrazumeva prijem gde se portabilni prijemnik sa povezanom antenom ili sa ugrađenom antenom koristi u zatvorenom prostoru, na visini ne manjoj od 1,5m iznad nivoa poda određenog sprata, u prostorijama sa sledećim karakteristikama:
  a) na spratu koji je u nivou tla;
  b) sa prozorom na spoljnom zidu.

Portabilni prijem u zatvorenom prostoru na visokim spratovima tretiraće se kao prijem u klasi B, uz primenu korekcija nivoa signala, iako je prijem u zatvorenom prostoru na spratu koji je u nivou tla najčešći slučaj.

I za klasu A, i za klasu B podrazumeva se da:

- optimalni uslovi prijema traže se tako što se antena pomera za do 0,5m u bilo kom pravcu;
- portabilni prijemnik se ne pomera u toku prijema i veliki objekti u blizini prijemnika se ne pomeraju;
- ekstremni slučajevi, kao što je prijem u potpuno oklopljenim sobama, su zanemareni.

1.3.13 Mobilni prijem

Mobilni prijem je definisan ka prijem prijemnikom koji se kreće i sa antenom smeštenom na visini ne manjoj od 1,5m u odnosu na nivo tla. To bi na primer mogao biti prijem u kolima ili ručna oprema.

Dominantan faktor u odnosu na efekte lokalnog prijema jeste feding u Rejlijevom kanalu. Margine za feding imaju zadatak da ublaže ove efekte. Vrednost margina za feding zavise od frekvencije i brzine kretanja prijemnika.

1.3.14 Višefrekvencijska mreža (MFN)

Mreža u kojoj predajne stanice koriste više radio kanala.

1.3.15 Mreža koja radi na jednoj frekvenciji (SFN)

Mreža sinhronizovanih predajnih stanica koje emituju identične signale na istom radio kanalu.

1.3.16 Referentna konfiguracija za planiranje (RPC)

Reprezentativna konfiguracija kriterijuma i parametara koji se koriste za svrhe frekvencijskog planiranja.

1.3.17 Referentna mreža (RN)

Opšta mrežna struktura predstavlja stvarnu mrežu, kao što za sada nije poznato, za svrhe analize kompatibilnosti. Glavna svrha je odrediti mogućnosti i otpornost mreže na interferenciju koju prouzrokuju tipični radiodifuzni sistemi.

1.3.18 Unos u digitalni Plan

Dodela ili zona raspodele, ili kombinacije dodela koje mogu ili ne moraju biti pridružene jednoj zoni raspodele koje su, za svrhe implementacije Plana i njegovih modifikacija, tretirane kao jedinstveni entitet.

DODATAK 1.1

Definicije date u Pravilniku o radio-komunikacijama (Izdanje 2004.) i dodatna objašnjenja iz nekih relevantnih ITU-R Preporuka

Prihvaćena interferencija (RR Br. 1.168)

Administracija (RR Br. 1.2)

Aeronautički mobilni servis (RR Br. 1.32)

Aeronautički mobilni satelitski servis (RR Br. 1.35)

Aeronautički radionavigacioni servis (RR Br. 1.46)

Afrička Radiodifuzna Zona (RR Br. od 5.10 do 5.13)

Raspodela (radio frekvencije ili radio-frekvencijskog kanala) (RR Br. 1.17)

Dodeljena frekvencija (RR Br. 1.148)

Dodela (radio frekvencije ili radio-frekvencijskog kanala) (RR Br. 1.18)

Radiodifuzni servis (RR Br. 1.38)

Radiodifuzna stanica (RR Br. 1.85)

Radiodifuzni satelitski servis (RR Br. 1.39)

Snaga nosioca (radio predajnika) (RR Br.1.159, Preporuka ITU-R V.573-4)

Koordinaciona kontura (RR Br. 1.172)

Efektivno izračena snaga u zadatom pravcu (RR Br. 1.162, Preporuka ITU-R V.573-4)

Emisija (RR Br. 1.138)

Ekvivalentna izotropno izračena snaga (RR Br. 1.161, Preporuka V.573-4)

Evropska Radiodifuzna Zona (RR Br. 5.14)

Fiksni servis (RR Br. 1.20)

Dobitak antene (RR Br. 1.160)

Interferencija (RR Br. 1.166)

Zemaljski mobilni sistemi (RR Br. 1.26)

Srednja snaga (radio predajnika) (RR Br. 1.158)

Mobilni servis (RR Br. 1.24)

Mobilni satelitski servis (RR Br. 1.25)

Potreban opseg (RR Br. 1.152)

Emitovanje izvan opsega (RR Br. 1.144)

Vršna snaga (radio predajnika) (RR Br. 1.157)

Dozvoljena interferencija (RR Br. 1.167)

Snaga (RR Br. 1.156)

Odnos zaštite (RR Br. 1.170)

Zračenje (RR Br. 1.137)

Radio astronomski servis (RR Br. 1.58)

Radionavigacioni servis (RR Br. 1.42)

Parazitna emisija (RR Br. 1.145)

Stanica (RR Br. 1.61)

Zemaljska stanica (RR Br. 1.62)

Neželjena emisija (RR Br. 1.146)

POGLAVLjE 2
ANEKSA 2

Informacije o propagaciji

SADRŽAJ

2.1 Pregled

U okviru preporuka ITU-R P.1546-2 formirana je osnova za metode predikcije intenziteta električnog polja, primenljive u radiodifuziji, zemaljskim mobilnim sistemima, pomorskim mobilnim sistemima i pojedinim fiksnim servisima (npr. onima koji koriste sisteme tačka - više tačaka). Kompletan opis predikcionih metoda dat je u Dodatku 2.1 ovog Poglavlja. Metode se mogu primeniti bilo grafički, bilo automatski (kompjuterski).

Potom su prikazane tabelarne vrednosti krivih propagacije, u Dodatku 2.2 ovog Poglavlja, zajedno sa detaljnim uputstvima za interpolaciju i ekstrapolaciju. Krive propagacije vezane za ove tabelarne vrednosti date su u Dodatku 2.3 ovog Poglavlja.

Predikcije se mogu vršiti u frekvencijskom opsegu Plana, za sledeće parametre opsega: rastojanje od izvora od 1 do 1000km; procenat vremena od 1 do 50%; za različite visine predajnih antena. Metoda crta razlike u putanjama preko tla, hladnih i toplih mora, trpi varijabilnost lokacija za predikciju zemaljskih servisa i uzima u obzir lokalni klater kojim je okružena zona prijema. Pored toga, omogućava procedure za postupanje sa negativnim efektivnim visinama predajne antene i propagacijom preko više različitih klatera (npr. u kombinaciji tla i vodene površine). Predikcija se koristi i za izračunavanje interferencije u mobilnim sistemima, gde se koristi termin „bazna stanica”.

Metoda može biti korišćena sa ili bez baze podataka o visinama terena, iako je tačnost predikcije veća ako je takva baza dostupna. Sve u svemu, podaci o terenu se ne koriste u procesu planiranja.

Za bilateralne ili multilateralne koordinacije, više metoda za predikciju propagacije električnog polja koje se baziraju na karakteristikama trase mogu biti korišćene, npr. koristeći visine terena i/ili podatke o pokrivanju može se postići veća tačnost predikcije ako se primeni metoda opisana u Dodatku 2.1 ovog Poglavlja i izračunaju korekcije za ugao vidljivosti terena.
Za stanice aeronautičkih radionavigacionih servisa koje se nalaze na letelicama, ako postoji linija optičke vidljivosti, propagacija u slobodnom prostoru trebalo bi da se koristi umesto metode prikazane u Dodatku 2.1 ovog Poglavlja; u suprotnom, pretpostavlja se da nema signala. Razlog je to što, u opštem slučaju, tačna lokacija letelice nije poznata.
Izvorno, Preporuka ITU-R P.1546-2 primenljiva je za visine antena samo do 3000m. Za svrhe RRC-06, razmatrana je mogućnost predikcije za visine zemaljskih predajnih antena veće od 3000 m i zaključeno je da se dobijaju pogrešni rezultati.

2.2 Opšti opis metodologije

Tabelarno data zavisnost intenziteta električnog polja od rastojanja u Dodatku 2.2 ovog Poglavlja daje predikovanu vrednost intenziteta električnog polja kao funkciju frekvencije i efektivne visine antene, prevaziđenu u 50% lokacija i u 50%, 10% ili 1% vremena. Vrednosti intenziteta električnog polja izražene su u decibelima u odnosu na 1μV/m (dB(μV/m)) za efektivno izračenu snagu od 1kW u pravcu prijemne tačke.

Vrednosti efektivne visine predajne antene treba da obezbedi administracija. Podaci o terenu mogu biti iskorišćeni za dobijanje skupa vrednosti efektivnih visina za slučajeve kada nadležna administracija nije u mogućnosti da obezbedi takve informacije i traži pomoć u određivanju ovih vrednosti. Za poslove proračuna u ITU procesu ne koriste se podaci o terenu.

Tabelarni podaci dati su za različite tipove oblasti i klima, imenovanih kao zemljište, hladna i topla mora i metoda predikcije uključuje proceduru ekstrapolacije podataka za oblasti karakteristične po ekstremnoj superrefrakciji. Zbog veoma značajnih razlika u uslovima propagacije za putanje iznad zemljišta i iznad vodene površine, linija obale mora biti uključena u proračun predikcije propagacije, kako bi proračun uzeo u obzir ove razlike u okviru proračuna interferencije.

Informacije o tipu propagacione putanje, kao što su zemljište, vodena površina ili mešovita putanja preko zemljišta i vode treba izvesti iz digitalnih mapa ukazujući na liniju obale, a takođe se ITU digitalizovana mapa sveta (MIFR) može dobiti iz Biroa. Informacije o podelama na topla i hladna mora i geografski podaci za druge propagacione oblasti i tipove putanja date su u §2.2.2 ovog Poglavlja.

Delovi koji slede sadrže opšte opise glavnih aspekata metodologije iz Dodatka 2.1 ovog Poglavlja i upotrebe podataka u Dodacima 2.2 i 2.3 ovog Poglavlja.

2.2.1 Krive propagacije

Krive propagacije predstavljene na graficima u Dodatku 2.3 ovog Poglavlja (i odgovarajuće tabelarne vrednosti u Dodatku 2.2 ovog Poglavlja) uspostavljaju vezu između intenziteta električnog polja i dužine putanje propagacije. Krive daju vrednosti intenziteta električnog polja prevaziđene na 50% lokacija i svaki grafik odgovara procentu vremena od 50%, 10% ili 1% za jednu od geografskih zona definisanih dole i prikazanih na mapi na slici 2.2-1.

Skup krivih na svakoj od slika obezbeđuje vrednosti intenziteta električnog polja za nominalne vrednosti frekvencije, efektivne visine predajne antene (antene bazne stanice) i rastojanja. Za druge vrednosti, interpolacione/ekstrapolacione formule date su u Dodatku 2.1 ovog Poglavlja.

Sve krive date su za vrednosti intenziteta električnog polja koje odgovaraju prijemnoj anteni/ anteni mobilnog uređaja visine 10m u odnosu na okolinu u otvorenom prostoru. Za druge vrednosti i druga okruženja, korekcioni faktor određen je u Dodatku 2.1 ovog Poglavlja.

2.2.2 Geografska podela

Podaci o propagaciji korišćeni za metode predikcije propagacije električnog polja bazirani su na različitim geografskim regionima i klimama, nazvanim zemljište, hladna mora, topla mora i geografski regioni karakteristični po ekstremno izraženoj superrefrakciji.

Informacije o tipu propagacione putanje, kao što je zemljište, more ili mešovite putanje iznad zemljišta i vodene površine treba da budu izvedene iz digitalnih mapa u kojima su označene linije obale, kao što je MIFR dostupan u Birou. Definicija podela na hladna/topla mora i geografske regione je prikazana dole.

Zona 1: umerene i subtropske regije;

Zona 2: regije u kojima su uslovi propagacije okarakterisani po niskoj vlažnosti, maloj količini padavina i malim godišnjim varijacijama klime;

Zona 3: ekvatorijalne regije u kojima su uslovi propagacije karakteristični po toploj i vlažnoj klimi;

Zona 4: morske regije u kojima se propagacija vrši preko toplih mora gde se povremeno dešava superrefrakcija (Kaspijsko more, Crno more i sva mora koja okružuju Afriku čine Zonu 4, izuzev Zone A i Zone B definisane dole);

Zona 5: morske regije u kojima se propagacija vrši preko hladnih mora;

Zona A: morske zone na malim nadmorskim visinama u kojima se često ispoljava superrefrakcija;

Zona B: morska zona na malim nadmorskim visinama u kojima je superrefrakcija slabije izražena nego u Zoni A;

Zona C: morske zone od spajanja linije obale Islamske Republike Irana sa njenom granicom sa Pakistanom zapadno duž linije obale Islamske Republike Irana i Iraka, do tačke 48°E, 30°N duž linije obale Kuvajta, istočne obale Saudijske Arabije, linije obale Katara, Ujedinjenih Arapskih Emirata i Omana, sve do preseka sa uporednikom 22°N.;

Zona D: regija koja sadži pojas kopna maksimalne širine od 100km koji okružuje Zonu C i kopno Zapadne Afrike i sastoji se iz dva dela. Severni deo proširuje se ne više od 50km od Atlantskog okeana u kopno, ali je ograničen na istoku linijom od 30°N 10°W do 20°N 13°W i na zapadu od 20°N 15°W do 15°N 12°W, a drugi od 35°N 12°W do 9°N 13°W, ali ne proširujući se iza linije obale.

Tabela 2.2-1 daje sve informacije o parametrima korišćenim za izvođenje tabelarnih vrednosti (videti Dodatak 2.2 ovog Poglavlja) i krive (videti Dodatak 2.3 ovog Poglavlja) za različite zone propagacije. Vrednosti *dN* bazirane su na indeksu vertikalne refrakcije na najnižih 65m atmosfere (videti Preporuku ITU-R P.453-9).

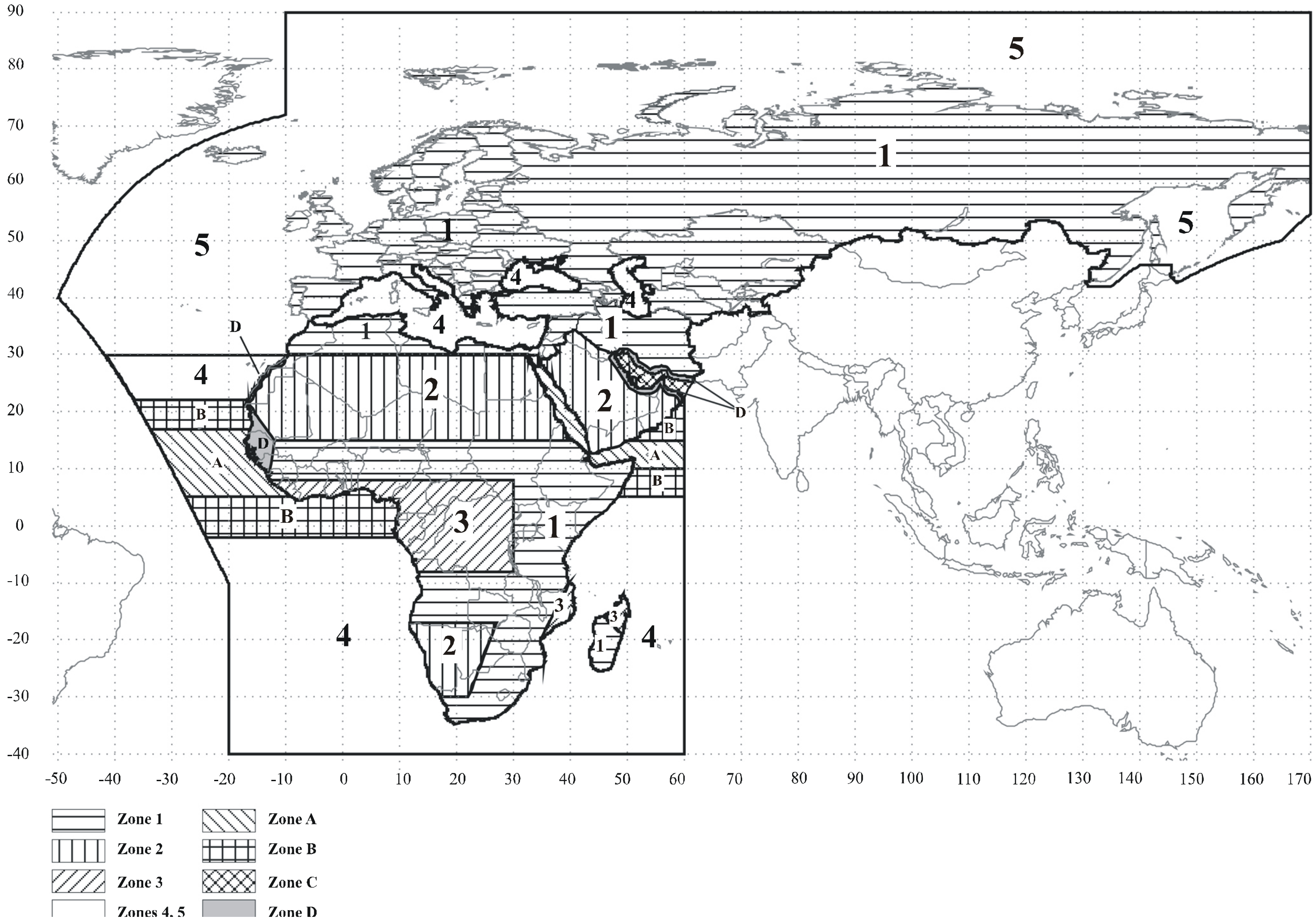
TABELA 2.2-1

Parametri korišćeni za izvođenje krivih iz Dodatka 2.3 ovog Poglavlja

Zona	Tip putanje	Izvedeno iz zone tipa	Indeks refrakcije, *dN,* nije prevaziđen u		
			1% vremena	10% vremena	50% vremena
1	zemljište		-301.3	-141.9	-43.3
2	zemljište	1	-200.0	-110.0	-30.0
3	zemljište	1	-250.0	-130.0	-40.0
4	more		-301.3	-141.9	-43.3
5	more		-301.3	-141.9	-43.3
A	more	4	-1 150.0	-1 000.0	-720.0
B	more	4	-680.0	-500.0	-320.0
C	more	4	-1 233.0	-850.0	-239.0
D	zemljište	1	-694.0	-393.0	-120.0

SLIKA 2.2-1

Geografska podela oblasti za koje se vrši planiranje na propagacione zone



Napomena: Ostrva u Mediteranu pripadaju Zoni 1

2.2.3 Predikcija željenog intenziteta električnog polja

Kada se vrši predikcija željenog intenziteta električnog polja za individualnu putanju predajnik-prijemnik, pogodno je uzeti vrednosti za 50% vremena datog u Dodatku 2.1 ovog Poglavlja, s obzirom na to da su te vrednosti takođe primenljive i za 99% procenata vremena. Kada su u pitanju kratka rastojanja (do 60km), razlika u vrednostima intenziteta električnog polja za 50% i 99% vremena je zanemarljiva. Ipak, postoje razlike u propagaciji preko različitih zona i stoga je potrebno uzeti u obzir prirodu svake individualne putanje propagacije.

2.2.4 Predikcija intenziteta interferirajućeg električnog polja

U procesu planiranja i koordinacije, neophodno je predvideti nivo interferirajućeg električnog polja u zoni pružanja servisa odgovarajuće dodele/zone raspodele, a koja potiče od strane druge dodele/zone raspodele. Kada se proračunava nivo interferirajućeg električnog polja potrebno je koristiti krive propagacije za zonu pružanja servisa i zonu propagacije, koje u obzir uzimaju procente vremena, iz Dodatka 2.3 ovog Poglavlja. Za intenzitet interferirajućeg električnog polja, procenat vremena u kome je intenzitet električnog polja prevaziđen je po pravilu 1%. Ipak, u specifičnim slučajevima (posebno za druge servise), mogu se koristiti i druge vrednosti.

Idealno, proračun bi se trebalo vršiti tako da čitava zona pružanja servisa odgovarajuće dodele/zone raspodele bude zaštićena. Ipak, pod nekim okolnostima ovo ne mora biti moguće, ili neophodno. Izdvajaju se sledeća dva slučaja.

2.2.4.1 Predikcija intenziteta električnog polja u zoni pružanja servisa

U slučajevima kada je oblast koju treba zaštititi predstavljena zonom pružanja servisa, predikcija intenziteta interferirajućeg električnog polja normalno bi se vršila za tačke na periferiji ove zone. Tačke koje definišu ivice zone pružanja servisa mogu biti specificirane ili izračunate. Pošto se one izračunaju, predikcija se može vršiti u 36 radijalnih pravaca u odnosu na poziciju predajnika.

2.2.4.2 Predikcija intenziteta električnog polja za zonu pružanja servisa

U nekim slučajevima nije moguće ili neophodno definisati zonu pružanja servisa na način kako je to opisano u prethodnom paragrafu, npr. radionavigaciona zemaljska stanica gde bi se interferencija merila radarskom antenom. Ovaj primer odgovara situaciji kada postoji radiodifuzna stanica sa malom servisnom zonom. Definisanje zone pružanja servisa i proračun nivoa interferencije u velikom broju tačaka izazvao bi nepotrebna izračunavanja. U ovom slučaju, lokacija predajne stanice može se smatrati reprezentativnom za zonu pružanja servisa koju treba zaštititi, pa se predikcija nivoa interferirajućeg električnog polja može vršiti za tu tačku.

2.2.5 Korekcioni faktori

Tačnost modela za predikciju propagacije može biti popravljena uvođenjem korekcionih faktora. Zahtevi za korekcionim faktorima i kada se oni koriste objašnjeni su dole.

2.2.5.1 Negativna efektivna visina antene

Za slučajeve negativnih efektivnih visina antene, za putanje iznad zemljišta ili iznad mešovitog terena, neophodno je uključiti korekcioni faktor koji je funkcija ugla vidljivosti terena (videti § A.2.1.4.3 ovog Poglavlja).

2.2.5.2 Visina prijemne antene

Kada visina tla na prijemnoj lokaciji nije poznata (npr. u fazi planiranja), podrazumeva se da je prijemna antena na visini od 10m u otvorenom prostoru ili suburbanoj oblasti. Da bi se prediktovane vrednosti korigovale za različite visine prijemnih antena iznad tla uvodi se korekcioni faktor primenom metode opisane u § A.2.1.9 ovog Poglavlja.

2.2.5.3 Ugao vidljivosti terena

Ako je zahtevana veća preciznost proračuna za svrhe koordinacije (i podaci su dostupni), u procesu predikcije intenziteta električnog polja za uslove prijema u specifičnim oblastima, korekcija za ugao vidljivosti terena primenjuje se za putanje iznad zemljišta, ili na delovima iznad zemljišta koji pripadaju mešovitim trasama (videti Dodatak 2.1 ovog Poglavlja).

2.2.5.4 Statistika lokacija

U okviru malih oblasti 100m ×100m do 200m ×200m, varijacije nivoa električnog polja biće slučajne, što je posledica lokalnih nepravilnosti terena i refleksija o objekte u okolini prijemne lokacije. Statistika ovog tipa varijacija može biti opisana log-normalnom raspodelom intenziteta električnog polja. Skorašnja merenja digitalnih signala pokazala su da standardna devijacija za putanje u slobodnom prostoru iznosi oko 5.5dB, zavisno od okruženja prijemne lokacije. Bilo koja vrednost koja se odnosi na na servis u zatvorenom prostoru biće bazirana na standardnoj devijaciji od 5.5dB. Za prijem u zatvorenom prostoru, standardna devijacija biće veća (videti Poglavlje 3 Aneksa 2 Sporazuma, § 3.2.2.2).
Različiti procenti lokacija mogu biti izračunati korišćenjem odgovarajućih umnožaka datih u Tabeli A.2.1-2 Dodatka 2.1 ovog poglavlja. Npr, za razliku između 50% i 95% lokacija u spoljašnjem prostoru uzima se vrednost od 9 dB za slučajeve gde je standardna devijacija 5.5dB. Ova vrednost nema uticaja na postojeće nepreciznosti modela za predikciju propagacije.
U slučaju da je željeni signal sastavljen od više signala različitih predajnika, rezultujuća standardna devijacija postaje varijabilna, zavisno od intenziteta polja pojedinačnih signala. Posledica toga je da razlika između željenih signala za 50% i 70% ili 95% lokacija postaje varijabilna. Ipak, ona će uvek biti manja od individualnih signala.

2.3 Informacije o propagaciji za ocenu kompatibilnosti između radiodifuznih servisa i drugih primarnih terestrijalnih servisa

2.3.1 Kompatibilnost između radiodifuznog servisa i drugih primarnih terestrijalnih servisa

U slučaju interferencije koja ometa radiodifuzni servis ili koju isti pravi, model za predikciju propagacije i procedura opisana u Dodatku 2.1 ovog Poglavlja treba da se iskoriste, uzimajući u obzir relevantne informacije vezane za stanice koje ometaju druge primarne terestrijalne servise ili koje su ometane od strane istih.

2.3.2 Kompatibilnost između radiodifuznog servisa i stanica na letelicama koje pružaju aeronautički servis

U slučaju interferencije koja ometa stanicu na letelici ili aeronautički radionavigacioni sistem ili koja potiče od istog:

- model predikcije propagacije u slobodnom prostoru treba koristiti u slučajevima kada postoji linija optičke vidljivosti između predajne i prijemne antene; i
- treba pretpostaviti nultu interferenciju u slučaju kada nema linije optičke vidljivosti.

Intenzitet električnog polja u slobodnom prostoru u odnosu na polutalasni dipol za 1kW efektivno izračene snage data je kao:

$$E = 106.9 - 20 \cdot \log d$$

gde je:

E: nivo električnog polja u slobodnom prostoru (dB(μV/m))
d: rastojanje (km) između predajne i prijemne antene.

DODATAK 2.1

Metode za predikciju propagacije

Terminologija korišćena u ovom Dodatku

Za potrebe vidljivosti, termin „*predajna antena/antena na baznoj stanici*” korišćen u ovom Dodatku treba da bude shvaćen kao „*predajna antena”*.
Tabelarne vrednosti propagacionih krivih u Dodatku 2.2 ovog Poglavlja date su samo za pojedine frekvencije, efektivne visine predajnih antena, rastojanja i procente vremena. Ove vrednosti su definisane kao nominalne u tekstu Dodatka 2.1 ovog Poglavlja.

A.2.1.1 Uvod

Ovaj Dodatak opisuje zasebne faze proračuna. Opis procedure, korak po korak, koji sledi dat je u § A.2.1.15 ovog Poglavlja.

A.2.1.2 Maksimalne vrednosti intenziteta električnog polja

Intenzitet električnog polja za bilo koju datu zonu propagacije ne sme prevazići maksimalnu vrednost E_{max} datu u vidu maksimuma krive na slikama u Dodatku 2.3 ovog Poglavlja. U slučaju propagacije iznad mešovitog tla, neophodno je izračunati maksimalnu vrednost intenziteta električnog polja metodom linearne interpolacije između vrednosti dobijenih za propagaciju po segmentima samo iznad zemljišta i samo iznad vodene površine. To je opisano formulom:

$$E_{\max} = \left(d_l \cdot E_{ml} + d_s \cdot E_{ms}\right) / d_{total} \qquad \text{dB}(\mu\text{V/m}) \qquad (1)$$

gde je:

E_{ml}: maksimalna vrednost intenziteta električnog polja za relevantne putanje koje se pružaju isključivo preko kopna (dB(μV/m))
E_{ms}: maksimalna vrednost intenziteta električnog polja za relevantne putanje koje se pružaju isključivo preko vodene površine (dB(μV/m))
d_l: ukupno rastojanje preko kopna (km)
ds: ukupno rastojanje preko vodene površine (km)
d_{total}: ukupno rastojanje (km).

Bilo koja korekcija koja povećava intenzitet električnog polja neće moći da rezultuje vrednostima koje su veće od ovih granica, za relevantnu familiju krivih. Ipak, ograničavanje maksimalne vrednosti biće primenjeno samo gde je naznačeno u § A.2.1.15 ovog Poglavlja.

A.2.1.3 Maksimalne vrednosti intenziteta električnog polja

Visina predajne antene/antene bazne stanice, h_1, koja se koristi u proračunima zavisi od tipa i dužine putanje i od različitih veličina vezanih za podatke o visini antene.

Efektivna visina predajne antene/antene bazne stanice, h_{eff}, definisana je kao njena visina u metrima iznad prosečnog nivoa tla između 3 i 15km od predajne antene/antene bazne stanice u pravcu prijemne antene/antene mobilnog uređaja.

Vrednosti h_1 koje se koriste u proračunu treba da budu izvedene primenom metode date u § A.2.1.3.1, A.2.1.3.2 ili u A.2.1.3.3 ovog Poglavlja.

A.2.1.3.1 Putanje iznad kopna kraće od 15km

Za putanje iznad kopna kraće od 15km primenjuje se jedna od sledeće dve metode.

A.2.1.3.1.1 Podaci o terenu nisu na raspolaganju

Ako podaci o terenu nisu na raspolaganju, za potrebe predikcije propagacije, vrednost h_1 se izračunava u skladu sa dužinom putanje d, kao što sledi:

$$h_1 = h_a \quad \text{m} \quad \text{za} \quad d \leq 3km \tag{2}$$

$$h_1 = h_a + (h_{eff} - h_a) \cdot (d - 3)/12 \quad \text{m} \quad \text{za} \quad 3km < d < 15km \tag{3}$$

gde je h_a visina antene iznad tla.

A.2.1.3.1.2 Podaci o terenu stoje na raspolaganju

Ako su podaci o terenu na raspolaganju za potrebe predikcije propagacije:

$$h_1 = h_b \quad \text{m} \tag{4}$$

gde je h_b visina antene iznad prosečne visine terena između $0.2d$ i d km.

A.2.1.3.2 Putanje iznad kopna duže od 15km

Za ovakve putanje:

$$h_1 = h_{eff} \quad \text{m} \tag{5a}$$

A.2.1.3.3 Putanje iznad vodene površine

Za ovakve putanje:

$$h_1 = h_{eff} \quad \text{m} \tag{5b}$$

Ovu metodu za predikciju propagacije ne bi trebalo koristiti za putanje koje su isključivo iznad vodene površine za vrednosti h_1 manje od 1m.

A.2.1.4 Primena visine predajne antene/antene bazne stanice, h_1

Vrednost h_1 određuje koju krivu iz familije krivih treba izabrati za očitavanje vrednosti intenziteta električnog polja, i za koju se vrše interpolacija i ekstrapolacija, kada je to potrebno. Sledeći slučajevi se izdvajaju.

A.2.1.4.1 Visina predajne antene/antene bazne stanice, h_1, u opsegu od 10 do 3000 m

Ako se vrednost za h_1 poklapaju sa jednom od osam vrednosti za koje su krive nacrtane, a to su 10, 20, 37.5, 75, 150, 300, 600, 1200m, traženi intenzitet električnog polja može biti očitan direktno sa iscrtane krive ili pridruženih tabela. U ostalim slučajevima, traženi intenzitet električnog polja može se dobiti interpolacijom ili ekstrapolacijom iz intenziteta električnog polja očitanog sa dve krive, korišćenjem formule:

$$E = E_{\inf} + (E_{\sup} - E_{\inf}) \cdot \log\left({h_1}/{h_{\inf}} \right) / \log(h_{\sup}/h_{\inf}) \quad \text{dB}(\mu\text{V/m}) \tag{6}$$

gde je:

h_{inf} : 600m ako je h_1>1 200m, a u ostalim slučajevima uzima se najbliža nominalna efektivna visina ispod h_1

h_{sup} : 1 200m ako je h_1>1 200m, a u ostalim slučajevima uzima se najbliža nominalna efektivna visina iznad h_1

E_{inf} : intenzitet električnog polja za h_{inf} na zahtevanom rastojanju (dB(μV/m)),
E_{sup} : intenzitet električnog polja za h_{sup} na zahtevanom rastojanju (dB(μV/m)),

Vrednost intenziteta električnog polja koja se dobije kao rezultat ekstrapolacije za h_1>1 200m treba ograničiti, ako je neophodno, tako da ne prevazilazi maksimum definisan u § A.2.1.2 ovog Poglavlja. Ovu metodu za predikciju propagacije ne bi trebalo koristiti kada je h_1>3 000m.

A.2.1.4.2 Visina predajne antene/antene bazne stanice, h_1, u opsegu od 0 do 10 m

Kada je h_1 manje od 10 m, metoda se bira u zavisnosti od toga da li se putanja propagacije pruža iznad kopna ili vodene površine.

Za kopno ili mešovitu podlogu:

Procedura ekstrapolacije vrednosti intenziteta električnog polja na zahtevanom rastojanju *d* km za vrednosti h_1 u opsegu vrednosti od 0 do 10 m bazirana je na rastojanjima glatkog horizonta (km), zapisano kao $d_H(h) = 4.1\sqrt{h}$, gde je *h* tražena vrednost visine predajne antene/antene bazne stanice h_1 (m).

Za $d < d_H(h_1)$, intenzitet električnog polja dat je kao kriva za efektivnu visinu antene od 10m na odgovarajućem rastojanju po horizontu, plus ΔE, gde je ΔE razlika između intenziteta električnog polja za krivu koja odgovara efektivnoj visini antene od 10 m, na rastojanju *d* i na rastojanju koje odgovara h_1.

Za $d \geq d_H(h_1)$, intenzitet električnog polja dat je krivom kojoj odgovara efektivna visina antene od 10 m na rastojanju Δ*d* iza rastojanja po horizontu, gde je Δ*d* razlika između *d* i rastojanja po horizontu za h_1.

To je izraženo sledećim formulama, gde je $E_{10}(d)$ intenziteta električnog polja u (dB(μV/m)) uzeta sa krive kojoj odgovara efektivna visina antene od 10 m, za rastojanje *d* (km):

$$E = E_{10}(d_H(10)) + E_{10}(d) - E_{10}(d_H(h_1)) \qquad \text{dB(μV/m)} \qquad (7a)$$

$$E = E_{10}(d_H(10) + d - d_H(h_1)) \qquad \text{dB(μV/m)} \qquad (7b)$$

Ako, u jednačini (7b) $d_H(10) + d - d_H(h_1)$ prevazilazi 1 000 km, čak i ako je $d \leq 1000km$, E treba odrediti linearnom ekstrapolacijom za logaritamsku vrednost (rastojanja) krive, dato na sledeći način:

$$E = E_{\inf} + (E_{\sup} - E_{\inf}) \cdot \log(d/D_{\inf}) / \log(D_{\sup}/D_{\inf}) \qquad \text{dB(μV/m)} \qquad (7c)$$

gde je:

D_{inf}: preliminarno tabelarno rastojanje (km)
D_{sup}: finalno tabelarno rastojanje (km)
E_{inf}: intenzitet električnog polja za preliminarno tabelarno rastojanje dB(μV/m)
E_{sup}: intenzitet električnog polja za finalno tabelarno rastojanje dB(μV/m)

Treba imati u vidu da ova metoda za predikciju propagacije ne treba koristiti za rastojanja veća od 1 000 km. Jednačinu (7c) treba koristiti samo za ekstrapolaciju za $h_1 < 10m$.

Za vodenu podlogu:

Treba imati u vidu da za putanje koje se pružaju iznad vodene površine h_1 ne sme biti manje od 1 m. Procedura zahteva da rastojanje na kome putanja iznosi 0.6 poluprečnika prve Frenelove zone nezahvaćeno vodenom površinom bude poznato. To je dato na sledeći način:

$$D_{h_1} = D_{06}(f, h_1, 10) \qquad \text{km} \qquad (8a)$$

gde je funkcija D_{06} definisana u § A.2.1.14 ovog Poglavlja i f je nominalna frekvencija.

Ako je $d > D_{h_1}$ biće neophodno da se izračuna i 0.6 Frenelove vidljivosti za vodene putanje gde predajna antena/antena bazne stanice ima visinu od 20 m, datu na sledeći način:

$$D_{20} = D_{06}(f, 20, 10) \qquad \text{km} \qquad (8b)$$

gde je f nominalna frekvencija.

Intenzitet električnog polja za zahtevano rastojanje d i vrednost h_1 data na sledeći način:

$E = E_{max}$ dB(μV/m) za $d \le D_{h_1}$ (9a)

$E = E_{D_{h_1}} + (E_{D_{20}} - E_{D_{h_1}}) \times \log(d / D_{h_1}) / \log(D_{20} / D_{h_1})$ dB(μV/m) za $D_{h_1} < d < D_{20}$ (9b)

$E = E' (1 - F_S) + E'' F_S$ dB(μV/m) za $d \ge D_{20}$ (9c)

gde je:

E_{max}: maksimalna vrednost intenziteta električnog polja data u okviru § A.2.1.2 ovog Poglavlja

$E_{D_{h_1}}$: E_{max} za rastojanje D_{h_1} datom u § A.2.1.2 ovog Poglavlja

$E_{D_{20}}$ = $E_{10}(D_{20})$ + $(E_{20}(D_{20}) - E_{10}(D_{20})) \log(h_1 / 10) / \log(20/10)$

$E_{10}(x)$: intenzitet električnog polja za h_1 = 10 m interpoliran za rastojanje x (dB(μV/m))

$E_{20}(x)$: intenzitet električnog polja za h_1 = 20 m interpoliran za rastojanje x (dB(μV/m))

E' = $E_{10}(d) + (E_{20}(d) - E_{10}(d)) \log(h_1/10) / \log(20/10)$ dB(μV/m)

E'': intenzitet električnog polja za rastojanje d izračunato metodom za putanje iznad kopna, datom gore

F_S = $(d - D_{20}) / d$.

A.2.1.4.3 Negativne vrednosti visine predajne antene/antene bazne stanice, h_1

Za putanje koje se prostiru iznad kopna i putanje iznad mešovite podloge, moguće je da efektivna visina predajne antene/antene bazne stanice h_{eff} ima negativnu vrednost, pošto je bazirana na prosečnoj visini terena na rastojanjima od 3 km to 15 km. Tako, h_1 može biti negativno.

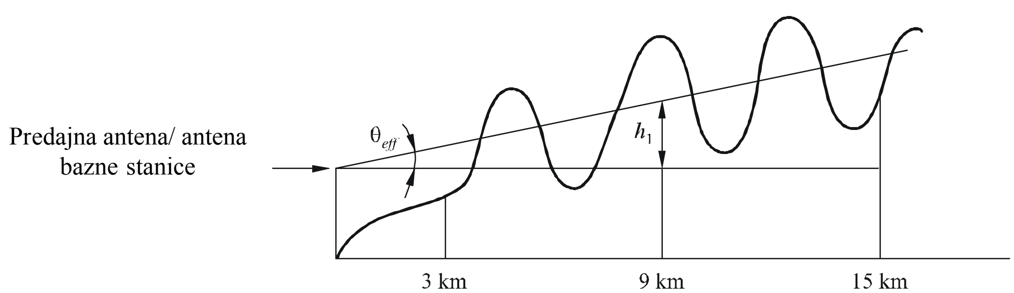
Procedura za negativne vrednosti h_1 podrazumeva da se očita vrednost intenziteta električnog polja za h_1 = 0, kao što je opisano u § A.2.1.4.2 ovog Poglavlja, i da se izračuna korekcija zasnovana na uglu vidljivosti terena opisanom u § A.2.1.10 ovog Poglavlja. Ugao vidljivosti računa se za nominalnu frekvenciju.

a) U slučajevima kada je na raspolaganju baza podataka o terenu, ugao vidljivosti terena iz pozicije predajne antene/antene bazne stanice treba računati kao elevacioni ugao linije koja je određena vrhovima prepreka na rastojanju do 15 km od predajne antene/antene bazne stanice u pravcu (ali ne dalje) prijemne antene/antene mobilnog prijemnika. Ovaj ugao vidljivosti koji će imati pozitivnu vrednost treba usvojiti umesto θ_{tca} u jednačini (23f) kada se primenjuje metoda izračunavanja korekcije ugla vidljivosti terena data u § A.2.1.10 ovog Poglavlja, kako bi se dobila vrednost korekcije, C_a, koja se dodaje na vrednost intenziteta električnog polja očitanu za $h_1 = 0$. Treba primetiti da primena ove metode može dovesti do pojave diskontinuiteta vrednosti intenziteta električnog polja u okolini $h_1 = 0$.

b) U slučajevima kada baza podataka o terenu nije na raspolaganju, (pozitivna) vrednost efektivnog ugla vidljivosti terena, θ_{eff}, može biti procenjena pretpostavljajući prepreku visine h_1, izračunatu u okviru § A.2.1.3.1.1 ovog Poglavlja,na rastojanju od 9 km od predajne antene/antene bazne stanice. Treba primetiti da se ovo koristi za sve dužine putanja, čak i za one kraće od 9 km. To je neregularan profil terena za rastojanja u opsegu od 3 km do 15 km od predajne antene/antene bazne stanice, aproksimiran kosinom čija visina na rastojanju od 9km iznosi $|h_1|$, kao što je prikazano na slici A.2.1-1. Vrednost θ_{eff} treba koristiti umesto θ_{tca} u jednačini (23f) u metodi za računanje korekcije ugla vidljivosti, datoj u § A.2.1.10 ovog Poglavlja radi određivanja korekcije, C_a, koja se dodaje na vrednost intenziteta električnog polja očitane za $h_1 = 0$. Ova korekcija se može primeniti jedino ako rezultuje smanjenjem intenziteta električnog polja.

SLIKA A.2.1-1

Efektivni ugao vidljivosti za h_1>0



θ_{eff}: efektivna vrednost ugla vidljivosti terena (pozitivna)
h_1: visina predajne antene/antene bazne stanice korišćena u proračunu

RRC06-A2-C2-A2-1-1

Efekti troposferskih gubitaka mogu se uzeti u obzir prilikom proračuna uvođenjem korekcije, C_t, datom na sledeći način:

$$C_t = \max[C_a, C_{tropo}] \tag{10a}$$

gde je:

$$C_{tropo} = 30 \log\left[\frac{\theta_e}{\theta_e + \theta_{tca}}\right] \tag{10b}$$

i

$$\theta_e = \frac{180d}{a\pi k} \quad \text{stepeni} \tag{10c}$$

sa vrednostima:

d: dužina putanje (km)

a: 6 370 km, poluprečnik Zemlje

k: 4/3, efektivna vrednost poluprečnika Zemlje za uslove medijanske refrakcije.

Pretpostavlja se da θ_{tca} ima vrednost 0.0 za efektivnu visinu od 0 m.

A.2.1.5 Interpolacija intenziteta električnog polja kao funkcije rastojanja

Slike u Dodatku 2.3 ovog Poglavlja prikazuju intenzitet električnog polja kao funkciju rastojanja, d, između 1 km i 1 000 km. Interpolacija za rastojanje nije potrebna ako se intenziteti električnog polja očitavaju direktno sa krivih. Za veću preciznost i mogućnost kompjuterske implementacije, intenziteti električnog polja treba da se očitavaju iz pridruženih tabela (koje se mogu dobiti od BR). U ovom slučaju, osim ako se d ne poklapa sa jednom od vrednosti za koje postoje tabele u Tabela A.2.1-1, intenzitet električnog polja, E (dB(μV/m)), treba da bude linearno interpoliran za logaritamsku vrednost rastojanja, koristeći sledeću jednačinu:

$$E = E_{inf} + (E_{sup} - E_{inf}) \log (d / d_{inf}) / \log (d_{sup} / d_{inf}) \qquad \text{dB(μV/m)} \qquad (11)$$

gde su:

d: rastojanje za koje se vrši predikcija (km)

d_{inf}: najbliža vrednost rastojanja za koje postoji tabela, manje od d (km)

d_{sup}: najbliža vrednost rastojanja za koje postoji tabela, veće od d (km)

E_{inf}: vrednost intenziteta električnog polja za d_{inf} (dB(μV/m))

E_{sup}: vrednost intenziteta električnog polja za d_{sup} (dB(μV/m)).

Ova metoda predikcije propagacije nije validna za vrednosti d manje od 1 km ili veće od 1 000 km.

TABELA A.2.1-1

Vrednosti rastojanja (km) korišćene u tabelama intenziteta električnog polja

1	14	55	140	375	700
2	15	60	150	400	725
3	16	65	160	425	750
4	17	70	170	450	775
5	18	75	180	475	800
6	19	80	190	500	825
7	20	85	200	525	850
8	25	90	225	550	875
9	30	95	250	575	900
10	35	100	275	600	925
11	40	110	300	625	950
12	45	120	325	650	975
13	50	130	350	675	1 000

A.2.1.6 Interpolacija vrednosti intenziteta električnog polja kao funkcije frekvencije

Vrednosti intenziteta električnog polja za datu zahtevanu frekvenciju treba odrediti interpolacijom između vrednosti za nominalnu frekvenciju od 100 MHz, 600 MHz i 2 000 MHz. Zahtevani intenzitet električnog polja, E, treba izračunati primenom:

$$E = E_{inf} + (E_{sup} - E_{inf}) \log(f / f_{inf}) / \log(f_{sup} / f_{inf}) \qquad \text{dB}(\mu\text{V/m}) \qquad (12)$$

gde je:

f: frekvencija za koju se predikcije zahteva (MHz)

f_{inf}: niža nominalna frekvencija (100 MHz ako je f < 600 MHz, 600 MHz u ostalim slučajevima)

f_{sup}: viša nominalna frekvencija (600 MHz ako f < 600 MHz, 2 000 MHz u ostalim slučajevima)

E_{inf}: vrednost intenziteta električnog polja za f_{inf} (dB(μV/m))

E_{sup}: vrednost intenziteta električnog polja za f_{sup} (dB(μV/m)).

A.2.1.7 Interpolacija vrednosti intenziteta električnog polja kao funkcija procenta vremena

Vrednosti intenziteta električnog polja za zahtevani procenat vremena između 1% i 50% treba izračunati interpolacijom između nominalnih vrednosti 1% i 10% ili između nominalnih vrednosti 10% i 50% primenom:

$$E = E_{sup} (Q_{inf} - Q_t) / (Q_{inf} - Q_{sup}) + E_{inf} (Q_t - Q_{sup}) / (Q_{inf} - Q_{sup}) \qquad \text{dB}(\mu\text{V/m}) \qquad (13)$$

gde je:

$Q_t = Q_i (t/100)$

$Q_{inf} = Q_i (t_{inf}/100)$

$Q_{sup} = Q_i (t_{sup}/100)$

E_{inf}: vrednost intenziteta električnog polja za procenat vremena t_{inf} (dB(μV/m))

E_{sup}: vrednost intenziteta električnog polja za procenat vremena t_{sup} (dB(μV/m))

t: procenat vremena za koji se zahteva predikcija

t_{inf}: niži nominalni procenat vremena

t_{sup}: viši nominalni procenat vremena

gde je $Q_i (x)$ inverzna komplementarna funkcija normalne raspodele.

Ovu metodu za predikciju propagacije treba koristiti za vrednosti intenziteta električnog polja prevaziđene u procentima vremena iz opsega samo od 1% do 50%. Ekstrapolacija izvan opsega od 1% do 50% procenta vremena nije validna.

Metoda za izračunavanje $Q_i (x)$ data je u § A.2.1.12 ovog Poglavlja.

A.2.1.8 Putanje preko mešovitog terena

Kada se desi da se putanja prostire preko različitih propagacionih zona, npr.kopno i vodena površina, oblasti sa različitim indeksom refrakcije, treba primeniti metodu koja je prikazana dole, pod sledećim uslovima:

a) za sve frekvencije i sve procente vremena i za one kombinacije propagacionih zona koje ne uključuju prelaze tipa kopno/more ili kopno/obalska zona, treba primeniti sledeću proceduru za izračunavanje intenziteta električnog polja:

$$E_{m,t} = \sum_i \frac{d_i}{d_T} E_{i,t} \qquad (14)$$

gde je:

$E_{m,t}$: intenzitet električnog polja za putanje preko mešovitog terena za t% procenat vremena (dB(μV/m))

$E_{i,t}$: intenzitet električnog polja za putanje u zoni i jednake dužine kao putanja koja se prostire iznad mešovitog terena za t% vremena (dB(μV/m))

d_i: dužina putanje u zoni i (km)

d_T: ukupna dužina putanje (km);

b) za sve frekvencije i sve procente vremena i za one kombinacije propagacionih zona koje uključuju jednu jedinu kopnenu kategoriju zone propagacije i jednu jedinu morsku ili obalsku kategoriju zone propagacije, treba primeniti sledeću proceduru za izračunavanje intenziteta električnog polja:

$$E_{m,t} = (1-A)\cdot E_{l,t} + A\cdot E_{s,t} \tag{15a}$$

gde je:

$E_{m,t}$: intenzitet električnog polja za putanju koja se prostire iznad mešovitog terena za t% vremena (dB(μV/m))

$E_{l,t}$: intenzitet električnog polja za putanju koja se prostire iznad kopna i jednake je dužine kao putanja koja se prostire iznad mešovitog terena za t% vremena (dB(μV/m))

$E_{s,t}$: intenzitet električnog polja za putanju koja se prostire iznad vodene površine ili obalske zone a čija je dužine jednaka dužini putanje koja se prostire iznad mešovitog terena za t% vremena (dB(μV/m))

A: interpolacioni faktor kao što je dato u § A.2.1.8.1 ovog Poglavlja;

c) za sve frekvencije i sve procente vremena i za one kombinacije tri ili više propagacionih zona koje uključuju najmanje jedan prelaz tipa kopno/vodena površina ili kopno/obalska zona, treba primeniti sledeću proceduru za izračunavanje intenziteta električnog polja:

$$E_{m,t} = \{1-A\}\cdot\frac{\sum_{i=1}^{n_l} d_i E_{li,t}}{d_{lT}} + A\cdot\frac{\sum_{j=1}^{n_s} d_j E_{sj,t}}{d_{sT}} \tag{15b*}$$

gde je:

$E_{m,t}$: intenzitet električnog polja za putanju preko mešovitog terena za t% vremena (dB(μV/m))

$E_{li,t}$: intenzitet električnog polja za putanju koja se pruža iznad i po dužini jednaku sa dužinom putanje preko mešovitog terena za t% vremena, i = 1, ..., n_l; n_l je broj zona preko koji se putanja pruža (dB(μV/m))

$E_{sj,t}$ intenzitet električnog polja za putanju iznad vodene površine ili obalske zone j, po dužini jednaku sa dužinom putanje preko mešovitog terena za t% vremena, j = 1, ..., n_s, gde je n_s ukupan broj zona preko kojih se putanja pruža (dB(μV/m))

* Primetiti da jednačina (15b) pojednostavljuje jednačinu (15a) za slučaj propagacije preko mešovitog terena koja uključuje samo jednu kopnenu propagacionu kategoriju i jednu morsku ili obalsku propagacionu kategoriju.

A: faktor interpolacije, kao što je dato u § A.2.1.8.1 ovog Poglavlja (primetiti da je "prelamanje putanje preko vodene površine" računato kao: d_{sT} / d_T)

d_i, d_j: dužina putanje u zonama *i*, *j* (km)

d_{lT}: ukupna dužina delova putanje koji se pruža iznad kopna = $\sum_{i=1}^{n_l} d_i$ (km)

d_{sT}: ukupna dužina delova putanje koji se prostiru iznad vodene površine ili obalskog područja = $\sum_{j=1}^{n_s} d_j$ (km)

d_T: ukupna dužina putanje propagacije = $d_{lT} + d_{sT}$ (km).

A.2.1.8.1 Faktor interpolacije za propagaciju preko mešovitog terena, *A*

Biće korišćene sledeće oznake:

N_s: ukupan broj vodenih i obalskih zona

n: broj zone kojoj pripadaju putanje koje se pružaju preko vodene površine ili preko kopna; *n* = 1, 2, ..., N_s

M_l: ukupan broj zona koje se pružaju preko kopna

m: broj zone kojoj pripadaju putanje preko kopna; *m* = 1, 2, ..., M_l

d_{sn}: rastojanje preko mora ili obalske zone *n* (km)

d_{lm}: rastojanje preko kopnene zone *m* (km).

Tada je:

$$d_{sT} = \sum_{n=1}^{N_s} d_{sn}$$ ukupna dužina putanja preko vodene ili obalske zone (16a)

$$d_{lT} = \sum_{m=1}^{M_l} d_{lm}$$ ukupna dužina putanja preko kopnene zone (16b)

$$d_T = d_{sT} + d_{lT}$$ dužina čitave putanje propagacije. (16c)

Traže se sledeće vrednosti intenziteta električnog polja:

$E_{sn}(d_T)$: vrednost intenziteta električnog polja dB(μV/m) za rastojanje d_T, za koje se pretpostavlja da je pređeno preko vodene ili obalske zone tipa *n*

$E_{lm}(d_T)$: vrednost intenziteta električnog polja dB(μV/m) za rastojanje d_T, za koje se pretpostavlja da je pređeno preko kopnene zone tipa *m.*

Interpolacioni faktor[1], A, dat je kao:

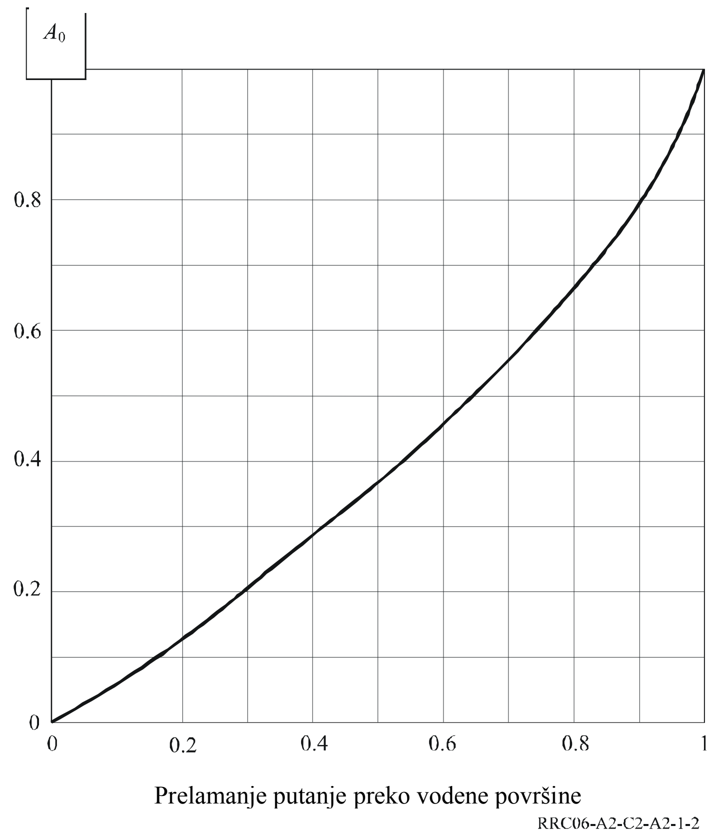
$$A = [A_0\,(F_s)]^V \tag{17}$$

gde:

$A_0\,(F_s)$: osnovni interpolacioni faktor, kao što je prikazano na slici. A.2.1-2.

Fl SLIKA A.2.1-2

Osnovni interpolacioni faktor, A, za mešovitu propagaciju



Prelamanje putanje preko vodene površine, F_s, korišćeno na slici . A.2.1-2 dato je kao:

$$F_s = \frac{d_{sT}}{d_T} \tag{18}$$

i V se računa primenom izraza:

---

[1] Interpolacioni faktor primenjuje se na sve frekvencije i sve procente vremena. Treba imati u vidu da se interpolacija primenjuje samo u sledećim slučajevima:

– putanja koje se prostiru i preko kopna i preko vodene površine
– putanja koje se prostiru i preko kopna i obalskih pojaseva
– putanja koje se prostiru preko kopna i preko obalske ili vodene zone

a ne i za:

– putanje koje se prostiru samo iznad kopna
– ili bilo koju drugu kombnaciju putanja preko vodene površine i/ili obalske zone.

$$V = \max\left[1.0, 1.0 + \frac{\Delta}{40.0}\right] \tag{19}$$

sa

$$\Delta = \sum_{n=1}^{N_s} E_{sn}(d_T)\frac{d_{sn}}{d_{sT}} - \sum_{m=1}^{M_l} E_{lm}(d_T)\frac{d_{lm}}{d_{lT}} \tag{20}$$

Na slici A.2.1-2 prikazana je zavisnost A_0 (F_s), koja se može primeniti za sve procente vremena.

A.2.1.9 Korekcija za visinu predajne antene/antene bazne stanice

Vrednosti intenziteta električnog polja krivama prostiranja i odgovarajućim tabelama, u ovoj metodi predikcije propagacije su reprezentativne za visinu antene iznad tla pokrivenog okolnim antenama, smatrajući da je minimalna visina antene 10 m. Za otvorene i suburbane zone, kao i za putanje koje se prostiru preko vodene površine, nominalna vrenost za R je 10 m.

Kada je pozicija predajne antene/antene bazne stanice na tlu, proračun prvo treba vršiti za ugao elevacije dolazećeg talasa tako što se računa sa modifikovanom reprezentativnom visinom klatera R' (m), datom kao:

$$R' = (1\,000\, d\, R - 15\, h_1)/(1\,000\, d - 15) \quad \text{m} \tag{21}$$

gde su h_1 i R dati u metrima i rastojanje d je u kilometrima.

Primetiti da važi $h_1 < 6.5d + R$, $R' \approx R$.

Vrednost R' mora biti ograničena, ako je neophodno, tako da ne bude manja od 1 m.

Kada je predajna antena/antena bazne stanice u suburbanoj ili urbanoj okolini, korekcija je data kao:

$$\text{Korekcija} = 6.03 - J(\nu) \quad \text{dB} \quad \text{za } h_2 < R' \tag{22a}$$

$$= K_{h_2} \log(h_2 / R') \quad \text{dB} \quad \text{za } h_2 \geq R' \tag{22b}$$

h_2: visina predajne antene/antene bazne stanice iznad tla (m)

gde je $J(\nu)$ dato jednačinom (23d),

i:

$$\nu = K_{nu}\sqrt{h_{dif}\theta_{clut}} \tag{22c}$$

$$h_{dif} = R' - h_2 \quad \text{m} \tag{22d}$$

$$\theta_{clut} = \arctan(h_{dif} / 27) \quad \text{stepeni} \tag{22e}$$

$$K_{h_2} = 3.2 + 6.2 \log(f) \tag{22f}$$

$$K_{nu} = 0.0108\sqrt{f} \tag{22g}$$

f= zahtevana frekvencija (MHz).

Kada je prijemna antena/antena mobilnog uređaja na tlu u ruralnoj oblasti ili otvorenom prostoru, korekcija je data jednačinom (22b) za sve vrednosti h_2.
Kada je pozicija prijemne antene/antene mobilnog uređaja na vodenoj površini, za $h_2 \geq 10$ m, korekcija će se računati primenom jednačine (22b), sa R' postavljenim na 10 m.
Kada je pozicija prijemne antene/antene mobilnog uređaja na vodenoj površini, za $h_2 < 10$ m, treba koristiti alternativnu metodu, baziranu na putanjama čije su dužine takve da 0.6 radijusa prve Frenelove zone nema preseka sa vodenom površinom. Aproksimativna metoda za izračunavanje ovog rastojanja date je u § A.2.1.14 ovog Poglavlja.
Rastojanje d_{10} na kome bi putanja imala 0.6 radijusa prve Frenelove zone vidljivo za traženu vrednost h_1 i za $h_2 = 10$ m treba računati kao $D_{06}(f, h_1, 10)$ u § A.2.1.14 ovog Poglavlja.
Ako je zahtevano rastojanje jednako ili veće od d_{10}, tada opet korekciju za zahtevanu vrednost h_2 treba računati primenom jednačine (22b), sa R' postavljenim na 10 m.
Ako je zahtevano rastojanje manje od d_{10}, tada korekcija koja se dodaje na intenzitet električnog polja E treba da se izračuna primenom formule:

Korekcija $= 0.0$dB za $d \leq d_{h_2}$ (22h)

$$= C_{10} \times \log(d / d_{h_2}) / \log(d_{10} / d_{h_2}) \quad \text{dB} \quad \text{for } d_{h_2} < d < d_{10} \qquad (22j)$$

gde:

C_{10}: korekcija za zahtevanu vrednost h_2 i rastojanje d_{10} primenom jednačine (22b) sa R' postavljenih na 10 m

d_{10}: rastojanje na kome putanja ima 0.6 Frenelove vidljivosti za h_2 □ 10 m izračunato kao $D_{06}(f, h_1, 10)$ kao što je dato u § A.2.1.14 ovog Poglavlja.

d_{h_2}: rastojanje na kome putanja ima 0.6 Frenelove vidljivosti za zahtevanu vrednost h_2 izračunatu kao $D_{06}(f, h_1, h_2)$ kao što je dato u § A.2.1.14 ovog Poglavlja.

Ova korekcija se ne koristi za slučaj prijemne antene/antene mobilnog uređaja čija je visina h_2 manja od 1 m kada je prijemna lokacija na tlu ili na manje od 3 m kada je na vodenoj površini.

A.2.1.10 Korekcija ugla vidljivosti terena

Za putanje preko kopna , i za slučaj kada je prijemna antena/antena mobilnog uređaja na kopnenom delu mešovite trase, ako se zahteva veća preciznost predikcije intenziteta električnog polja za uslove prijema u specifičnim oblastima, korekcija se može odrediti na osnovu ugla vidljivosti terena.Ugao vidljivosti terena, θ_{tca}, dat je kao:

$$\theta_{tca} = \theta - \theta_r \qquad \text{stepeni} \qquad (23a)$$

gde je θ izmereno u odnosu na liniju koja spaja prijemnu antenu/antenu mobilnog uređaja i vrhove prepreka koje postoje u pravcu predajne antene/antene bazne stanice na rastojanju do 16 km ali ne dalje prema predajnoj anteni/anteni bazne stanice, i pozitivan je ukoliko je linija vidljivosti iznad horizonta. Ovo je prikazano na slici A.2.1-3.

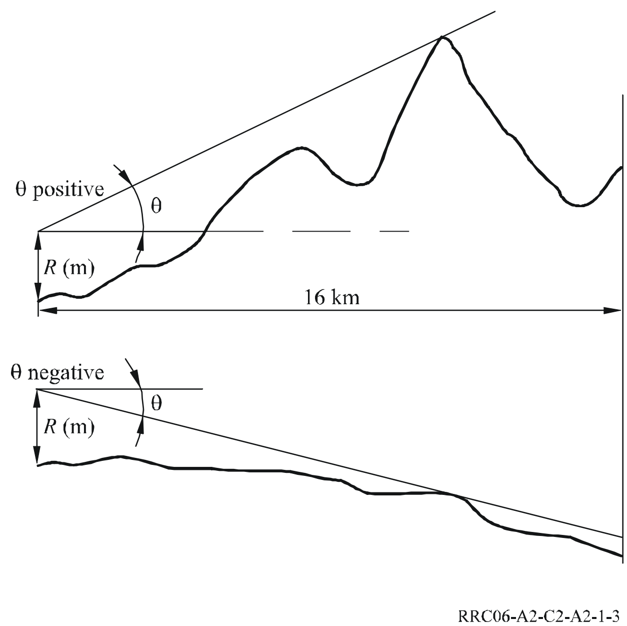
Referentni ugao θ_r dat je kao:

$$\theta_r = \arctan\left(\frac{h_{1s} - h_{2s}}{1\,000d}\right) \qquad \text{stepeni} \qquad (23b)$$

gde su h_{1s} i h_{2s} visine predajne antene/antene bazne stanice i prijemne antene/antene mobilnog uređaja, iznad nivoa mora, redom.

SLIKA A.21-3

Ugao vidljivosti terena



Kada je relevantna informacija o uglu vidljivosti terena na raspolaganju, korekcija koja se dodaje na intenzitet električnog polja računa se kao:

$$\text{Korekcija} = J(\nu') - J(\nu) \qquad \text{dB} \qquad (23c)$$

gde je $J(\nu)$ dato kao:

$$J(\nu) = \left[6.9 + 20\log\left(\nu - 0.1 + \sqrt{(\nu - 0.1)^2 + 1}\right)\right] \qquad (23d)$$

$$\nu' = 0.036\sqrt{f} \qquad (23e)$$

$$\nu = 0.065\,\theta_{tca}\sqrt{f} \qquad (23f)$$

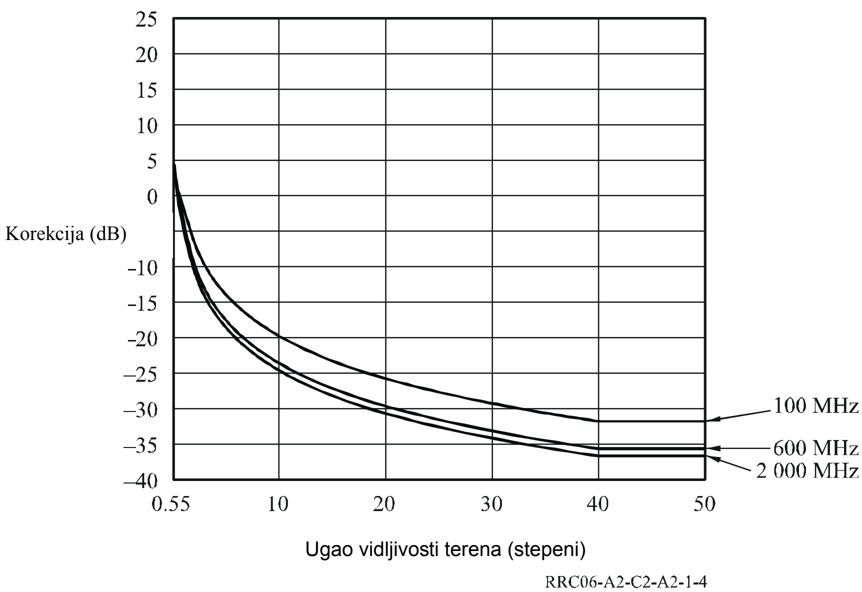
θ_{tca}: ugao vidljivosti terena (stepeni)

f: nominalna frekvencija (MHz) kada je korekcija za negativne vrednosti visine predajne antene/antene bazne stanice izračunata; zahtevana frekvencija (MHz) kada je korekcija za ugao vidljivosti terena izračunata.

Korekcija je validna za ugao vidljivoti, θ_{tca}, u opsegu +0.55° do 40°
Korekcija za θ_{tca} < +0.55 je ista kao za θ_{tca} = +0.55°.
Korekcija za θ_{tca} > +40° je ista kao za θ_{tca} = 40°.
Treba primetiti da krive opadanja intenziteta električnog polja uzimaju u obzir gubitke usled zaklanjanja prijemne antene/antene mobilnog uređaja koje pravi okolni teren. Tako, korekcije ugla vidljivosti terena imaju vrednost nula za male pozitivne uglove tipične za pozicije prijemne antene/antene mobilne stanice.
Slika A.2.1-4 ilustruje korekciju ugla vidljivosti terena za nominalne frekvencije.

SLIKA A.2.1-4

Korekcija ugla vidljivosti terena



A.2.1.11 Varijabilnost lokacija u predikciji zone pokrivanja

Za lokacije prijemnih antena/antena mobilnih uređaja koje se nalaze na tlu, intenzitet električnog polja E koji će biti prevaziđen za q% lokacija dat je kao:

$$E(q) = E\ (\text{medijanska vrednost}) + Q_i(q / 100)\ \sigma_L(f) \qquad \text{dB}(\mu\text{V/m}) \qquad (24)$$

gde:

$Q_i(x)$: inverzna funkcija normalne raspodele kao funkcija verovatnoće

σ_L: standardna devijacija Gausove raspodele lokalne srednje vrednosti u oblasti koja se analizira.

Vrednosti standardne devijacije za digitalne sisteme koji imaju propusni opseg manji od 1 MHz i za analogne sisteme, dati su kao funkcija frekvencije:

$$\sigma_L = K \square 1.6 \log(f) \quad \text{dB} \tag{25}$$

gde je:

K = 2.1 za mobilne sisteme na lokacijama u urbanim zonama

= 3.8 za mobilne sisteme na lokacijama u suburbanim zonama ili između brda

= 5.1 za analogne radiodifuzne sisteme

f: zahtevana frekvencija (MHz).

Za digitalne sisteme koji imaju propusni opseg od 1 MHz ili veći, standardna devijacija od 5.5 dB treba biti usvojena na svim frekvencijama.

Procenat lokacija q može varirati između 1% i 99%. Ova metoda predikcije propagacije ne sme biti korišćena za procente lokacija manje od 1% ili veće od 99%.

Korekcija za varijabilnost lokacija se ne primenjuje kada je lokacija prijemne antene/antene mobilne stanice na vodenoj površini.

A.2.1.12 Aproksimacija inverzne funkcije normalne raspodele

Sledeća aproksimacija inverzne komplementarne funkcije normalne raspodele, $Q_i(x)$, važi za $0.01 \leq x \leq 0.99$:

$$Q_i(x) = T(x) - \xi(x) \qquad \text{ako } x \leq 0.5 \tag{26a}$$

$$Q_i(x) = -\{T(1-x) - \xi(1-x)\} \qquad \text{ako } x > 0.5 \tag{26b}$$

gde je:

$$T(x) = \sqrt{[-2\ln(x)]} \tag{26c}$$

$$\xi(x) = \frac{[(C_2 \cdot T(x) + C_1) \cdot T(x)] + C_0}{[(D_3 \cdot T(x) + D_2) \cdot T(x) + D_1] \cdot T(x) + 1} \tag{26d}$$

C_0 = 2.515517

C_1 = 0.802853

C_2 = 0.010328

D_1 = 1.432788

D_2 = 0.189269

D_3 = 0.001308

Vrednosti koje su date prethodnim jednačinama, date su i u tabeli A.2.1-2.

TABELA A.2.1-2

Vrednosti aproksimativne inverzne komplementarne funkcije normalne raspodele

q%	Q_i (q/100)	q%	Q_i (q/100)	q%	Q_i (q/100)	q%	Q_i (q/100)
1	2.327	26	0.643	51	–0.025	76	–0.706
2	2.054	27	0.612	52	–0.050	77	–0.739
3	1.881	28	0.582	53	–0.075	78	–0.772
4	1.751	29	0.553	54	–0.100	79	–0.806
5	1.645	30	0.524	55	–0.125	80	–0.841
6	1.555	31	0.495	56	–0.151	81	–0.878
7	1.476	32	0.467	57	–0.176	82	–0.915
8	1.405	33	0.439	58	–0.202	83	–0.954
9	1.341	34	0.412	59	–0.227	84	–0.994
10	1.282	35	0.385	60	–0.253	85	–1.036
11	1.227	36	0.358	61	–0.279	86	–1.080
12	1.175	37	0.331	62	–0.305	87	–1.126
13	1.126	38	0.305	63	–0.331	88	–1.175
14	1.080	39	0.279	64	–0.358	89	–1.227
15	1.036	40	0.253	65	–0.385	90	–1.282
16	0.994	41	0.227	66	–0.412	91	–1.341
17	0.954	42	0.202	67	–0.439	92	–1.405
18	0.915	43	0.176	68	–0.467	93	–1.476
19	0.878	44	0.151	69	–0.495	94	–1.555
20	0.841	45	0.125	70	–0.524	95	–1.645
21	0.806	46	0.100	71	–0.553	96	–1.751
22	0.772	47	0.075	72	–0.582	97	–1.881
23	0.739	48	0.050	73	–0.612	98	–2.054
24	0.706	49	0.025	74	–0.643	99	–2.327
25	0.674	50	0.000	75	–0.674		

A.2.1.13 Ekvivalentni gubici usled prostiranja

Kada se zahteva, ekvivalentni gubici usled prostiranja za dati intenzitet električnog polja dati su kao:

$$L_b = 139 - E + 20 \log f \qquad \text{dB} \qquad (27)$$

gde je:

- L_b: ekvivalentni gubici usled prostiranja (dB)
- E: intenzitet električnog polja (dB(μV/m)) za 1 kW efektivno izračene snage (dB(μV/m))
- f: zahtevana frekvencija (MHz).

A.2.1.14 Aproksimacija dužine putanje 0.6 Frenelove vidljivosti

Dužina putanje kojom se postiže vidljivost od 0.6 radijusa prve Frenelove zone, preko glatke Zemlje, za zadatu frekvenciju i visine antene h_1 i h_2, aproksimativno je data kao:

$$D_{06}\,(f, h_1, h_2) = \frac{D_f \cdot D_h}{D_f + D_h} \quad \text{km} \qquad (28)$$

gde:

D_f: veličina koja zavisi od frekvencije

$$= 0.0000389\, f\, h_1 h_2 \quad \text{km} \qquad (28a)$$

D_h: asimptotska vrednost definisana rastojanjima prema horizontu

$$= 4.1(\sqrt{h_1} + \sqrt{h_2}) \quad \text{km} \qquad (28b)$$

f: nominalna frekvencija (MHz)

h_1, h_2: visina antene iznad glatke Zemlje (m).

U prethodnim jednačinama, vrednost h_1 mora biti ograničena, ako je neophodno, tako da ne bude manja od nule. Šta više, rezultujuća vrednost D_{06} mora biti ograničena, ako je neophodno, tako da ne bude manja od 0.001 km.

A.2.1.15 Procedura primene ove metode za predikciju propagacije

Procedura koja je prethodno data, korak po korak, namenjena je za primenu na vrednosti izvedene iz tabele koja prikazuje zavisnost intenziteta električnog polja od rastojanja (videti Dodatak 2.2 ovog Poglavlja). Ona može biti primenjena i na vrednosti očitane sa krivih i u tom slučaju procedura interpolacije rastojanja iz koraka 8.1.5 nije potrebna.

Korak 1: Određivanje tipa propagacione putanje, u smislu, tle, hladno ili toplo more. Ako je putanja mešovita, tada se određuju dva tipa putanje, koja se tretiraju kao prvi i drugi tip. Ako se putanja može predstaviti samo jednim tipom, onda se to posmatra kao prvi tip i nije potrebno sprovoditi proceduru za mešovite putanje, datu u koraku 11.

Korak 2: Za bilo koji dati procenat vremena (u opsegu 1% do 50%), treba odrediti dva nominalna procenta vremena, kao što sledi:

– ako je zahtevani procenat vremena > 1% i < 10%, niži i viši nominalni procenat iznose 1% i 10%, redom;

– ako je zahtevani procenat vremena > 10% i < 50%, niži i viši nominalni procenat iznose 10% i 50%, redom.

Ako je zahtevani procenat vremena jednak 1%, 10% ili 50%, ovu vrednost treba uzeti kao niži nominalni procenat vremena i proces interpolacije izložen u koraku 10 nije potreban.

Korak 3: Za bilo koju zahtevanu frekvenciju između 174 i 862 MHz, određene su dve nominalne frekvencije, kao što sledi:

– kada je zahtevana frekvencija < 600 MHz, niža i viša nominalna frekvencija iznose 100 i 600 MHz, redom;

– kada je zahtevana frekvencija > 600 MHz, niža i viša nominalna frekvencija su 600 i 2 000 MHz, redom.

Ako je zahtevana frekvencija jednaka 100 ili 600 MHz, ova vrednost će se usvojiti za nižu nominalnu frekvenciju i postupak interpolacije opisan u koraku 9 nije potreban.

Korak 4: Odrediti nižu i višu nominalnu frekvenciju iz tabele A.2.1-1 , najbliže zahtevanom rastojanju. Ako se zahtevano rastojanje poklapa sa vrednošću iz tabele A.2.1-1, ova vrednost će se usvojiti za niže nominalno rastojanje i proces interpolacije opisan u koraku 8.1.5 neće biti potreban.

Korak 5: Za prvi propagacioni tip pratiti korake od 6 do 10.

Korak 6: Za niži nominalni procenat vremena pratiti korake od 7 do 9.

Korak 7: Za niže nominalne frekvencije pratiti korak 8.

Korak 8: Održavati intenzitet električnog polja prevaziđenim na 50% lokacija za prijemnu antenu/antenu mobilne stanice na visini iznad tla, *R*, vrednost koja predstavlja klater okolnog terena, za zahtevano rastojanje i visinu predajne antene/antene bazne stanice:

Korak 8.1: Za visine predajne antene/antene bazne stanice h_1 jednake ili veće od 10 m, pratiti korake od 8.1.1 do 8.1.5.

Korak 8.1.1: Odrediti nižu i višu nominalnu vrednost h_1 primenom metode date u § A.2.1.4.1 ovog Poglavlja. Ako se h_1 poklapa sa nekom od nominalnih vrednosti 10, 20, 37.5, 75, 150, 300, 600 ili 1 200 m, trebalo bi je usvojiti kao nižu nominalnu vrednost za h_1, pa proces interpolacije iz koraka 8.1.6 nije potreban.

Korak 8.1.2: Za niže nominalne vrednosti $h_{1,}$ pratiti korake 8.1.3 do 8.1.5.

Korak 8.1.3: Za niže nominalne vrednosti rastojanja, pratiti korak 8.1.4.

Korak 8.1.4: Održavati intenzitet električnog polja prevaziđen na 50% lokacija za visinu prijemne antene/antene mobilnog uređaja, *R*, reprezentativnu za klater okolnog terena, za zahtevane vrednosti rastojanja, *d*, i visine predajne antene/antene bazne stanice, h_1.

Korak *8.1.5:* Ako se zahtevano rastojanje ne podudara sa nižim nominalnim rastojanjem, ponoviti korak 8.1.4 za više nominalno rastojanje i interpolirati dve vrednosti intenziteta električnog polja za zahtevano rastojanje koristeći metodu datu u § A.2.1.5 ovog Poglavlja.

Korak *8.1.6:* Ako zahtevana visina predajne antene/antene bazne stanice, h_1, ne podudara ni sa jednom od nominalnih vrednosti, ponoviti korake od 8.1.3 do 8.1.5 i interpolirati/ekstrapolirati vrednosti za h_1 koristeći metodu datu u § A.2.1.4.1 ovog Poglavlja. Ako je neophodno, ograničiti rezultat na maksimalnu vrednost datu u § A.2.1.2 ovog Poglavlja.

Korak 8.2: Za visinu predajne antene/antene bazne stanice h_1 manju od 10 m, odrediti intenzitet električnog polja za zahtevanu visinu i rastojanje, primenom metode date u § A.2.1.4.2 ovog Poglavlja. Ako je h_1 manje od nule, metodu datu u § A.2.1.4.3 ovog Poglavlja takođe treba primeniti.

Korak 9: Ako se zahtevana frekvencija ne podudara sa nižom nominalnom frekvencijom, ponoviti korak 8 za više nominalne frekvencije i interpolirati dva intenziteta električnog polja primenom metode date u § A.2.1.6 ovog Poglavlja. Ako je neophodno, ograničiti rezultujuću vrednost intenziteta električnog polja, kao što je dato u § A.2.1.2 ovog Poglavlja.

Korak 10: Ako se zahtevani procenat vremena ne podudara sa nižom nominalnom vrednošću procenta vremena, ponoviti korake od 7 do 9 za viši nominalni procenat vremena i interpolirati dve vrednosti intenziteta električnog polja koristeći metodu datu u § A.2.1.7 ovog Poglavlja.

Korak 11: Ako se predikcija vrši za putanju koja se pruža iznad mešovite zone, pratiti proceduru datu u § A.2.1.8 ovog Poglavlja.

Korak 12: Izvršiti korekciju vrednosti intenziteta električnog polja za visinu prijemne antene/antene mobilne stanice, $h_{2,}$ koristeći metodu datu u § A.2.1.9 ovog Poglavlja.

Korak 13: Ako je informacija o uglu vidljivosti terena na mestu prijemne antene na kopnu /antene mobilne stanice na kopnu, izvršiti korekciju vrednosti intenziteta električnog polja za ugao vidljivosti terena na mestu prijema, koristeći metodu datu u § A.2.1.10 ovog Poglavlja.

Korak 14: Ako je neophodno poznavati intenzitet električnog polja na lokaciji prijemne antene/antene mobilne stanice koja se nalazi na kopnu, koja je prevaziđena na procentu lokacija većem od 50%, korigovati vrednost intenziteta električnog polja za zahtevani procenat lokacija koristeći metodu datu u § A.2.1.11 ovog Poglavlja.

Korak 15: Ako je neophodno, ograničiti vrednost rezultujućeg električnog polja na maksimum dat u § A.2.1.2 ovog Poglavlja.

Korak 16: Ako se zahteva, pretvoriti vrednost intenziteta električnog polja u ekvivalentne gubitke usled prostiranja, primenom metode date u § A.2.1.13 ovog Poglavlja.

DODATAK 2.2

Tabelarni prikaz vrednosti intenziteta električnog polja

Vrednosti intenziteta električnog polja (dB(μV/m)) u zavisnosti od rastojanja (km), odgovaraju familiji propagacionih krivih datih u Dodatku 2.3 ovog Poglavlja, date su u sledećoj tabeli:

Tabela A.2.2.2

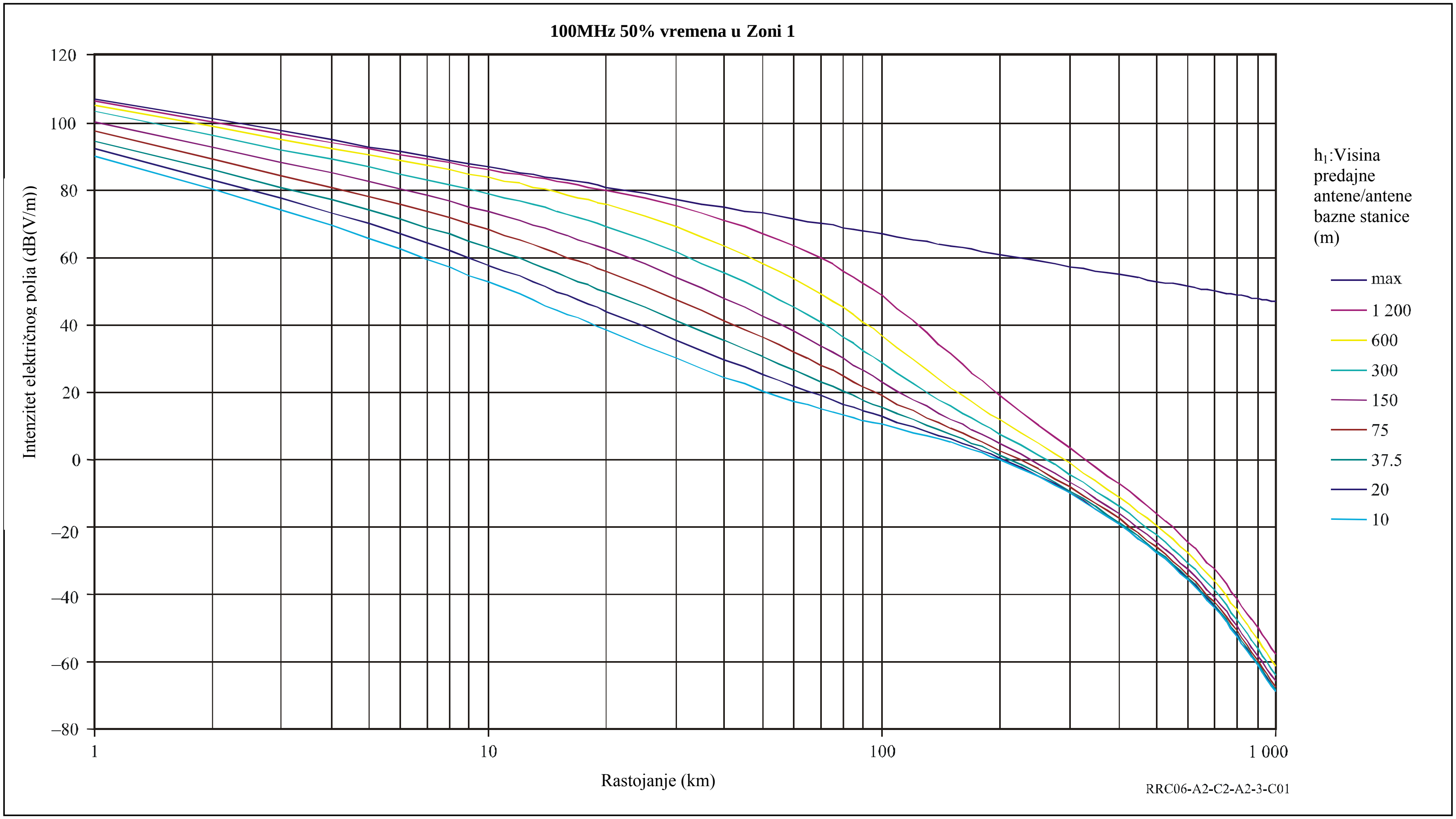
FS_curves_RRC_04.
txt

Detaljna uputstva za interpolaciju ovih tabelarnih vrednosti data su u § A.2.1.5, A.2.1.6 i A.2.1.7 Dodatka 2.1 ovog Poglavlja.

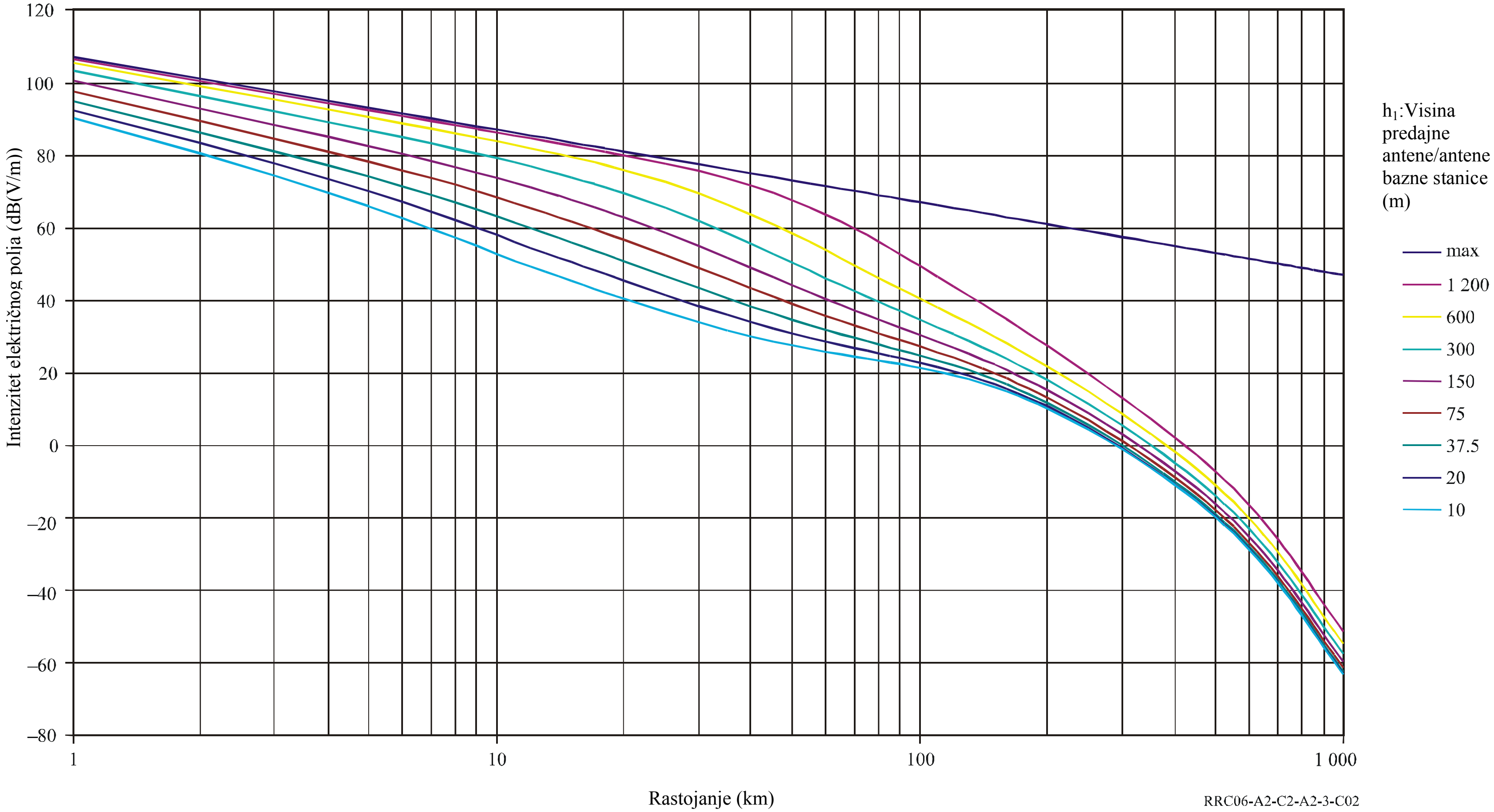
DODATAK 2.3

Propagacione krive

Propagacione krive koje su date na slikama koriste se, zajedno sa prikazom datim u § 2.2.2 Poglavlja 2 Aneksa 2 Sporazuma, za planiranje radiodifuznog servisa. One daju, na osnovu statistike izvedene iz mernih rezultata i teorijskih razmatranja, vrednost intenziteta električnog polja prevaziđenu na 50% lokacija za procente vremena od 50%, 10% i 1%. Izvedene vrednosti odgovaraju visini prijemne antene od 10 m iznad okolnog tla u otvorenom prostoru. Vrednosti su izražene u decibelima u odnosu na 1 μV/m (dB(μV/m)) za efektivno izračenu snagu od 1 kW u pravcu tačke prijema. Krive daju vrednosti intenziteta električnog polja prevaziđene na 50% lokacija, a svaka slika odgovara procentu vremena od 50%, 10% i 1% za svaku geografsku zonu.
Podaci su dati za različite tipove oblasti i klima (videti § 2.2.2 Poglavlja 2 Aneksa 2 Sporazuma).

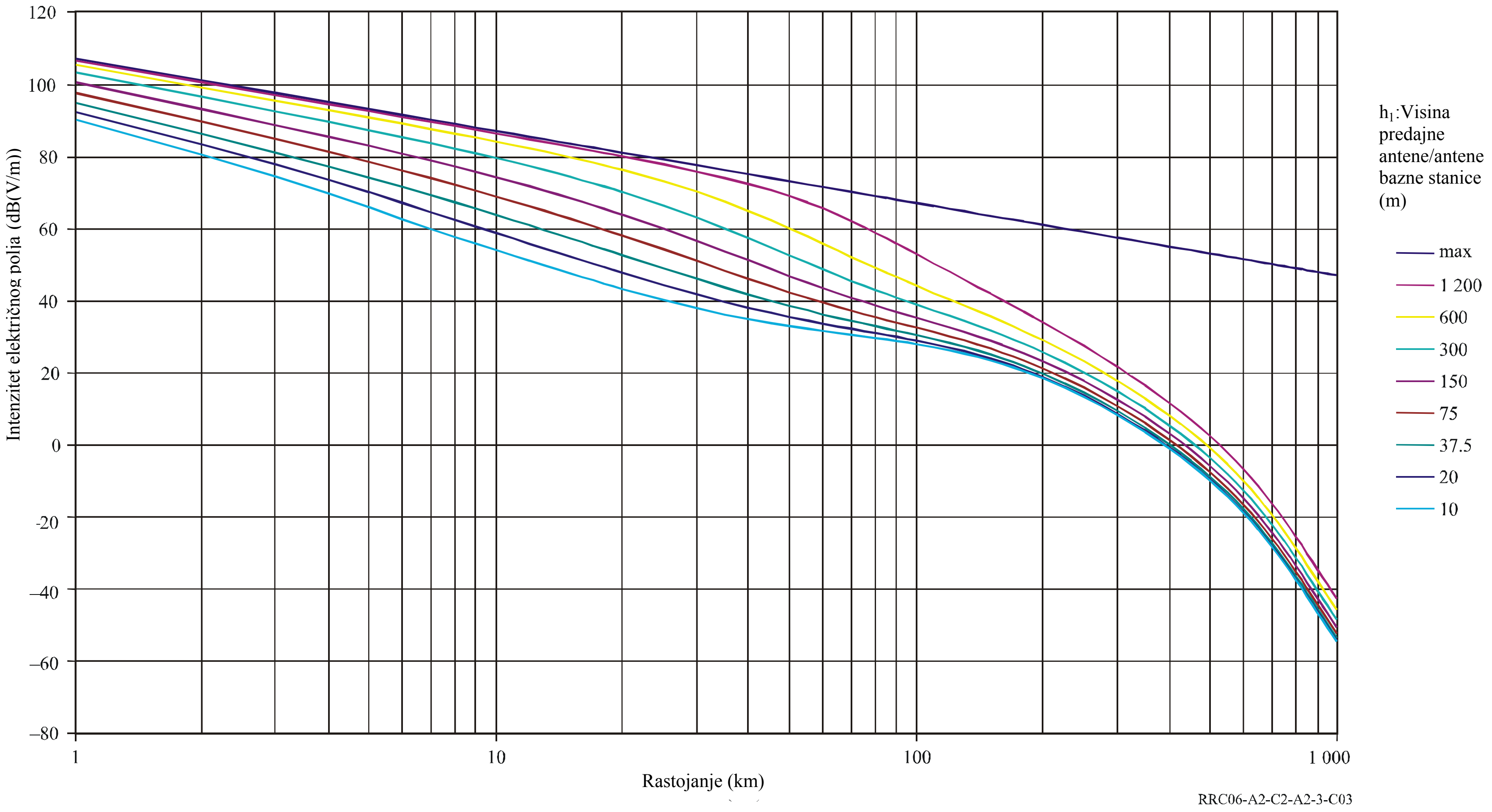

100MHz 50% vremena u Zoni 1
120
100
80
60
40
20
0
–20
–40
–60
–80
Intenzitet električnog polja (dB(V/m))
1
10
100
1 000
Rastojanje (km)
h1:Visina predajne antene/antene bazne stanice (m)
max
1 200
600
300
150
75
37.5
20
10
RRC06-A2-C2-A2-3-C01

100MHz 10% vremena u Zoni 1

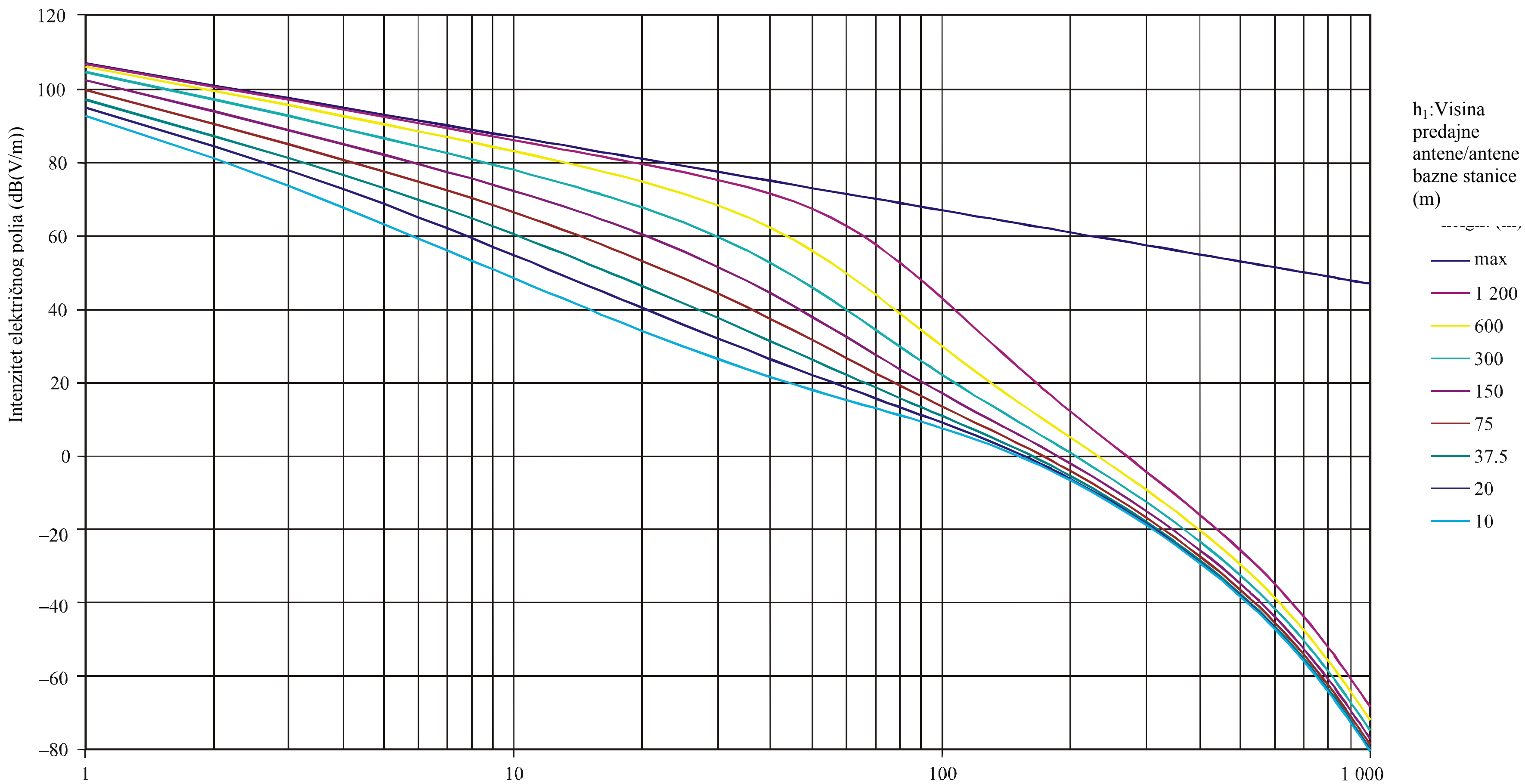


RRC06-A2-C2-A2-3-C02

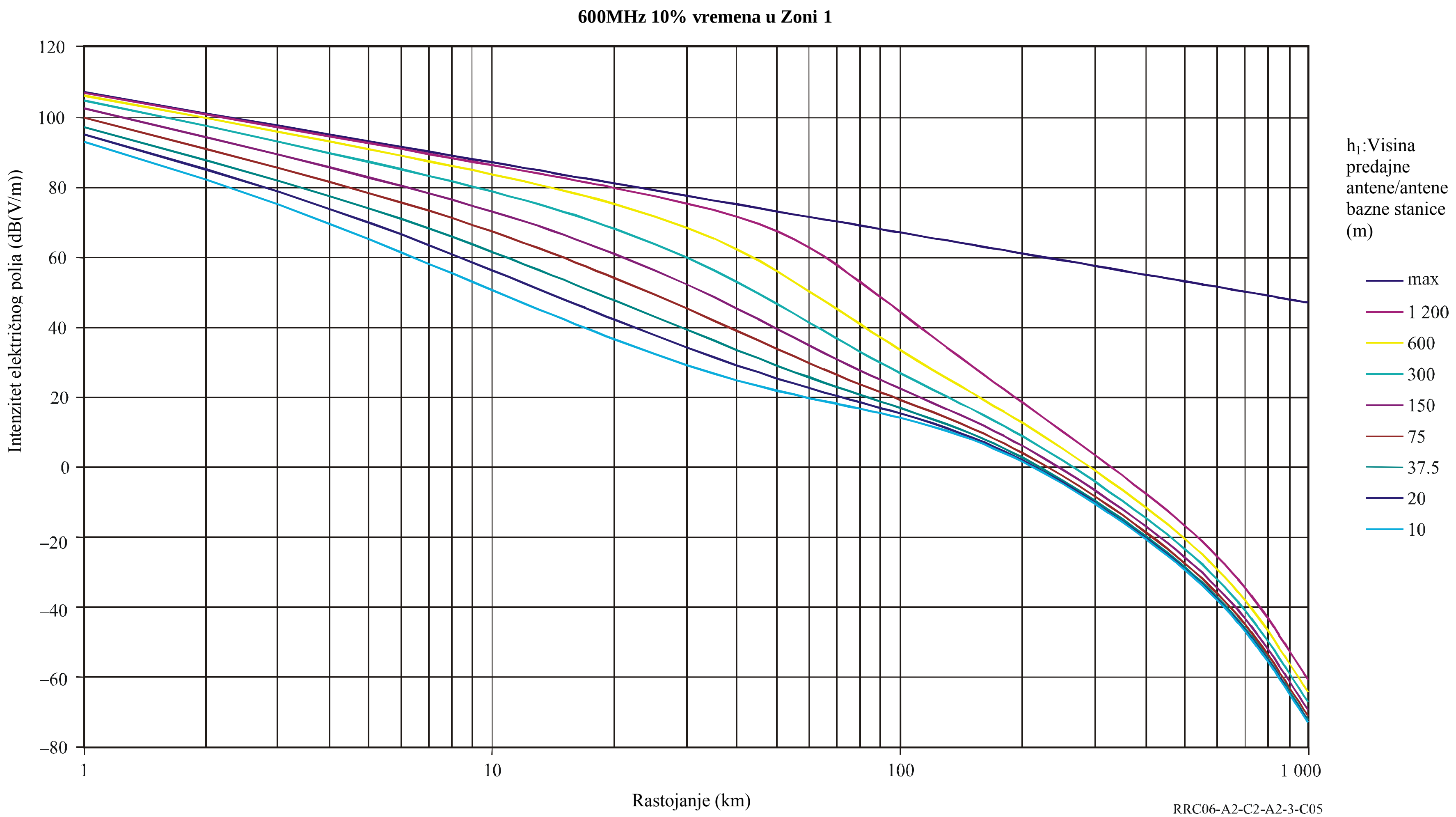
100MHz 1% vremena u Zoni 1

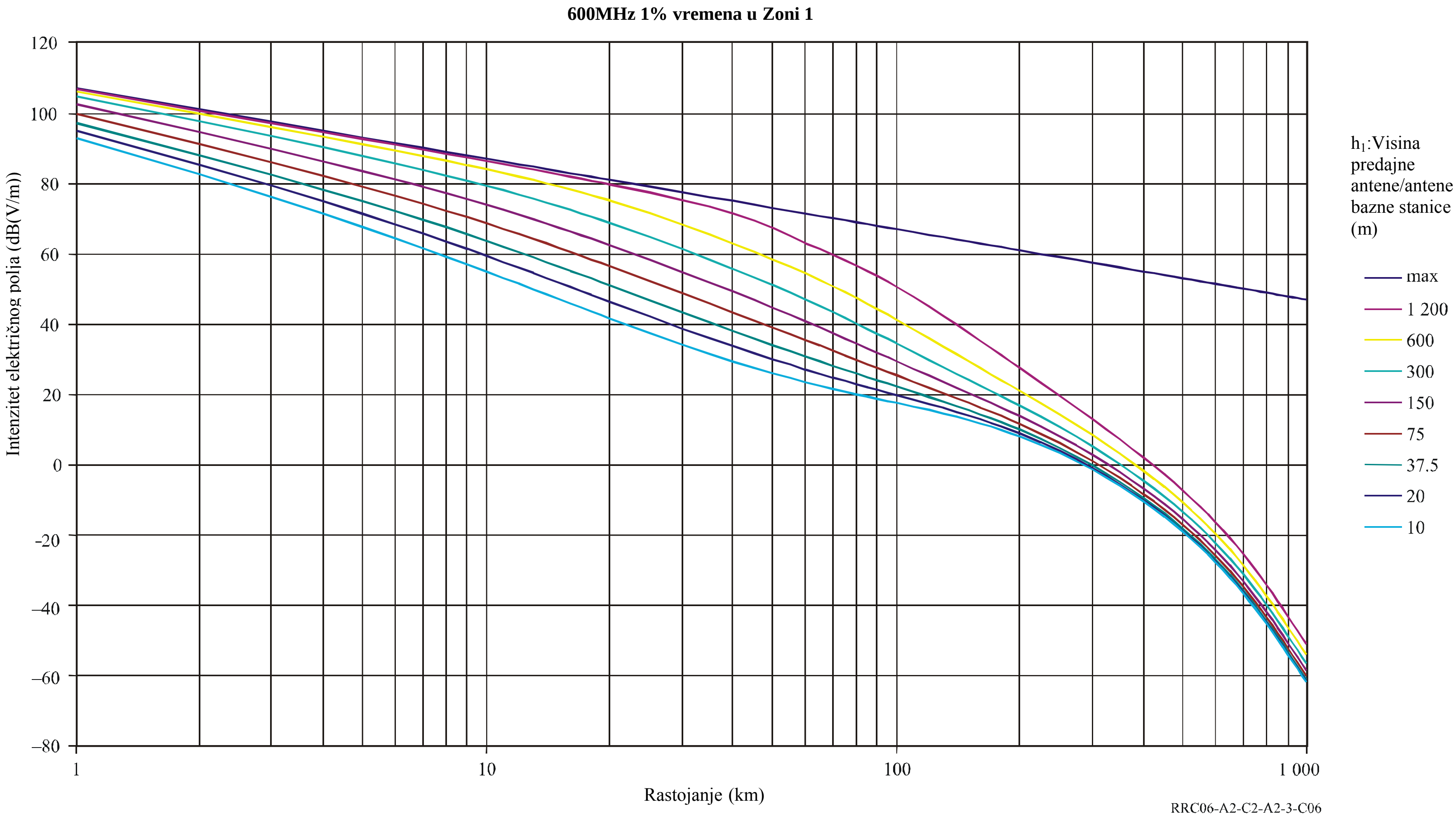


600MHz 50% vremena u Zoni 1

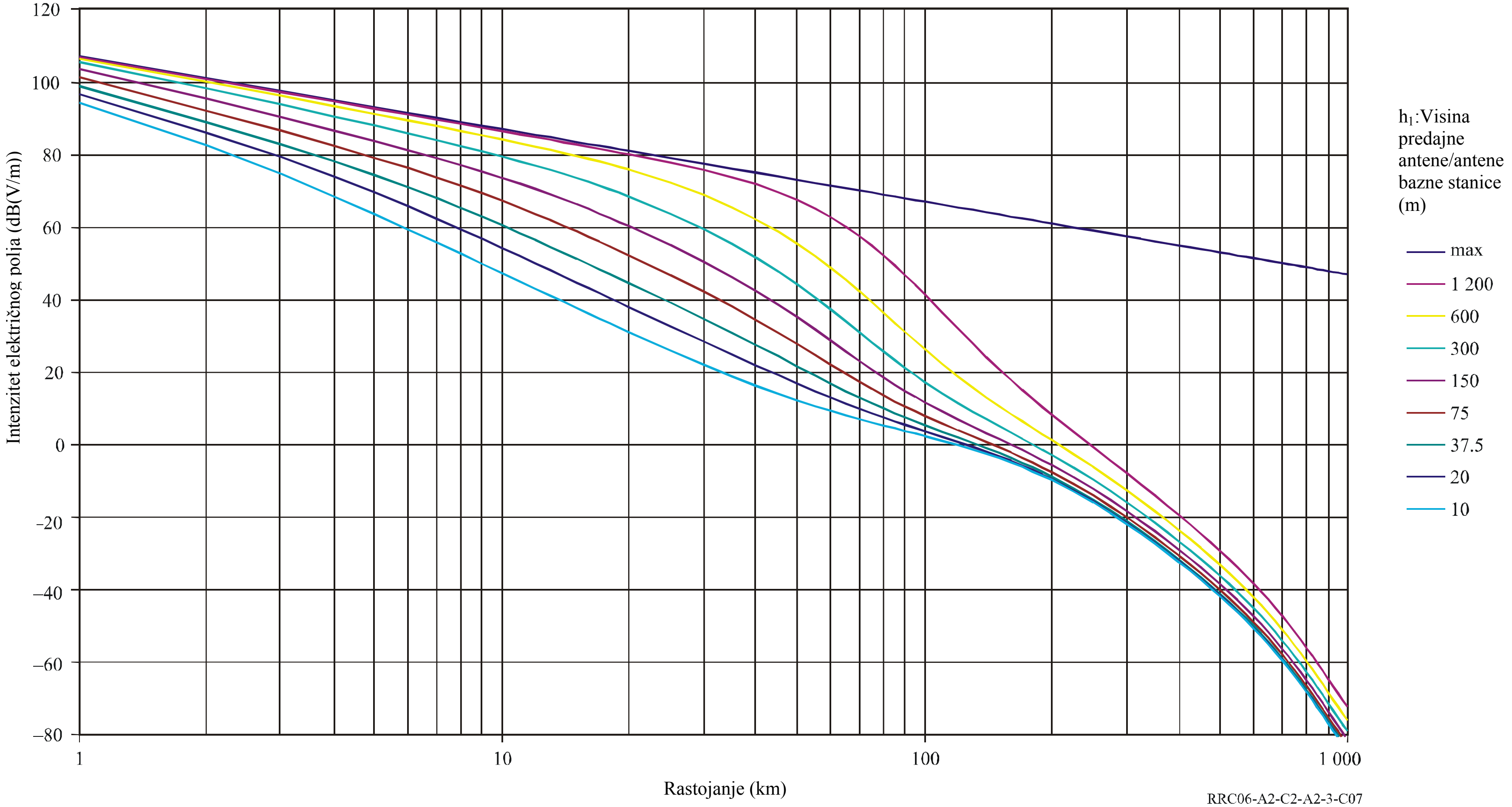


RRC06-A2-C2-A2-3-C04

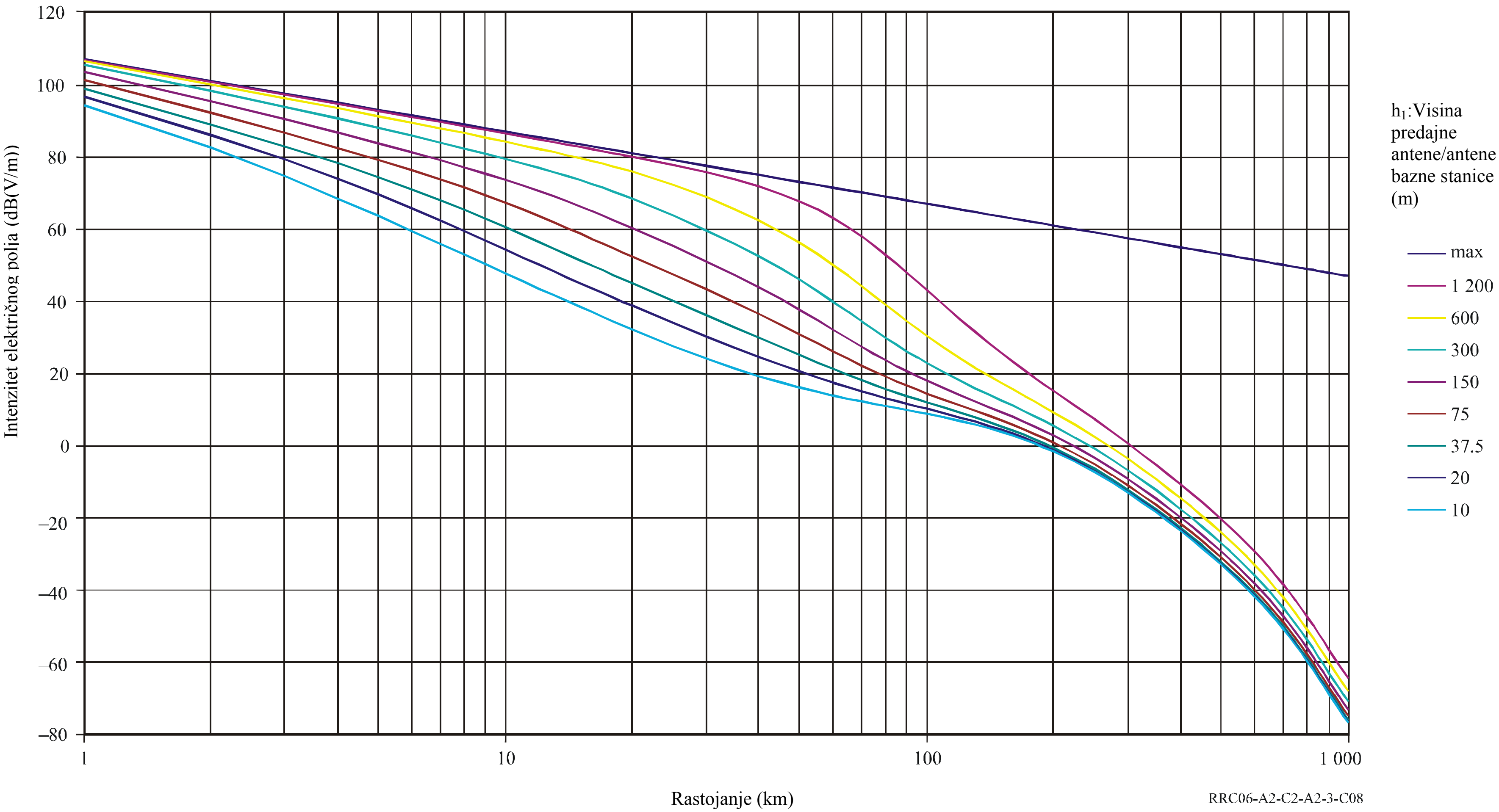

600MHz 10% vremena u Zoni 1
Intenzitet električnog polja (dB(V/m))
120
100
80
60
40
20
0
–20
–40
–60
–80
1
10
100
1 000
Rastojanje (km)
h1:Visina predajne antene/antene bazne stanice (m)
max
1 200
600
300
150
75
37.5
20
10
RRC06-A2-C2-A2-3-C05


600MHz 1% vremena u Zoni 1
120
100
80
60
40
20
0
–20
–40
–60
–80
Intenzitet električnog polja (dB(V/m))
1
10
100
1 000
Rastojanje (km)
h1:Visina predajne antene/antene bazne stanice (m)
max
1 200
600
300
150
75
37.5
20
10
RRC06-A2-C2-A2-3-C06

2000 MHz 50% vremena u Zoni 1 1

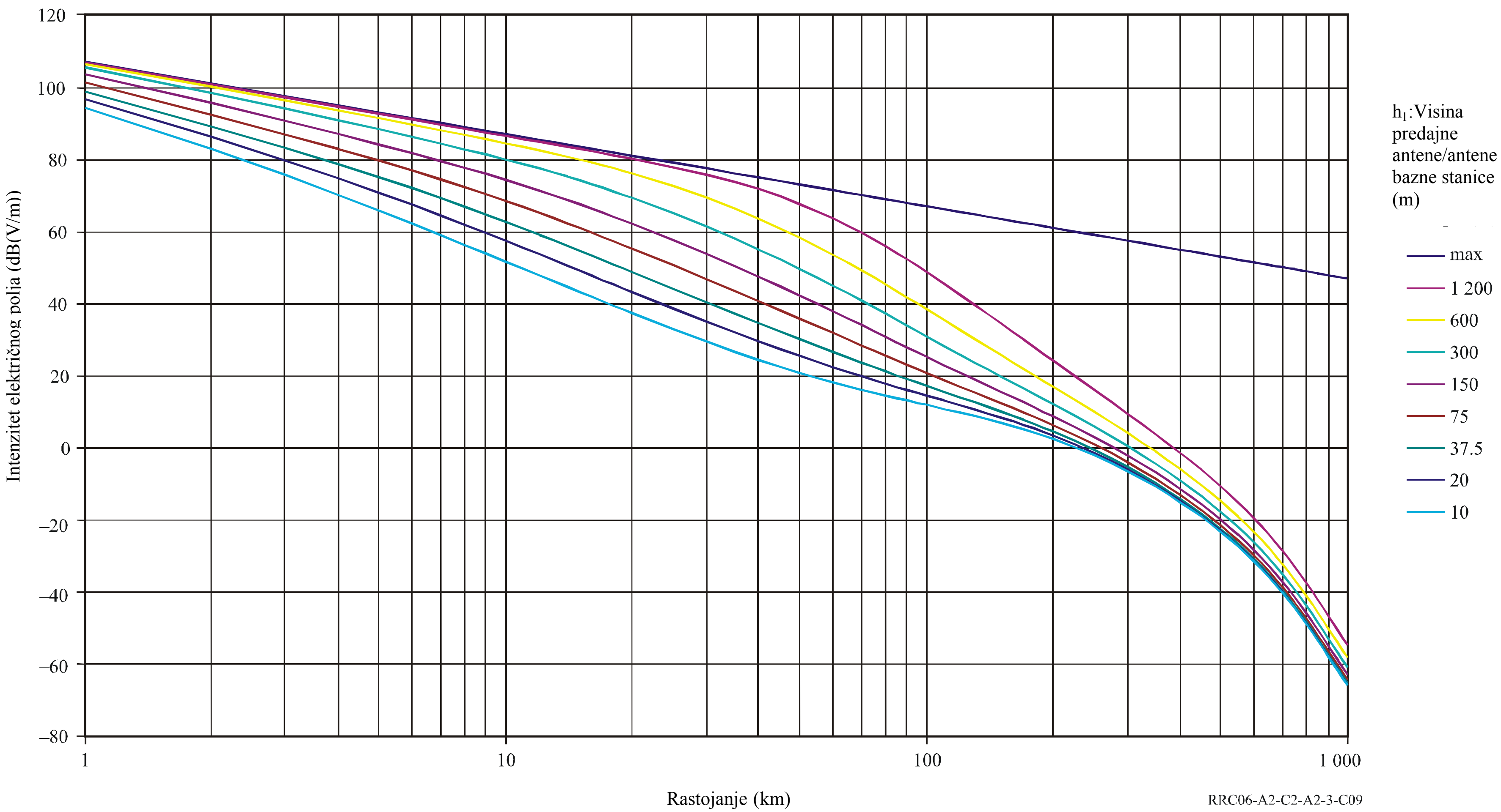


2000 MHz 10% vremena u Zoni 1

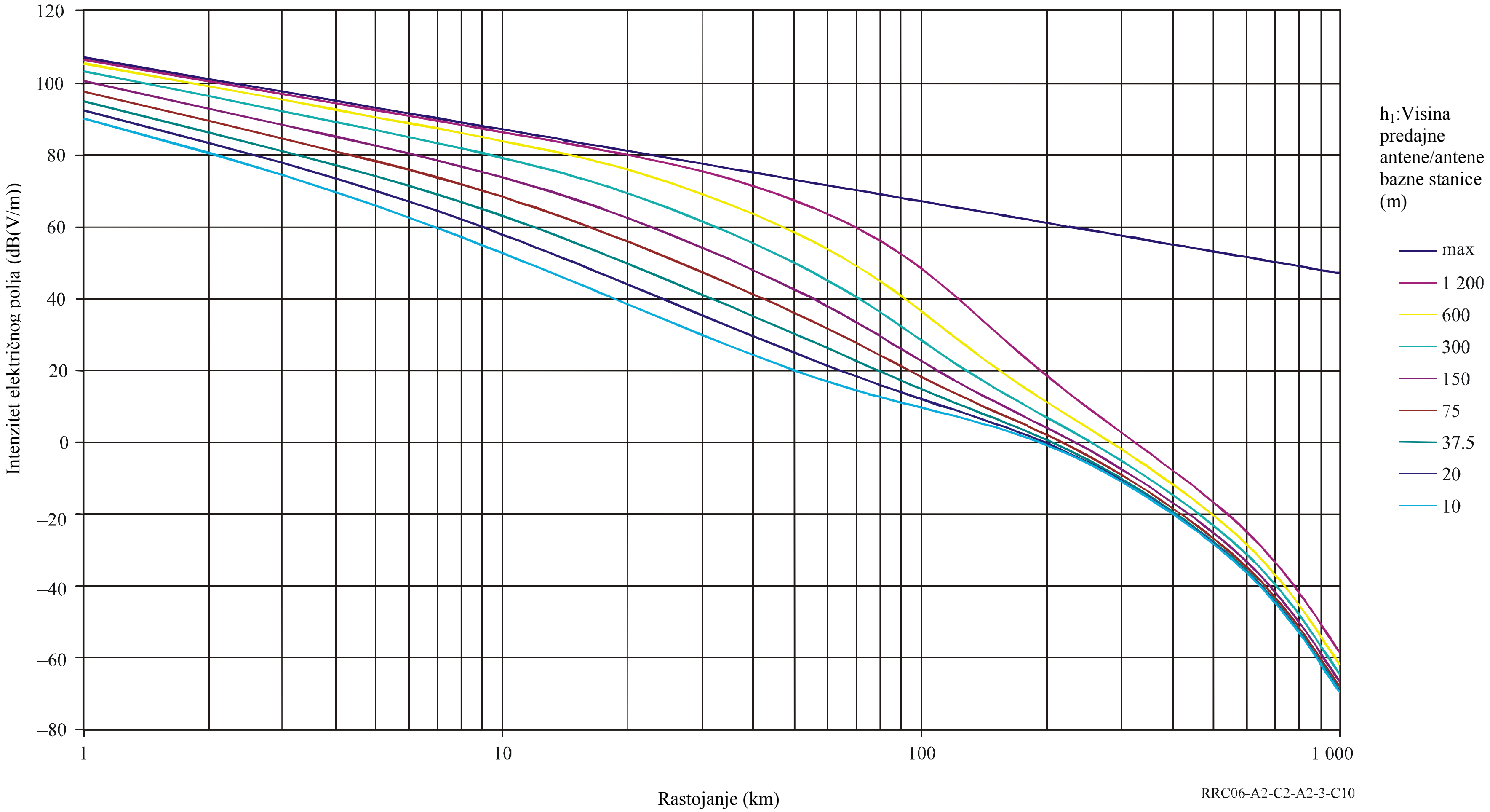


RRC06-A2-C2-A2-3-C08

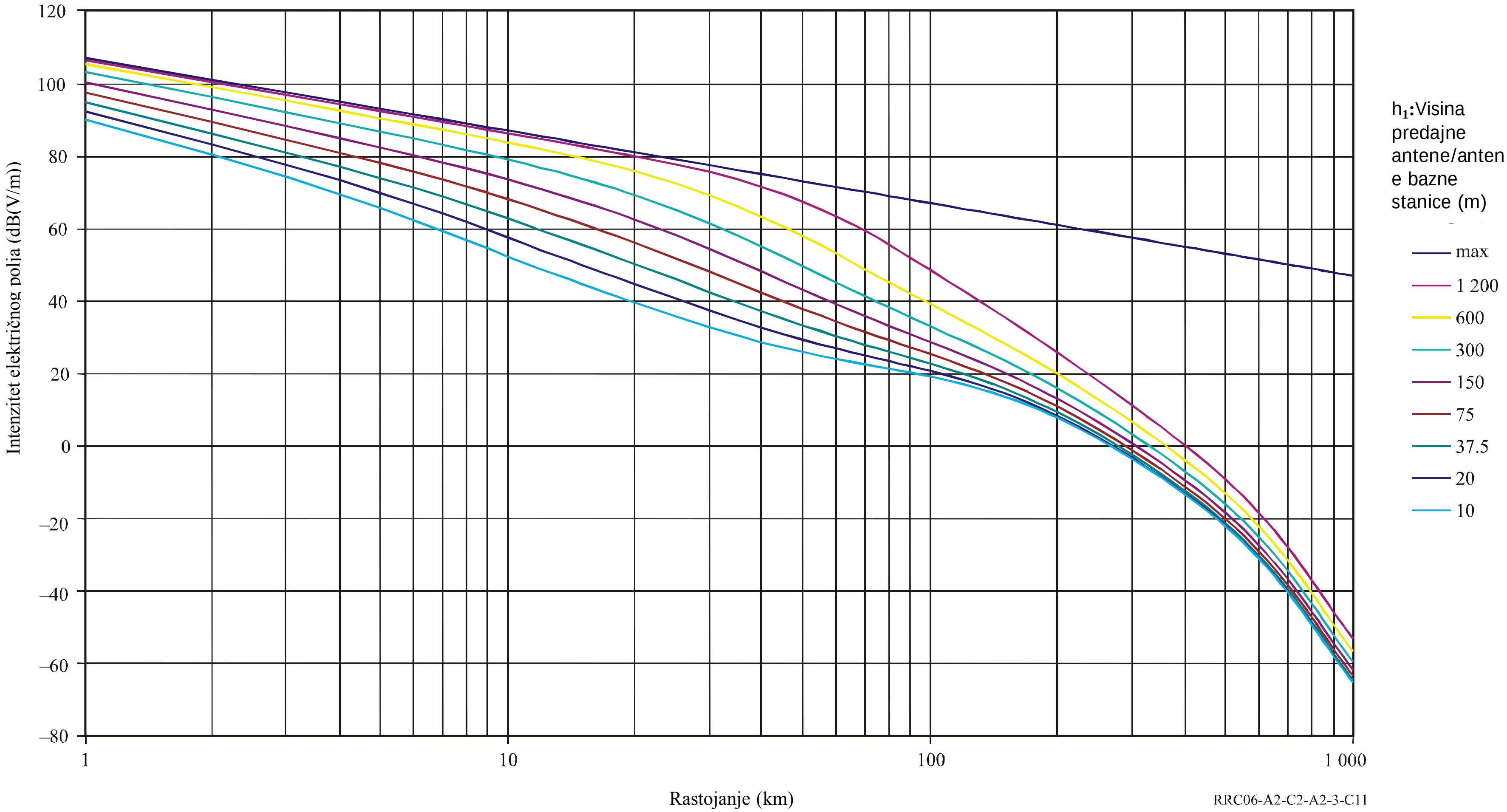
2000 MHz 1% vremena u Zoni 1



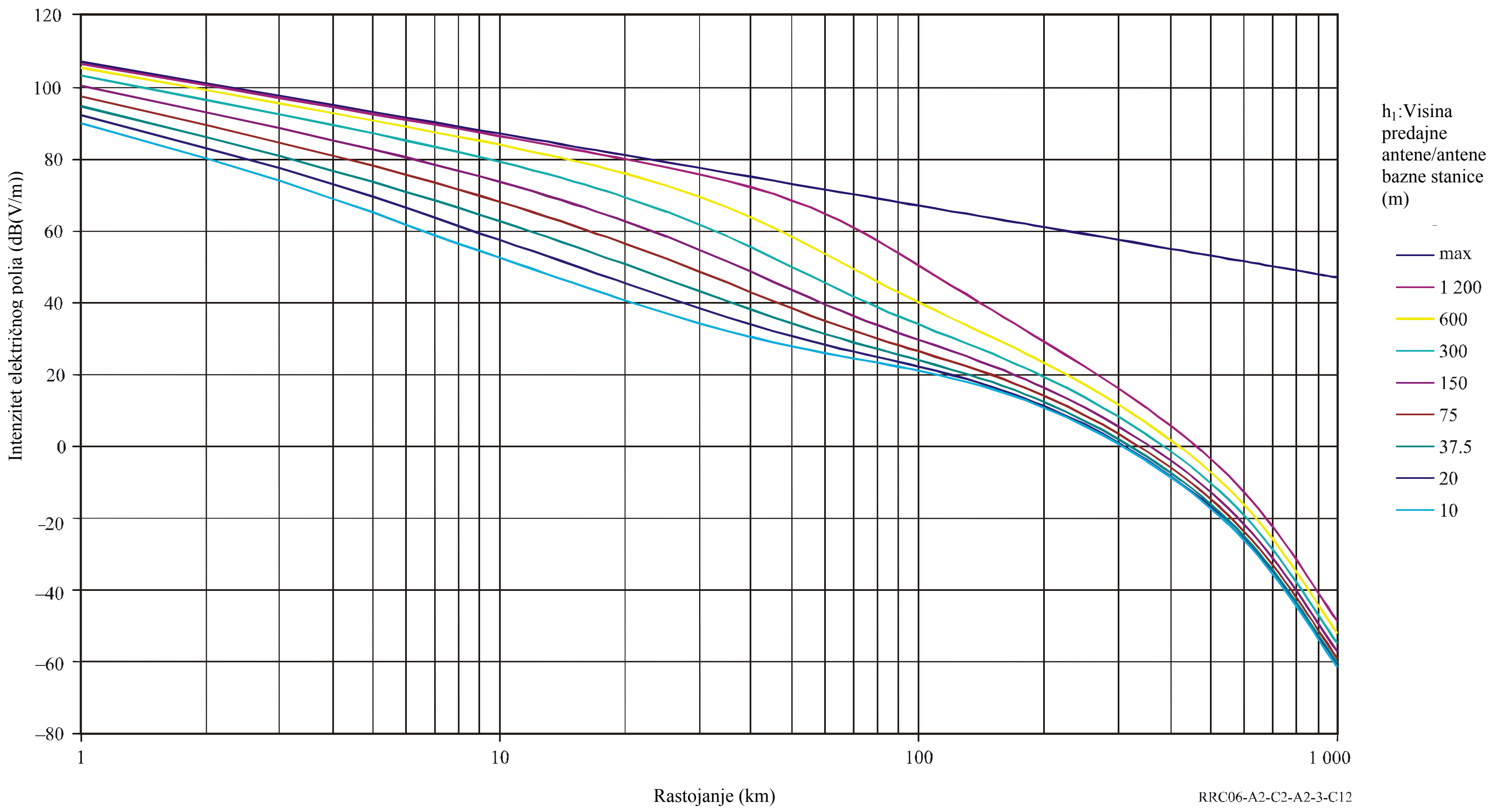
100MHz 50% vremena u Zoni 2



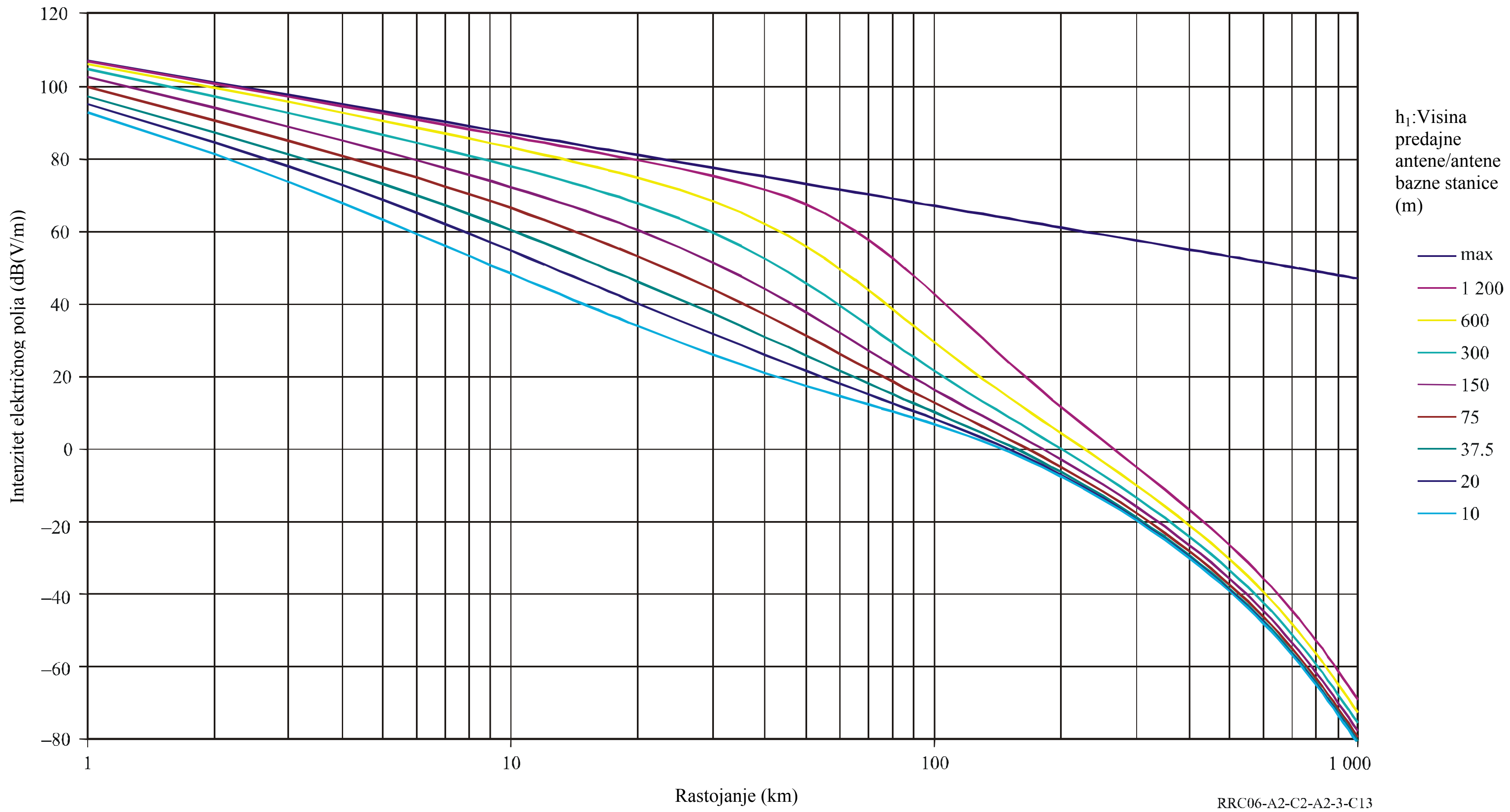
100MHz 10% vremena u Zoni 2



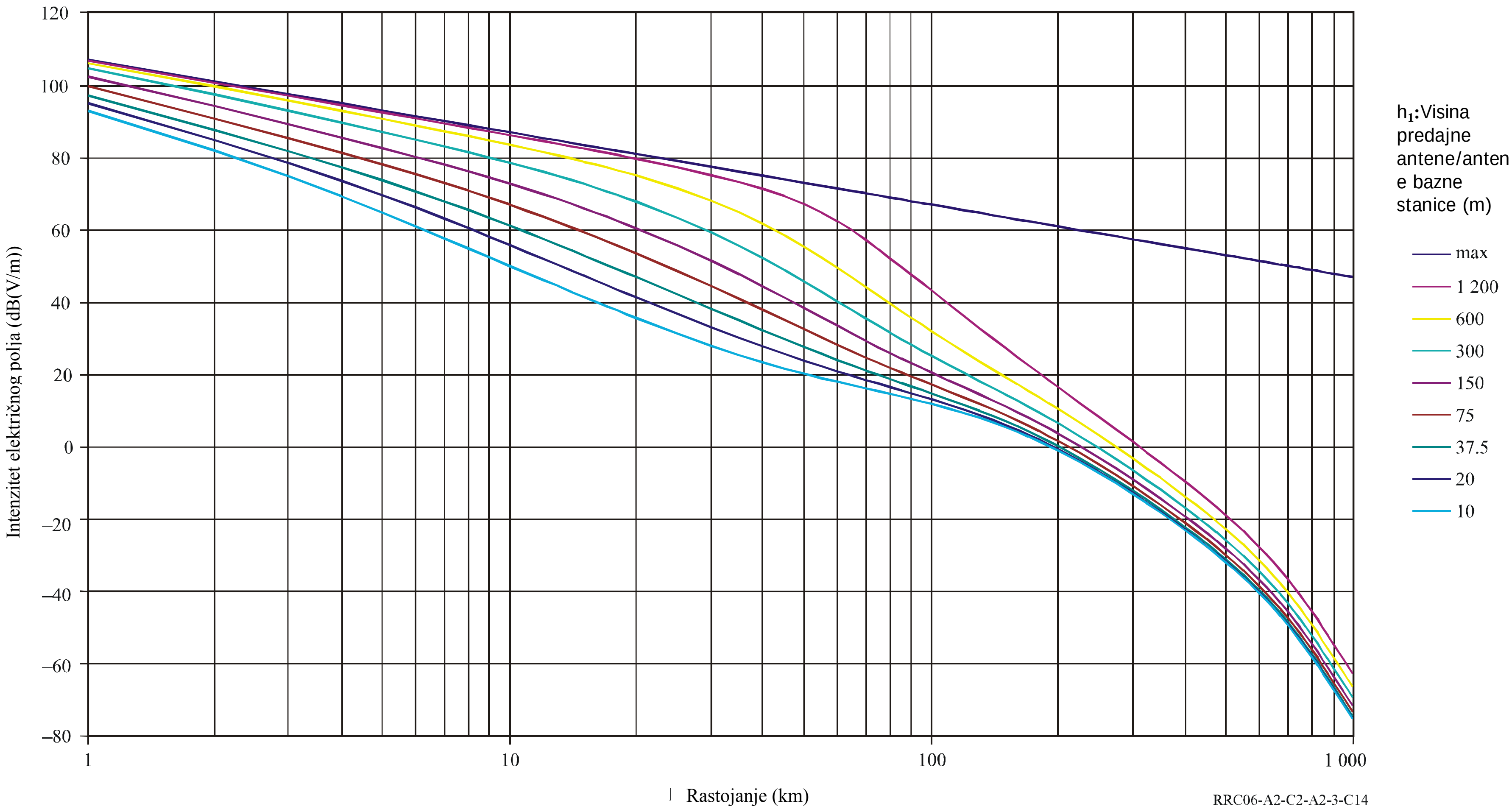
100MHz 1% vremena u Zoni 2



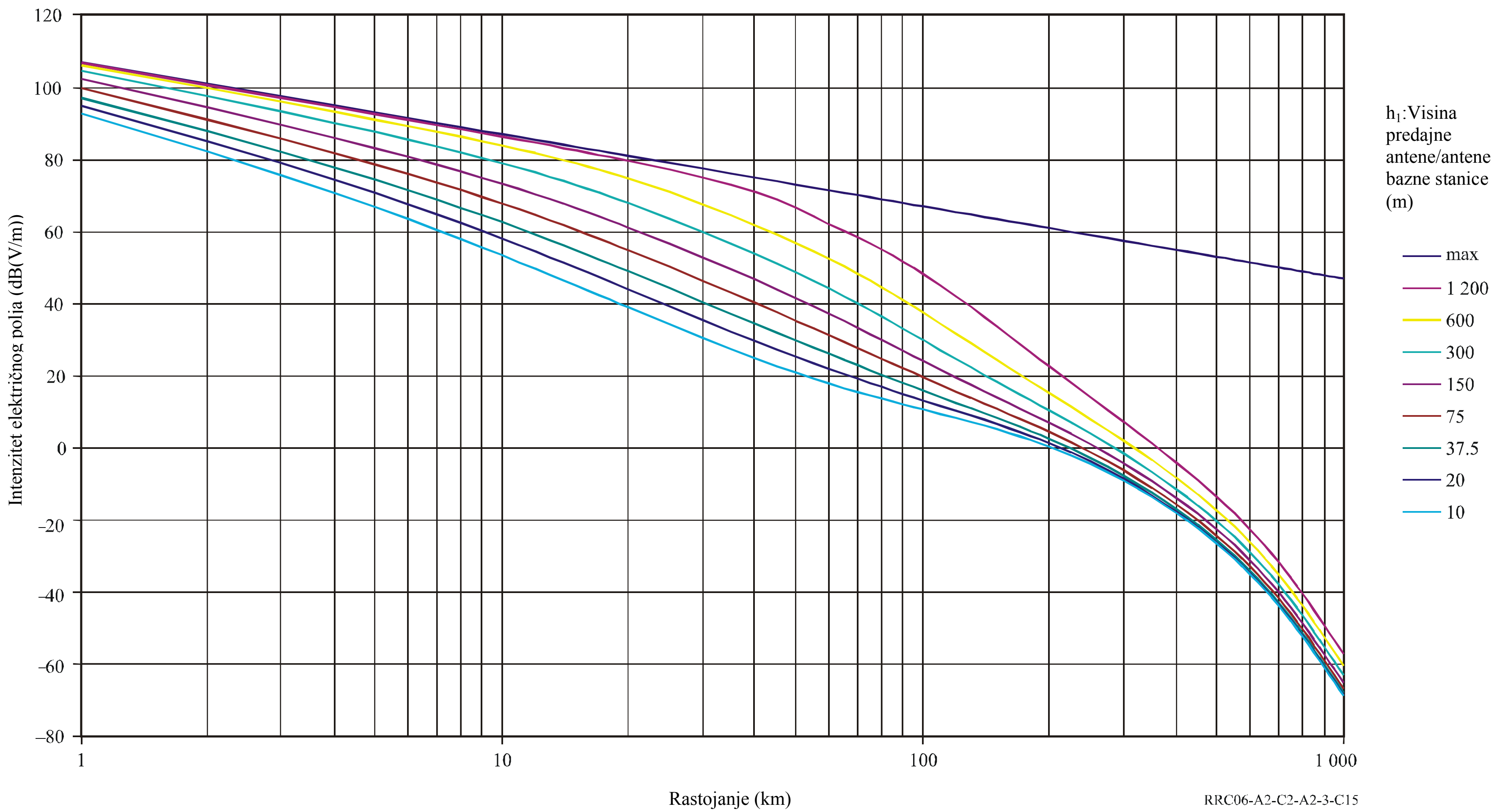
600MHz 50% vremena u Zoni 2



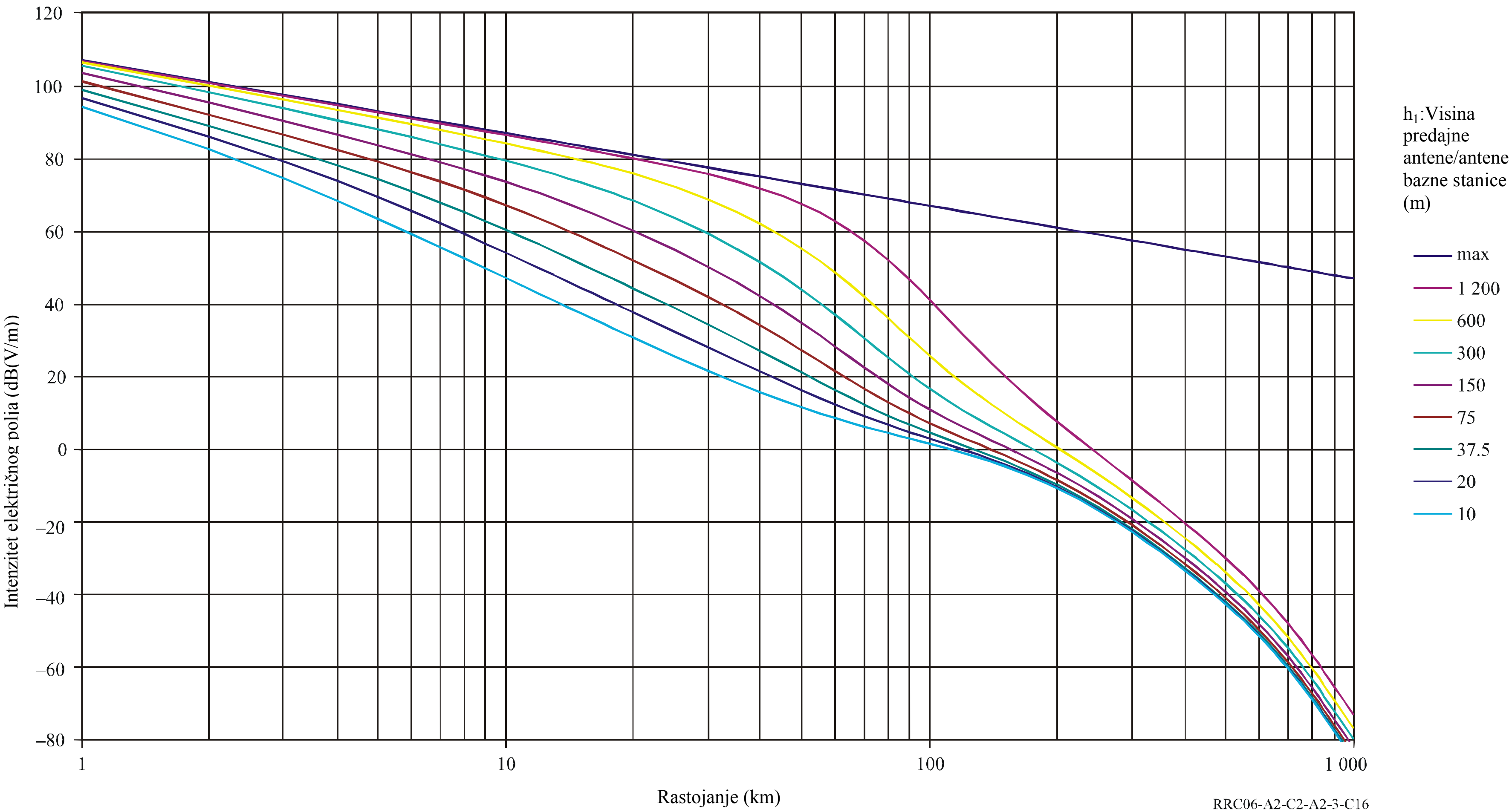
600MHz 10% vremena u Zoni 2



600MHz 1% vremena u Zoni 2

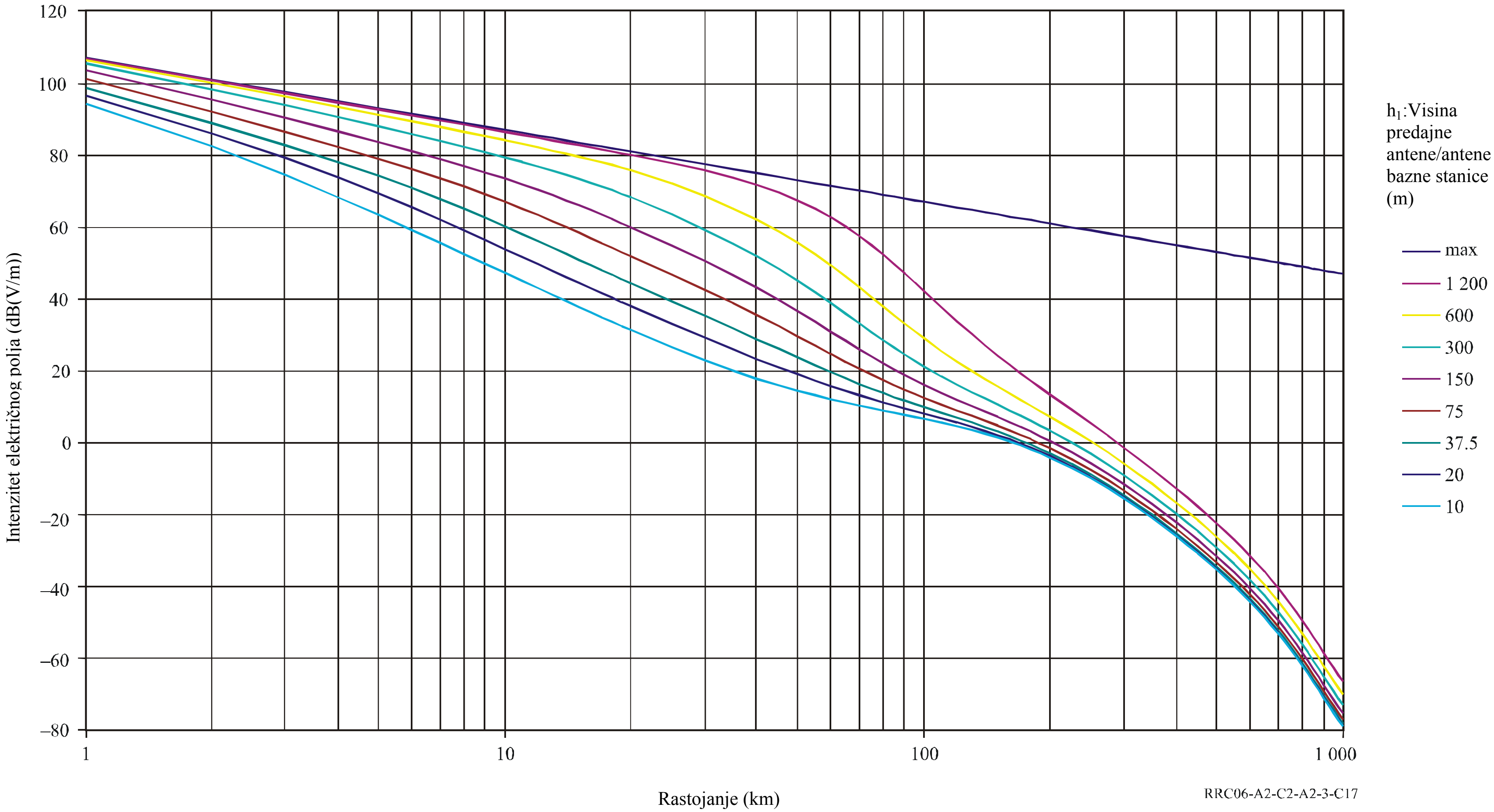


2000MHz 50% vremena u Zoni 2

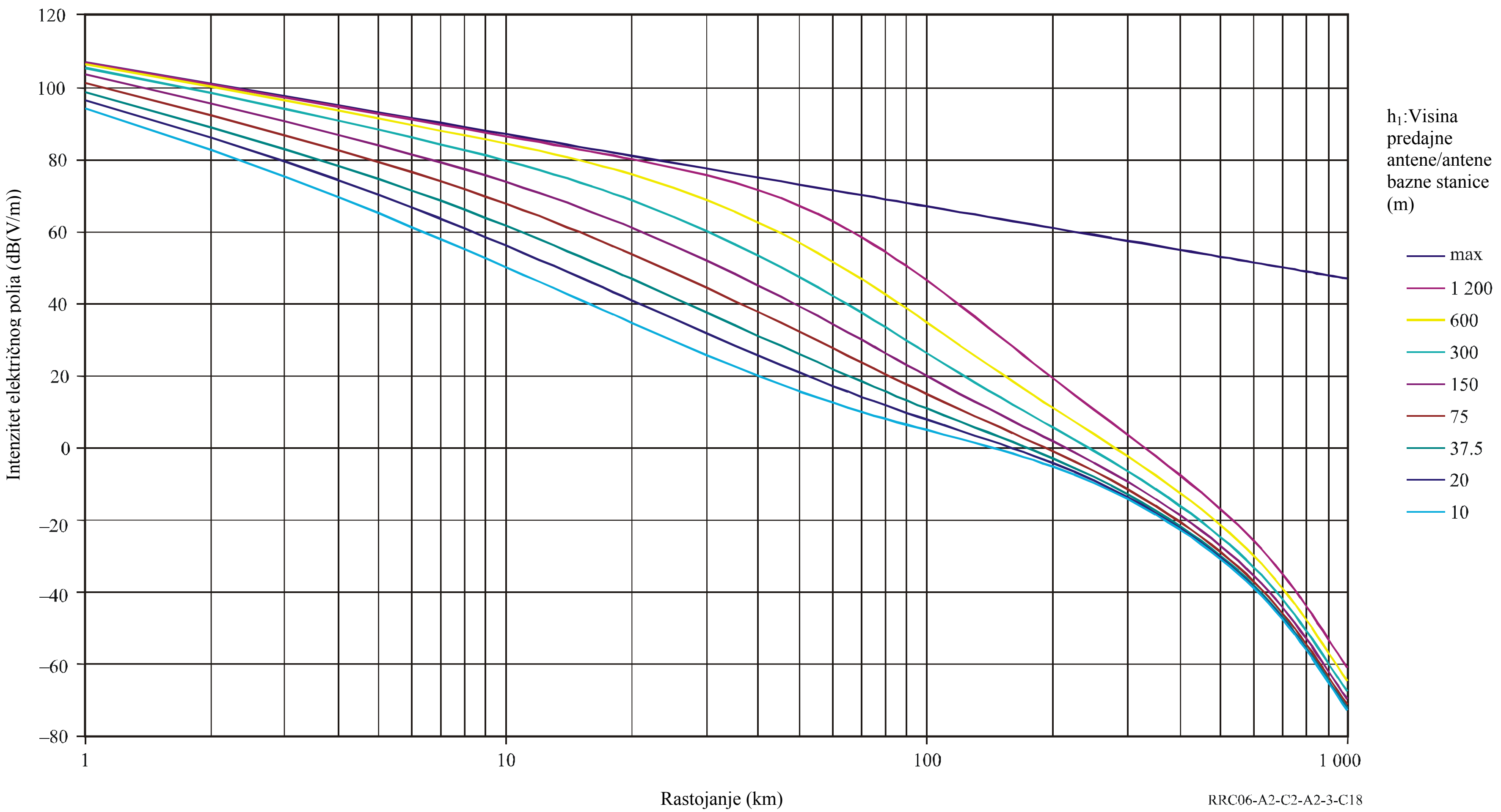


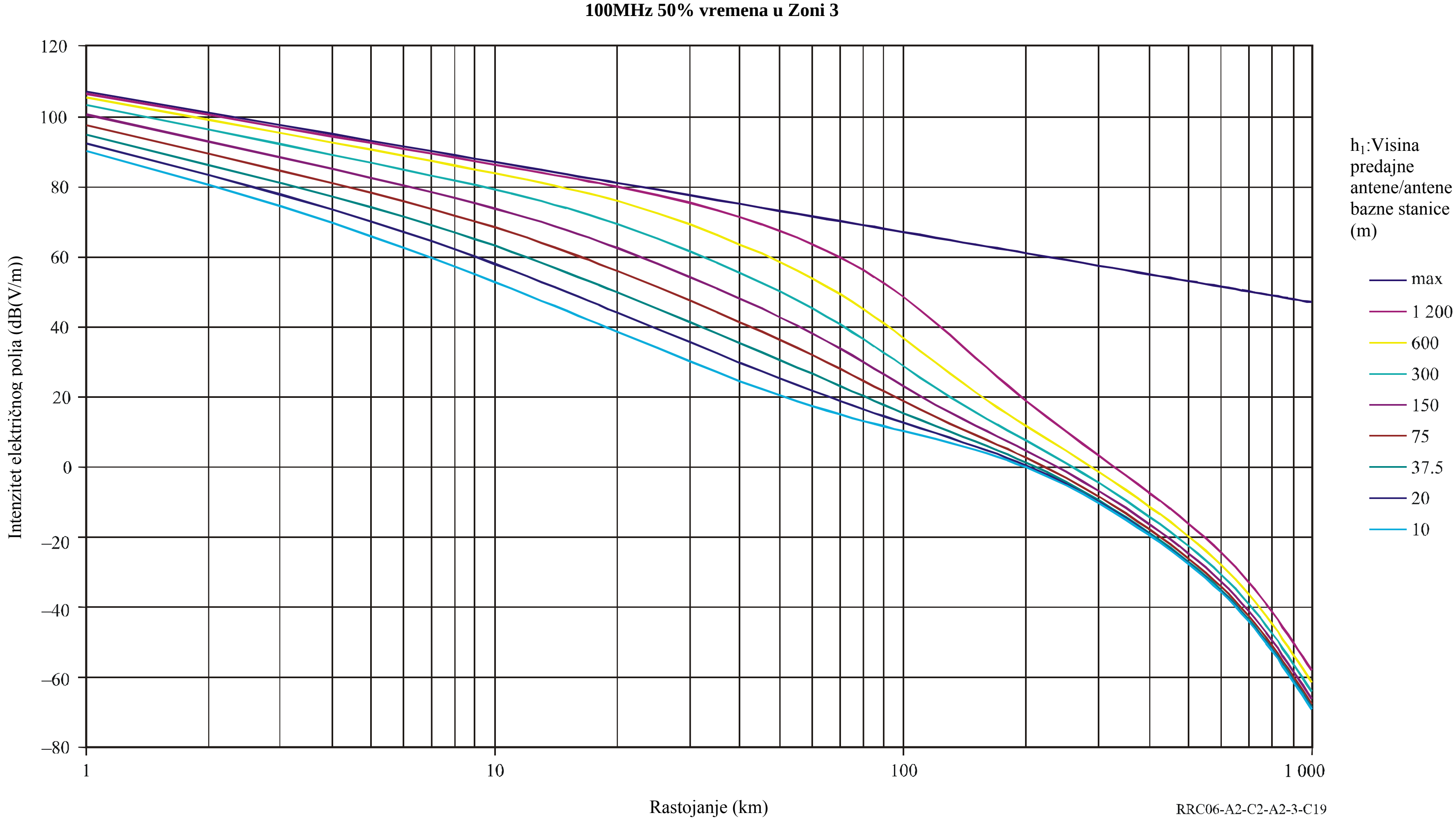
RRC06-A2-C2-A2-3-C16

2000 MHz 10% vremena u Zoni 2

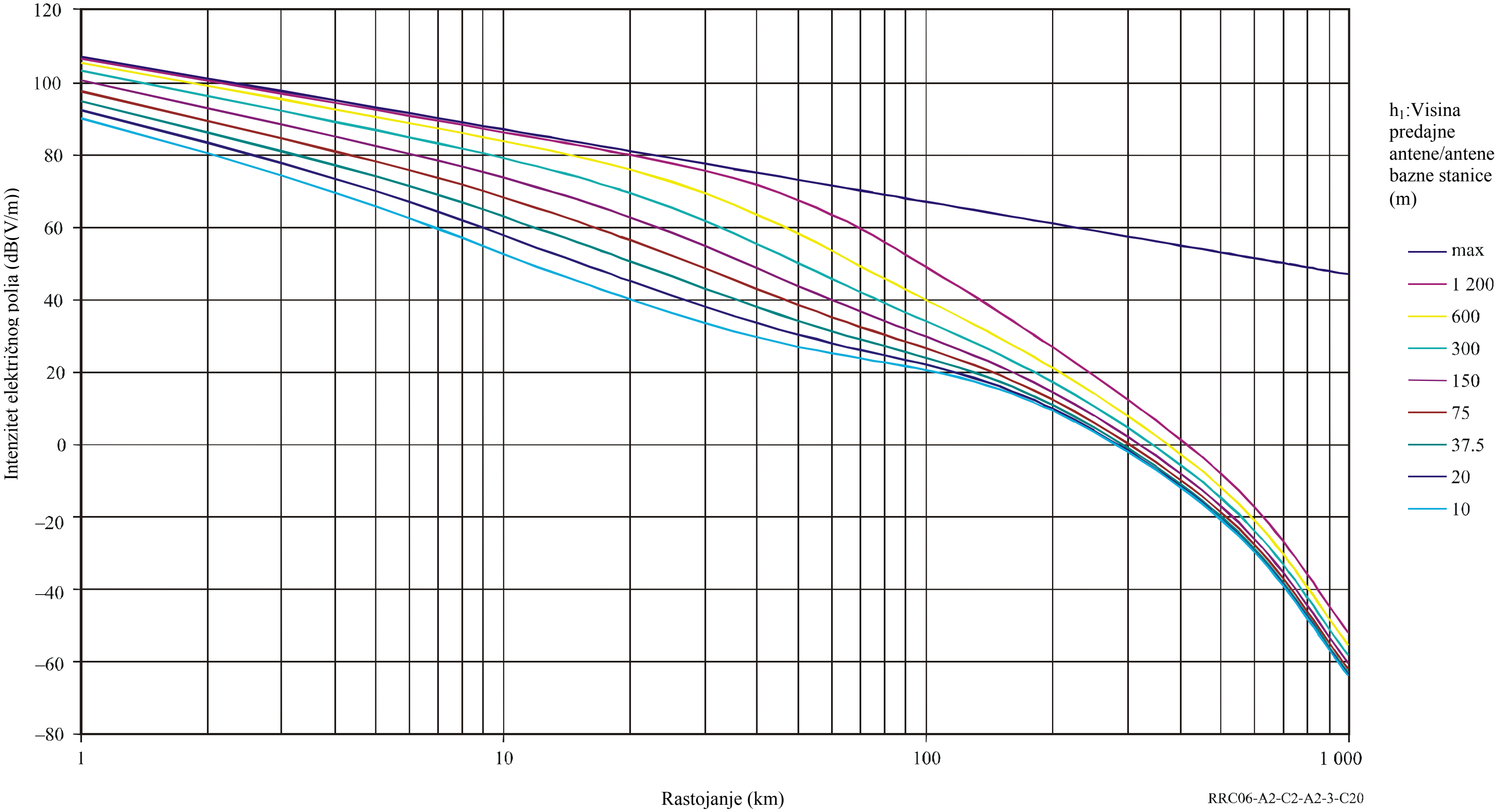


2000 MHz 1% vremena u Zoni 2



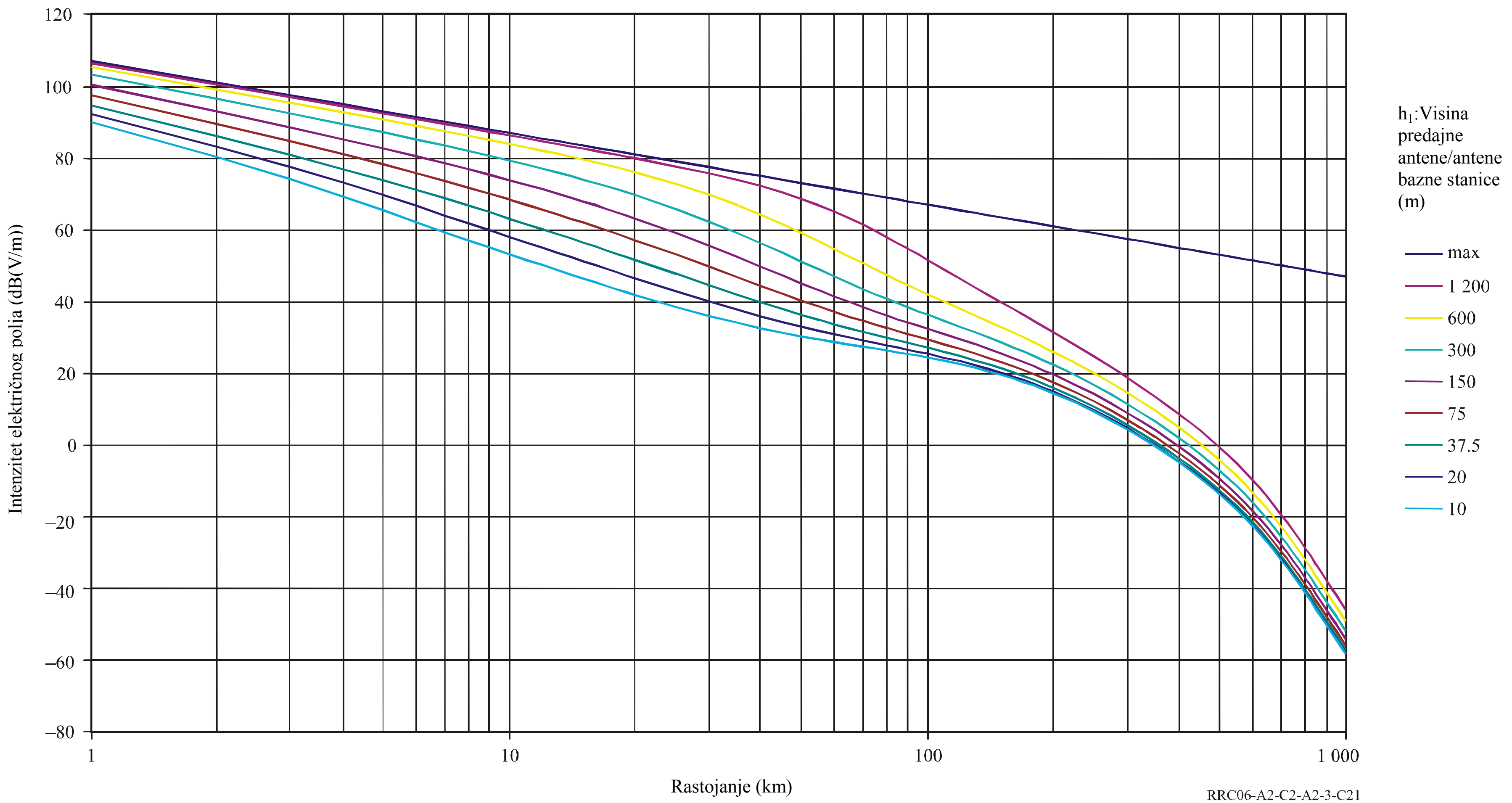

100MHz 50% vremena u Zoni 3
Intenzitet električnog polja (dB(V/m))
120
100
80
60
40
20
0
–20
–40
–60
–80
1
10
100
1 000
Rastojanje (km)
h1:Visina predajne antene/antene bazne stanice (m)
max
1 200
600
300
150
75
37.5
20
10
RRC06-A2-C2-A2-3-C19

100MHz 10% vremena u Zoni 3



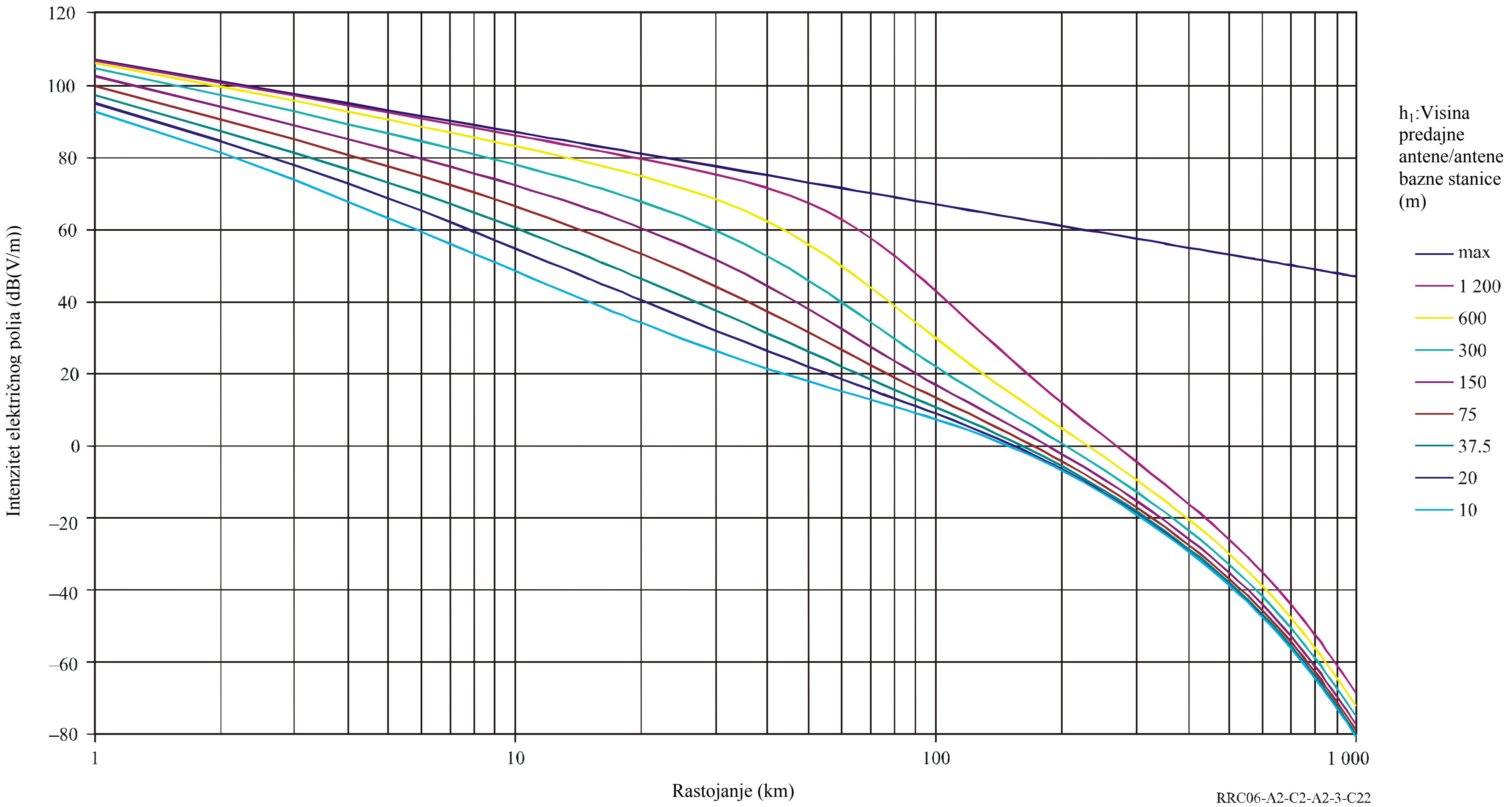
RRC06-A2-C2-A2-3-C20

100MHz 1% vremena u Zoni 3

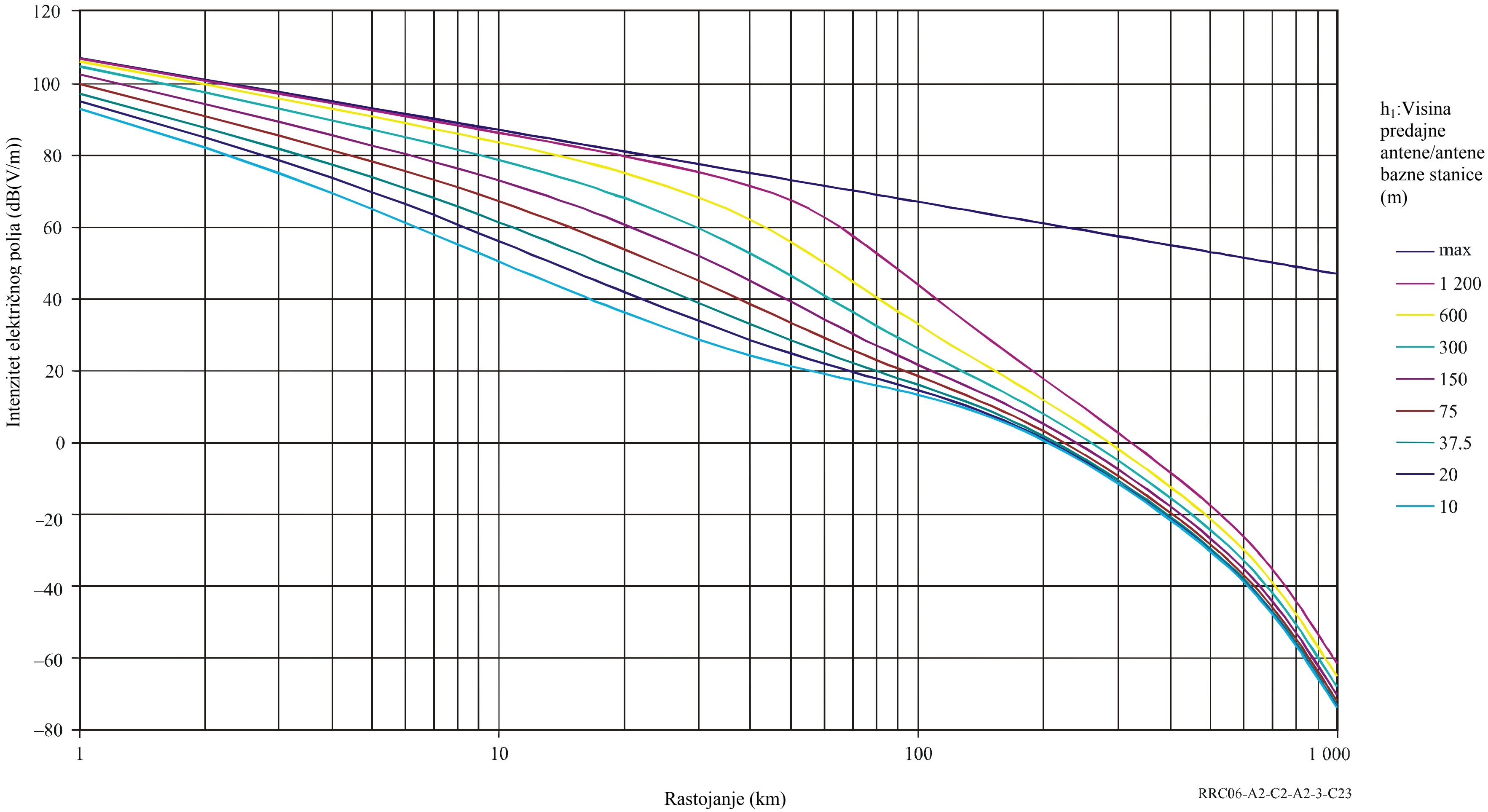


RRC06-A2-C2-A2-3-C21

600MHz 50% vremena u Zoni 3

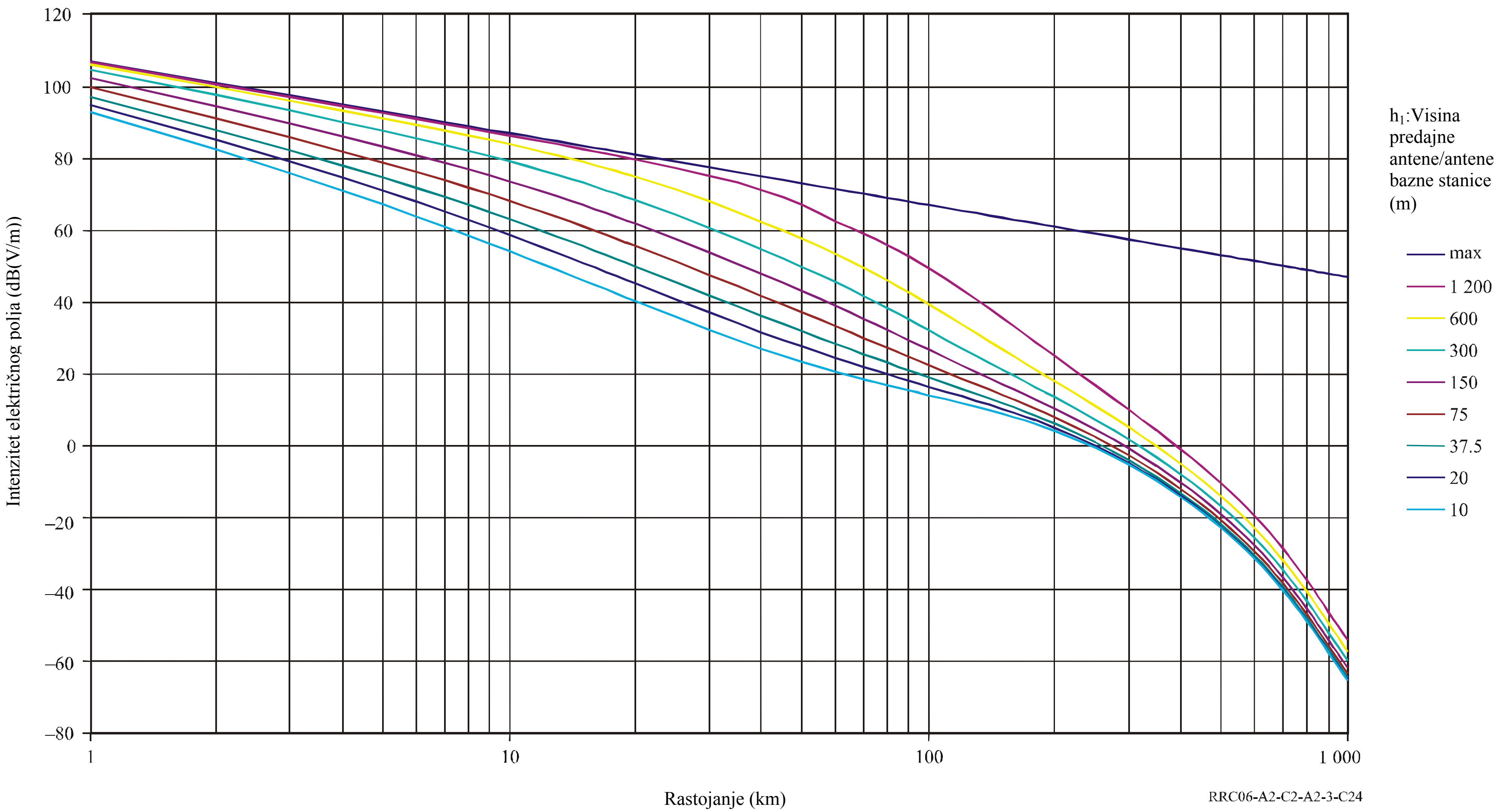


100MHz 10% vremena u Zoni 3

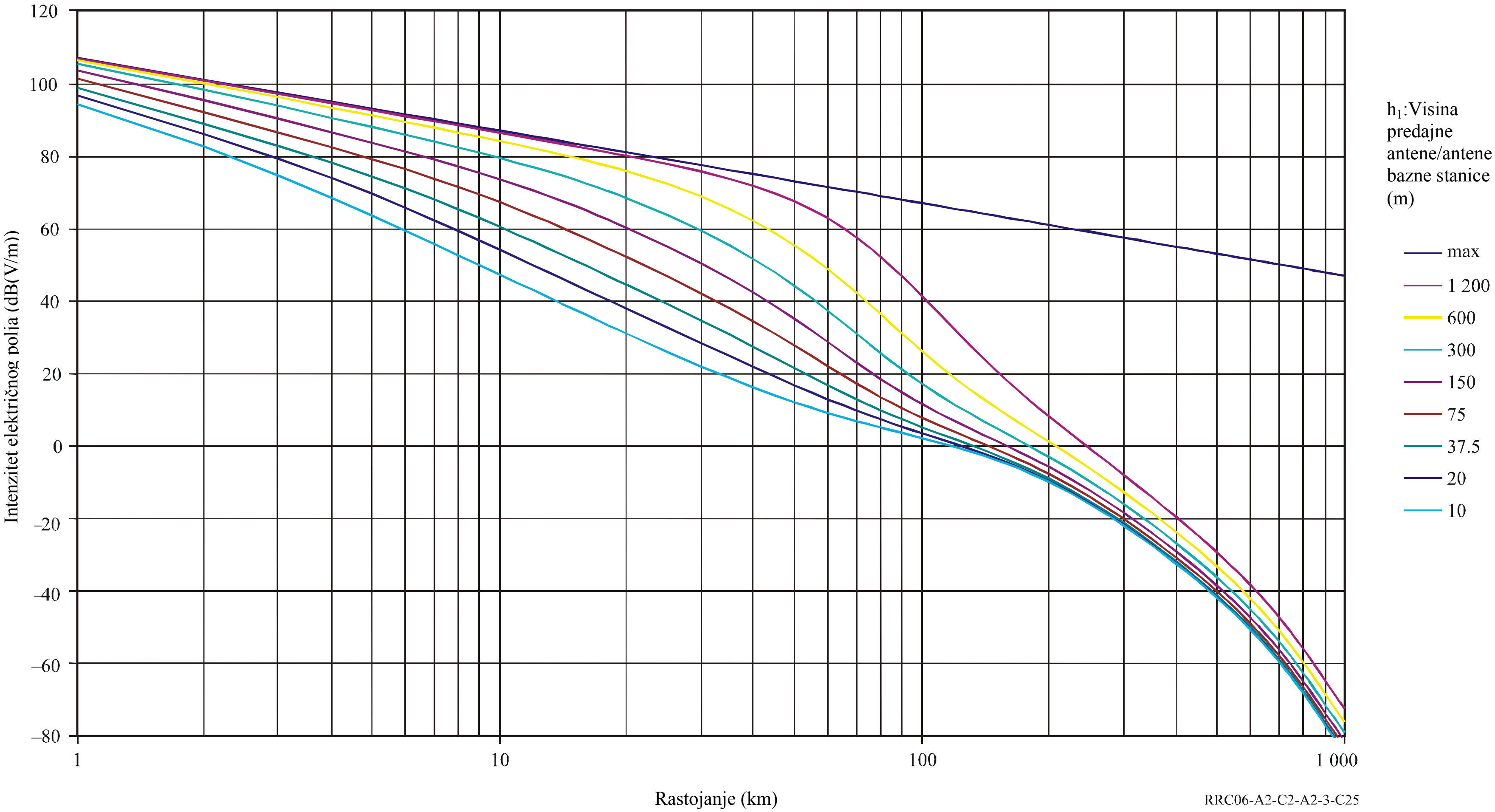


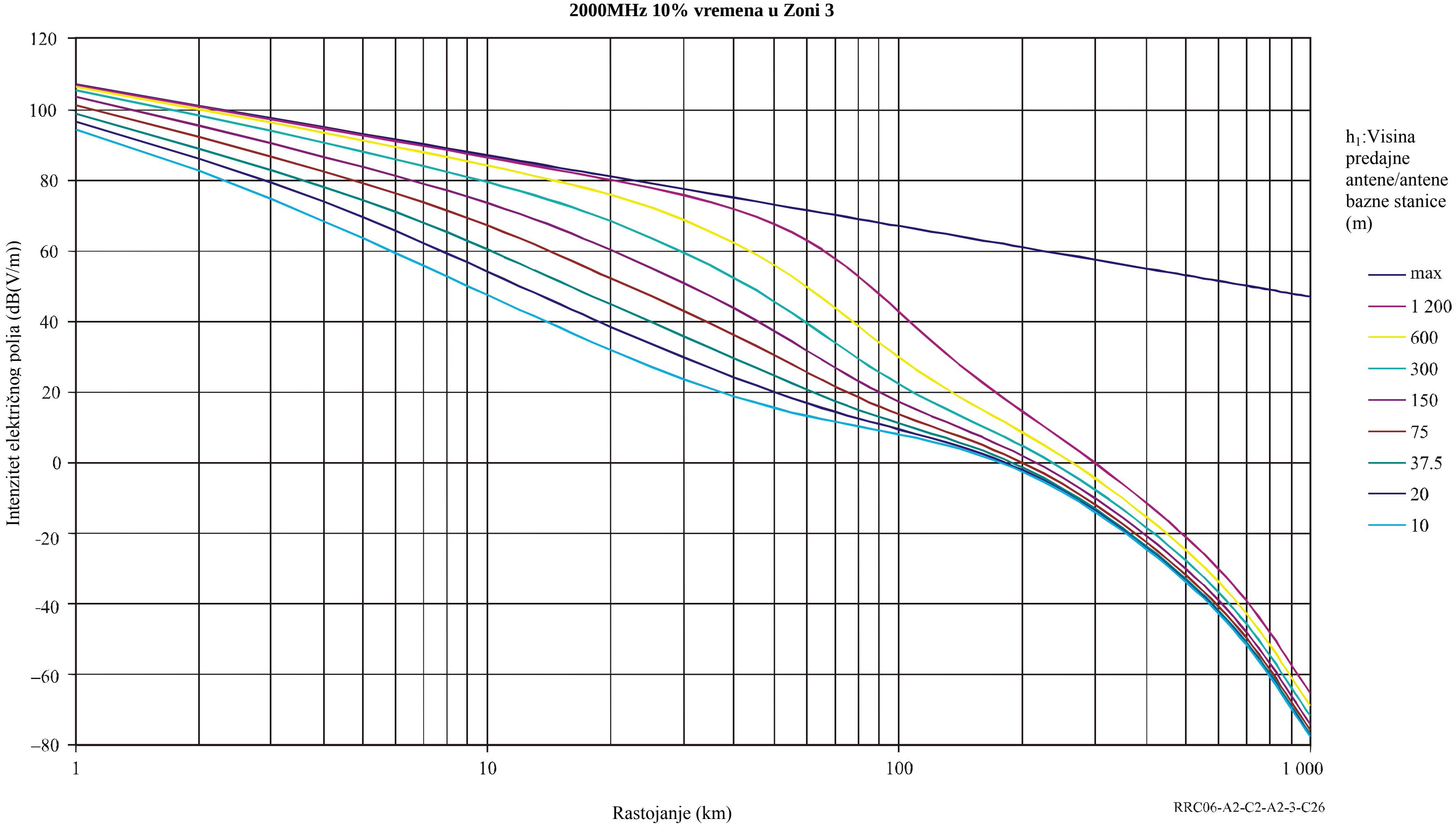
RRC06-A2-C2-A2-3-C23

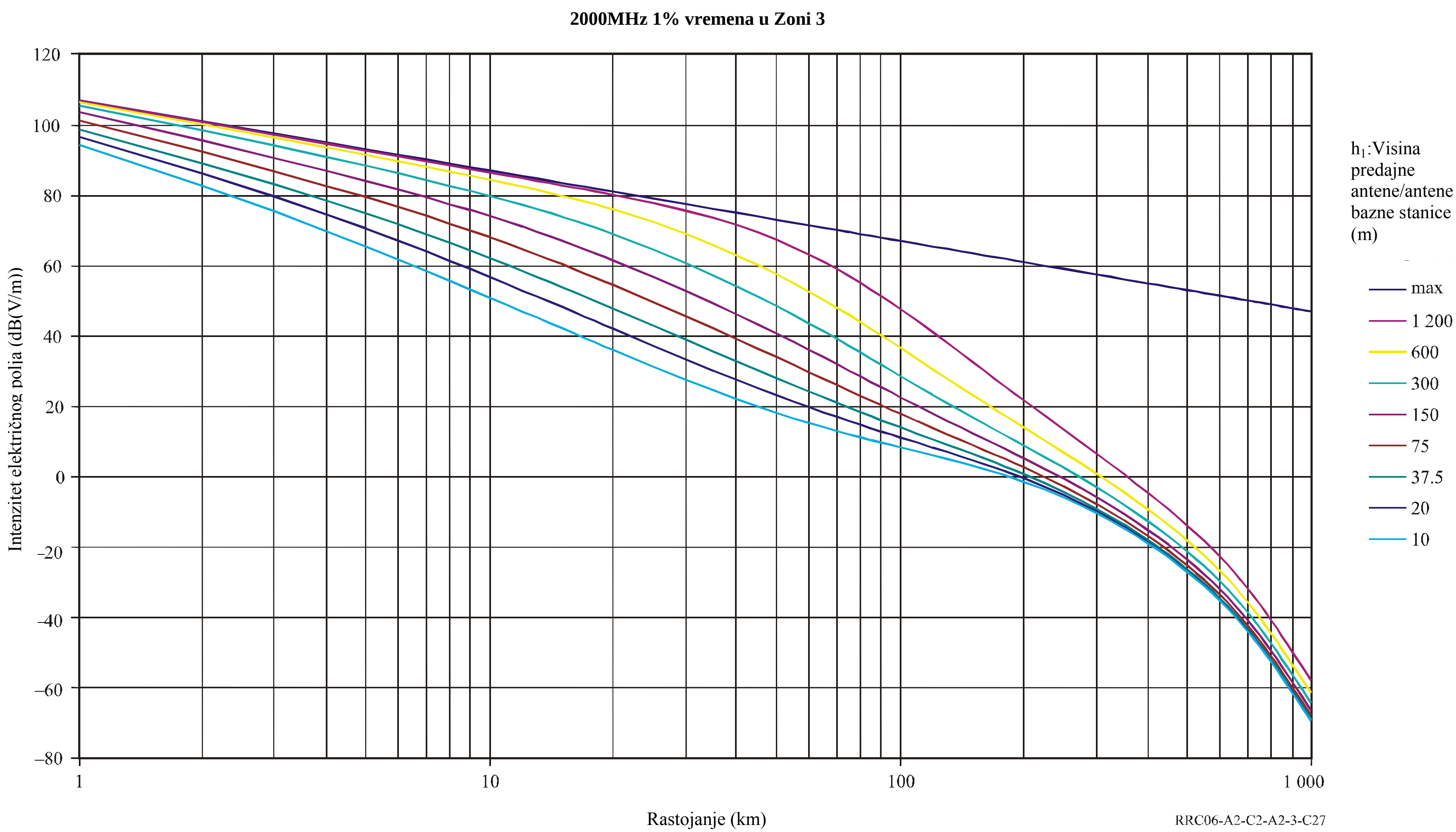
600MHz 1% vremena u Zoni 3



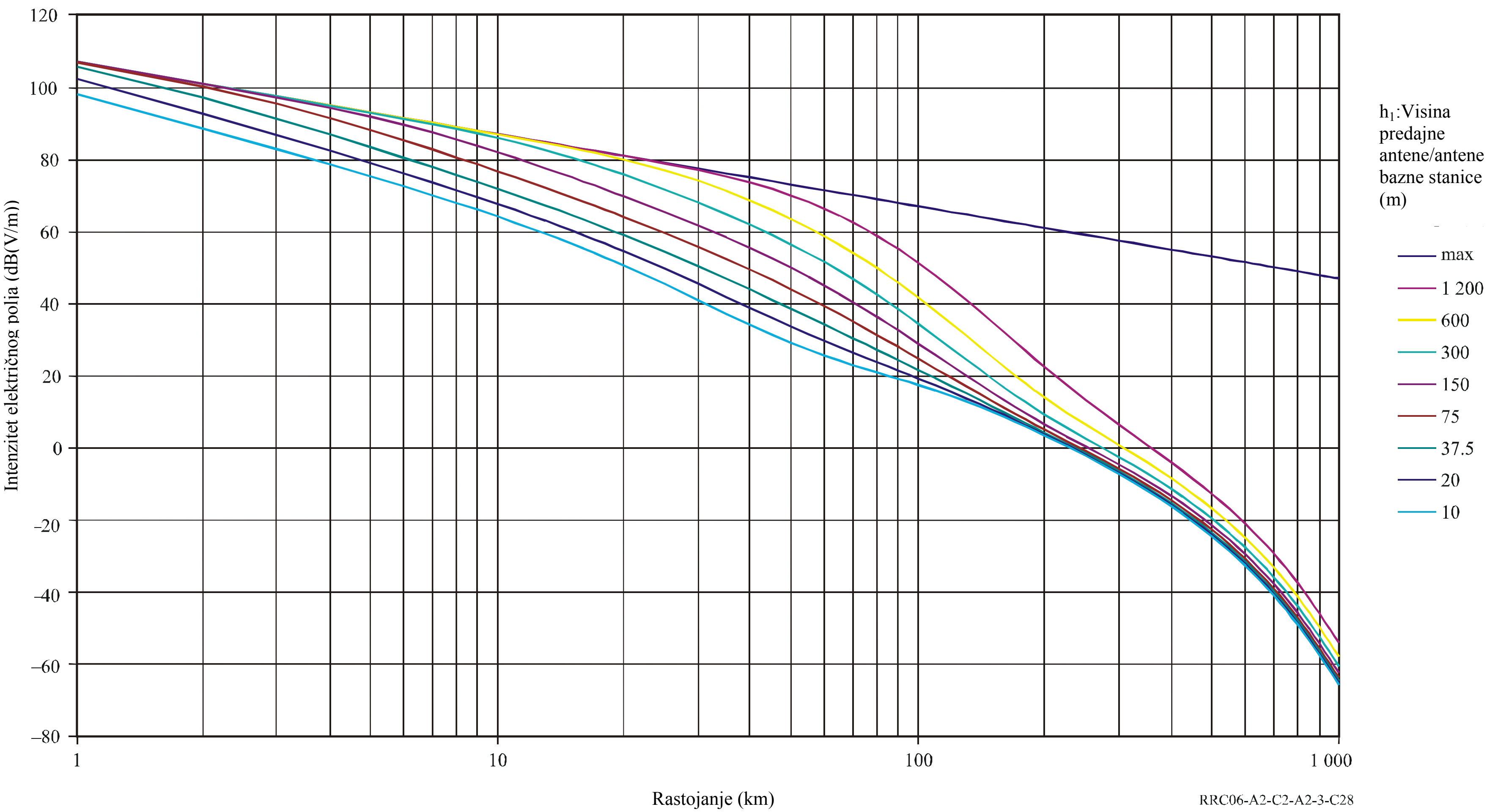
2000MHz 50% vremena u Zoni 3



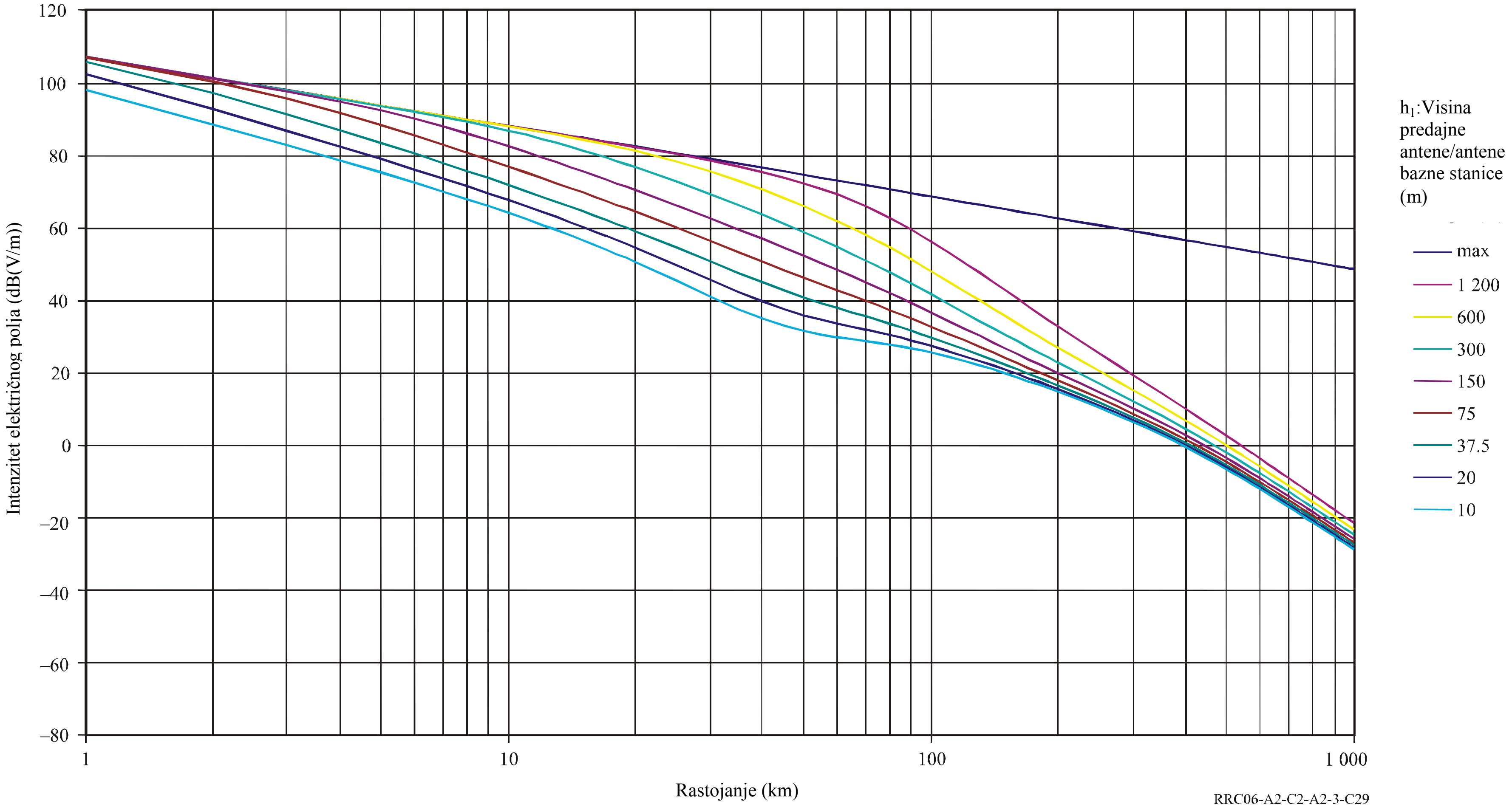

2000MHz 10% vremena u Zoni 3
120
100
80
60
40
20
0
-20
-40
–60
–80
1
10
100
1 000
Intenzitet električnog polja (dB(V/m))
Rastojanje (km)
h1:Visina predajne antene/antene bazne stanice (m)
max
1 200
600
300
150
75
37.5
20
10
RRC06-A2-C2-A2-3-C26


2000MHz 1% vremena u Zoni 3
120
100
80
60
40
20
0
–20
–40
–60
–80
Intenzitet električnog polja (dB(V/m))
1
10
100
1 000
Rastojanje (km)
h1:Visina predajne antene/antene bazne stanice (m)
max
1 200
600
300
150
75
37.5
20
10
RRC06-A2-C2-A2-3-C27

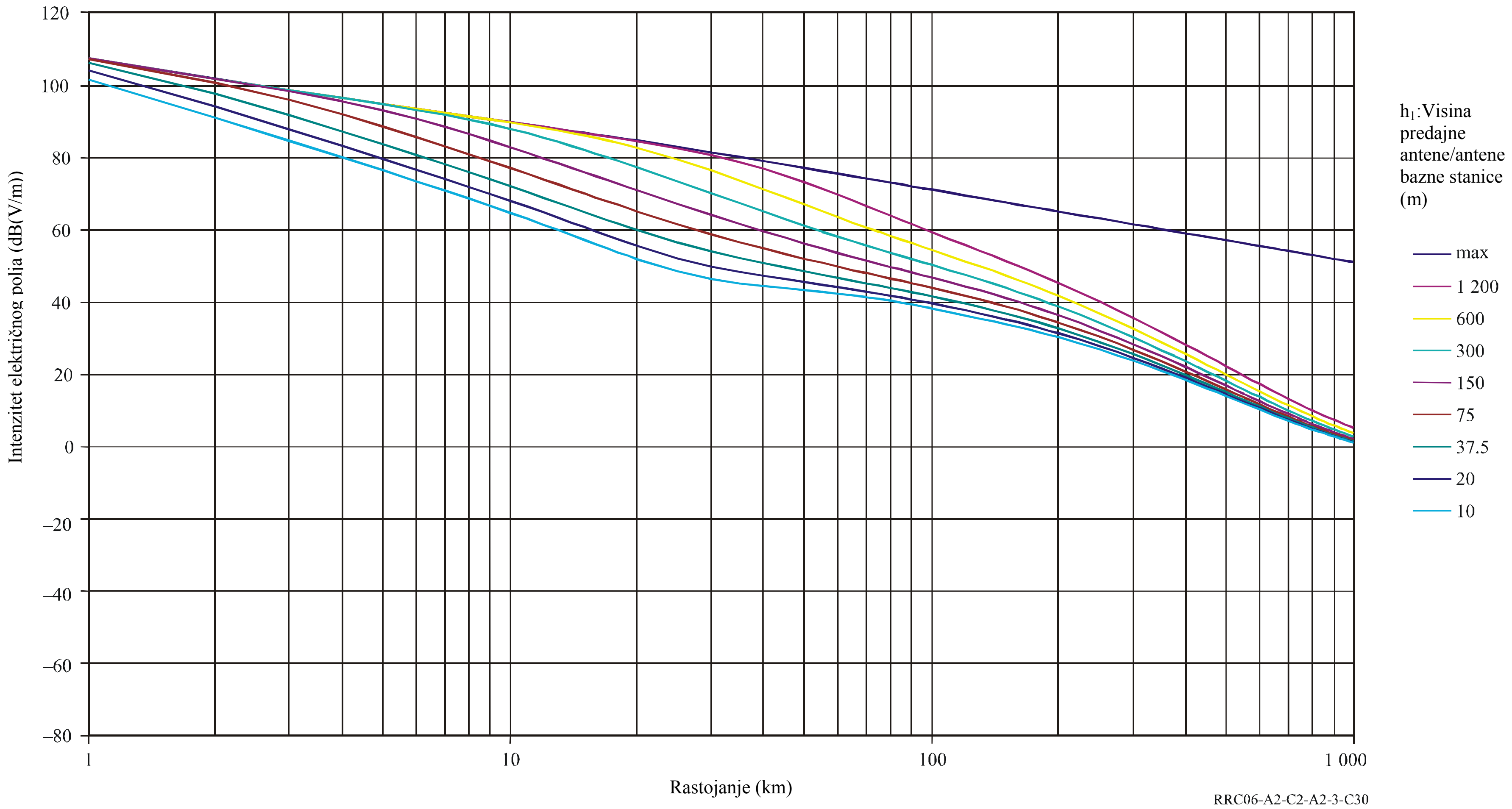
1 100MHz 50% vremena u Zoni 4



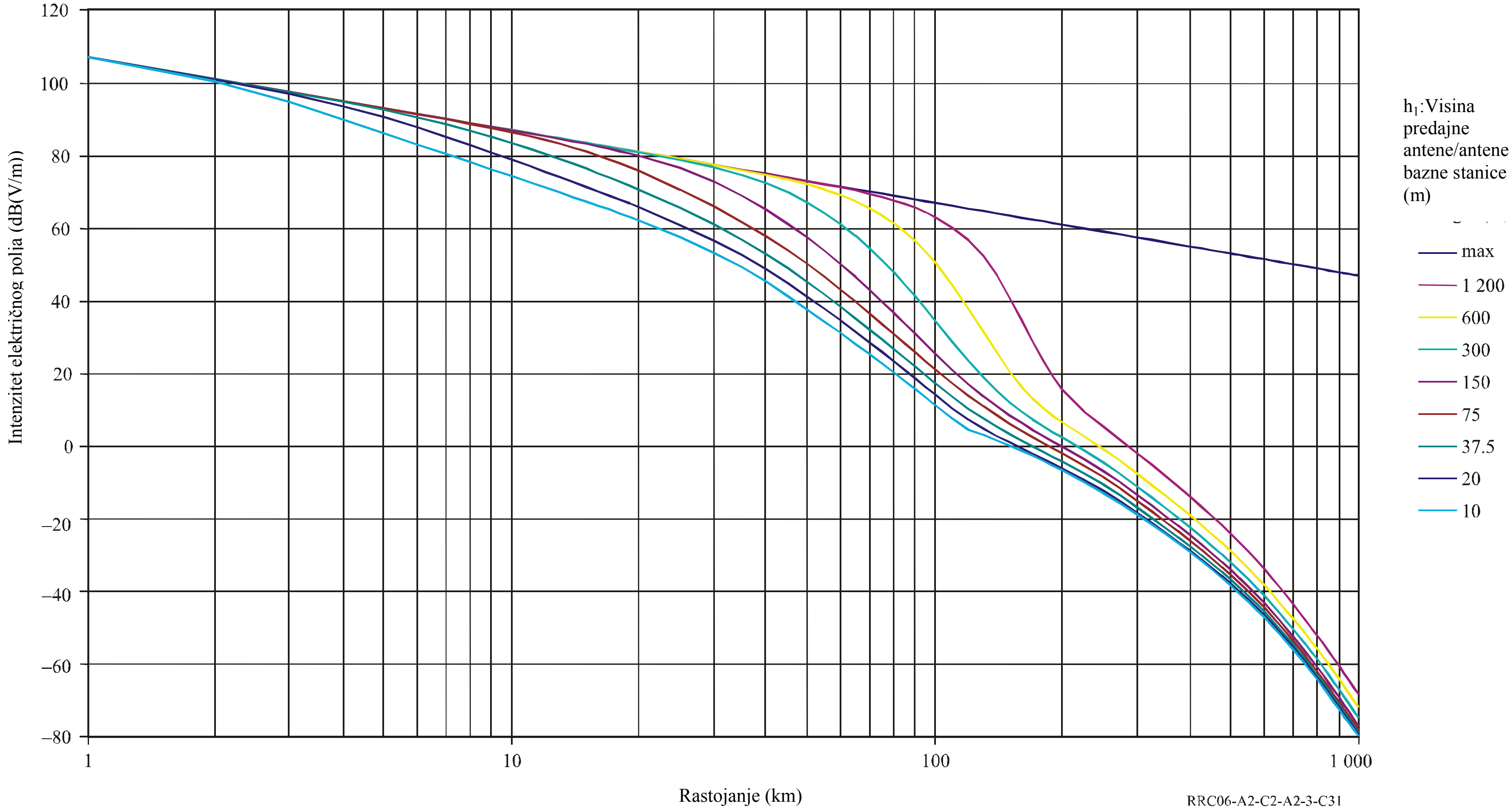
100MHz 10% vremena u Zoni 4



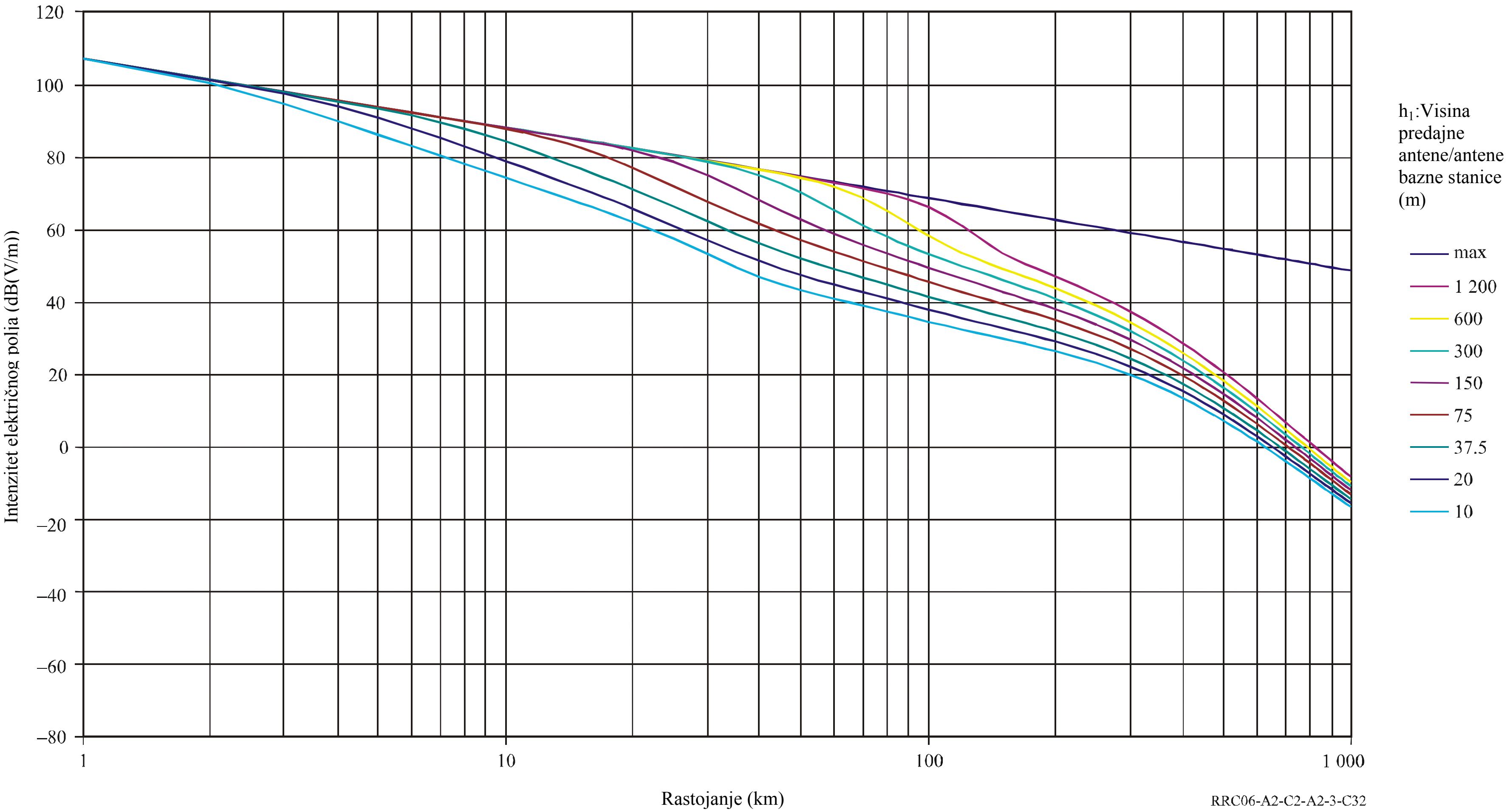
100MHz 1% vremena u Zoni 4



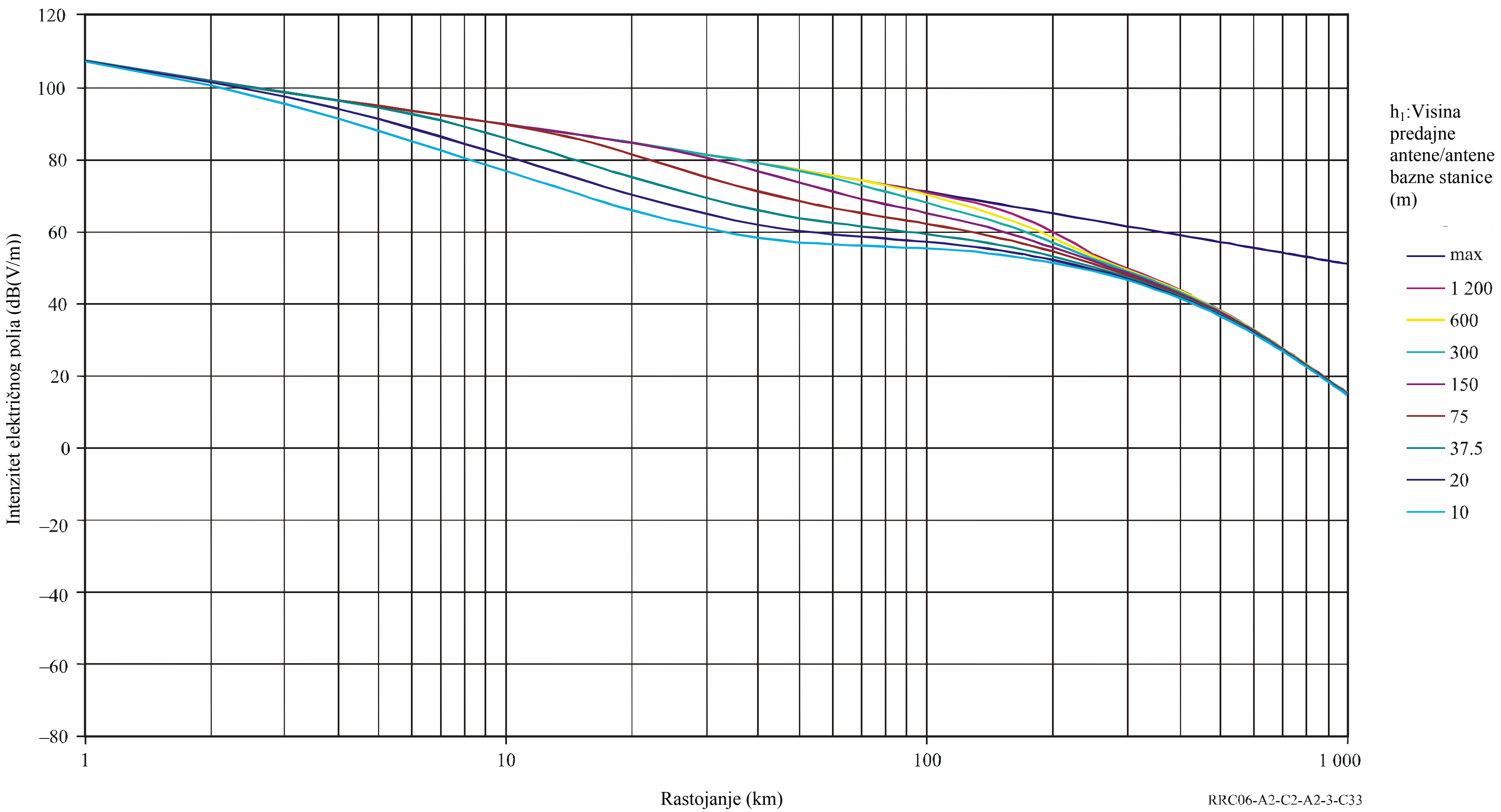
600MHz 50% vremena u Zoni 4



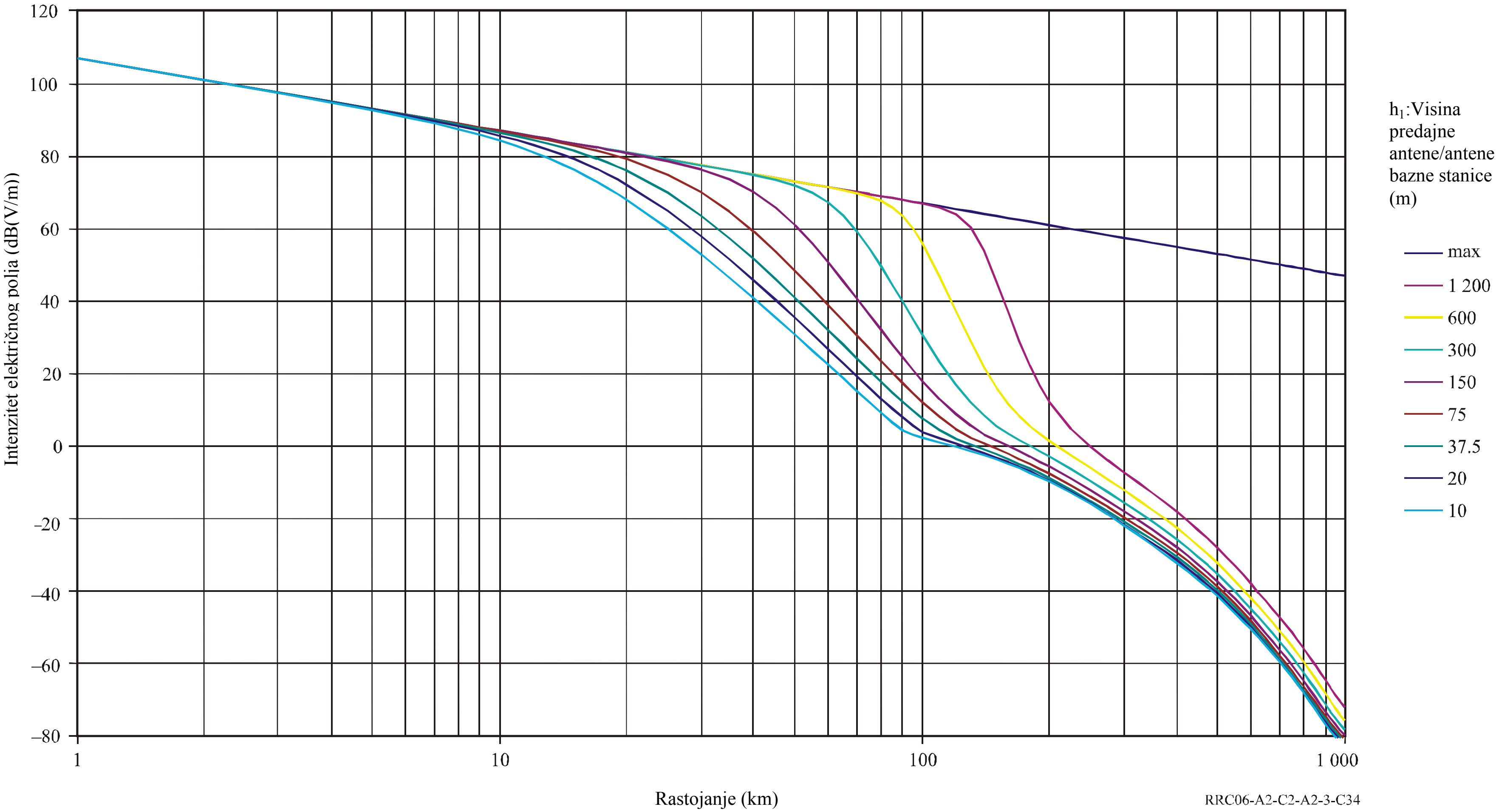
600MHz 10% vremena u Zoni 4



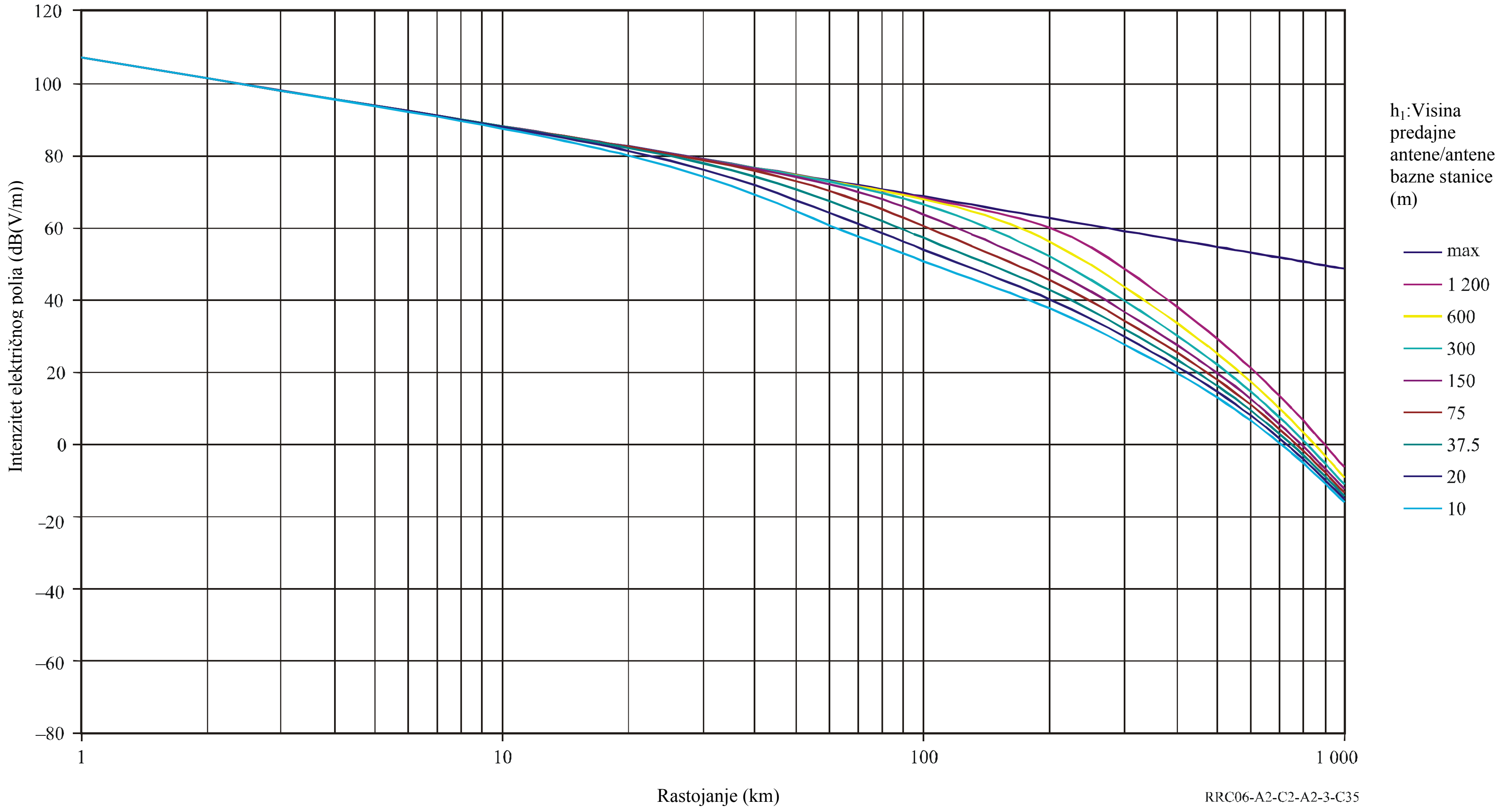
600MHz 1% vremena u Zoni 4



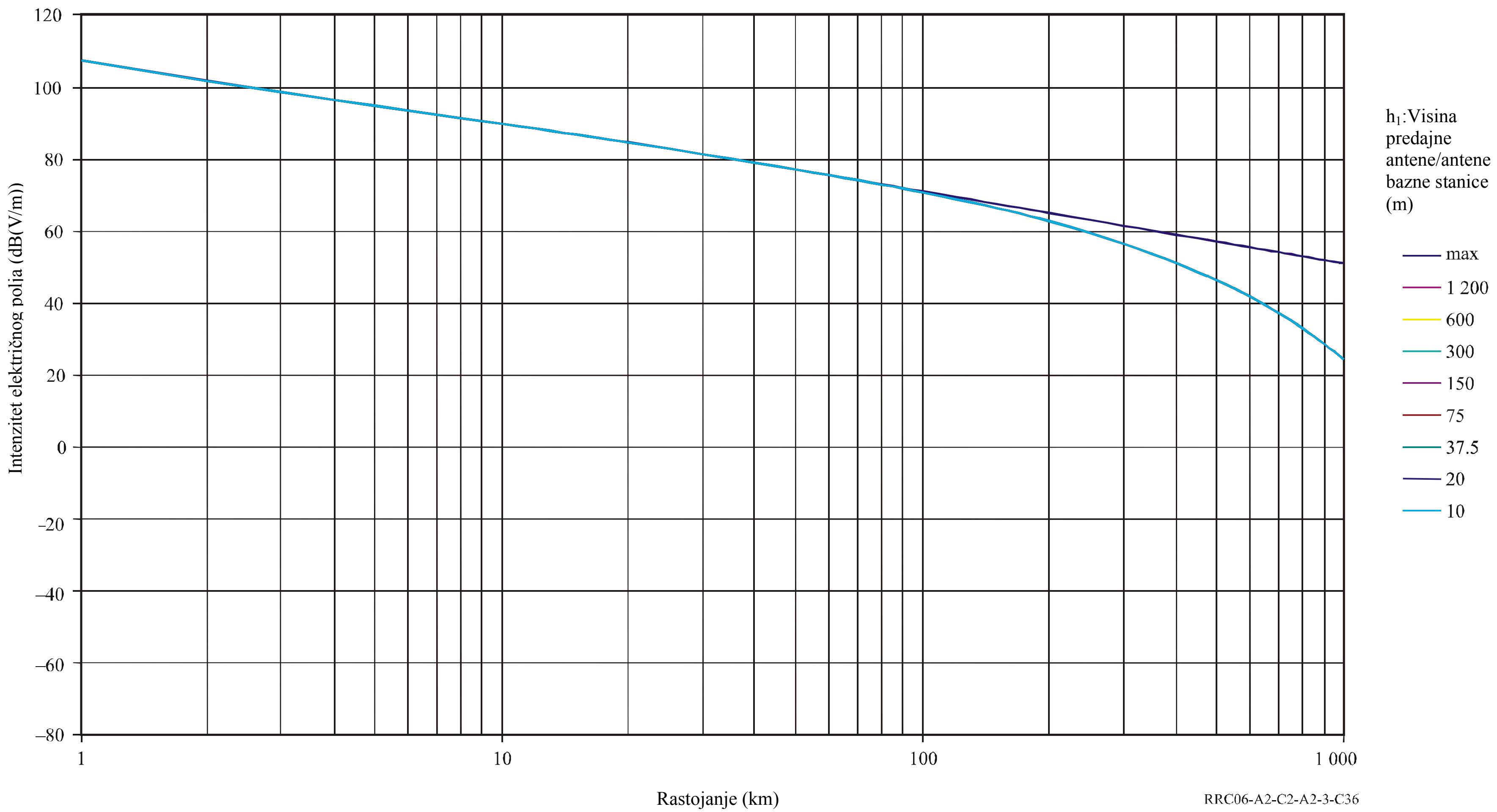
2000MHz 50% vremena u Zoni 4



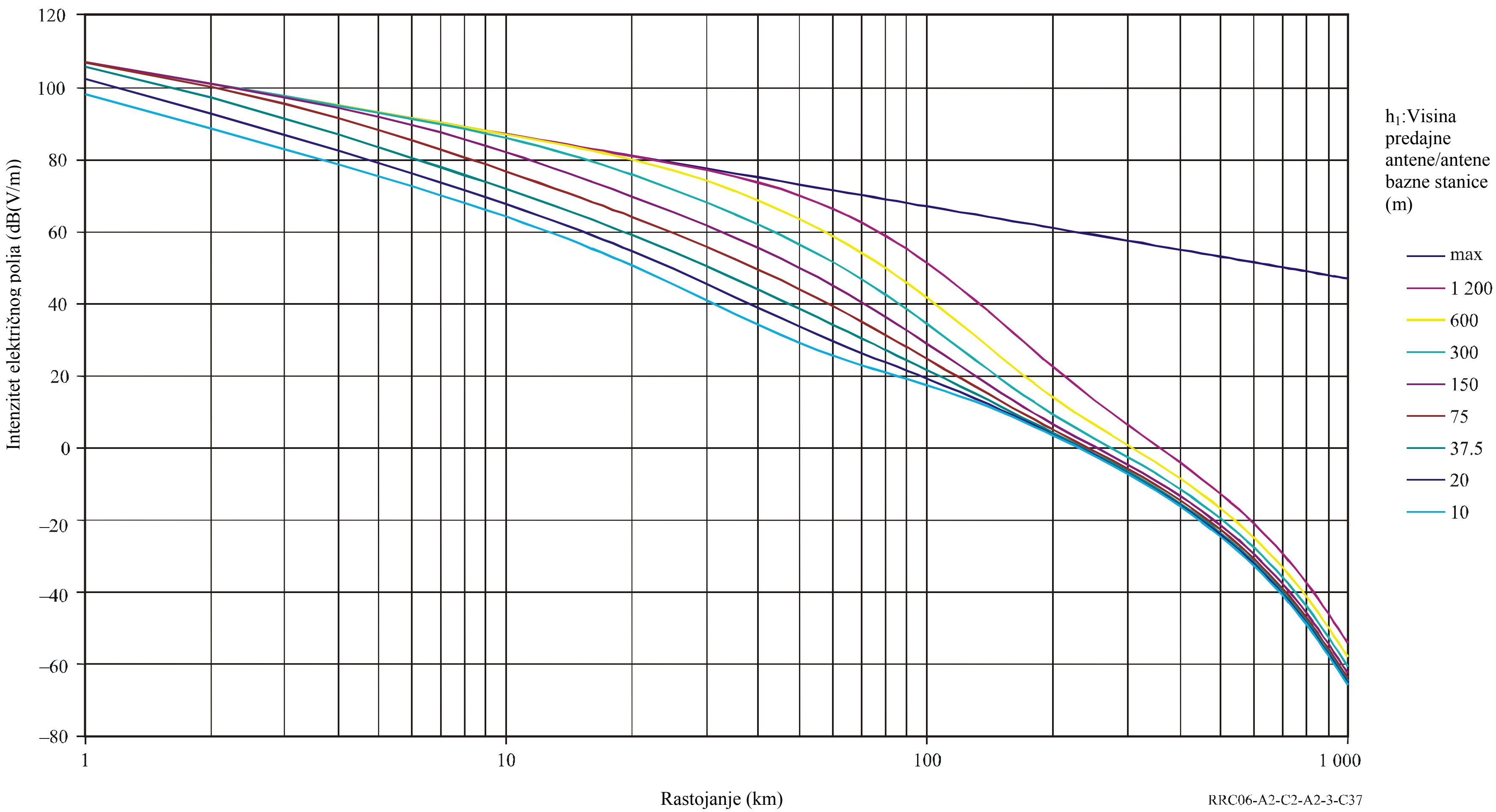
2000MHz 10% vremena u Zoni 4



2000MHz 1% vremena u Zoni 4

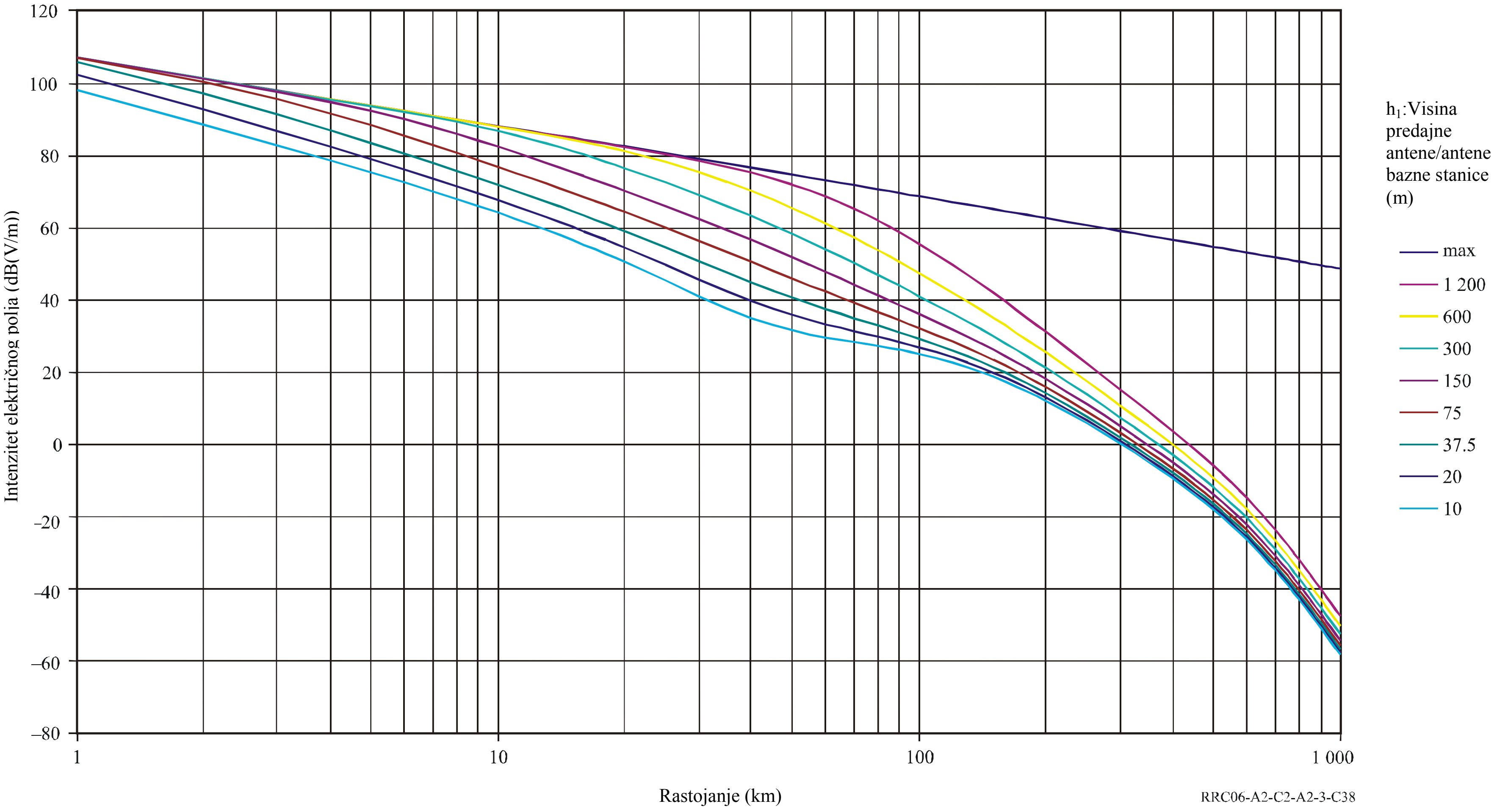


100MHz 50% vremena u Zoni 5

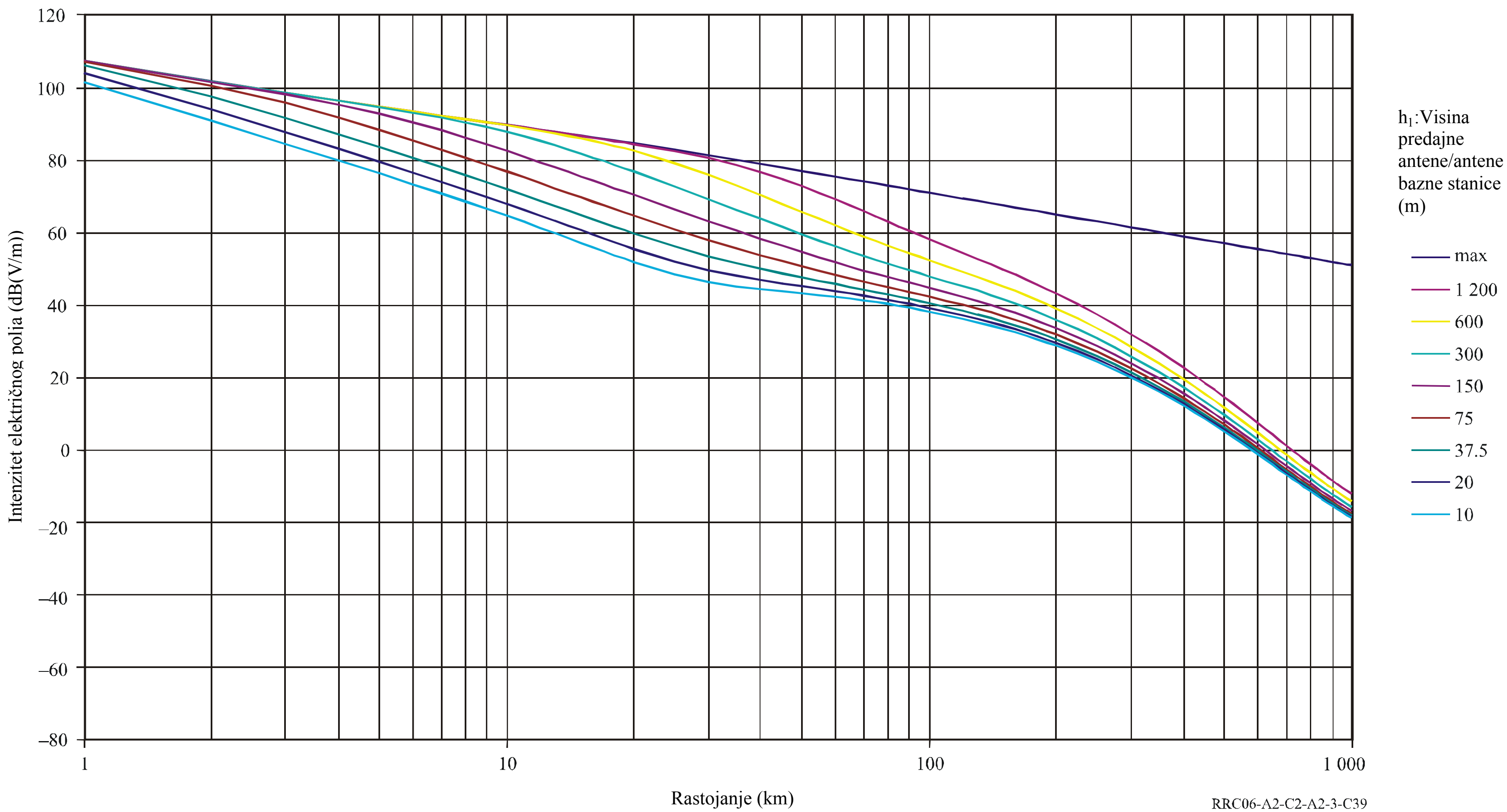


RRC06-A2-C2-A2-3-C37

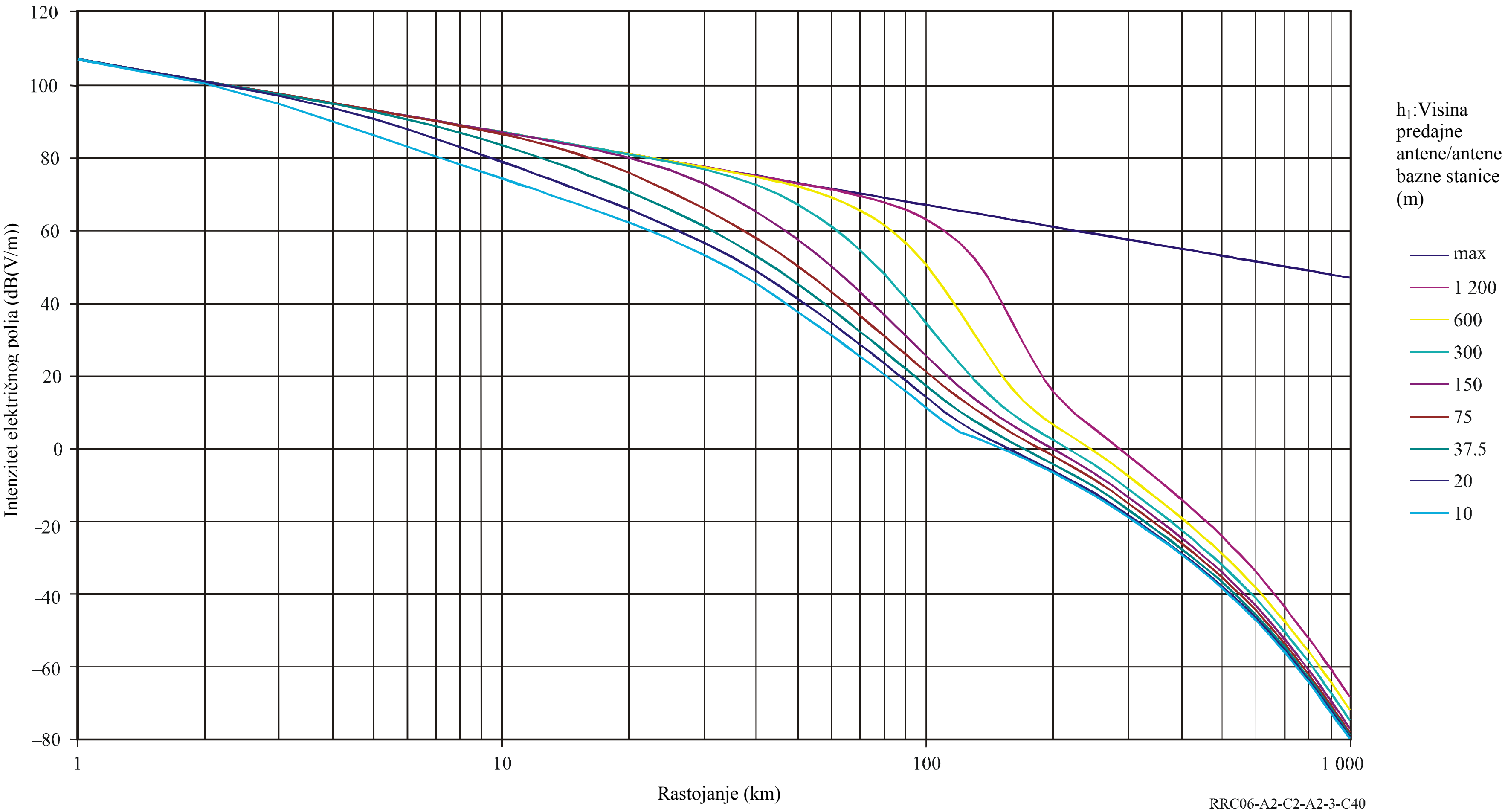
100MHz 10% vremena u Zoni 5



100MHz 1% vremena u Zoni 5

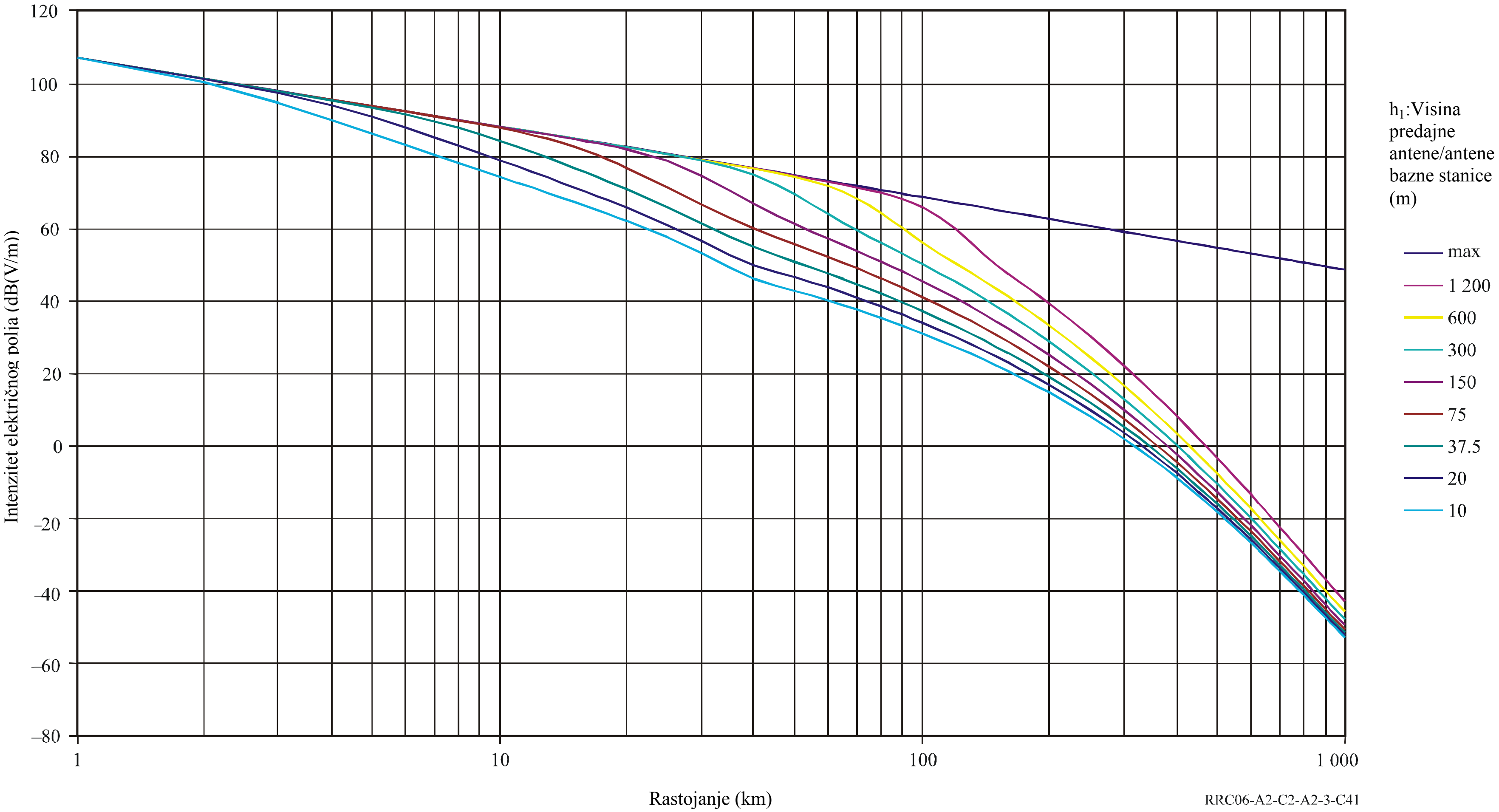


600MHz 50% vremena u Zoni 5

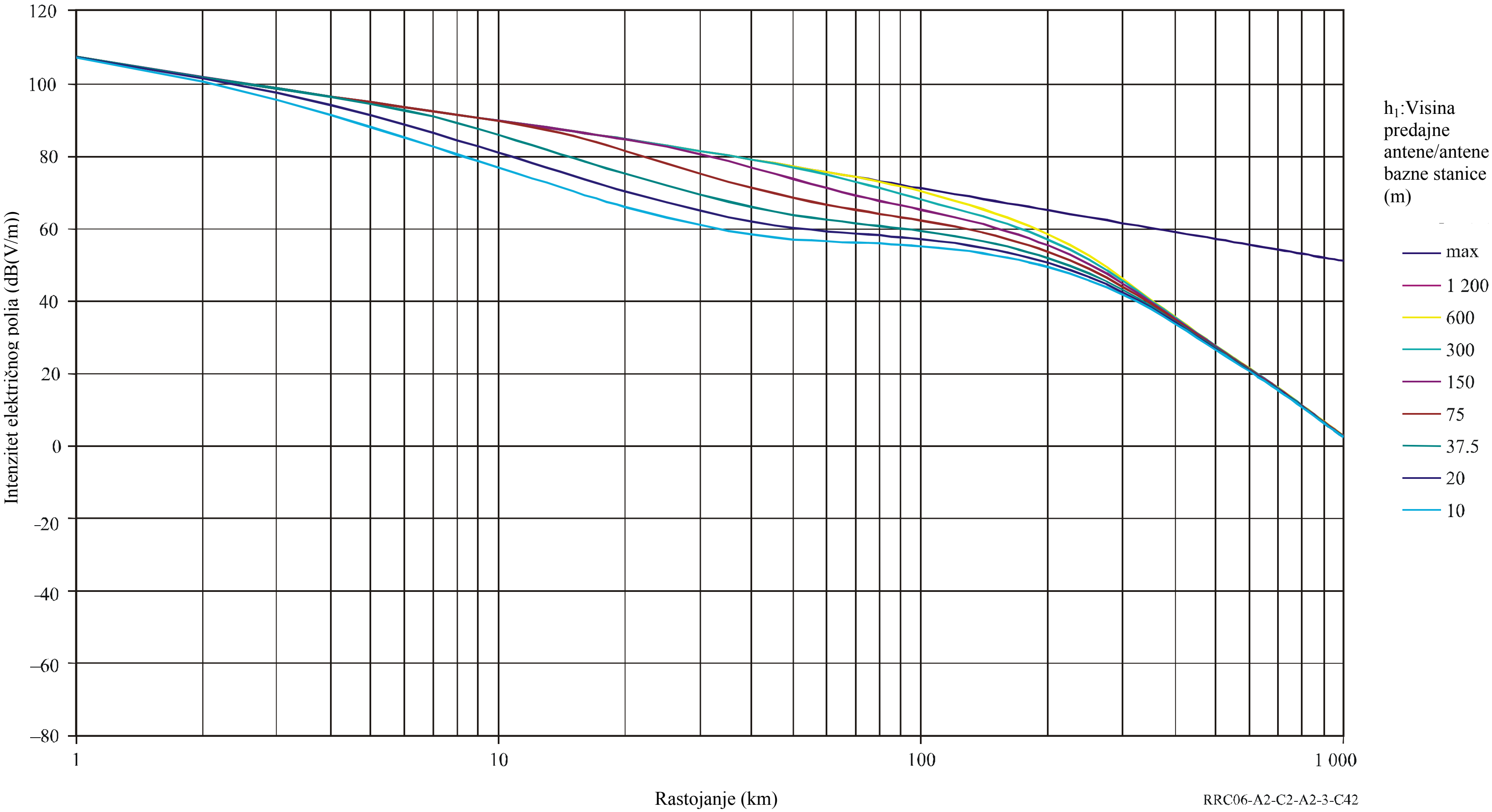


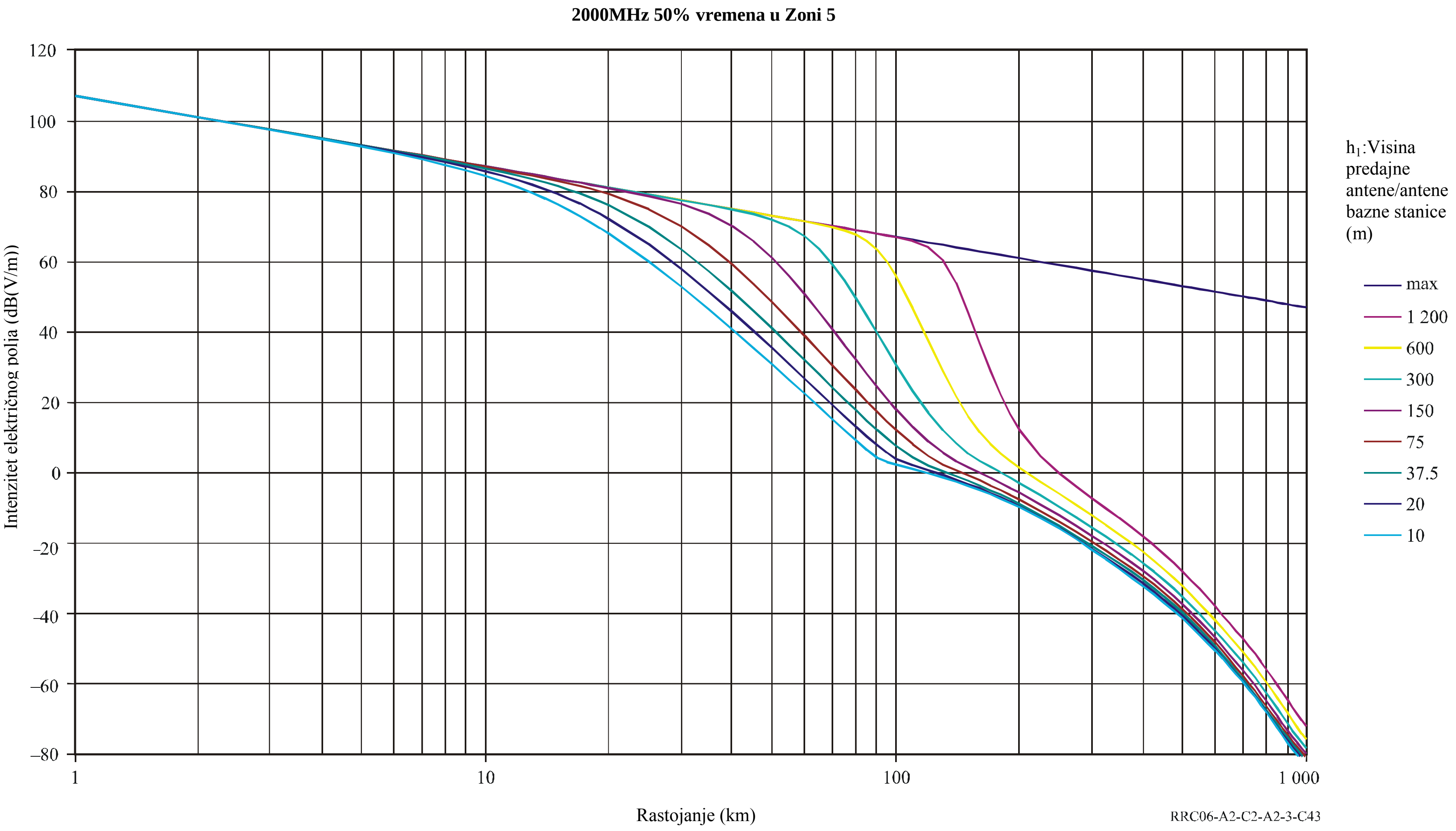
RRC06-A2-C2-A2-3-C40

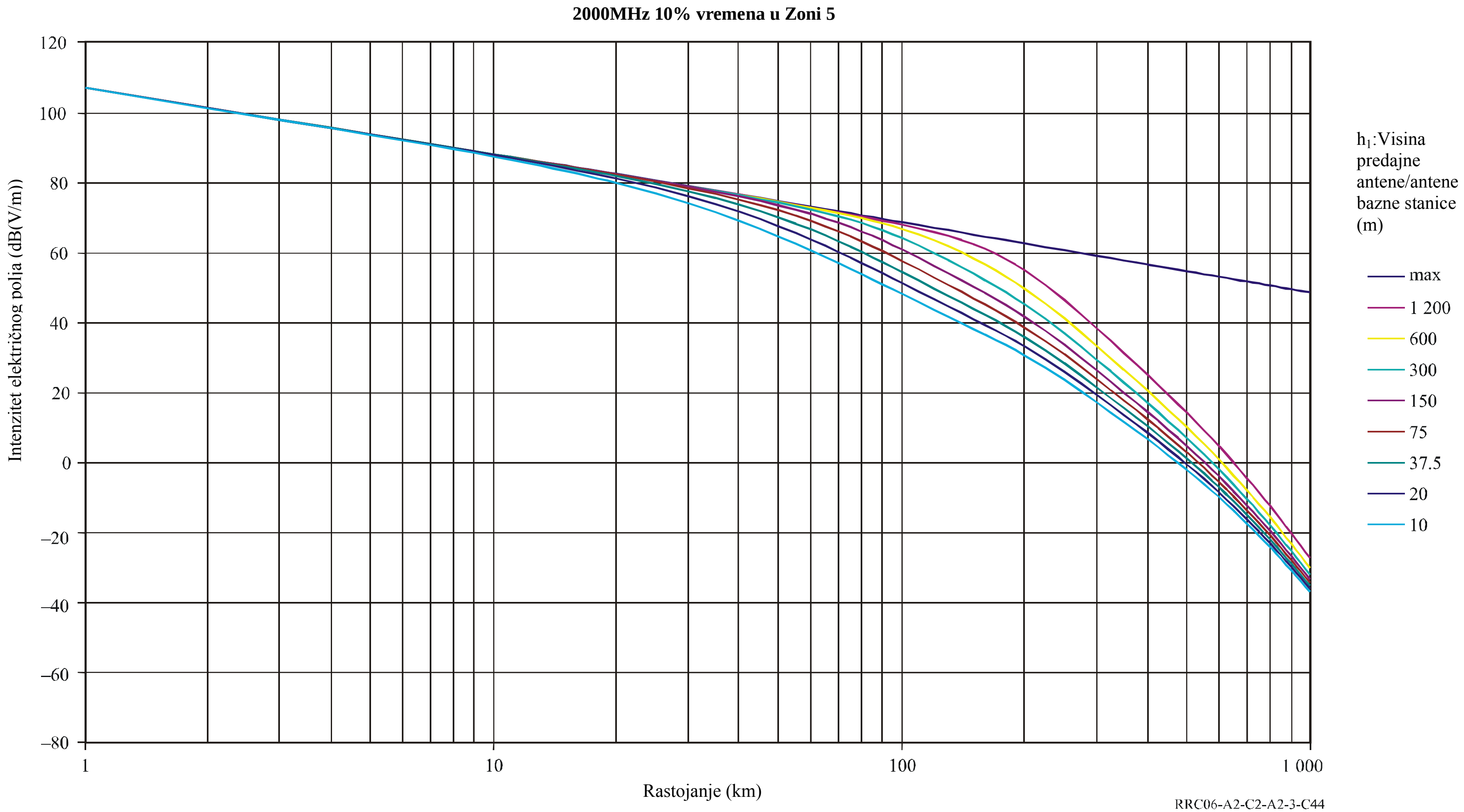
600MHz 10% vremena u Zoni 5



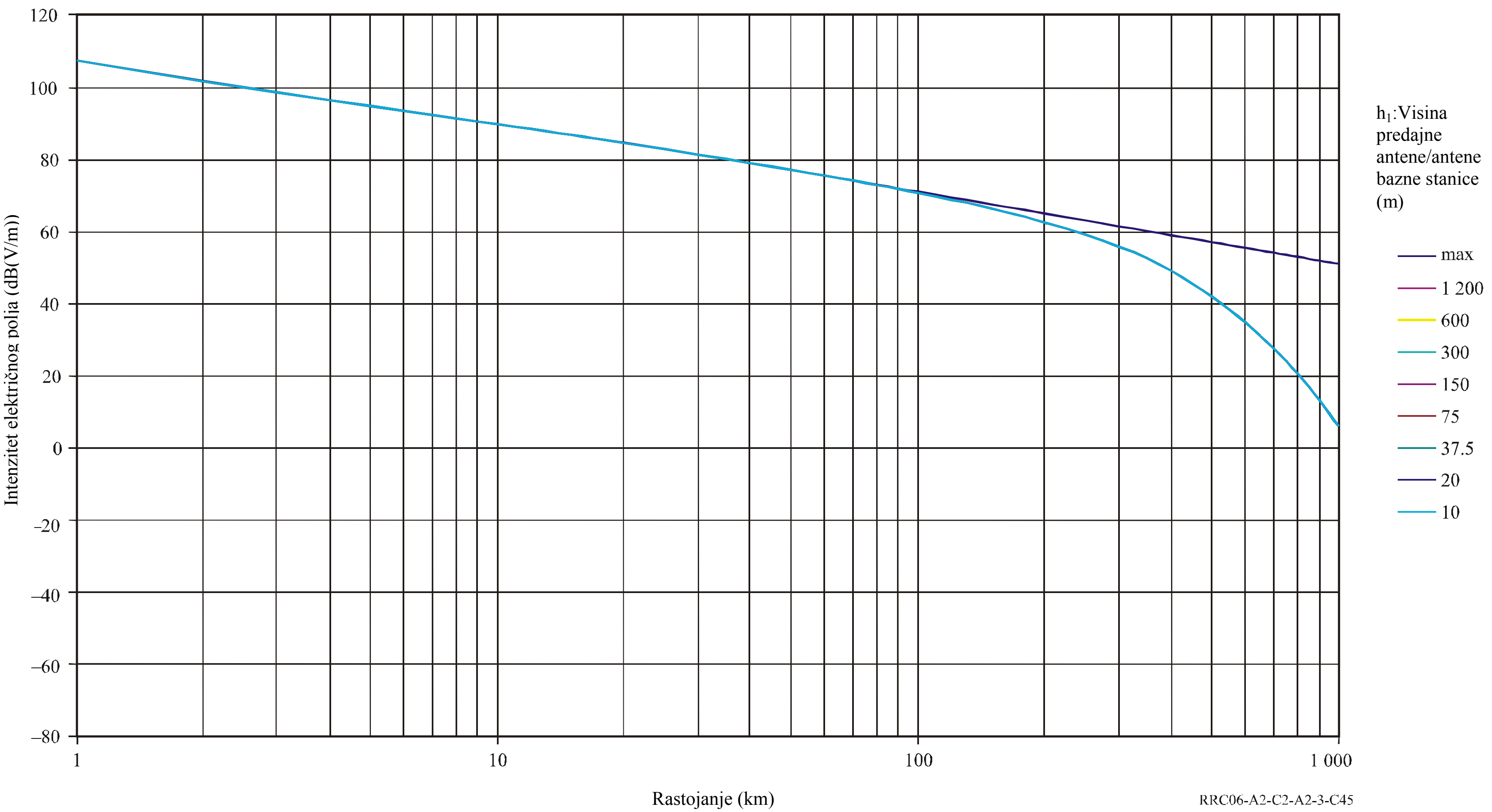
600MHz 1% vremena u Zoni 5



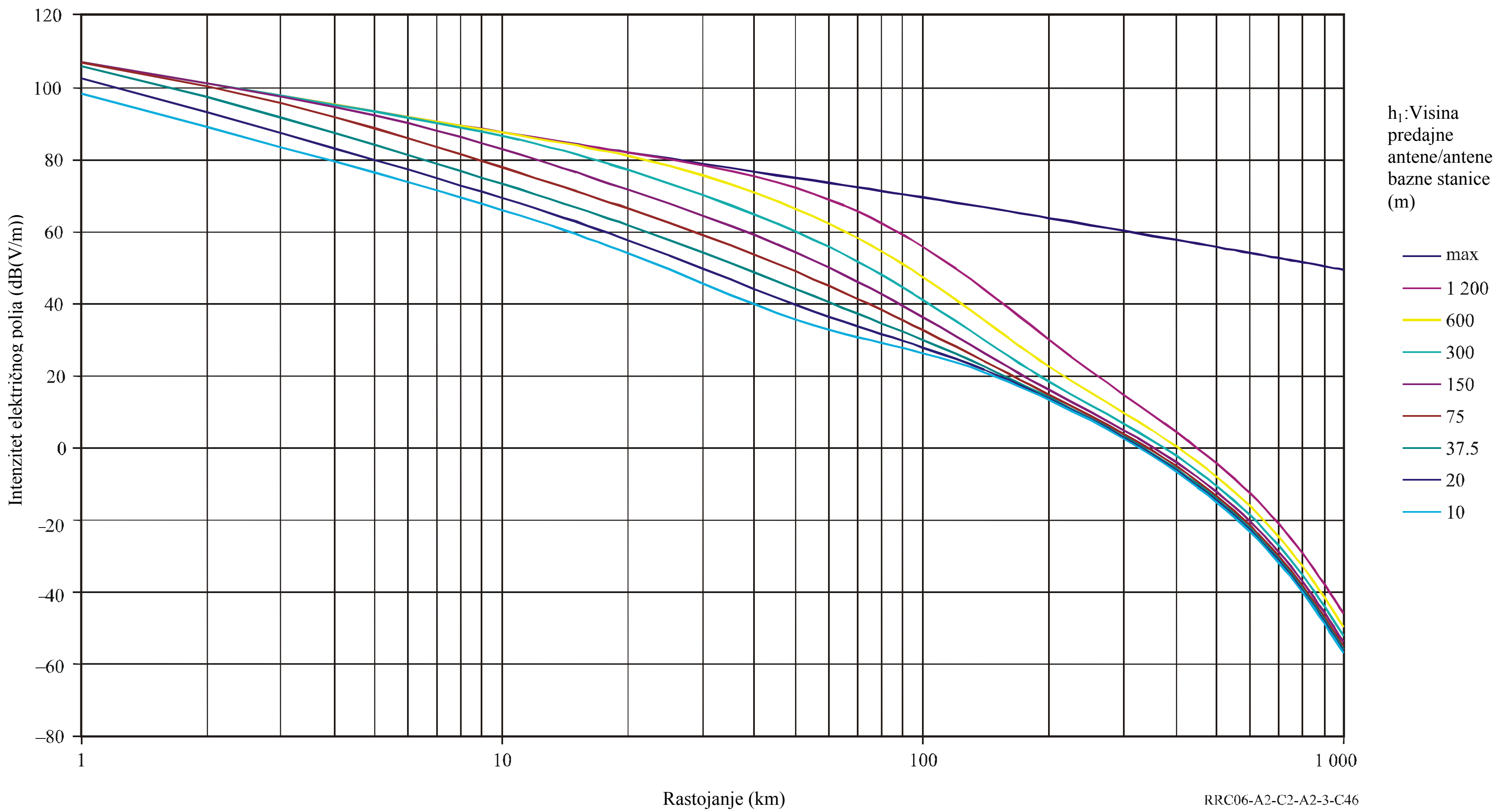

2000MHz 50% vremena u Zoni 5
120
100
80
60
40
20
0
–20
–40
–60
–80
Intenzitet električnog polja (dB(V/m))
1
10
100
1 000
Rastojanje (km)
h1:Visina predajne antene/antene bazne stanice (m)
max
1 200
600
300
150
75
37.5
20
10
RRC06-A2-C2-A2-3-C43


2000MHz 10% vremena u Zoni 5
120
100
80
60
40
20
0
–20
–40
–60
–80
Intenzitet električnog polja (dB(V/m))
1
10
100
1 000
Rastojanje (km)
h1:Visina predajne antene/antene bazne stanice (m)
max
1 200
600
300
150
75
37.5
20
10
RRC06-A2-C2-A2-3-C44

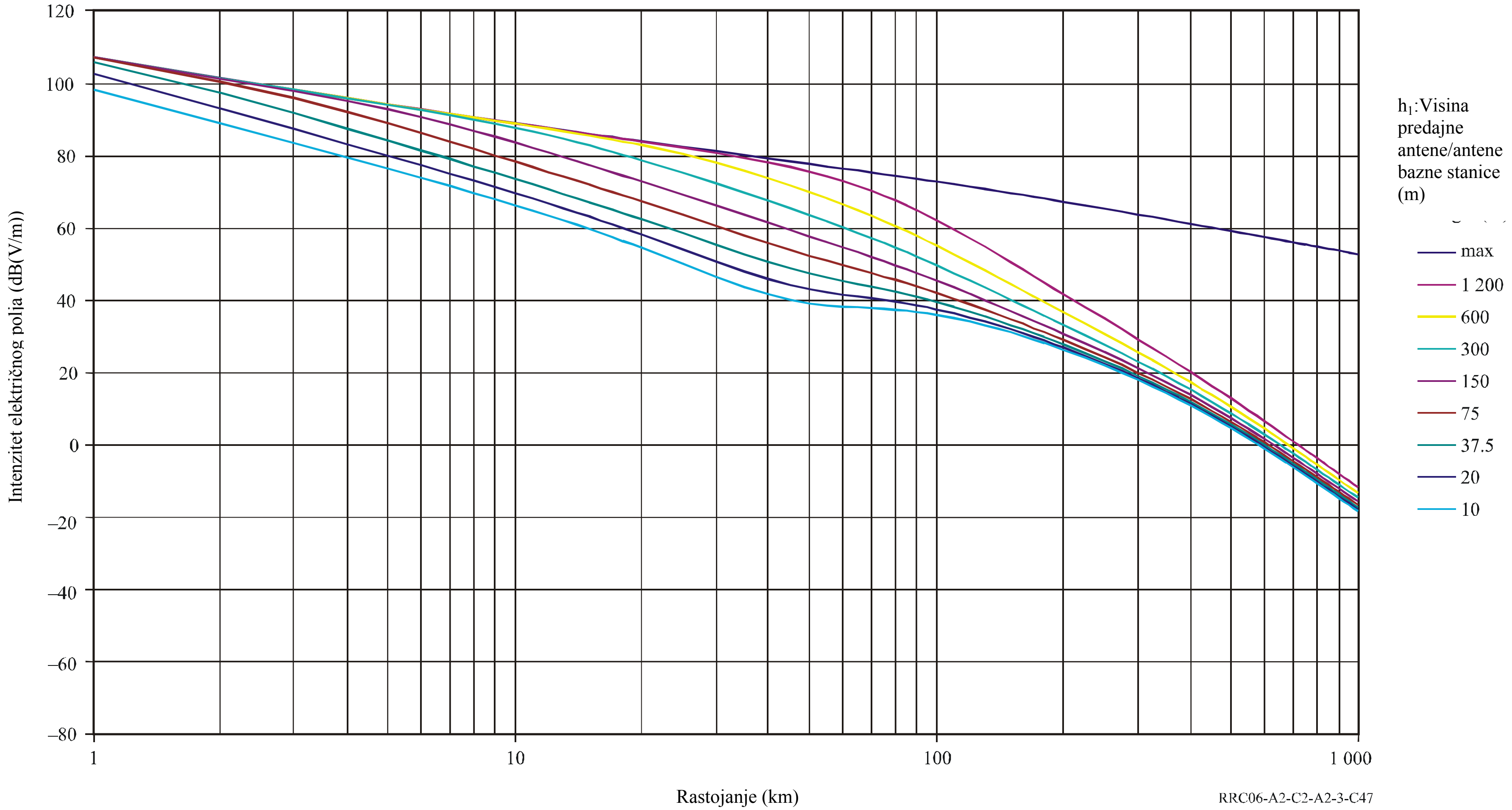
2000MHz 1% vremena u Zoni 5



100MHz 50% vremena u Zoni A

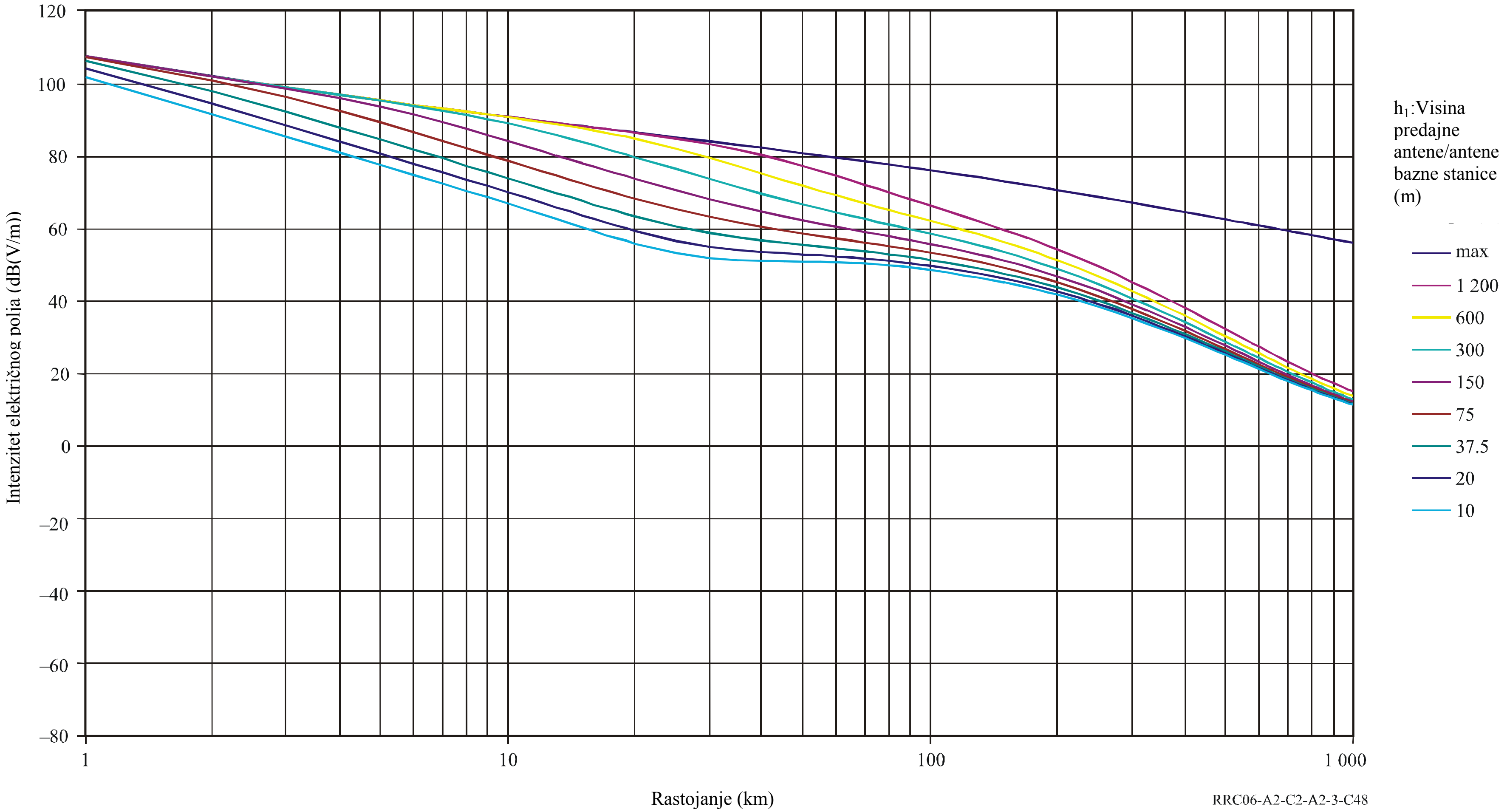


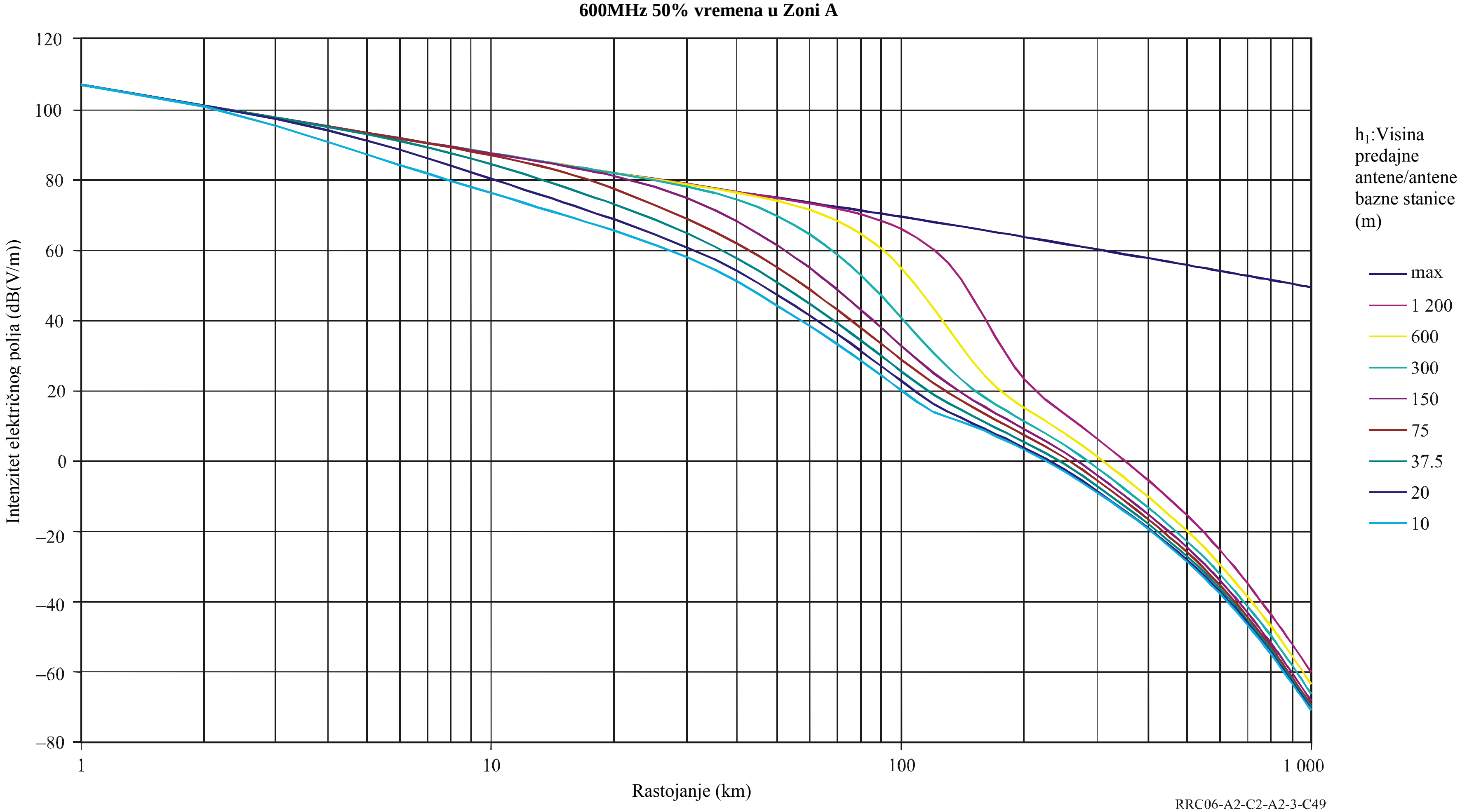
100MHz 10% vremena u Zoni A



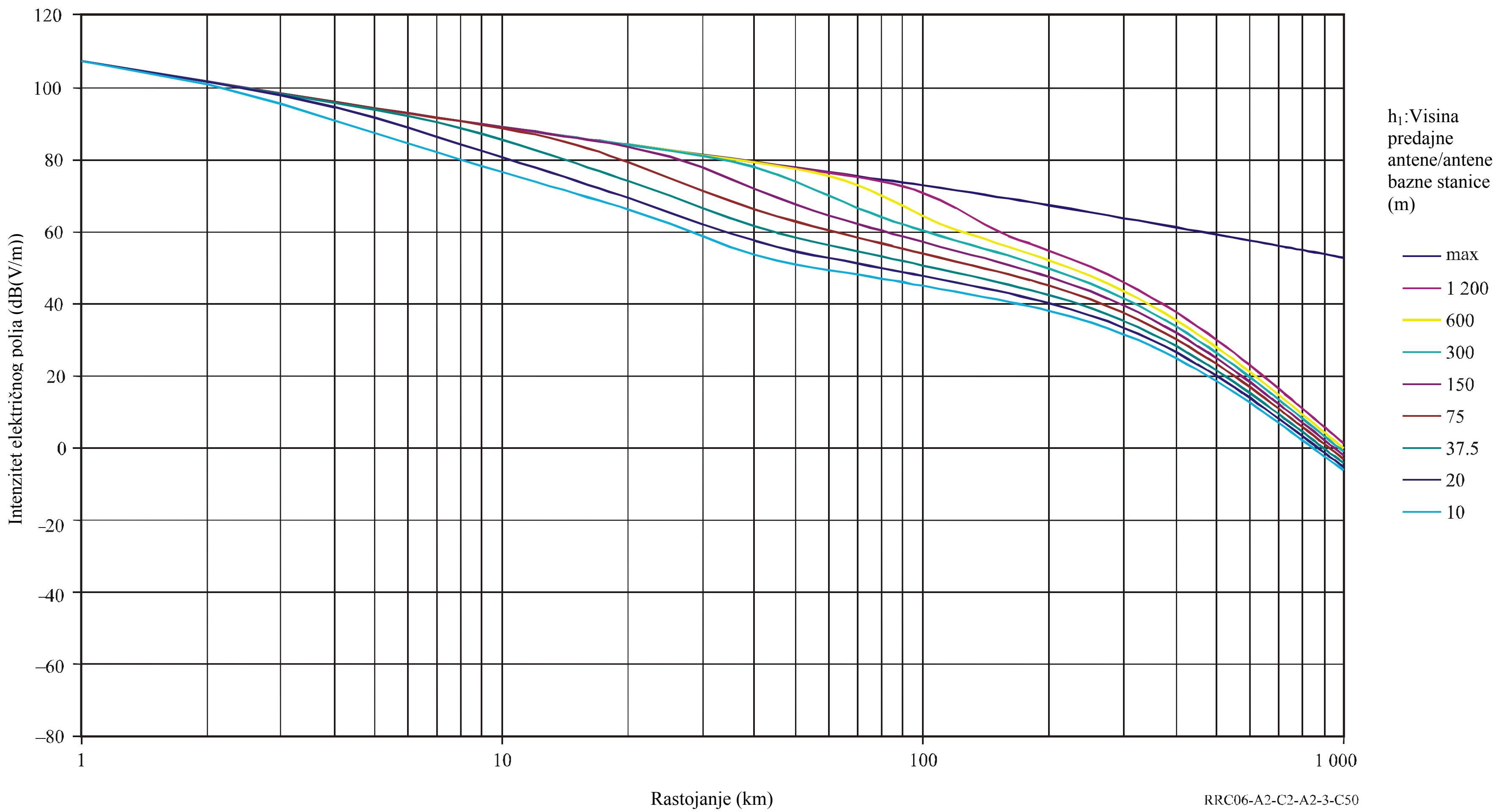
RRC06-A2-C2-A2-3-C47

100MHz 1% vremena u Zoni A

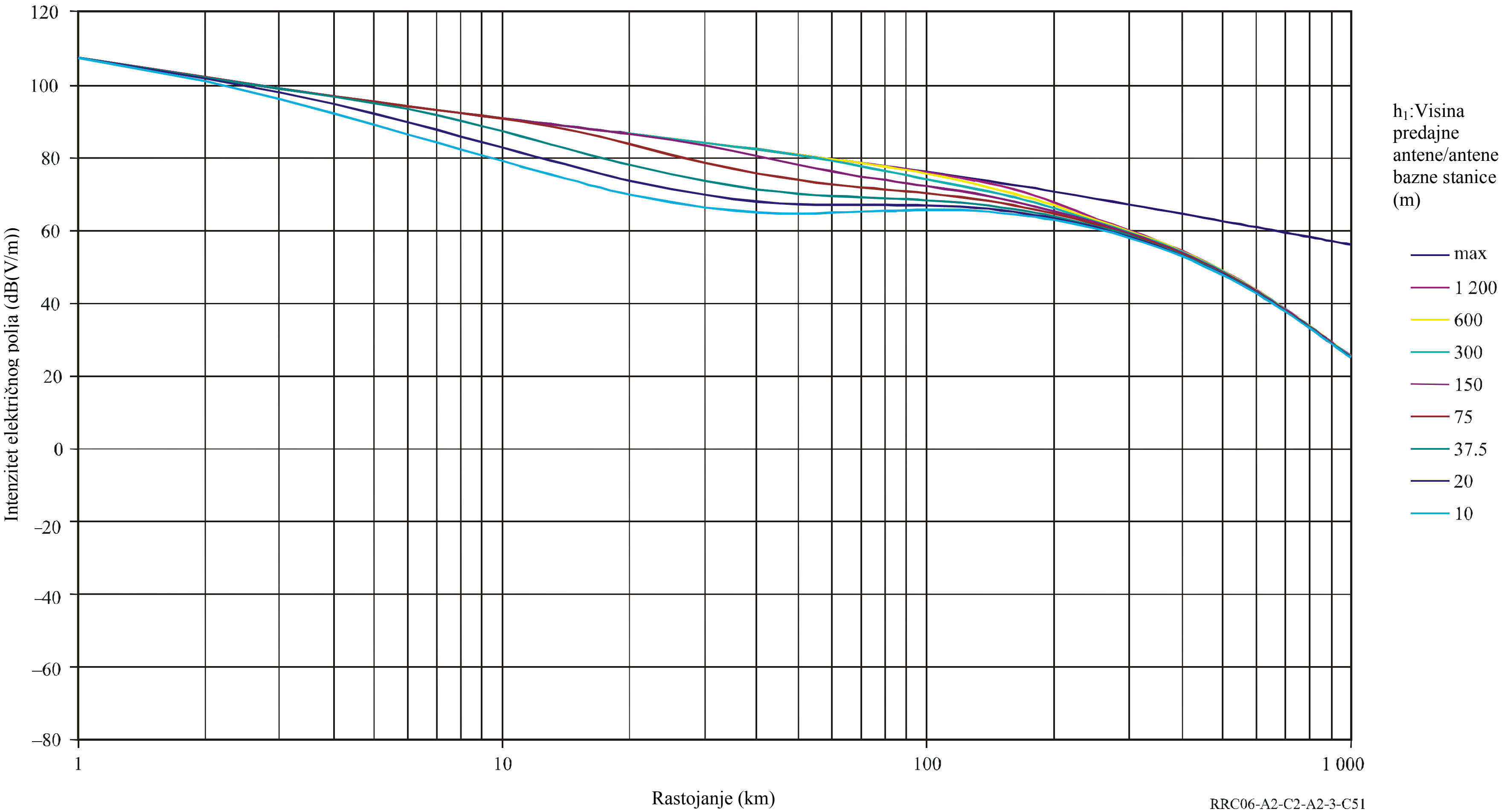



600MHz 50% vremena u Zoni A
120
100
80
60
40
20
0
–20
–40
–60
–80
Intenzitet električnog polja (dB(V/m))
1
10
100
1 000
Rastojanje (km)
h1:Visina predajne antene/antene bazne stanice (m)
max
1 200
600
300
150
75
37.5
20
10
RRC06-A2-C2-A2-3-C49

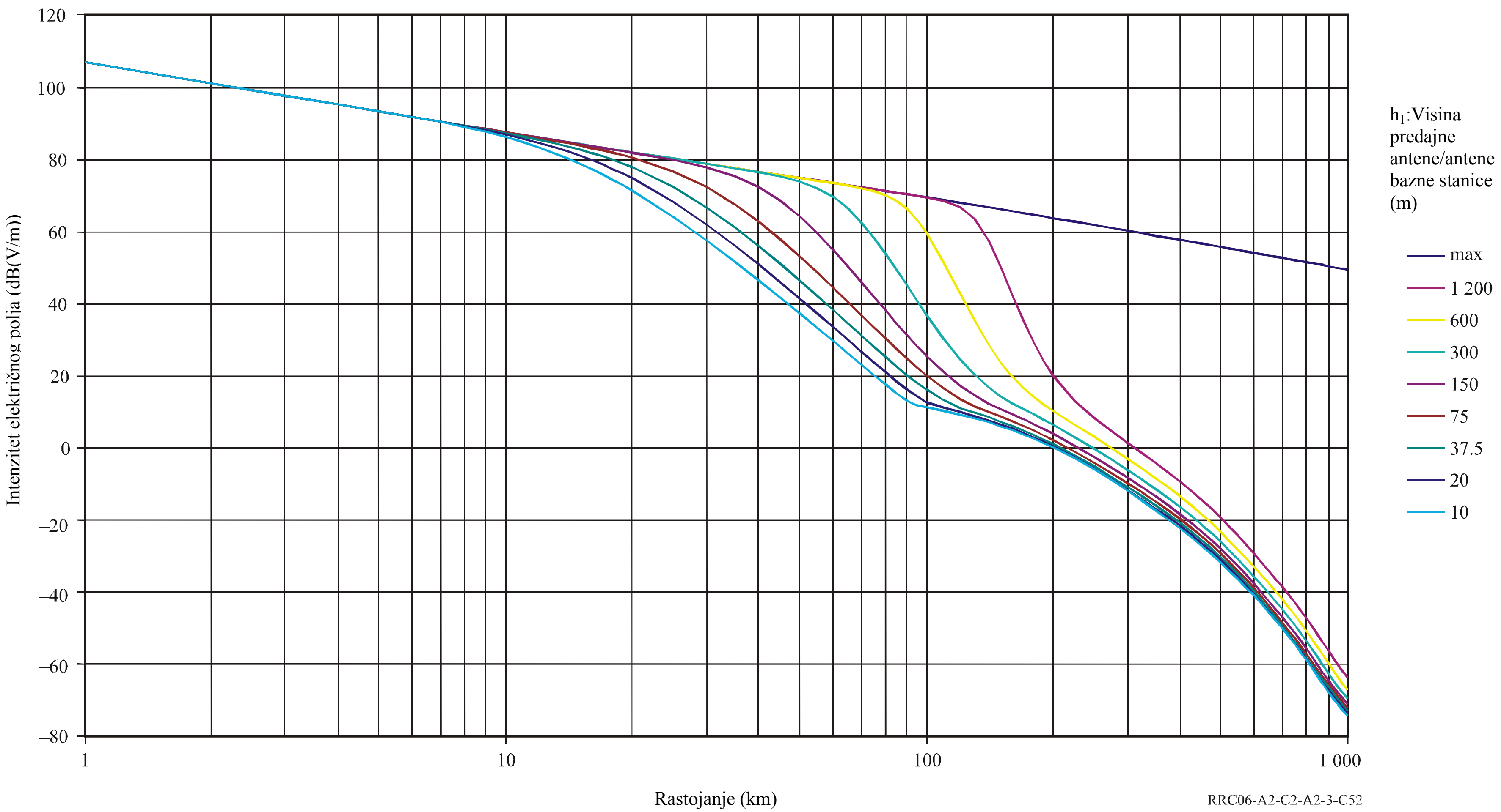
600MHz 10% vremena u Zoni A



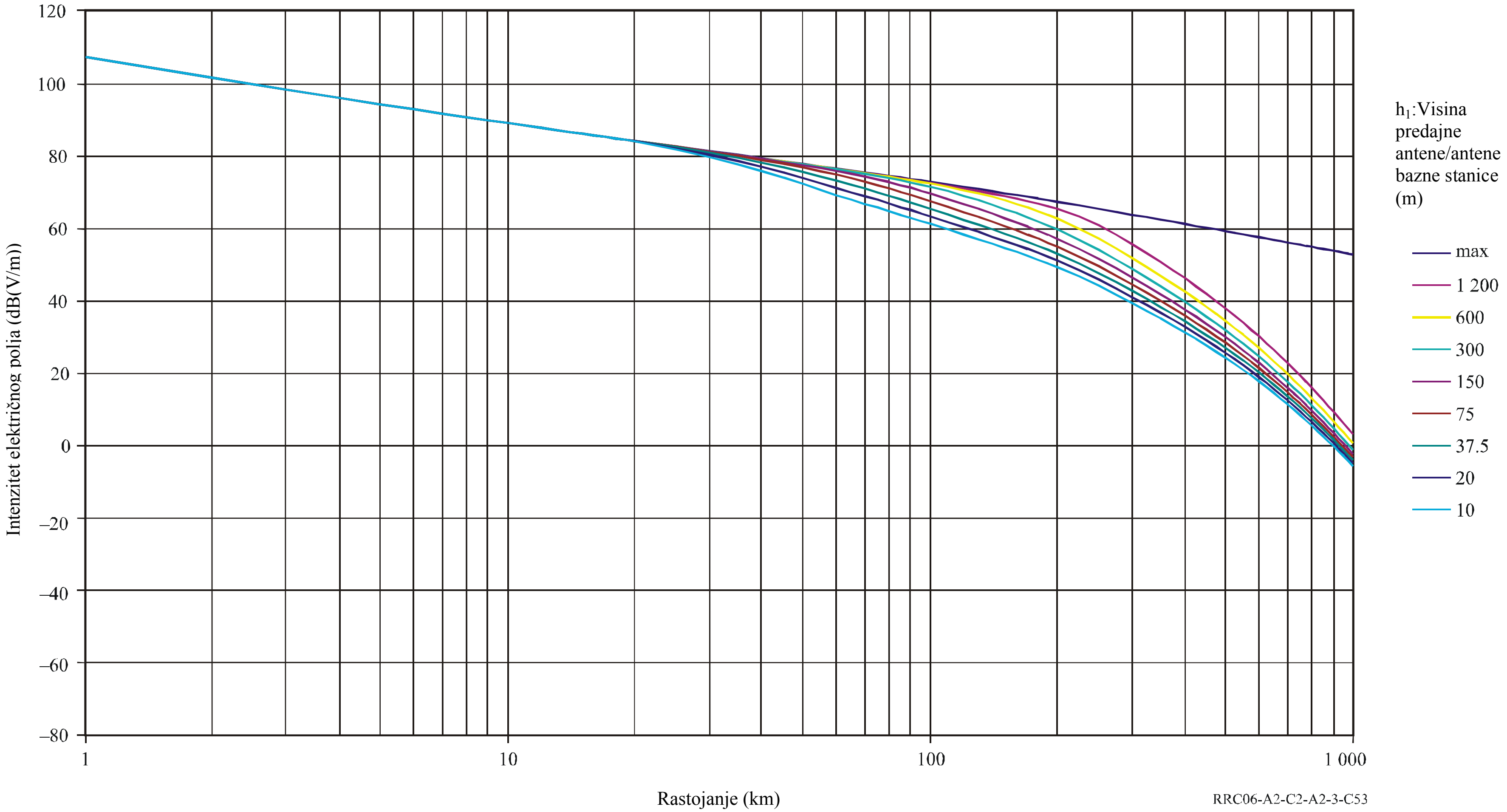
600MHz 1% vremena u Zoni A



2000MHz 50% vremena u Zoni A

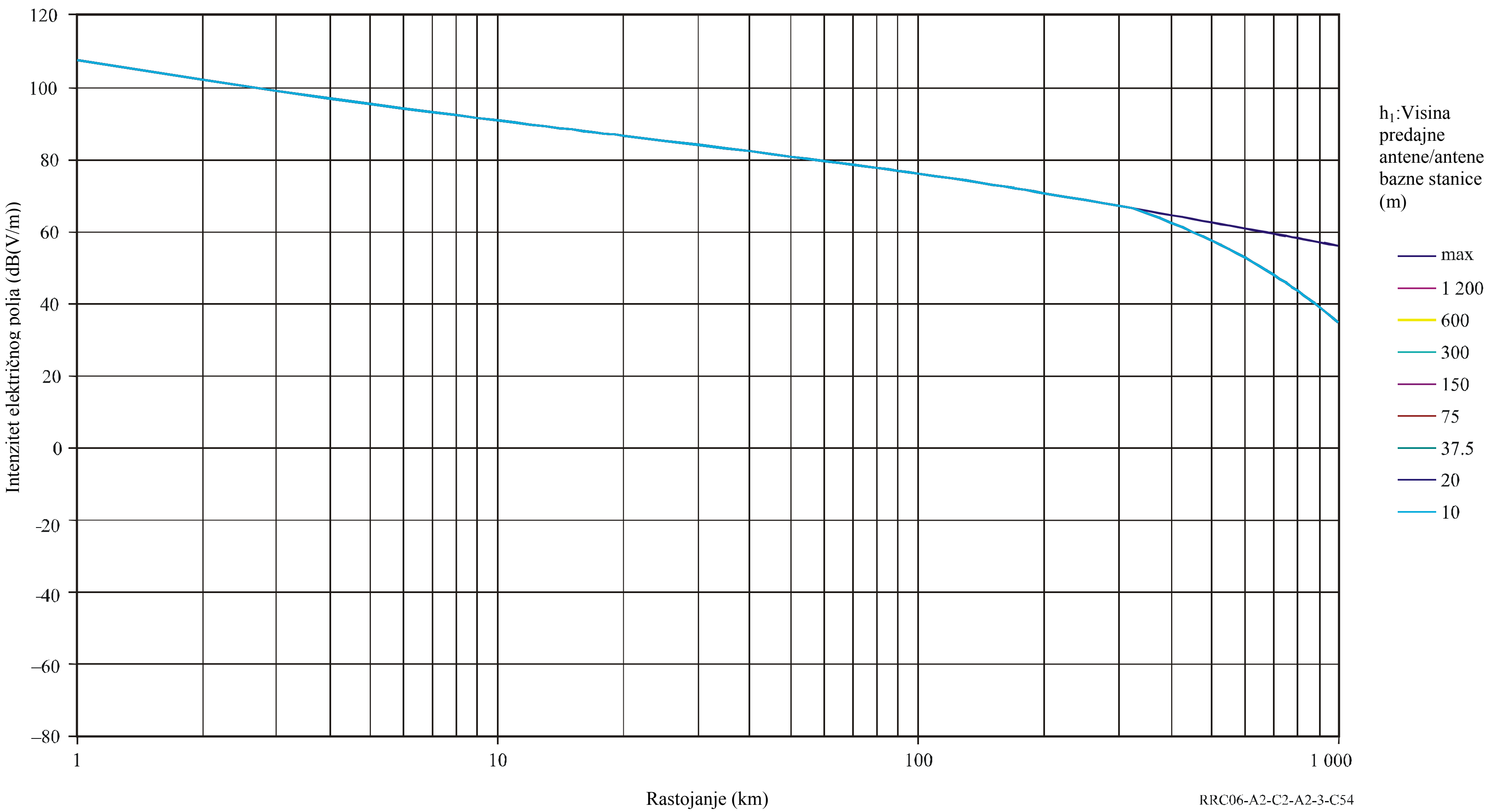


2000MHz 10% vremena u Zoni A

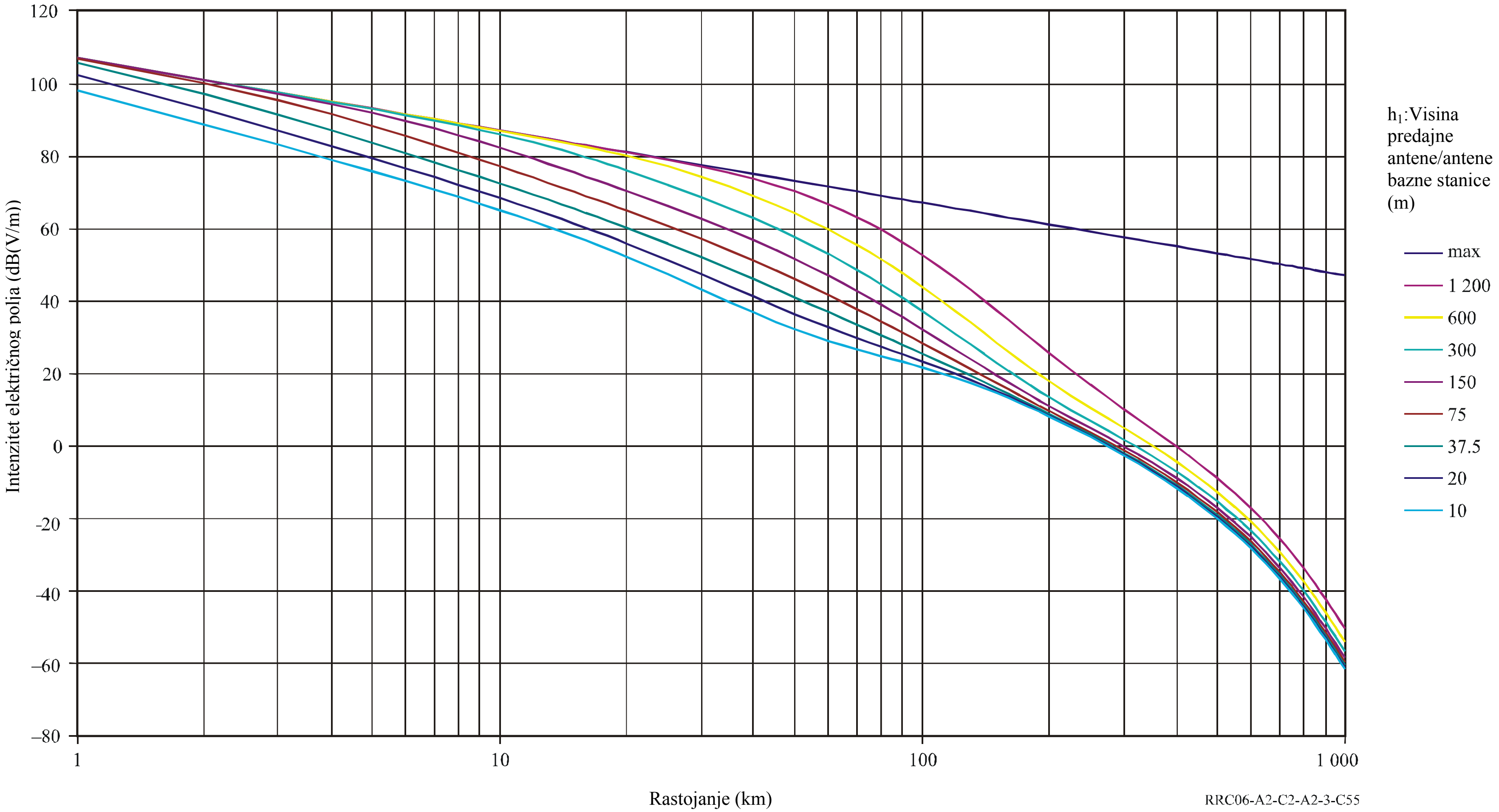


RRC06-A2-C2-A2-3-C53

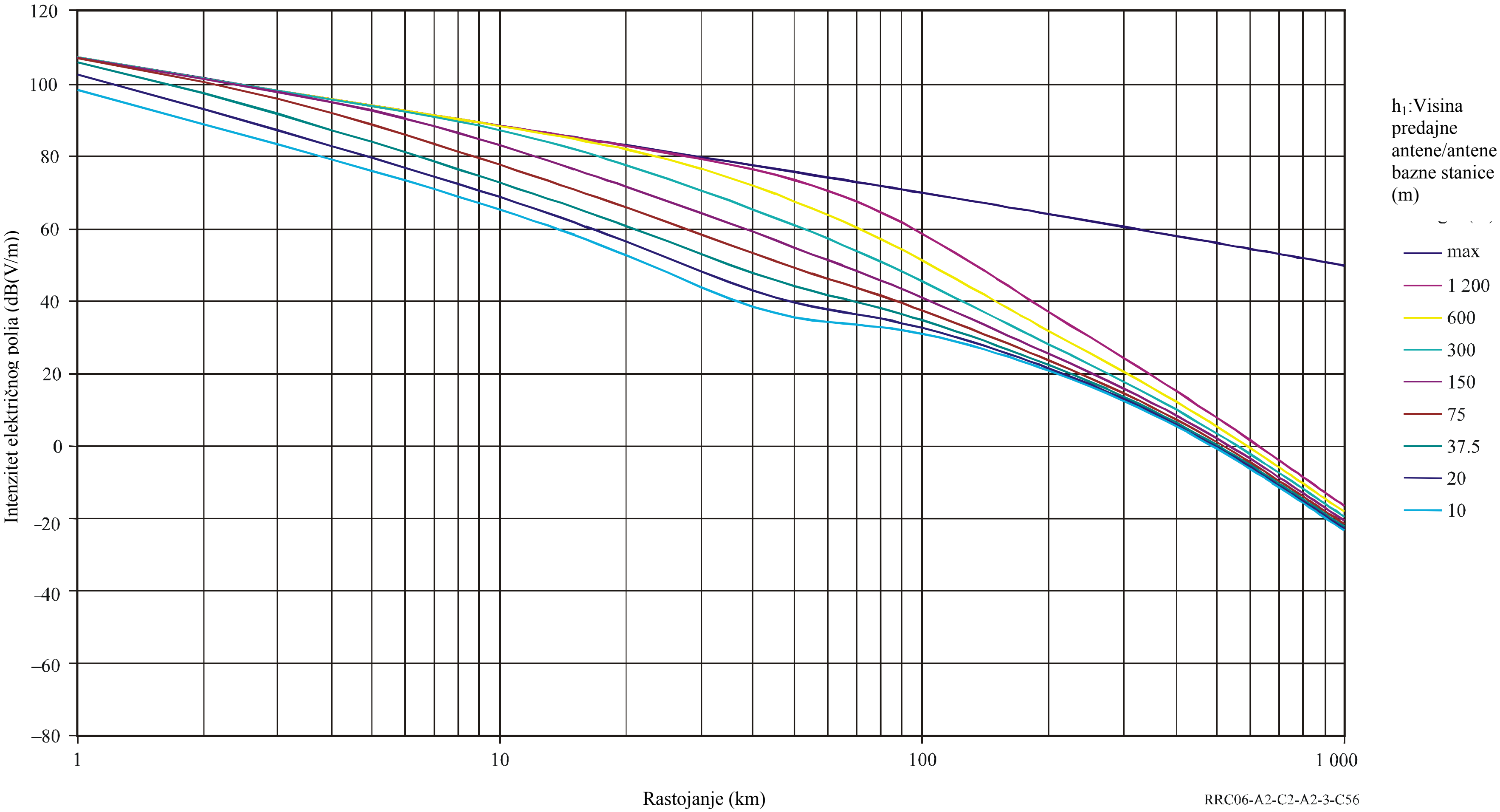
2000MHz 1% vremena u Zoni A



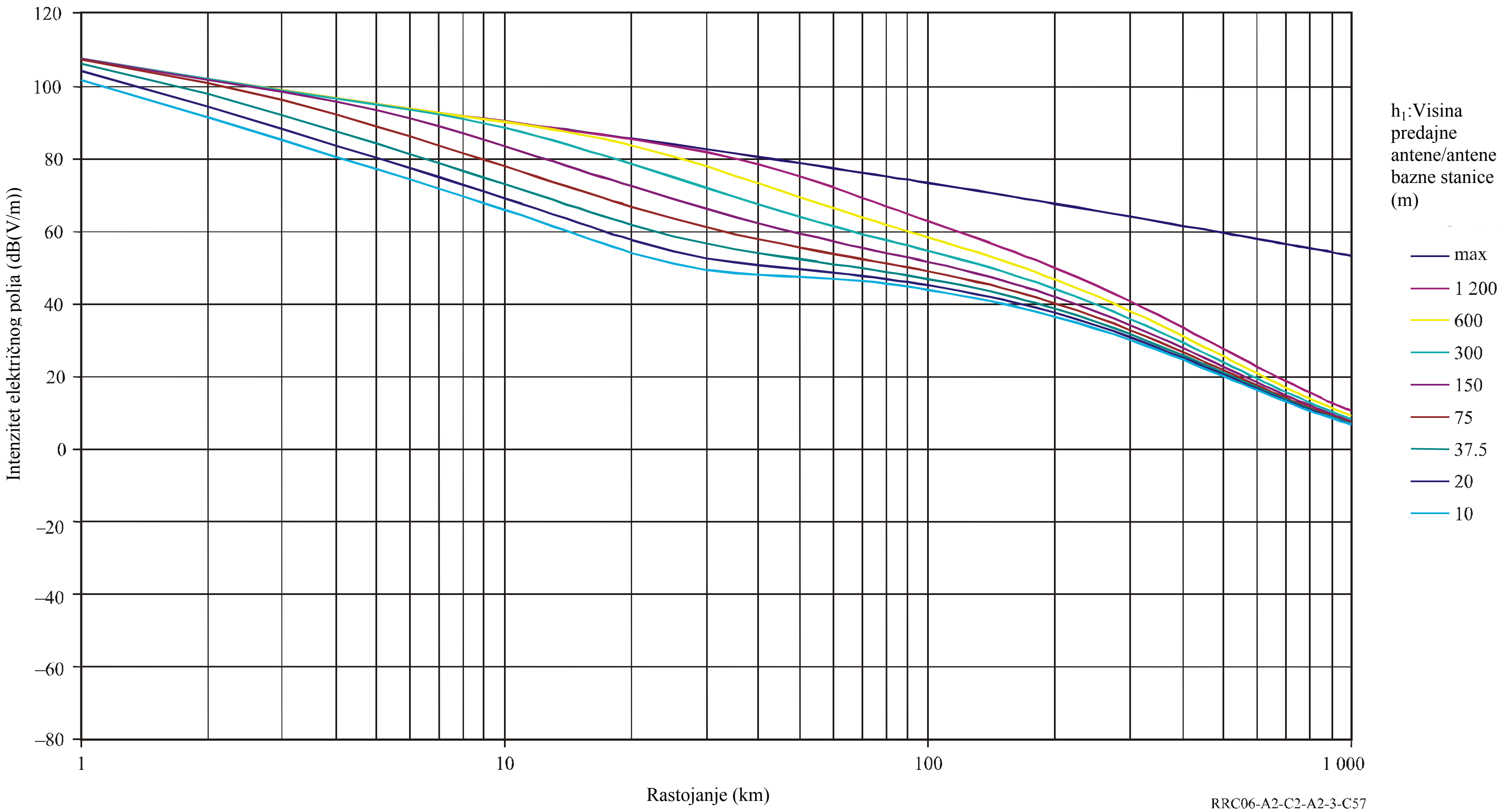
100MHz 50% vremena u Zoni B

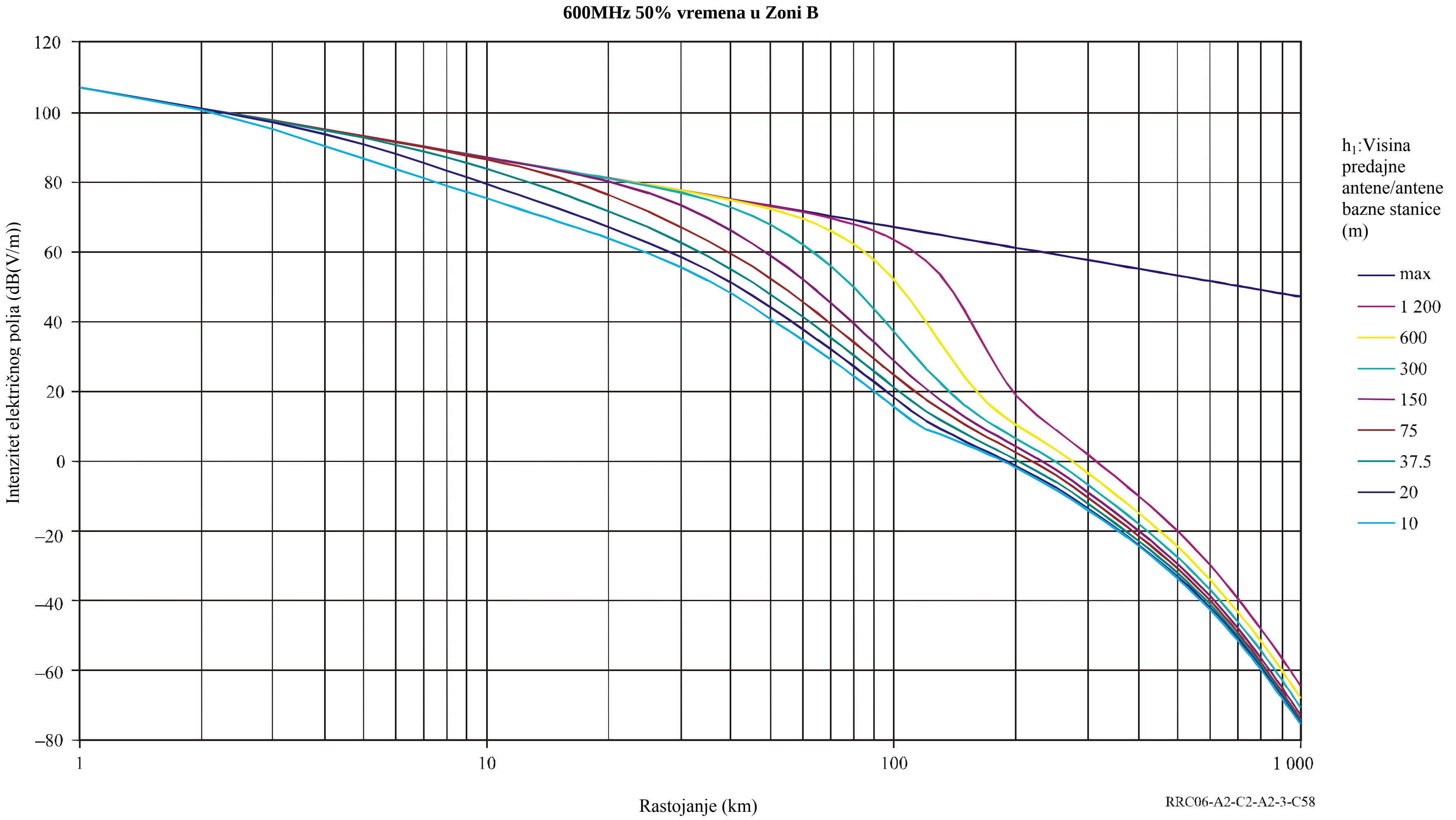


100MHz 10% vremena u Zoni B

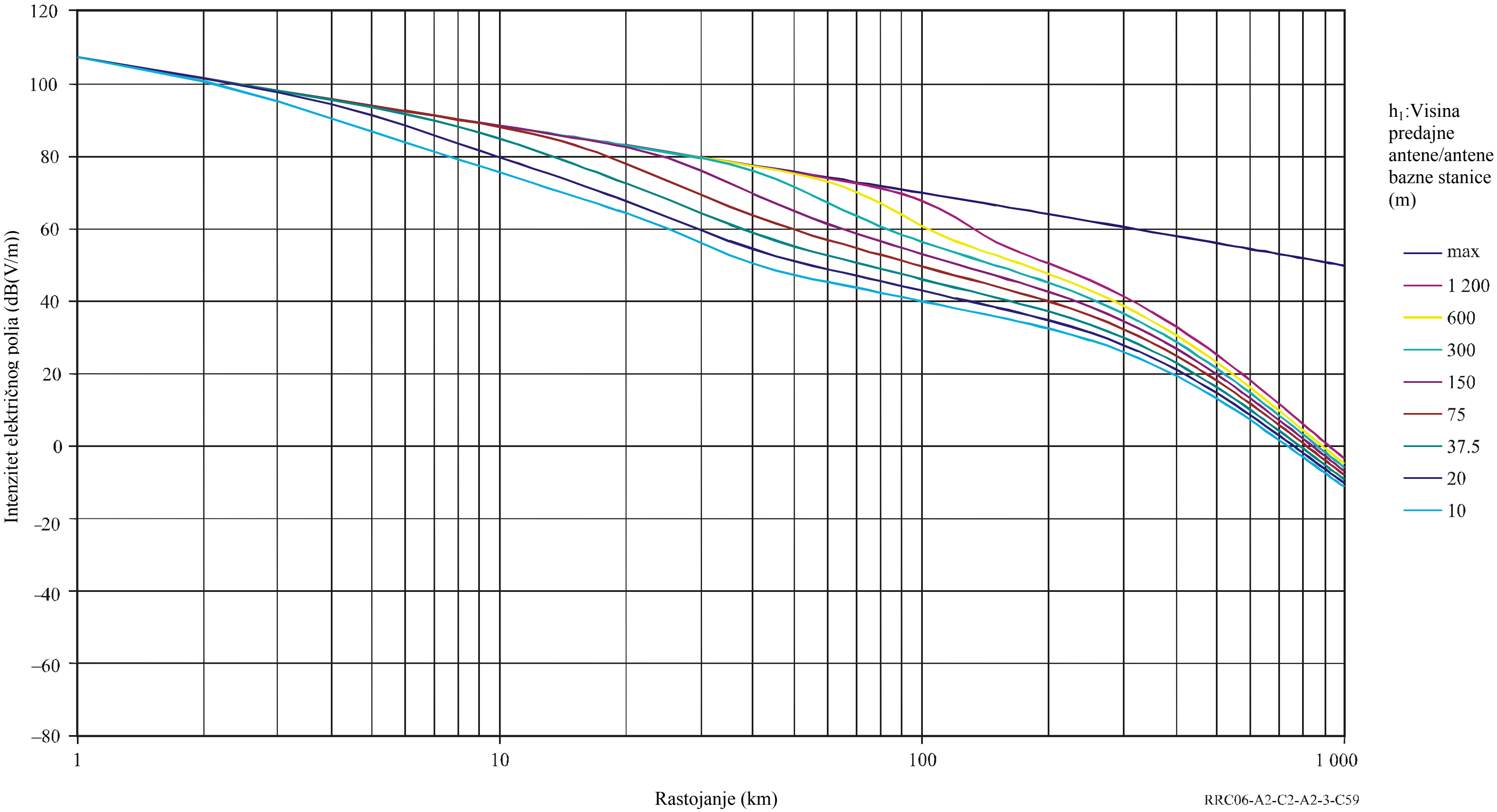


100MHz 1% vremena u Zoni B

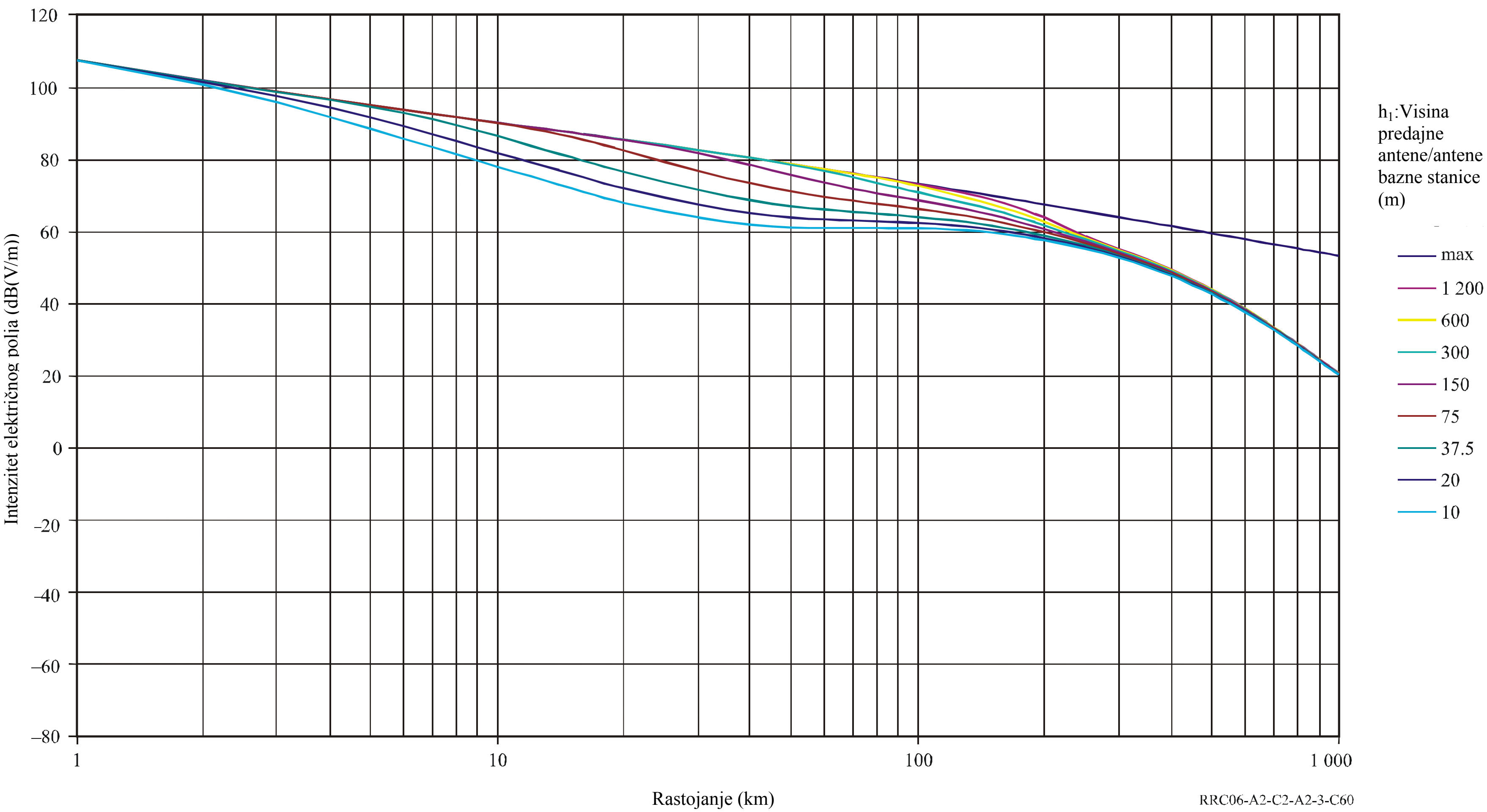


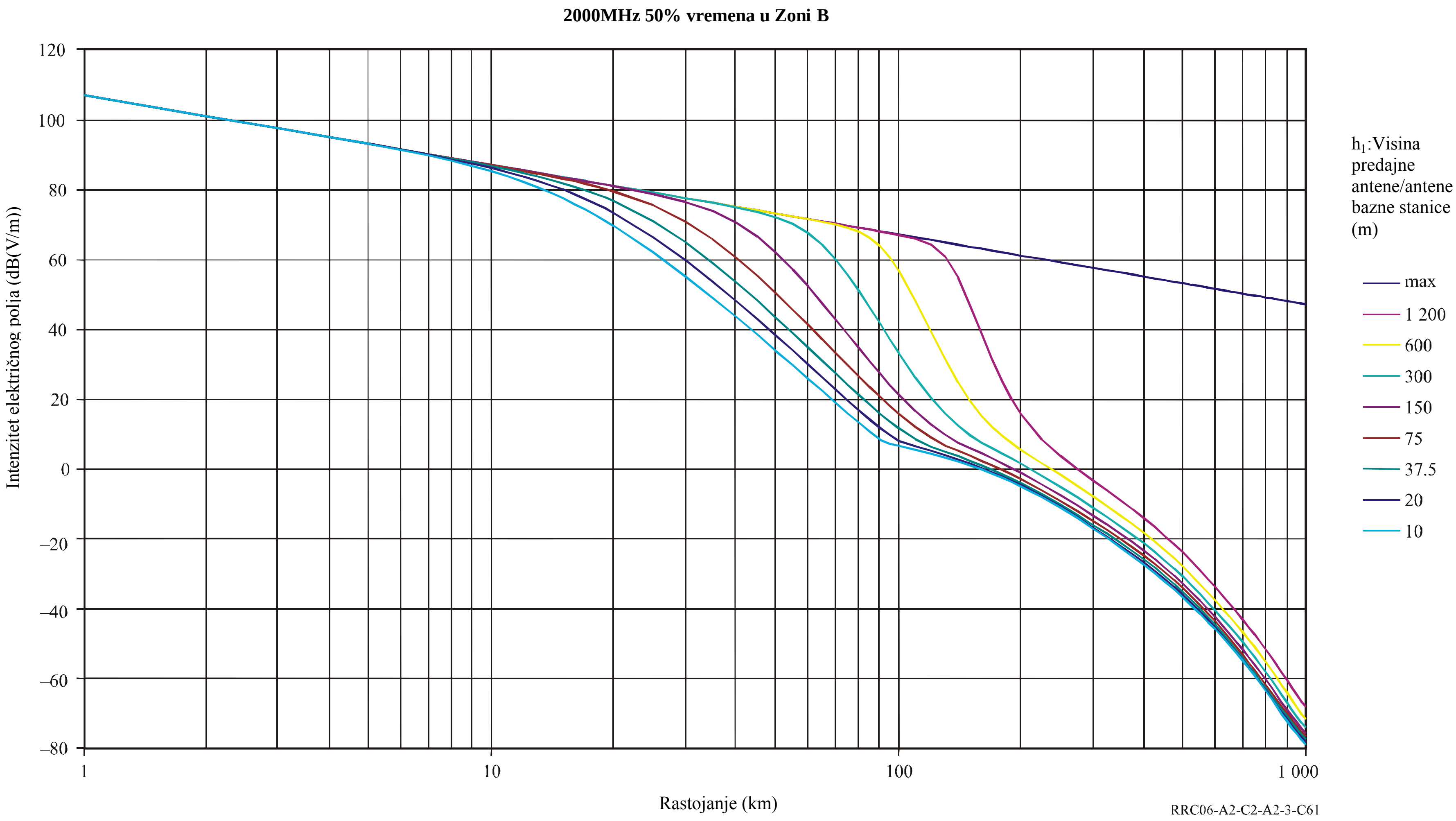

600MHz 50% vremena u Zoni B
Intenzitet električnog polja (dB(V/m))
120
100
80
60
40
20
0
–20
–40
–60
–80
1
10
100
1 000
Rastojanje (km)
h1:Visina predajne antene/antene bazne stanice (m)
max
1 200
600
300
150
75
37.5
20
10
RRC06-A2-C2-A2-3-C58

600MHz 10% vremena u Zoni B

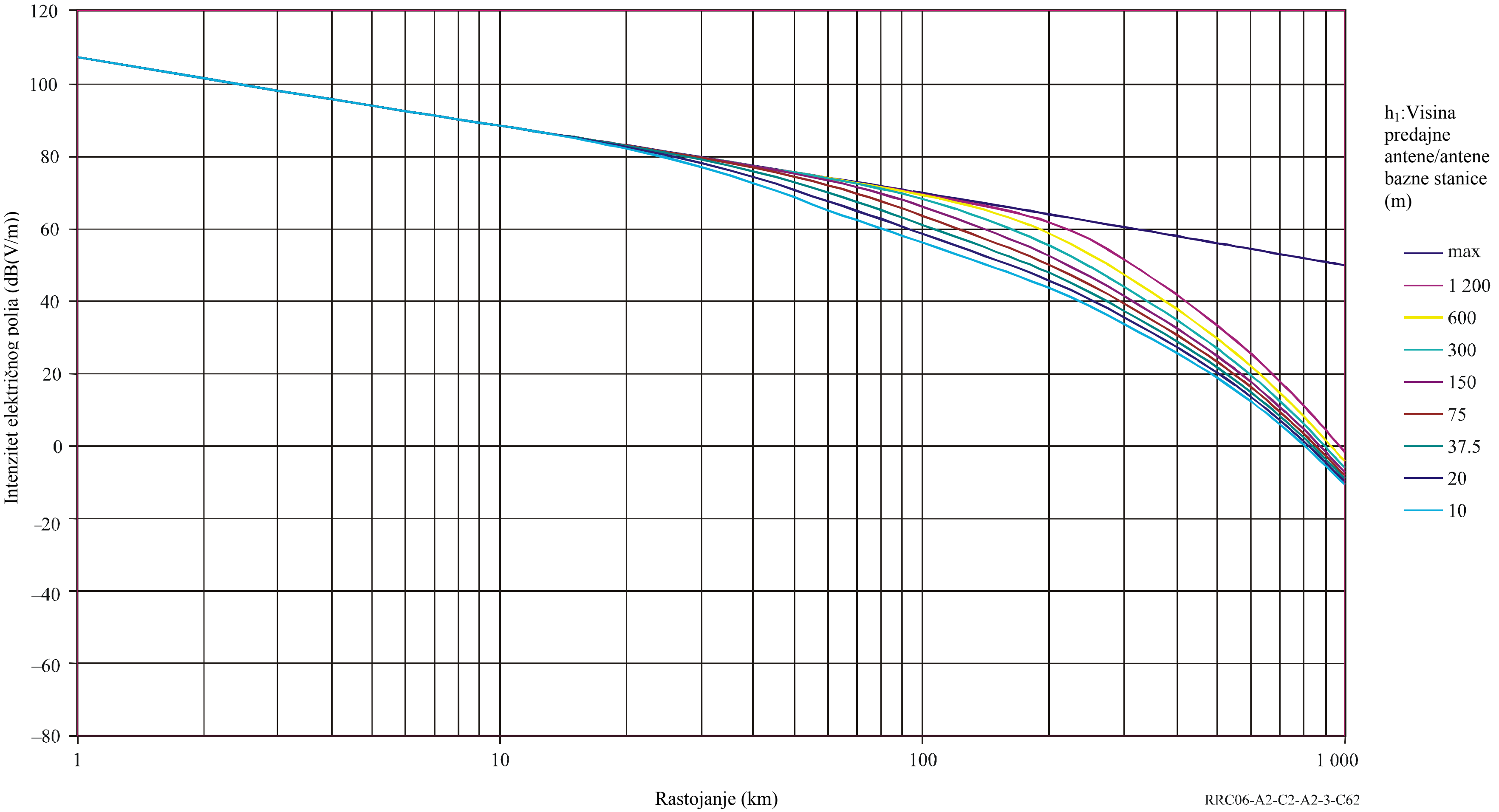


600MHz 1% vremena u Zoni B



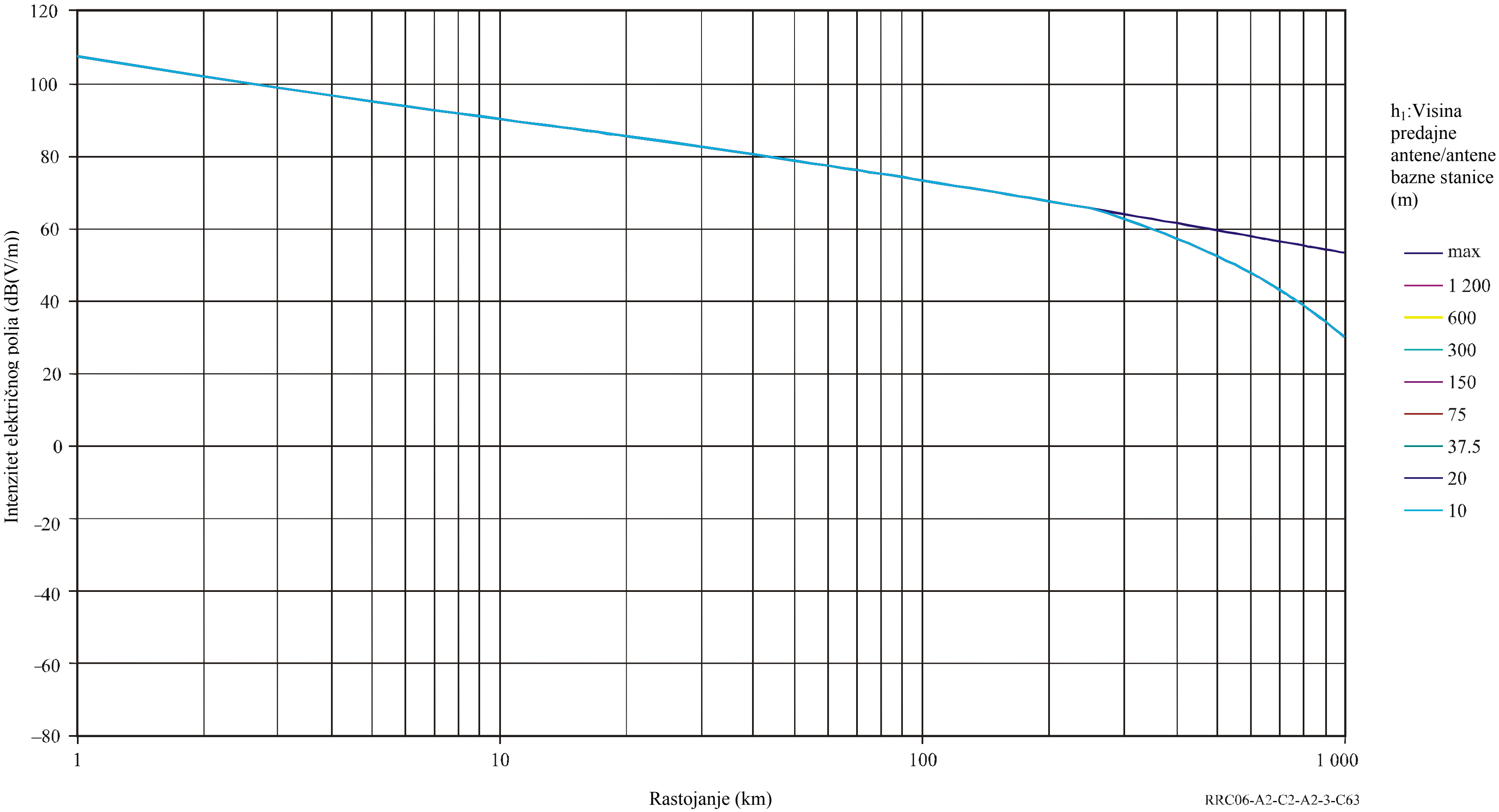

2000MHz 50% vremena u Zoni B
120
100
80
60
40
20
0
–20
–40
–60
–80
Intenzitet električnog polja (dB(V/m))
1
10
100
1 000
Rastojanje (km)
h1:Visina predajne antene/antene bazne stanice (m)
max
1 200
600
300
150
75
37.5
20
10
RRC06-A2-C2-A2-3-C61

2000MHz 10% vremena u Zoni B



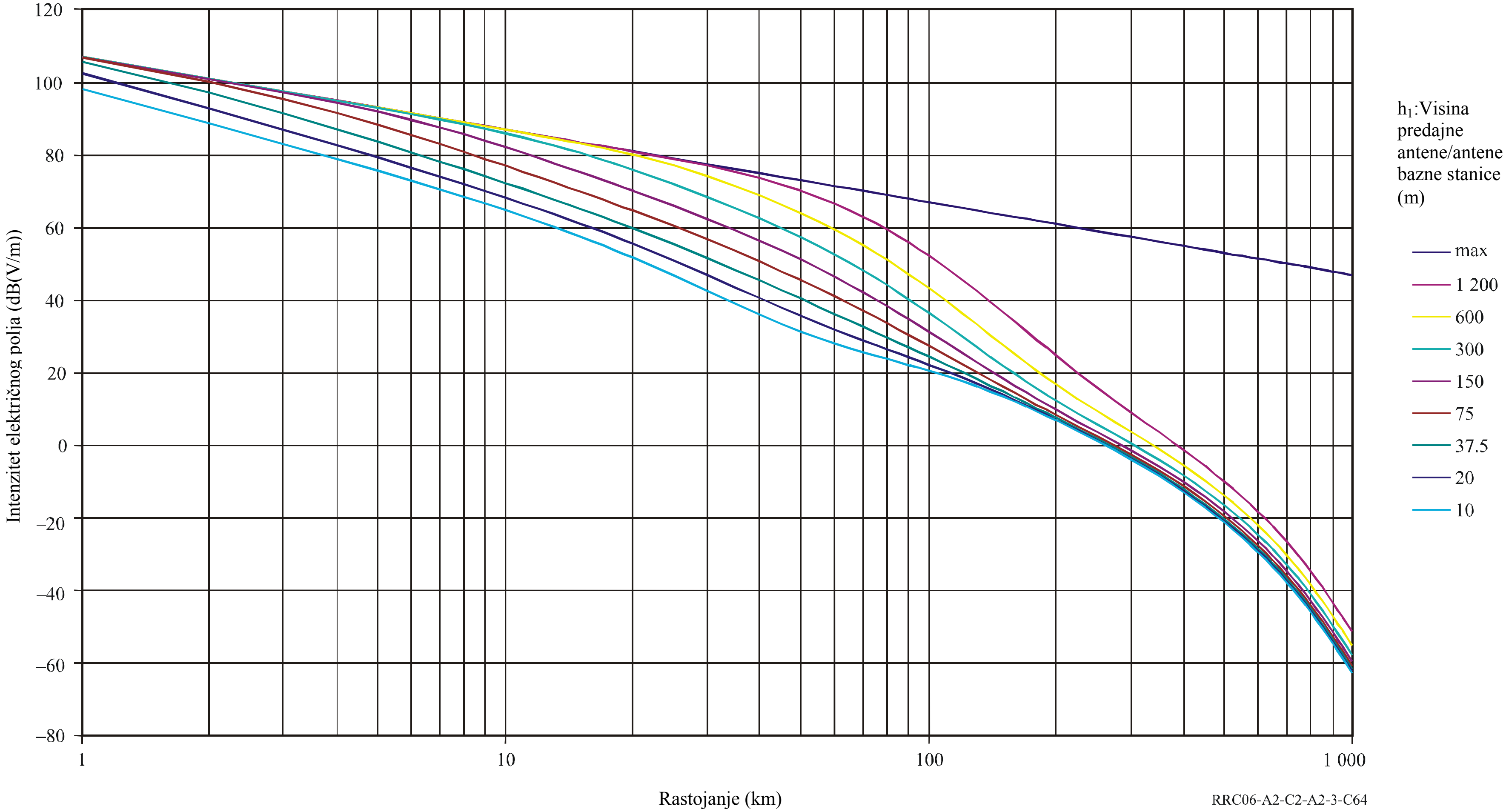
RRC06-A2-C2-A2-3-C62

2000MHz 1% vremena u Zoni B

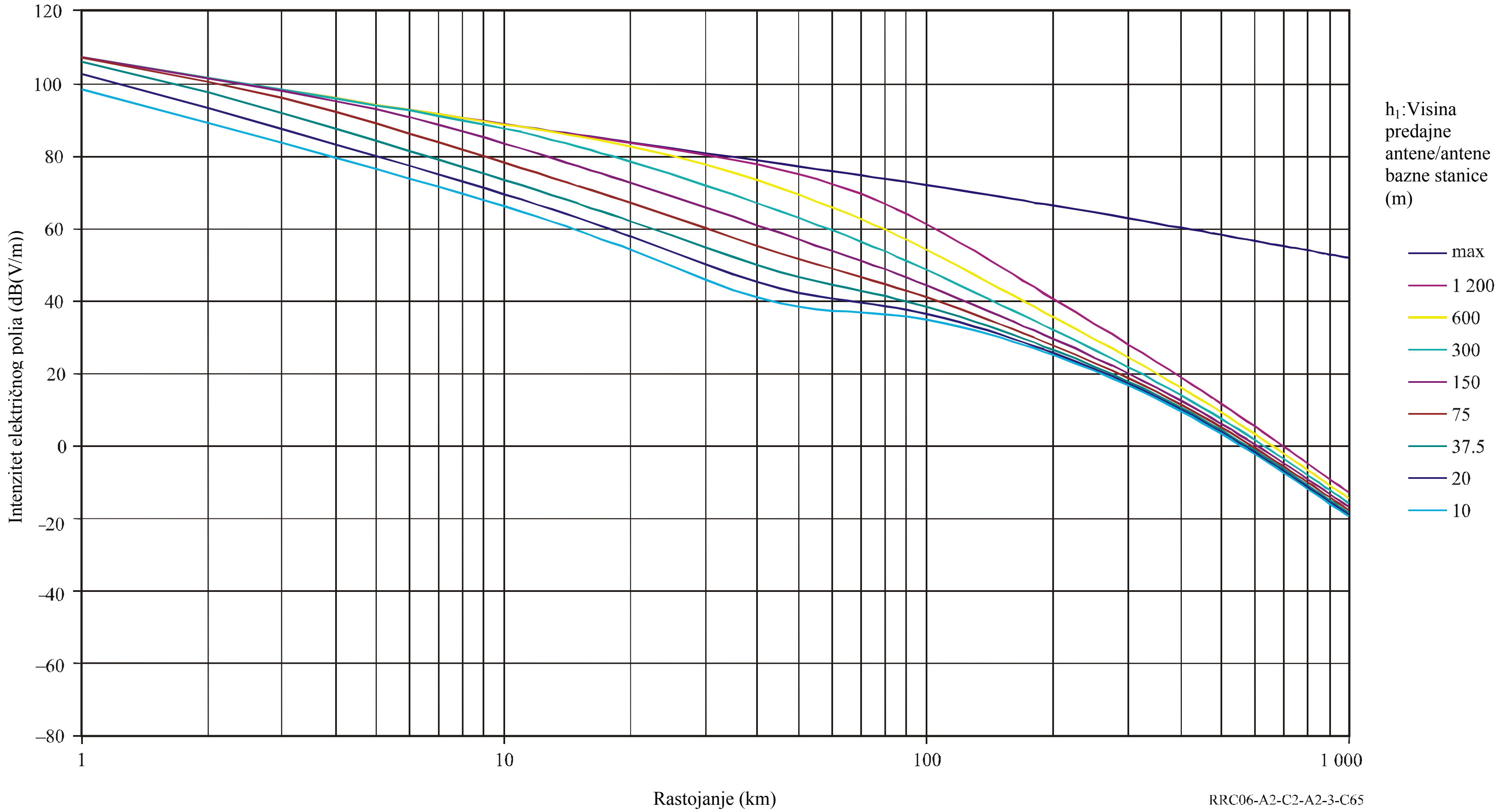


RRC06-A2-C2-A2-3-C63

100MHz 50% vremena u Zoni C

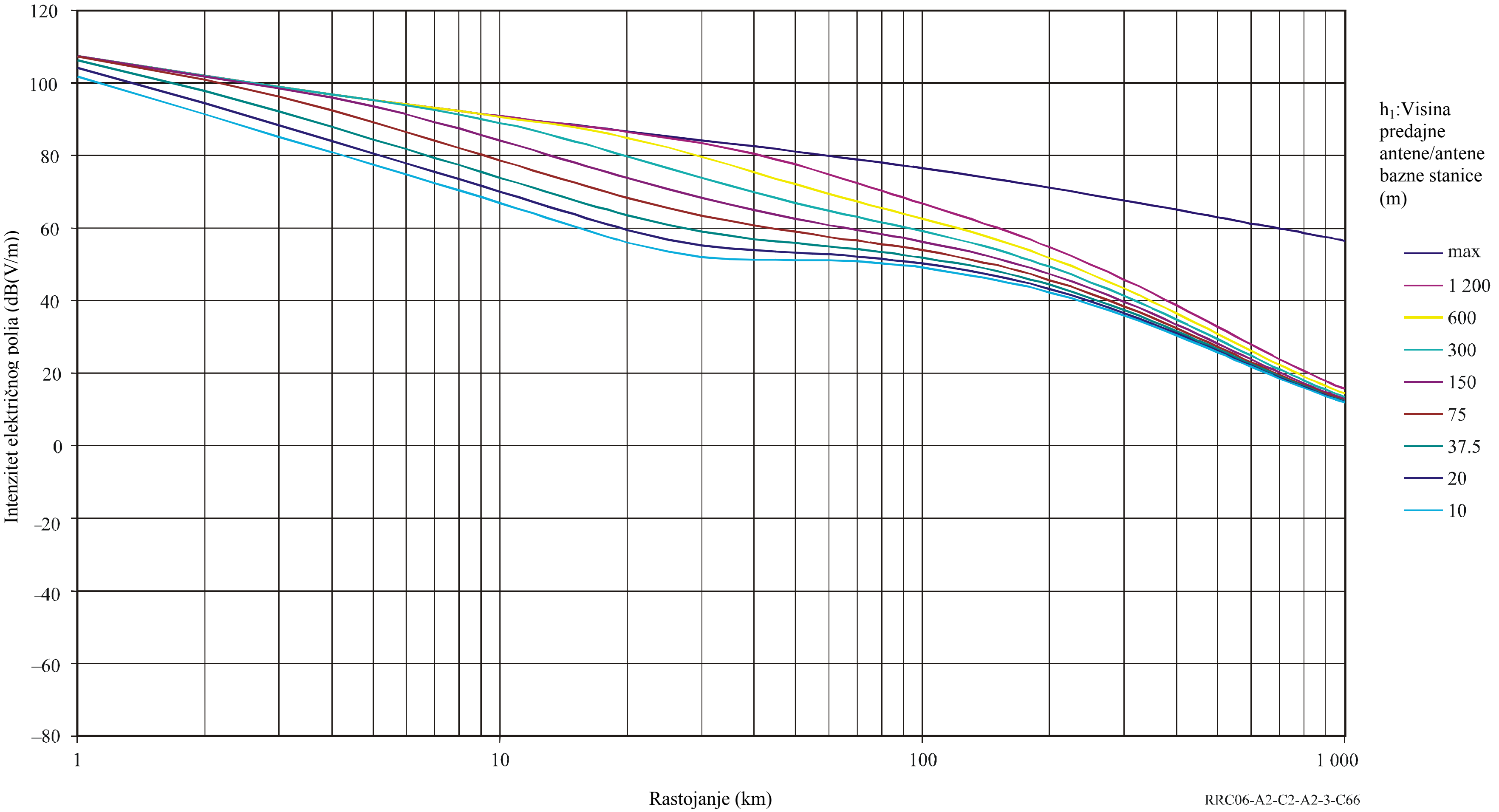


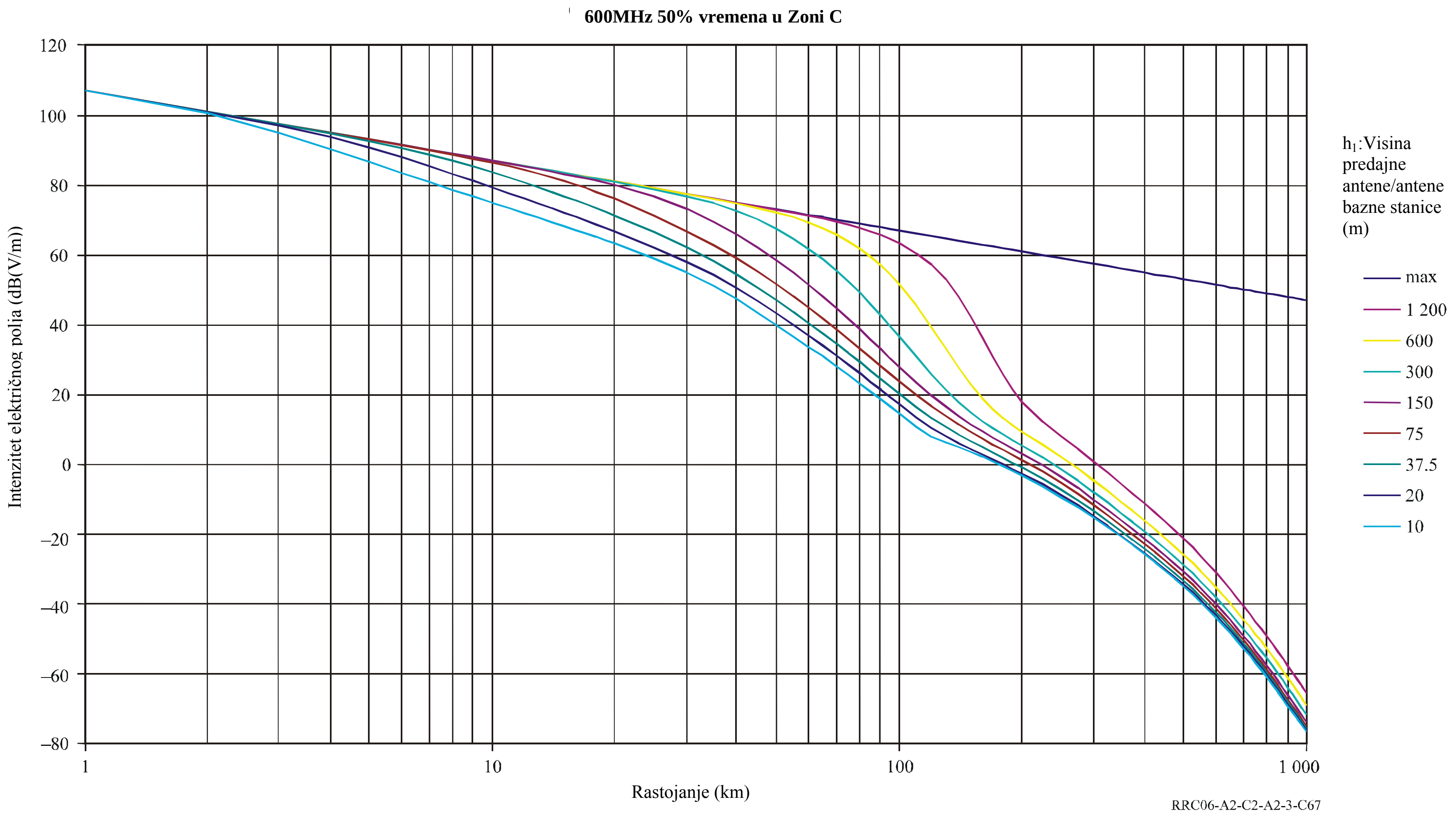
100MHz 10% vremena u Zoni C



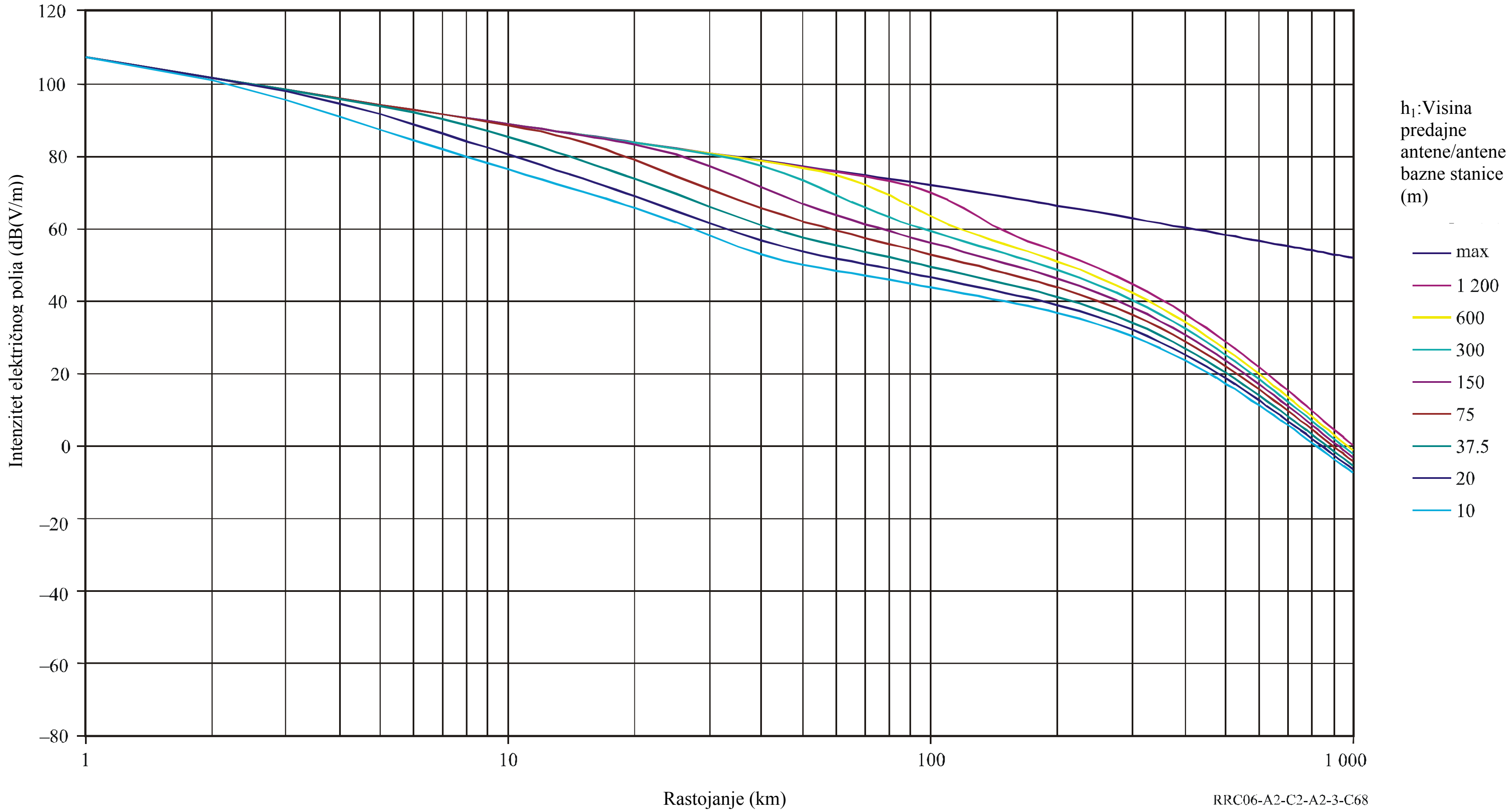
RRC06-A2-C2-A2-3-C65

100MHz 1% vremena u Zoni C

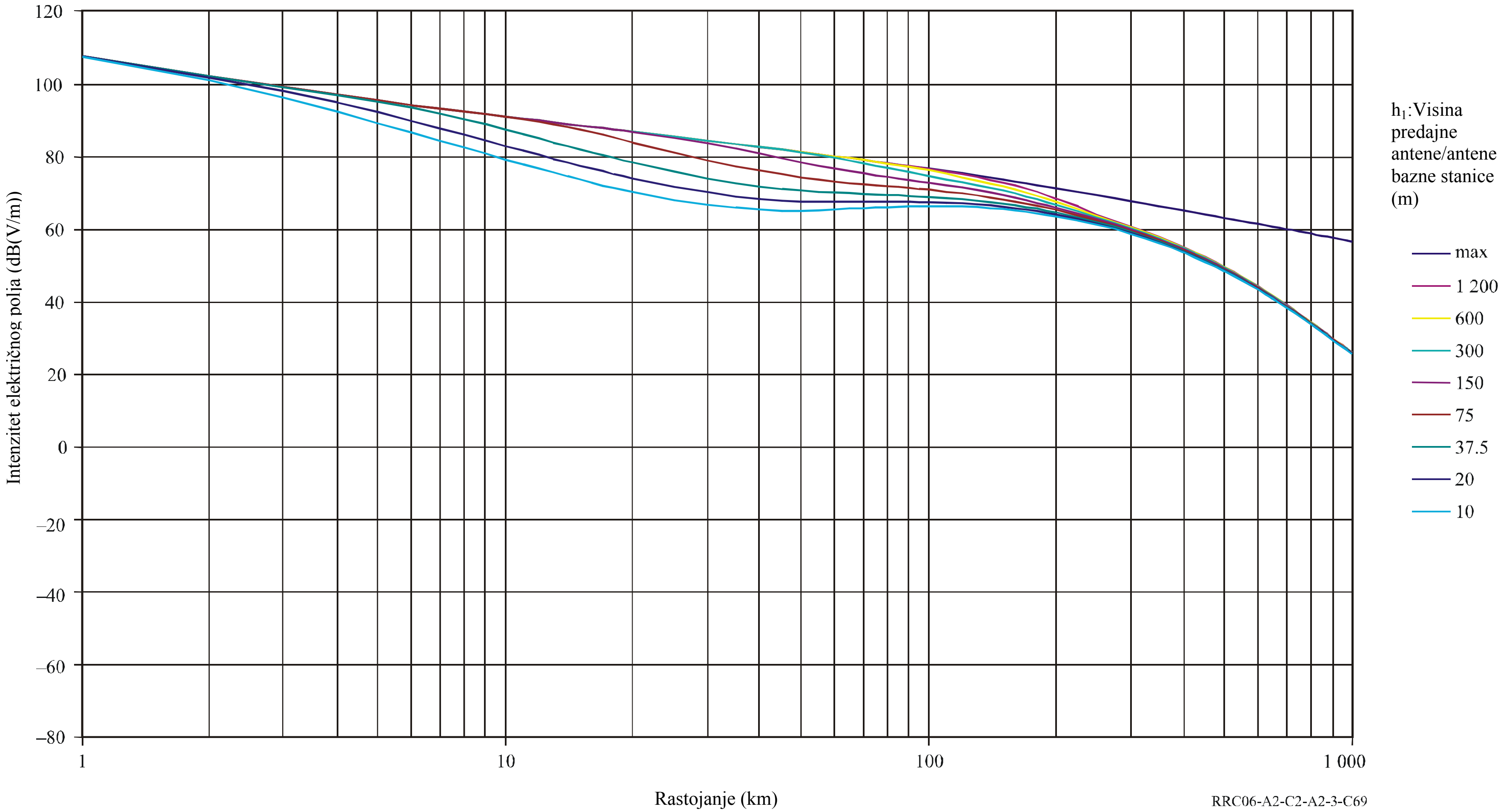



600MHz 50% vremena u Zoni C
120
100
80
60
40
20
0
–20
–40
–60
–80
Intenzitet električnog polja (dB(V/m))
1
10
100
1 000
Rastojanje (km)
h1:Visina predajne antene/antene bazne stanice (m)
max
1 200
600
300
150
75
37.5
20
10
RRC06-A2-C2-A2-3-C67

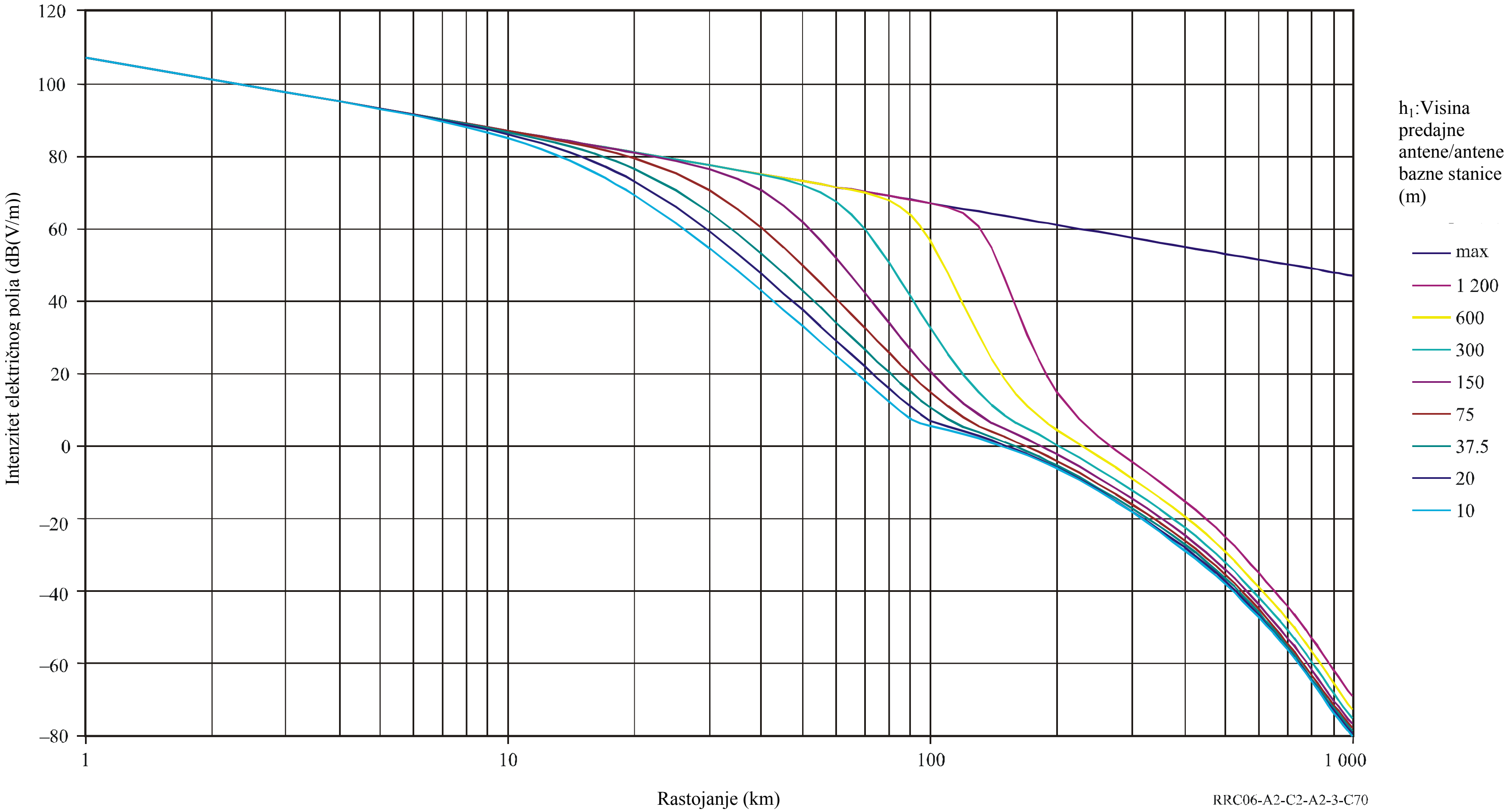
600MHz 10% vremena u Zoni C



600MHz 1% vremena u Zoni C

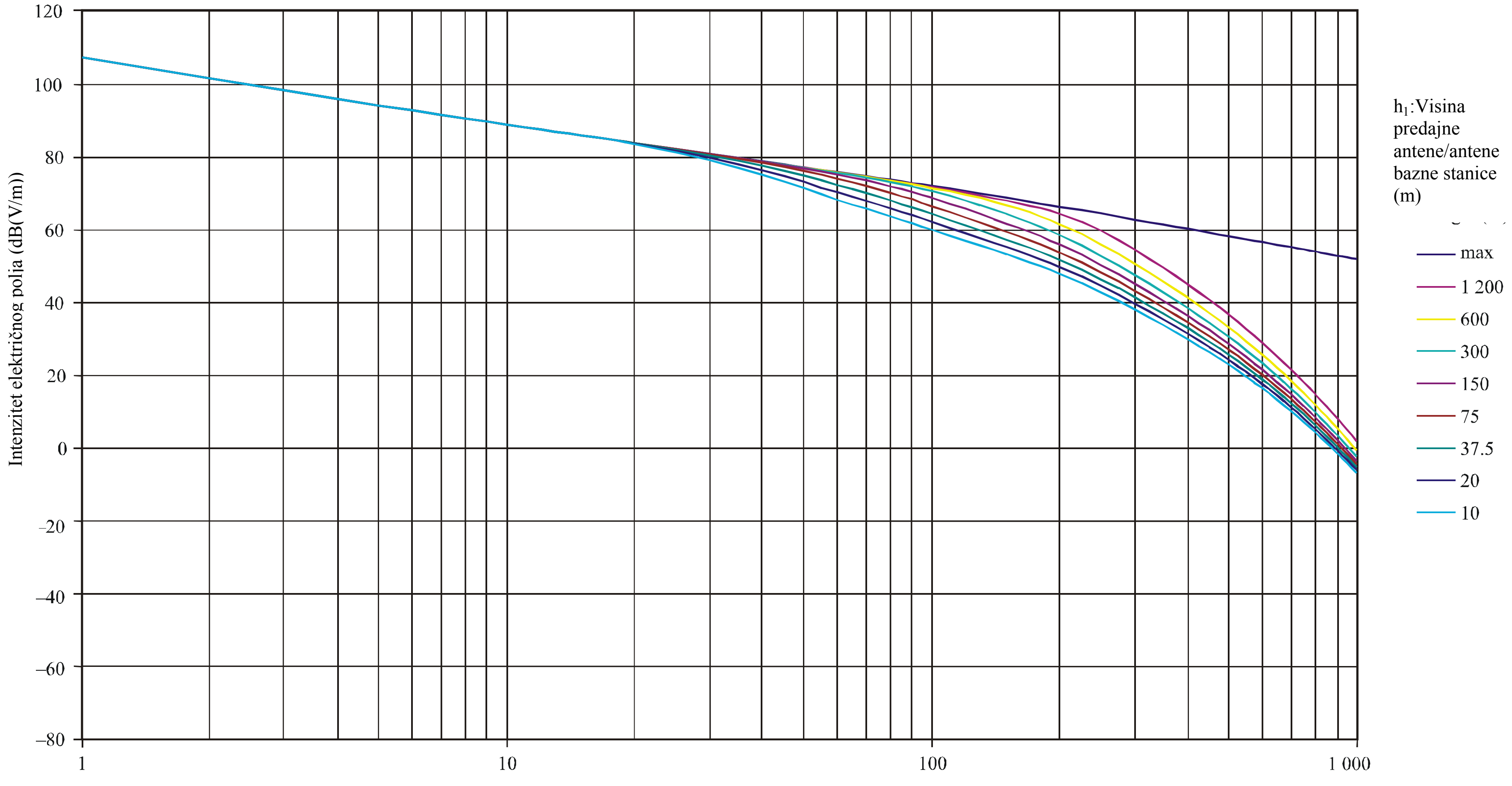


2000MHz 50% vremena u Zoni C



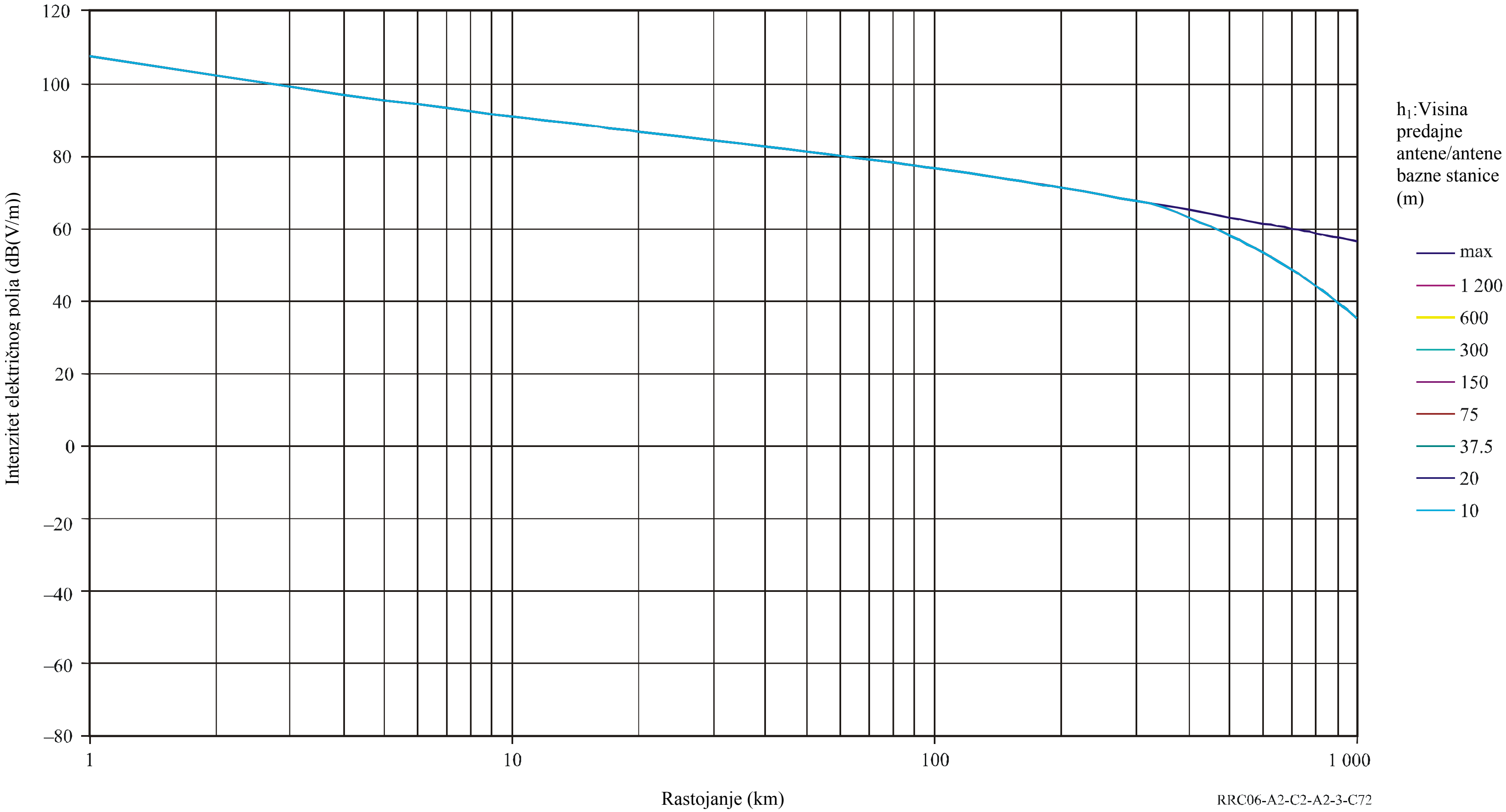
RRC06-A2-C2-A2-3-C70

2000MHz 10% vremena u Zoni C



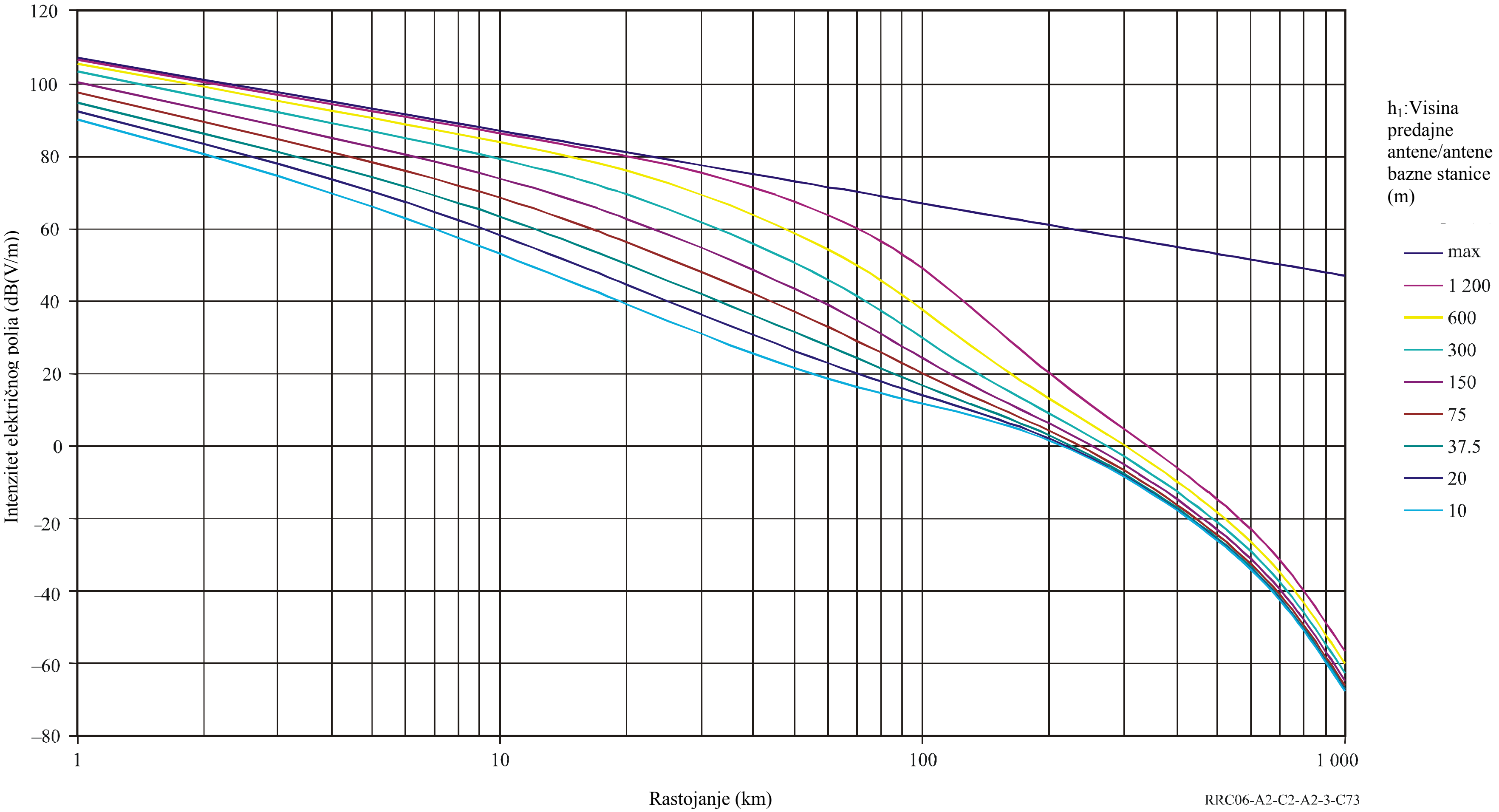
RRC06-A2-C2-A2-3-C71

2000MHz 1% vremena u Zoni C

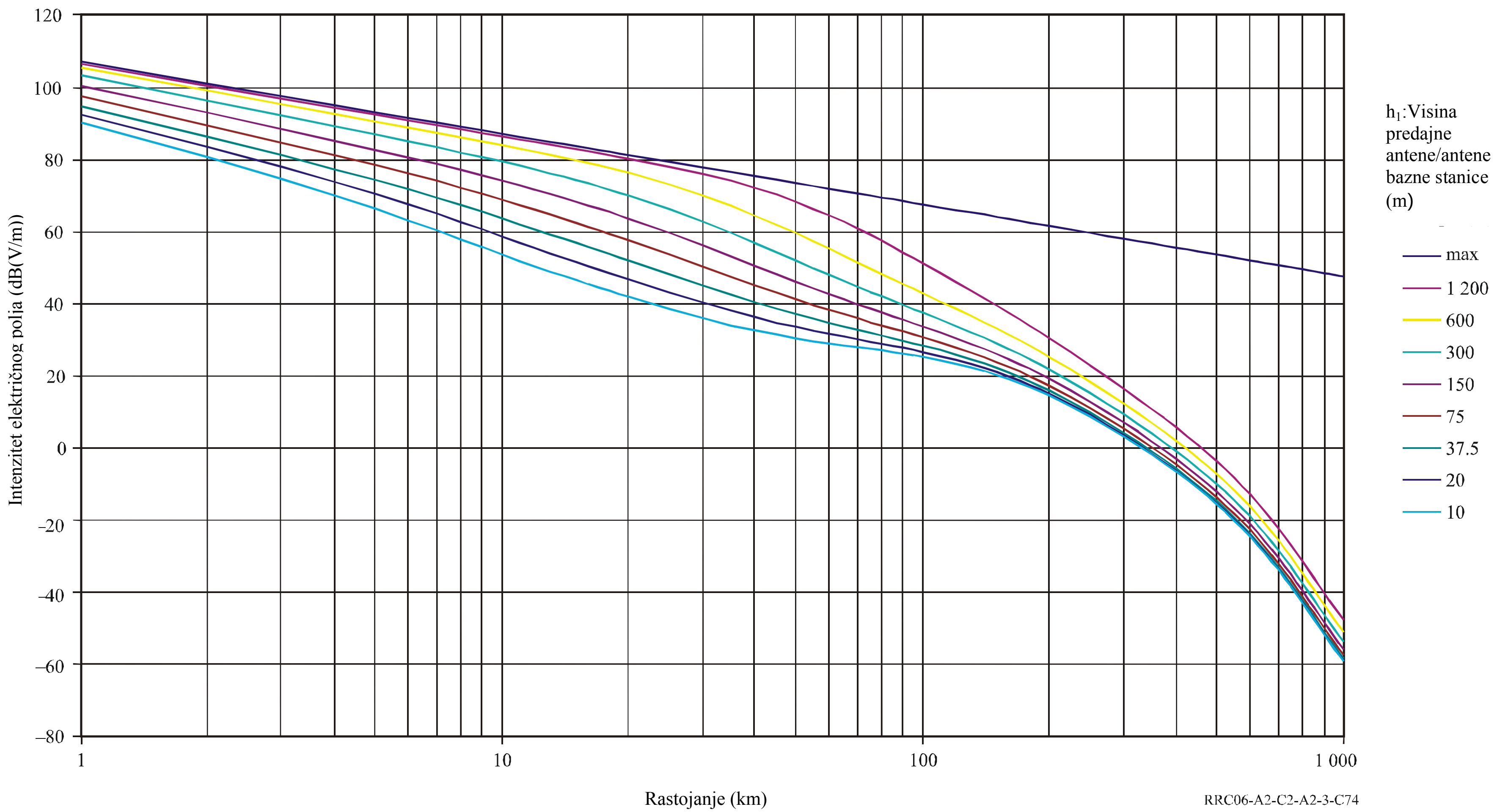


RRC06-A2-C2-A2-3-C72

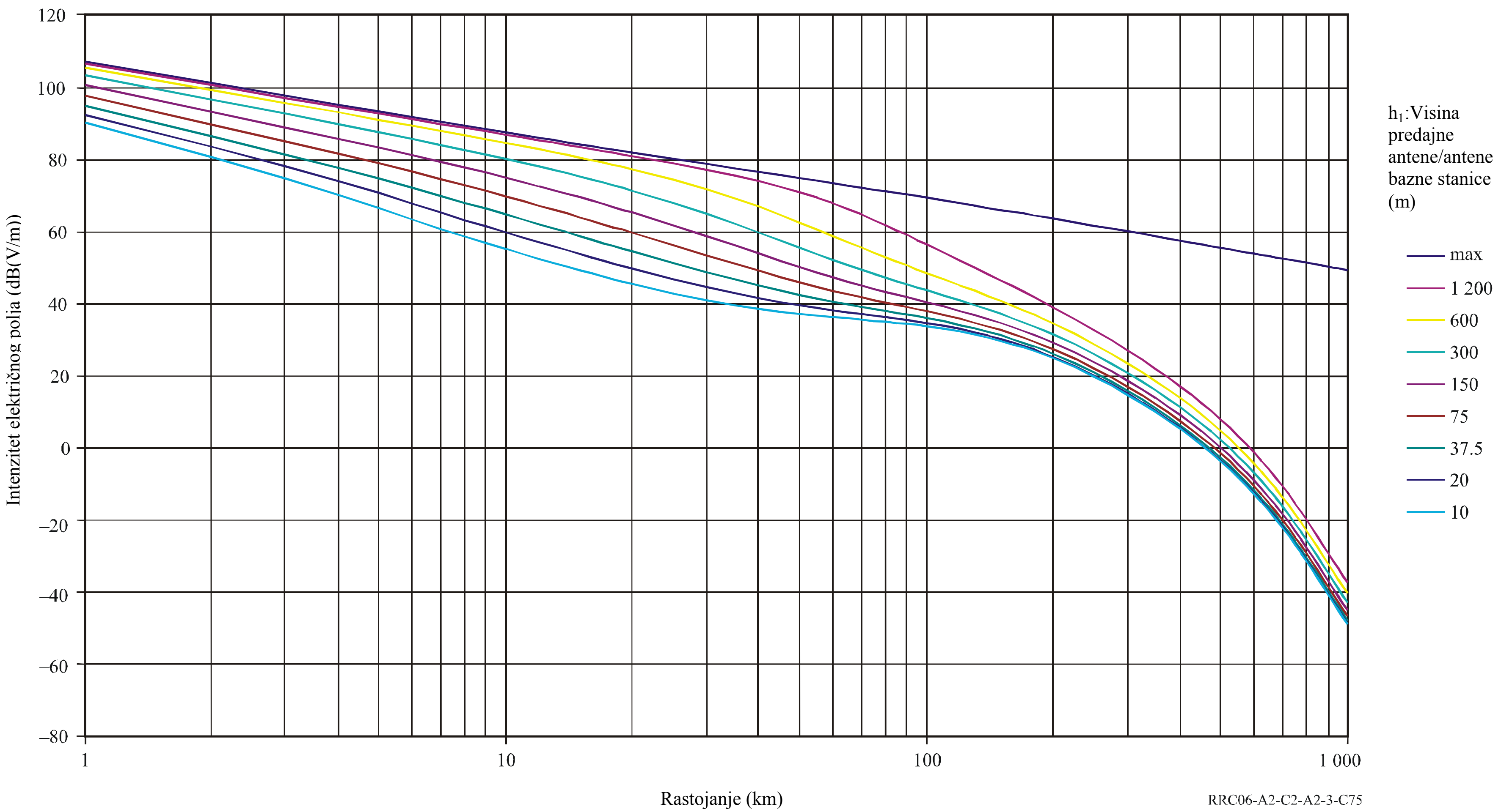
100MHz 50% vremena u Zoni D



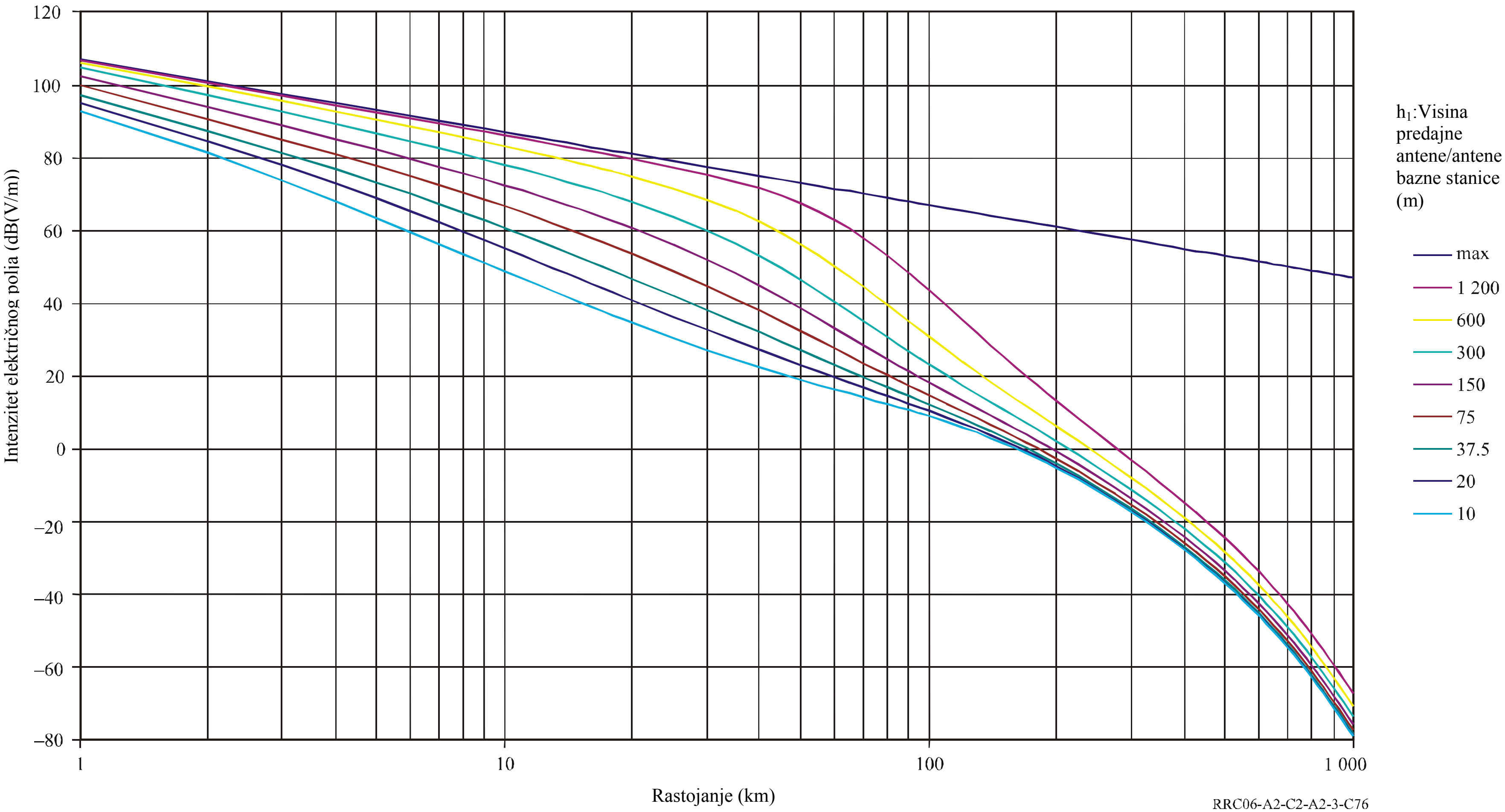
100MHz 10% vremena u Zoni D



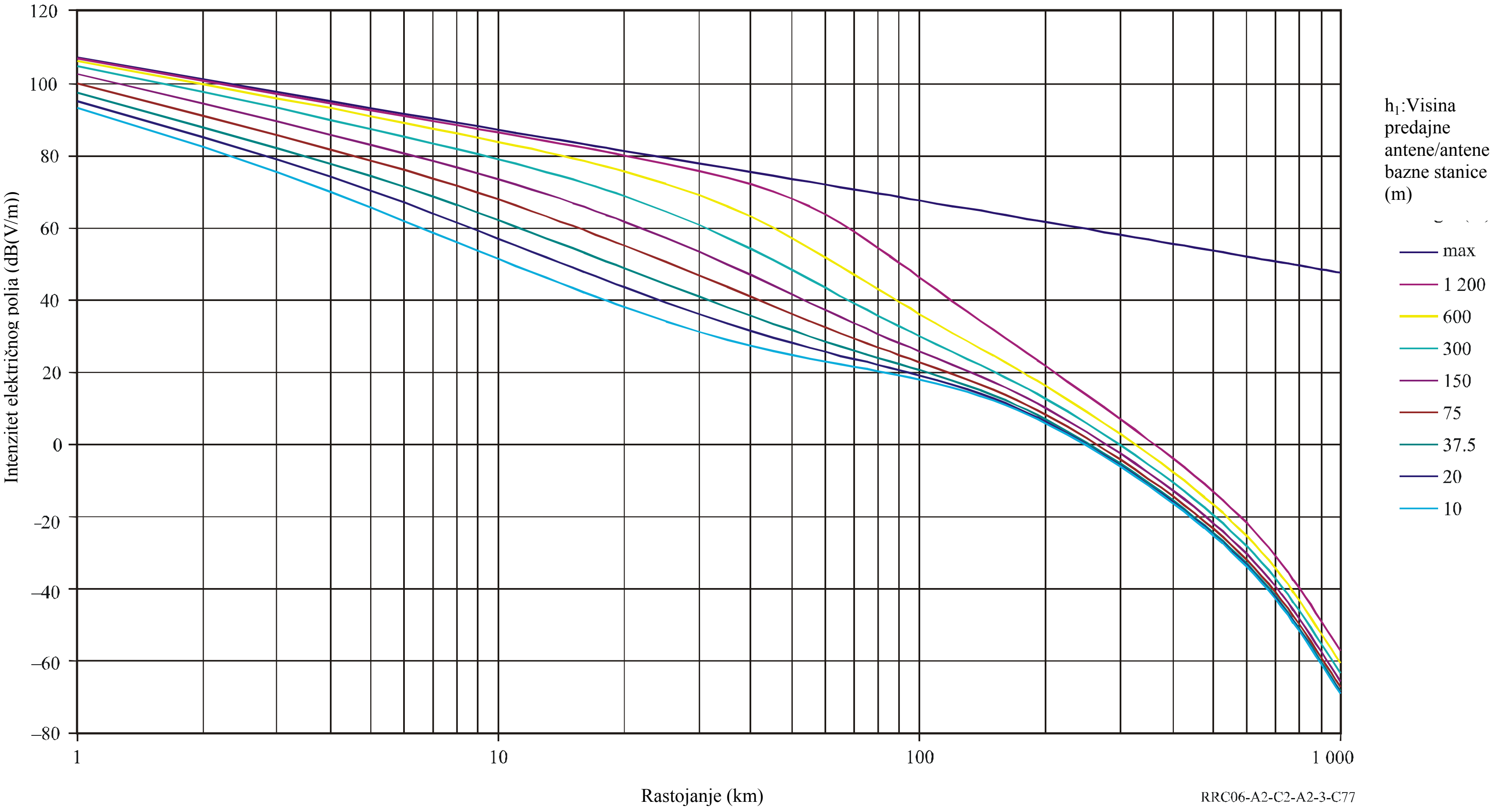
100MHz 1% vremena u Zoni D



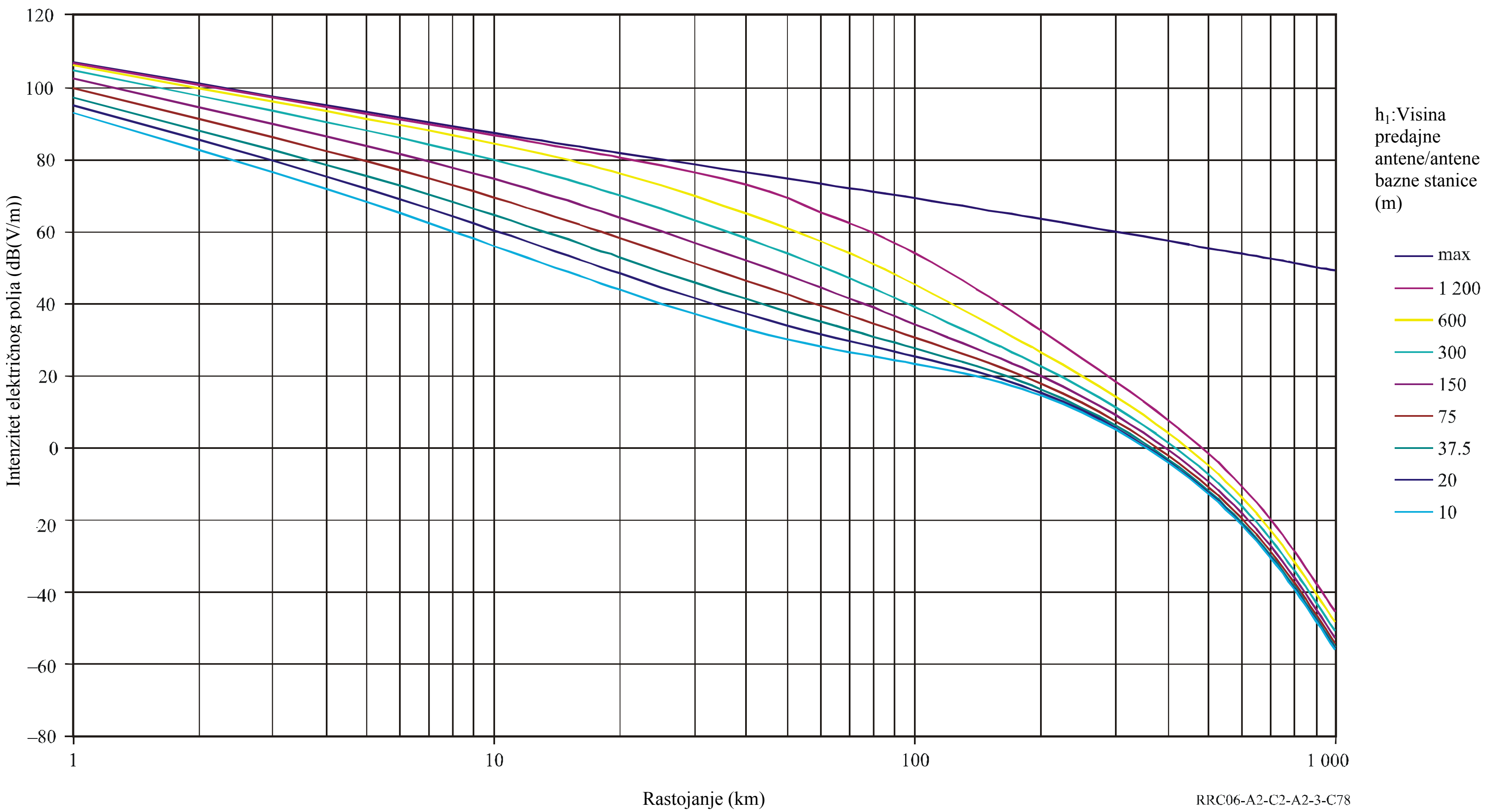
600MHz 50% vremena u Zoni D



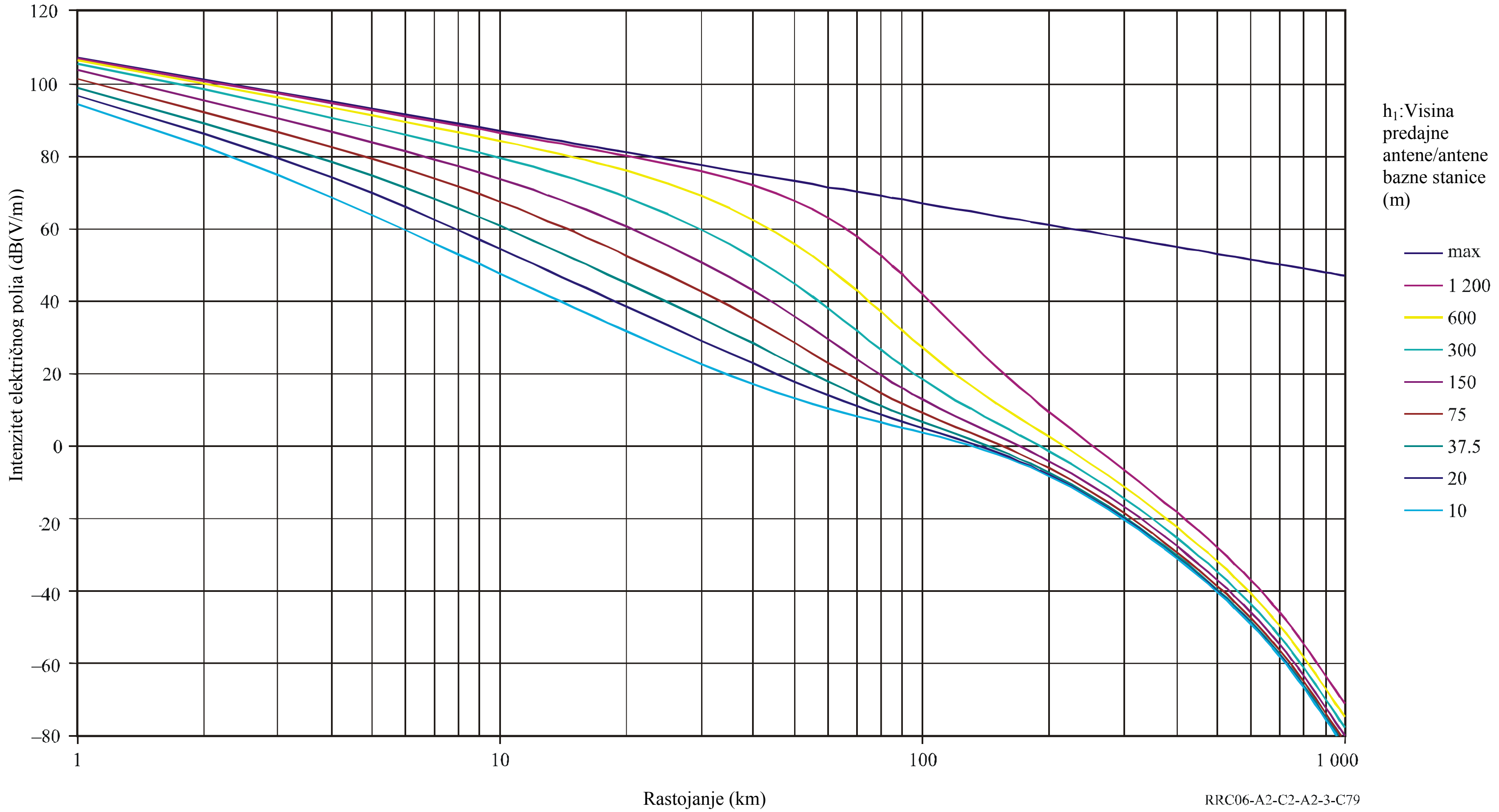
600MHz 10% vremena u Zoni D



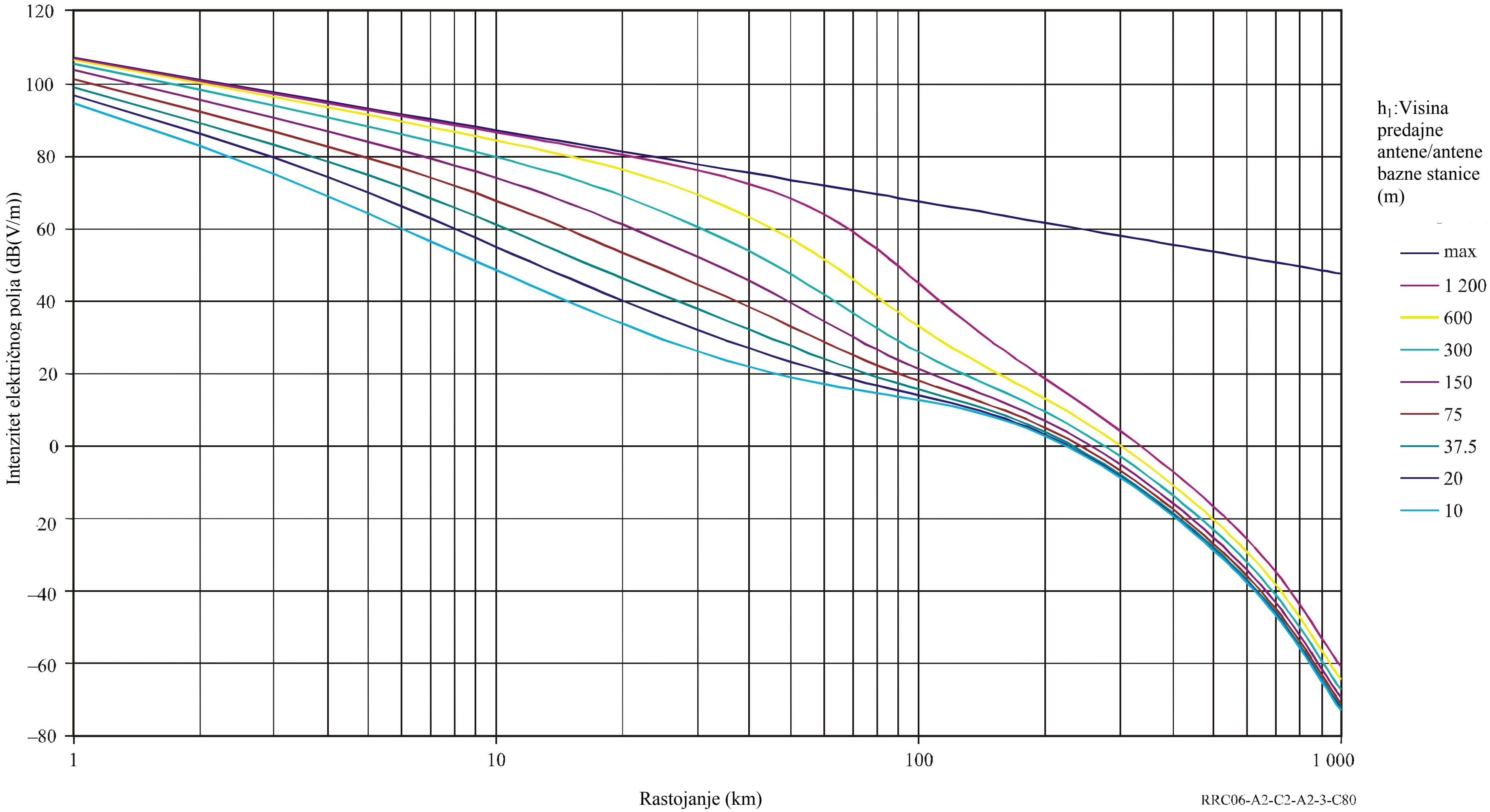
600MHz 1% vremena u Zoni D



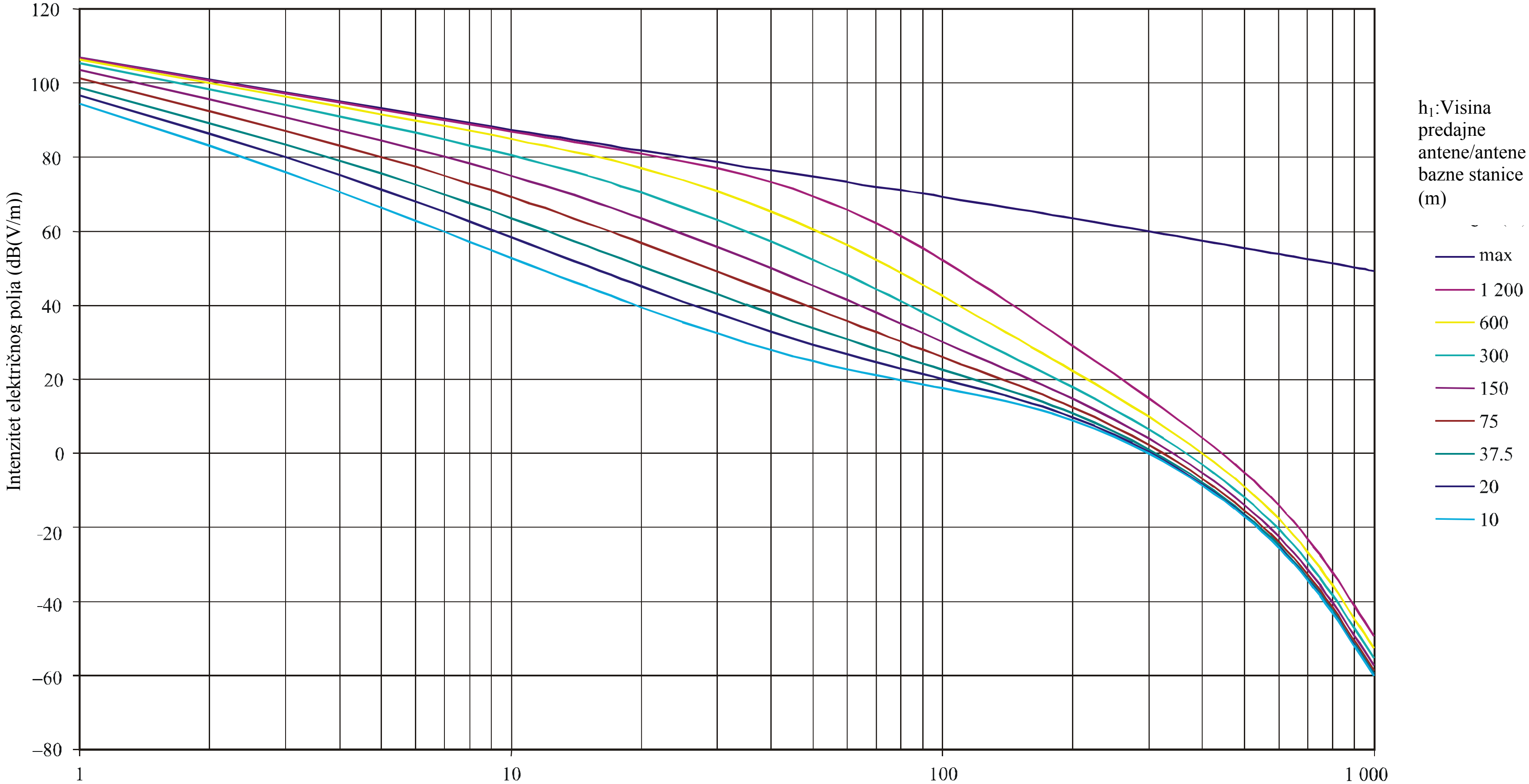
2000MHz 50% vremena u Zoni D



2000MHz 10% vremena u Zoni D



2000MHz 1% vremena u Zoni D



RRC06-A2-C2-A2-3-C81

POGLAVLjE 3

ANEKSA 2

Tehničke osnove za terestrijalni radiodifuzni servis

3.1 Sistemi terestrijalne radiodifuzije, frekvencijski opsezi, razdvajanje i distribucija kanala

3.1.1 Terestrijalni radiodifuzni sistemi u Opsezima III, IV i V

Plan digitalne radiodifuzije sadrži T-DAB i DVB-T pristupe definisane setom karakteristika navedenih u Aneksu 1 ovog Sporazuma.

Opseg III sadrži plan pristupa za DVB-T, za T-DAB i pristupe za analognu televiziju koji će biti zaštićeni tokom perioda tranizicije.

Opsezi IV i V sadrže plan pristupa za DVB-T i pristupe za analognu televiziju koji će biti zaštićeni tokom perioda tranizicije.

Preporuka ITU-R BT.470-7 sadrži detaljne tehničke podatke za konvencionalne analogne televizijske sisteme.

Preporuke ITU-R BT.1306-3 i ITU-R BT.1368-6 sadrže detaljne tehničke podatke o DVB-T. Tabela A.3.1-1 u dodatku 3.1 ovom Poglavlju pružaju informacije o projektantima i mrežnim protocima koji odgovaraju modelima DVB-T sistema.

Preporuke ITU-R BS. 1114-5 i ITU-R BS.1660-2 sadrže detaljne tehničke podatke o T-DAB.

Vrednosti i parametri dati u ovom Poglavlju korišćeni su u razvoju Plana i biće korišćeni za njegovu modifikaciju.

3.1.2 Frekvencijski opsezi, rastojanje između susednih kanala i raspodela kanala

U opsegu III, različita rastojanja između susednih kanala su korišćena duž zone planiranja. Veze između rastojanja susednih kanala i raspodele kanala za DVB-T za administracije u zoni planiranja nalaze se u Tabelama A.3.1-6 do A.3.1-14 Dodatka 3.1 ovog Poglavlja.

U opsezima IV i V, koristi se jedinstveno rastojanje između susednih kanala koje iznosi 8MHz, s tim da su donje i gornje granice kanala iste za sve zemlje u zoni planiranja.

U opsezima IV i V, za analognu i digitalnu televiziju koristi se isto rastojanje između susednih kanala i raspodela kanala. Za digitalnu televiziju, dodeljena frekvencija predstavlja centralnu frekvenciju. Tabela A.3.1-2 sadrži relevantne informacije o kanalu.

Informacije o rastojanju između kanala i raspodeli kanala za analogne televizijske sisteme, u odnosu na nosioce slike i nosioce zvuka, date su u tabelama A.3.1-6 do A.3.1-14 u Dodatku 3.1 ovog Poglavlja.

Za T-DAB u opsegu III, sve administracije u zoni planiranja koriste iste frekvencijske blokove i raspodelu blokova. Dodeljene frekvencije i blokovi frekvencija u opsegu III za T-DAB date su u tabeli A.3.1-15 Dodatka 3.1 ovog Poglavlja.

3.2 Modeli prijema za DVB-T i T-DAB

DVB-T je planiran za više različitih modela prijema, odnosno, fiksni prijem, portabilni prijem (na otvorenom i u zatvorenom prostoru) i mobilni prijem, primenom odgovarajućih verzija sistema i verovatnoće položaja.

T-DAB planiran je za mobilni prijem i portabilni prijem u zatvorenom prostoru.

3.2.1 Fiksni prijem

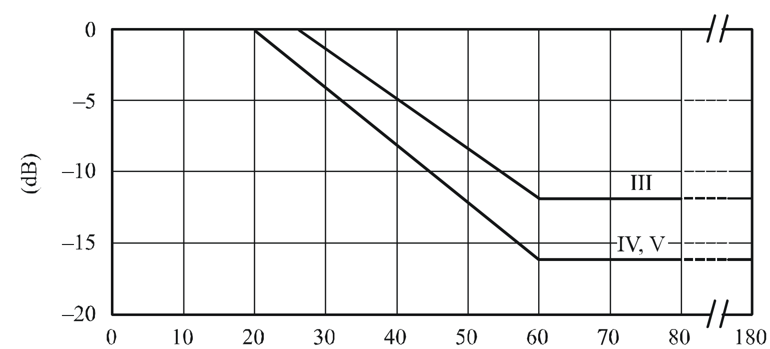
Referentna vrednost za visinu prijemne antene, koja služi kao uzorak za izračunavanje intenziteta električnog polja za fiksni prijem, iznosi 10 m iznad nivoa zemlje. Kako bi se odredio minimalni nivo srednje snage polja za opsege III, IV i V, vrednosti dobitaka prijemne antene i gubitaka usled propagacije signala, date su u § 3.2.1.2 i 3.2.1.3 ovog Poglavlja za referentne frekvencije. Minimalne srednje vrednosti nivoa snage polja se izvode interpolacijom kao što je opisano u Dodatku 3.3 ovog Poglavlja.

3.2.1.1 Dijagrami zračenja za fiksirane prijemne antene na nivou krova

Standardni dijagrami zračenja za prijemne antene za opsege III, IV i V su dati u Preporuci ITU-R BT.419-3 (videti sliku 3-1).

Slika 3-1 1

Usmerenost prijemnih antena u opsezima III, IV i V



Ugao u odnosu na pravac glavnog snopa zračenja (u stepenima)

3.2.1.2 Dobitak antena

Vrednosti dobitka antene (u odnosu na polutalasni dipol) korišćeni u izvođenju ekvivalentnih minimalnih vrednosti srednje snage polja, date su u Tabeli 3-1.

TABELA 3-1

Dobitak antene (u odnosu na polutalasni dipol) u opsezima III, IV i V

Frekvencija (MHz)	200	500	800
Dobitak antene (dBd)	7	10	12

3.2.1.3 Slabljenje signala u antenskom kablu

Vrednosti slabljenja signala u antenskom kablu, korišćene za izvođenje minimalnog nivoa srednje snage signala, date su u tabeli 3-2.

TABELA 3-2

Slabljenje signala u antenskom kablu u opsezima III, IV i V

Frekvencija (MHz)	200	500	800
Slabljenje signala u antenskom kablu (dB)	2	3	5

3.2.1.4 Verovatnoća položaja za fiksni prijem

Za fiksni prijem, koristiće se vrednost verovatnoće polažaja od 95%.

3.2.1.5 Polarizaciona dikriminacija za fiksni prijem

Moguće je iskoristiti polarizacionu diskriminaciju za fiksni prijem. Ipak, u slučaju ortogonalne selektivnosti, kombinovana diskriminacija koja je obezbeđena direktivnošću i ortogonalnošću ne može biti izračunata sabiranjem zasebnih vrednosti diskriminacije. Kombinovana vrednost diskriminacije od 16dB će biti primenjivana za sve uglove po azimutu u opsezima III i V.

3.2.2 Portabilni i mobilni prijem

3.2.2.1 Analiza gubitaka usled visine

Za portabilni prijem (unutar zatvorenih i na otvorenim prostorima), za visinu prijemne antene uzima se 1.5 m iznad nivoa zemlje. Ista visina prijemne antene koristi se, takođe, za mobilni prijem. Pošto su svi proračuni nivoa polja izvedeni za antenu na visini od 10 m, faktor korekcije za gubitke usled visine za antenu na visini 1.5 m biće korišćeni za određivanje minimalnih srednjih vrednosti nivoa električnog polja.

U svrhe planiranja, vrednosti gubitaka usled visine za portabilni i mobilni prijem za referenetne frekvencije su date u tabeli 3-3. Minimalna srednja vrednost polja za ostale frekvencije se izvode interpolacijom, kao što je opisano u Dodatku 3.3 ovog Poglavlja.

TABELA 3-3

Gubici usled visine u opsezima III, IV i V

Frekvencija (MHz)	200	500	800
Gubici usled visine (dB)	12	16	18

Ove vrednosti izvedene za pokrivanje predgrađa.

3.2.2.2 Gubici usled penetracije signala kroz zid

Tabela 3-4 sadrži srednje vrednosti gubitaka usled penetracije signala kroz zid i odgovarajuće vrednosti standardne devijacije za VHF i UHF.

TABELA 3-4

Gubici usled penetracije signala kroz zid za opsege III, IV i V

	Gubici usled penetracije signala u zgrade	**Standardna devijacija**
VHF	9 dB	3 dB
UHF	8 dB	5.5 dB

3.2.2.3 Dobitak antene za portabilni prijem

Preporuka ITU-R BT.1368-6 pruža u svom Aneksu 4, § 4.1, informacije o antenama za portabilni prijem. Za portabilni prijem primenjivaće se omnidirekciona antena. Dobitak antene (u odnosu na polutalasni dipol) dat je u Tabeli 3-5.

TABELA 3-5

Dobitak antene (dBd) za prijem na promenljivoj lokaciji

Band	**Dobitak (dBd)**
Opseg III (VHF)	–2
Opseg IV (UHF)	0
Opseg V (UHF)	0

3.2.2.4 Verovatnoća položaja za portabilni prijem

Za portabilni prijem, u zatvorenom i na otvorenom prostoru, koristiće se vrednost verovatnoće polažaja od 95%.

3.2.2.5 Polarizaciona dikriminacija za portabilni prijem

Polarizaciona diskriminacija neće biti uzimana u obzir za frekvencijsko planiranje portabilnog prijema.

3.2.2.6 Dobitak antene za mobilni prijem

Vrednosti dobitaka antene date u tabeli 3-6 biće korišćene za mobilni prijem.

TABELA 3-6

Dobitak antene (dBd) za mobilni prijem

Opseg	Dobitak (dBd)
Opseg III (VHF)	–2
Opseg IV (UHF)	0
Opseg V (UHF)	0

3.2.2.7 Verovatnoća položaja za mobilni prijem

Za mobilni prijem DVB-T signala, koristiće se vrednost verovatnoće polažaja od 95%; za mobilni prijem T-DAB signala, koristiće se vrednost verovatnoće polažaja od 99%.

3.2.2.8 Polarizaciona diskriminacija za mobilni prijem

Polarizaciona diskriminacija neće se uzimati u obzir za mobilni prijem.

3.2.3 Referentne konfiguracije za planiranje

Planska konfiguracija opisuje relevantne tehničke aspekte za implementaciju servisa emitovanja. Različiti aspekti planirane konfiguracije, na primer za DVB-T, su ukratko izložene u tabeli 3-7.

TABELA 3-7

Aspekti DVB-T planske konfiguracije

Aspekt	Element
Model prijema	Fiksni Portabilni prijem (otvoreni prostor) Portabilni prijem (zatvoreni prostor) Mobilni
Stepen pokrivenosti (u pogledu procenata lokacija)	70% 95% 99%
Struktura mreže	MFN (jedan predajnik) SFN Gusta SFN
Modeli DVB-T sistema	od QPSK 1/2 do 64-QAM 7/8
Frekvencijski opseg	Opseg III Opseg IV Opseg V

Detaljnije informacije o referentnim planskim konfiguracijama su date u Dodatku 3.5 ovog Poglavlja.

3.3 Dijagrami šuma za T-DAB i DVB-T prijemnike

Dijagram šuma od 7 dB biće korišćen i za DVB-T i T-DAB prijemnike.

3.4 Kriterijumi planiranja

Za razvoj Plana u Opsezima III, IV i V, korišćeni su sledeći kriterijumi planiranja; oni će biti korišćeni za modifikaciju Plana:

- minimalna srednja vrednost intenziteta električnog polja;
- intenziteti štetnih električnih polja;

zasnovano na:

- vrednostima odnosa C/N;
- zaštitnih odnosa;
- gubici usled penetracije signala u zatvorene prostorije;
- faktori korekcije položaja i procenta vremena ;
- mogućim ograničenjima spektralne maske koja odlikuje digitalnu transmisiju.

3.4.1 Vrednosti odnosa *C/N* potrebne za planiranje

Za DVB-T, vrednosti odnosa *C/N* se odnose na postojeće DVB-T prijemnike i ne-hijerarhijskom modelu. Ove *C/N* vrednosti, za različite verzije DVB-T sistema i za različite uslove prijema, naznačene u Tabeli A.3.2-1 u Dodatku 3.2 ovog Poglavlja.

Vrednosti odnosa *C/N*, date za Rajsov kanal biće korišćene za slučaj fiksnog prijema, a vrednosti za Rejlijev kanal biće korišćene za slučajeve portabilnog i mobilnog prijema.

Osim toga, referentne vrednosti odnosa *C/N* za tri DVB-T referentne konfiguracije za planiranje (RPC-a), nalaze se u tabeli A.3.5-1 u Dodatku 3.5 ovog Poglavlja.

Za T-DAB, vrednost odnosa *C/N* od 15 dB potiče iz Preporuke ITU-R BS.1660-2.

U slučaju T-DAB, portabilni prijem u zatvorenom prostoru i mobilni prijem su relevantni za potrebe planiranja. Jedinstveni referentni odnos *C/N* od 15 dB se uzima u obzir za oba modela prijema, kao što je naznačeno u Tabeli A.3.5-2 u Dodatku 3.5 ovog Poglavlja za RPC.

3.4.2 Odnosi zaštite

Odnosi zaštite su rezimirani u tabelama Dodatka 3.3 ovog Poglavlja.

Za DVB-T (DVB-T, T-DAB i analogne televizije, i obrnuto), zaštićeni odnosi dati u Dodatku 3.3 ovog Poglavlja baziraju se na onima razvijenim u Preporuci ITU-R BT.1368-6, posebno u Aneksu 2 - Kriterijumi planiranja za DVB-T digitalne televizijske sisteme u VHF/UHF opsezima.

U slučajevima delimičnog preklapanja između T-DAB i DVB-T (8 MHz), biće korišćeni odnosi zaštite za potpuno preklapanje.

Za T-DAB nasuprot T-DAB, biće korišćen odnos zaštite od 15 dB.

Ukoliko T-DAB ometa DVB-T ili analogna televizija, biće korišćeni odnosi zaštite dati u Dodatku 3.3 ovog Poglavlja. Ovi odnosi zaštite su bazirani na Preporuci ITU-R BS.1660-2.

Ukoliko analognu televiziju ometa T-DAB ili analogna televizija, biće korišćeni odnosi zaštite dati u Preporuci ITU-R BT.655-7.

3.4.3. Minimalni nivoi signala sistema za digitalno emitovanje

Za različite modele prijema, jačina polja potrebna da pruži željenoj lokaciji mogućnost prijema željenog signala, može se najbolje uporediti sa korišćenjem referentne visine antene, verovatnoće lokacije i procenta vremena uspešnog prijema, kao što sledi:

- Visina prijemne antene: 10 m iznad nivoa zemlje
- Verovatnoća lokacije: 50 %
- Procenat vremena uspešnog prijema: 50%

Intenziteti polja koji odgovaraju ovim stanjima nazivaju se „minimalnim srednjim vrednostima intenziteta električnog polja“, označene kao E_{med} u Dodacima 3.2, 3.4 i 3.5 ovog Poglavlja. Ove vrednosti intenziteta polja odgovaraju minimalnim nivoima signala, potrebnih da bi se nadjačao (prevazišao) prirodni i industrijski šum (u odsustvu interferencije koja potiče od drugih predajnika), koja je je poznata i kao „minimalna korisna snaga polja“.

3.4.4 Minimalni nivoi signala za analogne sisteme emitovanja

Za analognu televiziju biće korišćena minimalna snaga polja i referentni parametri za prikaz snage polja iz Preporuke ITU-R BT.417-5.

3.4.5 Faktori korekcije položaja i procenat vremena uspešnog prijema

Zbog značajne degradacije kvaliteta koja se javlja kada se ne postigne zahtevani odnos nosilac-interferencija ili zahtevani odnos nosilac-šum, potreban je veći procenat lokacija sa zahtevanim snagama polja (i manji procenat interferirajućih signala). Stoga, potrebna je korekcija vrednosti izvedene iz tabela i krivih u Poglavlju 2 Aneksa 2 Sporazuma.

Proračuni kompatibilnosti za digitalne sisteme emitovanja se zasnivaju na propagacionim krivama za 50% vremena traženog nivoa električnog polja i 1% za intenzitete neželjenih električnih polja, kao što je dato u Poglavlju 2 Aneksa 2 Sporazuma.

Proračuni kompatibilnosti za sisteme analogne televizije zasnovani su na propagacionim krivama datim u Poglavlju 2 Aneksa 2 Sporazuma. Interferencija koja potiče iz troposfere ili kontinulana interferencija se obrađuje kao što je opisano u Aneksu 2 Preporuke ITU-R BT.655-7.

3.4.5.1 Varijacije signala na otvorenom prostoru

Preporuka ITU-R P.1546-2 pruža standardnu devijciju određenu na makroskopskom nivou od 5.5 dB za širokopojasne signale. Ova vrednost će biti korišćena kako bi se odredila varijacija intenziteta polja na otvorenom prostoru, koja se uzima u obzir u vidu „faktora korekcije položaja“.

Faktori korekcije položaja za makro-varijacije (videti formule u Dodatku 3.4 ovog Poglavlja) su date u Tabeli 3-8.

TABELA 3-8

Željena pokrivenost (verovatnoća položaja) (%)	**Faktor korekcije položaja (VHF i UHF) (dB)**
99	13
95	9
70	3

3.4.5.2 Varijacija signala u zatvorenom prostoru

Varijacija intenziteta polja u zatvorenom prostoru predstavlja kombinaciju rezultata varijacije na otvorenom prostoru i varijacije kao posledice slabljenja koji unosi pentracija signala kroz zid. Za VHF, gde su standardne devijacije signala 5.5 dB i 3 dB, respektivno, kombinovana vrednost iznosi 6.3 dB. Za UHF, gde su standardne devijacije oba signala 5.5 dB, kombinovana vrednost je 7.8 dB.

Faktori korekcije položaja za makro-varijacije u zatvorenim lokacijama koji će biti korišćeni dati su u Tabeli 3-9.

TABELA 3-9

Ciljna pokrivenost (verovatnoća položaja) (%)	**Faktor korekcije položaja (VHF) (dB)**	**Faktor korekcije položaja (UHF) (dB)**
95	10	13
70	3	4

3.4.5.3 Kombinovani faktor korekcije položaja

Kombinovani faktor korekcije položaja koristi se da bi se željeni i intenziteti ometajućeg polja, koje se odnose na 50% lokacije, konvertuju u vrednost koja odgovara procentu lokacija potrebnih za željeni servis.

Kombinovani faktor korekcije položaja biće određen na sledeći način:

$$CF = \mu\sqrt{\sigma_w^2 + \sigma_n^2} \qquad \text{dB}$$

gde su:

σ_w: standardna devijacija varijacije položaja za željeni signal (dB)

σ_n: standardna devijacija varijacije položaja za ometajući signal (dB)

μ: faktor distribucije iznosi 0.52 za 70% lokacija, 1.64 za 95% lokacija i 2.33 za 99% lokacija i može se odrediti na sledeći način:

$$\mu = Q_i(1 - x/100)$$

gde su:

Q_i: faktor multiplikacije dat u § 2.1.12 Dodatka 2.1 Poglavlja 2 Aneksa 2 Sporazuma

x: procenat lokacije za koje je zaštita potrebna.

3.5 Metoda sumiranja snaga

Suma snaga je logaritamska vrednost sume individualnih intenziteta polja, izraženih kao aritmetičke vrednosti snage:

$$\mathrm{Sum} = 10\ \log\left(\sum 10^{\frac{E_i}{10}}\right)$$

gde E_i predstavlja individualne intenzitete polja (dB(μV/m)).

3.6 Spektralna maska

Radi modifikacija Plana, biće korišćena spektralna maska sa karakteristikama najmanje ekvivalentnim ne-kritičnoj maski i za T-DAB i za DVB-T.

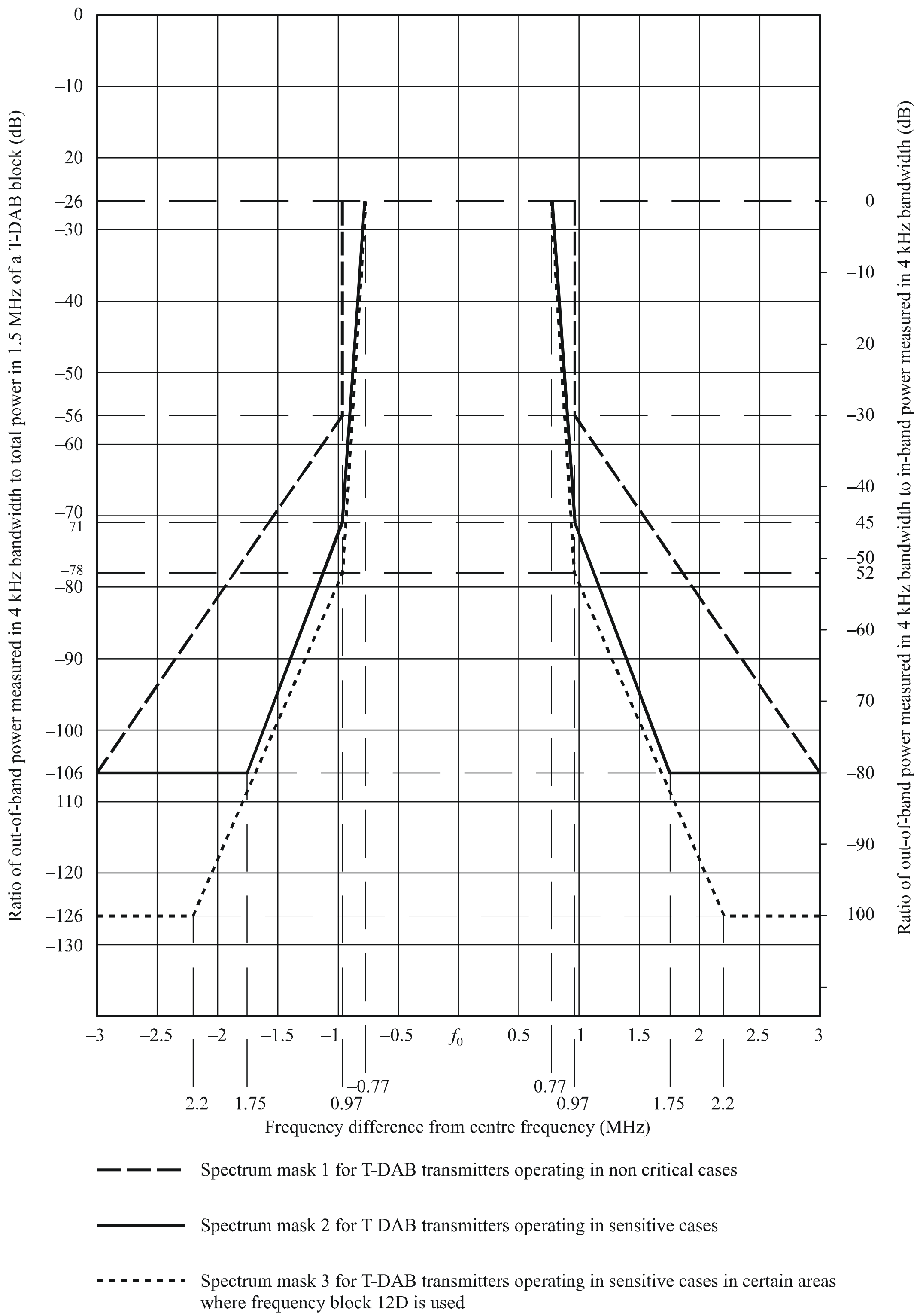
Spektralna maska se može koristiti radi obezbeđivanja koordinacije između adiministracija u kritičnim slučajevima.

3.6.1 Spektralna maska za T-DAB

Spektar van opsega izračenog signala u bilo kom kanalu širine 4 kHz biće ograničen jednom od maski definisanih Slikom 3-2 i njoj odgovarajućom Tabelom 3-10.

Slika 3-2

Spektralna maska nepropusnog opsega za T-DAV predajni signal



RRC06-A2-C3-2

TABELA 3-10

Spektralna tabela za T-DAB predajni signal izvan opsega

	Odnos frekvencije i centra kanala širine 1.54 MHz (MHz)	**Relativni nivo (dB)**
Spektralna maska za T-DAB predajnike koji rade u uslovima koji nisu kritični	±0.97	–26
	±0.97	–56
	±3.0	–106
Spektralna maska za T-DAB predajnike koji rade u osetljivim uslovima	±0.77	–26
	±0.97	–71
	±1.75	–106
	±3.0	–106
Spektralna maska za T-DAB predajnike koji rade u osetljivim uslovima u određenim zonmama gde se koristi frekvencijski blok 12 D	±0.77	–26
	±0.97	–78
	±2.2	–126
	±3.0	–126

Isprekidana linija definiše spektralnu masku za T-DAB predajnike koji rade u nekirtičnim uslovima (spektralna maska 1). Puna linija definiše spektralnu masku za T-DAB predajnike koji rade u osetljivim uslovima (spektralna maska 2), a maska opisana tačkama definiše spektralnu masku za T-DAB predajnike koji rade u osetljivim uslovima u određenim oblastima gde se koristi frekvencijski blok 12 D (spektralna maska 3)[2].

3.6.2 Spektralna maska za DVB-T u kanalima širine 8 MHz i 7 MHz

Spektralne maske su definisane na Slici 3-3 i njoj odgovarajućoj Tabeli 3-11. Gornja kriva definiše spektralnu masku za nekritične uslove, a donja kriva definiše spektralnu masku za osetljive uslove.

[2] Ova maska može biti korišćena i za druge frekvencijske blokove, gde za to postoji bilateralni/multilateralni sporazum.

SLIKA 3-3

Simetrične maske za nekritične i osetljive uslove

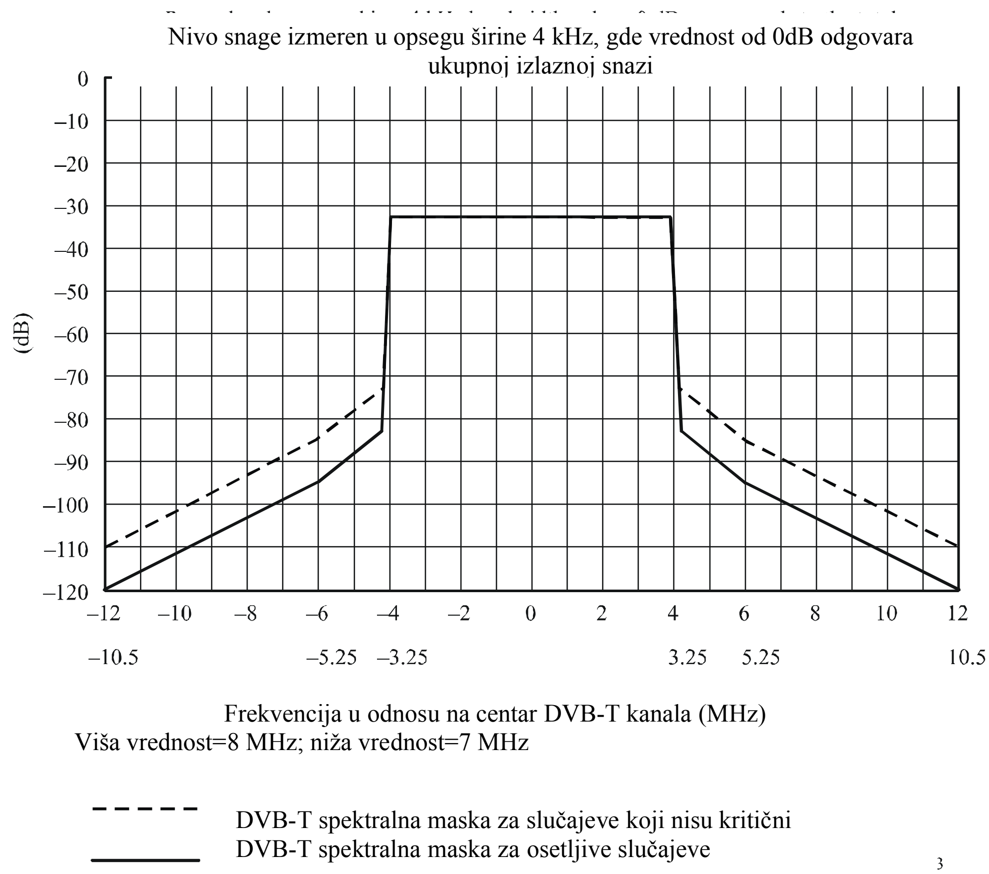


TABELA 3-11

Simetrične maske za osetljive uslove i uslove koji nisu kritični

Tačke prekida					
Kanali širine 8 MHz			Kanali širine 7 MHz		
	Nekritični uslovi	Osetljivi uslovi		Nekritični uslovi	Osetljivi uslovi
Relativna frekvencija (MHz)	Relativni nivo (dB)	Relativni nivo (dB)	Relativna frekvencija (MHz)	Relativni nivo (dB)	Relativni nivo (dB)
–12	–110	–120	–10.5	–110	–120
–6	–85	–95	–5.25	–85	–95
–4.2	–73	–83	–3.7	–73	–83
–3.9	–32.8	–32.8	–3.35	–32.8	–32.8
+3.9	–32.8	–32.8	+3.35	–32.8	–32.8
+4.2	–73	–83	+3.7	–73	–83
+6	–85	–95	+5.25	–85	–95
+12	–110	–120	+10.5	–110	–120

DODATAK 3.1

Varijacije DVB-T sistema

TABELA A.3.1-1

Varijacije DVB-T sistema i vrednosti protoka (Mbit/s)

Oznake različi-tih sistema	Modulacija	Code rate	Protok (Mbit/s) Za različite zaštitne intervale (GI)			
			GI = 1/4	GI = 1/8	GI = 1/16	GI = 1/32
Varijacije za kanal širine 8 MHz						
A1	QPSK	1/2	4.98	5.53	5.85	6.03
A2	QPSK	2/3	6.64	7.37	7.81	8.04
A3	QPSK	3/4	7.46	8.29	8.78	9.05
A5	QPSK	5/6	8.29	9.22	9.76	10.05
A7	QPSK	7/8	8.71	9.68	10.25	10.56
B1	16-QAM	1/2	9.95	11.06	11.71	12.06
B2	16-QAM	2/3	13.27	14.75	15.61	16.09
B3	16-QAM	3/4	14.93	16.59	17.56	18.10
B5	16-QAM	5/6	16.59	18.43	19.52	20.11
B7	16-QAM	7/8	17.42	19.35	20.49	21.11
C1	64-QAM	1/2	14.93	16.59	17.56	18.10
C2	64-QAM	2/3	19.91	22.12	23.42	24.13
C3	64-QAM	3/4	22.39	24.88	26.35	27.14
C5	64-QAM	5/6	24.88	27.65	29.27	30.16
C7	64-QAM	7/8	26.13	29.03	30.74	31.67
Varijacije za kanal širine 7 MHz						
D1	QPSK	1/2	4.35	4.84	5.12	5.28
D2	QPSK	2/3	5.81	6.45	6.83	7.04
D3	QPSK	3/4	6.53	7.26	7.68	7.92
D5	QPSK	5/6	7.26	8.06	8.54	8.80
D7	QPSK	7/8	7.62	8.47	8.97	9.24
E1	16-QAM	1/2	8.71	9.68	10.25	10.56
E2	16-QAM	2/3	11.61	12.90	13.66	14.08
E3	16-QAM	3/4	13.06	14.52	15.37	15.83
E5	16-QAM	5/6	14.52	16.13	17.08	17.59
E7	16-QAM	7/8	15.24	16.93	17.93	18.47
F1	64-QAM	1/2	13.06	14.51	15.37	15.83
F2	64-QAM	2/3	17.42	19.35	20.49	21.11
F3	64-QAM	3/4	19.60	21.77	23.05	23.75
F5	64-QAM	5/6	21.77	24.19	25.61	26.39
F7	64-QAM	7/8	22.86	25.40	26.90	27.71

Numeracija kanala i granice kanala

TABELA A.3.1-2

Raspored kanala DVB-T u opsezima IV i V

Redni broj kanala	Granice kanala (MHz)		Dodeljene frekvencije (MHz)
opseg IV			
21	470	478	474
22	478	486	482
23	486	494	490
24	494	502	498
25	502	510	506
26	510	518	514
27	518	526	522
28	526	534	530
29	534	542	538
30	542	550	546
31	550	558	554
32	558	566	562
33	566	574	570
34	574	582	578
opseg V			
35	582	590	586
36	590	598	594
37	598	606	602
38	606	614	610
39	614	622	618
40	622	630	626
41	630	638	634
42	638	646	642
43	646	654	650
44	654	662	658
45	662	670	666
46	670	678	674
47	678	686	682
48	686	694	690
49	694	702	698

TABELA A.3.1-2 (*kraj*)

Redni broj kanala	**Granice kanala (MHz)**		**Dodeljene frekvencije (MHz)**
50	702	710	706
51	710	718	714
52	718	726	722
53	726	734	730
54	734	742	738
55	742	750	746
56	750	758	754
57	758	766	762
58	766	774	770
59	774	782	778
60	782	790	786
61	790	798	794
62	798	806	802
63	806	814	810
64	814	822	818
65	822	830	826
66	830	838	834
67	838	846	842
68	846	854	850
69	854	862	858

Raspored DVB-T kanala u opsegu III

(Primenljivo u sledećim geografskim oblastima: ALB, ALG, AND, ARS, AUT, BEL, BHR, BIH, BUL, CME, CNR, CVA, CYP, CZE, D, DJI, DNK, E, EGY, ERI, EST, ETH, F, FIN, FRO, GHA, GIB, GNB, GNE, GRC, HNG, HOL, HRV, I, IRL, IRN, IRQ, ISL, ISR, JOR, KEN, KWT, LBN, LBR, LBY, LIE, LTU, LUX, LVA, MAU, MDA, MDR, MKD, MLI, MLT, MNE, MRC, MTN, NIG, NOR, OMA, POL, POR, QAT, ROU, RRW, S, SDN, SEY, SMR, SOM, SRB, SRL, STP, SUI, SVK, SVN, SYR, TCD, TUN, TUR, UAE, UGA, UKR, YEM, ZMB)

Redni broj kanala	Granice kanala (MHz)		Dodeljene frekvencije (MHz)
5	174	181	177.50
6	181	188	184.50
7	188	195	191.50
8	195	202	198.50
9	202	209	205.50
10	209	216	212.50
11	216	223	219.50
12	223	230	226.50

TABELA A.3.1-4

Raspored DVB-T kanala u opsegu III

(Primenljivo u sledećim geografskim oblastima: ARM, AZE, BLR, GEO, KAZ, KGZ, RUS, TJK, TKM, UZB)

Redni broj kanala	Granice kanala (MHz)		Dodeljene frekvencije (MHz)
6	174	182	178
7	182	190	186
8	190	198	194
9	198	206	202
10	206	214	210
11	214	222	218
12	222	230	226

TABELA A.3.1-5

Raspored DVB-T kanala u opsegu III

(Primenljivo u sledećim geografskim oblastima: BDI, BEN, BFA, CAF, COD, COG, COM, CPV, CTI, GAB, GUI, MDG, MYT, NGR, REU, SEN, TGO)

i

(Primenljivo u sledećim geografskim oblastima: AFS, AGL, ASC, BOT, G, GMB, LSO, MWI, NMB, SHN, TRC, TZA)

i

(Primenljivo u sledećim geografskim oblastima: MOZ, SWZ, ZWE)

Redni broj kanala	Broj kanala *	Granice kanala (MHz)		Dodeljene frekvencije (MHz)
5	4	174	182	178
6	5	182	190	186
7	6	190	198	194
8	7	198	206	202
9	8	206	214	210
10	9	214	222	218
11	10	222	230	226

* U MYT i REU.

TABELA A.3.1-6

Analogni televizijski Sistem B u opsegu III

Korišćen u sledećim geografskim oblastima:

ALB, ALG, ARS, AUT, BEL, BHR, BIH, CME, CNR, CVA, CYP, D, DJI, DNK, E, EGY, ERI, ETH, FIN, FRO, GHA, GIB, GNB, GNE, GRC, HOL, HRV, IRN, IRQ, ISL, ISR, JOR, KEN, KWT, LBN, LBR, LBY, LIE, LUX, MAU, MDR, MKD, MLI, MLT, MNE, MTN, NIG, NOR, OMA, POR, QAT, RRW, S, SDN, SEY, SOM, SRB, SRL, STP, SUI, SVN, SYR, TCD, TUN, TUR, UAE, UGA, YEM, ZMB

Redni broj kanala	Granice kanala (MHz)		Dodeljene frekvencije (MHz)	Nosilac slike (MHz)	Nosilac zvuka (MHz)	Dualni FM drugi nosilac zvuka (MHz)	NICAM nosilac (MHz)
5	174	181	177.50	175.25	180.75	180.99	181.1
6	181	188	184.50	182.25	187.75	187.99	188.1
7	188	195	191.50	189.25	194.75	194.99	195.1
8	195	202	198.50	196.25	201.75	201.99	202.1
9	202	209	205.50	203.25	208.75	208.99	209.1
10	209	216	212.50	210.25	215.75	215.99	216.1
11	216	223	219.50	217.25	222.75	222.99	223.1
12	223	230	226.50	224.25	229.75	229.99	230.1
13*	230	237	233.50	231.25	236.75	236.99	237.1
14*	246.18	253.18	249.68	247.43	252.63	252.87	252.98

* Korišćen samo u ZMB (izvan planiranih opsega za RRC-06).

TABELA A.3.1-7

Analogni televizijski sistem B u opsegu III

Korišćen u sledećim geografskim oblastima:

I, SMR

Redni broj kanala	Granice kanala (MHz)		Dodeljene frekvencije (MHz)	Nosilac slike (MHz)	Nosilac zvuka (MHz)	Dualni FM nosilac drugog zvuka (MHz)
D	174.00	181.00	177.50	175.25	180.75	180.99
E	182.50	189.50	186.00	183.75	189.25	188.49
F	191.00	198.00	194.50	192.25	197.75	197.99
G	200.00	207.00	203.50	201.25	206.75	206.99
H	209.00	216.00	212.50	210.25	215.75	215.99
H1	216.00	223.00	219.50	217.25	222.75	222.99
H2	223.00	230.00	226.50	224.25	229.75	229.99

TABLE A.3.1-8

Analogni televizijiski sistem B u opsegu III

Korišćen u sledećim geografskim oblastima:

MRC

Redni broj kanala	Granice kanala (MHz)		Dodeljene frekvencije (MHz)	Nosilac slike (MHz)	Nosilac zvuka (MHz)
4*	162	169	165.50	163.25	168.75
5*	170	177	173.50	171.25	176.75
6	178	185	181.50	179.25	184.75
7	186	193	189.50	187.25	192.75
8	194	201	197.50	195.25	200.75
9	202	209	205.50	203.25	208.75
10	210	217	213.50	211.25	216.75
11	216	223	219.50	217.25	222.75
12	223	230	226.50	224.25	229.75

* Izvan planiranih opsega (ili delimično izvan) za RRC-06.

TABELA A.3.1-9

Analogni TV sistem B1 u opsegu III

Korišćen u sledećim geografskim oblastima:

EST, SVK

Redni broj kanala	Granice kanala (MHz)		Dodeljene frekvencije (MHz)	Nosilac slike (MHz)	Nosilac zvuka (MHz)	Dualni nosilac drugog zvuka (MHz)	NICAM nosilac (MHz)
6	174	182	178.00	175.25	180.75	180.99	181.1
7	182	190	186.00	183.25	188.75	188.99	189.1
8	190	198	194.00	191.25	196.75	196.99	197.1
9	198	206	202.00	199.25	204.75	204.99	205.1
10	206	214	210.00	207.25	212.75	212.99	213.1
11	214	222	218.00	215.25	220.75	220.99	221.1
12	222	230	226.00	223.25	228.75	228.99	229.1

TABELA A.3.1-10

Analogni televizijski sistem D u opsegu III

Korišćen u sledećim geografskim oblastima:

ARM, AZE, BLR, BUL, CZE, GEO, HNG, KAZ, KGZ, LTU, LVA, MDA, ROU, RUS, SVK, TJK, TKM, UKR, UZB

Analogni televizijski sistem D1 u opsegu III

Korišćen u sledećim geografskim oblastima:

LTU, LVA, POL

Analogni televizijiski sistem K1 u Opsegu III

Korišćen u sledećim geografskim oblastima:

BDI, BEN, BFA, CAF, COD, COG, COM, CPV, CTI, GAB, GUI, MDG, MYT, NGR, REU, SEN, TGO

Redni broj kanala Sistem K1	Broj kanala Sistemi D i D1	Granice kanala (MHz)		Dodeljene frekvencije (MHz)	Nosilac slike (MHz)	Nosilac zvuka (MHz)	NICAM nosilac (MHz)
	6A*	173	181	177.00	174.25	180.75	180.10
5	6	174	182	178.00	175.25	181.75	181.10
6	7	182	190	186.00	183.25	189.75	189.10
7	8	190	198	194.00	191.25	197.75	197.10
8	9	198	206	202.00	199.25	205.75	205.10
9	10	206	214	210.00	207.25	213.75	213.10
10	11	214	222	218.00	215.25	221.75	221.10
11	12	222	230	226.00	223.25	229.75	229.10

* Samo za sistem D.

TABELA A.3.1-11

Analogni televizijski sistem I u opsegu III

Korišćen u sledećim geografskim oblastima:

AFS, AGL, ASC, BOT, G, GMB, IRL, LSO, MWI, NMB, SHN, TRC, TZA

Redni broj kanala GE89	Redni broj kanala ST61	Granice kanala (MHz)		Dodeljene frekvencije (MHz)	Nosilac slike (MHz)	Nosilac zvuka (MHz)	NICAM nosilac (MHz)
5	D	174	182	178.00	175.25	181.25	181.80
6	E	182	190	186.00	183.25	189.25	189.80
7	F	190	198	194.00	191.25	197.25	197.80
8	G	198	206	202.00	199.25	205.25	205.80
9	H	206	214	210.00	207.25	213.25	213.80
10	J	214	222	218.00	215.25	221.25	221.80
11	K	222	230	226.00	223.25	229.25	229.80
12*	–	230	238	234.00	231.25	237.25	237.80
13*	–	246.18	254.18	250.18	247.43	253.43	253.98

* Koristi se samo za AFS, BOT, MWI, NMB (izvan planiranog opsega za RRC-06).

TABELA A.3.1-12

Analogni televizijski Sistem L u Opsegu III

Korišćen u sledećim geografskim oblastima:

F

Redni broj kanala	Granice kanala (MHz)		Dodeljene frekvencije (MHz)	Nosilac slike (MHz)	Nosilac zvuka (MHz)	NICAM nosilac (MHz)
5	174.75	182.75	178.75	176.00	182.50	181.85
6	182.75	190.75	186.75	184.00	190.50	189.85
7	190.75	198.75	194.75	192.00	198.50	197.85
8	198.75	206.75	202.75	200.00	206.50	205.85
9	206.75	214.75	210.75	208.00	214.50	213.85
10	214.75	222.75	218.75	216.00	222.50	221.85

TABELA A.3.1-13

Analogni televizijski sistem G u opsegu III

Korišćen u sledećim geografskim oblastima:

MOZ, SWZ, ZWE

Redni broj kanala	Granice kanala (MHz)		Dodeljene frekvencije (MHz)	Nosilac slike (MHz)	Nosilac zvuka (MHz)
5	174.00	182.00	178.00	175.25	180.75
6	182.00	190.00	186.00	183.25	188.75
7	190.00	198.00	194.00	191.25	196.75
8	198.00	206.00	202.00	199.25	204.75
9	206.00	214.00	210.00	207.25	212.75
10	214.00	222.00	218.00	215.25	220.75
11	222.00	230.00	226.00	223.25	228.75
12*	230.00	238.00	234.00	231.25	236.75
13*	246.18	254.18	250.18	247.43	252.93

* Koristi se samo za MOZ i ZWE (izvan planiranih opsega za RRC-06).

TABELA A.3.1-14

Analogni televizijski sistemi D1, G, H, I, I1, K, K1 i L u Opsezima IV i V

Redni broj kanala	Granice kanala (MHz)		Nosilac slike (MHz)	Nosilac zvuka za Sisteme G, H (MHz)	Dualni nosilac drugog zvuka (MHz)	Sistem G Sistem L SistemD1 NICAM carrier (MHz)	Nosilac zvuka za Sistem I Sistem I1 (MHz)	Nosilac zvuka za Sistem K Sistem K1 Sistem L Sistem D1 (MHz)	SistemI Sistem1 NICAM nosilac (MHz)
21	470	478	471.25	476.75	476.99	477.1	477.25	477.75	477.8
22	478	486	479.25	484.75	484.99	485.1	485.25	485.75	485.8
23	486	494	487.25	492.75	492.99	493.1	493.25	493.75	493.8
24	494	502	495.25	500.75	500.99	501.1	501.25	501.75	501.8
25	502	510	503.25	508.75	508.99	509.1	509.25	509.75	509.8
26	510	518	511.25	516.75	516.99	517.1	517.25	517.75	517.8
27	518	526	519.25	524.75	524.99	525.1	525.25	525.75	525.8
28	526	534	527.25	532.75	532.99	533.1	533.25	533.75	533.8
29	534	542	535.25	540.75	540.99	541.1	541.25	541.75	541.8
30	542	550	543.25	548.75	548.99	549.1	549.25	549.75	549.8
31	550	558	551.25	556.75	556.99	557.1	557.25	557.75	557.8
32	558	566	559.25	564.75	564.99	565.1	565.25	565.75	565.8
33	566	574	567.25	572.75	572.99	573.1	573.25	573.75	573.8
34	574	582	575.25	580.75	580.99	581.1	581.25	581.75	581.8
35	582	590	583.25	588.75	588.99	589.1	589.25	589.75	589.8

TABELA A.3.1-14 (*kraj*)

Redni broj kanala	**Granice kanala (MHz)**		**Nosilac slike (MHz)**	**Nosilac zvuka za Sisteme G, H (MHz)**	**Dualni nosi-lac drugog zvuka (MHz)**	**Sistem G Sistem L Sistem m D1 NICAM nosilac (MHz)**	**Nosilac zvuka za Sistem I Sistem I1 (MHz)**	**Nosilac zvuka za Sistem K Sistem K1 Sistem L Sistem D1 (MHz)**	**Sistem I Sistem I1 NICAM nosilac (MHz)**
36	590	598	591.25	596.75	596.99	597.1	597.25	597.75	597.8
37	598	606	599.25	604.75	604.99	605.1	605.25	605.75	605.8
38	606	614	607.25	612.75	612.99	613.1	613.25	613.75	613.8
39	614	622	615.25	620.75	620.99	621.1	621.25	621.75	621.8
40	622	630	623.25	628.75	628.99	629.1	629.25	629.75	629.8
41	630	638	631.25	636.75	636.99	637.1	637.25	637.75	637.8
42	638	646	639.25	644.75	644.99	645.1	645.25	645.75	645.8
43	646	654	647.25	652.75	652.99	653.1	653.25	653.75	653.8
44	654	662	655.25	660.75	660.99	661.1	661.25	661.75	661.8
45	662	670	663.25	668.75	668.99	669.1	669.25	669.75	669.8
46	670	678	671.25	676.75	676.99	677.1	677.25	677.75	677.8
47	678	686	679.25	684.75	684.99	685.1	685.25	685.75	685.8
48	686	694	687.25	692.75	692.99	693.1	693.25	693.75	693.8
49	694	702	695.25	700.75	700.99	701.1	701.25	701.75	701.8
50	702	710	703.25	708.75	708.99	709.1	709.25	709.75	709.8
51	710	718	711.25	716.75	716.99	717.1	717.25	717.75	717.8
52	718	726	719.25	724.75	724.99	725.1	725.25	725.75	725.8
53	726	734	727.25	732.75	732.99	733.1	733.25	733.75	733.8
54	734	742	735.25	740.75	740.99	741.1	741.25	741.75	741.8
55	742	750	743.25	748.75	748.99	749.1	749.25	749.75	749.8
56	750	758	751.25	756.75	756.99	757.1	757.25	757.75	757.8
57	758	766	759.25	764.75	764.99	765.1	765.25	765.75	765.8
58	766	774	767.25	772.75	772.99	773.1	773.25	773.75	773.8
59	774	782	775.25	780.75	780.99	781.1	781.25	781.75	781.8
60	782	790	783.25	788.75	788.99	789.1	789.25	789.75	789.8
61	790	798	791.25	796.75	796.99	797.1	797.25	797.75	797.8
62	798	806	799.25	804.75	804.99	805.1	805.25	805.75	805.8
63	806	814	807.25	812.75	812.99	813.1	813.25	813.75	813.8
64	814	822	815.25	820.75	820.99	821.1	821.25	821.75	821.8
65	822	830	823.25	828.75	828.99	829.1	829.25	829.75	829.8
66	830	838	831.25	836.75	836.99	837.1	837.25	837.75	837.8
67	838	846	839.25	844.75	844.99	845.1	845.25	845.75	845.8
68	846	854	847.25	852.75	852.99	853.1	853.25	853.75	853.8
69	854	862	855.25	860.75	860.99	861.1	861.25	861.75	861.8

TABELA A.3.1-15

T-DAB frekvencijski blokovi u opsegu III

T-DAB frekvencijski blok	**Dodeljena frekvencija (MHz)**	**Opseg frekvencijskog bloka (MHz)**	**Niži zaštitni opseg (kHz)**	**Viši zaštitni opseg (kHz)**	**Frekvencijski opseg (MHz)**
5A	174.928	174.160-175.696	–	176	
5B	176.640	175.872-177.408	176	176	174.0-181.0
5C	178.352	177.584-179.120	176	176	
5D	180.064	179.296-180.832	176	336	
6A	181.936	181.168-182.704	336	176	
6B	183.648	182.880-184.416	176	176	181.0-188.0
6C	185.360	184.592-186.128	176	176	
6D	187.072	186.304-187.840	176	320	
7A	188.928	188.160-189.696	320	176	
7B	190.640	189.872-191.408	176	176	188.0-195.0
7C	192.352	191.584-193.120	176	176	
7D	194.064	193.296-194.832	176	336	
8A	195.936	195.168-196.704	336	176	
8B	197.648	196.880-198.416	176	176	195.0-202.0
8C	199.360	198.592-200.128	176	176	
8D	201.072	200.304-201.840	176	320	
9A	202.928	202.160-203.696	320	176	
9B	204.640	203.872-205.408	176	176	202.0-209.0
9C	206.352	205.584-207.120	176	176	
9D	208.064	207.296-208.832	176	336	
10A	209.936	209.168-210.704	336	176	
10B	211.648	210.880-212.416	176	176	209.0-216.0
10C	213.360	212.592-214.128	176	176	
10D	215.072	214.304-215.840	176	320	
11A	216.928	216.160-217.696	320	176	
11B	218.640	217.872-219.408	176	176	216.0-223.0
11C	220.352	219.584-221.120	176	176	
11D	222.064	221.296-222.832	176	336	
12A	223.936	223.168-224.704	336	176	
12B	225.648	224.880-226.416	176	176	223.0-230.0
12C	227.360	226.592-228.128	176	176	
12D	229.072	228.304-229.840	176	–	

* Dati frekvencijski opsezi odgovaraju kanalima Sistema B/PAL, koji su široki 7 MHz. Oni nemaju nikakav drugi značaj.

DODATAK 3.2

C/*N* vrednosti i vrednosti minimalne srednje vrednosti intenziteta električnog polja za različite verzije DVB-T sistema za različite uslove prijema

TABELA A.3.2-1

***C*/*N* (dB) vrednosti za različite verzije DVB-T sistema za Gausove, Rajsove i Rejlijeve kanale i odgovarajuće vrednosti za slučaj fiksnog prijema (FX), portabilni prijem na otvorenom (PO), portabilni prijem u zatvorenom (PI) i mobilni prijem (MO)**

Verzije sistema	Modulacija	Kodni količnik	Gausov	Rajsov	Rejlijev		
				FX	PO	PI	MO
A1, D1	QPSK	1/2	4.9	5.9	8.1	8.1	11.1
A2, D2	QPSK	2/3	6.8	7.9	10.2	10.2	13.2
A3, D3	QPSK	3/4	7.9	9.1	11.5	11.5	14.5
A5, D5	QPSK	5/6	9.0	10.3	12.8	12.8	15.8
A7, D7	QPSK	7/8	9.9	11.3	13.9	13.9	16.9
B1, E1	16-QAM	1/2	10.6	11.6	13.8	13.8	16.8
B2, E2	16-QAM	2/3	13.0	14.1	16.4	16.4	19.4
B3, E3	16-QAM	3/4	14.5	15.7	18.1	18.1	21.1
B5, E5	16-QAM	5/6	15.6	16.9	19.4	19.4	22.4
B7, E7	16-QAM	7/8	16.1	17.5	20.1	20.1	23.1
C1, F1	64-QAM	1/2	16.2	17.2	19.4	19.4	22.4
C2, F2	64-QAM	2/3	18.4	19.5	21.8	21.8	24.8
C3, F3	64-QAM	3/4	20.0	21.2	23.6	23.6	26.6
C5, F5	64-QAM	5/6	21.4	22.7	25.2	25.2	28.2
C7, F7	64-QAM	7/8	22.3	23.7	26.3	26.3	29.3

TABELA A.3.2-2

Vrednosti minimalne srednje vrednosti intenziteta električnog polja (dB(μV/m)) kod različitih verzija DVB-T sistema za različite uslove fiksnog prijema (FX), portabilni prijem u otvorenom prostoru (PO), portabilni prijem u zatvorenom prostru (PI) i mobilni prijem (MO) za dve referentne frekvencije, 200 MHz i 500 MHz

Verzija sistema	Modulacija	Kodni količnik	MHz	FX	PO	PI	MO
A1, D1	QPSK	1/2	200.0	34.90	56.10	66.10	59.10
A2, D2	QPSK	2/3	200.0	36.90	58.20	68.20	61.20
A3, D3	QPSK	3/4	200.0	38.10	59.50	69.50	62.50
A5, D5	QPSK	5/6	200.0	39.30	60.80	70.80	63.80
A7, D7	QPSK	7/8	200.0	40.30	61.90	71.90	64.90
B1, E1	16-QAM	1/2	200.0	40.60	61.80	71.80	64.80
B2, E2	16-QAM	2/3	200.0	43.10	64.40	74.40	67.40
B3, E3	16-QAM	3/4	200.0	44.70	66.10	76.10	69.10
B5, E5	16-QAM	5/6	200.0	45.90	67.40	77.40	70.40
B7, E7	16-QAM	7/8	200.0	46.50	68.10	78.10	71.10
C1, F1	64-QAM	1/2	200.0	46.20	67.40	77.40	70.40
C2, F2	64-QAM	2/3	200.0	48.50	69.80	79.80	72.80
C3, F3	64-QAM	3/4	200.0	50.20	71.60	81.60	74.60
C5, F5	64-QAM	5/6	200.0	51.70	73.20	83.20	76.20
C7, F7	64-QAM	7/8	200.0	52.70	74.30	84.30	77.30
A1, D1	QPSK	1/2	500.0	38.90	64.10	76.10	67.10
A2, D2	QPSK	2/3	500.0	40.90	66.20	78.20	69.20
A3, D3	QPSK	3/4	500.0	42.10	67.50	79.50	70.50
A5, D5	QPSK	5/6	500.0	43.30	68.80	80.80	71.80
A7, D7	QPSK	7/8	500.0	44.30	69.90	81.90	72.90
B1, E1	16-QAM	1/2	500.0	44.60	69.80	81.80	72.80
B2, E2	16-QAM	2/3	500.0	47.10	72.40	84.40	75.40
B3, E3	16-QAM	3/4	500.0	48.70	74.10	86.10	77.10
B5, E5	16-QAM	5/6	500.0	49.90	75.40	87.40	78.40
B7, E7	16-QAM	7/8	500.0	50.50	76.10	88.10	79.10
C1, F1	64-QAM	1/2	500.0	50.20	75.40	87.40	78.40
C2, F2	64-QAM	2/3	500.0	52.50	77.80	89.80	80.80
C3, F3	64-QAM	3/4	500.0	54.20	79.60	91.60	82.60
C5, F5	64-QAM	5/6	500.0	55.70	81.20	93.20	84.20
C7, F7	64-QAM	7/8	500.0	56.70	82.30	94.30	85.30

Minimalna srednja vrednost intenziteta električnog polja u Tabeli A.3.2-2 je data za 200 MHz (Opseg III) i 500 MHz (Opsezi IV/V). Za ostale frekvencije biće korišćena sledeća interpolacija:

– $E_{med}(f) = E_{med}(f_r) + \text{Corr}$;

– za fiksni prijem, Corr = 20 $\log_{10} (f/f_r)$, gde su f stvarna frekvencija, a f_r referentna frekvencija prethodno navedenog relevantnog opsega;

– za portabilni i mobilni prijem, Corr = 30 $\log_{10} (f/f_r)$, gde su f stvarna frekvencija, a referentna frekvencija prethodno navedenog relevantnog opsega.

DODATAK 3.3

Zaštitni opsezi za terestrijalne radiodifuzne sisteme

A.3.3.1 Pregled tabela sa zaštitnim opsezima

Željeni signal	Neželjeni signal	Tabela
DVB-T	Istokanalni DVB-T	A.3.3-1
DVB-T	DVB-T signal susednog kanala	A.3.3-2
DVB-T	Istokanalna analogna TV	A.3.3-3
DVB-T	Niži kanal analogne TV	A.3.3-4
DVB-T	Viši kanal analogne TV	A.3.3-5
DVB-T (8 MHz)	Preklapajući 7 MHz analogne TV	A.3.3-6
DVB-T (7 MHz)	Preklapajući 7 MHz analogne TV	A.3.3-7
DVB-T (8 MHz)	Preklapajući 8 MHz analogne TV	A.3.3-8
DVB-T (7 MHz)	Preklapajući 8 MHz analogne TV	A.3.3-9
DVB-T	Istokanalni T-DAB	A.3.3-10
DVB-T (za RPCs)	Istokanalni DVB-T	A.3.3-11
DVB-T (za RPCs)	Istokanalni T-DAB	A.3.3-12
T-DAB	DVB-T (8 MHz)	A.3.3-13
T-DAB	DVB-T (7 MHz)	A.3.3-14
T-DAB	Analogni TV – I/PAL	A.3.3-15
T-DAB	Analogni TV – B/PAL	A.3.3-16
T-DAB	Analogni TV – D/SECAM	A.3.3-17
T-DAB	Analogni TV – L/SECAM	A.3.3-18
T-DAB	Analogni TV – B/SECAM, B/PAL (T2)	A.3.3-19
T-DAB	Analogni TV – D/PAL	A.3.3-20
T-DAB	Analogni TV – G/PAL	A.3.3-21
T-DAB	Analogni TV – K1/SECAM	A.3.3-22
Analogna TV	Istokanalni DVB-T	A.3.3-23
Analogna TV	Preklapajući 7 MHz DVB-T	A.3.3-24
Analogna TV	Preklapajući 8 MHz DVB-T	A.3.3-25

Napomena:

FX: fiksni prijem

PO: portabilni prijem na otvorenom

PI: portabilni prijem u zatvorenom prostoru

MO: mobilni prijem

Gauss: Gausov kanal

A.3.3.2 Odnosi zaštite za DVB-T

A.3.3.2.1 Odnosi zaštite za DVB-T koji je ometan sa DVB-T signalom

TABELA A.3.3-1

Istokanalni zaštini odnosi (dB) za DVB-T signal koji je ometan sa DVB-T signalom druge DVB-T verzije za slučaj fiksnog prijema (FX), prijema sa promenljive lokacije na otvorenom prostoru (PO), prijema sa promenljive lokacije u zatvorenom prostoru (PI) i mobilni prijem (MO)

Verzije DVB-T istema	FX	PO	PI	MO
QPSK 1/2	6.00	8.00	8.00	11.00
QPSK 2/3	8.00	11.00	11.00	14.00
QPSK 3/4	9.30	11.70	11.70	14.70
QPSK 5/6	10.50	13.00	13.00	16.00
QPSK 7/8	11.50	14.10	14.10	17.10
16-QAM 1/2	11.00	13.00	13.00	16.00
16-QAM 2/3	14.00	16.00	16.00	19.00
16-QAM 3/4	15.00	18.00	18.00	21.00
16-QAM 5/6	16.90	19.40	19.40	22.40
16-QAM 7/8	17.50	20.10	20.10	23.10
64-QAM 1/2	17.00	19.00	19.00	22.00
64-QAM 2/3	20.00	23.00	23.00	26.00
64-QAM 3/4	21.00	25.00	25.00	28.00
64-QAM 5/6	23.30	25.80	25.80	28.80
64-QAM 7/8	24.30	26.90	26.90	29.90

A.3.3.2.2 Odnosi zaštite za slučaj preklapajućih i susednih kanala

Postupanje sa slučajevima preklapajućih i susednih kanala (DVB-T vis-à-vis DVB-T) opiseno je u Preporuci ITU-R BT.1368-6. Biće korišćeni odnosi zaštite za susedne kanale date u Tabeli A.3.3-2.

TABELA A.3.3-2

Odnosi zaštite (dB) za DVB-T signal koji je ometan DVB-T signalima u nižim ($N - 1$) i višim ($N + 1$) susednim kanalima

Kanal	$N - 1$	$N + 1$
PR	–30	–30

A.3.3.2.3 Iznosi zaštite za DVB-T koji interferira sa sistemima analogne televizije

TABELA A.3.3-3

Istokanalni odnosi zaštite (dB) za DVB-T signale ometane signalima analogne televizije

Verzije DVB-T sistema	Gaus	FX	PO	PI	MO
QPSK 1/2	−12.0	−12.0	−12.0	−12.0	−9.0
QPSK 2/3	−8.0	−8.0	−8.0	−8.0	−5.0
QPSK 3/4	−4.0	−2.8	−0.4	−0.4	2.6
QPSK 5/6	3.0	4.3	6.8	6.8	9.8
QPSK 7/8	9.0	10.4	13.0	13.0	16.0
16-QAM 1/2	−8.0	−8.0	−8.0	−8.0	−5.0
16-QAM 2/3	−3.0	0.0	3.0	3.0	6.0
16-QAM 3/4	0.0	2.5	5.0	5.0	8.0
16-QAM 5/6	9.0	10.3	12.8	12.8	15.8
16-QAM 7/8	16.0	17.4	20.0	20.0	23.0
64-QAM 1/2	−3.0	0.0	3.0	3.0	6.0
64-QAM 2/3	3.0	4.5	6.0	6.0	9.0
64-QAM 3/4	9.0	12.0	15.0	15.0	18.0
64-QAM 5/6	15.0	16.3	18.8	18.8	21.8
64-QAM 7/8	20.0	21.4	24.0	24.0	27.0

TABELA A.3.3-4

Iznos zaštite (dB) za interferenciju nižeg susednog kanala (*N* – 1) za DVB-T signale ometane signalima analogne televizije, uključujući i zvuk

Verzije DVB-T sistema	Gaus	FX	PO	PI	MO
QPSK 1/2	−44.0	−44.0	−44.0	−44.0	−41.0
QPSK 2/3	−44.0	−44.0	−44.0	−44.0	−41.0
QPSK 3/4	−42.9	−42.9	−42.9	−42.9	−39.9
QPSK 5/6	−41.8	−41.8	−41.8	−41.8	−38.8
QPSK 7/8	−40.9	−40.9	−40.9	−40.9	−37.9
16-QAM 1/2	−43.0	−43.0	−43.0	−43.0	−40.0
16-QAM 2/3	−42.0	−42.0	−42.0	−42.0	−39.0
16-QAM 3/4	−38.0	−38.0	−38.0	−38.0	−35.0
16-QAM 5/6	−39.4	−39.4	−39.4	−39.4	−36.4
16-QAM 7/8	−38.9	−38.9	−38.9	−38.9	−35.9
64-QAM 1/2	−40.0	−40.0	−40.0	−40.0	−37.0
64-QAM 2/3	−35.0	−35.0	−35.0	−35.0	−32.0
64-QAM 3/4	−32.0	−32.0	−32.0	−32.0	−29.0
64-QAM 5/6	−32.0	−32.0	−32.0	−32.0	−29.0
64-QAM 7/8	−31.1	−31.1	−31.1	−31.1	−28.1

TABELA A.3.3-5

Iznos zaštite (dB) za interferenciju višeg susednog kanala (*N* + 1) za DVB-T signale ometane signalima analogne televizije uključujući i zvuk

Verzije DVB-T sistema	Gaus	FX	PO	PI	MO
QPSK 1/2	−48.9	−48.9	−48.9	−48.9	−45.9
QPSK 2/3	−47	−47	−47	−47	−44
QPSK 3/4	−45.9	−45.9	−45.9	−45.9	−42.9
QPSK 5/6	−44.8	−44.8	−44.8	−44.8	−41.8
QPSK 7/8	−43.9	−43.9	−43.9	−43.9	−40.9
16-QAM 1/2	−45.4	−45.4	−45.4	−45.4	−42.4
16-QAM 2/3	−43	−43	−43	−43	−40
16-QAM 3/4	−41.5	−41.5	−41.5	−41.5	−38.5
16-QAM 5/6	−40.4	−40.4	−40.4	−40.4	−37.4
16-QAM 7/8	−39.9	−39.9	−39.9	−39.9	−36.9
64-QAM 1/2	−40.2	−40.2	−40.2	−40.2	−37.2
64-QAM 2/3	−38	−38	−38	−38	−35
64-QAM 3/4	−36.4	−36.4	−36.4	−36.4	−33.4
64-QAM 5/6	−35	−35	−35	−35	−32
64-QAM 7/8	−34.1	−34.1	−34.1	−34.1	−31.1

TABELA A.3.3-6

Iznos zaštite (dB) za DVB-T 8 MHz signale ometane preklapajućim 7 MHz signalima analogne televizije uključujući zvuk

Δf = 0.75 MHz

Verzije DVB-T sistema	**Gaus**	**FX**	**PO**	**PI**	**MO**
QPSK 1/2	−10.5	−9.5	−7.3	−7.3	−4.3
QPSK 2/3	−8.6	−7.5	−5.2	−5.2	−2.2
QPSK 3/4	−7.5	−6.3	−3.9	−3.9	−0.9
QPSK 5/6	−6.4	−5.1	−2.6	−2.6	0.4
QPSK 7/8	−5.5	−4.1	−1.5	−1.5	1.5
16-QAM 1/2	−4.8	−3.8	−1.6	−1.6	1.4
16-QAM 2/3	−2.4	−1.3	1.0	1.0	4.0
16-QAM 3/4	−0.9	0.3	2.7	2.7	5.7
16-QAM 5/6	0.2	1.5	4.0	4.0	7.0
16-QAM 7/8	0.7	2.1	4.7	4.7	7.7
64-QAM 1/2	0.8	1.8	4.0	4.0	7.0
64-QAM 2/3	3.0	4.1	6.4	6.4	9.4
64-QAM 3/4	4.6	5.8	8.2	8.2	11.2
64-QAM 5/6	6.0	7.3	9.8	9.8	12.8
64-QAM 7/8	6.9	8.3	10.9	10.9	13.9

Faktor korekcije za ostale vrednosti Δf u odnosu na Δf = 0.75 MHz													
−9.75	**−9.25**	**−8.75**	**−8.25**	**−6.75**	**−3.95**	**−3.75**	**−2.75**	**−1.75**	**−0.75**	**2.25**	**3.25**	**4.75**	**5.25**
−40	−17	−11	−7	−5	−2	0	0	0	0	−1	−4	−32	−39

Δf: Razlika frekvencija nosioca slike i centralne frekvencije DVB-T signala

TABELA A.3.3-7

Iznos zaštite (dB) za DVB-T 7 MHz signale ometane sa preklapajućim analognim televizijskim signalom 7 MHz uključujući zvuk za

Δ*f* = 0 MHz

Verzija DVB-T sistema	Gaus	FX	PO	PI	MO
QPSK 1/2	−11.5	−10.5	−8.3	–8.3	–5.3
QPSK 2/3	−9.6	−8.5	−6.2	–6.2	–3.2
QPSK 3/4	−8.5	−7.3	−4.9	–4.9	–1.9
QPSK 5/6	−7.4	−6.1	−3.6	–3.6	–0.6
QPSK 7/8	−6.5	−5.1	−2.5	–2.5	0.5
16-QAM 1/2	−5.8	−4.8	−2.6	–2.6	0.4
16-QAM 2/3	−3.4	−2.3	0.0	0.0	3.0
16-QAM 3/4	−1.9	−0.7	1.7	1.7	4.7
16-QAM 5/6	−0.8	0.5	3.0	3.0	6.0
16-QAM 7/8	−0.3	1.1	3.7	3.7	6.7
64-QAM 1/2	−0.2	0.8	3.0	3.0	6.0
64-QAM 2/3	2.0	3.1	5.4	5.4	8.4
64-QAM 3/4	3.6	4.8	7.2	7.2	10.2
64-QAM 5/6	5.0	6.3	8.8	8.8	11.8
64-QAM 7/8	5.9	7.3	9.9	9.9	12.9

Faktor korekcije za ostale vrenosti Δ*f* u odnosu na Δ*f* = 0 MHz													
−9.25	**−8.75**	**−8.25**	**−7.75**	**−6.25**	**−3.45**	**−3.25**	**−2.25**	**−1.25**	**0.00**	**1.75**	**2.75**	**4.25**	**4.75**
−37	−14	−13	−7	−5	−3	2	−1	−2	0	−7	−7	−38	−40

Δ*f*: Razlika frekvencija nosioca slike i centralne frekvencije DVB-T signala

TABELA A.3.3-8

Iznos zaštite (dB) za DVB-T 8 MHz signale ometane sa preklapajućim 8 MHz signalom analogne televizije uključujući zvuk za

Δf = 0 MHz

Verzija DVB-T sistema	**Gauss**	**FX**	**PO**	**PI**	**MO**
QPSK 1/2	−11.5	−10.5	−8.3	−8.3	−5.3
QPSK 2/3	−9.6	−8.5	−6.2	−6.2	−3.2
QPSK 3/4	−8.5	−7.3	−4.9	−4.9	−1.9
QPSK 5/6	−7.4	−6.1	−3.6	−3.6	−0.6
QPSK 7/8	−6.5	−5.1	−2.5	−2.5	0.5
16-QAM 1/2	−5.8	−4.8	−2.6	−2.6	0.4
16-QAM 2/3	−3.4	−2.3	0.0	0.0	3.0
16-QAM 3/4	−1.9	−0.7	1.7	1.7	4.7
16-QAM 5/6	−0.8	0.5	3.0	3.0	6.0
16-QAM 7/8	−0.3	1.1	3.7	3.7	6.7
64-QAM 1/2	−0.2	0.8	3.0	3.0	6.0
64-QAM 2/3	2.0	3.1	5.4	5.4	8.4
64-QAM 3/4	3.6	4.8	7.2	7.2	10.2
64-QAM 5/6	5.0	6.3	8.8	8.8	11.8
64-QAM 7/8	5.9	7.3	9.9	9.9	12.9

Faktor korekcije za ostale vrenosti Δf u odnosu na Δf = 0 MHz													
−10.25	**−9.75**	**−9.25**	**−8.75**	**−7.25**	**−3.45**	**−3.25**	**−2.25**	**−1.25**	**0.00**	**1.75**	**2.75**	**4.25**	**4.75**
−37	−14	−13	−7	−5	−3	2	−1	−2	0	−7	−7	−38	−40

Δf: Razlika frekvencija nosioca slike i centralne frekvencije DVB-T signala

A.3.3.2.4 Iznosi zaštite za DVB-T ometan sa T-DAB

TABELA A.3.3-10

Istokanalni iznosi zaštite (dB) za DVB-T signal ometan T-DAB signalom za različite verzije DVB-T sistema za slučaj fiksnog prijema (FX), portabilni prijem u otvorenom prostoru (PO), portabilni prijem u zatvorenom prostoru (PI) i mobilni prijem (MO)

Verzija DVB-T sistema	FX	PO	PI	MO
QPSK 1/2	11.00	13.20	13.20	16.20
QPSK 2/3	13.10	15.40	15.40	18.40
QPSK 3/4	15.20	17.60	17.60	20.60
QPSK 5/6	15.50	18.00	18.00	21.00
QPSK 7/8	16.50	19.10	19.10	22.10
16-QAM 1/2	16.00	18.20	18.20	21.20
16-QAM 2/3	19.10	21.40	21.40	24.40
16-QAM 3/4	21.20	23.60	23.60	26.60
16-QAM 5/6	21.90	24.40	24.40	27.40
16-QAM 7/8	22.50	25.10	25.10	28.10
64-QAM 1/2	21.00	23.20	23.20	26.20
64-QAM 2/3	25.10	27.40	27.40	30.40
64-QAM 3/4	27.20	29.60	29.60	32.60
64-QAM 5/6	28.30	30.80	30.80	33.80
64-QAM 7/8	32.40	35.00	35.00	38.00

A.3.3.2.5 Iznosi zaštite za RPC

Radi analiza kompatibilnosti, potrebni su iznosi zaštite i za referentne planirane konfiguracije. Pošto RPC predstavlja veštačku (sintetičku) konfiguraciju, ne postoje odgovarajući zaštitini iznosi. Sledeće vrednosti biće korišćene:

- za DVB-T ometan sa DVB-T, videti Tabelu A.3.3-11;
- za DVB-T ometan sa T-DAB, videti Tabelu A.3.3-12;
- za DVB-T ometan analognom televizijom:
  - za RPC 1, vrednosti zaštitnog iznosa za verziju DVB-T sistema 64-QAM 3/4 – fiksni prijem, pronaći u Tabelama A.3.3-3 do A 3.3-9;
  - za RPC 2, vrednosti zaštitnog iznosa za verziju DVB-T sistema 16-QAM 3/4 – portabilni prijem na otvorenom prostoru, pronaći u Tabelama A.3.3-3 do A 3.3-9;
  - za RPC 3, vrednosti zaštitnog iznosa za verziju DVB-T sistema 16-QAM 3/4 – portabilni prijem u zatvorenom prostoru, pronaći u Tabelama A.3.3-3 do A 3.3-9;

TABELA A.3.3-11

Istokanalani iznos zaštite (dB) za DVB-T signal ometan DVB-T signalom za RPC -e

RPC	ZO (dB)
RPC 1	21
RPC 2	19
RPC 3	17

TABELA A.3.3-12

Istokanalani iznos zaštite (dB) za DVB-T signal ometan T-DAB signalom za RPC-e

RPC	ZO (dB)
RPC 1	27.2
RPC 2	23.6
RPC 3	21.4

A.3.3.3 Iznos zaštite za T-DAB

A.3.3.3.1 T-DAB ometan sa DVB-T

TABELA A.3.3-13

Iznos zaštite za T-DAB ometan DVB-T 8 MHz sistemom

Δf (1) (MHz)	−5	−4.2	−4	−3	0	3	4	4.2	5
ZO (dB) za mobilni i portabilni prijem	−43	6	7	8	8	8	7	6	−43
ZO (dB) Gausov kanal	−50	−1	0	1	1	1	0	−1	−50

(1) Δf: Razlika centralne frekvencije DVB-T signala i centralne frekvencije T-DAB signala.

TABELA A.3.3-14

Iznos zaštite za T-DAB ometan DVB-T 7 MHz sistemom

Δf (1) (MHz)	−4.5	−3.7	−3.5	−2.5	0	2.5	3.5	3.7	4.5
ZO (dB) za mobilni i portabilni prijem	−42	7	8	9	9	9	8	7	−42
ZO (dB) Gausov kanal	−49	0	1	2	2	2	1	0	−49

(1) Δf: Razlika centralne frekvencije DVB-T signala i centralne frekvencije T-DAB signala.

A.3.3.3.2 Iznos zaštite T-DAB ometan signalom analogne televizije

Koristiće se odnosi zaštite za T-DAB ometan analognom terestrijalnom televizijom iz Tabela A.3.3-15 do A.3.3-22.

TABELA A.3.3-15

Iznosi zaštite za T-DAB ometan analognim televizijskim sistemom I/PAL (Opseg III)

I/PAL (Opseg III)											
Δ*f* (MHz)	−8.0	−7.5	−7.0	−6.5	−6.0	−5.5	−5.0	−4.5	−4.0	−3.5	−3.0
PR (dB)	−42.0	−23.5	−10.0	−3.0	−2.0	−3.0	−24.0	−21.0	−23.0	−31.0	−31.5
Δ*f* (MHz)	−2.5	−2.0	−1.5	−1.0	−0.9	−0.8	−0.7	−0.6	0.0	0.6	0.7
PR (dB)	−30.0	−28.5	−25.0	−19.5	−17.5	−11.0	−7.0	−1.5	−1.5	−4.0	−5.5
Δ*f* (MHz)	0.8	0.9	1.0	2.0	3.0						
PR (dB)	−13.5	−17.0	−20.0	−33.0	−47.5						

Δ*f:* Razlika frekvencije analognog nosioca slike i centralne frekvencije T-DAB.

TABELA A.3.3-16

Iznosi zaštite za T-DAB ometan analognim televizijskim sistemom B/PAL (Opseg III)

B/PAL (Opseg III)											
Δ*f* (MHz)	−7.0	−6.5	−6.0	−5.5	−5.0	−4.5	−4.0	−3.5	−3.0	−2.5	−2.0
PR (dB)	−47.0	−18.0	−5.0	−3.0	−5.0	−20.0	−22.0	−31.5	−31.5	−29.0	−26.5
Δ*f* (MHz)	−1.5	−1.0	−0.9	−0.8	−0.7	−0.6	0.0	0.6	0.7	0.8	0.9
PR (dB)	−23.0	−18.5	−16.0	−9.0	−5.0	−3.0	−0.5	−3.0	−4.0	−12.0	−16.0
Δ*f* (MHz)	1.0	2.0									
PR (dB)	−19.5	−45.3									

Δ*f:* Razlika frekvencije analognog nosioca slike i centralne frekvencije T-DAB.

TABELA A.3.3-17

Iznosi zaštite za T-DAB ometan analognim televizijskim sistemom D/SECAM (Opseg III)

D/SECAM (Opseg III)											
Δ*f* (MHz)	−8.0	−7.5	−7.0	−6.5	−6.0	−5.5	−5.0	−4.5	−4.0	−3.5	−3.0
PR (dB)	−47.0	−42.5	−3.0	−2.5	−3.0	−37.5	−21.5	−18.5	−20.5	−26.5	−33.5
Δ*f* (MHz)	−2.5	−2.0	−1.5	−1.0	−0.9	−0.8	−0.7	−0.6	0.0	0.6	0.7
PR (dB)	−31.5	−29.0	−26.5	−18.5	−16.5	−9.0	−6.0	−3.0	−2.5	−4.0	−4.5
Δ*f* (MHz)	0.8	0.9	1.0	2.0							
PR (dB)	−12.0	−22.0	−25.0	−46.0							

Δ*f:* Razlika frekvencije analognog nosioca slike i centralne frekvencije T-DAB.

TABELA A.3.3-18

Iznosi zaštite za T-DAB ometan analognim televizijskim sistemom L/SECAM (Opseg III)

L/SECAM (Opseg III)											
Δ*f* (MHz)	−8.0	−7.5	−7.0	−6.5	−6.0	−5.5	−5.0	−4.5	−4.0	−3.5	−3.0
PR (dB)	−46.5	−42.5	−15.5	−13.0	−15.0	−26.5	−18.5	−17.0	−18.0	−23.0	−31.5
Δ*f* (MHz)	−2.5	−2.0	−1.5	−1.0	−0.9	−0.8	−0.7	−0.6	0.0	0.6	0.7
PR (dB)	−30.5	−27.5	−24.5	−18.0	−16.5	−8.0	−5.0	−1.5	1.5	−2.0	−3.5
Δ*f* (MHz)	0.8	0.9	1.0	2.0	3.0						
PR (dB)	−12.5	−18.5	−19.0	−31.0	−46.8						

Δ*f:* Razlika frekvencije analognog nosioca slike i centralne frekvencije T-DAB.

TABELA A.3.3-19

Iznosi zaštite za T-DAB ometan analognim televizijskim sistemima B/SECAM, B/PAL (T2) (Opseg III)

B/SECAM (Opseg III), B/PAL (T2) za podatke											
Δ*f* (MHz)	−7.0	−6.5	−6.0	−5.5	−5.0	−4.5	−4.0	−3.5	−3.0	−2.5	−2.0
PR (dB)	−47.0	−18.0	−5.0	−3.0	−5.0	−20.0	−22.0	−31.5	−31.5	−29.0	−26.5
Δ*f* (MHz)	−1.5	−1.0	−0.9	−0.8	−0.7	−0.6	0.0	0.6	0.7	0.8	0.9
PR (dB)	−23.0	−18.5	−16.0	−9.0	−5.0	−3.0	−0.5	−3.0	−4.0	−12.0	−16.0
Δ*f* (MHz)	1.0	2.0									
PR (dB)	−19.5	−45.3									

Δ*f:* Razlika frekvencije analognog nosioca slike i centralne frekvencije T-DAB.

TABELA A.3.3-20

Iznosi zaštite za T-DAB ometan analognim televizijskim sistemom D/PAL (Opseg III)

D/PAL (Opseg III)											
Δ*f* (MHz)	−8.0	−7.5	−7.0	−6.5	−6.0	−5.5	−5.0	−4.5	−4.0	−3.5	−3.0
PR (dB)	−47.0	−42.5	−3.0	−2.5	−3.0	−37.5	−21.5	−20.0	−22.0	−31.5	−31.5
Δ*f* (MHz)	−2.5	−2.0	−1.5	−1.0	−0.9	−0.8	−0.7	−0.6	0.0	0.6	0.7
PR (dB)	−29.0	−26.5	−23.0	−18.5	−16.0	−9.0	−5.0	−3.0	−0.5	−3.0	−4.0
Δ*f* (MHz)	0.8	0.9	1.0	2.0							
PR (dB)	−12.0	−16.0	−19.0	−45.3							

Δ*f:* Razlika frekvencije analognog nosioca slike i centralne frekvencije T-DAB.

TABELA A.3.3-21

Iznosi zaštite za T-DAB ometan analognim televizijskim sistemom G/PAL (Opseg III)

G/PAL (Opseg III)											
Δf (MHz)	−7.0	−6.5	−6.0	−5.5	−5.0	−4.5	−4.0	−3.5	−3.0	−2.5	−2.0
PR (dB)	−47.0	−18.0	−5.0	−3.0	−5.0	−20.0	−22.0	−31.5	−31.5	−29.0	−26.5
Δf (MHz)	−1.5	−1.0	−0.9	−0.8	−0.7	−0.6	0.0	0.6	0.7	0.8	0.9
PR (dB)	−23.0	−18.5	−16.0	−9.0	−5.0	−3.0	−0.5	−3.0	−4.0	−12.0	−16.0
Δf (MHz)	1.0	2.0									
PR (dB)	−19.5	−45.3									

Δf: Razlika frekvencije analognog nosioca slike i centralne frekvencije T-DAB .

TABELA A.3.3-22

Iznosi zaštite za T-DAB ometan analognim televizijskim sistemom K1/SECAM (Opseg III)

K1/SECAM (Opseg III)											
Δf (MHz)	−8.0	−7.5	−7.0	−6.5	−6.0	−5.5	−5.0	−4.5	−4.0	−3.5	−3.0
PR (dB)	−47.0	−42.5	−3.0	−2.5	−3.0	−37.5	−21.5	−18.5	−20.5	−26.5	−33.5
Δf (MHz)	−2.5	−2.0	−1.5	−1.0	−0.9	−0.8	−0.7	−0.6	0.0	0.6	0.7
PR (dB)	−31.5	−29.0	−26.5	−18.5	−16.5	−9.0	−6.0	−3.0	−2.5	−4.0	−4.5
Δf (MHz)	0.8	0.9	1.0	2.0							
PR (dB)	−12.0	−22.0	−25.0	−46.0							

Δf: Razlika frekvencije analognog nosioca slike i centralne frekvencije T-DAB .

A.3.3.4 Iznos zaštite za analognu terestrijalnu televiziju

A.3.3.4.1 Iznos zaštite za analogne televizijske signale ometane DVB-T signalima

a) Vrednosti istokanalnog zaštitnog iznosa za analogne televizijske sisteme ometane digitalnom televizijom smatraju se istim. Ipak, vrednosti zaštitnog iznosa se razlikuju za 1 dB u zavisnosti da li je neželjeni signal 8 MHz DVB-T ili 7 MHz DVB-T. Biće korišćeni iznosi zaštite iz Tabele A.3.3-23.

TABELA A.3.3-23

Istokanalni iznos zaštite (dB) za analogni terestrijalni signal ometan istokanalanim DVB-T signalom

	Troposferska interferencija	**Kontinualna interferencija**
DVB-T 8 MHz (UHF)	34	40
DVB-T 7 MHz (VHF)	35	41

b) Iznos zaštite u tabelama A.3.3-24 i A.3.3-25 biće korišćene za slučajeve preklapajućih kanala.

TABELA A.3.3-24

Iznosi zaštite (dB) za analogne B, D, D1, G, H, K/PAL signale slike ometane DVB-T 7 MHz signalom (preklapajući kanali)

Razlika centralne frekvencije neželjenog DVB-T signala i frekvencije nosioca slike željenog analognog televizijskog signala (MHz)		Iznos zaštite	
		Troposferska interferencija	Kontinualna interferencija
	−7.75	−16	−11
(*N* − 1)	−4.75	−9	−5
	−4.25	−3	4
	−3.75	13	21
	−3.25	25	31
	−2.75	30	37
	−1.75	34	40
	−0.75	35	41
(*N*)	2.25	35	41
	4.25	35	40
	5.25	31	38
	6.25	28	35
	7.25	26	33
	8.25	6	12
(*N* + 1)	9.25	−8	−5
	12.25	−8	−5

Za sve SECAM sisteme primenjuju se iste vrednosti.

TABELA A.3.3-25

Iznos zaštite (dB) za analogne B, D, D1, G, H, K/PAL signale slike ometane DVB-T 7 MHz signalom (preklapajući kanali)

Razlika centralne frekvencije neželjenog DVB-T signala i frekvencije nosioca slike željenog analognog televizijskog signala (MHz)	Iznos zaštite	
	Troposferska interferencija	Kontinualna interferencija
−8.25	−16	−11
(*N* − 1) −5.25	−9	−5
−4.75	−4	3
−4.25	12	20
−3.75	24	30
−3.25	29	36
−2.25	33	39
−1.25	34	40
(*N*) 2.75	34	40
4.75	34	39
5.75	30	37
6.75	27	34
7.75	25	32
8.75	5	11
(*N* □ 1) 9.75	−8	−5
12.75	−8	−5

(1) Vrednosti troposferske i kontinualne interferencije su izvedene iz Tabele A.3.3-24

Za sve SECAM sisteme primenjuju se iste vrednosti.

A.3.3.4.2 Iznosi zaštite za signale analogne televizije ometane sa signalom T-DAB i signalima analogne televizije

Kada je analogna televizija ometana T-DAB sistemom i analognom televizijom, biće korišćeni odnosi zaštite iz Preporuke ITU-R BT.655-7.

DODATAK 3.4

Određivanje minimalne srednje vrednosti intenziteta električnog polja

Minimalna srednja vrednost intenziteta električnog polja biće određena primenom sledećih formula:

$$P_n = F + 10\log_{10}(k\,T_0\,B)$$

$$P_{s\,min} = C/N + P_n$$

$$A_a = G + 10\log_{10}(1.64\lambda^2/4\pi)$$

$$\varphi_{min} = P_{s\,min} - A_a + L_f$$

$$E_{min} = \varphi_{min} + 120 + 10\log_{10}(120\pi) = \varphi_{min} + 145.8$$

$E_{med} = E_{min} + P_{mmn} + C_l$ za fiksni prijem

$E_{med} = E_{min} + P_{mmn} + C_l + L_h$ za portabilni prijem na otvorenom i u zatvorenom prostoru

$E_{med} = E_{min} + P_{mmn} + C_l + L_h + L_b$ za portabilni prijem u zatvorenom prostoru

$$C_l = \mu * \sigma_c$$

$$\sigma_c = \sqrt{\sigma_b^2 + \sigma_m^2}$$

Gde su:

P_n : snaga šuma na ulazu u prijemnik (dBW)

F : faktor šuma prijemnika (dB)

k : Bolcmanova konstanta ($k = 1.38 \times 10^{-23}$ J/K)

T_0 : apsolutna temperatura ($T_0 = 290$ K)

B : širina opsega šuma na ulazu u prijemnik
(6.66 × 10^6 Hz za 7 MHz DVB-T kanal,
7.61 × 10^6 Hz za 8 MHz DVB-T kanal i
1.54 × 10^6 Hz za T-DAB frekvencijski blok)

$P_{s\,min}$: minimalna snaga signala na ulazu u prijemnik (dBW)

C/N : RF minimalni odnos signal šum na ulazu u prijemnik (dB)

A_a : efektivna apertura antene (dBm^2)

G : dobitak antene u odnosu na polutalasni dipol (dBd)

λ : talasna dužina signala (m)

φ_{min} : minimalna gustina snage na mestu prijema (dB(W/m^2))

L_f : gubici antenskog kabla (dB)

E_{min} : minimalni intenzitet električnog polja na mestu prijema (dB(μV/m))

E_{med} : minimalana srednja vrednost intenziteta električnog polja (dB(μV/m))

P_{mmn} : tolerancija na industrijski šum (dB)

L_h : faktor korekcije visine (položaj prijemne antene je na 1.5 m iznad nivoa zemlje) (dB)

L_b : srednja vrednost gubitaka usled penetracije signala kroz zid (dB)

C_l : faktor korekcije položaja (dB)

σ_c : kombinovana standardna devijacija (dB)

σ_m : standardna devijacija određena na makro nivou (dB) (σ_m = 5.5 dB)

σ_b : standardna devijacija gubitaka usled penetracije signala kroz zid (dB)

μ: distribucioni faktor (0.52 za 70%, 1.64 za 95% i 2.33 za 99%).

DODATAK 3.5

Referentna konfiguracija za planiranje

A.3.5.1 Referentna konfiguracija za planiranje za DVB-T

U cilju definisanja referentnih planskih konfiguracija (RPC) za DVB-T, konfiguracije za planiranje se mogu grupisati prema prijemnom modelu i frekvencijskom opsegu.

Prijemni modeli su grupisani na sledeći način:

– fiksni prijem;

– portabilni prijem u slobodnom prostoru, mobilni prijem i prijem na promenljivim lokacijama u zatvorenom prostoru sa niskom pokrivenošću;

– portabilni prijem u zatvorenom prostoru sa visokom pokrivenošću.

Za referentne frekvencije:

– 200 MHz (VHF);

– 650 MHz (UHF).

Referentne konfiguracije za planiranje za DVB-T koje bi trebalo da se koriste prikazane su u Tabeli A.3.5-1.

TABELA A.3.5-1

RPC za DVB-T

RPC	RPC 1	RPC 2	RPC 3
Verovatnoća pokrivenosti referentne lokacije	95%	95%	95%
Referentni C/N (dB)	21	19	17
Referntno $(E_{med})_{ref}$ (dB(μV/m)) na f_r=200 MHz	50	67	76
Referntno $(E_{med})_{ref}$ (dB(μV/m)) na f_r=650 MHz	56	78	88

$(E_{med})_{ref}$: Referentna vrednost minimalne sredenje vrednosti intenziteta električnog polja

RPC 1: RPC za fiksni prijem

RPC 2: RPC za portabilni prijem u slobodnom prostoru, mobilni prijem i portabilni prijem u zatvorenom prostoru sa niskom pokrivenošću

RPC 3: RPC za portabilni prijem u zatvorenom prostoru sa visokom pokrivenošću

Za druge frekvencije, referentne vrednosti intenziteta električnog polja u Tabeli A.3.5-1 se trebaju prilagoditi dodajući korekcioni faktor definisanog prema sledećem pravilu:

– $(E_{med})_{ref}(f) = (E_{med})_{ref}(f_r)$ + Corr;

– za fiksni prijem, Corr = 20 $\log_{10}(f/f_r)$, gde je f aktuelna frekvencija i f_r je referentna frekvencija relevantnog opsega datog u Tabeli A.3.5-1;

– za portabilni prijem ili mobilni prijem, Corr = 30 log10 (f/f_r) gde je f aktuelna frekvencija i f_r je referentna frekvencija relevantnog opsega datog u tabeli A.3.5-1.

Referentni parametri RPC koji su dati u tabeli A.3.5-1 (verovatnoća pokrivenosti referentne lokacije, C/N, minimalna sredenja vrednost intenziteta polja) nisu pridruženi određenoj varijanti DVB-T sistema ili konkretnoj DVB-T mrežnoj implementaciji; već, oni važe za veliki broj različitih konkretnih implementacija. Na primer, DVB-T servis za mobilni prijem mogao bi uzeti kao realni implementacioni parametar verovatnoću pokrivenosti lokacije od 99% i robusnu DVB-T varijantu sa C/N od 14 dB. Međutim, ovaj servis biće reprezentovan sa RPC 2 sa verovatnoćom pokrivenosti referentne lokacije od 95% i referentnim C/N od 19 dB bez ograničavanja mogućnosti za impementaciju „realnog“ servisa za mobilne DVB-T prijemnike.

Standardna devijacija korišćena u izračunavanju lokacijskog korekcionog faktora (videti § 3.4.5 u ovom poglavlju) svakog RPC treba da bude:

– za RPC 1 i RPC 2: 5.5 dB u VHF i UHF području,

– za RPC 3: 6.3 dB u VHF i 7.8 dB u UHF području.

Treba da se iskoristi odnos zaštite za RPC dat u Dodatku 3.3 ovog Poglavlja.

A.3.5.2 Referentna konfiguracija za planiranje za T-DAB

Dve RPC definisane u Tabeli A.3.5-2 za T-DAB u Opsegu III treba da koriste:

TABELA A.3.5-2

RPC za T-DAB

Referentna konfiguracija za planiranje	RPC 4	RPC 5
Verovatnoća lokacije	99%	95%
Referentni *C/N* (dB)	15	15
referentno $(E_{med})_{ref}$ (dB(μV/m)) na f_r = 200 MHz	60	66

$(E_{med})_{ref}$: Referentna vrednost minimalne srednje vrednosti intenziteta polja

RPC 4: RPC za mobilni prijem

RPC 5: RPC za portabilni prijem u zatvorenom prostoru

Za druge frekvencije, referentna vrednost intenziteta polja iz Tabele A.3.5-2 treba da se prilagodi dodajući korekcioni faktor definisan prema sledećem pravilu:

– (Emed)ref(f) = (Emed)ref(fr) + Corr;

– Corr = 30 $\log_{10}$ (f/f_r) gde je f aktuelna frekvencija i f_r je referentna frekvencija relevantnog opsega datog u Tabeli A.3.5-2.

Treba da se iskoristi relevantni zaštitini odnos za računanje kompatibilnosti dat u Dodatku 3.3 ovog Poglavlja.

DODATAK 3.6

Referentne mreže

A.3.6.1 Referentne mreže za DVB-T

A.3.6.1.1 Opšta razmatranja

Definisane su četiri referentne mreže (RN) u cilju pokrivanja različitih implementacionih zahteva za DVB-T mreže.

Za određivanje budžeta snage referentne mreže, visina antena i njena snaga je tako prilagođena da se dobije određena verovatnoća pokrivanja na svakoj tački zone opsluživanja.

Metod za određivanje budžeta snage mreže je baziran na maksimalno dozvoljenoj vrednosti šuma, koji je poznat po tome da nije frekventno efikasan. U cilju prevazilaženja ovog nedostatka, snage na predajnicima u referentnoj mreži su povećane za 3 dB. (Videti tabele A.3.6-1 do A.3.6-4.)

Za efektivne visine antena predajnika u referentnoj mreži treba uzeti kao srednju vrednost od 150 m.

Otvorena mrežna struktura je izabrana za referentnu mrežu, pošto je pretpostavljeno da će realna mrežna implementacija biti drugačija u odnosu na referentnu. Zona pokrivanja se definiše kao šestougao koji je za približno 15% veći od šestougla sačinjenog od perifernih predajnika. Međutim, da bi omogućili implementaciju mreže sa veoma malom potencijalnom interferencijom, predstavljena je poluzatvorena mrežna struktura referentne mreže. (Videti referentnu mrežu 4 u § A.3.6.1.5 u ovom Dodatku.)

U nekim slučajevima, potencijalna interferencija u referentnoj mreži značajno precenjuje moguću interferenciju u realnoj mrežnoj impelementaciji, na primer, tamo gde se standardna geometrija referentne mreže značajno razlikuje od određenog oblika realne zone pružanja servisa. U ovim slučajevima, administracija može da usvoji odgovarajuću metodu, dogovoren na bilateralnoj osnovi, da bi bolje modelovala potencijalnu interferenciju referentne mreže.

A.3.6.1.2 Referentna mreža 1 (velika SFN zona pokrivanja)

Mreža se sastoji iz sedam predajnika smeštenih u centru i u uglovima šestougaone rešetke. Otvoreni tip mreže je izabran, tj. predajnici imaju neusmerene antene i pretpostavljeno je da je zona pokrivanja veća za 15% u odnosu na šestougao koji formiraju predajnici. Geometrija mreže je data na Slici A.3.6-1.

Ova referentna mreža (RN 1) može da se primeni na različite slučejeve: fiksni prijem (RPC 1), prijem u otvorenom prostoru/mobilni prijem (RPC 2) i prijem u zatvorenom prostoru (RPC 3), za oba opsega Opseg III i Opseg IV/V.

RN 1 je namenjena za velike SFN zone pokrivanja. Pretpostavljeno je da glavni predajnici sa odgovarajućim efektivnim visinama antena sačinjavaju osnovu ovog tipa mreže. Za prijem na promenljivim lokacijama ili mobilni prijem, veličina stvarne zone pokrivanja za ovaj tip SFN pokrivanja je ograničen na 150 do 200 km u prečniku zbog samointerferencije, osim ukoliko nije uzeta veoma robustna varijanta DVB-T sistema ili je usvojen koncept guste mreže.

SLIKA A.3.6-1

RN 1 (velika SFN zona pokrivanja

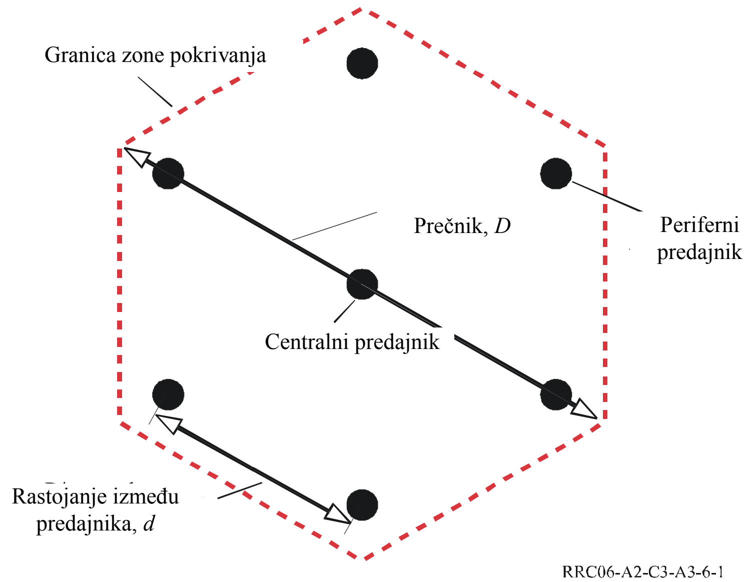


TABELA A.3.6-1

Parametri RN 1 (velika SFN zona pokrivanja)

RPC i tip prijemae		**RPC 1 Fiksna antena**	**RPC 2 Sa promenljive lokacije u slobodnom prostoru i mobilna**	**RPC 3 Sa promenljive lokacije u zatvorenom prostoru**
Tip mreže		Otvoreni	Otvoreni	Otvoreni
Geometrija zone pokrivanja		Šestougaona	Šestougaona	Šestougaona
Broj predajnika		7	7	7
Geometrija predajne rešetke		Šestougaona	Šestougaona	Šestougaona
Udaljenost između predajnika *d* (km)		70	50	40
Prečnik zone pokrivanja *D* (km)		161	115	92
Tx efektivna visina antene (m)		150	150	150
Tx dijagram zračenja antene		Neusmereni	Neusmereni	Neusmereni
e.i.s.* (dBW)	Opseg III	34.1	36.2	40.0
	Opseg IV/V	42.8	49.7	52.4

e.i.s. je dat za 200 MHz u Opsegu III i za 650 MHz u Opsegu IV/V; za druge frekvencije (*f* u MHz) potrebno je dodati frekvencijski zavisni korekcioni faktor: 20 $\log_{10}(f/200$ ili $f/650)$ za RPC 1 i 30 $\log_{10}(f/200$ ili $f/650)$ za RPC 2 i RPC 3.

* e.i.s. veličina data u ovoj tabeli sadrži i dodatnu marginu snage od 3 dB.

Za maksimalnu dužinu zaštitnog intervala uzeta je vrednost od 1/4 T_u 8k FFT moda. Udaljenost između predajnika u SFN ne bi trebalo značajnije da premašuje razdaljinu koja odgovara trajanju zaštitnog intervala. U ovom slučaju, trajanje zaštitnog intervala iznosi 224 μs što odgovara razdaljini od 67 km. Za udaljenost između predajnika za RPC 1 uzeta je vrednost od 70 km. Za RPC 2 i RPC 3 udaljenost od 70 km je suviše velika usled nepovoljnog budžeta snage. Iz tog razloga, izabrana je manja udaljenost između predajnika i to 50 km za RPC 2 i 40 km za RPC 3.

Potrebno je koristiti parametre i budžet snage za RN 1 koji su dati u Tabeli A.3.6-1.

A.3.6.1.3 Referentna mreža 2 (mala SFN zona pokrivanja, gusta SFN)

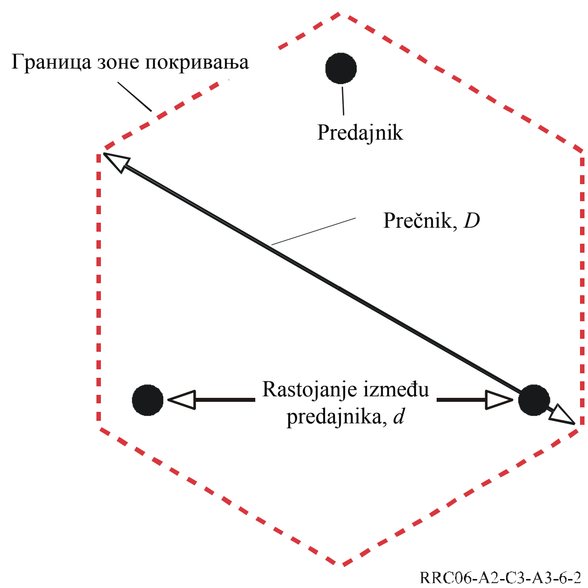
Mreža se sastoji iz tri predajnika smeštenih u temenima jednakostraničnog trougla. Izabran je otvoreni tip mreže, tj. predajnici imaju neusmerene antene. Za zonu pokrivanja je pretpostavljeno da je šestougaonog oblika, kao što je to pokazano na Slici A.3.6-2.

Ova referentna mreža (RN 2) je primenjena na više različitih slučajeva: fiksni prijem (RPC 1), prijem u otvorenom prostoru/mobilni prijem (RPC 2) i prijem u zatvorenom prostoru (RPC 3), za oba opsega Opseg III i Opseg IV/V.

RN 2 je namenjena za male SFN zone pokrivanja. Pretpostavljeno je da predajnici sa odgovarajućim visinama antena stoje na raspolaganju u ovakvim mrežama i očekuju se mala ograničenja usled samointerferencije. Tipičan prečnik zone pokrivanja iznosi od 30 do 50 km.

Takođe je moguće pokriti velike zone sa ovim tipom guste SFN. Međutim, za to je potreban veliki broj predajnika. Iz tog razloga čini se razumnim da su velike zone pokrivanja reprezentovane sa RN 1, čak iako je predviđena gusta mrežna struktura.

SLIKA A.3.6-2
RN 2 (mala SFN zona pokrivanja)



U RN 2 za RPC2 i RPC 3 međupredajničko rastojanje je 25 km. Zato je moguće iskoristiti vrednost od 1/8 Tu (8k FFT) za zaštitni interval, što bi trebalo da poveća raspoloživi kapacitet u odnosu na slučaj kada se kao zaštitni interval koristi vrednost od 1/4 Tu. Ista vrednost za zaštitni interval bi se mogla iskoristiti za RPC 1, sa većom udaljenošću između predajnika od 40 km, pošto je prijem na krovu manje osetljiv na samointerferenciju zbog usmerenih karakteristika prijemnih antena.

Parametre i bilans snaga za RN 2 date u Tabeli A.3.6-2 treba iskoristiti.

TABELA A.3.6-2

Parametri za RN 2 (mala SFN zona pokrivanja)

RPC i tip prijema		**RPC 1 Fiksna antena**	**RPC 2 Sa promenljive lokacije u slobodnom prostoru i mobilna**	**RPC 3 Sa promenljive lokacije u zatvorenom prostoru**
Tip mreže		Otvorena	Otvorena	Otvorena
Geometrija zone pokrivanja		Šestougaona	Šestougaona	Šestougaona
Broj predajnika		3	3	3
Geometrija predajne rešetke		Trougaona	Trougaona	Trougaona
Udaljenost između predajnika *d* (km)		40	25	25
Dijametar zone pokrivanja *D* (km)		53	33	33
Tx efektivna visina antene (m)		150	150	150
Tx dijagram zračenja antene		Neusmereni	Neusmereni	Neusmereni
e.i.s.* (dBW)	Opseg III	24.1	26.6	34.1
	Opseg IV/V	31.8	39.0	46.3

e.i.s. je dat za 200 MHz u Opsegu III i za 650 MHz u Opsegu IV/V; za druge frekvencije (*f* u MHz) potrebno je dodati frekventno zavisni korekcioni faktor: $20 \log_{10}(f/200$ ili $f/650)$ za RPC 1 i $30 \log_{10}(f/200$ ili $f/650)$ za RPC 2 i RPC 3.

* e.i.s. veličina data u ovoj tabeli sadrži i dodatnu marginu snage od 3 dB.

A.3.6.1.4 Referentna mreža 3 (mala SFN zona pokrivanja za urbane sredine)

Geometrija mreže predajnika referentne mreže 3 (RN 3) i zona pokrivanja su identični kao kod RN 2. (Videti Sliku A.3.6-2.)

RN 3 se primenjuje za različite tipove prijema: fiksni (RPC 1), u slobodnom prostoru/mobilna (RPC 2) i u zatvorenom prostoru (RPC 3), i to za oba Opseg III i Opseg IV/V.

Namena RN 3 je za male SFN zone pokrivanja u urbanim zonama. Identičan je sa RN 2 osim u činjenici da se koriste gubici za visine u urbanim zonama. To povećava zahteve za snage SFN predajnika za približno 5 dB za RPC 2 i RPC 3.

Parametre i bilans snaga za RN 3 date u tabeli A.3.6-3 treba iskoristiti.

TABELA A.3.6-3

Parametri za RN 2 (mala SFN zona pokrivanja za urbane sredine)

RPC i tip prijema		**RPC 1 Fiksna antena**	**RPC 2 Sa promenljive lokacije u slobodnom prostoru i mobilna**	**RPC 3 Sa promenljive lokacije u zatvorenom prostoru**
Tip mreže		Otvorena	Otvorena	Otvorena
Geometrija zone pokrivanja		Šestougaona	Šestougaona	Šestougaona
Broj predajnika		3	3	3
Geometrija predajne rešetke		Trougaona	Trougaona	Trougaona
Udaljenost između predajnika *d* (km)		40	25	25
Prečnik zone pokrivanja *D* (km)		53	33	33
Tx efektivna visina antene (m)		150	150	150
Tx dijagram zračenja antene		Neusmereni	Neusmereni	Neusmereni
e.i.s.* (dBW)	Opseg III	24.1	32.5	40.1
	Opseg IV/V	31.8	44.9	52.2

e.i.s. je dat za 200 MHz u Opsegu III i za 650 MHz u Opsegu IV/V; za druge frekvencije (f u MHz) potrebno je dodati frekventno zavisni korekcioni faktor: 20 $\log_{10}(f/200$ ili $f/650)$ za RPC 1 i 30 $\log_{10}(f/200$ ili $f/650)$ za RPC 2 i RPC 3.

* e.i.s. veličina data u ovoj tabeli sadrži i dodatnu marginu snage od 3 dB.

A.3.6.1.5 Referentna mreža 4 (poluzatvorena mala SFN zona pokrivanja)

Ova referentna mreža (RN 4) je namenjena za one slučajeve kada su povećani napori za pronalaženje odgovarajućih lokacija predajnika i njihovih dijagrama zračenja, a sve u cilju smanjenja izlazne interferencije mreže.

Geometrija RN 4 je identična kao za RN 2, osim za dijagrame zračenja antena predajnika, koji imaju smanjenu izlaznu jačinu polja za 6 dB u opsegu od 240° (t.j. to je poluzatorena RN). Zona pokrivanja ove RN je prikazana na slici A.3.6-3. Oštar prelaz sa 0 dB na 6 dB je pretpostavljen na označenim ivicama kružnih lukova.

RN 4 je primenjena za različite tipove prijema: fiksni (RPC 1), u slobodnom prostoru/mobilna (RPC 2) i u zatvorenom prostoru (RPC 3), i to za oba Opseg III i Opseg IV/V.

SLIKA A.3.6-3

RN 4 (poluzatvorena mala SFN zona pokrivanja)

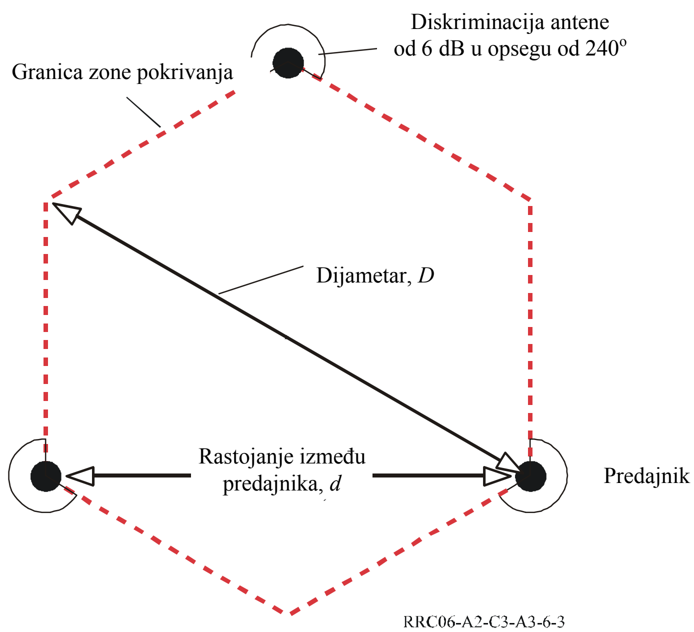


TABELA A.3.6-4

Parametri za RN 4 (poluzatvorena mala SFN zona pokrivanja**)**

RPC		**RPC 1**	**RPC 2**	**RPC 3**
Tip mreže i tip prijema		Poluzatvorena Fiksna antena	Poluzatvorena Sa promenljive lokacije u slobodnom prostoru i mobilna	Poluzatvorena Sa promenljive lokacije u zatvorenom prostoru
Geometrija zone pokrivanja		Šestougaona	Šestougaona	Šestougaona
Broj predajnika		3	3	3
Geometrija predajne rešetke		Trougaona	Trougaona	Trougaona
Udaljenost između predajnika *d* (km)		40	25	25
Prečnik zone pokrivanja *D* (km)		46	29	29
Tx efektivna visina antene (m)		150	150	150
Tx dijagram zračenja antene		Usmeren 6 dB redukcije preko 240°	Usmeren 6 dB redukcije preko 240°	Usmeren 6 dB redukcije preko 240°
e.i.s.* (dBW)	Opseg III	22.0	24.0	32.5
	Opseg IV/V	29.4	37.2	44.8

e.i.s. je dat za 200 MHz u Opsegu III i za 650 MHz u Opsegu IV/V; za druge frekvencije (*f* u MHz) potrebno je dodati frekventno zavisni korekcioni faktor: 20 $\log_{10}(f/200$ ili $f/650)$ za RPC 1 i 30 $\log_{10}(f/200$ ili $f/650)$ za RPC 2 i RPC 3.

* e.i.s. veličina data u ovoj tabeli sadrži i dodatnu marginu snage od 3 dB.

Razlika između RN 4 i RN 2 je u izlaznoj interferenciji (potencijalnoj interferenciji). RN 4 ima niži interferencioni potencijal u odnosu na RN 2. Zbog toga, udaljenost na kojoj se može ponovo upotrebiti ista frekvencija je manja ako su obe zone raspodele planirane pomoću RN 4.

Potrebno je napraviti kompromis između nižeg interferencionog potencijala i troškova usmerenih antena. Ovo treba imati na umu kada se bira tip RN za planiranje. Javlja se, takođe, i smanjenje prečnika zone pokrivanja u odnosu na RN 2.

Parametri i bilans snaga za RN 4 dat u Tabeli A.3.6-4 treba da se iskoristi.

A.3.6.2 Referentna mreža za T-DAB

Za T-DAB, definisane su dve RPC, RPC 4 za mobilni prijem i RPC 5 za prijem sa promenljive lokacije u zatvorenom prostoru. Dve odgovarajuće referentne mreže su predviđene koje su identične osim u slučaju bilansa snaga. One su direktno povezane sa dve RPC.

Za RPC 4, slučaj mobilnog prijema, referentna mreža se sastoji iz sedam predajnika smeštenih u centru i temenima šestougaonika koji čine zatvoreni tip mreže. Snaga centralnog predajnika je niža za 10 dB u odnosu na periferne predajnike, koji imaju snagu od 1 kW. Dijagram zračenja perifernih predajnika ima redukciju intenziteta izlaznog polja od 12 dB u opsegu od 240°. Oštar prelaz sa 0 dB na 12 dB je pretpostavljen na označenim ivicama kružnih lukova.

TABELA A.3.6-5

Parametri za RN 5 za RPC 4 i RN 6 za RPC 5

RPC	RPC 4	RPC 5
Prijemni tip	Mobilni	Sa promenljive lokacije u zatvorenom prostoru
Tip mreže	Zatvoreni	Zatvoreni
Geometrija zone pokrivanja	Šestougaona	Šestougaona
Broj predajnika	7	7
Geometrija predajničke mreže	Šestougaona	Šestougaona
Rastojanje između predajnika *d* (km)	60	60
Prečnik zone pokrivanja *D* (km)	120	120
Tx efektivna visina antene (m)	150	150
Periferni Tx dijagram zračenje antena	Usmerenil 12 dB redukcija u opsegu od 240°	Usmerenil 12 dB redukcija u opsegu od 240°
Centralni Tx dijagram zračenje antene	Neusmereni	Neusmereni
Periferni Tx e.i.s. (dBW)	30.0	39.0
Centralni Tx e.i.p. (dBW)	20.0	29.0

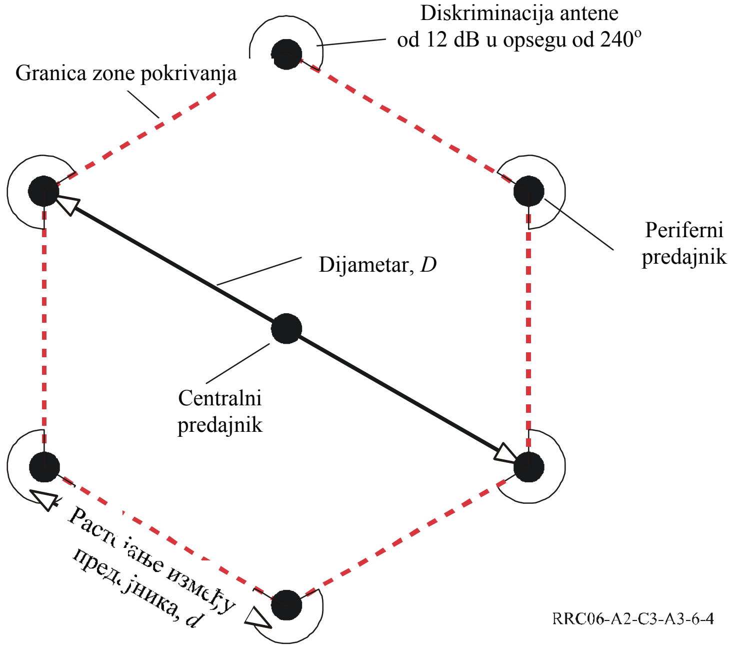
e.i.p. dat za 200 MHz; za preostale frekvencije (*f* u MHz) frekventno zavisni korekcioni faktor koji treba dodati je: $30 \log_{10} (f/200)$ za RPC 4 i RPC 5.

Za RPC 5, prijem na promenljivoj lokaciji u zatvorenom prostoru, ista referentna mreža je iskorišćena kao i za RPC 4, osim što je snaga predajnika veća za 9 dB, što odgovara većoj vrednosti minimalnog intenziteta polja koja je neophodna za ovu vrstu prijema.

Parametri i bilans snaga za RN 5 za RPC 4 i RN 6 za RPC 5 dati u Tabeli A.3.6-5 treba da se iskoristi. Na slici A.3.6-4 prikazana je geometrija RN.

SLIKA A.3.6-4

Geometrija RN za T-DAB



DODATAK 3.7

Proračun interferencije jednofrekvencijske mreže i zona raspodele

Interferncija za jednofrekvencijske mreže (SFN) i zone raspodele su prikazane u cilju osiguranja nepristrasnog tretmana različitih kombinacija zona raspodele i odgovarajuće dodele frekvencija. Proračun koji sledi treba da se koristi od strane Biroa i administracije osim ukoliko nije drugačije uzajamno dogovoreno između dotičnih administracija za različite slučajeve zona raspodele i odgovarajuće dodele frekvencija kao što je to prikazano u tabeli u nastavku teksta.

Slučaj	Opis	Način proračuna
1	Određeni broj digitalnih dodela frekvencije koji sačinjavaju SFN, označenih istim SFN-ID.	Odvojene konture pokrivanja su proračunate za svaku individualnu digitalnu dodelu frekvencija. Neće biti formirana zajednička kontura koja obuhvata sve digitalne dodele frekvencija. Nekompatibilnosti između ovih digitalnih dodela frekvencija nisu uzete u obzir. Nekompatibilnosti sa drugim digitalnim zahtevima su proračunate kao zbir snaga pojedinih digitalnih dodela frekvencija. Interferencija na dodeljene frekvencije u SFN je proračunata na osnovu njihovih individualnih kontura zone pokrivanja.
2	Jedan ili više digitalnih dodela frekvencija pridruženih zoni raspodele. Sve digitalne dodele su označene istiom oznakom zone raspodele i istim SFN-ID.	Za interferenciju se uzima veća vrednost od: – zbira snaga interferencija od individualnih digitalnih dodela; ili – interferencije referentne mreže i pridružene joj zone raspodele (koje se nadalje tretira kao u slučaju 4, datom ispod). Interferencija u zoni raspodele je izračunata na tačkama testiranja koje definišu površinu zone raspodele.
3	Jedna digitalna dodela pridružena zoni raspodele bez SFN oznake. Nije moguće dodati drugu frekvencijsku dodelu zoni raspodele osim ukoliko zona raspodele nije promenjena.	Interferencija u zoni raspodele je izračunata u tačkama testiranja koje definišu površinu zone raspodele.
4	Zona raspodele sa nepovezanim dodelama.	Interferencija iz zone raspodele je izračunata koristeći referentnu mrežu kojoj je pridružena zona raspodele, a koja je locirana na tačkama testiranja koje definišu površinu zone raspodele. Interferencija u zoni raspodele je izračunata na test tačkama koje definišu površinu zone raspodele.

POGLAVLJE 4
ANEKS 2

Kompatibilnost sa ostalim primarnim servisima

4 Uvod

Ovo Poglavlje sadrži tehničke parametre i zaštitne kriterijume za analizu kompatibilnosti drugih primarnih servisa sa radiodifuznim servisima, koji su bili korišćeni u razvoju Plana i koji bi trebalo da se koriste za njihovu implementaciju.

Ovi tehnički parametri i zaštitni kriterijumi mogli bi se koristiti prilikom koordinacije novih ili modifikovanih zona raspodele/frekvencijske dodele, ukoliko ne postoji drugačiji zajednički Sporazum između administracija, a koji pokriva ovu oblast.

Dodatni tehnički tehnički parametri i zaštitni kriterijumi, koji nisu bili korišćeni u razvoju Plana, su takođe sadržani u dodacima ovog Poglavlja. Ovi tehnički parametri i zaštitni kriterijumi mogli bi se koristiti prilikom koordinacije novih ili modifikovanih zona raspodele/frekvencijske dodele, ukoliko ne postoji drugačiji zajednički Sporazum između administracija, a koji pokriva ovu oblast.

S obzirom na druge servise, GE06 Sporazum uzima u obzir samo druge primarne zemaljske servise. Podela između radiodifuznih i satelitskih sistema se donosi na osnovu relevantnih mera Pravilnika o radio-komunikacijama.

4.1 Kompatibilnost sa drugim primarnim terestrijalnim servisima u planiranom opsegu

4.1.1 Drugi primarni servisi i učešće u opsezima 174-230 MHz i 470-862 MHz

Većina zemalja iz zone planiranja koriste radiodifuzni servis u opsezima 174-230 MHz i 470-862 MHz; međutim, radiodifuzni servis nema ekskluzivno pravo na ovaj opseg. U trenutku kada je pripreman ovaj Sporazum, postojala je sledeća situacija.

4.1.1.1 Učešće drugih terestrijalnih primarnih servisa

U VHF opsegu, postoje sledeće primarne frekvencijske dodele za druge servise u Zoni Planiranja u opsegu 174-230 MHz:

– **fiksni servis** u Islamskoj Republici Iran u opsegu 174-230 MHz;
– **mobilni servisi** u Islamskoj Republici Iran u opsegu 174-230 MHz;
– **servis aeronautičke radionavigacije** u Islamskoj Republici Iran i u zemljama Regiona 1 navedenim u RR No. 5.247 u opsegu 223-230 MHz;
– **zemaljski mobilni servisi** u opsegu 174-223 MHz, lociranih u zemljama navedenim u RR No. 5.235. Zaštita se zahteva samo između zemalja spomenutim u odredbama.

U UHF opsegu, postoje sledeće primarne frekvencijske dodele za druge servise u Zoni Planiranja u opsegu 470-862 MHz:

– **fiksni servis** u Regionu 1 i u Islamskoj Republici Iran u opsegu 790-862 MHz, i u Islamskoj Republici Iran u opsegu 470-790 MHz;

- **mobilni servisi** u Islamskoj Republici Iran u opsegu 470-862 MHz;
- **mobilni, osim aeronautičkih mobilnih servisa** u opsegu 790-862 MHz, lociranih u zemljama Regiona 1 naznačenim u RR No. 5.316. Zaštita se zahteva samo između zemalja spomenutim u odredbama;
- **radionavigacioni servisi** u Islamskoj Republici Iran u opsegu 585-610 MHz;
- **aeronautički radionavigacioni servisi** u Velikoj Britaniji u opsegu 590-598 MHz prema RR No. 5.302 i u zemljama Regiona 1 naznačenim u RR No. 5.312 u opsegu 645-862 MHz;
- **radioastronomski servis**, koji može da se koristi u čitavoj zoni Afrike u opsegu 606-614 MHz, prema RR No. 5.304.

4.1.2 Zaštita terestrijalnih servisa, uključujući aeronautičke stanice drugih primarnih terestrijalnih servisa, od prenosa digitalne terestrijalne radiodifuzije

4.1.2.1 Zaštitni kriterijumi drugih primarnih servisa ometanih od strane digitalne terestrijalne radiodifuzije

Zaštitni kriterijumi za druge primarne servise dati su u Dodacima 4.1 i 4.2 ovog Poglavlja. Tu su date neke osnovne informacije kao i predefinisane vrednosti za jačinu polja koje treba da se štite, odnos zaštite (ZO) kao funkcija frekvencijskog razdvajanja i visine prijemne antene za neke tipične sisteme.

Dodatak 4.1 ovog Poglavlja daje zaštitne kriterijume za druge primarne servise ometane od strane digitalne terestrijalne radiodifuzije radijskih signala (T-DAB) i Dodatak 4.1 ovog Poglavlja daje zaštitne kriterijume za druge primarne servise ometane od strane digitalne zemaljske televizijske radiodifuzije (DVB-T).

4.1.2.2 Proračuni potrebni za zaštitu drugih primarnih terestrijalnih sevisa od digitalne terestrijalne radiodifuzije

Tokom propreme Plana, izvršen je proračun za sve fiksne lokacije i sve test tačke koje definišu granicu zone pokrivanja drugih primarnih servisa koristeći sledeće korake:

Izračuna se interferirajući intenzitet polja (vrednost za pokrivenost 50% lokacija i vrednost za odgovarajući procenat vremena prijema) uzrokovan zonom raspodele ili frekvencijskom dodelom digitalne terestrijalne radiodifuzije, uzimajući u obzir usmerenost predajnih antena.

Na osnovu ovoga se odredi intenzitet ometajućeg polja uzrokovan zonom raspodele ili frekvencijskom dodelom digitalne terestrijalne radiodifuzije, uzimajući u obzir odnos zaštite i ukoliko je relevantno, usmerenost i polarizaciju antene.

Oduzeti jačinu ometajućeg polja (izazvanu radiodifuznom zonom raspodele ili frekvencijske dodele) i kombinovani korekcioni faktor lokacija od minimalnog intenziteta polja (vrednost za pokrivenost 50% lokacija), da bi se dobila zaštitna margina koja je korišćena u procesu koordinacije.

Informacije o modelu propagacije koji su korišćeni u proračunu mogu se naći u Poglavlju Aneksa 2 Sporazuma.

Dodatne pretpostavke koje se tiču drugih servisa, npr. visina antena, koje su korišćene u proračunu date su u Dodatku 4.5 ovog Poglavlja.

Tokom pripreme Plana za interferenciju su dozvoljene određene tolerancije. Za ovu svrhu uveden koncept ograničenih margina. Termin „ograničena margina“ interpretira se u smislu da bilo koja izračunata margina koja je manja od relevantne ograničene margine ukazuje na kompatibilnu situaciju. Za razvoj Plana u slučaju tražene druge primarne zemaljske dodele, za vrednost ograničene margine uzeta je vrednost od 1.0 dB. Ova 1 dB ograničena margina daće kao rezultat 6 dB razlike između minimalne srednje vrednosti intenziteta polja i intenziteta ometajućeg polja.

Međutim, u mnogim slučajevima administrativne deklaracije dozvoljavaju viši nivo interferencije koje su dogovorene tokom izrade Plana.

4.1.3 Zaštita digitalne terestrijalne radiodifuzije od prenosnih stanica drugih primarnih zemaljskih servisa

4.1.3.1 Zaštitni kriterijum za digitalnu terestrijalnu radiodifuziju ometanu od strane drugih primarnih terestrijalnih servisa

U Dodacima 4.3 i 4.4 ovog Poglavlja su dati zaštitni kriterijumi za digitalnu terestrijalnu radiodifuziju, kao što su minimalna intenzitet polja koja se štiti i odnos zaštite kao funkcija frekvencijske separacije.

Dodatak 4.3 ovog Poglavlja daje zaštitne kriterijume za T-DAB ometane od strane primarnih servisa i Dodatak 4.4 ovog Poglavlja daje zaštitne kriterijume za DVB-T ometane od strane primarnih servisa.

4.1.3.2 Proračun zahtevan za zaštitu digitalne terestrijalne radiodifuzije od drugih primarnih terestrijalnih servisa

U toku pripreme Plana izvršen je proračun za svaku test tačku koje definišu zonu pokrivanja digitalne terestrijalne radiodifuzije koristeći sledeće korake:

Izračunati jačinu interferentnog polja (vrednost za pokrivenost 50% lokacija i vrednost za odgovarajući procenat vremena prijema) prouzrokovanu drugim primarnim servisima, uzimajući u obzir usmerenost predajnih antena.

Na osnovu ovoga izračunati jačinu ometajućeg polja prouzrokovanu drugim primarnim servisima, uzimajući u obzir odnos zaštite i ako je relevantno diskriminaciju antene (usmerenost, polarizaciju).

Potrebno je oduzeti jačinu ometajućeg polja (izazvano drugim primarnim servisima) i kombinovani korekcioni faktor u zavisnosti od lokacije od minimalnog intenziteta polja koji se štiti (vrednost za pokrivenost 50% lokacija) da bi se dobila zaštitna margina koja je korišćena u procesu koordinacije.

Informacije o modelu propagacije koji su korišćeni u proračunu mogu se naći u Poglavlju 2 Aneksa 2 Sporazuma.

Dodatne pretpostavke koje se tiču drugih servisa, npr. visina antena, koje su korišćene u proračunu date su u Dodatku 4.5 ovog Poglavlja.

Tokom pripreme Plana za interferenciju su dozvoljene određene tolerancije. Za ovu svrhu uveden je koncept ograničenih margina. Termin „ograničena margina“ interpretira se u smislu da bilo koja izračunata margina koja je manja od relevantne ograničene margine ukazuje na kompatibilnu situaciju. Za razvoj Plana u slučaju tražene druge primarne terestrijalne dodele, za vrednost ograničene margine uzeta je vrednost od 1.25 dB. Ova 1.25 dB ograničena margina daće kao rezultat 4.771 dB strožiji kriterijum za interferenciju iz jedne dodele.

Međutim, u mnogim slučajevima administrativne deklaracije dozvoljavaju viši nivo interferencije koje su dogovorene tokom izrade Plana, kao i za slučaj planiranja različitih primena radiodifuzije.

4.2 Slučajevi koji su zajednički za primarne prostorne servise

U UHF opsegu postoje primarne dodele za mobilne satelitske servise (MSS) i radiodifuzne satelitske servise (RSS):

– **radiodifuzni satelitski servisi** u opsegu 620-790 MHz (videti RR No. 5.311* (WRC-03));

– **mobilni satelitski, izuzev aeronautičkog mobilnog satelitskog servisa** u opsegu, 806-840 MHz (Zemlja-svemir) i 856-862 MHz (svemir-Zemlja) koji koriste samo zemlje naznačene u RR No. 5.319.

Odnos između radiodifuznih i satelitskih sistema je definisan relevantnim odlukama Radio Regulatora (RR).

Nota Dodacima 4.1-4.5 ovog Poglalja – Termin „tip sistemskog koda“ odgovara terminu „tip servisnog koda“ koji koriste drugi primarni servisi tokom razvoja digitalnog Plana.

* Videti takođe Rezoluciju 1 (RRC-06).

DODATAK 4.1
Zaštitni keriterijumi drugih primarnih servisa koji interferiraju sa T-DAB

Vrednosti intenziteta električnog polja koje se štite, za druge primarne servise koji interferiraju sa T-DAB date su u tabeli A.4.1-1, a odgovarajući odnosi zaštite dati su u tabelama od A.4.1-2 do A.4.1-12.

TABELA A.4.1-1

Kod tipa sistema	Tip sistema	Vrednost intenziteta električnog polja koja se štiti (dB(μV/m))	Visina prijemnika (m)	Tabela zaštitnih odnosa
AL**	Aeronautički mobilni sistem AL	26	10 000	A.4.1-2
CA**	Fiksni sistem CA	15	10	A.4.1-5
DA**	Aeronautički mobilni sistem DA	26	10 000	A.4.1-11
DB**	Aeronautički mobilni sistem DB	26	10 000	A.4.1-12
IA**	Fiksni sistem IA	48	10	A.4.1-6
MA	Zemaljski mobilni sistem MA	4	10	A.4.1-3
MT	Mobilni i fiksni sistemi MT (prenosivi)	20	10	A.4.1-4
MU**	Mobilni sistem MU (niske snage)	54	10	A.4.1-7
M1	Mobilni sistem M1 (uskopojasni FM, 12.5 kHz) koji interferira sa jednim T-DAB blokom(1) (privatni mobilni radio)	15	10	A.4.1-5
M2**	Mobilni sistem M2 (uskopojasni), koji interferira sa dva ili više T-DAB blokova	36	10	A.4.1-5
RA1**	Mobilni sistem RA1 (uskopojasni FM, 12.5 kHz) koji interferira sa jednim T-DAB blokom(1)	15.0	1.5	A.4.1-5
RA2**	Moblini sistem RA2 (uskopojasni FM, 12.5 kHz) koji interferira sa jednim T-DAB blokom(1)	7.0	20.0	A.4.1-5
R1**	Zemaljski mobilni sistem R1 (medicinska telemetrija)	32.0	10.0	A.4.1-8
R3**	Mobilni sistem R3 (daljinsko upravljanje)	30.0	10.0	A.4.1-7
R4**	Mobilni sistem R4 (daljinsko upravljanje)	30.0	10.0	A.4.1-7
XA**	Zemaljski mobilni sistem XA (privatni mobilni radio)	15.0	10.0	A.4.1-5
XB**	Fiksni sistem XB (alarmni sistem)	37.0	10.0	A.4.1-9
XE**	Aeronautički mobilni sistem XE	0.0	0.0	A.4.1-10
XM**	Zemaljski mobilni sistem XM (radio mikrofoni, VHF)	48.0	10.0	A.4.1-6

** Zaštitni kriterijumi za ove sisteme nisu korišćeni tokom razvoja Plana, zbog odsustva odgovarajućih dodela u referentnim situacijama (videti uvod ovog Poglavlja).

(1) Pretpostavlja se da su frekvencije na kojima radi T-DAB uvek više od frekvencija na kojima radi privatni mobilni radio.

Beleške uz Tabelu A.4.1-1:

1. Za sisteme AL, DA i DB pretpostavljeno je rastojanje od 1 000 m kojim se razdvaja AL prijemnik i T-DAB predajnik.
2. U sledećim tabelama:

   Δf: frekvencijsko odstupanje (MHz), tj. razlika centralne frekvencije interferirajućeg T-DAB bloka i centralne frekvencije na kojoj radi primarni servis sa kojim se interferira

   PR 1%: odnos zaštite (dB) zahtevan radi troposferske interferencije.

TABELA A.4.1-2

AL

Δf (MHz)	–10.000	–9.000	–0.800	–0.600	–0.400	–0.200	0.000	0.200	0.400	0.600	0.800
PR 1% (dB)	–66.0	–6.6	–6.6	2.7	3.2	4.1	6.5	4.1	3.2	2.7	–6.6
Δf (MHz)	9.000	10.000									
PR 1% (dB)	–6.6	–66.0									

TABELA A.4.1-3

MA

Δf (MHz)	–1.000	–0.900	0.000	0.900	1.000
PR 1% (dB)	–60.0	–40.0	12.0	–40.0	–60.0

TABELA A.4.1-4

MT

Δf (MHz)	–2.000	–1.000	0.000	1.000	2.000
PR 1% (dB)	–5.0	15.0	25.0	15.0	–5.0

TABELA A.4.1-5

CA, M1, M2, RA1, RA2, XA

Δf (MHz)	–0.920	–0.870	–0.820	–0.795	–0.782	–0.770	0.00	0.770	0.782	0.795	0.820	0.870	0.920
PR 1% (dB)	–58.0	–49.0	–41.0	–37.0	–34.0	–14.0	–12.0	–14.0	–34.0	–37.0	–41.0	–49.0	–58.0

TABELA A.4.1-6

IA, XM

Δf (MHz)	–1.00	–0.900	–0.800	0.000	0.800	0.900	1.000			
PR 1% (dB)	–22.0	–16.0	18.0	18.0	18.0	–16.0	–22.0			

TABELA A.4.1-7

MU, R3, R4

Δ*f* (MHz)	–1.000	–0.900	–0.800	0.000	0.800	0.900	1.000				
PR 1% (dB)	–12.0	5.0	38.0	38.0	38.0	5.0	–12.0				

TABELA A.4.1-8

R1

Δ*f* (MHz)	–1.800	–1.600	0.000	1.600	1.800						
PR 1% (dB)	–60.0	–6.0	–6.0	–6.0	–60.0						

TABELA A.4.1-9

XB

Δ*f* (MHz)	–0.600	–0.500	0.000	0.500	0.600						
PR 1% (dB)	–60.0	10.0	10.0	10.0	–60.0						

TABELA A.4.1-10

XE

Δ*f* (MHz)	–0.100	0.000	0.100								
PR 1% (dB)	–60.0	–60.0	–60.0								

TABELA A.4.1-11

DA

Δ*f* (MHz)	–10.20	–6.550	–6.350	–6.150	–5.930	–5.770	0.000	10.000			
PR 1% (dB)	–56.0	–56.0	–54.0	–49.0	–33.0	6.0	6.0	6.0			

TABELA A.4.1-12

DB

Δ*f* (MHz)	–5.250	–4.470	–4.270	0.000	9.770	9.970	10.750				
PR 1% (dB)	–81.0	–46.0	–1.0	–1.0	–1.0	–46.0	–81.0				

DODATAK 4.2

Zaštitni kriterijumi za druge primarne servise koji interferiraju sa DVB-T

Ovaj Dodatak sadrži zaštitne kriterijume specifične za određene sisteme primarnih servisa koji rade u opsezima 174-230 MHz i 470-862 MHz kao i opšte zaštitne kriterijume za fiksne i mobilne servise koji rade u opsezima 174-230 MHz i 470-862 MHz. Sistemi za koje postoje zaštitni kriterijumi dati su u tabeli A.4.2-1.

TABELA A.4.2-1

Kod tipa sistema	**Sekundarni kod implementi-ran u softver za planiranje**	**Tip sistema**	**Vrednost intenziteta električno g polja koja se štiti (dB(μV/m))**	**Visina na kojoj se nalazi prijem-nik (m)**	**Tabela zaštit-nih odnosa**
AA8	BL8	Aeronautički radionavigacioni sistem BL8 (RSBN, 0.7 ili 0.8 MHz)	42.0	10 000.0	A.4.2-24
AA8	BN8	Aeronautički radionavigacioni sistem BN8 (RSBN, 3 MHz)	42.0	10.0	A.4.2-24
AA8	BY8	Aeronautički radionavigacioni sistem BY8 (RSBN, 0.7 MHz)	42.0	10.0	A.4.2-24
AA8	BX8	Aeronautički radionavigacioni sistem BX8 (RSBN, 3 MHz)	42.0	10 000.0	A.4.2-24
AB	AB8N	Aeronautički radionavigacioni sistem AB8N (RLS 1 tip 1, 6 MHz)	13.0	10.0	A.4.2-16
AB	AB8C	Aeronautički radionavigacioni sistem AB8C (RLS 1 tip 1, 6 MHz)	13.0	10.0	A.4.2-17
AB	AC8N	Aeronautički radionavigacioni sistem AC8N (RLS 1 Type 2, 3 MHz)	13.0	10.0	A.4.2-18
AB	AC8C	Aeronautički radionavigacioni sistem AC8C (RLS 1 tip 2, 3 MHz)	13.0	10.0	A.4.2-19
BA	BA8N	Aeronautički radionavigacioni sistem BA8N (RLS 2 tip 1)	29.0	10.0	A.4.2-20
BA	BA8C	Aeronautički radionavigacioni sistem BA8C (RLS 2 tip 1)	29.0	10.0	A.4.2-21
AA2	BB8N	Aeronautički radionavigacioni sistem BB8N (RLS 2 tip 2, predaja sa letelice, 8 MHz)	24.0	10.0	A.4.2-22
AA2	BB8C	Aeronautički radionavigacioni sistem BB8C (RLS 2 tip 2, predaja sa letelice, 8 MHz)	24.0	10.0	A.4.2-23

TABELA A.4.2-1 (*nastavak*)

Kod tipa sistema	Sekundarni kod implementiran u softver za planiranje	Tip sistema	Vrednost intenziteta električnog polja koja se štiti (dB(μV/m))	Visina prijemnika (m)	Odnos zaštite
BC	BC8N	Aeronautički radionavigacioni sistem BC8N (RLS 2 tip 2, predaja sa tla, 3 MHz)	73.0	10 000.0	A.4.2-18
BC	BC8C	Aeronautički radionavigacioni sistem BC8C (RLS 2 tip 2, predaja sa tla, 3 MHz)	73.0	10 000.0	A.4.2-19
BD	BD8N	Aeronautički radionavigacioni sistem BD8N (RLS 2 tip 1, predaja sa tla, 4 MHz)	52.0	10 000.0	A.4.2-20
BD	BD8C	Aeronautički radionavigacioni sistem BD8C (RLS 2 tip 1, predaja sa tla, 4 MHz)	52.0	10 000.0	A.4.2-21
FF	FF7	Fiksni sistem FF7 (prenosivi, 7 MHz)	35.0	10.0	A.4.2-2
FF	FF8	Fiksni sistem FF8 (tprenosivi, 8 MHz)	35.0	10.0	A.4.2-3
FH	FH8	Fiksni sistem FH8 (P-MP)	18.0	10.0	A.4.2-4
FK7	FK7N	Osnovna fiksna maska koja nije kritična	–	10.0	(vidi belešku)
FK7	FK7C	Osnovna fiksna osetljiva maska	–	10.0	(vidi belešku)
FK8	FK8N	Osnovna fiksna maska koja nije kritična	–	10.0	((vidi belešku)
FK8	FK8C	Osnovna fiksna osetljiva maska	–	10.0	(vidi belešku)
NX**	NX8	Zemaljski mobilni sistem NX8	27.0	20.0	A.4.2-7
NR**	NR7	Zemaljski mobilni sistem NR7 (radio mikrofon, 7 MHz)	68.0	1.5	A.4.2-8
NR**	NR8	Zemaljski mobilni sistem NR8 (radio mikrofon, 8 MHz)	68.0	1.5	A.4.2-9
NS**	NS7	Mobilni sistem NS7 (OB link, stereo, nekompendovani)	86.0	10.0	A.4.2-10
NS**	NS8	Mobilni sistem NS8 (OB link, stereo, nekompendovan)	86.0	10.0	A.4.2-11
NT**	NT7	Mobilni sistem NT7 (povratni kanal, nekompendovan)	31.0	1.5	A.4.2-12
NT**	NT8	Mobilni sistem NT8 (povratni kanal, nekompendovan)	31.0	1.5	A.4.2-13
NA	NA8N	Digitalni zemaljski mobilni sistem NA8N (nije kritičan)	13.0	20.0	A.4.2-14
NA	NA8C	Digitalni zemaljski mobilni sistem NA8C (osetljiv)	13.0	20.0	A.4.2-15

** Zaštitni kriterijumi za ovaj sistem nisu korišćeni u toku izrade Plana, zbog odsustva odgovarajućih dodela za referentnu situaciju (videti uvod ovog Poglavlja).

TABELA A.4.2-1 (*završetak*)

Kod tipa sistema	**Sekundarni kod implementi-ran u softver za planiranje**	**Tip sistema**	**Vrednost intenziteta elektri-čnog polja koja se štiti (dB(μV/m))**	**Visina prijem-nika (m)**	**Tabela zaštit-nih odnosa**
NB	NB7N	Osnovna mobilna maska koja nije kritična	–	10.0	(vidi belešku)
NB	NB7C	Osnovna mobilna osetljiva maska	–	10.0	(vidi belešku)
NB	NB8N	Osnovna mobilna maska koja nije kritična	–	10.0	(vidi belešku)
NB	NB8C	Osnovna mobilna osetljiva maska	–	10.0	(vidi belešku)
XG	XG8	Aeronautički radionavigacioni sistem XG8 (na kanalu 36, 4 MHz aerodromski radari, UK)	–12.0	7.0	A.4.2-25
PL	PL8	Aeronautički radionavigacioni sistem PL8 (radari, veštačke vrednosti)	0.0	1.5	A.4.2-25
NY	X7N	Zemaljski mobilni sistem X7N (VHF)	28.0	1.5	A.4.2-26
NY	X7C	Zemaljski mobilni sistem X7C (VHF)	28.0	1.5	A.4.2-27
NY	X8N	Zemaljski mobilni sistem X8N (VHF)	28.0	1.5	A.4.2-28
NY	X8C	Zemaljski mobilni sistem X8C (VHF)	28.0	1.5	A.4.2-29
NY	Y8N	Zemaljski mobilni sistem Y8N na 480 MHz	31.0	1.5	A.4.2-28
NY	Y8C	Zemaljski mobilni sistem Y8C na 480 MHz	31.0	1.5	A.4.2-29
NY	Z8N	Zemaljski mobilni sistem Z8C na 620 MHz	33.0	1.5	A.4.2-28
NY	Z8C	Zemaljski mobilni sistem Z8C na 620 MHz	33.0	1.5	A.4.2-29
XA8**	ZA8C	Radio astronomska teleskopska osetljiva DVB-T maska sa jednim reflektorom	–39.0	50.0	A.4.2-5
XA8**	ZA8N	Radio astronomska teleskopska nekritična DVB-T maska sa jednim reflektorom	–39.0	50.0	A.4.2-6
XB8**	ZB8C	Radio astronomska VLBI osetljiva DVB-T maska	2.0	50.0	A.4.2-5
XB8**	ZB8N	Radio astronomska VLBI nekritična DVB-T maska	2.0	50.0	A.4.2-6
	ZC8C**	Radio astronomska interferometrijska osetljiva DVB-T maska sa jednim reflektorom	–22.0	50.0	A.4.2-5
	ZC8N**	Radio astronomska interferometrijska nekritična DVB-T maska sa jednim reflektorom	–22.0	50.0	A.4.2-6

** Zaštitni kriterijumi za ovaj sistem nisu korišćeni u toku izrade Plana, zbog odsustva odgovarajućih dodela za referentnu situaciju (videti uvod ovog Poglavlja).

Beleška uz Tabelu A.4.2-1 – Videti Prilog ovom Dodatku, vezano za proračun intenziteta električnog polja (dB(μV/m)) dozvoljenog interferirajućeg televizijskog signala za opšti slučaj fiksnog i mobilnog servisa.

TABELA A.4.2-2

Prenosivi sistem u Holandiji koji radi na 7 MHz, FF7

Δ*f* (MHz)	–5.5	–4.5	–3.5	0	3.5	4.5	5.5
PR (dB)	–46	–39	7	11	7	–39	–46

TABELA A.4.2-3

Prenosivi sistem u Holandiji koji radi na 8 MHz, FF8

Δ*f* (MHz)	–6	–5	–4	0	4	5	6
PR (dB)	–46	–39	7	11	7	–39	–46

TABELA A.4.2-4

P-MP sistem u Ukrajini FH8

Δ*f* (MHz)	–6.0	–4.2	–3.9	–3.4	0.0	3.4	3.9	4.2	6.0
PR (dB)	–65.0	–54.0	–4.0	–1.0	–1.0	–1.0	–4.0	–54.0	–65.0

TABELA A.4.2-5

Radio astronomska osetljiva DVB-T maska ZA8C, ZB8C, ZC8C

Abs(Δ*f*) (MHz)	9.0	8.0	7.0	6.0	5.0	4.0	3.0	2.0	1.0	0.0
PR (dB)	–71.0	–66.0	–41.0	–9.0	–6.0	–4.0	–3.0	–2.0	–1.0	–1.0

TABELA A.4.2-6

Radio astronomska nekritična DVB-T maska ZA8N, ZB8N, ZC8N

Abs(Δ*f*) (MHz)	9.0	8.0	7.0	6.0	5.0	4.0	3.0	2.0	1.0	0.0
PR (dB)	–61.0	–56.0	–37.0	–9.0	–6.0	–4.0	–3.0	–2.0	–1.0	–1.0

TABELA A.4.2-7

Zemaljski mobilni sistemi – NX8

Abs(Δ*f*) (MHz)	10.0	9.0	8.0	7.0	6.0	5.0	4.0	3.9	3.8	3.7	3.0	1.0	0.0
PR (dB)	–70.5	–67.9	–65.8	–64.3	–63.0	–61.8	–61.2	–52.3	–24.0	–23.2	–23.2	–23.2	–23.2

TABELA A.4.2-8

Radio mikrofon – NR7

Abs(Δ*f*) (MHz)	10.5	8.8	7.0	5.2	3.7	3.3	3.2	0.0
PR (dB)	–49.0	–49.0	–44.0	–39.0	–34.0	8.0	13.0	13.0

TABELA A.4.2-9

Radio mikrofon – NR8

Abs(Δ*f*) (MHz)	12.0	10.0	8.0	6.0	4.2	3.8	3.6	0.0
PR (dB)	–50.0	–50.0	–45.0	–40.0	–35.0	7.0	12.0	12.0

TABELA A.4.2-10

OB link (stereo, nekompendovani) – NS7

Abs(Δ*f*) (MHz)	10.5	8.8	7.0	5.2	3.7	3.3	3.2	0.0
PR (dB)	–17.0	–16.0	–11.0	–8.0	–4.0	37.0	44.0	44.0

TABELA A.4.2-11

OB link(stereo, nekompendovani) – NS8

Abs(Δ*f*) (MHz)	12.0	10.0	8.0	6.0	4.2	3.8	3.6	0.0
PR (dB)	–18.0	–17.0	–12.0	–9.0	–5.0	36.0	43.0	43.0

TABELA A.4.2-12

Povratni kanal– NT7

Abs(Δ*f*) (MHz)	10.5	8.8	7.0	5.2	3.7	3.3	3.2	0.0
PR (dB)	–96.0	–91.0	–84.0	–79.0	–69.0	–19.0	–13.0	–13.0

TABELA A.4.2-13

Povratni kanal– NT8

Abs(Δ*f*) (MHz)	12.0	10.0	8.0	6.0	4.2	3.8	3.6	0.0
PR (dB)	–97.0	–92.0	–85.0	–80.0	–70.0	–20.0	–14.0	–14.0

TABELA A.4.2-14

Digitalni zemaljski mobilni sistem NA8N (nije kritičan)

Abs(Δ*f*) (MHz)	7.5	6.2	5.0	3.8	2.5	1.2	0.0
PR (dB)	–63.0	–57.0	–50.0	–7.0	–5.0	–5.0	–5.0

TABELA A.4.2-15

Digitalni zemaljski mobilni sistem NA8C (osetljiv)

Abs(Δ*f*) (MHz)	7.5	6.2	5.0	3.8	2.5	1.2	0.0
PR (dB)	–73.0	–67.0	–60.0	–7.0	–5.0	–5.0	–5.0

TABELA A.4.2-16

RLS 1 tip 1 AB8N (nije kritičan)

Abs(Δ*f*) (MHz)	17	15	9	7.5	6.5	6	4	1	0
PR 10% (dB)	–80.6	–63.79	–47.1	–44.4	–11.7	–8.8	–4.1	–1.1	–1

TABELA A.4.2-17

RLS 1 tip 1 AB8C (osetljiv)

Abs(Δ*f*) (MHz)	17	15	9	7.5	6.5	6	4	1	0
PR 10% (dB)	–90.66	–63.9	–47.3	–45.4	–11.8	–8.8	–4.1	–1.1	–1

TABELA A.4.2-18

RLS 1 tip 2 AC8N (nije kritičan)
RLS 2 tip 2 BC8N (nije kritičan)

Abs(Δ*f*) (MHz)	16	14	8	6.5	6	5	4	2	0
PR 10% (dB)	–82.8	–64	–49.2	–45.8	–45.39	–12.1	–7.25	–4	–4

TABELA A.4.2-19

RLS 1 tip 2 AC8C (osetljiv)
RLS 2 tip 2 BC8C (osetljiv)

Abs(Δ*f*) (MHz)	16	14	8	6.5	6	5	4	2	0
PR 10% (dB)	–92.4	–64.3	–49.4	–46.28	–46.26	–12.2	–7.27	–4	–4

TABELA A.4.2-20

RLS 2 tip 1 BA8N (nije kritičan)
RLS 2 tip 1 BD8N (nije kritičan)

Abs(Δ*f*) (MHz)	16	15	6.5	6	5.5	5	4	2.5	0
PR 10% (dB)	–81.3	–66.4	–44.1	–34	–12	–9	–5.9	–3.5	–2.8

TABELA A.4.2-21

RLS 2 tip 1 BA8C (osetljiv)
RLS 2 tip 1 BD8C (osetljiv)

Abs(Δ*f*) (MHz)	16	15	6.5	6	5.5	5	4	2.5	0
PR 10% (dB)	–90.9	–66.5	–44.9	–39	–12	–9	–6	–3.5	–2.8

TABELA A.4.2-22

RLS 2 tip 2 BB8N (nije kritičan)

Abs(Δ*f*) (MHz)	17	15	10	9	8.5	8	7	4	0
PR 10% (dB)	–79.4	–61.2	–46.3	–43.2	–43	–19.9	–8.7	–2.9	0

TABELA A.4.2-23

RLS 2 tip 2 BB8C (osetljiv)

Abs(Δ*f*) (MHz)	17	15	10	9	8.5	8	7	4	0
PR 10% (dB)	–89.4	–61.3	–46.5	–43.4	–43	–20.2	–8.7	–2.9	0

TABELA A.4.2-24

Aeronautički navigacioni RSBN BL8
Aeronautički navigacioni RSBN BN8
Aeronautički navigacioni RSBN BY8
Aeronautički navigacioni RSBN BX8

Abs(Δ*f*) (MHz)	12.0	10.0	8.0	6.0	4.0	2.0	0.0
PR 10% (dB)	–65.0	–50.0	–27.0	–16.0	–5.0	0.0	0.0

TABELA A.4.2-25

CH36 aerodromski radari (UK) XG8
Radarske (POL) veštačke vrednosti PL8

Abs(Δ*f*) (MHz)	5.0	4.0	3.0	0.0
PR (dB)	–79.0	–40.0	0.0	0.0

TABELA A.4.2-26

Zemaljski mobilni sistemi u VHF X7N

Abs(Δf) (MHz)	3.7	3.3	0.0
PR (dB)	–55.0	–17.0	–10.0

TABELA A.4.2-27

Zemaljski mobilni sistemi u VHF X7C

Abs(Δf) (MHz)	3.7	3.3	0.0
PR (dB)	–65.0	–17.0	–10.0

TABELA A.4.2-28

Zemaljski mobilni sistemi u VHF X8N
Zemaljski mobilni sistemi na 480 MHz Y8N
Zemaljski mobilni sistemi na 620 MHz Z8N

Abs(Δf) (MHz)	4.2	3.8	0.0
PR (dB)	–55.0	–17.0	–10.0

TABELA A.4.2-29

Zemaljski mobilni sistemi u VHF X8C
Zemaljski mobilni sistemi na 480 MHz Y8C
Zemaljski mobilni sistemi na 620 MHz Z8C

Abs(Δf) (MHz)	4.2	3.8	0.0
PR (dB)	–65.0	–17.0	–10.0

PRILOG
DODATKU 4.2

Proračun intenziteta električnog polja dozvoljenog interferirajućeg televizijskog signala za opšti slučaj fiksnih i mobilnih servisa, korišćen prilikom izrade Plana

Intenzitet električnog polja, E, dozvoljenog interferirajućeg televizijskog signala za opšte slučajeve fiksnih i mobilnih servisa računa se na sledeći način:

$$E = -37 + F - G_i + L_F + 10 \log (B_i) + P_o + 20 \log f - K \qquad \text{dB}(\mu\text{V/m}) \qquad (1)$$

gde je:

- F: faktor šuma prijemnika bazne ili mobilne stanice zemaljskog mobilnog servisa (ZMS) (dB)
- B_i: propusni opseg terestrijalne radiodifuzne stanice (MHz)
- G_i: dobitak prijemne antene (dBi)
- L_F: gubici antenskog kabla (dB)
- f: centralna frekvencija na kojoj radi interferirajuća stanica (MHz)
- P_o: industrijski šum (dB) tipična vrednost je 1 dB za VHF opseg i 0 dB za UHF opseg
- K: faktor korekcije preklapanja (za DVB-T) dat u Tabelama AT.4.2-4 i AT.4.2-5 ispod (dB).

Za opšti slučaj fiksnog servisa, zasnovano na Preporukama ITU-R F.758-4, ITU-R F.1670-1 i ITU-R SM.851-1, koriste se sledeće vrednosti za F, G_i , L_F i P_o:

TABELA AT.4.2-1

Frekvencija (MHz)	174-230	500	800
F (dB)	5	5	5
G_i (dBi)	9	14	16
L_F (dB)	4	5	5
P_o (dB)	1	0	0
$F - G + L_F + P_o$	1	–4	–6

U UHF opsegu, varijacija vrednosti ($F - G + L_F + P_o$) u odnosu na frekvenciju od 500 MHz data je formulom: 10 log (f/500).

Za opšti slučaj zemaljskog mobilnog servisa (bazne stanice), koriste se sledeće vrednosti za F, G_i, L_F i P_o:

TABELA AT.4.2-2

Frekvencija (MHz)	174	230	470	790	862
F (dB)	8	8	4	3	3
G_i (dBi)	6	8	12	17	17
L_F (dB)	2	2	2	4	4
P_o (dB)	1	1	0	0	0
$F - G_i + L_F + P_o$	5	3	–6	–10	–10

Za opšti slučaj zemaljskog mobilnog servisa (mobilna stanica),koriste se sledeće vrednosti za F, G_i, L_F i P_o:

TABELA AT.4.2-3

Frekvencija (MHz)	174	230	470	790	862
F (dB)	11	11	7	7	7
G_i (dBi)	0	0	0	0	0
L_F (dB)	0	0	0	0	0
P_O (dB)	1	1	0	0	0
$F - G_i + L_F + P_o$	12	12	7	7	7

Proračun faktora korekcije preklapanja *K*

Faktor korekcije preklapanja je K (dB). Kada se proračunava interferencija ugroženog prijemnika, u jednačinu (1) se mora uključiti i ovaj faktor.

Sa ciljem da se izračuna korekcioni faktor preklapanja K, potrebno je:

– Izračunati širinu propusnog opsega preklapanja B_o

$$B_o = \text{Min}\ (B_v, (B_v + B_i)/2 - \Delta f) \quad (2)$$

gde je:

B_v: širina propusnog opsega ugroženog prijemnika

B_i: širina propusnog opsega interferirajućeg signala

Δf: odstupanje centralne frekvencije sistema fiksnog servisa i centralne frekvencije interferirajućeg (DVB-T) signala.

TABELA AT.4.2-4

Za DVB-T masku - slučajevi koji nisu kritični

Širina propusnog opsega preklapanja, B_o	Faktor preklapanja, K (dB)
$B_o = B_v$	0
$B_v > B_o > 10^{-4} B_v$	$10 \log_{10} (B_o/B_v)$
$10^{-4} B_v > B_o > -0.5$	–40
$B_o = -1$	–45
$B_o = -2$	–52
$B_o = -4$	–60
$B_o = -8$	–77

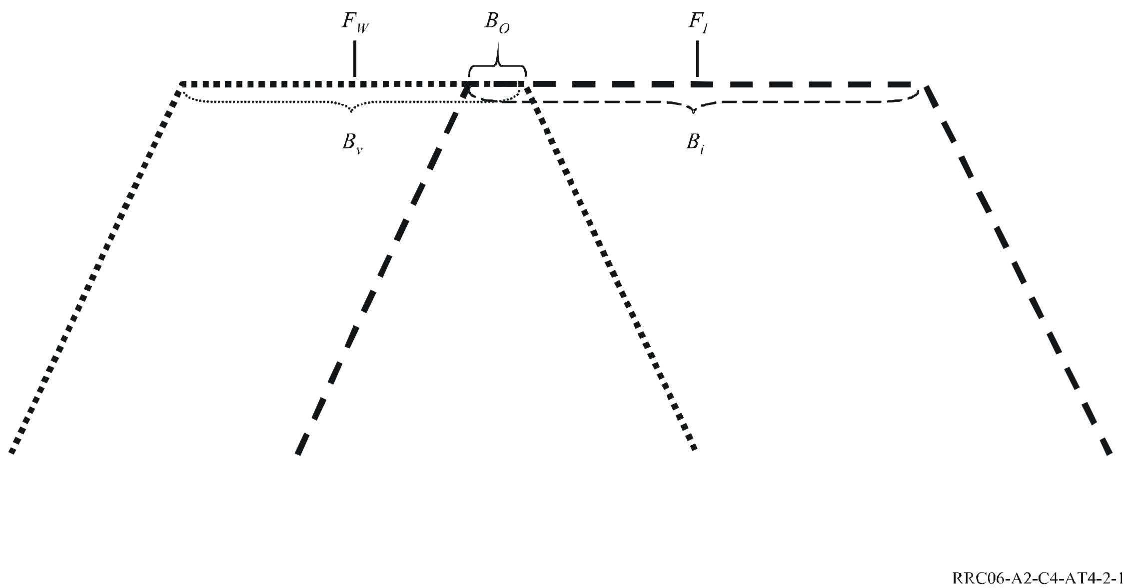
TABELA AT.4.2-5

Za DVB-T masku – osetljivi slučajevi

Širina propusnog opsega preklapanja, B_o	Faktor preklapanja, K (dB)
$B_o = B_v$	0
$B_v > B_o > 10^{-5} B_v$	$10 \log_{10} (B_o/B_v)$
$10^{-5} B_v > B_o > -0.5$	–50
$B_o = -1$	–55
$B_o = -2$	–62
$B_o = -4$	–70
$B_o = -8$	–87

Treba primetiti da se faktor preklapanja, K, računa tako što se u obzir uzima tačka preloma DVB-T maske kao što je opisano u Poglavlju 3 Aneksa 2 ovog Sporazuma.
Na slici ispod su prikazani B_o, B_i i B_v.

SLIKA AT.4.2-1



F_W: centralna frekvencija korisnog signala
F_I: centralna frekvencija interferirajućeg signala

Primeri

Pretpostavljeno je da:

B_v = 0.2 MHz
B_i = 8 MHz

DVB-T slučaj koji nije kritičan

Δf (MHz)	3.8	4.0	4.1	4.8
B_o (MHz)	0.3	0.1	0	–0.7
K (dB)	0	10 log(0.1/0.2) = 3 dB	–40	Videti ispod K = –42

Primer interpolacije

F = 4.8 MHz iz prethodnog primera
Odstupanje = $-B_o$ = 0.7 MHz

Za slučajeve koji nisu kritični: tabela AT.4.2-4:

0.5 MHz –40 dB
1 MHz –45 dB
$K = ((0.7 - 0.5)/(1.0 - 0.5))*(-45 - (-40)) - 40$
$K = -42$ dB

DODATAK 4.3

Zaštitni kriterijumi za T-DAB koji interferira sa drugim primarnim servisima

Vrednosti zaštitnog odnosa za T-DAB koji interferira sa drugim primarnim servisima datim u Tabeli A.4.3-1 nalaze se u Tabelama od A.4.3-2 do A.4.3-5 ovog Dodatka i izvedene su iz Preporuke ITU-R BS.1660-2 – Tehničke osnove za planiranje terestrijalne digitalne radiodifuzije zvuka u VHF opsegu (§ 3.5 Dodatka 1 Aneksa 1 Preporuke, T-DAB interferira sa servisima koji nisu radiodifuzni).

Vrednost intenziteta električnog polja koja se štiti za T-DAB u Opsegu III je 58 dB(μV/m). Dodatne informacije o minimalnoj vrednosti intenziteta električnog polja za T-DAB mogu se pronaći u Poglavlju 3.

TABELA A.4.3-1**

Kod tipa sistema	**Tip sistema**	**Tabela zaštitnog odnosa**
AL**	Aeronautički mobilni sistemi AL	A.4.3-2
CA**	Fiksni sistem CA	A.4.3-3
DA**	Aeronautički mobilni sistem DA	A.4.3-2
DB**	Aeronautički mobilni sistem DB	A.4.3-3
IA**	Fiksni sistem IA	A.4.3-3
MA	Zemaljski mobilni sistem MA	A.4.3-3
MT	Mobilni i fiksni sistemi MT (prenosivi)	A.4.3-3
MU**	Mobilni sistem MU (niske snage)	A.4.3-4
M1	Mobilni sistemi M1 (usko pojasni FM, 12.5 kHz)(2)	A.4.3-3
M2**	Mobilni sistemi M2 (uskopojasni)	A.4.3-3
RA1**, RA2**	Mobilni sistemi RA1 i RA2 uskopojasni FM (12.5 kHz)(2)	A.4.3-3
R1**	Zemaljski mobilni sistem R1 (medicinska telemetrija)	A.4.3-5
R3**	Mobilni sistem R3 (daljinsko upravljanje)	A.4.3-3
R4**	Mobilni sistem R4 (daljinsko upravljanje)	A.4.3-3
XA**	Zemaljski mobilni sistem XA (privatni mobilni radio)	A.4.3-3
XB**	Fiksni sistem XB (alarm)	A.4.3-3
XE**	Aeronautički (OR) sistem XE	A.4.3-3
XM**	Zemaljski mobilni sistem XM (radio mikrofoni VHF)	A.4.3-3

** Zaštitni kriterijumi za ove sisteme nisu korišćeni u toku razvoja plana, zbog odsustva odgovarajućih dodela u referentnoj situaciji (videti uvod ovog Poglavlja)

(2) Frekvencija T-DAB pretpostavljena je tako da bude uvek viša od frekvencije privatnog mobilnog radia.

Za sve sledeće tabele ovog Dodatka važi:

Δf : frekvencijsko odstupanje (MHz), t.j. razlika centralne frekvencije interferirajućeg signala i centralne frekvencije T-DAB bloka sa kojim se interferira.

PR :zahtevani zaštitni opseg (dB).

TABELA A.4.3-2

AL, DA

Δf (MHz)	**–0.9**	**–0.8**	**–0.6**	**–0.4**	**–0.2**	**0**	**0.2**	**0.4**	**0.6**	**0.8**	**0.9**
PR 1% (dB)	–66	–6.6	2.7	3.2	4.1	6.5	4.1	3.2	2.7	–6.6	–66

TABELA A.4.3-3

CA, DB, IA, MA, MT, M1, M2, RA1, RA2, R3, R4, XA, XB, XE, XM

Δf (MHz)	**–0.9**	**–0.8**	**–0.6**	**–0.4**	**–0.2**	**0**	**0.2**	**0.4**	**0.6**	**0.8**	**0.9**
PR 1% (dB)	–60	–6.6	2.7	3.2	4.1	6.5	4.1	3.2	2.7	–6.6	–60

TABELA A.4.3-4

MU

Δf (MHz)		**–2.0**	**–1.9**	**–1.8**	**–1.7**	**–1.6**	**–1.5**	**–1.4**	**–1.3**	**–1.2**	**–1.1**
PR 1% (dB)		–48.0	–47.9	–47.1	–46.7	–46.4	–46.0	–45.4	–45.1	–43.9	–38.4
Δf (MHz)	**–1.0**	**–0.9**	**–0.8**	**–0.8**	**–0.7**	**–0.6**	**–0.5**	**–0.4**	**–0.3**	**–0.2**	**–0.1**
PR 1% (dB)	–37.5	–28.9	–12.9	–4.9	–1.0	2.1	3.5	4.3	4.1	4.4	4.1
Δf (MHz)	**0.0**	**0.1**	**0.2**	**0.3**	**0.4**	**0.5**	**0.6**	**0.7**	**0.8**	**0.8**	**0.9**
PR 1% (dB)	4.0	4.1	4.4	4.1	4.3	3.5	2.1	–1.0	–4.9	–12.9	–28.9
Δf (MHz)	**1.0**	**1.1**	**1.2**	**1.3**	**1.4**	**1.5**	**1.6**	**1.7**	**1.8**	**1.9**	**2.0**
PR 1% (dB)	–37.5	–38.4	–43.9	–45.1	–45.4	–46.0	–46.4	–46.7	–47.1	–47.9	–48.0

TABELA A.4.3-5

R1

Δf (MHz)	–0.8	0	0.8
PR 1% (dB)	–66	–66	–66

DODATAK 4.4

Zaštitni kriterijum za DVB-T koji interferira sa drugim primarnim servisima

Zaštitni opseg za DVB-T (64-QAM 2/3 Gausov kanal) koji interferira sa drugim primarnim servisima iz Tabele A.4.4-1 dati su u Tabelama od A.4.4-2 do A.4.4-14 ovog Dodatka. One su izvedene iz Preporuke ITU-R BT.1368-6 (Kriterijumi planiranja servisa digitalne zemaljske televizije u VHF/UHF opsezima). Informacije o vrednostima intenziteta električnog polja koje treba zaštititi za različite varijante DVB-T mogu se naći u gore pomenutoj Preporuci. Dodatno, informacije o vrednostima intenziteta električnog polja koje treba zaštititi i odnos za različite varijante DVB-T i modele prijema mogu se pronaći u Poglavlju 3.
Tabela A.4.4-15 daje korekcione faktore za različite varijante DVB-T sistema i modela prijema u odnosu na DVB-T 64-QAM 2/3 Gausov kanal. Vrednosti date u Tabeli A.4.4-15 treba dodati zaštitnom odnosu za DVB-T 64-QAM 2/3 Gausov kanal.

TABELA A.4.4-1

Zaštitni kriterijum za DVB-T koji interferira sa drugim primarnim servisima

Kod tipa sistema (KTS)	**Sekundarni kod implemen-tiran u softver za planiranje**	**Tip sistema**	**Odnos zaštite za 64-QAM 2/3 DVB-T Gausov kanal: Tabela**
AA2	BB	Aeronautički radionavigacioni sistem BB (RLS 2, tip 2, predaja sa letelice, 8 MHz)	A.4.4-5
AA8	BL	Aeronautički radionavigacioni sistem BL (RSBN, predaja sa tla, 0.7 ili 0.8 MHz)	A.4.4-6
AA8	BN	Aeronautički radionavigacioni sistem BN (RSBN, predaja sa letelice, 3 MHz)	A.4.4-3
AA8	BX	Aeronautički radionavigacioni sistem BX (RSBN, predaja sa tla, 3 MHz)	A.4.4-3
AA8	BY	Aeronautički radionavigacioni sistem BY (RSBN, predaja sa letelice, 0.7 MHz)	A.4.4-6
AB	AB	Aeronautički radionavigacioni sistem AB (RLS 1, tip 1 predaja sa tla, 6 MHz)	A.4.4-2
AB	AC	Aeronautički radionavigacioni sistem AC (RLS 1, tip 2 predaja sa tla, 3 MHz)	A.4.4-3
BA	BA	Aeronautički radionavigacioni sistem BA (RLS 2, tip 1 predaja sa letelice, 4 MHz)	A.4.4-4
BC	BC	Aeronautički radionavigacioni sistem BC (RLS 2, tip 2 predaja sa tla, 3 MHz)	A.4.4-3

TABELA A.4.4-1 (*završetak*)

Kod tipa sistema (KTS)	**Sekundarni kod implemen-tiran u softver za planiranje**	**Tip sistema**	**Odnos zaštite za 64-QAM 2/3 DVB-T Gausov kanal: Tabela**
BD	BD	Aeronautički radionavigacioni sistem BD (RLS 2, tip 1 predaja sa tla, 4 MHz)	A.4.4-4
FF	FF	Fiksni sistem FF (prenosivi, 1.2 MHz)	A.4.4-9
FI	FI	Fiksni sistem FI (prenosivi, 2 MHz)	A.4.4-7
FH	FH	Fiksni sistem FH (širina propusnog opsega veća od 250 kHz)	A.4.4-8, A.4.4-9
FH	FJ	Fiksni sistem FJ (širina propusnog opsega do 250 kHz)	A.4.4-11, A.4.4-12
FK	FK	Osnovni fiksni sistem FK (širina propusnog opsega veća od 250 kHz)	A.4.4-8, A.4.4-9
FK	FL	Osnovni fiksni sistem FL (širina propusnog opsega do 250 kHz)	A.4.4-11, A.4.4-12
NA	NA	Zemaljski mobilni sistem NA (digitalni, 3 MHz)	A.4.4-3
NA	NC	Zemaljski mobilni sistem NC (digitalni, 5 MHz)	A.4.4-10
NB	NB	Osnovni mobilni sistem NB	A.4.4-11,A.4.4- 12
NY	OX	Zemaljski mobilni sistem OX u VHF opsegu	A.4.4-11, A.4.4-12
NY	OY	Zemaljski mobilni sistem OY na 480 MHz	A.4.4-12
NY	OZ	Zemaljski mobilni sistem OZ na 620 MHz	A.4.4-12
XG	XG	Aeronautički radionavigacioni sistem XG (na kanalu 36, 4 MHz aerodromski radari, UK)	A.4.4-4
–	–	Zemaljski mobilni sistem (CDMA-1X)	A.4.4-13
–	–	Zemaljski mobilni sistem (CDMA-3X)	A.4.4-14

TABELA A.4.4-2

Odnosi zaštite za DVB-T 8 MHz 64-QAM kodni količnik 2/3 signal u Gausovom kanalu koji interferira sa AB sistemom

Δf (MHz)	**−13**	**−5.5**	**−4.75**	**0**	**4.75**	**5.5**	**13**
PR (dB)	−40	10	11	16	11	10	−40

TABELA A.4.4-3

Odnosi zaštite za DVB-T 8 MHz 64-QAM kodni količnik 2/3 signal u Gausovom kanalu koji interferira sa AC, BC, BN, BX i NA sistemima

Δf (MHz)	**−12**	**−4**	**−3.25**	**0**	**3.25**	**4**	**12**
PR (dB)	−37	9	14	19	14	9	−37

TABELA A.4.4-4

Odnosi zaštite za DVB-T 8 MHz 64-QAM kodni količnik 2/3 signal u Gausovom kanalu koji interferira sa BA, BD i XG sistemima

∆*f* (MHz)	**−12**	**−4.5**	**−3.75**	**0**	**3.75**	**4.5**	**12**
PR (dB)	−38	8	13	18	13	8	−38

TABELA A.4.4-5

Odnosi zaštite za DVB-T 8 MHz 64-QAM kodni količnik 2/3 signal u Gausovom kanalu koji interferira sa BB sistemom

∆*f* (MHz)	**−14**	**−6.5**	**−5.75**	**0**	**5.75**	**6.5**	**14**
PR (dB)	−41	5	10	15	10	5	−41

TABELA A.4.4-6

Odnosi zaštite za DVB-T 8 MHz 64-QAM kodni količnik 2/3 signal u Gausovom kanalu koji interferira sa BL i BY sistemima

∆*f* (MHz)	**−12**	**−4.5**	**−3.9**	**0**	**3.9**	**4.5**	**12**
PR (dB)	−38	−33	−3	−3	−3	−33	−38

TABELA A.4.4-7

Odnosi zaštite za DVB-T 8 MHz 64-QAM kodni količnik 2/3 signal u Gausovom kanalu koji interferira sa FI sistemom

∆*f* (MHz)	**−12**	**−4.5**	**−3.75**	**0**	**3.75**	**4.5**	**12**
PR (dB)	−45	−27	1	4	1	−27	−45

TABELA A.4.4-8

Odnosi zaštite za DVB-T 7 MHz 64-QAM kodni količnik 2/3 signal u Gausovom kanalu koji interferira sa FH i FK sistemima

∆*f* (MHz)	**−10.5**	**−4**	**−3.25**	**0**	**3.25**	**4**	**10.5**
PR (dB)	−44	−26	1	3	1	−26	−44

TABELA A.4.4-9

Odnosi zaštite za DVB-T 8 MHz 64-QAM kodni količnik 2/3 signal u Gausovom kanalu koji interferira sa FF, FH i FK sistemima

Δ*f* (MHz)	**12**	**−4.5**	**−3.9**	**0**	**3.9**	**4.5**	**12**
PR (dB)	−45	−27	0	2	0	−27	−45

TABELA A.4.4-10

Odnosi zaštite za DVB-T 8 MHz 64-QAM kodni količnik 2/3 signal u Gausovom kanalu koji interferira sa NC sistemom

Δ*f* (MHz)	**−12**	**−5**	**−4.25**	**0**	**4.25**	**5**	**12**
PR (dB)	−39	7	12	17	12	7	−39

TABELA A.4.4-11

Odnosi zaštite za DVB-T 7 MHz 64-QAM kodni količnik 2/3 signal u Gausovom kanalu koji interferira sa OX, FJ, FL i NB sistemima

Δ*f* (MHz)	**−10.5**	**−4**	**−3.4**	**0**	**3.4**	**4**	**10.5**
PR (dB)	−37	−32	−2	−2	−2	−32	−38

TABELA A.4.4-12

Odnosi zaštite za DVB-T 8 MHz 64-QAM kodni količnik 2/3 signal u Gausovom kanalu koji interferira sa OX, OY, OZ, FJ, FL i NB sistemima

Δ*f* (MHz)	**−12**	**−4.5**	**−3.9**	**0**	**3.9**	**4.5**	**12**
PR (dB)	−38	−33	−3	−3	−3	−33	−38

TABELA A.4.4-13

Odnosi zaštite za DVB-T 8 MHz 64-QAM kodni količnik 2/3 signal u Gausovom kanalu koji interferira sa signalima koje emituju CDMA-1X (izmereno)

Δ*f* (MHz)	–12	–4.5	–3.75	0	3.75	4.5	12
PR (dB)	–38	–20	–3	10	–3	–20	–38

Karakteristike interferirajućeg signala:
Modulacija: QPSK
Širina propusnog opsega: 1.25 MHz (99%)

TABELA A.4.4-14

Odnosi zaštite za DVB-T 8 MHz 64-QAM kodni količnik 2/3 signal u Gausovom kanalu koji interferira sa signalima koje emituju CDMA-3X (izmereno)

Δf (MHz)	–12	–4.5	–3.75	0	3.75	4.5	12
PR (dB)	–38	8	13	18	13	8	–38

Karakteristike interferirajućeg signala:
Modulacija: QPSK
Širina propusnog opsega: 4 MHz (99%)

TABELA A.4.4-15

Korekcioni faktori za zaštitne odnose (dB) za različite varijante sistema u odnosu na 64-QAM 2/3 DVB-T signal i za različite uslove prijema kada je prisutna interferencija koja potiče od drugih primarnih servisa

varijanta DVB-T sistema	Gausov kanal	Fiksni prijem	Portabilni prijem u spoljašnjem prostoru	Portabilni prijem u zatvorenom prostoru	Mobilni prijem
QPSK 1/2	−13.5	−12.5	−10.3	−10.3	−7.3
QPSK 2/3	−11.6	−10.5	−8.2	−8.2	−5.2
QPSK 3/4	−10.5	−9.3	−6.9	−6.9	−3.9
QPSK 5/6	−9.4	−8.1	−5.6	−5.6	−2.6
QPSK 7/8	−8.5	−7.1	−4.5	−4.5	−1.5
16-QAM 1/2	−7.8	−6.8	−3.6	−3.6	−1.6
16-QAM 2/3	−5.4	−4.3	−2.0	−2.0	1.0
16-QAM 3/4	−3.9	−2.7	−0.3	−0.3	2.7
16-QAM 5/6	−2.8	−1.5	1.0	1.0	4.0
16-QAM 7/8	−2.3	−0.9	1.7	1.7	4.7
64-QAM 1/2	−2.2	−1.2	1.0	1.0	4.0
64-QAM 2/3	0.0	1.1	3.4	3.4	6.4
64-QAM 3/4	1.6	2.8	5.2	5.2	8.2
64-QAM 5/6	3.0	4.3	6.8	6.8	9.8
64-QAM 7/8	3.9	5.3	7.9	7.9	10.9

DODATAK 4.5

Polazne pretpostavke u pogledu drugih primarnih terestrijalnih servisa, korišćene u razvoju Plana digitalne radiodifuzije, GE06

Ovaj Dodatak predstavlja zbir svih pretpostavki korišćenih u postupku utvrđivanja digitalnog Plana GE06.

Sledeće pretpostavke korišćene su u toku utvrđivanja digitalnog Plana:

1 Za svrhe planiranja, pretpostavljeno je da su lokacije predajne i prijemne stanice aeronautičkog radionavigacionog sistema koji u Ujedinjenom Kraljevstvu rade u opsegu 590-598 MHz kolocirane, njihove antene nisu usmerene, a prijemna antena se nalazi na 7 m iznad tla.

2 U odsustvu zabeleženih vrednosti visine iznad nivoa tla, pretpostavljene su sledeće vrednosti kao predefinisanu efektivnu visinu antene predajne stanice nekog drugog primarnog servisa:

− stanice na letelicama aeronautičkog radionavigacionog servisa: 10 000 m;

− zemaljske stanice aeronautičkog radionavigacionog servisa: 37.5 m;

− stanice fiksnog servisa: 37.5 m;

− bazna stanica zemaljskog mobilnog servisa: 37.5 m.

3 U odsustvu vrednosti iz Izveštaja RRC-04, sledeća polazna vrednost visine prijemne antene pretpostavljena je za stanice drugih primarnih servisa:

− stanice na letelicama aeronautičkih radionavigacionih servisa: 10 000 m;

− stanice fiksnog servisa: 10 m;

− bazne stanice u mobilnom servisu: 20 m;

− mobilne stanice u mobilnom servisu: 1.5 m;

− prijemne zemaljske stanice u aeronautičkom radionavigacionom servisu: 10 m.

4 U odsustvu zabeleženih vrednosti efektivno izračene snage, vrednosti efektivno izračene snage izračunate su kao zbir snaga isporučenih anteni i dobitka antene.

5 Pošto Glavni Međunarodni Registar Frekvencija (MIFR) ne poseduje informacije o usmerenosti prijemne antene za druge primarne servise i Izveštaj RRC-04 ne sadrži informacije u pogledu toga, pretpostavlja se da ne postoji diskriminacija usmerenosti u slučaju prijemne antene, za bilo koji slučaj.

6 Kada je zabeležena širina propusnog opsega uža od izračunate širine propusnog opsega za više od 10°, tada se koristi izračunata vrednost širine propusnog opsega.

7 Kada se zabeležena vrednost ugla azimuta pravca maksimalnog zračenja razlikuje od izračunatog ugla azimuta za više od 3°, tada se koristi izračunata vrednost ugla azimuta.

8 Antene se razmatra kao neusmerena ako je njen dobitak manji od 3.7 dB.

9 Ako nije data vrsta polarizacije, smatra se da je “U” (nedefinisana).

10 S obzirom na to da tipične predajne stanice ne sadrže informacije o odgovarajućim prijemnicima, proračun inteferencije koja potiče od digitalnih radiodifuznih sistema a ugrožava dodele pridružene tipičnim stanicama i uključene u refernetnu situaciju izvode se u toku uspostave Plana.
11 Kada MIFR ne poseduje informacije o kodovima tipa sistema, za takve dodele se koristi opšti kod tipa sistema.
12 Kada se zabeležena servisna zona predajne ili prijemne stanice drugog primarnog servisa preklapa sa teritorijom susedne države, servisna zona takve stanice je ograničena nacionalnim granicama administracije nadležne za razmatranu stanicu.

ANEKS 3*

Osnovne karakteristike koje treba utvrditi u toku primene Sporazuma

Oznake simbola korišćenih u Tabelama 1,2 i 3

X	Obavezne informacije
+	Obaveza pod uslovima definisanim u Poglavlju 2
O	Opcione informacije
C	Obavezno ako se koristi kao osnova za koordinaciju sa drugom administracijom

Čitanje tabela
Pravila povezivanja znaka i teksta bazirana su na zaglavljima kolona tabele koje pokrivaju specifične procedure i specifične servise.

1 Ako bilo koji podatak ima uz sebe uslov, tada ima “+”.

4	ako je namena ili dodela deo mreže koja radi na jednoj frekvenciji, identifikacioni kod za mrežu koja radi na jednoj frekvenciji	+

2 Podaci grupisani u isto podzaglavlje koje ograničava opseg procedure, servisa ili frekvencijskog opsega ima “X”, dok je priroda uslova određena podzaglavljem.

	Za određenu predajnu stanicu koja radi na jednoj fiksnoj lokaciji	
7	naziv lokacije predajne stanice	X

* Kada je sadržaj ovog Aneksa jednom umetnut u Dodatk 4 *Pravilnik o radiokomunikacijama*, administracija treba da koristi taj Dodatak kada primenjuje relevantne delove Sporazuma, umesto Aneksa 3 (videti Rezoluciju 2 (RRC-06)).

TABELA 1

Podaci namene ili dodele za digitalnu radiodifuziju

Br.	KARAKTERISTIKE KOJE TREBA UTVRDITI ZA SVAKU NAMENU ILI DODELU ZA DIGITALNU RADIODIFUZIJU	Član 4. T-DAB raspodela	Član 4. T-DAB dodela	Član 5 T-DAB dodela	Član 4 DVB-T raspodela	Član 4 DVB-T ndodela	Član 5 DVB-Tdodela
1	**OPŠTE INFORMACIJE I FREKVENCIJSKE KARAKTERISTIKE**						
1.1	ITU simbol odgovarajuće administracije (videti Uvod)	X	X	X	X	X	X
1.2	Statusni kod (Dodati, Menjati, Izbaciti)	X	X	X	X	X	X
1.3	Jedinstveni identifikacioni kod dat od strane administracije za namenu ili dodelu (AdminID)	X	X	X	X	X	X
1.4	Kod unosa u Plan (1 – Namena, 2 – Mreža koja radi na jednoj frekvenciji (SFN), 3 – Dodela, 4 – Zona raspodele sa izvršenim dodelama i SFN_ID, 5 – Zona raspodele sa jednom dodelom i bez SFN_ID	X	X	X	X	X	X
1.5	Kod namene (L – Povezan, C – Pretvoren, S – Samostalan)		X	X		X	X
1.6	Ako je namena povezana sa dodelom, jedinstveni identifikacioni kod za pridruženu dodelu		+	+		+	+
1.7	Ako su namena ili dodela delove mreže koja radi na jednoj frekvenciji, identifikacioni kod za mrežu koja radi na jednoj frekvenciji	+	+	+	+	+	+
1.8	Pozivni znak ili druga identifikacija korišćena u skladu sa članom 19. Pravilnika o radiokomunikacijama			O			O
1.9	Namenjena frekvencija (MHz)	X	X	X	X	X	X

TABELA 1 (*nastavak*)

Br.	KARAKTERISTIKE KOJE TREBA UTVRDITI ZA SVAKU NAMENU ILI DODELU ZA DIGITALNU RADIODIFUZIJU	Član 4. T-DAB raspodela	Član 4. T-DAB dodela	Član 5 T-DAB dodela	Član 4 DVB-T raspodela	Član 4 DVB-T ndodela	Član 5 DVB-Tdodela
1.10	Ako centralna predajna frekvencija odstupa od namenjene frekvencije, frekvencijsko odstupanje (kHz)	+	+	+	+	+	+
1.11	Datum (stvaran ili predviđen, kako je pogodno) uvođenja frekvencijske namene (nove ili modifikovane) u upotrebu		C	X		C	X
1.12	Ako je namena ili dodela vezano za § 4.1.5.4 Člana 4, datum isticanja tog perioda	+	+	+	+	+	+
2	**LOKACIJA ANTENE (ANTENA)**						
2.1	Naziv lokacije predajne stanice		X	X		X	X
2.2	Naziv dodele za digitalnu radiodifuziju	X			X		
2.3	Simbol države ili geografske oblasti (videti Uvod)	X	X	X	X	X	X
2.4	Geografske koordinate predajne antene:						
2.4.1	geografska širina (±DDMMSS)		X	X		X	X
2.4.2	geografska dužina (±DDDMMSS)		X	X		X	X
2.5	**Za dodelu:**						
2.5.1	Ako su sve tačke za testiranje na državnim granicama ili granicama geografske oblasti ove zone raspodele, simbol države ili geografske oblasti	+			+		
2.5.2	Ako nisu sve tačke za testiranje zone raspodele na državnim granicama ili granicama geografske oblasti, broj (najviše 9) podoblasti u okviru zone raspodele (ako nema dodatnih podela, uneti 1 kao jedinstveni konturni broj)	+			+		

TABELA 1 (*nastavak*)

Br.	KARAKTERISTIKE KOJE TREBA UTVRDITI ZA SVAKU NAMENU ILI DODELU ZA DIGITALNU RADIODIFUZIJU	Član 4. T-DAB raspodela	Član 4. T-DAB dodela	Član 5 T-DAB dodela	Član 4 DVB-T raspodela	Član 4 DVB-T ndodela	Član 5 DVB-Tdodela
2.5.3	**Za svaku podoblast (najviše 9):**						
2.5.3.1	Jedinstveni konturni broj	X			X		
2.5.3.2	Broj tačaka za testiranje koje se nalaze na granicama podoblasti (najviše 99)	X			X		
2.5.3.3	Geografske koordinate svake tačke za testiranje na granicama podoblasti:						
2.5.3.3.1	geografska širina (±DDMMSS)	X			X		
2.5.3.3.2	geografska dužina (±DDDMMSS)	X			X		
3	**KARAKTERISTIKE SISTEMA ZA DIGITALNU RADIODIFUZIJU**						
3.1	Ako referentna konfiguracija za planiranje nije na raspolaganju, sistem digitalne televizije (uključujući varijante DVB-T) (A, B, C, D, E, F i 1, 2, 3, 5, 7)					+	+
3.2	Ako referentna konfiguracija za planiranje nije na raspolaganju, model prijema (FX, PO, PI, MO)					+	+
3.3	Referentna konfiguracija za planiranje (RPC 1, RPC 2, RPC 3, RPC 4 ili RPC 5) U slučaju DVB-T dodele, traži se ako sistem digitalne televizije i model prijema nisu na raspolaganju	X	X	X	X	+	+
3.4	Tip referentne mreže (RN1, RN2, RN3 ili RN4)				X		
3.5	Tip spektralne maske (za DVB-T: N = Nije kritično, O =Osetljivo. Za T-DAB: 1, 2, 3 (videti § 3.6 ovog Sporazuma))	C	X	X	C	X	X

TABELA 1 (*nastavak*)

Br.	KARAKTERISTIKE KOJE TREBA UTVRDITI ZA SVAKU NAMENU ILI DODELU ZA DIGITALNU RADIODIFUZIJU	Član 4. T-DAB raspodela	Član 4. T-DAB dodela	Član 5 T-DAB dodela	Član 4 DVB-T raspodela	Član 4 DVB-T ndodela	Član 5 DVB-Tdodela
3.6	Ako je polarizacija horizontalna ili kosa, maksimalna efektivno izračena snaga horizontalno polarizovane komonente u horizontalnoj ravni (dBW)		+	+		+	+
3.7	Ako je polarizacija vertikalna ili kosa, maksimalna efektivno izračena snaga vertikalno polarizovane komponente u horizontalnoj ravni (dBW)		+	+		+	+
3.8	Maksimalna efektivno izračena snaga u ravni definisanoj uglom tilta glavnog snopa zračenja (dBW)					O	O
4	**KARAKTERISTIKE ANTENE**						
4.1	Usmerenost antene (usmerena (U) ili nije usmerena (NU))		X	X		X	X
4.2	Polarizacija (H – horizontalna, or V – vertikalna, or K – kosa), or N[(1)] – nedefinisana, samo za dodele	X	X	X	X	X	X
4.3	Visina predajne antene iznad nivoa tla (m)		X	X		X	X
4.4	Visina lokacije na kojoj se nalazi antena u odnosu na nivo mora (m) merena od osnove predajne antene		X	X		X	X
4.5	Maksimalna efektivna visina antene (m)		X	X		X	X

(1) Nedefinisana – Može biti horizontalna (H), vertikalna (V), ili kosa (K). Sve vreme korišćenja RPC i RN, sva snaga koju nosi horizontalna polarizacija, vertikalna polarizacija ili u slučaju kose polarizacije, zbir snaga horizontalne i vertiklne komponente, treba da ostane konstantna. Za referentnu mrežu treba primeniti istu metodu za obe polarizacije.

TABELA 1 (*nastavak*)

Br.	KARAKTERISTIKE KOJE TREBA UTVRDITI ZA SVAKU NAMENU ILI DODELU ZA DIGITALNU RADIODIFUZIJU	Član 4. T-DAB raspodela	Član 4. T-DAB dodela	Član 5 T-DAB dodela	Član 4 DVB-T raspodela	Član 4 DVB-T ndodela	Član 5 DVB-Tdodela
4.6	Efektivna visina antene (m) merena u horizontalnoj ravni počevši od pravca severa u smeru kazaljke na časovniku, za 36 različitih uglova azimuta, na svakih 10°		X	X		X	X
4.7	Ako je polarizacija horizontalna ili kosa, vrednost pojačalja antene (dB) horizontalno polarisane komponente, normalizovana na 0 dB, merena u horizontalnoj ravni počevši od pravca severa u pravcu kazaljke na časovniku, za 36 različitih uglova azimuta, na svakih 10°		+	+		+	+
4.8	Ako je polarizacija vertikalna ili kosa, vrednost pojačanja antene (dB) vertikalno polarisane komponente, normalizovana na 0 dB, merena u horizontalnoj ravni u odnosu na pravac severa, za 36 različitih uglova azimuta, na svakih 10°		+	+		+	+
4.9	Ugao tilta glavnog snopa zračenja antene (stepeni)					O	O
5	**RADNI ČASOVI**						
5.1	Regularni radni časovi (UTC) na dodeljenoj frekvenciji:						
5.1.1	početno vreme			X			X
5.1.2	krajnje vreme			X			X
6	**KOORDINACIJA I SPORAZUM**						
6.1	Ako je koordinacija neophodna i sporazum je postignut:						
6.1.1	ITU simbol administracije sa kojom se vrši koordinacija	**+**	**+**	+	+	+	+

TABELA 1 (*završetak*)

Br.	KARAKTERISTIKE KOJE TREBA UTVRDITI ZA SVAKU NAMENU ILI DODELU ZA DIGITALNU RADIODIFUZIJU	Član 4. T-DAB raspodela	Član 4. T-DAB dodela	Član 5 T-DAB dodela	Član 4 DVB-T raspodela	Član 4 DVB-T ndodela	Član 5 DVB-Tdodela
6.1.2	Odredba (Broj odredbe Pravilnika o radiokomunikacijama, Regionalnog sporazuma ili drugi dogovor) koja zahteva takvu koordinaciju	**+**	**+**	+	+	+	+
6.2	Ako je dodela predmet § 5.1.2 člana 5, deklaracija nadležne administracije da su svi uslovi vezani za predlog u potpunosti ispunjeni, za datu dodelu sa ciljem unosa u MIFR			+			+
6.3	Ako je dodela predmet § 5.1.8 člana 5, preuzeta je obaveza od stane nadležne administracije da podneta dodela za upis u MIFR neće prouzrokovati neprihvatljivu interferenciju i neće iziskivati zaštitu			+			+
7	**NADLEŽNA ADMINISTRACIJA ILI AGENCIJA**						
7.1	Simbol nadležne agencije (videti Uvod)			O			O
7.2	Simbol adrese administracije (videti Uvod) odgovorne za stanice i kojoj se prosleđuju informacije u slučaju hitnih slučajeva u pogledu interferencije, kvaliteta emisije i pitanja vezana za funkcionisanje tehničke opreme (videti član **15.** Pravilnika o radio-komunikacijama)			X			X
8	**NAPOMENE**						
8.1	Bilo kakav komentar koji bi pomogao Birou u obradi ovog dokumenta	O	O	O	O	O	O

TABELA 2

Podaci o nameni za VHF/UHF analogne televizijske sisteme
(koristiti u periodu tranzicije)

Br.	POTREBNE KARAKTERISTIKE O DODELI ANALOGNOM RADIODIFUZNOM SISTEMU	Član 4 (GE06)	Član 5 (GE06)
1	**OPŠTE INFORMACIJE I FREKVENCIJSKE KARAKTERISTIKE**		
1.1	ITU simbol nadležne administracije (videti Uvod)	X	X
1.2	Statusni kod (Dodati, Menjati,Izbaciti)	X	X
1.3	Jedinstveni identifikacioni kod dodele dat od strane nadležne administracije (Admin ID)	X	X
1.4	Pozivni znak ili druga identifikacija korišćena u skladu sa članom 19. Pravilnika o radiokomunikacijama		O
1.5	Frekvencija pridružena zoni raspodele (MHz)	X	X
1.6	Frekvencijsko odstupanje nosioca slike, izraženo kao umnožak 1/12 linijske frekvencije odgovarajućeg televizijskog sistema , izraženo kao broj (pozitivan i negativan) ili u kHz	X	X
1.7	Ako je frekvencijsko odstupanje nosioca zvuka različito od frekvencijskog odstupanja nosioca slike, frekvencijsko odstupanje nosioca zvuka izraženo kao umnožak 1/12 linijske frekvencije odgovarajućeg televizijskog sistema, izraženo kao broj (pozitivan ili negativan) ili u kHz	+	+
1.8	Datum stvaran ili predviđen, kako je pogodno dodeljivanja frekvencije (nove ili izmenjene)	C	X
1.9	Ako se dodela odnosi na § 4.1.5.4 Člana 4, datum isteka tog perioda	+	+
2	**LOKACIJA PREDAJNE ANTENE (ANTENA)**		
2.1	Ime lokacije predajne stanice	X	X
2.2	ITU simbol države ili geografske oblasti	X	X
2.3	Geografske koordinate predajne antene:		
2.3.1	geografska širina (±DDMMSS)	X	X
2.3.2	geografska dužina (±DDDMMSS)	X	X

TABELA 2 (*nastavak)*

Br.	POTREBNE KARAKTERISTIKE O DODELI ANALOGNOM RADIODIFUZNOM SISTEMU	Član 4 (GE06)	Član 5 (GE06)
3	**KARAKTERISTIKE ANALOGNOG RADIODIFUZNOG SISTEMA**		
3.1	Pokazatelj frekvencijske stabilnosti (RELAXED, NORMAL ili PRECISION)	X	X
3.2	Odgovarajući simbol televizijskog sistema (B, B1, D, D1, G, H, I, K, K1, L ili M)	X	X
3.3	Odgovarajući simbol kolor sistema (P = PAL, S = SECAM)	X	X
3.4	Ako je polarizacija horizontalna ili kosa, maksimalna efektivno izračena snaga horizontalno polarisane komponente (dBW)	+	+
3.5	Ako je polarizacija vertikalna ili kosa, maksimalna efektivno izračena snaga vertikalno polarisane komponente (dBW)	+	+
3.6	Odnos snaga nosioca slike i nosioca zvuka	X	X
4	**KARAKTERISTIKE ANTENE**		
4.1	Usmerenost antene (usmerena (U) ili nije usmerena (NU))	X	X
4.2	Polarizacija (H – horizontalna, ili V – vertikalna, ili K – kosa)	X	X
4.3	Visina antene iznad nivoa tla (m)	X	X
4.4	Visina lokacije iznad nivoa mora (m) merena od osnove predajne antene	X	X
4.5	Maksimalna efektivna visina antene (m)	X	X
4.6	Efektivna visina antene (m), merena u horizontalnoj ravni, počevši od pravca severa u pravcu kazaljke na časovniku, za 36 različitih uglova azimuta, na svakih 10°	X	X
4.7	Ako je polarizacija horizontalna ili kosa, vrednost pojačanja antene (dB) za horizontalno polarisanu komponentu, mereno u horizontalnoj ravni, počevši od pravca severa u smeru kazaljke na časovniku, za 36 različitih uglova azimuta, na svakih 10°	+	+
4.8	Ako je polarizacija vertikalna ili kosa, vrednost pojačanja antene (dB) za vertikalno polarisanu komponentu, mereno u horizontalnoj ravni, počevši od pravca severa u smeru kazaljke na časovniku, za 36 različitih uglova azimuta, na svakih 10°	+	+

TABLE 2 (*završetak*)

Br.	POTREBNE KARAKTERISTIKE O DODELI ANALOGNOM RADIODIFUZNOM SISTEMU	Član 4 (GE06)	Član 5 (GE06)
5	**RADNI ČASOVI**		
5.1	Regularni radni časovi (UTC) na dodeljenoj frekvenciji:		
5.1.1	početno vreme	C	X
5.1.2	krajnje vreme	C	X
6	**KOORDINACIJA I SPORAZUM**		
6.1	Ako je koordinacija neophodna i dogovor je postignut:		
6.1.1	ITU simbol administracije sa kojom se vrši koordinacija	+	+
6.1.2	Odredba (Broj odredbe Pravilnika o radiokomunikacijama, regionalni sporazum ili drugi dogovor) koja zahteva tahvu koordinaciju	+	+
6.2	Ako je dodela predmet § 5.1.2 člana 5, deklaracija nadležne administracije da su svi uslovi vezani za predlog u potpunosti ispunjeni, za datu dodelu sa ciljem unosa u MIFR		+
7	**NADLEŽNA ADMINISTRACIJA ILI AGENCIJA**		
7.1	Simbol nadležne agencije (videti Uvod)		O
7.2	Simbol adrese administracije (videti Uvod) odgovorne za stanice i kojoj se prosleđuju informacije u slučaju hitnih slučajeva u pogledu interferencije, kvaliteta emisije i pitanja vezana za funkcionisanje tehničke opreme (videti član **15.** Pravilnika o radio-komunikacijama)		X
8	**NAPOMENE**		
8.1	Bilo kakav komentar koji bi pomogao Birou u sprovođenju ovog dokumenta	O	O

TABELA 3

Podaci vezani za dodelu stanici nekog drugog primarnog terestrijalnog servisa

Br.	KARAKTERISTIKE KOJE TREBA UTVRDITI ZA SVAKU DODELU DRUGIM PRIMARNIM ZEMALjSKIM SERVISIMA	Dodatak. 4 Pravilnik o radiokomunik acijamaa	Član 4 (GE06)	Član 5 (GE06)
1	**OPŠTE INFORMACIJE I FREKVENCIJSKE KARAKTERISTIKE**			
1.1	ITU simbol nadležne organizacije (videti Uvod)	B	X	X
1.2	Statusni kod (Dodati, Modifikovati, Odbaciti)		X	X
1.3	Jedinstveni identifikacioni kod frekvencijske dodele, dat od strane nadležne administracije(AdminRefId)		X	X
1.4	Pozivni znak ili druga identifikacija korišćena u skladu sa članom 19. Pravilnika o radiokomunikacijama	3A		O
1.5	Dodeljena frekvencija (MHz)	1A	X	X
1.6	Ako je anvelopa modulacije asimetrična, referentna frekvencija (MHz)	1B	+	+
1.7	Datum stupanja na snagu frekvencijske dodele	2C	C	X
1.8	Ako je dodela vezena za § 4.2.5.5 Člana 4, datum isticanja tog perioda		+	+
2	**LOKACIJA PREDAJNE ANTENE (ANTENA)**			
2.1	**Za određenu predajnu stanicu koja radi na jednoj fiksnoj lokaciji:**			
2.1.1	Ime lokacije predajne stanice	4A	X	X
2.1.2	ITU simbol države ili geografske oblasti	4B	X	X
2.1.3	Geografske koordinate predajne antene:	4C		
2.1.3.1	geografska širina (±DDMMSS)		X	X
2.1.3.2	geografska dužina (±DDDMMSS)		X	X
2.2	**Za kružnu ili definisanu oblast koja sadrži tipične predajne stanice ili mobilne predajne stanice:**			
2.2.1	Ako simbol države ili geografske oblasti nije raspoloživ, geografske koordinate centra kružne oblasti:	4C		
2.2.1.1	geografska širina (±DDMMSS)		+	+
2.2.1.2	geografska dužina (±DDDMMSS)		+	+

TABELA 3 (*nastavak)*

Br.	**KARAKTERISTIKE KOJE TREBA UTVRDITI ZA SVAKU DODELU DRUGIM PRIMARNIM ZEMALjSKIM SERVISIMA**	**Dodataka 4 Pravilnik o radiokomunikac ijamaa**	**Član 4 (GE06)**	**Član 5 (GE06)**
2.2.2	Ako simbol države ili geografske oblasti nije raspoloživ, nominalni poluprečnik (km) kružne oblasti	4D	+	+
2.2.3	Ako geografske koordinate i nominalni poluprečnik nisu raspoloživi, ITU simbol države ili geografske oblasti	4E	+	+
3	**LOKACIJA PRIJEMNE ANTENE**			
3.1	**Za određenu prijemnu stanicu koja radi na jednoj određenoj lokaciji:**			
3.1.1	Ime lokacije prijemne stanice	5A	X	X
3.1.2	ITU simbol države ili geografske oblasti	5B	X	X
3.1.3	Geografske koordinate prijemne antene:	5C		
3.1.3.1	geografska širina (±DDMMSS)		X	X
3.1.3.2	geografska dužina (±DDDMMSS)		X	X
3.2	**Za definisanu zonu prijema povezanu sa određenom predajnom stanicom:**			
3.2.1	Ako nije ostvarena kružna oblast prijema, ITU simbol države ili geografske oblasti prijema	5D	+	+
3.2.2	Ako podaci o geografskoj oblasti nisu na raspolaganju, geografske koordinate centra kružne prijemne oblasti:	5E		
3.2.2.1	geografska širinae (±DDMMSS)		+	+
3.2.2.2	geografska dužina (±DDDMMSS)		+	+
3.2.3	Ako podaci o geografskoj oblasti nisu na raspolaganju, nominalni poluprečnik (km) kružne zone prijema	5F	+	+
3.2.4	Ako podaci o prijemnoj stanici fiksnog servisa i karakteristike pod 3.1gore nisu na raspolaganju, geografske koordinate (između 3 i 6 grupa) koje definišu oblast u kojoj je locirana prijemna stanica:	5C		
3.2.4.1	geografska širina (±DDMMSS)		+	+
3.2.4.2	geografska dužina (±DDDMMSS)		+	+
4	**KLASA STANICE I PRIRODA SERVISA**			
4.1	Klasa stanice, koristeći simbole iz Uvoda	6A	X	X
4.2	Priroda servisa koji se pruža, koristeći simbole iz Uvoda	6B	X	X
5	**KARAKTERISTIKE SISTEMA**			
5.1	Klasa emisije, u skladu sa članom 2. i Dodatkom 1 Pravilnika o radiokomunikacijama	7A	X	X

TABELA 3 (*nastavak)*

Br.	KARAKTERISTIKE KOJE TREBA UTVRDITI ZA SVAKU DODELU DRUGIM PRIMARNIM ZEMALjSKIM SERVISIMA	Dodatak 4 Pravilnika o radiokomunikacijama	Član 4 (GE06)	Član 5 (GE06)
5.2	Neophodna širina propusnog opsega, u skladu sa članom 2. Dodatka 1. Pravilnika o radiokomunikacijama	7A	X	X
5.3	Kod tipa sistema		X	X
5.4	Ako je izlazna snaga predajnika ostvarena, simbol kojim se to opisuje, kako je pogodno, tip snage (X, Y ili Z)	8	+	+
5.5	Ako izračena snaga nije ostvarena, izlazna snaga predajnika (dBW)	8A	+	+
5.6	Maksimalna gustina snage (dB(W/Hz)) uprosečena za najgorih 4 kHz širine propusnog opsega predajne antene	8AB	O	X
5.7	Ako izlazna snaga predajnika nije ostvarena, masimalna efektivno izračena snaga izračena u dBW	8B	+	+
6	**KARAKTERISTIKE ANTENE**			
6.1	Ako maksimalna efektivno izračena snaga nije postignuta, maksimalni dobitak antene u odnosu na polutalasni dipol, u pravcu maksimalnog zračenja	9G	+	+
6.2	**Za dodelu za određenu predajnu/prijemnu stanicu koja radi na jednoj fiksnoj lokaciji (izuzev tipičnih stanica):**			
6.2.1	Polarizacija	9D	X	X
6.2.2	Visina antene iznad nivoa tla (m)	9E	X	X
6.2.3	Usmerenost antene (usmerena (U) ili nije usmerena (NU))	9	X	X
6.2.4	**Za usmerenu predajnu/prijemnu antenu koja radi na fiksnoj lokaciji:**			
6.2.4.1	Ugao širine glavnog snopa zračenja meren horizontalno u ravni koja sadrži pravac ose maksimalnog zračenja (u stepenima), u kojoj izračena snaga u bilo kom smeru ne opada više od 3 dB u odnosu na snagu izračenu u pravcu maksimalnog zračenja	9C	O	O
6.2.4.2	Dobitak antene u oblasti lokalnog horizonta		O	O
6.2.5	**Za predajnu antenu koja radi na fiksnoj lokaciji:**			
6.2.5.1	Visina pozicije antene u odnosu na nivo mora merena od osnove antene (m)	9EA	X	X
6.2.5.2	Maksimalna efektivna visina antene (m)	9EB	X	X
6.2.5.3	Efektivna visina antene (m) merena u horizontalnoj ravni, počevši od pravca severa u smeru kazaljke na časovniku, za 36 različitih uglova azimuta, na svakih 10°	9EC	X	X

TABELA 3 (*završetak*)

Br.	KARAKTERISTIKE KOJE TREBA UTVRDITI ZA SVAKU DODELU DRUGIM PRIMARNIM ZEMALjSKIM SERVISIMA	Dodatak 4 Pravilnika o radiokomunikacijama	Član 4 (GE06)	Član 5 (GE06)
6.2.5.4	**Za usmerenu predajnu antenu koja radi na fiksnoj lokaciji:**			
6.2.5.4.1	Ako glavni snop zračenja antene ne rotira ili prebrisava prostor, ugao azimuta maksimalnog zračenja u stepenima (u smeru kazaljke na časovniku) u odnosu na pravac severa	9A	+	+
6.2.5.4.2	Ako glavni snop zračenja rotira ili prebrisava prostor, deo prostora po azimutu prebrisan od strane glavnog snopa antene:	9AB		
6.2.5.4.2.1	početna vrednost ugla azimuta, u stepenima, u smeru kazaljke na časovniku, u odnosu na pravac severa		+	+
6.2.5.4.2.2	krajnja vrednost ugla azimuta, u stepenima, u smeru kazaljke na časovniku, u odnosu na pravac severa		+	+
7	**RADNI ČASOVI**			
7.1	Regularni radni časovi (UTC) za dodeljenu frekvenciju:	10B		
7.1.1	početno vreme		C	X
7.1.2	krajnje vreme		C	X
8	**KOORDINACIJA I DOGOVOR**			
8.1	Ako je koordinacija neophodna i dogovor je postignut, ITU simbol administracije sa kojom se vrši koordinacija	11	+	+
8.2	Ako je dodela predmet § 5.1.2 člana 5, deklaracija nadležne administracije da su svi uslovi vezani za predlog u potpunosti ispunjeni, za datu dodelu sa ciljem unosa u MIFR			+
9	**NADLEŽNA ADMINISTRACIJA ILI AGENCIJA**			
9.1	Simbol nadležne agencije (videti Uvod)	12A		O
9.2	Simbol adrese administracije (videti Uvod) odgovorne za stanice i kojoj se prosleđuju informacije u slučaju hitnih slučajeva u pogledu interferencije, kvaliteta emisije i pitanja vezana za funkcionisanje tehničke opreme (videti član **15.** Pravilnika o radio-komunikacijama)	12B	X	X
10	**NAPOMENE**			
10.1	Bilo kakav komentar koji bi pomogao Birou u sprovođenju dokumenta		O	O

ANEKS 4

I Deo
Aneksa 4

Ograničenja i metodologija za određivanje kada je potreban dogovor sa drugom administracijom

1 Uvod

Ako administracija predloži izmenu Plana ili koordinaciju dodele frekvencije stanici koja pruža drugi primerni zemaljski servis, neophodno je proceniti da li neka od administracija iz oblasti planiranja može biti ugrožena, odnosno, identifikovati administracije sa kojima je neophodno postići dogovor. Ovaj Aneks sadrži ograničenja prilikom koordinacije i odgovarajuću tehničku metodologiju koju treba primeniti prilikom identifikacije administracija sa kojima je potrebno izvršiti koordinaciju.
Metodologija definiše oblast unutar koje je vrednost koordinacionog praga intenziteta električnog polja prevaziđena. Izborom odgovarajućih vrednosti koordinacionog praga intenziteta električnog polja iz priloženih dodataka, moguće je identifikovati čitavu oblast u kojoj je relevantna vrednost koordinacionog praga intenziteta električnog polja prevaziđena za skup servisa, i dalje određuje administraciju sa kojom je potrebno izvršiti koordinaciju.
Proces identifikacije administracije koja može biti ugrožena baziran je na određivanju koordinacionih kontura, priloženim uz predložene modifikacije (videti § 2 ovog Dela). Ugrožene administracije su one administracije čije državne granice, za radiodifuziju, ili servisne zone drugih primernih terestrijalnih servisa koje se presecaju sa ovim konturama ili se nalaze unutar njih.

2 Metoda identifikacije potencijalno ugrožene administracije

Čitava oblast u okviru koje je relevantna vrednost koordinacionog praga intenziteta električnog polja prevaziđena, određena je na osnovu poznatih karakteristika predložene modifikacije. Sve u svemu, detalji o radu potencijalno ugrožene stanice nisu poznati, i neophodno je pretpostaviti parametre u najgorem slučaju putanje propagacije i za sistemske parametre nepoznate prijemne stanice.
Iako je određivanje oblasti u okviru koje se zahteva koordinacija bazirano na tehničkim kriterijumima, važno je primetiti da ono predstavlja regulatorni koncept, za svrhu identifikacije oblasti u okviru koje je potrebno izvesti detaljniji proračun moguće interefrencije.
Nadalje, zona za koju se vrši koordinacija nije izuzetak u okviru koga je zabranjeno deljenje frekvencija, ali se smatra za zonu u kojoj se mora vršiti detaljniji proračun interferencije.

U najvećem broju slučajeva, detaljnija analiza će pokazati da je deljenje frekvencije u okviru iste koordinacione zone moguće, pošto je procedura određivanja koordinacione oblasti zasnovana na ravnopravnim pretpostavkama vezanim za mogućnost javljanja interferencije.
Metodologija omogućava, za određivanje rastojanja za svaku vrednost ugla azimuta oko predložene nove ili modifikovane stanice ili oblasti u okviru koje je stanica locirana, iznad koje je očekivana intenzitet interferirajućeg električnog polja manja od specifične vrednosti za sve sem specificiranog procenta vremena. Kada je ovo rastojanje određeno za svaku vrednost ugla azimuta, ono definiše konturu intenziteta električnog polja, nazvanu koordinacionom konturom, koja obuhvata koordinacionu oblast. Zasebne koordinacione konture formiraju se za svaku zahtevanu vrednost koordinacionog praga intenziteta električnog polja.
Određivanje intenziteta električnog polja zasnovano je na propagacionom modelu iz Poglavlja 2 Aneksa 2 Sporazuma. Ovaj propagacioni model nije validan iznad 1 000 km, tako da je proračun interfrencije od bilo kog predajnika ograničen na 1 000 km maksimalnog rastojanja propagacionog modela.

2.1 Identifikacija administracije potencijalno ugrožene modifikacijama Planova

Sa ciljem da se identifikuju administracije koje bi mogle biti ugrožene predloženim modifikacijama Planova, neophodno je identifikovati relevantnu vršnu vrednost intenziteta električnog polja koja se koristi prilikom proračuna.
Kada se namerava modifikovati Plan, karakteristike dodele ili zone raspodele su poznate. Posebno, geografske koordinate koje definišu zonu raspodele ili lokaciju predajnika su poznate. Na osnovu ovih informacija, sastavljena je lista država u okviru 1 000 km zone raspodele razmatranog predajnika. Ova lista može biti razvijena na osnovu preseka odgovarajućih kontura sa državnim granicama administracija, kao što je dato u MIFR.
Metoda identifikovanja potencijalno ugroženih administracija sastoji se iz sledećih pet koraka:

Korak 1 – Postavljanje konture na 1 000 km
Sa ciljem da se identifikuju potencijalno ugroženi servisi, sve države čije granice leže unutar ili se presecaju sa konturom na 1 000 km uzimaju se u razmatranje.

Korak 2 – Izbor administracija čiji je radiodifuzni servis potencijalno ugrožen

Kontura je razvijena za svaki frekvencijski opseg, zasnivajući se na vršnoj koordinacionoj vrednosti koja odgovara tipu radiodifuznog servisa za koji se modifikuje Plan, kao što je specificirano u tabeli A.1.1 Dodatka 1 ovog Dela i prateći proceduru razvijenu u § 3 ovog Dela.

Korak 3 – Izbor dodela za druge servise koje se nalaze na konturi na 1 000 km
U ovom koraku, biraju se dodele za druge primerne servise, što je zasnovano na sledećim kriterijumima:

– dodela pripada administraciji koja se nalazi u okviru konture na 1 000 km;

– dodela je sadržana na Listi dodela za primarne terestrijalne servise date u Aneksu 5 ovog Sporazuma ili za koje je već započeta procedura iz Člana 4. ovog Sporazuma.

Rezultat procesa selekcije biće lista država/dodela za koje odgovarajuće vršne vrednosti moraju biti izdvojene iz tabela vršnih vrednosti Dodatka 1 ovog Dela.

Korak 4 – Konstrukcija koordinacionih kontura

Za svaku pojedinačnu vršnu vrednost sa gornje liste, razvija se koordinaciona kontura. Na taj način, uvek će postojati jedna koordinaciona kontura koja će štititi od radiodifuznog servisa identifikovanog u koraku 2 i za svaki frekvencijski opseg, moguće je da bude izabrano nekoliko koordinacionih kontura za svaki tip servisa izabranih u koraku 3.

Metoda proračuna koordinacione konture za različite scenarie koordinacije opisana je u § 4 ovog Dela. Tehničke pretpostavke koje treba koristiti date su u § 5.1 ovog Dela. Koordinacione vršne vrednosti date su u Dodatku 1 ovog Dela.

Korak 5 – Identifikacija potencijalno ugroženih administracija

Administracija sa kojom se zahteva koordinacija identifikovana je koordinacionim konturama koje se presecaju ili se nalaze unutar:

– državnih granica administracija identifikovanih u koraku 2, vezano za radiodifuziju;

– lokacija prijemne stanice/servisnih zona drugog primarnog servisa identifikovanog u koraku 3.

2.2 Identifikacija potencijalno ugroženih administracija od strane dodela drugim primarnim terestrijalnim servisima

Početna stavka su modifikacije koje se nameravaju izvršiti ili dodaci listi iz Aneksa 5 ovog Sporazuma, čije su karakteristike poznate. Na osnovu ovih informacija, i primenom metoda opisanih u § 2.1 ovog Dela, dodele i administracije sa kojima se zahteva koordinacija se identifikuju.

Analiza se završava eksplicitnim proračunom vrednosti intenziteta električnog polja na državnim granicama identifikovane države.

Kada se uoči dodela drugom primarnom servisu, koordinacione konture za predajnu stanicu i pridruženu prijemnu stanicu na određenoj lokaciji ili servisnoj zoni moguće je odrediti. Veća od dve konture treba da bude uzeta u obzir prilikom identifikacije ugroženih administracija.

Detalji proračuna koordinacionih kontura za različite koordinacione scenarie opisani su u § 3 i 4 ovog Dela. Tehničke pretpostavke koje treba koristiti specificirane su u § 5.2 ovog dela. Vršne koordinacione vrednosti date su u Dodatku 1 ovog Dela.

3 Konstrukcija koordinacionih kontura

Koordinacione konture razvijaju se korišćenjem ekvidistantnih radijalnih linija, odvojenih po 1°, opisanih u 360° oko zone raspodele/dodele ili servisne zone, sa centrom u jednoj referentnoj tački, lokaciji koja je u okviru § 4 ovog Dela definisana za svaki koordinacioni scenario.

Koordinaciona kontura se izračunava za svaki radijalni pravac počevši sa udaljenošću od 1 000 km od lokacije stanice ili ivice zone u kojoj se stanica nalazi, kao što je definisano u §4. ovog Dela, a za svaki scenario koordinacije. Proračun se izvodi pomeranjem duž radijalnog pravca prema referentnoj tački, u koracima od po 10 km.
U ovom Aneksu, procedura podrazumeva određivanje rastojanja za koje je vršna vrednost intenziteta električnog polja dostignuta i koristi se za formiranje koordinacione konture. Svi proračuni intenziteta električnog polja bazirani su na propagacionom modelu opisanom u Poglavlju 2 Aneksa 2 ovog Sporazuma.
Sve u svemu, ako vršna vrednost intenziteta električnog polja nije dostignuta na rastojanju od 1 000 km koje predstavlja ograničenje propagacionog modela, koordinaciona kontura na tom radijalnom pravcu/pravcu azimuta treba da ima rastojanje 1 000 km od lokacije stanice na ivici zone u kojoj je locirana.
Rezultujuća koordinaciona kontura može biti nacrtana na mapi sa ciljem da se olakša proces koordinacije.

3.1 Zahtevi za određivanje koordinacione konture

Scenariji koordinacije i različite procedure sadržane u ovom Aneksu bazirane su na različitim pretpostavkama. Dodatno, veličina koordinacione konture zavisiće od scenaria koordinacije. Odvojene koordinacione konture sa zato traže za svaki deljeni scenario opisan u § 4 ovog Dela. Dalje, koordinaciona kontura razvijena za jedan koordinacioni scenario ne može biti korišćena za određivanje uticaja bilo kog radiokomunikacionog servisa pokrivenog drugačijim scenariom koordinacije.

3.2 Dodatne konture

Kao dodatak koordinacionim konturama, administarcije mogu nacrtati dodatne konture kako bi omogućile detaljnije razmatranje koordinacije. Ove dodatne konture mogu biti bazirane na manje strogim deljenim kriterijumima (npr. uzimanje u obzir polarizacije, diskriminacije antene ugroženog prijemnika) u odnosu na kriterijume korišćene za određivanje koordinacione oblasti. Ove dodatne konture mogu biti razvijane istom metodom korišćenom za određivanje koordinacione konture, ili drugim metodama, ako je tako ugovoreno na bilateralnoj osnovi između administracija.

4 Različiti scenariji koordinacije

Sledeće stavke opisuju osnovne pretpostavke o proceni interferencije i lokaciji referentne tačke za konstrukciju koordinacionih kontura za različite scenarie deljenja frekvencija.

4.1 Individualne stanice koje rade na fiksnoj i određenoj lokaciji

Za radiodifuznu stanicu ili stanicu koja pruža neki drugi primerni terestrijalni servis na fiksnoj lokaciji koordinacione konture se računaju u svim pravcima po azimutu u odnosu na geografsku lokaciju predajne ili prijemne antene i uzimaju se u razmatranje sve varijacije dobitka antene (ako je taj podatak na raspolaganju).

4.2 Tipična predajna stanica koja radi sa fiksne lokacije u okviru specificirane servisne zone

Za tipičnu predajnu stanicu referentna tačka je centar gravitacije specificirane servisne zone. Ako to nije slučaj, za referentnu tačku se uzima tačka najbliža centru gravitacije specificirane servisne zone. Koordinaciona kontura se konstruiše oko granica specificirane servisne zone u okviru koje se nalazi stanica koja je u razmatarnju.
Nisu uvedene tolerancije vrednosti diskriminacije i polarizacije antene.

4.3 Radiodifuzne stanice u mreži koja radi na jednoj frekvenciji

Za radiodifuznu stanicu u mreži koja radi na jednoj frekvenciji, koordinacione konture se računaju koristeći referentnu tačku, centar gravitacije svih geografskih koordinata svih predajnih lokacija u mreži. Individualni doprinosi intenziteta električnog polja predajnika kombinuju se po metodi sumiranja snaga (videti Poglavlje 3 Aneksa 2 Sporazuma).

4.4 Radiodifuzne zone raspodele

U slučaju zone raspodele, referentna tačka je centar gravitacije zone raspodele ukoliko je on lociran u okviru pomenute zone. Ako to nije slučaj, za referentnu tačku se uzima tačka najbliža centru gravitacije a koja se nalazi unutar zone raspodele. Karakteristike pridružene referentne mreže (RN) i referentne konfiguracije za planiranje (RPC) koriste se kao izvor interferirajućeg električnog polja. Svaka tačka za testiranje koja se nalazi na ivici zone raspodele biće razmatrana kao potencijalni izvor interferencije u zoni raspodele (videti Dodatak 3 ovog Dela za detaljan opis). Najveća ostvarena vrednost intenziteta električnog polja, za svaku tačku koja se razmatra prilikom proračuna, od svake tačke za testiranje na granici zone raspodele određuje se vrednost intenziteta električnog polja.
Za slučaj zone raspodele sa završenom dodelom frekvencija i identifikatorom mreže koja radi na jednoj frekvenciji, treba izvršiti dva proračuna opisana u nastavku:

– U prvom proračunu, kao potencijalni izvor interferencije posmatraju se karakteristične pridružene referentne mreže i referentne konfiguracije za planiranje, kao što je opisano ranije.
– U drugom proračunu koriste se karakteristike svake od izvršenih dodela, kako bi se izračunala ukupna snaga interferirajućeg signala u tački za koju se vrši proračun.

Viša od vrednosti intenziteta električnog polja dobijenih iz prethodna dva proračuna smatra se relevantnom vrednošću intenziteta električnog polja.
Za dodelu izvršenu u zoni raspodele koja nema identifikator mreže koja radi na jednoj frekvenciji, karakteristike dodele se koriste za izračunavanje vrednosti intenziteta električnog polja, kao što je opisano u § 4.1 ovog Dela.

4.5 Mobilne stanice (izuzev aeronautičkih mobilnih stanica)

Za mobilnu stanicu (izuzev aeronautičke mobilne stanice), za referentnu tačku uzima se centar gravitacije određene servisne zone i koordinaciona kontura se formira oko ivica određene servisne zone, u okviru koje mobilna stanica radi. U dodatku, određena oblast u kojoj mobilna stanica radi treba da se nalazi unutar nacionalne teritorije. Ne postoje tolerancije za vrednost diskriminacije antene.

4.6 Aeronautički radionavigacioni sistemi

Za aeronautičke radionavigacione stanice postavljene na tlu, referentna tačka je geografska lokacija stanice.
Za aeronautičke radionavigacione stanice koje se nalaze u vazduhu, referentna tačka je centar gravitacije određene servisne zone u okviru koje aeronautička radionavigaciona stanica radi, ako je locirana unutar servisne zone. Ako to nije slučaj, za referentnu tačku se uzima tačka najbliža centru gravitacije koja se nalazi u servisnoj zoni. Za stanice koje rade u vezduhu, nisu dozvoljene tolerancije za vrednost diskriminacije antene.
Za stanice koje se nalaze u vazduhu, određena servisna zona treba da se nalazi unutar nacionalne teritorije.

5 Određivanje vrednosti koordinacionog praga intenziteta električnog polja

5.1 Modifikacije Plana

5.1.1 Zaštita radiodifuznog servisa

Konstrukcija koordinacionih kontura i proračun interferirajuće intenziteta električnog polja bazirane su na propagacionom modelu opisanom u Pogavlju 2 Aneksa 2 Sporazuma. Za određivanje interferencije radiodifuznog prijemnika koriste se sledeće veličine:

– objavljene vrednosti izračene snage i efektivne visine antene;

– koordinacione vršne vrednosti intenziteta električnog polja iz tabele A.1.1 Dodatka 1 ovog Dela;

– propagacione krive za slučaj troposfere (efektivna izotropno izračena snaga za 1% vremena i 50% lokacija);

– visina prijemne antene koja se nalazi 10 m iznad tla.

5.1.2 Zaštita drugih primarnih terestrijalnih servisa

Konstrukcija koordinacionih kontura bazirana je na modelu za predikciju propagacije uključenom u Poglavlje 2 Aneksa 2 Sporazuma.

Za proračune za slučajeve u kojima su i predajna i prijemna antena na tlu, koriste se krive propagacije za 10% vremena i 50% lokacija.

Za proračune u slučajevima u kojima je jedna antena na tlu a druga u vazduhu, treba koristiti model propagacije u slobodnom prostoru. Koordinaciona kontura ograničena je na rastojanje od 420 km po liniji optičke vidljivosti.

Intenzitet električnog polja izračunata je za visinu prijemne antene i data u odgovarajućim tabelama u § A.2, A.3 ili A.4 Dodatka 1 ovog Dela.

Za sisteme drugih primarnih terestrijalnih servisa, koordinacione vršne vrednosti intenziteta električnog polja date su u tabelama A.1.2 do A.1.8 Dodatka 1 ovog Dela.

5.2 Koordinacija dodela stanicama drugih primarnih terestrijalnih servisa

5.2.1 Koordinacija dodele predajnoj stanici drugog primarnog terestrijalnog servisa

Konstrukcija koordinacione konture i proračun intenziteta interferirajućeg električnog polja bazirani su na propagacionom modelu opisanom u Poglavlju 2 Aneksa 2 Sporazuma.

Za proračune u slučajevima kada su i predajna i prijemna stanica na tlu, treba koristiti propagacione krive za 1% vremena i za 50% lokacija.

Za slučajeve kada je jedna antena na tlu a druga u vazduhu, treba koristiti model prostiranja u slobodnom prostoru. Koordinaciona kontura je ograničena na rastojanje od 420 km po liniji optičke vidljivosti.

U slučaju aeronautičkih servisa za stanice na avionima, visina predajne antene iznad tla iznosi 10 000 m.

Za zaštitu Plana, koordinacione vršne vrednosti intenziteta električnog polja date su u Tabeli A.1.10 Dodatka 1 ovog Dela.

5.2.2 Koordinacija dodele prijemnoj stanici drugog primarnog terestrijalnog servisa

Za koordinaciju dodela prijemnoj stanici, neophodno je usvojiti sledeće parametre rada radiodifuzne stanice:

– ukupna maksimalno izračena snaga 53 dBW;

– maksimalna efektivna visina antene od 600 m i kosa polarizacija.

Ako iskorišćenje ovih pretpostavljenih vrednosti paramatara ne obezbedi identifikaciju administracije koja radi ili planira da radi, stanica koja premašuje ove vrednosti, tada administracija odgovorna za prijem stanice slaže se da neće biti prigovora za zaštitu od administracija odgovornih za radiodifuzne stanice, sem ako drugačije nije dogovoreno u procesu koordinacije.

Maksimalno koordinaciono rastojanje za prijemnike na letelicama iznosi 500 km.

Za konstrukciju koordinacionih kontura iz § 5 ovog Dela, referentna tačka za konstrukciju ekvidistantnih radijalnih linija je lokacija prijemne stanice ili centar gravitacije oblasti u kojoj se nalazi prijemna stanica. Koordinaciona kontura se računa za svaku radijalnu liniju postavljanjem prethodno pomenute radiodifuzne stanice na rastojanje od 1 000 km od referentne tačke i određivanjem intenziteta električnog polja u referentnoj tački. Ako je vrednost intenziteta električnog polja ispod praga prijema prijemne stanice, potencijalna radiodifuzna stanica se pomera duž radijalnog pravca ka referentnoj tački u koracima od 10 km sve dok se ne dostigne vrednost praga prijema. Rastojanje na kome se dostigne vrednost praga prijema određuje se za svaki radijalni pravac i ova rastojanja se ujedine kako bi formirala koordinacionu konturu.

DODATAK 1
DELA 1

A Granične vrednosti intenziteta električnog polja za koje se zahteva koordinacija zbog zaštite radiodifuznih i ostalih primarnih servisa kod modifikacije Plana

A.1 Granične vrednosti intenziteta električnog polja za indentifikaciju administracije radi zaštite radiodifuznog servisa kod modifikacije Plana

Ovaj Sporazum se odnosi na različite radiodifuzne sisteme. Zbog toga, različite granične vrednosti intenziteta električnog polja treba da se uzmu u obzir.
Osnove za određivanje tih vrednosti date su u Dodatku 2 Sekcije 1.
Tabela A.1.1 prikazuje predložene granične intenziteta polja za koje se zahteva koordinacija i koje se upotrebljavaju za indentifikaciju dotaknutih administracija zbog zaštite radiodifuzije kod modifikacije Plana.

TABELA A.1.1

Granične vrednosti intenziteta električnog polja za koje se zahteva koordinacija zbog zaštite sistema u radiodifuznom servisu kod modifikacije Plana

Radiodifuzni sistem koji modifikuje Plan	Granična intenzitet električnog polja (dB(μV/m))			
	Opseg III (174-230 MHz)	Opseg IV (470-582 MHz)	Opseg V (582-718 MHz)	Opseg V (718-862 MHz)
DVB-T	17	21	23	25
T-DAB	12	–	–	–
Analogna TV	10	18	20	22

A.2 Granične vrednosti intenziteta električnog polja za koje se zahteva koordinacija zbog zaštite mobilnog servisa u opsezima 174-230 MHz i 470-862 MHz

Nivoi graničnih intenziteta električnog polja zbog zaštite sistema u mobilnom servisu od T-DAB i DVB-T sistema dati su u tabelama A.1.2 i A.1.3, sa odgovarajućim kodovima za tipove sistema.

TABELA A.1.2

Granične vrednosti intenziteta električnog polja za koje se zahteva koordinacija zbog zaštite sistema u mobilnom servisu od T-DAB u opsegu 174-230 MHz

Sistem koji se štiti	Kod za tip sistema (vidi Aneks 2, Poglavlje 4)	Granični intenzitet električnog polja (dB(μV/m))[1]	Visina prijemne antene (m)
Mobilni sistem MU (male snage)	MU	16	10
Mobilni sistem M1 (uskopojasni FM, 12.5 kHz) (privatni mobilni radio) Mobilni sistemi RA1 i RA2 (uskopojasni FM, 12.5 kHz)	M1 i RA	19 (bazna stanica) 27 (mobilna stanica)	20 (bazna stanica) 1.5 (mobilna stanica)
Mobilni sistem M2 (uskopojasni)	M2	48	10
Kopneni mobilni sistem XA (privatni mobilni radio)	XA	27	10
Kopneni mobilni sistem XM (radio mikrofoni VHF)	XM	30	10
Kopneni mobilni sistem MA	MA	21	10
Mobilni i fiksni sistemi (prenosni)	MT	5	10

[1] Vrednosti graničnog intenziteta električnog polja odnose se na opseg od 1.5 MHz T-DAB.

TABELA A.1.3

Granične vrednosti intenziteta električnog polja za koje se zahteva koordinacija zbog zaštite sistema u mobilnom servisu od DVB-T

Sistem koji se štiti	Kod za tip sistema (vidi Aneks 2, Poglavlje 4)	Frekvencijski opseg	Granični intenzitet električnog polja (dB(μV/m))[1]	Visina prijemne antene (m)
Analogni privatni mobilni radio, 12.5 kHz	NV	Opseg III	30 (bazne stanice) 38 (mobilne stanice)	20 (bazna stanica) 1.5 (mobilna stanica)
Kopneni mobilni sistem NR (radio mikrofon)	NR	790-862 MHz/Opseg III	58 (UHF)/50 (VHF)	1.5
Mobilni sistem NS (OB link, stereo, non-companded)	NS	790-862 MHz/Opseg III	45 (UHF)/37 (VHF)	10
Mobilni sistem NT (Talk-back)	NT	790-862 MHz/Opseg III	47 (UHF)/39 (VHF)	1.5

TABELA A.1.3 (*kraj*)

Sistem koji se štiti	Kod za tip sistema (vidi Aneks 2, Poglavlje 4)	Frekvencijski opseg	Granični intenzitet električnog polja (dB(μV/m))[1]	Visina prijemne antene (m)
Digitalni kopneni mobilni sistem NA (na pr. CDMA)	NA	470-862 u Regionu 3, 790-862 MHz u saglasnosti sa RR No. 5.316	18 (bazna stanica)	20 (bazna stanica)
Generički mobilni sistem NB	NB	174-230 MHz/ 470-862 MHz	Vidi jednakost(A.1.1) i Tabelu A.1.4 (bazna stanica) Vidi jednakost (A.1.1) i Tabelu A.1.5 (mobilna stanica)	20.0 (bazna stanica) 1.5 (mobilna stanica)
Kopneni mobilni sistem XN (VHF)	XN	Opseg III	38	1.5
Kopneni mobilni sistem YN (480 MHz)	YN	480 MHz	41	1.5
Kopneni mobilni sistem ZC (620 MHz)	ZC	620 MHz	43	1.5

(1) Granične vrednosti intenziteta električnog polja su u odnosu na opseg od DVB-T.

Za generički slučaj (kod za tip NB) u mobilnom servisu, tj. kad nijedna vrednost zaštitnog odnosa nije na raspolaganju, treba da se upotrebi sledeća jednačina:

$$F_{trigger} = -37 + F - G_i + L_F + 10\ \log(B_i) + P_o + 20\ \log f + I/N \qquad \text{(A.1.1)}$$

gde je:

- F: prijemni faktor šuma (u dB) prijemnika mobilnog servisa bazne ili mobilne stanice (dB)
- B_i: širina opsega zemaljske radiodifuzne stanice (MHz)
- G_i: pojačanje antene prijemnika stanice u mobilnom servisu (dBi)
- L_F: gubici napojnog voda antenskog kabla (dB)
- f: centralna frekvencija interferirajuće stanice (MHz)
- P_o: veštački (man-made) šum (dB) (tipična vrednost je 1 dB za VHF opseg i 0 dB za UHF opseg)
- I/N: odnos interferencije i šuma, koji ne sme da pređe prag (granicu) što se primenjuje kad se razvija Plan (I/N = –6 dB).

Za opšti slučaj kopnenog mobilnog servisa, sledeće tipične vrednosti F, G_i, L_F i P_o za upotrebu (vidi Preporuku ITU-R M.1767 kao izvor informacija) date su u Tabelama A.1.4 i A.1.5 za bazne i mobilne stanice:

TABELA A.1.4

Tipične vrednosti parametara kad se primeni jednakost (A.1.1) za izvođenje graničnih vrednosti intenziteta električnog polja za koje se zahteva koordinacija zbog zaštite baznih stanica za opšti slučaj (kod za tip NB) mobilnog servisa od DVB-T

Frekvencija (MHz)	174	230	470	790	862
F (dB)	8	8	4	3	3
G_i (dBi)	6	8	12	17	17
L_F (dB)	2	2	2	4	4
P_o (dB)	1	1	0	0	0
$F - G_i + L_F + P_o$	5	3	–6	–10	–10

TABELA A.1.5

Tipične vrednosti parametara kad se primeni jednakost (A.1.1) za izvođenje graničnih vrednosti intenziteta električnog polja za koje se zahteva koordinacija zbog zaštite mobilnih stanica za opšti slučaj (kod za tip NB) mobilnog servisa od DVB-T

Frekvencija (MHz)	174	230	470	790	862
F (dB)	11	11	7	7	7
G_i (dBi)	0	0	0	0	0
L_F (dB)	0	0	0	0	0
P_o (dB)	1	1	0	0	0
$F - G_i + L_F + P_o$	12	12	7	7	7

A.3 Intenziteta električnog polja za koji se zahteva koordincija za vazduhoplovni radio-navigacijski servis u opsezima 223-330 MHz, 590-598 MHz i 645-862 MHz i za radio-navigacijski servis u opsegu 585-610 MHz

Nema dodela za stanice vazduhoplovnog radio-navigacijskog servisa koje rade u opsegu 223-230 MHz u Regionu 3 i u nekim zemljama u regionu 1, u saglasnosti sa RR No. 5.247, o kojima je obavešten ITU. Zbog toga nema graničnih vrednosti u toj situaciji.

Nivoi granične vrednosti intenziteta električnog polja za zaštitu vazduhoplovnog radionavigacijskog servisa od DVB-T dati su u Tabeli A.1.6.

Za graničnu vrednost intenziteta električnog polja za koje se zahteva koordinacija zbog zaštite vazduhoplovnog radio-navigacijskog servisa u opsegu 223-230 MHz, od T-DAB and DVB-T, najnovije ITU-R preporuke, ili vrednosti obostrano prihvaćene od zainteresovanih administracija, treba da budu upotrebljene.

TABELA A.1.6

Granične vrednosti intenziteta električnog polja za koje se zahteva koordinacija zbog zaštite radio-navigacijskog i vazduhoplovnog radio-navigacijskog servisa od DVB-T(2)

Sistem koji treba da se štiti	Kod za tip sistema (videti Aneks 2, Poglavlja4)	RR namena	Primena	Frekvencija (MHz)	Granični intenzitet električnog polja (dB(μV/m))(1)	Visina prijemne antene (m)
Vazduhoplovni radio-navigacijski sistem XG (na kanalu 36,4 MHz aerodromski radari, UK)	XG	Zemlje u No. 5.302	Aerodromski radar	590-598	–12	7
Vazduhoplovni radio-navigacijski sistem AB (RLS 1)	AB	Region 3	Tip 1 Zemlja-zemlja	Odgovarajući kanali u opsegu 585-610 MHz	13	10
Vazduhoplovni radio-navigacijski sistem AA8 (RSBN)	AA8	Zemlje u No. 5.312	Vazduh-zemlja komponenta	Odgovarajući kanali u opsegu 645-862 MHz	36	10
Vazduhoplovni radio-navigacijski sistem AA8 (RSBN)	AA8	Zemlje u No. 5.312	Zemlja-vazduh komponenta	Odgovarajući kanali u opsegu 645-862 MHz	42	10 000
Vazduhoplovni radio-navigacijski sistem AB (RLS)	AB	Zemlje u No. 5.312	Zemlja-zemlja	Odgovarajući kanali u opsegu 645-862 MHz	13	10
Vazduhoplovni radio-navigacijski sistem BD (RLS 2, Tip 1, terestrijalni prenos, 4 MHz)	BD	Zemlje u No. 5.312	Zemlja-vazduh komponenta	Odgovarajući kanali u opsegu 645-862 MHz	49	10 000
Vazduhoplovni radio-navigacijski sistem BA (RLS 2, Tip 1, vazdušni prenos, 4 MHz)	BA	Zemlje u No. 5.312	Tip 1 Vazduh-zemlja komponenta	Odgovarajući kanali u opsegu 645-862 MHz	29	10

TABELA A.1.6 (*kraj*)

Sistem koji treba da se štiti	Kod za tip sistema (vidi Aneks 2, Poglavlja4)	RR namena	Primena	Frekvencija (MHz)	Granični intenzitet električnog polja (dB(μV/m))(1)	Visina prijemne antene (m)
Vazduhoplovni radio-navigacijski sistem BC (RLS 2, Tip 2, zemaljski prenos, 3 MHz)	BC	Zemlje u No. 5.312	Tip 2 Zemlja-vazduh komponenta	Odgovarajući kanali u opsegu 645-862 MHz	71	10 000
Vazduhoplovni radio-navigacijski sistem BB (RLS 2, Tip 2, vazdušni prenos, 8 MHz)	AA2	Zemlje u No. 5.312	Tip 2 Vazduh-zemlja komponenta	Odgovarajući kanali u opsegu 645-862 MHz	21	10

(1) Granične vrednosti intenziteta električnog polja su u odnosu na opseg od DVB-T

(2) Vidi također tekst u § A.3.

A.4 Granične vrednosti intenziteta električnog polja koje zahtevaju koordinaciju za fiksni servis u opsezima 174-230 MHz i 470-862 MHz

Granične vrednosti intenziteta električnog polja za zaštitu sistema fiksnog servisa od T-DAB i DVB-T date su u Tabeli A.1.7, sa odgovarajućim kodovima za tip servisa.

TABELA A.1.7

Granične vrednosti vrednosti intenziteta električnog polja za koje se zahteva koordinacija zbog zaštite sistema fiksnog servisa od T-DAB i DVB-T

Servis, sistem koji treba da se štiti	Kod za tip sistema (vidi Aneks 2, Poglavlje 4)	Frekvencijski opseg (MHz)	Granični intenzitet električnog polja (dB(μV/m))	Visina prijemne antene (m)
Fiksni sistem FF (prenosivi, 1.2 MHz)	FF	790-862	24(1)	37.5
Fiksni sistem FH	FH	790-862	13(1)	37.5
Generički fiksni sistem FK	FK	174-230 i 470-862	Vidi jednakost (A.1.2) i Tabelu A.1.8	37.5

(1) Granične vrednosti intenziteta električnog polja su u odnosu na opseg od DVB-T.

Za generički slučaj (kod tipa FK), tj. kad nijedna vrednost zaštitnog odnosa nije na raspolaganju, trebala bi da se upotrebi sledeća jednačina:

$$F_{trigger} = -37 + F - G_i + L_F + 10\log(B_i) + P_o + 20\log f + I/N \qquad \text{(A.1.2)}$$

gde je:

F: prijemni faktor šuma (u dB) prijemnika FS stanice (dB)

B_i: širina opsega zemaljske radiodifuzne stanice (MHz)

G_i: pojačanje antene prijemnika FS stanice (dBi)

L_F: gubici napojnog voda antenskog kabla (dB)

f: centralna frekvencija interferirajuće radiodifuzne stanice (MHz)

P_o: industrijski šum (dB) (tipična vrednost je 1 dB za VHF opseg i 0 dB za UHF opseg)

I/N: odnos interferencije i šuma, koji ne sme da pređe prag koji se primenjuje kad se razvija Plan (I/N = –6 dB).

Bazirano na informaciji u Preporukama ITU-R F.758-4, ITU-R F.1670-1 i ITU-R SM.851-1, sledeće tipične vrednosti F, G_i, L_F i P za upotrebu date su u Tabeli A.1.8:

TABELA A.1.8

Tipične vrednosti parametara kad se primeni jednakost (A.1.2) za izvođenje graničnih vrednosti intenziteta električnog polja za zaštitu stanica za opšti slučaj (kod za tip FK) fiksnog servisa od DVB-T

Frekvencija(MHz)	174-230	500	800
F (dB)	5	5	5
G_i (dBi)	9	14	16
L_F (dB)	4	5	5
P_o (dB)	1	0	0
$F – G_i + L_F + P_o$	1	–4	–6

Za ostale frekvencije UHF opsega, interpolaciju bi trebalo izvršiti primenjujući korekciju od 10 log (f/500).

B Vrednosti koordinacionog praga intenziteta električnog polja za koje se zahteva koordinacija za zaštitu Plana od stanica ostalih primarnih terestrijalnih servisa

B.1 Tipični radiodifuzni sistemi

Vidi Dodatak 2 Dela 1 za varijante radiodifuznih sistema.

B.2 Izvođenje graničnih nivoa

Urađeno je nekoliko detaljnih istraživanja o zaštiti DVB-T sistema od interferencije sa sistemima iz fiksnih i mobilnih servisa. Njihov radni opseg frekvencija leži ili unutar opsega signala digitalne televizije, ili se delimično preklapaju. Zbog toga, opštiji slučaj interferencije od ostalih servisa na digitalnu terestrijalnu radiodifuziju može se tretirati koristeći granične kriterijume za digitalnu radiodifuziju u interferenciji sa digitalnom radiodifuzijom.

Nisu još rađene detaljne studije o analognoj televiziji u interferenciji sa svim sistemima sa kojima se pojavljuje preklapanje, na pr. ARNS, mobilni servis, fiksni servis. Zbog toga, preporučuje se u tu svrhu korišćenje istih graničnih kriterijuma za analognu televiziju u interferenciji sa zemaljskom radiodifuzijom.

B.3 Vrednosti koordinacionog praga intenziteta električnog polja radi zaštite Plana od stanica ostalih primarnih terestrijalnih servisa

Tabela A.1.9 daje vrednosti koordinacionog praga intenziteta električnog polja za tipične radiodifuzne sisteme kao što je opisano u Dodatku 2 Dela 1 za frekvencije 200 MHz i 650 MHz.

TABELA A.1.9

Vrednosti koordinacionog praga intenziteta električnog polja za tipične radiodifuzne sisteme

Radiodifuzni sistem koji treba da se štiti	Vrednosti koordinacionog praga intenziteta električnog polja (dB(μV/m))(1)			
	Opseg III (174-230 MHz)	Opseg IV (470-582 MHz)	Opseg V (582-718 MHz)	Opseg V (718-862 MHz)
DVB-T	17	21	23	25
T-DAB	27	–	–	–
Analogna TV	10	18	20	22

(1) Vrednosti koordinacionog praga intenziteta električnog polja su u odnosu na opseg od sistema koji treba da se štiti.

Predlaže se da se uzme najkritičniji slučaj za željene sisteme, jer se ne zna unapred koji sistem može biti korišćen od dotaknute administracije. Naravno, očekuje se od analogne televizije da bude ugašena nakon tranzicionog perioda. Zbog toga verovatno treba držati dva seta vrednosti. Tabela A.1.10 daje finalni rezultat predloženih vrednosti koordinacionog praga intenziteta električnog polja.

TABELA A.1.10

Vrednosti koordinacionog praga intenziteta električnog radi zaštite Plana od drugih primarnih terestrijalnih servisa

Radiodifuzni sistem koji treba da se štiti	Vrednosti koordinacionog praga intenziteta električnog polja (dB(μV/m))(1)			
	Opseg III (174 -230 MHz)	Opseg IV (470-582 MHz)	Opseg V (582-718 MHz)	Opseg V (718-862 MHz)
Analogni i digitalni(2)	10	18	20	22
Digitalni	17	21	23	25

(1) Vrednosti koordinacionog praga intenziteta električnog polja su u odnosu na opseg od 7 ili 8 MHz sistema koji se štiti.

(2) Da bude na raspolaganju za vreme tranzicionog perioda.

Dodatak 2
Dela 1

Osnova za određivanje koordinacionog praga intenziteta električnog polja radi zaštite radiodifuznog servisa

Svrha ovog Dodatka jeste da postavi temeljne principe izvođenja vrednosti koordinacionog praga intenziteta električnog polja radi zaštite radiodifuznog servisa.

1 Tipični radiodifuzni sistemi

Ovaj Dodatak se bavi različitim radiodifuznim sistemima. Zbog toga, različite vrednosti koordinacionog praga intenziteta električnog polja treba uzeti u obzir. Naravno, za određivanje ugrožene administracije, vrednosti koordinacionog praga intenziteta električnog polja su izvedene za sledeće tipične sistemske varijante od T-DAB, DVB-T i analogne TV, uključujući dotične prijemne modove i verovatnoće ciljnih lokacija:

– DVB-T: 64-QAM 3/4, fiksni prijem na krovu, 95% verovatnoća lokacije

– T-DAB: mobilni prijem, 99% verovatnoća lokacije (Mode I, PL 3, vidi Preporuku ITU-R BS.1114-5)

– Analogna TV: SECAM L, fiksni prijem na krovu, 50% verovatnoća lokacije.

Ove varijante se smatraju najosetljivijim varijantama u praksi.

2 Određivanje vrednosti koordinacionog praga intenziteta električnog polja radi zaštite radiodifuznog servisa

Granični intenzitet električnog polja $F_{trigger}$ računa se na sledeći način:

$$F_{trigger} = F_{med} + f_{corr} - PR - CF \qquad (A.2.1)$$

gde je :

F_{med}: najmanji prosečni intenzitet (medijana) električnog polja od odgovarajućeg (dotaknutog) radiodifuznog sistema

f_{corr}: korekcija frekvencije, kako je opisano niže

PR: odgovarajući odnos zaštite dat u Poglavlju 3 Aneksa 2 ovog Sporazuma

CF: odgovarajući kombinovani korekcijski faktor lokacije kako je opisano u Poglavlju 3 Aneksa 2 ovog Sporazuma.

Ako se odnosi zaštite razlikuju između troposferske i kontinualne interferencije, troposferski slučaj treba da se uzme. Za računanje najlošijeg slučaja prijema, diskriminacija antene za fiksni prijem na krovu se ne uzima u obzir. U Poglavlju 3 Aneksa 2 ovog Sporazuma, najmanji prosečni intenzitet (medijana) električnog polja za referentnu plansku konfiguraciju je izračunata za 200 MHz (Opseg III) i 650 MHz (Opseg IV/V). Za ostale frekvencije sledeće interpolacijsko pravilo je upotrebljeno:

– za fiksni prijem, $f_{corr} = 20 \log_{10} (f/f_r)$, gde je f stvarna frekvencija a f_r referentna frekvencija odgovarajućeg opsega spomenutog gore;

– za portabilni prijem i mobilni prijem, $f_{corr} = 30 \log_{10} (f/f_r)$ gde je f stvarna frekvencija a f_r referentna frekvencija odgovarajućeg opsega spomenutog gore.

3 Vrednosti koordinacionog praga intenziteta električnog polja radi zaštite radiodifuznog servisa

Tabele A.2.1 i A.2.2 daju vrednosti koordinacionog praga intenziteta električnog polja za tipične radiodifuzne susteme kako je gore opisano za frekvencije 200 MHz i 650 MHz. Najkritičnije vrednosti koordinacionog praga intenziteta električnog polja označene su pojačanim slovima u Tabelama A.2.1 i A.2.2.

TABELA A.2.1

Vrednosti koordinacionog praga intenziteta električnog polja[(1)] za tipične radiodifuzne sisteme na 200 MHz

	Radiodifuzni sistem koji treba da se štiti		
	DVB-T	**T-DAB**	**Analogna TV**
Najmanji prosečni intenzitet (medijana) električnog polja	F_{med} = 51 dB(μV/m)	F_{med} = 60 dB(μV/m)	F_{med} = 55 dB(μV/m)
Interferirajući sistem			
DVB-T	*PR* = 21 dB **$F_{trigger}$ = 17 dB(μV/m)**	*PR* = 9 dB $F_{trigger}$ = 33 dB(μV/m)	*PR* = 35 dB $F_{trigger}$ = 20 dB(μV/m)
T-DAB	*PR* = 26 dB **$F_{trigger}$ = 12 dB(μV/m)**	*PR* = 15 dB $F_{trigger}$ = 27 dB(μV/m)	*PR* = 42 dB $F_{trigger}$ = 13 dB(μV/m)
Analogna TV	*PR* = 9 dB $F_{trigger}$ = 29 dB(μV/m)	*PR* = 2 dB $F_{trigger}$ = 40 dB(μV/m)	*PR* = 45 dB **$F_{trigger}$ = 10 dB(μV/m)**

(1) Vrednosti koordinacionog praga intenziteta električnog polja su u odnosu na opseg od sistema kojeg treba da se štiti.

TABELA A.2.2

Vrednosti koordinacionog praga intenziteta električnog polja[(1)] za tipične radiodifuzne sisteme na 650 MHz

	Radiodifuzni sistem koji treba da se štiti	
	DVB-T	**Analogna TV**
Najmanji prosečni intenzitet (medijana) električnog polja	F_{med} = 57 dB(μV/m)	F_{med} = 65 dB(μV/m)
Interferirajući sistem		
DVB-T	*PR* = 21 dB **$F_{trigger}$ = 23 dB(μV/m)**	*PR* = 35 dB $F_{trigger}$ = 30 dB(μV/m)
Analogna TV	*PR* = 9 dB $F_{trigger}$ = 35 dB(μV/m)	*PR* = 45 dB **$F_{trigger}$ = 20 dB(μV/m)**

(1) Vrednosti koordinacionog praga intenziteta električnog polja su u odnosu na opseg od 8 MHz sistema koji treba da se štiti.

Predlaže se da se napravi razlika između analognog i digitalnog radiodifuznog sistema za koji će da se vrši koordinacija ali da se uzme najkritičniji slučaj željenog sistema, jer se ne zna unapred koji sistem može da upotrebi dotaknuta administracija.

Dodatak 3
Dela 1

Pozicija i orijentacija referentne mreže za zonu raspodele

Za proračun izlazne interferencije referentne mreže, svaka granična tačka testiranja zone raspodele smatra se izvorom izlazne interferencije. Za pomenuti proračun neophodno je znati kako je referentna mreža pozicionirana i orijentisana u odnosu na graničnu tačku testiranja.

Sve referentne mreže mogu se okarakterisati kao šestougao. Jedna ivica (“početna ivica”) šestougla je postavljena vertikalno na liniju između granične tačke testiranja i tačke proračuna. Centar početne ivice se postavi na graničnu tačku testiranja.

U tom položaju ostale ugaone tačke i centar šestougla su udaljenije od tačke proračuna nego ugaone tačke početne strane. To određuje položaj referentne mreže i njenih predajnika. Zatim se izračunava intenzitet električnog polja.

Takva referentna mreža se zatim pomera duž granica zone raspodele do sledeće tačke testiranja, gde se intenzitet električnog polja ponovo određuje za istu tačku proračuna. Ta procedura se ponavlja sve dok se referentna mreža ne vrati u početni položaj.

Intenzitet električnog polja u tački proračuna dobija se posebno za svaki predajnik referentne mreže koristeći karakteristike odgovarajuće referentne konfiguracije za planiranje. Za tu svrhu, efektivno izračena snaga za DVB-T referentnu mrežu trebala bi da uključi granicu snage od 3 dB.

Rezultirajući intenzitet električnog polja interferencije dobija se primenom metode sumiranja snaga. Mešovita kopno-more putanja prostiranja računa se na bazi Poglavlja 2 Aneksa 2.

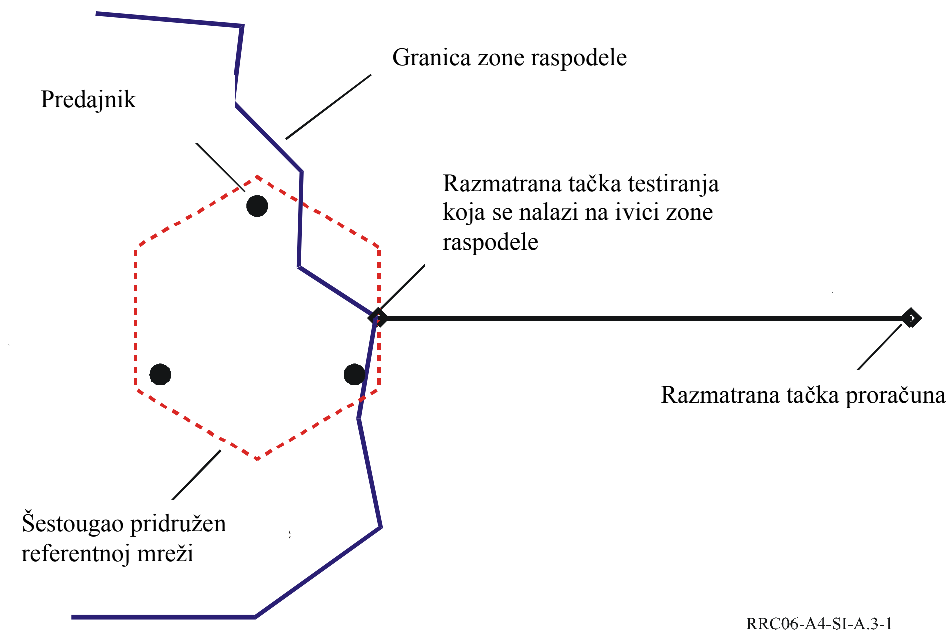
U slučaju šestougla sa tri predajnika, predajnik najbliži graničnoj tački testiranja leži na desnoj strani, gledajući od granične tačke testiranja ka tački proračuna.

Skica te situacije data je za dve moguće referentne mrežne konfiguracije (od 3 predajnika i 7 predajnika) na slikama A.3-1 i A.3-2.

Zbog pomeranja zamišljenog šestougla duž državne granice, moguće je da bi se jedan ili više predajnika referentne mreže mogao naći izvan teritorije administracije za čiju se zonu raspodele proračun radi.

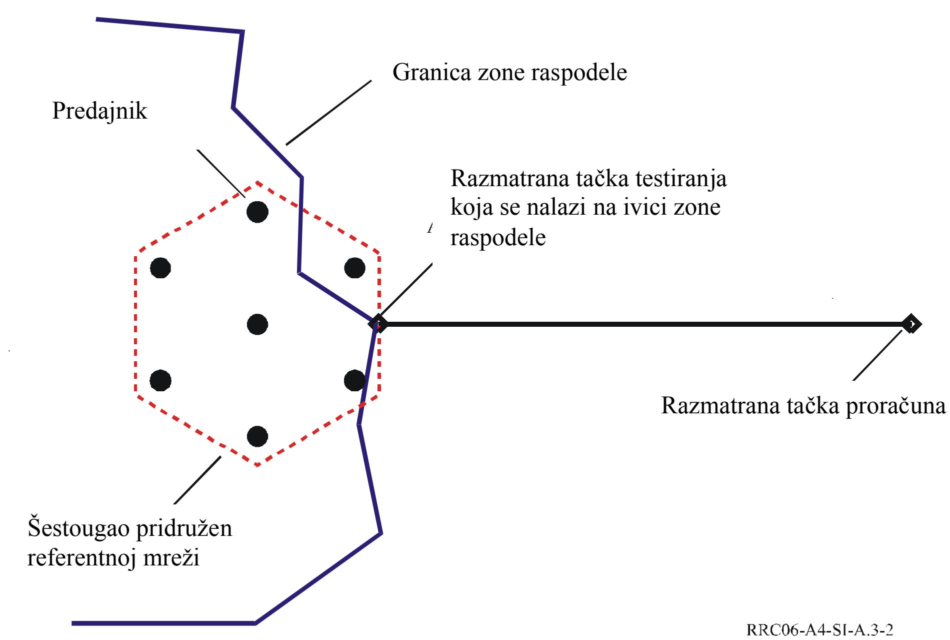
SLIKA A.3-1

Šestougaona referentna mreža sa 3 predajnika



SLIKA A.3-2

Šestougaona referentna mreža sa 7 predajnika



Deo 2
Aneksa 4

Ispitivanje saglasnosti sa stavkom digitalnog Plana

1 Uvod

Ovaj deo opisuje metodu koju koristi Biro u primeni čl. 4. i 5. ovog Sporazuma.
Ova metoda trebalo bi da bude primenjena u sledećim slučajevima:

– kada je jedna ili više dodela izvedena iz konverzije stavke digitalnog Plana, a obuhvataju istu zonu raspodele, ili su izvedene iz konverzije stavke digitalnog Plana sa vezanim dodelama, kao u § 4.1.2.7 člana 4 ovog Sporazuma;

– kada je stavka digitalnog Plana modifikovana bez da je povećan nivo interferencije te stavke digitalnog Plana kao u § 4.1.2.4 *b)* članu 4 ovog Sporazuma; i

– kada je jedna ili više dodela objavljena pod članom 5 za zapisivanje u MIFR.

Glavni izrazi upotrebljeni u Aneksu objašnjeni su u Dodatku 4 ovog Dela.

2 Osnovni principi

U nastavku, izraz “*implementacija stavke digitalnog Plana*” se upotrebljava:

– u primeni člana 4, da bi se označile sve dodele vezane za stavku digitalnog Plana koje su već uključene u Plan ili predložene da budu uključene u Plan;

– u primeni člana 5, da bi se označile sve dodele vezane za stavku digitalnog Plana koje su već zapisane u MIFR, ili predložene da se zapišu u MIFR.

Metoda za ispitivanje saglasnosti obuhvata sledeće :

a) verifikaciju da je kanal ili blok *implementacije stavke digitalnog Plana* isti kao onaj od pridružene stavke digitalnog Plana i da je geografska lokacija *implementacije stavke digitalnog Plana* u okviru postavljenih limita; i

b) poređivanje anvelope interferencije koja proizlazi iz stavke digitalnog Plana sa združenom interferencijom *implementacije stavke digitalnog Plana*. Područje u kojem se poređenje izvodi ograničeno je konturom praga intenziteta električnog polja na kojoj je izvršeno završno poređivanje svih interferirajućih intenziteta električnog polja.

Implementacija stavke digitalnog Plana je u saglasnosti sa Planom kada je verifikacija od Biroa pod *a)* potvrđena i kada pod *b)* interfencija *implementacije stavke digitalnog Plana* ne prelazi anvelopu interferencije dobijenu iz karakteristika stavke digitalnog Plana u bilo kojoj relevantnoj tački proračuna.

3 Osobine metode primenjive na sve stavke digitalnog Plana

Kontura praga intenziteta električnog polja obezbeđuje mehanizam koji prilikom ispitivanja saglasnosti srazmerno određuje broj tačaka za proračun prema vrednosti efektivne izračene snage i graničnog intenziteta električnog polja. Granični kriterij je relevantna vrednost koordinacionog praga intenziteta električnog polja iz Dela 1 Aneksa 4 ovog Sporazuma.

Ako se predložene dodele nalaze u frekvencijskom opsegu gde nema dodele nekog drugog primarnog terestrijalnog servisa u krugu od 1000 km, što je zabeleženo u Listi ili za koje je procedura iz člana 4. ovog Sporazuma već pokrenuta, i kontura praga intenziteta električnog polja, bazirana na vrednosti koordinacionog praga intenziteta električnog polja za potrebe radiodifuzije, ne prelazi državnu granicu administracije, tada je ispitivanje saglasnosti poželjno.

Ako se predložene dodele nalaze u frekvencijskom opsegu gde ima dodela za neki drugi primarni terestrijalni servis u krugu od 1000 km, što je zabeleženo u Listi ili za koje je procedura iz člana 4. ovog Sporazuma već pokrenuta, i kontura praga intenziteta električnog polja, bazirana na vrednosti koordinacionog praga intenziteta radiodifuznog električnog polja, ne prelazi državnu granicu administracije, kontura praga intenziteta električnog polja se ponovno crta koristeći odgovarajuću vrednost koordinacionog praga intenziteta električnog polja za dodele ostalih primarnih terestrijalnih servisa koji treba da se štite preko niza azimuta koji odgovaraju smeru potencijalno dotaknutog servisnog područja, ograničenog na državnu teritoriju administracije čiji ostali primarni terestrijalni servisi mogu da budu dotaknuti. Ako kontura praga intenziteta električnog polja, koja proizlazi iz tog procesa još uvek ne prelazi državnu granicu administracije, ispitivanje saglasnosti je poželjno.

Ako kontura praga intenziteta električnog polja prelazi limite teritorije obaveštavajuće administracije na bilo kom mestu, serija geometrijskih kontura se kreira. Te konture se kreiraju u svrhu verifikacije da, u svakoj njihovoj tački, združena interferencijski intenzitet električnog polja iz predložene konverzije digitalne stavke u Planu, i iz dodela u MIFR (uklljučujući vezane dodele) koje se odnose na digitalnu stavku u Planu, gde je primenjivo, ne prelazi anvelopu interferencije iz digitalne stavke u Planu.

Na tim konturama, tačke proračuna su locirane u koracima od 1° uzduž geometrijskih kontura, okružujući područje zone raspodele a ili dodele (dodela). Nisu sve tačke uzete u obzir: upotrebljavaju se samo one tačke proračuna koje leže izvan teritorije administracije i unutar kontura praga intenziteta električnog polja oko zone raspodele a ili dodele (dodela).

Implementacija stavke digitalnog Plana je u saglasnosti kad u svakoj tački proračuna interferencija od *implementacije stavke digitalnog Plana* ne prelazi anvelopu interferencije dobijenu iz karakteristika stavke digitalnog Plana.

3.1 Izračunavanje intenziteta električnog polja

Izračunavanje intenziteta električnog polja zasniva se na modelu prostiranja iz Poglavlja 2 Aneksa 2 ovog Sporazuma (krive propagacije za troposferski slučaj, tj. trebalo bi da se uzme 1% vremena i 50% lokacija). Izračunavanje interferencije od bilo kog predajnika je ograničeno na 1 000 km. Izračunate vrednosti su zaokružene na jedno decimalno mesto.

U slučaju da intenzitet električnog polja koje potiču od više izvora signala treba da budu združene, koristi se metod sumiranja snaga. Pojedinačni intenziteti električnog polja dobijeni su u tačkama proračuna od svih predajnih stanica neke zone raspodele, a procesiraju se opadajućim redom. Suma snaga dobija se na sledeći način:

– počevši od najviše, vrednosti snaga koje su ekvivalentne interferencijskim intenzitetma električnog polja dodaju se jedna za drugom;

– kod svakog sumiranja, rezultat se upoređuje sa prethodnim;

– ako je porast snage veći ili jednak 0.5 dB, proces sumiranja se nastavlja;

– ako bi porast snage bio manji od 0.5 dB, proces sumiranja se zaustavlja i 0.5 dB se dodaje, dajući rezultat sume snaga.

3.2 Konstrukcija geometrijskih kontura i tačaka proračuna

Geometrijske konture nalaze se na razdaljinama 60, 100, 200, 300, 500, 750 i 1 000 km od lokacije stanice (ili više njih) ili granica stavke digitalnog Plana.

Konstrukcija geometrijskih kontura zavisi od tipa stavke digitalnog Plana.

Za svaki tip stavke digitalnog Plana definisana je jedna referentna tačka. Iz te referentne tačke polazi 360 pravih, svaki pod uglom za 1° većim od prethodne, počevši tačno od severa. Mesto gde prava seče konturu praga intenziteta električnog polja i bilo koju geometrijsku konturu koja leži izvan državne granice administracije, jesu mesta tačaka proračuna.

4 Primena metode za svaki tip stavki digitalnog Plana

Ovaj Plan zasniva se na dva osnovna objekta za planiranje, a to su dodele i raspodele. I dodele i raspodele se generalno karakterišu skupom tehničkih karakteristika datih u Aneksu 1 ovog Sporazuma. Ta dva objekta mogu biti kombinovana u pet različitih tipova stavke Plana koji mogu da se upišu u Plan. Osobine svakog od pet različitih tipova digitalnog Plana imaju uticaj na metod za ispitivanje saglasnosti.

4.1 Stavka digitalnog Plana koja obuhvata samo jednu zonu raspodele

Ovu stavku digitalnog Plana karakteriše granica zone raspodele , dodeljena frekvencija, tip referentne mreže (RN) i referentna konfiguracija za planiranje (RPC).

4.1.1 Lokacija dodela izvedenih iz stavke digitalnog Plana

Takve dodele moraju biti locirane unutar područja zone raspodele ili maksimalno do 20km van granice zone raspodele . Te lokacije trebalo bi da se nalaze unutar teritorije administracije, osim ako je administracija koju se to tiče pristala na drugačije rešenje (videti Pravilnik o radio-komunikacijama Br. 18.2).

4.1.2 Geometrijske konture za stavku digitalnog Plana

Referentna tačka zone raspodele Plana je centar tj. težište zone raspodele oblika mnogougla, a konstrukcija geometrijske konture je opisana u Dodatku 1 ovog Dela.

4.1.3 Anvelopa interferencije stavke digitalnog Plana

Karakteristike referentne mreže koja je pridružena zoni raspodele koriste se kao izvor za izračunavanje anvelope interferencije. Referentna mreža smeštena u svakoj graničnoj tački zone raspodele a ponaša se kao izvor interferencije. Pozicioniranje referentne mreže opisano je u Dodatku 2 ovog Dela. Najveći dobijeni intenzitet električnog polja, u razmatranoj tački proračuna, iz svake granične tačke zone raspodele je vrednost intenziteta električnog polja interferencije koja treba da se upotrebi.

4.1.4 Intenzitet električnog polja interferencije iz *implementacije stavke digitalnog Plana*

a) Primena člana 4.

U slučaju konverzije zone raspodele Plana u dodelu, sa namerom da se ta dodela uključi u Plan, združena interferencija se izračunava koristeći metod sumiranja snaga, kako je opisano gore u § 3.1, od doprinosa interferencija iz:

– dodele koja je već uključena u Plan kao rezultat konverzije zone raspodele; i

– novih dodela nastalih iz konverzije zone raspodele i podnešenih pod članom 4. za uključivanje u Plan.

b) Primena člana 5.

U slučaju konverzije zone raspodele Plana u dodelu, gde je namera zapisivanje te dodele u MIFR, združena interferencija se izračunava koristeći metod sumiranja snaga, kako je opisano gore u § 3.1, od doprinosa interferencija iz:

– dodela već zapisanih u MIFR kao rezultat konverzije zone raspodele; i

– novih dodela nastalih iz konverzije zone raspodele i podnešenih pod članom 5. za zapisivanje u MIFR.

4.1.5 Kontura praga intenziteta električnog polja za stavku digitalnog Plana

Referentna tačka za konstrukciju konture praga intenziteta električnog polja je centar tj. težište zone raspodele oblika mnogougla, a metoda za konstrukciju konture je opisana u Dodatku 3 ovog Dela.

4.2 Stavka digitalnog Plana koja obuhvata samo jednu dodelu

Stavka digitalnog Plana sastoji se od samo jedne dodele. Karakteriše je potreban skup tehničkih karakteristika opisanih u Aneksu 1 ovog Sporazuma. Neke tehničke karakteristike mogu da budu opisane u smislu jedne RPC.

U slučaju da su karakteristike *implementacije stavke digitalnog Plana* indentične sa onima iz stavke digitalnog Plana, automatski se smatra da je dodela u saglasnosti sa stavkom digitalnog Plana i zato nije potrebno da se radi ispitivanje saglasnosti.

4.2.1 Lokacija objavljene dodele
Lokacija antene predajnika ne sme da bude udaljena više od 20 km od geografske lokacije navedene u odgovarajućoj stavki digitalnog Plana. Ta lokacija trba da bude u okviru teritorije obaveštavajuće administracije, osim ako je administracija koju se to tiče pristala na drugačije rešenje (videti Pravilnik o radiokomunikacijama Br. 18.2).

4.2.2 Geometrijske konture za stavku digitalnog Plana
Referentna tačka je geografska lokacija predajne antene kako je zabeleženo u Planu, a geometrijske konture sastoje se od koncentričnih krugova, centriranih oko te tačke.

4.2.3 Anvelopa interferencije stavke digitalnog Plana
Karakteristike dodele, izlistane u Planu, koriste se za izračunavanje anvelope interferencije stavke digitalnog Plana.

4.2.4 Intenzitet električnog polja interferencije iz *implementacije stavke digitalnog Plana*
U primeni člana 5, intenzitet električnog polja interferencije iz *implementacije stavke digitalnog plana* je ona koja je proizvedena od objavljene dodele.

4.2.5 Kontura intenziteta električnog polja stavke dogitalnog Plana
Referentna tačka konstrukcije konture praga intenziteta električnog polja je geografska lokacija predajne antene kako je zapisano u Planu, a metod konstrukcije konture je opisan u Dodatku 3 ovog Dela.

4.3 Stavka digitalnog Plana koja obuhvata jednu zonu raspodele sa izvršenim dodelama
Stavka digitalnog Plana sastoji se od jedne zone raspodele i skupa izvršenih dodela. Zonu raspodele karakterišu granica zone raspodele, dodeljena frekvencija, tip RN i/ili jedna RPC ili neka sistemska varijanta zajedno sa načinom prijema. Svaku od vezanih dodela karakterišu potreban skup tehničkih karakteristika opisanih u Aneksu 1 ovog Sporazuma, a veza između zone raspodele i dodela je ostvarena tako što dodele imaju istu zonu raspodele i SFN indikator kao i zona raspodele.

4.3.1 Lokacija dodela koje implementuje stavka digitalnog Plana
Dodele koje su konvertovane iz zone raspodele moraju da se nalaze unutar područja zone raspodele ili ne više od 20 km izvan granice zone raspodele. Lokacija predajne antene za vezanu dodelu ne sme da bude udaljena više od 20 km od geografske lokacije specifikovane u stavki digitalnog Plana za odgovarajuću dodelu.
Te lokacije treba da se nalaze na teritoriji obaveštavajuće administracije, osim ako je administracija koju se to tiče pristala na drugačije rešenje (videti Pravilnik o radio-komunikacijama Br. 18.2).

4.3.2 Geometrijske konture stavke digitalnog Plana
Referentna tačka je centar tj. težište zone raspodele oblika mnogougla, a konstrukcija geometrijske konture je opisana u Dodatku 1 ovog Dela.

4.3.3 Anvelopa interferencije stavke digitalnog Plana

Anvelopa interferencije zone raspodele u kojoj su izvršene dodele, neke stavke digitalnog Plana, izračunava se kao najveća vrednost, u svakoj pojedinačnoj tački proračuna, kao jedno od sledeće dve mogućnosti:

– metod sumiranja snaga interferencije koja potiče od izvršenih digitalnih dodela, kako je opisano gore u § 3.1; ili

– interferencija od referentne mreže pridružene zoni raspodele (vidi Dodatak 2 ovog dela).

Budući da, u principu, zona raspodele teži da bude konvertovana u dodele koje bi imale uticaj na raspoloživi interferentni potencijal stavke digitalnog Plana, treba da bude urađeno ispitivanje saglasnosti i u slučaju kada su karakteristike objavljenih izvršenih dodela indentične onima u odgovarajućoj stavki digitalnog Plana.

4.3.4 Intenzitet električnog polja interferencije implementacije stavke digitalnog Plana

a) Primena člana 4.

Intenzitet električnog polja interferencije izračunava se, kako je opisano gore u § 3.1, metodom sumiranja snaga od doprinosa interferencija iz:

– dodela već uključenih u Plan kao rezultat konverzije dela koji se odnosi na zonu raspodele u digitalnom Planu (tj. isključujući izvršene dodele); i

– novih dodela nastalih iz konverzije dela koji se odnosi na zonu raspodele u digitalnom Planu i dostavljenih pod članom 4. za uključivanje u Plan.

b) Primena člana 5.

Ukupna interferencija se izračunava koristeći metodu sabiranja snaga, kako je opisano gore u § 3.1, od doprinosa interferencija iz:

– dodela koje su već zapisane u MIFR kao rezultat konverzije dela koji se odnosi na zonu raspodele; i

– izvršenih dodela koje odgovaraju stavki digitalnog Plana, koje su već bile zapisane u MIFR pod § 5.1.4, 5.1.6 i 5.1.7[1] člana 5; i

– novih dodela nastalih konverzijom dela koji se odnosi na zonu raspodele digitalnog Plana i dostavljenih pod članom 5. za upisivanje u MIFR; i

– izvršenih dodela koje odgovaraju stavki digitalnog Plana i dostavljenih pod članom 5. za upisivanje u MIFR.

[1]Uključenje dodele u izračunavanju interferencije ne podrazumeva priznanje ili da neka zaštita bude dodeljena dodeli

4.3.5 Kontura praga vrednosti intenziteta električnog polja stavke digitalnog Plana

Referentna tačka je centar tj. težište zone raspodele oblika mnogougla, a metoda konstrukcije konture praga intenziteta električnog polja je opisana u Dodatku 3 ovog Dela.

4.4 Stavka digitalnog Plana koja obuhvata skup dodela sa zajedničkim SFN indentifikatorom

Stavka digitalnog Plana sastoji se od skupa dodela sa zajedničkim SFN identifikatorom a da pritom nijedna zona raspodele nije pridružena tom skupu. Svaka pojedinačna dodela karakterisana je tehničkim karakteristikama u Aneksu 1 ovog Sporazuma.

Broj dodela implementovanih u stavki digitalnog Plana ne može da bude veći od broja dodela u skupu koji obuhvata stavka digitalnog Plana.

U slučaju da su karakteristike svih objavljenih dodela identične sa odgovarajućim dodelama iz stavke digitalnog Plana, nije potrebno da se vrši ispitivanje saglasnosti.

Međutim, ako je bilo koja dodela objavljena sa različitim karakteristikama od onih u odgovarajućoj dodeli stavke digitalnog Plana, tada treba da se uradi ispitivanje saglasnosti uzimajući u obzir sve dodele implementovane u stavki digitalnog Plana.

4.4.1 Lokacija izvršenih dodela

Lokacije izvršenih dodela ne smeju da budu udaljene više od 20 km od odgovarajućih geografskih lokacija specifikovanih u stavci digitalnog Plana.

4.4.2 Geometrijske konture stavke digitalnog Plana

Referentna tačka stavke digitalnog Plana je centar tj. težište geografskih koordinata svih lokacija pojedinačnih predajnih antena.

Za svaku dodelu stavke digitalnog Plana konstruisana je serija koncentričnih krugova na razdaljinama definisanih gore u § 3.2. Ti krugovi, na istim razdaljinama na kojima se seku, združuju se da bi se dobila jedna ili više kontura, okružujući lokacije dodela od SFN na odgovarajućim udaljenostima.

4.4.3 Anvelopa interferencije stavke digitalnog Plana

Karakteristike svake dodele, kao što je izlistano u Planu, koriste se da bi se izračunala združena anvelopa interferencije u saglasnosti sa varijacijom metode sumiranja snaga, gore u § 3.1.

4.4.4 Intenzitet električnog polja interferencije *implementacije stavke digtalnog Plana*

U ovom slučaju, verifikacija saglasnosti se jedino provodi u okviru člana 5. Intenzitet interferirajućeg električnog polja iz *implemantacije stavke digitalnog Plana* je združena interferencija, kako je opisano gore u § 3.1, nastala iz:

– svih dodela koje odgovaraju stavki digitalnog Plana i već zapisanih u MIFR, uključujući one zapisane pod § 5.1.4, 5.1.6 i 5.1.7[2] člana 5; i

– svih dodela koje odgovaraju stavki digitalnog Plana i podnešenih pod članom 5. za zapisivanje u MIFR.

---

2 Uključivanje dodele pri proceni interferencije ne podrazumeva njeno prepoznavanje ili obezbeđivanje zaštite ovom dodelom.

4.4.5 Kontura praga za skup dodela sa zajedničkim SFN indikatorom

Referentna tačka za konstrukciju konture praga intenziteta električnog polja je centar tj. težište geografskih koordinata svih lokacija pojedinačnih predajnih antena, a metoda konstrukcije konture praga intenziteta električnog polja je opisana u Dodatku 3 ovog Dela.

4.5 Stavka digitalnog Plana koja obuhvata dodelu u zonu raspodele a da pritom ne postoji SFN identifikator

Stavka digitalnog Plana sastoji se od zone raspodele u kojoj je izvršena jedna dodela ali ne postoji SFN identifikator. U tom slučaju jedina interferencija potiče od dodele, i granica zone raspodele jedino definiše područje koje treba da se štiti u toku planiranja RRC-06. Za ovo poslednje, ili je specificirana RPC ili neka sistemska varijanta zajedno sa načinom prijema. Dodela je karakterisana potrebnim skupom tehničkih karakteristika opisanih u Aneksu 1 ovog Sporazuma.

Nije moguće konvertovanje zone raspodele u dodelu (dodele) ako tip stavke digitalnog Plana nije zamenjen drugim tipom stavke digitalnog Plana. Konverzija u dodelu (dodele) zahtevala bi da zona raspodele ima SFN identifikator, tj. dodela vezana za zonu raspodele bez SFN identifikatora stavke digitalnog Plana trebalo bi da bude zamenjena zonom raspodele iz digitalnog Plana.

U slučaju da su karakteristike *implemantacije stavke digitalnog Plana* identične sa onima u stavki digitalnog Plana, dodela se automatski smatra saglasnom sa stavkom digitalnog Plana, i zato nije neophodno da se radi ispitivanje na saglasnost.

Metoda ispitivanja na saglasnost objavljene dodele koji odgovara dodeli u dodeli vezanoj za zonu raspodele iz stavke digitalnog Plana bez SFN identifikatora ista je kao metoda opisana gore pod § 4.2.

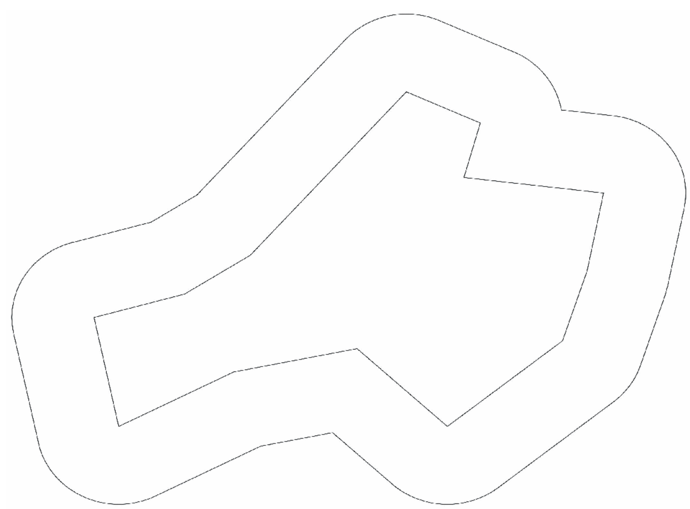
Dodatak 1
Deo 2

Konstrukcija geometrijske konture za stavke zone raspodele Plana i za zonu raspodele sa izvršenim dodelama stavke Plana

Metod konstrukcije skupa geometrijskih kontura za datu zatvorenu površinu zahteva da površina bude definisana kao skup graničnih tačaka, tj. mnogougao.
Prvi korak u konstrukciji geometrijske konture je da se granične tačke poređaju u smeru kazaljke na satu. Eliminišu se duplikati graničnih tačaka, tj. granične tačke ivica čija je dužina nula. Ako dve susedne ivice imaju isti smer, zajednička tačka se eliminiše.
U sledećem koraku kreiraju se nove ivice koje su odvojene udaljenošću datom u § 3.2 Aneksa 4, Dela 2 iz mnogougla koji se razmatra. Te nove "ivice" su paralelne linije i lukovi, kad se ispupčene granične tačke sudare. U ovom zadnjem slučaju, originalne granične tačke služe kao središta lukova.
Rezultujuće linije i lukovi spajaju se zajedno tako da se izračunaju tačke preseka dve uzastopne linije ili luka. Tačke preseka predstavljaju deo skupa ugaonih tačaka koje definišu geometrijsku konturu. Uzduž preostalih lukova dodatne tačke treba da budu definisane da bi luk bio aproksimiran mnogouglom na odgovarajući način. Slika A.1-1 niže pokazuje rezultate.

SLIKA A.1-1

Geometrijska kontura područja jedne zone raspodele



Sledeći ovu proceduru moguće je da se razviju geometrijske konture za svaki oblik područja zone raspodele, uključujući ona koja pokazaju izraženu ispupčenost. Ispupčeni ili udubljeni delovi mnogougla biće obuhvaćeni tako da je iz bilo koje tačke granice zone raspodele udaljenost do konture jednaka jednoj od zahtevanih udaljenosti datih u § 3.2 Aneksa 4, Dela 2.
Gornja procedura dozvoljava da granične tačke geometrijske konture budu identifikovane.

Dodatak 2
Dela 2

Pozicionisanje i orijentisanje referentne mreže za izračunavanje anvelope interferencije koja potiče od stavki digitalnog Plana koje obuhvataju jednu zonu raspodele ili jednu zonu raspodele sa izvršenim dodelama

Za izračunavanje izlazne interferencije referentne mreže svaka granična tačka testiranja zone raspodele smatra se izvorom izlazne interferencije. Za to izračunavanje neophodno je znati kako je referentna mreža pozicionirana i orijentisana u odnosu na referentnu tačku.

Sve referentne mreže mogu da budu okarakterisane kao mnogouglovi. Jedna ivica ("početna ivica") mnogougla je postavljena normalno na liniju između granične tačke i tačke proračuna. Centar početne ivice se zatim postavi na graničnu tačku.

U toj poziciji ostale granične tačke i centar mnogougla udaljenije su od tačke proračuna nego granične tačke od početne ivice. To fiksira poziciju referentne mreže i njenih predajnika. Zatim se određuje intenzitet električnog polja.

Referentna mreža se zatim pomera duž granica zone raspodele do sledeće granične tačke, gde se intenzitet električnog polja ponovo određuje za istu tačku proračuna. Ta procedura se ponavlja sve dok se referentna mreža ne vrati u početnu tačku.

Intenzitet električnog polja u tački proračuna izračunava se posebno za svaki predajnik referentne mreže koristeći karakteristike pridružene referentne konfiguracije za planiranje. U tu svrhu, efektivna izračena snaga za DVB-T referentne mreže uključuje marginu snage od 3 dB.

Rezultujuća suma intenziteta interferirajućih električnih polja izračunava se primenom uobičajene metode sumiranja snaga. Mešovita kopno-more putanja prostiranja izračunava se na osnovu Poglavlja 2 Aneksa 2 ovog Sporazuma.

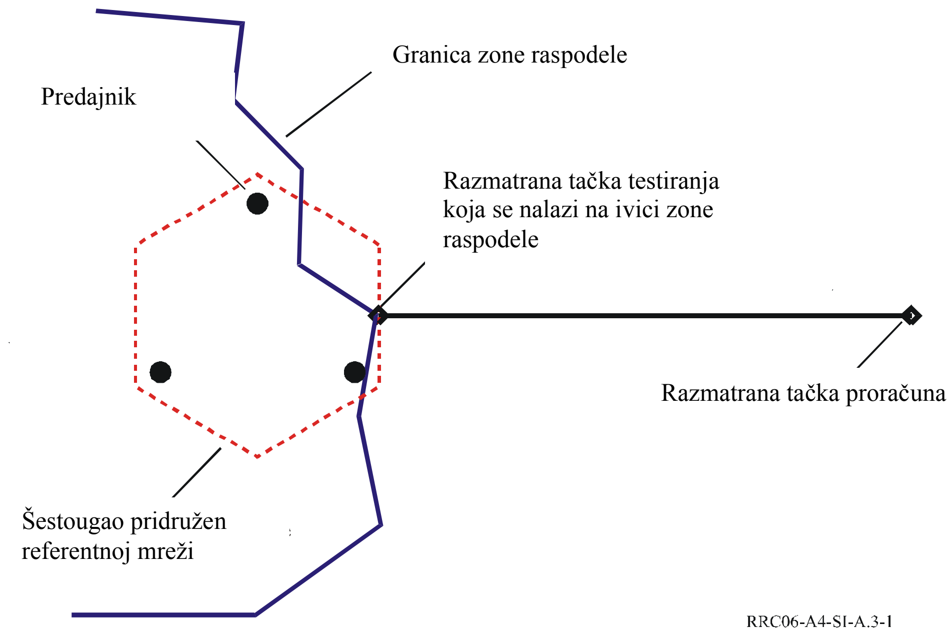
U slučaju mnogougla sa tri predajnika najbliži predajnik do granične tačke leži na desnoj strani gledajući od granične tačke ka tački proračuna.

Skica situacije data je za obe moguće konfiguracije referentne mreže (3 predajnika i 7 predajnika) niže na slikama A.2-1 i A.2-2.

Zbog pomicanja zamišljenog mnogougla uzduž državne granice, moguće je da bi jedan ili više predajnika mogao da leži izvan teritorije administracije za čiju se zonu raspodele izračunavanje radi.

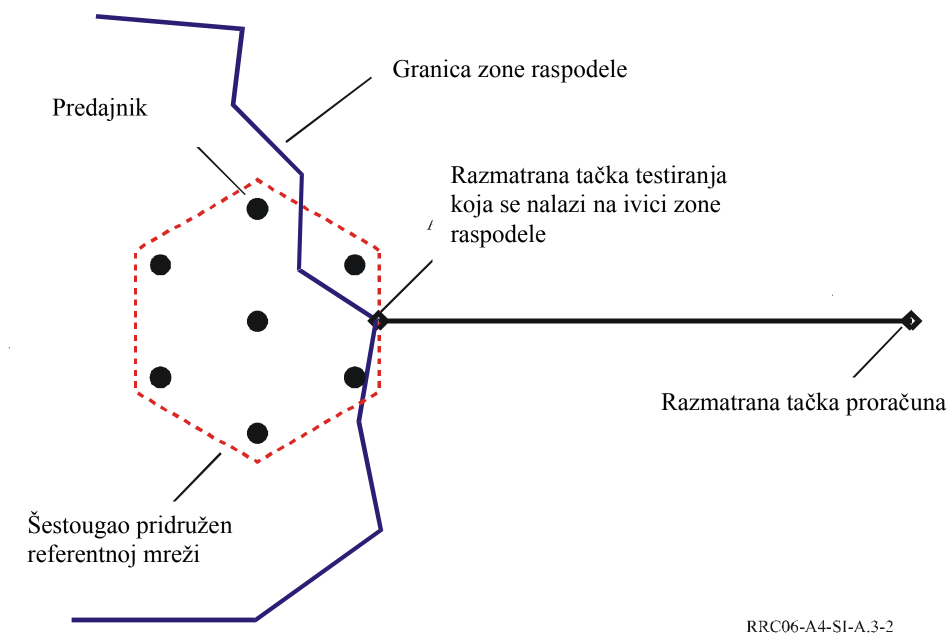
SLIKA A.2-1

Šestougaona referentna mreža sa 3 predajnika



SLIKA A.2-2

Šestougaona referentna mreža sa 7 predajnika



Dodatak 3
Dela 2

Konstrukcija konture praga intenziteta električnog polja

Vrednosti praga intenziteta električnog polja predstavljaju minimalne granične vrednosti intenziteta električnog polja iz Aneksa 4, Dela 1 ovog Sporazuma.

Kontura praga intenziteta električnog polja je razvijena koristeći jednako razmaknute (1°) radijalne zrake, uzduž 360° centrirano u jedinstvenu referentnu tačku, čija je lokacija definisana za svaki tip stavke digitalnog Plana u § 4 Aneksa 4, Dela 2.

Uzduž tih radijalnih zraka združena vrednost intenziteta električnog polja *implementacije stavke digitalnog Plana* računa se kao što je opisano u § 3.1 Aneksa 4, Dela 2 (uzimajući vrednosti za 1% vremena) počevši na daljini od 1 000 km, mereno od najbližeg predajnika *implementacije stavke digitalnog Plana* ili granice zone raspodele, i pomičući se ka referentnoj tački dok se ne dostigne prag intenziteta električnog polja.

Povezujući tačke na svakom radijalnom pravcu gde je prag intenziteta električnog polja dostignut, dobija se kontura praga intenziteta električnog polja.

U nekim slučajevima (na pr. područja nenormalnog prostiranja, predajnici jačih snaga, osetljiva granična vrednost za koju se zahteva koordinacija) postoji mogućnost da prag intenziteta električnog polja može da bude prekoračen na maksimalnoj daljini od 1 000 km. U tom slučaju tačka na 1 000 km biće pozicija konture praga intenziteta električnog polja na tom radijalnom pravcu.

Dodatak 4
Dela 2

Izrazi upotrebljeni u ovom Aneksu

Tačka proračuna: Tačka za koju se vrši proračun intenziteta električnog polja.

Geometrijska kontura: Linija na konstantnoj udaljenosti iz stavke digitalnog Plana

Kontura praga intenziteta električnog polja: Linija gde je intenzitet električnog polja proizveden implementacijom digitalnog Plana jednak specificiranoj vrednosti.

Stavka digitalnog Plana: Dodela, ili zona raspodele, ili kombinacija dodela koje mogu ali ne moraju da budu vezane za jednu zonu raspodele i tako, u svrhu implementacije *Plana* i njegovih modifikacija, tretiraju se kao celina.

Anvelopa interferencije stavke digitalnog Plana: Združeni intenzitet električnog polja, u tački proračuna, izračunat na bazi karakteristika stavke digitalnog Plana.

Dodela izvedena (ili konvertovana) iz zone raspodele: Dodela, zabeležena u digitalnom Planu i/ili u MIFR, koja ne menja anvelopu interferencije odgovarajuće stavke digitalnog Plana.

Izvršena dodela (dodele): Jedna ili više dodela, pridruženih zoni raspodele, koja se pojavljuje u digitalnom Planu i može da poveća anvelopu celokupne interferencije stavke digitalnog Plana iznad one prouzrokovane referentnom mrežom.

Implementacija stavke digitalnog Plana:
U primeni člana 4, označava sve dodele koje odgovaraju stavki digitalnog Plana koje su već uključene u Plan ili predložene za uključivanje u Plan;
U primeni člana 5, označava sve dodele koje odgovaraju stavki digitalnog Plana koje su već zapisane u MIFR, ili predložene da se zapišu u MIFR.

ANEKS 5

Lista dodela ostalih primarnih terestrijalnih sevisa u odnosu na § 1.15 člana 1. ovog Sporazuma[1]

Informacije koje sadrže podaci u Listi

br.	Opis
1	ITU serijski broj
2	ITU simbol za nadležnu administraciju
3	Jedinstveni identifikacioni kod dodeljen od administracije za dodelu (AdminID)
4	Dodeljena frekvencija (MHz)
5	Referentna frekvencija (MHz)
6	Vreme unosa u Listu
7	Naziv lokacije predajne/prijemne stanice
8	ITU simbol zemlje ili geografskog područja
9	Geografske koordinate mesta predajne/prijemne stanice:
	9a širina (±DDMMSS)
	9b dužina (±DDDMMSS)
10	Nominalni poluprečnik (km) kružnog prenosnog područja
11	ITU simbol zemlje ili geografskog područja gde je predajna stanica smeštena
12	ITU simbol zemlje ili geografskog područja gde je prijemna stanica smeštena
13	Geografske koordinate centra kružnog prijemnog područja:
	13a širina (±DDMMSS)
	13b dužina (±DDDMMSS)
14	Nominalni poluprečnik (km) kružnog prijemnog područja
15	Klasa stanice
16	Klasa emisije, prema članu 2. i Dodatku 1
17	Potrebna širina opsega, prema članu 2. i Dodatku 1
18	Tip koda sistema (vidi Aneks 2, Poglavlje 4 ovog Sporazuma)
19	Tip snage (X, Y ili Z)
20	Izlazna snaga predajnika (dBW)
21	Maksimalna gustina snage (dB(W/Hz)) kao prosek od najlošijeg 4 kHz opsega i napaja antensku predajnu liniju
22	Maksimalna efektivna izračena snaga (dBW)
23	Usmerenost (direktivnost) antene (U ili NU)

[1] Spisak relevantnih karakteristika za radio astronomske stanice nije dat, jer trenutno ne postoje zapisi o radio astronomskim stanicama na Spisku. Ipak, ako se u budućnosti radio astronomske stanice uvrste u Spisak, karakteristike će biti zasnovane na parametrima sadržanim u Dodatku 4 Pravilnika o radiokomunikacijama.

br.	Opis
1	ITU serijski broj
2	ITU simbol za nadležnu administraciju
3	Jedinstveni identifikacioni kod dodeljen od administracije za dodelu (AdminID)
4	Dodeljena frekvencija (MHz)
5	Referentna frekvencija (MHz)
6	Vreme unosa u Listu
7	Naziv lokacije predajne/prijemne stanice
8	ITU simbol zemlje ili geografskog područja
9	Geografske koordinate mesta predajne/prijemne stanice:
	9a širina (±DDMMSS)
	9b dužina (±DDDMMSS)
10	Nominalni poluprečnik (km) kružnog prenosnog područja
11	ITU simbol zemlje ili geografskog područja gde je predajna stanica smeštena
12	ITU simbol zemlje ili geografskog područja gde je prijemna stanica smeštena
13	Geografske koordinate centra kružnog prijemnog područja:
	13a širina (±DDMMSS)
	13b dužina (±DDDMMSS)
14	Nominalni poluprečnik (km) kružnog prijemnog područja
15	Klasa stanice
16	Klasa emisije, prema članu 2. i Dodatku 1
17	Potrebna širina opsega, prema članu 2. i Dodatku 1
18	Tip koda sistema (vidi Aneks 2, Poglavlje 4 ovog Sporazuma)
19	Tip snage (X, Y ili Z)
20	Izlazna snaga predajnika (dBW)
21	Maksimalna gustina snage (dB(W/Hz)) kao prosek od najlošijeg 4 kHz opsega i napaja antensku predajnu liniju
22	Maksimalna efektivna izračena snaga (dBW)
23	Usmerenost (direktivnost) antene (U ili NU)
24	Azimut pravca maksimalnog zračenja predajne antene (u stepenima) u smeru kazaljke na satu počevši iz pravca severa
25	Ugao azimuta širine glavnog snopa zračenja meren (u stepenima) u smeru kazaljke na satu počevši iz pravca severa:
	25a Početni ugao
	25b Završni ugao
26	Polarizacija
27	Visina antene iznad zemlje (m)
28	Nadmorska visina mesta (m)
29	Maksimalna efektivna visina antene (m)
30	Efektivna visina antene (m) za 36 različitih uglova u intervalima od 10°, mereno u horizontalnoj ravni počevši iz pravca severa u smeru kazaljke na satu
31	Maksimalno pojačanje antene u odnosu na polutalasni dipol
32	Simbol(i) administracije sa kojom je ostvarena koordinacija
33	Primedbe

Napomena sekretarijata: Ova lista i njena skraćena verzija uključene su u CD-ROM pridružen ovim Finalnim Aktima. CD-ROM predstavlja integralni deo Finalnih Akata. Sažetak broja dodela uključenih u Listu, po administraciji, dat je u Tabeli 5-1.

br.	Opis
24	Azimut pravca maksimalnog zračenja predajne antene (u stepenima) u smeru kazaljke na satu počevši iz pravca severa
25	Ugao azimuta širine glavnog snopa zračenja meren (u stepenima) u smeru kazaljke na satu počevši iz pravca severa:
	25a Početni ugao
	25b Završni ugao
26	Polarizacija
27	Visina antene iznad zemlje (m)
28	Nadmorska visina mesta (m)
29	Maksimalna efektivna visina antene (m)
30	Efektivna visina antene (m) za 36 različitih uglova u intervalima od 10°, mereno u horizontalnoj ravni počevši iz pravca severa u smeru kazaljke na satu
31	Maksimalno pojačanje antene u odnosu na polutalasni dipol
32	Simbol(i) administracije sa kojom je ostvarena koordinacija
33	Primedbe

Napomena sekretarijata: Ova lista i njena skraćena verzija uključene su u CD-ROM pridružen ovim Finalnim Aktima. CD-ROM predstavlja integralni deo Finalnih Akata. Sažetak broja dodela uključenih u Listu, po administraciji, dat je u Tabeli 5-1.

TABELA 5-1

Sažetak broja dodela za ostale primarne zemaljske servise kako se pojavljuju u Listi u frekvencijskim opsezima 174-230 MHz i 470-862 MHz

Države članice	**ITU simbol**	**br. dodela za ostale primarne zemaljske servise uključene u Listu**
Saudijska Arabija (Kraljevstvo)	ARS	339
Republika Azerbejdžan	AZE	3
Belgija	BEL	4
Obala Slonovače (Republika)	CTI	14
Egipat (Arapska Republika)	EGY	474
Ujedinjeni Arapski Emirati	UAE	4
Ruska Federacija	RUS	1 420
Francuska	F	250
Gruzija	GEO	7
Iran (Islanska Republika)	IRN	551
Izrael (Država)	ISR	372
Jordan (Hašemitska Kraljevina)	JOR	2 017
Kazahstan (Republika)	KAZ	18
Maroko (Kraljevina)	MRC	70
Uzbekistan (Republika)	UZB	27
Kirgiska Republika	KGZ	10
Ujedinjeno Kraljevstvo Velike Britanije i Severne Irske	G	5 428
Tadžikistan (Republika)	TJK	2

REZOLUCIJE

REZOLUCIJA 1 (RRC-06)

Radiodifuzni satelitski servis u opsegu 620-790 MHz

Regionalna konferencija o radiokomunikacijama za planiranje digitalnog terestrijalnog radiodifuznog servisa u Regionu 1 (delovi Regiona 1 se nalaze zapadno od meridijana 170° Istok i severno od paralele 40° Sever, osim za teritoriju Mongolije) i u Islamskoj Republici Iranu, u frekvencijskom opsegu 174-230 MHz i 470-862 MHz (Ženeva, 2006) (RRC-06),

s obzirom

a) da je prva sednica Konferencije prihvatila Rezoluciju COM4/1 (RRC-04);

b) da je neophodno da se efektivno zaštite, između ostalog, terestrijalni televizijski radiodifuzni sistemi u ovom opsegu;

c) da su geostacionarno (GSO) radiodifuzne satelitske (RS) i ne-GSO RS mreže ili sistemi u fazi poodmaklog objavljivanja i koordinacije, ili su najavljene u frekvencijskom opsegu 620-790 MHz;

d) da uticaj ovih GSO RS mreža i ne-GSO RS mreža ili sistema na analogne i digitalne televizijske radiodifuzne sisteme trba da se još ispita i da kriterijumi deljenja, uključujući pfd limite koji se zahtevaju za zaštitu terestrijalnih servisa u tom frekvencijskom opsegu, nisu poznati i zavise od moguće odluke 2007 Svetske Konferencije za Radiokomunikacije (WRC-07);

e) da mnoge administracije imaju opsežnu infrastrukturu za prenos i primanje analognih i digitalnih televizijskih signala između 620 MHz i 790 MHz;

f) da je ova Konferencija usvojila Sporazum i prateće Planove za digitalnu terestrijalnu radiodifuziju, između ostalog, u opsegu 620-790 MHz, i da je neophodno da se efektivno zaštite ti Planovi,

konstatujući

a) da Br. **5.311** Pravilnik o radiokomunikacijama specifikuje uslove pod kojim opseg 620-790 MHz može da se koristi za dodele za televizijske stanice koristeći frekvencijsku modulaciju u RS;

b) da je upotreba opsega 620-790 MHz od GSO i ne-GSO RS mreža suspendovana Rezolucijom 545 (WRC-03) sve do odluke WRC-07,

dalje konstatujući

a) da shodno odluci 3 Rezolucije 545 (WRC-03), GSO RS mreže i ne-GSO RS mreže ili sistemi u opsegu 620-790 MHz što nisu ovde spomenuti, stavljeni u upotrebu i sa datumom stavljanja u upotrebu potvrđeni pre završetka Svetske Konferencije za radiokomunikacije (Ženeva, 2003) (WRC-03), ne bi trebalo da budu stavljani u upotrebu pre završetka WRC-07;

b) da shodno odluci 5 Rezolucije 545 (WRC-03), BSS sistemi na kojie se odnosi odluka 1 te Rezlucije ne bi trebalo da se uzmu u obzir u primeni odluke 3.4 Rezolucije Saveta 1185 (modifikovane, 2003)[1],

poziva Svetsku konferenciju za radiokomunikacije, 2007

1 da se preduzmu odgovarajuće i neophodne mere da se efektivno zaštite radiodifuzni Planovi usvojeni na ovoj Konferenciji i njihova naredna evolucija od GSO RS i/ili ne-GSO RS mreža/sistema koji nisu stavljeni u upotrebu pre 5.7.2003.;

2 da se poduzmu odgovarajuće i neophodne mere da terminali na zemlji od GSO i/ili ne-GSO RS mreža/sistema koji nisu stavljeni u upotrebu pre 5.7.2003. ne mogu da imaju zaštitu iz Planova usvojenih na ovoj konferenciji i njihovih narednih evolucija, niti da postavljaju ikakva ograničenja radu dodela ovih Planova i njihovih narednih evolucija,

nalaže se Generalnom Sekretaru

da skrene pažnju na ovu Rezoluciju 2007 Svetskoj konferenciji za radiokomunikacije.

[1] Rezolucija 1185 je opozvana i zamenjena Rezolucijom 1244 usvojenom od Saveta na sednici 2004, gde se odluka 2.1.2 odnosi na deljenje sa ostalim primarnim servisima

REZOLUCIJA 2 (RRC-06)

Karakteristike koordinacije i obaveštavanja primarnog terestrijalnog servisa u opsezima 174-230 MHz i 470-862 MHz u području planiranja

Regionalna Konferencija o Radiokomunikacijama za planiranje digitalnog terestrijalnog radiodifuznog servisa u Regionu 1 (delovi Regiona 1 se nalaze zapadno od meridijana 170° Istok i severno od paralele 40° Sever, osim za teritoriju Mongolije) i u Islamskoj Republici Iranu, u frekvencijskom opsegu 174-230 MHz i 470-862 MHz (Ženeva, 2006) (RRC-06),

s obzirom na to
da je ova Konferencija usvojila Regionalni Sporazum (Ženeva, 2006), koji sadrži procedure za koordinaciju i obaveštavanja za dodele radiodifuznih servisa i drugih primarnih terestrijalnih servisa, i čiji Aneks 3 sadrži karakteristike koje treba da su priložene za aplikaciju tih procedura

konstatujući
da bi moglo biti poželjno da sve karakteristike koje treba da se prilože Birou za radiokomunikacije za koordinaciju i obaveštavanje o dodelama budu uključene u Dodatak 4 Pravilnika o radiokomunikacijama

poziva Svetsku konferenciju za radiokomunikacije, 2007
da ispita, kako treba, Dodatak 4 Pravilnika o radiokomunikacijama u pogledu uključivanja karakteristika Aneksa 3 Regionalnog Sporazuma (Ženeva, 2006),

nalaže se Generalnom Sekretaru
da skrene pažnju na ovu Rezoluciju Svetskoj konferenciji za radiokomunikacije 2007.

Član 3.

Ovaj zakon stupa na snagu osmog dana od dana objavljivanja u "Službenom glasniku Republike Srbije - Međunarodni ugovori".