



*Radiocommunication Bureau*

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Circular Letter  
**CR/302**

19 May 2009

## To Administrations of Member States of ITU

**Subject:** Implementation of Appendix **30B** in accordance with Resolution **149 (WRC-07)**

**Reference:** Circular Letter **CR/299** of 27 March 2009

### To the Director-General

Dear Sir/Madam

1 In the Circular Letter referenced above, the Radiocommunication Bureau informs administrations of the actions which have been taken to implement Resolution **149 (WRC-07)**, especially the status and schedule to develop and test the software for application of technical examinations under Appendix **30B (Rev.WRC-07)**.

2 In this regard, the Bureau is happy to inform administrations that it has completed the first production version of software for implementation of Annex 4 to Appendix **30B** technical examinations. This version includes the minimum functionalities required for calculating *C/I* degradation compared with the Annex 4 protection criteria, as well as establishing the Plan and List reference situations in the AP30B database.

3 The software is integrated into the GIBC software and is available to administrations on the BR IFIC 2644 (space services) of 19 May 2009. Administrations are requested to use this software together with a new AP30B database having upgraded structure (version 6.1), which is included in the same BR IFIC.

4 A preliminary upgraded version of SpaceCap software which operates with above-mentioned AP30B database is also available in the BR IFIC 2644. This version includes a facility for the conversion from an existing database in version 6.0 format to the new database format in version 6.1.

5 Administrations are invited to advise the Bureau of any difficulties or problems that they may encounter in using this new software package.

6 With software packages for examination of Annex 3 and Annex 4 to Appendix **30B**, the Bureau has started to process the submissions under Article 7 of Appendix **30B** received after 17 November 2007. With the final production version of the AP30B software package to be made available by the end of July 2009, the Bureau will resume the examination of submissions received under Article 6 of Appendix **30B** which have not yet been processed.

7 In accordance with *instructs the Director of the Radiocommunication Bureau* 2 of Resolution **149 (WRC-07)**, the Bureau is requested to “communicate to administrations the details of the interpolation method implemented for examination under Annex 4 of Appendix **30B (Rev.WRC-07)**”. In this connection, the description of the implemented interpolation method used in the Appendix **30B** Annex 4 software is included in Annex 1 to this Circular Letter.

8 The Radiocommunication Bureau trusts that the information provided in this Circular Letter is useful to your Administration and remains at your disposal for any further information it may require.

Yours faithfully,

Valery Timofeev  
Director, Radiocommunication Bureau

#### Annex: 1

##### Distribution:

- Administrations of Member States of ITU
- Members of the Radio Regulations Board

## Annex 1

### Description of the interpolation method implemented in BR software for calculation of space-to-Earth single entry C/I within the service area of allotments/assignments in examination under Annex 4 to Appendix 30B

#### 1 Introduction

Before WRC-07, the protection of the service area of allotments in the Appendix 30B Plan and assignments in the List was limited to a set of corresponding test points. However, it was noted that allotments in the Plan and assignments in the List were not sufficiently protected from some submitted space station-shaped beams whose antenna diagrams contained a number of holes (very low gain in a small area) towards certain specific downlink test points. In order to properly protect allotments in the Plan and assignments in the List, WRC-07 adopted a new Annex 4 to Appendix 30B. The *note 19* of Annex 4 to Appendix 30B (WRC-07) mentioned that the Bureau shall examine the space-to-Earth (downlink) single-entry C/I everywhere within the service area against the criteria established in that Annex. This requirement is implemented in a new software package integrated into GIBC.

#### 2 Generation of grid points within the service area

The service area is regularly covered by a grid of points so that the average distance between points is set to a value proportional to the area size, with a maximum of 600 km and a minimum of 100 km. To ensure good coverage of irregularly shaped areas, points are also added on the border of the service area.

#### 3 Calculation of reference values at grid points

The interpolation formula used for calculating the interpolated values at grid points is as follows:

$$V_{Eg} = \frac{\sum_{h=1}^{Nt} R_{Th} \times (d_{Th})^{-2}}{\sum_{h=1}^{Nt} (d_{Th})^{-2}} \quad (1)$$

where:

*Th*: test point number h of the wanted downlink service area

*Eg*: point number g of the grid of examination points on the wanted downlink service area

*Nt*: total number of test points

*d<sub>Th</sub>*: distance (km) between the test point *Th* and the grid point *Eg*

*R<sub>Th</sub>*: single entry C/I limit reference value (dB) at the test point *Th*

*V<sub>Eg</sub>*: interpolated single entry C/I reference value at (dB) grid point *Eg*

The range of the interpolated values at grid points is within the range of the corresponding test point's reference situation. In other words, the interpolated value shall not be less than the minimum or greater than the maximum reference single entry *C/I* limit value of the corresponding test points. In addition, it has been proved that the above formula gives continuous interpolated values and is convergent to the single entry *C/I* reference value at a test point as the grid point moves towards that test point.

If the interpolated value is higher than  $(C/N)_d + 11.65$  dB at any grid point,  $(C/N)_d + 11.65$  dB should be used as the reference value for that grid point; otherwise, the interpolated value is the reference value.

For each session of Appendix 30B Annex 4 examination, the coordinates of the generated grid points, calculated *C/I* reference values and degradation values at grid points are stored in an output file of GIBC.

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