

## UPDATES to the

### Rules of Procedure

(Edition of 2017)

#### Approved by the Radio Regulations Board\*

Revision (Circular No.)	Date	Part	AR/AP	RR No. or other reference	Pages to be removed	Pages to be inserted
1 See CR/424	November 2017	A1	AR11	11.14	4	4 (rev.1)
2 See CR/433	July 2018	A1	AR04	4.4	1-3	1(rev.2) - 3(rev.2)
		A1	Receivability <sup>1</sup>		1-2	1(rev.2) - 2bis(rev.2)
		A1	AR09 <sup>2</sup>	9.11A-9.15	10	10(rev.2)
			AR09	9.27	21-24	21(rev.2) - 24(rev.2)
		A1	AR11	11.48	28	28(rev.2) - 28bis(rev.2)
		A1	AP30	5.2.2.2	15	15(rev.2)
			AP30A	5.2.2.2	12-13	12(rev.2) - 13(rev.2)
		A10	GE06	5.2.2	13-14	13(rev.2) - 15(rev.2)
		B3			3 6-10	3(rev.2) 6(rev.2) - 10bis(rev.2)
		Table of content			1-2	1(rev.2) - 2(rev.2)

\* The new Rules or modifications to the existing Rules of Procedure take effect immediately or as otherwise indicated.

<sup>1</sup> Effective date of application of the Rule: 1 August 2018.

<sup>2</sup> Effective date of application of the Rule: 1 January 2017.



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## Rules concerning

### ARTICLE 4 of the RR

<b>4.4</b>
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#### **1 Use of a frequency under RR No. 4.4** (MOD RRB18/78)

1.1 This provision states that “Administrations of the Member States shall not assign to a station any frequency in derogation of either the Table of Frequency Allocations in this Chapter or the other provisions of these Regulations, except on the express condition that such a station, when using such a frequency assignment, shall not cause harmful interference to, and shall not claim protection from harmful interference caused by, a station operating in accordance with the provisions of the Constitution, the Convention and these Regulations.”

1.2 The scope of the terms “in derogation of either the Table of Frequency Allocations in this Chapter or the other provisions of these Regulations” is specified in No. **8.4** by the indication that the “other provisions” shall be identified and included in a Rule of Procedure. The Rules of Procedure on No. **11.31** provide a complete list of these “other provisions”.

1.3 The scope of No. **4.4** is therefore limited to derogations to the Table of Frequency Allocations and to the provisions listed in the Rules of Procedure on No. **11.31** with regard to the “other provisions”. In particular, administrations intending to authorize the use of spectrum under No. **4.4** still have the obligation, under Sections I and II of Article **9**, Nos. **11.2** and **11.3**, to notify to the Bureau “any frequency assignment if its use is capable of causing harmful interference to any service of another administration”.

1.4 Further, it can be seen from Nos. **8.5** and **11.36** that the recording of an assignment with a reference to No. **4.4** includes the commitment by the notifying administration to immediately eliminate any harmful interference actually caused to other frequency assignments operated in accordance with the Radio Regulations upon receipt of advice thereof. This limitation on the use of an assignment notified with a reference to No. **4.4** is valid only when both categories of assignments detailed in No. **8.5** are in use.

1.5 The Board considers that the determination of whether or not a frequency assignment to a transmitting station is capable of causing harmful interference to the stations of another administration operating in accordance with the Radio Regulations does not lie only on the side of the administration operating the transmitting station that may be producing the interference and other administrations should have information about a use under No. **4.4** to assess its interference potential or identify the source of harmful interference. For this reason, an administration intending to use a frequency assignment to a transmitting station under No. **4.4** has to notify to the Bureau this frequency assignment, pursuant to Article **11**<sup>1</sup>, if possible prior to bringing it into use. For space services, this includes the prior application of the relevant provisions of Article **9** (see also § 1.3 above).

1.6 The Board also concluded that administrations, prior to bringing into use any frequency assignment to a transmitting station operating under No. **4.4**, shall determine:

- a) That the intended use of the frequency assignment to the station under No. **4.4** will not cause harmful interference into the stations of other administrations operating in conformity with the Radio Regulations;
- b) What measures it would need to take in order to comply with the requirement to immediately eliminate harmful interference pursuant to No. **8.5**.

When notifying the use of frequency assignments to be operated under No. **4.4**, the notifying Administration shall provide a confirmation that it has determined that these frequency assignments meet the conditions referred to above in item a) and that it has identified measures to avoid harmful interference and to immediately eliminate such in case of a complaint.

1.7 Taking into account No. **4.4** as well as Nos. **5.43** and **5.43A**, frequency assignments to receiving stations not in conformity with the Radio Regulations are recorded with a symbol which includes the indication that the notifying administration cannot claim protection from any harmful interference that may be caused by frequency assignments operated in accordance with the Radio Regulations.

See also the Rules of Procedure relating to No. **11.37**.

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<sup>1</sup> It is recognised that the exchange of information about the use of frequency assignments, including those under No. **4.4** by stations of terrestrial services in certain bands (e.g. in bands not shared with space services), could also be achieved through bilateral/multilateral arrangements or mechanisms.

## **2 Emissions in bands where uses other than those authorized are prohibited**

2.1 The provisions listed below relating either to frequencies or bands to be used for safety and distress communications or allocated for passive usage prohibit any other use:

*a) Provisions relating to safety and distress communications:*

Appendix 15 (GMDSS), Tables 15-1 and 15-2: frequencies marked with an asterisk (\*) to indicate that any emission causing harmful interference to distress and safety communications is prohibited.

*b) Provisions relating to passive usage:*

No. 5.340.

2.2 The Board considers that, in view of this prohibition, a notification concerning any other use than those authorized in the band or on the frequencies concerned cannot be accepted even with a reference to No. 4.4; furthermore the administration submitting such a notice is urged to abstain from such usage.

### **4.5**

1 The application of this provision involves the case of an adjacent band not allocated to the service concerned as well as the case of an adjacent band allocated to the service concerned with a different category of allocation.

1.1 A frequency assignment, of which the assigned frequency band overlaps a band not allocated to the service concerned, shall receive an unfavourable regulatory finding under No. 11.31.

1.2 A frequency assignment, of which the assigned frequency band overlaps a band allocated with a lower category of service will be considered as having the lower category of service and, when recorded, will bear a symbol to this effect. (See Symbols R and S in Table 13B, Column 13B2, of the Preface to the IFL.)

2 To resolve cases of harmful interference between services in adjacent bands it was decided that, irrespective of the phenomena at the origin of the interference (out-of-band emission, intermodulation products, etc.), the administration responsible for the emission overlapping a non-allocated band shall use appropriate means to eliminate the interference.

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**Rules concerning the Receivability of forms of notice generally  
applicable to all notified assignments submitted to  
the Radiocommunication Bureau in application  
of the Radio Regulatory Procedures\***

**1 Submission of information in electronic format** (MOD RRB18/78)

1.1 Space services

The Board noted the requirement for mandatory electronic filing and submission of comments/objections and requests for inclusion or exclusion specified in the *resolves* of Resolutions **55 (Rev.WRC-15)** and **908 (Rev.WRC-15)**. It also noted that capture and validation software had been made available to administrations by the Bureau, including software to submit information required in Annex 2 of Resolution **552 (Rev.WRC-15)** and in the Attachment to Resolution **553 (Rev.WRC-15)**. Accordingly, all information indicated in the *resolves* of Resolution **55 (Rev.WRC-15)**, in Annex 2 of Resolution **552 (Rev.WRC-15)** and in the Attachment to Resolution **553 (Rev.WRC-15)** under § 8 and § 9, shall be submitted to the Bureau in electronic format (except graphical data which can still be submitted in paper form) which is compatible with the BR electronic notice form capture software (SpaceCap) and comments/objections software (SpaceCom)<sup>1</sup>, using the ITU web interface “e-Submission of satellite network filings” available at <https://www.itu.int/itu-r/go/space-submission>.

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\* **Note:** WRC-15 took the decision related to the RoP on the Receivability of forms of notice during the 8<sup>th</sup> Plenary, Par. 1.39 to 1.42 of Doc. CMR15/505, with the approval of Doc. CMR15/416 in relation to Section 3.2.2.4.1 of Doc. 4 (Add2) (Rev1), as follows:

*“For the submission of a request for coordination under No. 9.30 related to a non-GSO satellite network or system, the notice will be receivable only in the cases described below:*

- i) satellite systems with one (or more than one) set(s) of orbital characteristics and inclination value(s) with all frequency assignments to be operated simultaneously; and,*
- ii) satellite systems with more than one set of orbital characteristics and inclination values with, however, a clear indication that the different sub-sets of orbital characteristics would be mutually exclusive; in other terms, frequency assignments to the satellite system would be operated on one of the sub-sets of orbital parameters to be determined at the notification and recording stage of the satellite system at the latest.”*

<sup>1</sup> Except comments submitted in accordance with §§4.1.7, 4.1.9, 4.1.10 of Article 4 of Appendix 30 and 30A with respect to additional uses under Article 4 and use of the guardbands under Article 2A of those Appendices in Region 1 and Region 3.

## 1.2 Terrestrial services

Submission of frequency assignment/allotment notices for terrestrial services in the context of Articles **9**, **11**, **12** and Appendix **25** of the Radio Regulations and various regional agreements shall be made exclusively via the ITU web interface *WISFAT* (**W**eb **I**nterface for **S**ubmission of **F**requency **A**ssignments/allotments) available at <https://www.itu.int/ITU-R/go/wisfat/en>. It should also be noted that the Bureau has made available to administrations through the BR IFIC a software tool TerRaNotices for creating and validating notices by the Bureau. Additionally, an online validation tool is accessible via the ITU website at: <https://www.itu.int/ITU-R/terrestrial/OnlineValidation/Login.aspx>.

## 2 Receipt of notices (MOD RRB18/78)

It is incumbent on all administrations to meet deadlines established in the Radio Regulations and, accordingly, to take account of possible mail delays, holidays or periods during which ITU may be closed<sup>2</sup>.

Having regard to the electronic submissions of notices and various means available for transmission of related correspondence, the Board has decided the following:

### 2.1 Electronic submissions of notices

- a) Notices submitted using “e-Submission of satellite network filings” for space services or via WISFAT for terrestrial services shall be recorded as received on the actual date of receipt, irrespective of whether or not that is a working day at the ITU/BR’s offices in Geneva.
- b) Notices submitted using “e-Submission of satellite network filings” for space services or via WISFAT for terrestrial services do not require any separate confirmation by telefax or mail.
- c) Receipt of notices related to space services shall be acknowledged immediately by ITU/BR e-mail. Receipt of notices related to terrestrial services is acknowledged immediately by a message sent by WISFAT automatically.

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<sup>2</sup> The Radiocommunication Bureau shall inform administrations by circular letter at the beginning of each year, and as appropriate, about holidays or periods in which ITU may be closed in order to assist them in meeting their obligations.

## 2.2 Correspondence related to submission of notices

- a)* Mail received through the postal service<sup>3</sup> shall be recorded as received on the first working day on which it is delivered to the ITU/BR's offices in Geneva. Where the mail is subject to a regulatory time limit that occurs on a date on which the ITU is closed, the mail should be accepted if it has been recorded as received on the first working day following the period of closure.
- b)* E-mail and telefax documents shall be recorded as received on the actual date of receipt, irrespective of whether or not that is a working day at the ITU/BR's offices in Geneva.
- c)* All mail must be sent to the following address:

Radiocommunication Bureau  
International Telecommunication Union  
Place des Nations  
CH-1211 Geneva 20  
Switzerland

- d)* All telefaxes must be sent to:

+41 22 730 57 85 (several lines)

- e)* All e-mails must be sent to:

brmail@itu.int

- f)* Information received in the ITU/BR by e-mail shall be acknowledged immediately by e-mail by the ITU/BR.

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<sup>3</sup> Includes courier, messenger or other services.



TABLE 9.11A-1 (continued)

1	2	3	4	5	6	7
Frequency band (MHz)	Footnote No. in Article 5	Space services mentioned in a footnote referring to Nos. 9.11A, 9.12, 9.12A, 9.13 or 9.14, as appropriate	Other space services or systems to which Nos. 9.12 to 9.14 provisions(s) apply equally, as appropriate	Applicable Nos. 9.12 to 9.14 provision(s), as appropriate	Terrestrial services in respect of which No. 9.14 apply equally	Notes
1 610-1 626.5	5.364	MOBILE-SATELLITE RADIODETERMINATION-SATELLITE (Region 2 (except country in No. 5.370), countries in No. 5.369)	AERONAUTICAL MOBILE-SATELLITE (R) (5.367)	9.12, 9.12A, 9.13	---	
1 610-1 626.5	5.364	Radiodetermination-satellite (Region 1 (5.371), Region 3, country in No. 5.370))	---	9.12, 9.12A, 9.13	---	
1 613.8-1 626.5	5.365	Mobile-satellite	---	9.12, 9.12A, 9.13, 9.14	Fixed (5.355)	
1 626.5-1 660.5	5.354	MOBILE-SATELLITE	---	9.12, 9.12A, 9.13	---	
1 668-1 668.4	5.379B	MOBILE-SATELLITE	SPACE RESEARCH	9.12, 9.12A, 9.13	---	
1 668.4-1 670	5.379B	MOBILE-SATELLITE	---	9.12, 9.12A, 9.13	---	
1 670-1 675	5.379B	MOBILE-SATELLITE	METEOROLOGICAL-SATELLITE	9.12, 9.12A, 9.13	---	6
1 980-2 010	5.389A	MOBILE-SATELLITE	---	9.12, 9.12A, 9.13	---	
2 010-2 025	5.389C	MOBILE-SATELLITE (Region 2)	---	9.12, 9.12A, 9.13	---	
2 160-2 170	5.389C	MOBILE-SATELLITE (Region 2)	---	9.12, 9.12A, 9.13, 9.14	FIXED (Region 2) MOBILE (Region 2) (see also No. 5.389E)	
2 170-2 200	5.389A	MOBILE-SATELLITE	---	9.12, 9.12A, 9.13, 9.14	FIXED MOBILE (see also No. 5.389F)	
2 483.5-2 500	5.402	MOBILE-SATELLITE RADIODETERMINATION-SATELLITE	---	9.12, 9.12A, 9.13, 9.14	FIXED MOBILE RADIOLOCATION (Region 2, Region 3) (see also No. 5.398A & 5.399)	
2 483.5-2 500	5.402	Radiodetermination-satellite (Region 1 and Region 3)	---	9.12, 9.12A, 9.13	---	
2 500-2 520	5.414	MOBILE-SATELLITE (Region 3)	FIXED SATELLITE (Region 2 and Region 3), RADIODETERMINATION-SATELLITE (5.404)	9.12, 9.12A, 9.13, 9.14* * Only applicable to MSS in J and IND (see No. 5.414A)	FIXED LAND MOBILE MARITIME MOBILE	

TABLE 9.11A-1 (continued) (MOD RRB18/78)

1	2	3	4	5	6	7
Frequency band (MHz)	Footnote No. in Article 5	Space services mentioned in a footnote referring to Nos. 9.11A, 9.12, 9.12A, 9.13 or 9.14, as appropriate	Other space services or systems to which Nos. 9.12 to 9.14 provisions(s) apply equally, as appropriate	Applicable Nos. 9.12 to 9.14 provision(s), as appropriate	Terrestrial services in respect of which No. 9.14 apply equally	Notes
2 520-2 535	5.403	MOBILE-SATELLITE (except AERONAUTICAL MOBILE-SATELLITE) (Region 3)	BROADCASTING-SATELLITE, FIXED SATELLITE (Region 2 and Region 3) AERONAUTICAL MOBILE-SATELLITE (countries in No. 5.415A)	9.12, 9.12A, 9.13, 9.14* * Only applicable to MSS, including AMSS in J and IND (see Nos. 5.414A and 5.415A)	FIXED LAND MOBILE MARITIME MOBILE	
2 630-2 655	5.418A 5.418B 5.418C	BROADCASTING-SATELLITE (sound) (5.418)	BROADCASTING-SATELLITE (Region 2) FIXED-SATELLITE (Region 2)	9.12, 9.12A, 9.13	---	4, 5
2 655-2 670	5.420	MOBILE-SATELLITE (except AERONAUTICAL MOBILE-SATELLITE) (Region 3)	BROADCASTING-SATELLITE FIXED SATELLITE (Region 2 and Region 3)	9.12, 9.12A, 9.13	---	
2 670-2 690	5.419	MOBILE-SATELLITE (Region 3)	FIXED SATELLITE (Region 2 and Region 3)	9.12, 9.12A, 9.13	---	
5 010-5 030	5.328B	RADIONAVIGATION-SATELLITE	AERONAUTICAL MOBILE-SATELLITE (R)	9.12, 9.12A, 9.13	---	
5 030-5 091	5.443D	AERONAUTICAL MOBILE-SATELLITE (R)	---	9.12, 9.12A, 9.13, 9.14	AERONAUTICAL MOBILE (R)	
5 091-5 150	5.444A	FIXED-SATELLITE (limited to non-GSO MOBILE-SATELLITE SERVICE feeder links)	AERONAUTICAL MOBILE-SATELLITE (R)	9.12, 9.12A, 9.13	---	
5 150-5 216	5.447A 5.447B	FIXED-SATELLITE (limited to non-GSO MOBILE-SATELLITE SERVICE feeder links)	RADIOTELETERMINATION-SATELLITE (non-GSO) (5.446), with date of bringing into use prior to 17.11.1995 (see No. 5.447C)	9.12, 9.12A, 9.13	---	
5 216-5 250	5.447A	FIXED-SATELLITE (limited to non-GSO MOBILE-SATELLITE SERVICE feeder links)	---	9.12, 9.12A, 9.13	---	
6 700-7 075	5.458B	FIXED-SATELLITE (limited to non-GSO MOBILE-SATELLITE SERVICE feeder links)	FIXED-SATELLITE (non GSO) in bands 6 700-6 725 MHz and 7 025-7 075 MHz	9.12		

## **9.23**

1 When the information under Nos. **9.30** and **9.32**, as the case may be, relating to only one form of coordination (e.g. No. **9.7**) has been received by the Bureau, in the case where there is a need to effect more than one form of coordination in accordance with Nos. **9.30** and **9.32**, as the case may be, it is in the interest of administrations that the Bureau establishes those other forms of coordination requirement immediately, rather than to proceed with them after receiving the request at a later date. Moreover, it will be more efficient, expeditious and easy to proceed with the publication required under Nos. **9.34/9.38** at one time (same date of receipt) on the same information.

In view of the above the Board decided to take the following practical approach. The Bureau, as far as possible, identifies any administrations with which coordination may need to be effected under Nos. **9.7** to **9.14** and **9.21** where applicable and includes their names in the publication even if the requests for a specific coordination form is not received by the Bureau at that time. If no comment is received from the administration responsible within the four months from the date of publication, it shall be considered that this publication is implemented according to the request of the administration and the corresponding coordination requirement has been established.

## **9.27**

### **1 Frequency assignments to be taken into account in the coordination procedure**

Frequency assignments to be taken into account in the coordination procedure are mentioned in § 1 to 5 of Appendix **5** (see also Rules of Procedure concerning No. **9.36** and Appendix **5**).

1.1 The period between the date of receipt by the Bureau of relevant information under No. **9.1A** for a satellite network and the date of bringing into use of the assignments of the satellite network in question shall in no circumstance exceed seven years as referred to in No. **11.44**. Consequently, frequency assignments not complying with these time-limits will no longer be taken into account under the provisions of No. **9.27** and Appendix **5**. (See also Nos. **11.43A**, **11.48**, Resolution **49 (Rev.WRC-15)** and Resolution **552 (WRC-15)**.) (MOD RRB18/78)

### **2 Modification of characteristics of a satellite network during coordination**

2.1 After an administration informs the Bureau of a modification of characteristics of its network, it is essential to establish its proper coordination requirements with respect to other administrations, i.e. with which administration(s), and for which of their network(s), the modified part of the network needs to effect coordination before it can be notified for recording.

2.2 The guiding principles for dealing with modifications are:

- general obligation to effect coordination before notification (No. **9.6**), and
- the fact that coordination is not required when the nature of the change is such as not to increase the interference to or from, as the case may be, the assignments of another administration, as specified in Appendix 5.

2.3 Based on these principles, and provided that the appropriate coordination trigger limit is exceeded, the modified part of the network will need to effect coordination with respect to space networks that are to be taken into account for coordination:

- a) networks with “2D-Date”<sup>2</sup> before D1<sup>3</sup>;
- b) networks with “2D-Date” between D1 and D2<sup>4</sup>, where the nature of the change is such as to increase the interference to or from, as the case may be, the assignments of these networks. In case of GSO networks referred to in No. **9.7**, including those to which the coordination arc approach has been applied (see No. **9.7** of Table 5-1 of Appendix 5), the increase of interference will be measured in terms of  $\Delta T/T$ , or pfd values when Resolution **553 (Rev.WRC-15)** or Resolution **554 (WRC-12)** apply. In case of non-GSO networks referred to in No. **9.7B**, the increase of interference will be measured in terms of a cumulative distribution function of equivalent power-flux density (epfd) produced to these earth stations. (MOD RRB18/78)

2.3.1 Where the coordination requirements of the modification involve any network under *b*) above, the modified assignments will have D2 as their “2D-Date”. Otherwise, they will retain D1 as their “2D-Date”.

2.3.2 In case of successive modifications of the same part of the network, if the next modification (compared with the previous modification) does not increase the interference to or from a particular network not included in the coordination requirements under *b*) above, that particular network will not be included in the coordination requirements of that next modification.

2.3.3 If it is not possible to verify that there is no increase of interference (e.g. in the absence of appropriate criteria or calculation methods), the “2D-Date” of the modified assignments will be D2.

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<sup>2</sup> The “2D-Date” is the date from which an assignment is taken into account as defined in § 1 *e*) of Appendix 5.

<sup>3</sup> D1 is the original “2D-Date” of the network undergoing modification.

<sup>4</sup> D2 is the date of receipt of request for modification. Concerning the date of receipt, see the Rule of Procedure on Receivability.



2.4 When the frequency assignments of non-GSO networks or systems are subject to epfd limits contained in Nos. **22.5C**, **22.5D** and **22.5F**, and/or to coordination under No. **9.7B**, administrations may wish to modify previously submitted data required for Article **22** examination<sup>4bis</sup>. As the modified parameters are not used for coordination between non-GSO networks or systems, the modified frequency assignments will retain D1 as their “2D-Date” provided that: (ADD RRB18/78)

- a) the previous assignments received favourable findings under No. **11.31** with respect to Article **22**; (ADD RRB18/78)
- b) the modified assignments received a favourable finding under No. **11.31** with respect to Article **22** using the latest version of the epfd validation software; (ADD RRB18/78)
- c) the modified assignments, in case that they are subject to No. **9.7B**, retain D1 as their “2D-Date” in accordance with §§ 2.3 to 2.3.2 above. (ADD RRB18/78)

2.5 After having examined the modified network as described in § 2.3 and § 2.4 above, the Bureau shall publish the modification, including its coordination requirements, in the appropriate Special Section for comments by administrations within the usual 4-month period, as appropriate. Initial characteristics are thus replaced by the published modified characteristics, and only the latter will be taken into account in subsequent applications of No. **9.36**. (MOD RRB18/78)

### **3 Modification to characteristics of an earth station**

3.1 The use of another associated space station may be one of the modifications of characteristics to an earth station. In the case of examination under Nos. **9.15**, **9.17** and **9.17A**, a new coordination contour is drawn and compared with the previous one. Coordination is then required with any administration on the territory of which a coordination distance is increased. In the case of examination under No. **9.19**, the pfd of the transmitting earth station with modified characteristics is calculated at the edge of the BSS service area. Coordination is then required with any administration on the territory of which the pfd at the edge of the BSS service area is increased as the result of modification of characteristics of the transmitting earth station in the FSS and is above the permissible level. However, if the initial associated space station has been cancelled or if the coordinated frequency assignments of the earth station do not cover the newly notified assignments, this notification of the assignments of the earth station will be considered as a new notice (first notification).

3.2 Generally, the Bureau uses the same approach, i.e. an increase of the coordination distance or an increase of the pfd at the edge of the BSS service area, according to the case, in order to decide if there is an increase of interference.

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<sup>4bis</sup> Limited to the elements listed under A.14, A.4.b.6.a and A.4.b.7 of RR Appendix 4.

<b>9.28, 9.29 and 9.31</b>
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1 These provisions of the Radio Regulations establish the complete responsibility of the requesting administration for effecting the coordination of the frequency assignments to stations in the terrestrial services and to earth stations (specific or typical) of satellite networks with respect to other earth stations and stations of terrestrial services (see Nos. **9.15** to **9.19**), without any involvement of the Radiocommunication Bureau, except the cases referred to in Nos. **9.33** and/or **9.52**. Therefore, the Board considers these provisions as being addressed to administrations, and the Bureau has no action to take in this respect.

2 See also the Rules of Procedure under No. **11.32** (§ 4).

<b>9.36</b>
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1 Under this provision, the Bureau “shall identify any administrations with which coordination may need to be effected”. In applying Appendix **5** with respect to No. **9.21**, the Bureau uses the following calculation methods and criteria<sup>5</sup>:

- space network vs. space network: Appendix **8**;
- earth station vs. terrestrial stations and *vice versa*, and earth station vs. other earth stations operating in the opposite direction of transmission: Appendix **7**;
- transmitting terrestrial stations vs. receiving space stations: criteria of Article **21**;
- transmitting space stations vs. terrestrial services<sup>6</sup>:
  - power flux-density (pfd) limits defined in Article **21** (where such limits are not applicable as hard limits to the service which is subject to No. **9.21**); or
  - coordination threshold pfd values applicable to other services in the same frequency band (e.g. pfd values in Table 5-2 of Annex 1 to Appendix **5**); or
  - frequency overlap with recorded terrestrial stations when no applicable pfd value mentioned above is available;
- receiving space stations vs. transmitting terrestrial stations: frequency overlap within the visibility area of the satellite network;
- between stations of terrestrial services in some specific frequency bands: Rules of Procedure B4, B5 and B6 as appropriate.

2 For coordination requests under Nos. **9.11** to **9.14** and **9.21**, it is to be noted that irrespective of the identification by the Bureau under No. **9.36** (see footnote **9.36.1**), any administration, even one which was not identified, may disagree with the published assignment under No. **9.52** and any administration, including one identified by the Bureau, that has not commented on the proposed use within the regulatory time limit is considered to be unaffected by that use in accordance with No. **9.52C**.

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<sup>5</sup> For cases not covered under this paragraph, the Bureau, in collaboration with the appropriate Radiocommunication Study Groups, continue to develop applicable calculation methods and criteria in the form of Rules of Procedure to be submitted to the Board for approval.

<sup>6</sup> Cases relevant to this indent are shown in the Annex to this Rule.

### 11.13

1 This provision stipulates that no notification shall be made of the frequencies that are prescribed for common use by stations of a given service. According to this provision the Bureau established a list of the frequencies that enter into this category. This list is regularly updated and published in the Preface to the International Frequency List (IFL), in frequency order (Chapter VI of the Preface). The common frequencies appear in the Master International Frequency Register (Master Register) and in the IFL.

2 A summary of the frequencies/frequency bands that are prescribed for common use, is given below:

- GMDSS frequencies for distress and safety calling using DSC techniques (2 187.5 kHz, 4 207.5 kHz, 6 312 kHz, 8 414.5 kHz, 12 577 kHz, 16 804.5 kHz and 156.525 MHz);
- GMDSS frequencies for distress and safety traffic by NBDP telegraphy (2 174.5, 4 177.5, 6 268, 8 376.5, 12 520 and 16 695 kHz);
- GMDSS frequencies for distress and safety traffic by radiotelephony (2 182 kHz, 4 125 kHz, 6 215 kHz, 8 291 kHz, 12 290 kHz, 16 420 kHz and 156.8 MHz);
- International frequencies for search and rescue operations (2 182 kHz, 3 023 kHz, 5 680 kHz, 8 364 kHz, 10 003 kHz, 14 993 kHz, 19 993 kHz, 121.5 MHz, 123.1 MHz, 156.3 MHz, 156.8 MHz, 161.975 MHz, 162.025 MHz and 243 MHz);
- International frequencies for digital selective calling, for purposes other than distress and safety (455.5, 458.5, 2 177, 2 189.5, 4 208, 4 208.5, 4 209, 4 219.5, 4 220, 4 220.5, 6 312.5, 6 313, 6 313.5, 6 331, 6 331.5, 6 332, 8 415, 8 415.5, 8 416, 8 436.5, 8 437, 8 437.5, 12 577.5, 12 578, 12 578.5, 12 657, 12 657.5, 12 658, 16 805, 16 805.5, 16 806, 16 903, 16 903.5, 16 904, 18 898.5, 18 899, 18 899.5, 19 703.5, 19 704, 19 704.5, 22 374.5, 22 375, 22 375.5, 22 444, 22 444.5, 22 445, 25 208.5, 25 209, 25 209.5, 26 121, 26 121.5 and 26 122 kHz);
- International frequencies for selective calling using the sequential single-frequency code system (2 170.5, 4 125, 4 417, 6 516, 8 779, 13 137, 17 302, 19 770, 22 756 and 26 172 kHz);
- International frequencies for radiotelephone calling (4 125, 4 417, 6 215, 6 516, 8 255, 8 779, 12 290, 12 359, 13 137, 16 420, 16 537, 17 302, 18 795, 19 770, 22 060, 22 756, 25 097 and 26 172 kHz);
- International ship-to-shore working or intership frequencies (2 045, 2 048, 2 635 and 2 638 kHz);

- 410 kHz, worldwide frequency for radio direction-finding in the maritime radio-navigation services;
- 75 MHz, worldwide frequency assigned to aeronautical marker beacons.

3 If these frequencies are used by other services and/or for purposes other than those specified in the Radio Regulations, they should be notified under the relevant provisions of Article **11** and, in some cases, under the provisions of No. **4.4**.

#### **11.14**

(MODD RRB17/76)

1 This provision stipulates, *inter alia*, that frequency assignments to ship stations and to mobile stations of other services shall not be notified under Article **11**. On the other hand, the provisions of No. **11.2** stipulate the conditions under which receiving stations are to be notified to the Bureau. Similarly, the provisions of No. **11.9** stipulate the conditions under which a land station for reception from mobile stations is to be notified to the Bureau. In combining the conditions of all these provisions, the Board concluded that the following categories are not to be notified to the Bureau:

- Worldwide frequencies for use by ship and coast SSB radiotelephone stations by simplex (single-frequency) operation and for intership cross-band (two-frequency) operation (frequencies indicated in Part B, Section I, Sub-Section B of Appendix **17**);
- Worldwide working frequencies for ship stations equipped for NBDP telegraphy and data transmission systems on a non-paired basis (frequencies indicated in Part B, Section III of Appendix **17**).

2 If the frequencies referred to in § 1 above are used by other services and/or for purposes other than those specified in the Radio Regulations, they should be notified under the relevant provisions of Article **11** and in some cases under the provisions of No. **4.4**.

**11.44B**

1 This provision concerns the bringing into use of a frequency assignment to a space station in the geostationary-satellite orbit. In order to consider such a frequency assignment as having been brought into use, the notifying administration has to inform the Bureau within thirty days from the end of the ninety-day period during which a space station in the geostationary satellite orbit with the capability of transmitting or receiving that frequency assignments has been deployed and maintained continuously at the notified orbital location.

2 The Board carefully studied the relationship between the various provisions related to bringing into use of frequency assignments for a GSO satellite network under Nos. **11.43A**, **11.44**, **11.44.2**, **11.44.3**, **11.44B**, **11.44B.1**, **11.44B.2** and **11.47** and concluded that the Bureau will apply the following procedure.

3 No. **11.44**<sup>10</sup> establishes the regulatory time limit for bringing frequency assignments to a space station into use and states that the Bureau shall cancel those frequency assignments which are not brought into use within the required regulatory period. Nos. **11.44B** and **11.44B.2** established the conditions upon which a frequency assignment to a space station in the geostationary-satellite orbit shall be considered as having been brought into use. The Bureau will record the date of the commencement of the ninety-day period defined in No. **11.44B**, or the date provided by the administration in accordance with No. **11.44B.2**, as the notified date of bringing into use (see No. **11.44.2**). The date of bringing into use of an assignment will be made available on the BR web with indication of status of confirmation and subsequently be published in PART II-S of the BR IFIC if the assignment is to be recorded in MIFR. In the absence of the confirmation information under No. **11.44B** and No. **11.44B.2**, the Bureau shall cancel the assignments provisionally recorded in the MIFR under No. **11.44**<sup>11</sup> and/or delete the relevant special sections under No. **11.48**<sup>12</sup>, as appropriate.

4 Frequency assignments for which an administration has submitted notification information for recording in the MIFR without submitting the mandatory information required under provision No. **11.44B**, will be recorded provisionally in the MIFR. Thereafter, at the end of the period provided under No. **11.44**, the Bureau shall act in accordance with the provisions of No. **11.47** and/or No. **11.44B**.

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<sup>10</sup> Similarly applicable to §§4.1.3 or 4.1.3*bis* or 4.2.6 or 4.2.6*bis* of Article 4 of Appendices **30** and **30A** and §§6.1 or 6.31*bis*, and 6.33 of Article 6 of Appendix **30B**.

<sup>11</sup> Similarly applicable to §5.3.1 of Article 5 of Appendices **30** and **30A** and §8.16 of Article 8 of Appendix **30B**.

<sup>12</sup> Similarly applicable to §§4.1.3 or 4.1.3*bis* or 4.2.6 or 4.2.6*bis* of Article 4 of Appendices **30** and **30A** and §6.33 of Article 6 of Appendix **30B**.

**11.47**

The reference in No. **11.47** to No. **11.44** and its regulatory period should be considered as five years from the date of receipt of a notice of a change referred to in No. **11.43A**. (See also the comments made under the Rules of Procedure concerning No. **11.43A** and No. **11.44B**).

**11.48**

**Note:** WRC-15 took the decision related to RR No. **11.48** during the 8<sup>th</sup> Plenary, Par. 1.39 to 1.42 of Doc. CMR15/505, Approval of Doc. CMR15/416 in relation to Section 2.2.2, as follows:

*“WRC-15 noted the inconsistency between RR No. **11.48** and § 8 of Annex 1 to Resolution 552 (WRC-12)\* and confirmed its understanding that frequency assignments of satellite networks operating in the 21.4-22 GHz band shall be cancelled by the Bureau 30 days after the end of the seven-year period following the date of receipt by the Bureau of the relevant complete information under RR No. **9.1** or **9.2**, as appropriate, and after the end of the three-year period following the date of suspension under RR No. **11.49**\*\*.”*

(ADD RRB18/78)

### **Actions from the Bureau following a Board decision to grant an extension for bringing into use frequency assignments to a satellite network**

When the Board decides to grant an extension of the regulatory time limit for bringing into use frequency assignments to a satellite network in cases of *force majeure* or co-passenger delay, this raises the question of whether the deadline for the submission of Resolution **49 (Rev.WRC-15)** and notification information should also be extended. Indeed, No. **11.48** does not only relate to the bringing into use, but also requires that the Radiocommunication Bureau receives the first notice for recording of the frequency assignments under No. **11.15** and the due diligence information under Resolution **49 (Rev.WRC-15)** before the end of the 7-year regulatory period.

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

\*\* *Note by the Secretariat:* WRC-15 further amended the provisions of No. **11.49**. As a consequence, the “three-year period following the date of suspension” is understood to refer to the end of the maximum period of suspension under No. **11.49**.

Unless explicitly decided otherwise by the Board, an extension of the date of bringing into use of frequency assignments to a satellite network does not imply an extension of the regulatory deadline for submitting the notification and Resolution **49 (Rev.WRC-15)** information under No. **11.48**, because such information about the planned frequency usage and coordination status would be useful to other administrations in the planning of their satellite projects and their coordination activities. Consequently, in cases where this information has not been provided before the decision of the Board to grant an extension of the deadline for bringing into use, the Bureau will inform the notifying administration after the Board decision that it still has to provide, within the 7-year period and in accordance with No. **11.48**, the notification and Resolution **49 (Rev.WRC-15)** information pertaining to the satellite that faced a case of *force majeure* or a co-passenger delay.

If, before the end of the period of extension or within one year following the Board's decision to grant an extension, whichever is earlier, the notifying administration has not provided to the Bureau updated Resolution **49 (Rev. WRC-15)** information for the new satellite under procurement, the related frequency assignments shall lapse. If, one month before the above-mentioned deadline, the notifying administration has not provided to the Bureau updated Resolution **49 (Rev. WRC-15)** information, the Bureau shall promptly send a reminder to the notifying administration.

<b>11.49 and 11.49.1<sup>13</sup></b>
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## **1 Suspended assignments**

1.1 Under the provisions of No. **11.49**, the Board understands that an administration may inform the Bureau of the suspension of the use of a frequency assignment to a space station for a period not exceeding three years and that during this period the frequency assignment shall still continue to enjoy the protection acquired by virtue of the coordination agreements already obtained.

1.2 The Board decided that the procedure described below shall apply. The procedure will only be valid for suspended assignments which are not modified before being brought back into use.

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<sup>13</sup> Similarly applicable to §§5.2.10 and 5.2.11 of Article 5 of Appendices **30** and **30A** and §8.17 of Article 8 of Appendix **30B**.





**An. 1**

**Limits for determining whether a service of an administration is affected  
by proposed modifications to the Region 2 Plan or by proposed  
new or modified assignments to the Regions 1 and 3 List**

**1**

*a) Test points*

1 In examining a proposed modification, all test points communicated to the Bureau by administrations are used. These test points are periodically published by the Bureau together with the updated reference situation of the Plan(s) and List(s).

*b) Implementation of the power flux-density limit referred to in the first paragraph of Section 1 of Annex 1 to Appendix 30*

The power flux-density limit of  $-103.6 \text{ dB(W/(m}^2 \cdot 27 \text{ MHz))}$  which is indicated in the first paragraph of Section 1 of Annex 1 to Appendix 30 was established in order to protect BSS assignments from interference that may be caused by BSS networks located outside an arc of  $\pm 9^\circ$  around a wanted BSS network, under worst-case station-keeping conditions. Therefore, this power flux-density limit was intended to be considered as a hard-limit that shall not be exceeded.

c) *Implementation of the power flux-density masks and equivalent protection margin criterion referred to in sub-paragraphs a) and b) of Section 1 of Annex 1 to Appendix 30*

1 In accordance with sub-paragraphs a) and b) of Section 1 of Annex 1 to Appendix 30, an administration, which has assignment(s) in the Plan, in the List or assignment(s) for which the procedure of Article 4 of Appendix 30 has already been initiated, is considered as affected by a proposed new or modified assignment in the List if all the following conditions are met:

- the orbital spacing between both assignments is less than 9°, under worst-case station-keeping conditions; and
- there is a frequency overlap between the bandwidths assigned to each assignment; and
- under assumed free-space propagation conditions, the power flux-density value derived from the appropriate power flux-density mask given in § a) of Section 1 of Annex 1 to Appendix 30 is exceeded at least at one of the test-points<sup>10</sup> of the wanted assignment; and
- the reference equivalent protection margin of at least one of the test-points<sup>10</sup> of that wanted assignment falls more than 0.45 dB below 0 dB, or if already negative, more than 0.45 dB below that reference equivalent protection margin value.

d) *Reference protection margin<sup>11</sup>*

1 The reference equivalent protection margin values of:

- the assignments in the downlink or feeder-link Plans;
- the assignments in the downlink or feeder-link Lists;
- the assignments for which the procedure of Article 4 of Appendices 30 or 30A has been initiated,

include the potential interference effects of the other assignments of the corresponding Plan and List, as established at WRC-2000, and those of the other assignments entered in the corresponding List after a successful application of the Article 4 procedure.

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<sup>10</sup> In the case of a wanted assignment in the Plan, the test-points referred to in this paragraph are those defined in that Plan. In the case of a wanted assignment in the List or for which the procedure of Article 4 of Appendices 30/30A has already been initiated, the test-points referred to in this paragraph are those provided under former Annex 2 to Appendices 30/30A or under Appendix 4.

<sup>11</sup> An analysis carried out by the Bureau has shown that the sensitivity to interference, in terms of being identified as affected, by networks received by the Bureau under Article 4 of Appendices 30 and 30A, caused by subsequent proposed modifications to the Plan, decreases when those networks have a very low equivalent protection margin. In those cases where, because of the above phenomenon they are not identified as affected (the equivalent protection margin reduces by at least 0.45 dB) it is up to the administrations concerned to take necessary action, as appropriate.

The Board concluded that all technical characteristics published in the Part B Special Section for a given network need to be taken into account in this examination. Therefore, the examination from the viewpoint of conformity with the Lists is carried out in two steps:

- a) to ensure that the characteristics notified are those specified in the columns of the List concerned, as updated, and those specified in the Part B Special Section of a given network. If the characteristics are different then the examination under § 5.2.1 *d*) is carried out;
- b) to ensure that the protection criteria resulting from the Regions 1 and 3 Plan and List concerned are not exceeded. To this effect, the characteristics specified in the columns of the List concerned, as updated, and those specified in the Part B Special Section of a given network are examined.

3 See also the Rules of Procedure relating to the scope of application of Article 5 of Appendix 30A.

#### **5.2.1 d)**

1 If an administration notifies any assignment with characteristics different from those listed in § 1 *b*) of the Rules of Procedure related to § 5.2.1 *b*) of Article 5 of Appendix 30A, and those allowed in § 5.2.1 *d*) of the same Article, a calculation is undertaken by the Bureau to determine if the proposed new characteristics would increase the interference level caused to other assignments in the appropriate Regional Plan, in the Regions 1 and 3 List(s), in the same service of an inter-regional Plan or in another service sharing the same frequency bands.

1.1 With respect to the compatibility of the proposed new characteristics with other assignments of the same Regional Plan and List, as appropriate, the increase of the interference will be checked by comparing the equivalent protection margin/overall equivalent protection margin values of these other assignments, which result from the proposed new characteristics on the one hand, and those obtained with the previous<sup>4</sup> characteristics of the network in question on the other hand. These equivalent protection margin/overall equivalent protection margin calculations are performed under the same technical assumptions and conditions taking into account the orbital separation limit of  $\pm 9^\circ$  for assignments in the Regions 1 and 3 Plan and List. A more detailed analysis of the interference situation could also be required by using single entry *C/I* values in order to identify the assignments of the network in question which are causing the increase of the interference.

In addition, in the case of Regions 1 and 3, the notified assignments with new characteristics for the network in question are examined with respect to their compliance with the power flux-density hard-limit defined in § 4 of Annex 1 to Appendix 30A, or, as the case may be, with respect to their compliance with the power flux-density level of the corresponding assignments in the Plan(s) or in the List(s) if those assignments were adopted by WRC-2000 with power flux-density level(s) higher than the above-mentioned power flux-density hard-limit.

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<sup>4</sup> As appearing in the appropriate Plan or List, according to the case.

1.2 With respect to the compatibility with other inter-regional assignments in the same service or assignments in another service sharing the same frequency bands, as appropriate, the increase of the interference will be checked by calculating the  $\Delta T/T$  values, in accordance with the method given in Appendix 8, produced by the proposed new characteristics, and by comparing the resulting  $\Delta T/T$  values, with those obtained with the previous<sup>4</sup> characteristics of the subject assignment.

1.3 Should the results of the calculations described in § 1.1 and 1.2 above indicate that the proposed new characteristics increase the interference to other assignments, the Bureau would reach an unfavourable finding with respect to § 5.2.1 *d*) of Article 5 of Appendix 30A and proceed accordingly.

2 With respect to the fourth indent of § 5.2.1 *d*), in the case of administrations of Region 2, the orbital position shall be examined to ensure compliance with the cluster concept (§ B of Annex 7 to Appendix 30 and § 4.13.1 of Annex 3 to Appendix 30A) as follows:

- if the orbital position is identical with that shown in the Plan, no further agreements are necessary;
- however, if the orbital position is different from that contained in the Plan but it is in the same cluster, then the agreement of administrations having assignments in the same cluster is necessary. The clusters are listed in Attachment 1 to the Rules of Procedure concerning Appendix 30. Appendices 30 and 30A do not contain any paragraph indicating the procedure to be followed for the above-mentioned agreement. The task of the Bureau in this respect is to ensure that the agreement of the administrations concerned is indicated in the notice; otherwise it considers the assignment to be not in conformity with Plan.

#### 5.2.2.1

This paragraph implicitly relates to the cases where the Bureau reaches a favourable finding with respect to § 5.2.1 *a*), § 5.2.1 *c*) and § 5.2.1 *f*) and an unfavourable finding with respect to § 5.2.1 *b*) but a favourable finding with respect to § 5.2.1 *d*).

However, considering the Rules of Procedure relating to the scope of application of Article 5 of Appendix 30A, the Board concluded that § 5.2.2.1 relates to the cases where the Bureau reaches a favourable finding with respect to § 5.2.1 *a*) and § 5.2.1 *c*) and an unfavourable finding with respect to § 5.2.1 *b*) but a favourable finding with respect to § 5.2.1 *d*).

In this event the frequency assignment shall be recorded in the Master Register.

## Art. 6

### Coordination, notification and recording of receiving terrestrial assignments when FSS feeder-links are involved

#### 6.1

1 The paragraphs of Article 6 do not mention interim systems implemented in accordance with Resolution **42 (Rev.WRC-03)\***. Such systems may be implemented in the frequency band 17.7-17.8 GHz for Region 2 shared with equal rights with terrestrial services:

Such usage may affect terrestrial stations.

2 This paragraph refers to “a feeder-link earth station located on the territory of another administration and included in the service area of an assignment to a broadcasting-satellite service feeder-link space station which is in conformity with the appropriate regional feeder-link Plan”. This earth station is to be considered a typical earth station located at the worst location.

3 In order to evaluate the interference, an Administration A, intending to use terrestrial stations, needs to know the fixed-earth station existing or planned. In order to take them into account administrations may calculate the coordination area as indicated in § 1.4.6 of Appendix 7 around the service area mentioned in § 6.1.

#### 6.2

1 This paragraph refers to the need for an Administration B to communicate the actual location of its feeder-link earth stations without specifying which of these earth stations should be taken into account. As no indication is given, the Board understands that the administration may communicate the locations of earth stations without any limitations.

2 The actual locations of earth stations so communicated to Administration A and to the Bureau will be examined for their conformity with the characteristics listed under comments relating to § 5.2.1 *b)* of this Appendix or those for which the procedure of Article 4 was successfully applied. This examination will lead to the following:

- earth stations which conform to the above characteristics will be entered in the Plan without applying the Article 4 procedure, and Administration A will be informed accordingly;

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

- earth stations which do not conform to the characteristics listed under the comments relating to § 5.2.1 *b)* and for which the Article 4 procedure was not applied will be recorded in the Plan once the procedure of Article 4 is successfully applied and in this application of Article 4 the proposed use of the terrestrial service by Administration A shall be taken into account.

3 It is concluded from this paragraph that no transportable earth station can be used in the band 17.7-17.8 GHz in Region 2.

## 6.5

This paragraph implies that these feeder-link earth stations will not be entered in the Plan. For this reason the Bureau shall in such cases recommend to the administration that it applies the procedure of Article 4 in order to permit its earth stations to be entered in the Plan.

## Art. 7

### **Coordination, notification and recording of FSS assignments when feeder-links to BSS assignments are involved**

## 7.7

The comments under § 6.5 apply.

## An. 1

### **Limits for determining whether a service of an administration is affected by proposed modifications to the Region 2 Plan or by proposed new or modified assignments to the Regions 1 and 3 feeder-link Lists**

## 3

See comments made under the Rules of Procedure concerning § 2 of Annex 1 to Appendix 30.

## 4

*a) Test points*

See comments made under the Rules of Procedure concerning § *a)* of Section 1 of Annex 1 to Appendix 30.

- 3) if the field strength from the reference broadcasting station is less than the trigger field strength at all “boundary points”, then the reference broadcasting station is moved along the radial in 10 km steps towards the centre of gravity of the service area until the field strength, produced from this new location, exceeds or is equal to the trigger field strength at any of the “boundary points”. The location of the reference broadcasting station, from which the reference broadcasting station produces a field strength which exceeds or is equal to the trigger field strength at any of the “boundary points”, determines the coordination distance for this radial.
- 4) In the case of a receiving airborne station in the aeronautical mobile service or in aeronautical radionavigation service, the Bureau will use the same methodology as the one described in § 3 above, by replacing the 1 000 km geometrical contour with 420 km geometrical contour, in accordance with § 2 above.

(ADD RRB18/78)

## 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.2 Coordination trigger field strengths to protect the mobile service in the bands 174-230 MHz and 470-862 MHz**

Table A.1.3 of this section contains the system type codes for mobile service systems and their corresponding coordination trigger field-strength values to protect from DVB-T. These coordination triggers cannot be applied to IMT-2000 and IMT-Advanced stations, since the specific systems listed in the Table do not belong to the IMT “family” of standards. As for a generic code ‘NB’ contained in the Table, it cannot be used for IMT systems, pursuant to Resolutions **749 (Rev.WRC-15)** and **760 (WRC-15)**.

In view of the above, the Board decided that, when submitting frequency assignments to stations of IMT-2000 and IMT-Advanced systems, e.g. LTE and LTE-Advanced, in the band 470-862 MHz for application of the GE06 coordination procedure and notification for the Master Register, administrations shall use the system type code ‘ND’.

The coordination trigger field strengths corresponding to this code are calculated by the Bureau using the notified technical characteristics and equation (2) from Recommendation ITU-R M. 1767-0, as follows:

$$F_{trigger} = -37 + F - G_i + L_F + 10 \log(B_i) + P_o + 20 \log f + I / N - K$$

where:

- $F$ : receiver noise figure of the mobile service base or mobile station receivers (dB)
- $B_i$ : the bandwidth of a 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 0 dB for the UHF band)
- $I/N$ : interference to noise ratio
- $K$ : overlap correction factor, calculated as shown in the Attachment to Appendix 4.2 of the GE06 Agreement (Tables AT.4.2-4 and AT.4.2-5), where the overlapped bandwidth  $B_o$  is calculated as follows:

$$B_o = \text{Min} (B_i, B_v, (B_v + B_i)/2 - |\Delta f|)$$

where:

- $B_v$ : the bandwidth of the receiving station in the mobile service
- $\Delta f$ : the difference between the centre frequency of the mobile service system and the centre frequency of the interfering (DVB-T) signal.

The parameters to be applied in the equation are listed below. They are derived from Report ITU-R M.2039-3 for IMT-2000 systems and Report ITU-R M.2292-0 for IMT-Advanced systems.

Parameters	Receiving base station (ML)	Receiving mobile station (FB)
$f$ (centre frequency, MHz)	470-862	
$F$ (receiver noise figure, dB)	5	9
$G_i$ (receiver antenna gain, dBi)	15	-3
$L_F$ (antenna cable feeder loss, dB)	3	0
$P_o$ (man-made noise, dB)	0	0
$F - G_i + L_F + P_o$	-7	12
$I/N$ (interference to noise ratio, dB)	-6	
$B_i$ (bandwidth of TV station, MHz)	8	

The above parameters apply to stations operating on frequency 790 MHz. For other frequencies in the UHF band, the interpolation should be made by adding a correction factor of  $10 \log (f/790)$ .



As an indication of the resulting values, the trigger field strengths of an IMT station operating on 790 MHz are equal to 17 dB( $\mu$ V/m) for a receiving base station and 36 dB( $\mu$ V/m) for a receiving mobile station, when the *K* factor is 0, i.e. when the IMT station uses a bandwidth less than or equal to 8 MHz.

For establishing coordination contours, the heights of receiving antennas of base and mobile stations are assumed to be 30 m and 1.5 m respectively.

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II. The assessment of interference caused by the network submitted for examination under No. **11.32A** into incumbent networks:

In this case, to calculate the required  $C/I$  of each of the incumbent networks, the lower value between the submitted  $C/N$  objective (see item C.8.e.1 of Annex 2 of Appendix 4) and the calculated  $C/N$  (using power values submitted by the notifying administration in items C.8.a.1/C.8.b.1 of Appendix 4) of the incumbent network is used.

If no  $C/N$  objectives are submitted by notifying administrations (since this was not required in the past), the calculated  $C/N$  values are used.

In respect of  $C/N$  ratio calculations used to define single entry protection criteria ( $C/I$  required), Table 2 of Recommendation ITU-R S.741-2 (see below) defines " $C/N_{tot}$ " as a "ratio (dB) of carrier to total noise power which includes all internal system noise and interference from other systems". Therefore, and to comply with this definition, an additional margin of 0.46 dB for cases involving wanted analogue TV emissions and 1.87 dB for other wanted emissions should be added to the margins calculated on the basis of the internal system noise values provided by the concerned administrations unless the submitted  $C/N$  objective already includes a margin to account for inter-system interference. Attachment 2 contains the calculation methodology used for deriving the above-mentioned additional margin. (MOD RRB18/78)

For the identification of the required  $C/I$  with respect to networks received on or after 1 January 2005, whenever the submitted  $C/N$  objective is used, no additional margins should be added to the value submitted/provided since, following a revision of Appendix 4 by WRC-03, the  $C/N$  objective submitted after this date should already include a margin to account for inter-system interference. On the other hand, whenever the calculated  $C/N$  is used to identify the required  $C/I$ , as it may be the case according to Scenario II above, the relevant additional margin should be added to the value of the calculated  $C/N$ . (ADD RRB18/78)

### 3.1 Interfering cases

Table 1 below presents a summary of the different interfering situations to be dealt with when performing  $C/I$  calculations.

TABLE 1  
Interference cases

Desired Interfering	Digital	Analogue (TV-FM)	Analogue (other than TV-FM)	Other
Digital	Use <i>C/I</i> plus interference adjustment factor <sup>1</sup> (I)	Use <i>C/I</i> plus interference adjustment factor <sup>1</sup> (II)	Use <i>C/I</i> plus interference adjustment factor <sup>1</sup> (III)	Use <i>C/I</i> plus interference adjustment factor <sup>1</sup> (XI)
Analogue (TV-FM)	Use <i>C/I</i> plus interference adjustment factor <sup>2</sup> (IV)	<u>Co-frequency:</u> use <i>C/I</i> plus interference adjustment factor <sup>1</sup> (X)  <u>Non co-frequency:</u> use relative protection ratio mask <sup>3</sup> (V)	Use <i>C/I</i> plus interference adjustment factor <sup>2</sup> (VI)	Use <i>C/I</i> plus interference adjustment factor <sup>2</sup> (XII)
Analogue (other than TV-FM)	Use <i>C/I</i> plus interference adjustment factor <sup>2</sup> (VII)	Use <i>C/I</i> plus interference adjustment factor <sup>2</sup> (VIII)	Use <i>C/I</i> plus interference adjustment factor <sup>2</sup> (IX)	Use <i>C/I</i> plus interference adjustment factor <sup>2</sup> (XIII)
Other	Use <i>C/I</i> plus interference adjustment factor <sup>2</sup> (XIV)	Use <i>C/I</i> plus interference adjustment factor <sup>2</sup> (XV)	Use <i>C/I</i> plus interference adjustment factor <sup>2</sup> (XVI)	Use <i>C/I</i> plus interference adjustment factor <sup>2</sup> (XVII)

<sup>1</sup> Interference adjustment factor for Cases I, II, III, X and XI is the same (see § 2.1.1 of Attachment 1).

<sup>2</sup> Interference adjustment factor for Cases IV, VI to IX and XII to XVII is the same (see § 3.5 below).

<sup>3</sup> See § 3.1 of Attachment 1.

The selection of an interference case defined in Table 1 above requires the identification of the type of each carrier. Taking into account the information submitted to the Bureau by administrations in accordance with Appendix 4 (i.e. the class of emission as defined in Annex 2 item C.7.a), the Bureau shall use the following carrier type definition:

– Analogue (TV-FM):

When the Class of Emission (item C.7.a of Annex 2 to Appendix 4) is defined with “F” for the first character and with “F” or “W” for the third character.

– Analogue (other than TV-FM):

When the first character of the Class of Emission is “F” and the third character is anything other than “F” or “W”.

– Digital:

When the first character of the Class of Emission is “G”.

– Other:

When the first character of the Class of Emission is anything other than “F” or “G”.

### **3.2 Margin $M$ , $C/I$ , $C/N$ algorithms**

The algorithms described in Attachment 1 shall be used to evaluate compliance with the mutually accepted interference criteria or with the single entry limits established in Table 2.

Table 2 provided below takes into account the information submitted to the Bureau by administrations in accordance with Appendix 4 and the carrier type definition in § 3.1 above and is a simplification of Table 2 of Recommendation ITU-R S.741-2.

TABLE 2 (MOD RRB18/78)

**Single entry interference (SEI) protection criteria**

Interfering carrier type Desired carrier type	Analogue (TV-FM) or other	Digital	Analogue (other than TV-FM)
Analogue (TV-FM)	$C/N_{tot} + 14$ (dB)		
Digital	If $DeNeBd \leq InEqBd$ then $C/N_{tot} + 9.4 + 3.5 \log(\delta) - 6 \log(i/10)$ (dB) (i.e. $C/N_{tot} + 5.5 + 3.5 \log(DeNeBd \text{ (MHz)})$ ) Otherwise if $DeNeBd > InEqBd$ then $C/N_{tot} + 12.2$ (dB)	$C/N_{tot} + 12.2$ (dB)	
Analogue (other than TV-FM)	$13.5 + 2 \log(\delta) - 3 \log(i/10)$ (dB) (i.e. $11.4 + 2 \log(DeNeBd \text{ (MHz)})$ )	$C/N_{tot} + 12.2$ (dB)	
Other	$13.5 + 2 \log(\delta) - 3 \log(i/10)$ (dB) (i.e. $11.4 + 2 \log(DeNeBd \text{ (MHz)})$ )	$C/N_{tot} + 14$ (dB)	

where:

$C/N_{tot}$ : ratio (dB) of carrier to total noise power which includes all internal system noise and interference from other systems

DeNeBd: necessary bandwidth of desired carrier (Appendix 4, Annex 2, item C.7.a)

InEqBd: equivalent bandwidth of interfering carrier (equal to total power to power density ratio (see Appendix 4, Annex 2, items C.8.a.1 and C.8.a.2 respectively))

$\delta$ : ratio of desired signal bandwidth to peak-to-peak deviation of the TV carrier caused by the energy dispersal signal (a peak-to-peak deviation of 4 MHz is used in all cases)

$i$ : pre-demodulation interference power in the desired signal bandwidth expressed as a percentage of the total pre-demodulation noise power (a value of 20 is used in all cases).

### 3.3 Single channel per carrier (SCPC) cases

When dealing with composite interference from a number of narrow-band carriers such as a transponder loaded with SCPC carriers the assumption is made, in the absence of more detailed data from administrations, that the interfering satellite has its transponder fully loaded with SCPC carriers and the individual carriers can be replaced with one wideband carrier which has a total power equal to the sum of the powers of the individual SCPC carriers. The protection ratios given in Recommendation ITU-R S.671 are used to protect SCPC transmissions interfered with by analogue television carriers only modulated with energy dispersal signals.

### 3.4 Interference between analogue FDM-FM signals (Case (IX) in Table 1 above)

When dealing with FDM-FM carriers, and to find out the resulting margin, the  $C/I$  ratio is calculated and compared with the required  $C/I$ . However a  $C/N + K$  type protection criteria is developed based on the equations of Recommendation ITU-R SF.766 which are required to calculate the  $B$  factor (interference reduction factor). In the absence of detailed information for the calculation of the  $B$  factor, the interference adjustment factor described in § 3.5 below shall be used.

### 3.5 Other interference cases

For cases (IV), (VI), (VII), (VIII), IX and (XI) to (XVII) in Table 1 above, the interference adjustment factor mentioned in § 3 above shall be used. In calculating this factor consideration shall be given to the third paragraph of § 3.4 of Annex 1 to Recommendation ITU-R S.741-2.

## ATTACHMENT 1

### Calculation algorithms ( $M$ , $C/I$ , $C/N$ )

#### 1 Margin algorithm (MOD RRB18/78)

To compute the margins, it is necessary first to determine the required  $\left(\frac{C}{I}\right)_m$  value, which is a function of the  $C/N$  and the  $K$  factor:

$$\left(\frac{C}{I}\right)_m = \left(\frac{C}{N_{tot}}\right) + K$$

where:

$\left(\frac{C}{I}\right)_m$  : required  $C/I$  value (dB)

$\left(\frac{C}{N_{tot}}\right)$  : ratio (dB) of carrier to total noise power which includes all internal system noise and interference from other systems

$K$  : factor used in computing the required  $C/I$  (dB). Generally, this will be either 14.0 or 12.2, depending on the modulation characteristics of the desired signals (see Recommendations ITU-R S.483 and ITU-R S.523).

The total carrier-to-noise ratio is defined, as follows:

a) For receiving frequency assignments of a network received before 1 January 2005:

- Scenario I (as defined in Section 3):

$$\left(\frac{C}{N_{tot}}\right) = \left(\frac{C}{N}\right)_{obj} - X$$

- Scenario II:

$$\left(\frac{C}{N_{tot}}\right) = MIN\left(\frac{C}{N_i}, \left(\frac{C}{N}\right)_{obj}\right) - X$$

b) For receiving frequency assignments of a network received on and after 1 January 2005:

- Scenario I:

$$\left(\frac{C}{N_{tot}}\right) = \left(\frac{C}{N}\right)_{obj}$$

- Scenario II:

$$\left(\frac{C}{N_{tot}}\right) = MIN\left(\frac{C}{N_i} - X, \left(\frac{C}{N}\right)_{obj}\right)$$

where:

$X$  : Additional margin (see Attachment 2, Sections 3 to 5) to comply with the definition of carrier to total noise power, which includes all internal system noise and interference from other systems. Attachment 2 contains the methodology used for deriving the additional margin.

$C/N_i$ : Calculated value of carrier-to-noise ratio, based on internal system noise power, defined in Section 3 below.



$(C/N)_{obj}$ :  $C/N$  objective of the network (see item C.8.e.1 of Annex 2 of Appendix 4) submitted by the notifying administration for examination under No. **11.32A**.

Since  $\left(\frac{C}{I}\right)_m$  and  $\left(\frac{C}{I}\right)_a$  will vary depending on the geographical location within the service area, both values are computed:

- At the geographical locations of the associated specific earth stations, if any, or,
- In case of associated typical earth stations, at the test point located within the service area where the  $\left(\frac{C}{I}\right)_a$  value is minimum in accordance with the method given in Attachment 3.

The margin is the difference between the calculated  $C/I$  value and the required  $C/I$  value:

$$M = \left(\frac{C}{I}\right)_a - \left(\frac{C}{I}\right)_m$$

where:

$M$ : margin (dB)

$\left(\frac{C}{I}\right)_a$ : adjusted value of  $C/I$ , taking into account the interference adjustment factor (dB)

$\left(\frac{C}{I}\right)_m$ : required  $C/I$  value (dB) computed above.

Therefore, substituting:

$$M = \left( \frac{C}{I} \right)_a - \left( \frac{C}{N_{tot}} \right) - K$$

## 2 The $\left( \frac{C}{I} \right)_a$ algorithm for interfering situations

The basic  $C/I$  is adjusted as follows:

$$\left( \frac{C}{I} \right)_a = \left( \frac{C}{I} \right)_b - I_a$$

where:

$\left( \frac{C}{I} \right)_a$ : adjusted value of  $C/I$ , taking into account the interference adjustment factor (dB)

$\left( \frac{C}{I} \right)_b$ : basic calculated value of  $C/I$ , before taking into account the interference adjustment factor (dB)

$I_a$ : interference adjustment factor (dB).

### 2.1 Determination of interference adjustment factor

#### 2.1.1 Interference from noise-like digital carriers (interference adjustment factor 1)

The current version of Recommendation ITU-R S.741-2 covers the case of co-frequency interference from noise-like digital carriers. For non-co-frequency interference, an interference adjustment factor (or bandwidth advantage factor) resulted from the work of ITU-R study groups concerning the methodology to treat cases of frequency offset carriers. This is reflected in the application of a factor  $A$  defined below (mentioned as  $I_a$  in § 2 above).

For the case of frequency offset between carriers, the resultant  $C/I$  can be determined by the following equation:

$$C/I = 10 \log (c/i) - A$$

where  $A$  is the bandwidth advantage factor (dB).

The factor  $A$  is the ratio of the interfering carrier power contained in the desired signal bandwidth to the total interfering carrier power under the assumption that the interfering carrier has uniform power spectral density across its occupied bandwidth.

### 2.1.2 Interference from noise-like analogue carriers (interference adjustment factor 2)

For these cases, the resultant  $C/I$  can be determined by using the equation in § 2.1.1 above where the factor  $A$  is the ratio of the interfering carrier power contained in the desired signal bandwidth to the interfering carrier power with the approximation that the power spectral density of the interfering carrier is constant over the bandwidth of the desired carrier and is equal to the maximum value (see the third paragraph of § 3.4 of Annex 1 to Recommendation ITU-R S.741-2).

## 3 The $C/N$ algorithm

The algorithm for  $C/N$  requires the computation of the value of  $N$ , as follows:

$$N_i = -228,6 + 10[\log_{10}(T_R) + 6 + \log_{10}(BW)]$$

where:

$N_i$  : value of internal system noise (dBW)

$T_R$  : receiving system noise temperature (K)

$BW$  : bandwidth (MHz).

The value of  $N_i$  is determined once for the uplink (if there is an uplink) and once for the downlink (if there is a downlink) for the desired system.

Once  $N_i$  is determined,  $C/N_i$  will be computed at each uplink test point (if there is an uplink) and each downlink test point (if there is a downlink):

$$\left( \frac{C}{N_i} \right) = C - N_i$$

where:

$C$  : carrier (dBW)

$N_i$  : internal system noise (dBW) computed above.

