30TH WORLD RADIOCOMMUNICATION SEMINAR

24 – 28 October 2022
Geneva, Switzerland

Receivability of Coordination requests for GSO networks

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www.itu.int/go/wrs-22
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First come, First served !

What should you do
to make your notice for satellite networks
receivable

How to obtain promptly
a **formal date of receipt**
for your satellite network

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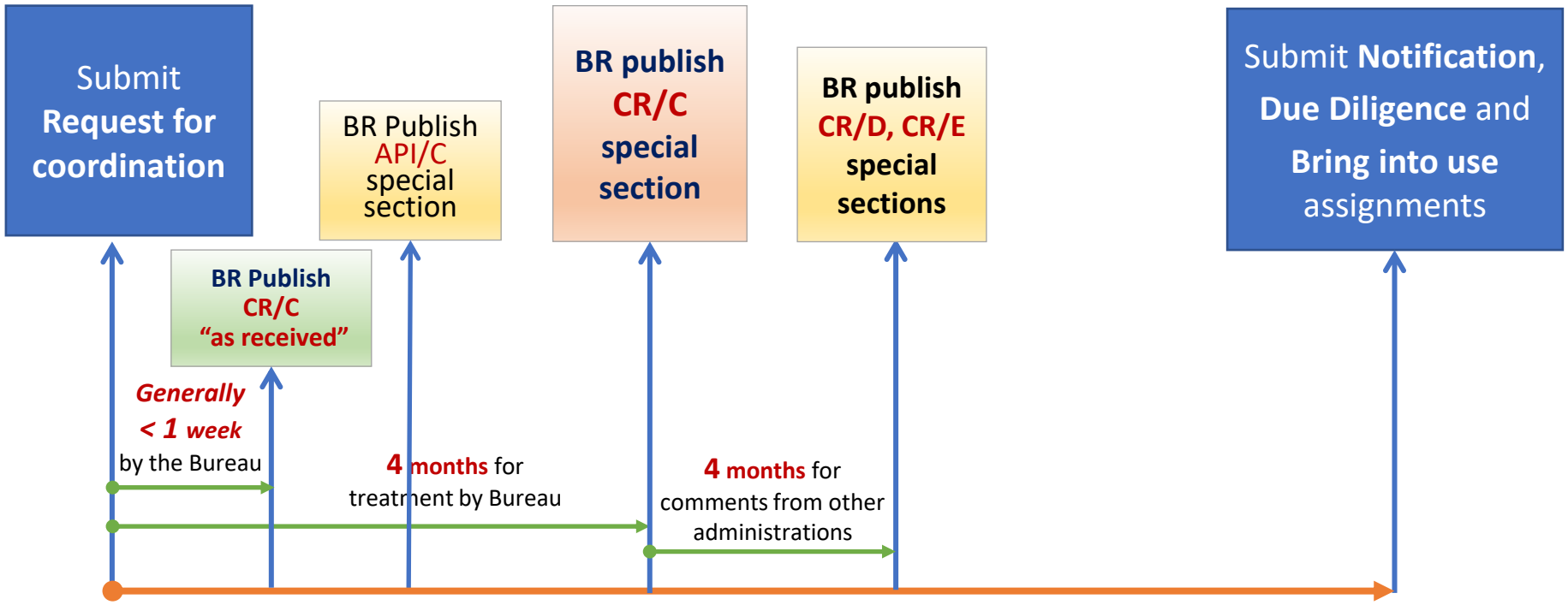
ITU process for satellite networks subject to coordination



MAXIMUM 7 YEARS !

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Submission and Receivability of Notices

Notices contain *mandatory* information contained in Annex 2 of Appendix 4 of RR

- ✓ SNS data
- ✓ Graphical data (GIMS)

Submission of information in electronic format

- ✓ E-submissions Receivability §2 (RoP 2017 Rev.2)

Establishment of Date of Receipt (RoP *Receivability* §3)

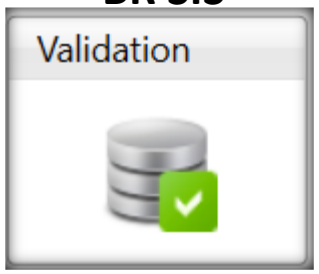
- ✓ Completeness and Correctness
  - BRSIS SpaceVal Fatal Errors are the main guideline for completeness checks
  - BRSIS SpaceVal Warnings point to possible correctness issues
- ✓ Dealing with missing information
  - Correspondence exchanges

Rules concerning Receivability

Appendix 4

Notice Database

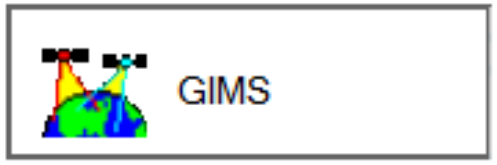
BR SIS



Cross validation

Diagram Database

Use the latest BR software V9.1



Check completeness and **correctness**
to **establish a formal date of receipt**

CR/464 only GIMS mdb format
shall be receivable under **RES 55** (WRC-19).

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RoP (Edition of 2017 Rev.2); **RES 55, RES 908** (Rev.WRC-15); **CR/464**(2020)

Establishment of a formal date of receipt of info

- In order to establish a formal date of receipt for the purpose of treatment of the submissions, the Bureau shall examine inter alia the completeness and correctness of the information submitted by administrations.

- Where a notice received by the Bureau does not contain all of the mandatory information as defined in Annex 2 of Appendix 4 or appropriate reason for any omissions, the Bureau shall regard the notice as incomplete. The Bureau shall immediately inform the administration and seek the information not provided.

- Further processing of the notice by the Bureau will remain in abeyance and a formal date of receipt will not be established until the missing information is received. The formal date of receipt will be the date of receipt of the missing information.

Rules concerning Receivability(3.5-3.8 of RoP)

3.5 After processing the Appendix **4** Form of Notice as set out in § 3.3, if the Bureau finds that further clarification is required concerning the correctness of the mandatory data submitted, it shall request the administration responsible for the station or network to provide the clarification within 30 days, otherwise it shall establish the formal date of receipt as that recorded in accordance with § 2 and § 3.2 above.

3.6 If the information or clarification is provided within that period of 30 days (counted from the date of the dispatch of Bureau's message), the date of receipt established by the Bureau in accordance with § 2 and § 3.2 above will be considered as the formal date of receipt for the purpose of any subsequent processing of the notice.

3.7 Nevertheless, for replies received within the above period of 30 days, a new formal date of receipt is established in those cases (or for the concerned part of the station or network) where the information submitted subsequently is outside the scope and beyond the objective of the Bureau's enquiry pursuant to § 3.5 above, if the new or modified data has impact on the regulatory and technical examination, irrespective of whether the newly provided information adds new affected administrations or not. See also the Rules of Procedure relating to provision No. **9.27**.

3.8 If the information or clarification is not provided within the above period of 30 days, the submission shall be considered incomplete and the Bureau will establish no formal date of receipt. A new formal date of receipt will be established when the complete information is received.

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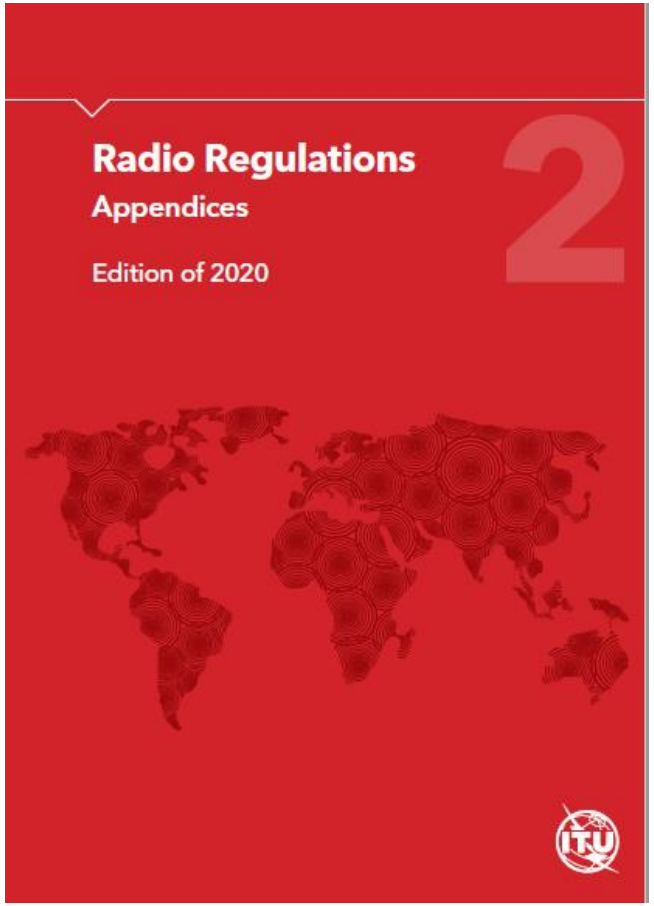
Appendix 4 of the Radio Regulations



- **ANNEX-2 - Characteristics of satellite networks, earth stations or radio astronomy stations**
  - TABLE A – GENERAL CHARACTERISTICS OF THE SATELLITE NETWORK, EARTH STATION OR RADIO ASTRONOMY STATION
  - *TABLE B – CHARACTERISTICS TO BE PROVIDED FOR EACH SATELLITE ANTENNA BEAM OR EACH EARTH STATION OR RADIO ASTRONOMY ANTENNA*
  - *TABLE C – CHARACTERISTICS TO BE PROVIDED FOR EACH GROUP OF FREQUENCY ASSIGNMENTS FOR A SATELLITE ANTENNA BEAM OR AN EARTH STATION OR RADIO ASTRONOMY ANTENNA*
  - *TABLE D - OVERALL LINK CHARACTERISTICS*

https://www.itu.int/pub/R-REG-RR

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Appendix 4 of the Radio Regulations –Ap4 items to be submitted for coordination requests

Table of characteristics to be submitted for space and radio astronomy services
(Rev.WRC-12)

TABLE A

GENERAL CHARACTERISTICS OF THE SATELLITE NETWORK OR SYSTEM, EARTH STATION OR RADIO ASTRONOMY STATION (Rev.WRC-19)

Items in Appendix	*A - GENERAL CHARACTERISTICS OF THE SATELLITE NETWORK OR SYSTEM, EARTH STATION OR RADIO ASTRONOMY STATION*	Advance publication of a geostationary-satellite network	Advance publication of a non-geostationary-satellite network or system subject to coordination under Section II of Article 9	Advance publication of a non-geostationary-satellite network or system not subject to coordination under Section II of Article 9	Notification or coordination of a geostationary-satellite network (including space operation functions under Article 2A of Appendices 30 or 30A)	Notification or coordination of a non-geostationary-satellite network or system	Notification or coordination of an earth station (including notification under Appendices 30A or 30B)	Notice for a satellite network in the broadcasting-satellite service under Appendix 30 (Articles 4 and 5)	Notice for a satellite network (feeder-link) under Appendix 30A (Articles 4 and 5)	Notice for a satellite network in the fixed-satellite service under Appendix 30B (Articles 6 and 8)	Items in Appendix
A.1	**IDENTITY OF THE SATELLITE NETWORK OR SYSTEM, EARTH STATION OR RADIOASTRONOMY STATION**										A.1
A.1.a	the identity of the satellite network or system	X	X	X	X	X		X	X	X	A.1.a
A.1.b	the beam identification In the case of Appendix **30** or **30A**, required only for modification, suppression or notification of Plan assignments In the case of Appendix **30B**, required only for a network derived from the Allotment Plan							+	+	+	A.1.b
A.1.e	**Identity of the earth station or radio astronomy station:**										A.1.e
A.1.e.1	the type of earth station (specific or typical)						X				A.1.e.1
A.1.e.2	the name of the station						X				A.1.e.2
A.1.e.3	**For a specific earth station or radio astronomy station:**										A.1.e.3
A.1.e.3.a	the country or geographical area in which the station is located, using the symbols from the Preface						X				A.1.e.3.a
							X				A.1.e.3.b
											A.1.f
		X	X	X	X	X	X	X	X	X	A.1.f.1
		+	+	+	+	+		+	+	+	A.1.f.2
		+	+	+	+	+		+	+	+	A.1.f.3
				X		+					A.1.g
											A.1.g.1
											A.1.g.2

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
	The data item is not applicable to the corresponding notice

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Space Operation Service

Space operation: ET ≠ EK, ER, ED

RoP No. 1.23

In the No. **11.31** examinations, notices concerned with space operation **functions** will be considered in conformity with the Table of Frequency Allocations (favourable Finding) in the case where the assigned frequency (and the assigned frequency band) lies in a frequency band allocated to the:

- Space operation **service**, or
- The main service in which the space station is operating (e.g. FSS, BSS, MSS).

In the case where the assigned frequency concerning space operation **functions**, lies in a frequency band allocated to a service in which the space station has no operating **function** the No. **11.31**, finding will be unfavourable.

Advice: Please include ET (space operation) as class of station if the band is allocated to Space operation service otherwise indicate ED (space telecommand), ER (space telemetry) or EK (space tracking)

RES 163/164 in 14.5-14.8 GHz (GSO FSS)

- Feeder link for BSS under No. **5.510** in Region 2 only
- Not for feeder link for BSS
  - ✓Resolution **163** (**14.5-14.75** GHz) – specific countries in Regions 1 and 2
    Resolution **164** (**14.5-14.8** GHz) – Specific countries in Region 3

Use GIMs software to capture these countries as a service region with the symbols Res.163 or Res.164

- ✓Specific data requirements when used under Res **163/164**:
  - **A16c commitment** must be provided
    - *will meet the separation distance as specified in No. **5.509E** and the power flux-density limits that are specified in No. **5.509D***
  - **Antenna diameter** must be provided
    - *Minimum 6m (No.**5.509C**)*

Earth Station Antenna Diameter

Associated earth station antenna diameter in meters (AP4 Annex 2 No. C.10.d.7)

- required for fixed-satellite service (EC) operating in the frequency bands
  - ✓13.75-14 GHz
  - ✓14.5-14.8 GHz (not for feeder link for the BSS under Res **163/164**)
  - ✓24.65-25.25 GHz (Region 1)
  - ✓24.65-24.75 GHz (Region 3)
  - ✓**51.4-52.4 GHz (WRC-19)**

- required for maritime mobile-satellite service (EG) operating in the frequency band 14-14.5 GHz

- Take note of the restrictions on earth station diameters in the **footnote** to the **Table of Frequency Allocations**

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RoP relating to No. 21.16 – PFD limits for steerable beams

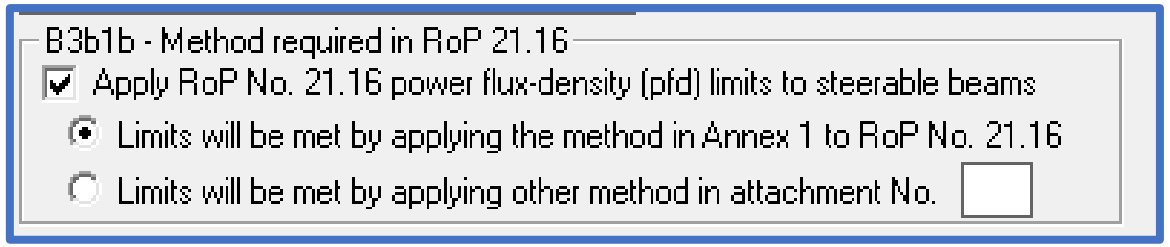
RoP relating to **No.21.16** requires the following for **steerable** beams:

- ✓Administration should **state** that the applicable PFD limits will be met by applying **a method** with descriptions
  - One possible example of such a method is described in the Annex to the Rule relating to No. **21.16**.
  - If other methods are used, description of the method should be provided as an attachment
  - Administrations may also decide not to use the method required in RoP

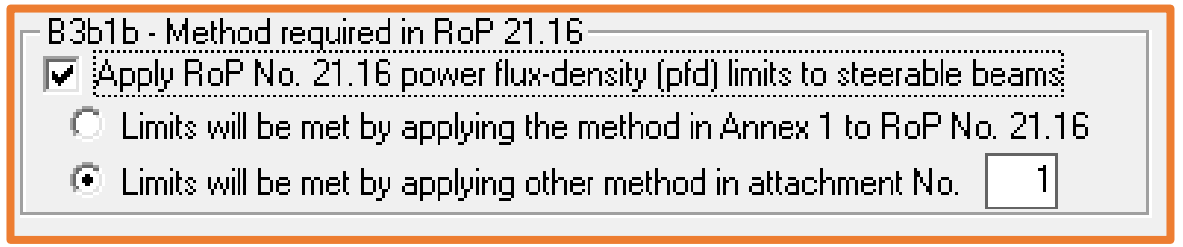
How to submit information related to No.21.16 in Space V9.1

➢ **3 Possibilities**

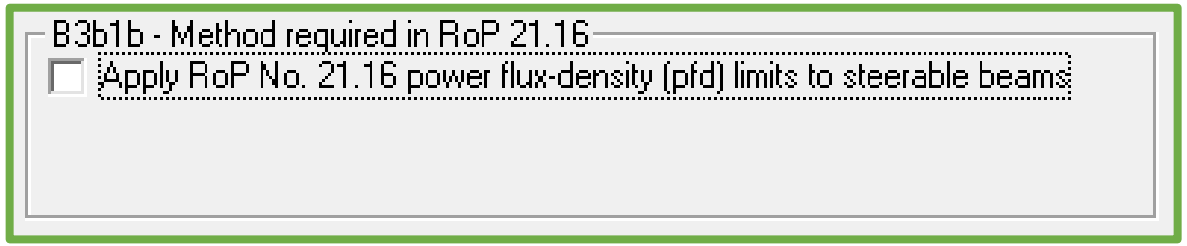
1) Frequency band subject to No. **21.16** -Rules of Procedure to be applied -Annex 1 method will be used to meet limits



2) Frequency band subject to No. **21.16** -Rules of Procedure to be applied –Method in attachment to meet the limits



3) Frequency band subject to No. **21.16-** Do not wish for Rules of Procedure to be applied



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Some Tips:

Inclination ≤ 15°

- **No. 1.185** + Article **9** Footnote **A.9.6A**

Station keeping / Tolerance of space stations

≤ 0.1° for FSS / BSS

- **No. 22.6 – No.22.10** + ROP relating to **22.10**

Station keeping / Tolerance of space stations

≤ 0.5° for other services

- **No. 22.11 – No.22.18** + ROP relating to **22.14**

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Graphical Data / DIAGRAMS IN GIMS MDB

GIMS

Diagram Database

CR/464 (2020) **only GIMS mdb format** shall be receivable under **RES 55**.

Main Graphical Data for CRC (GSO) in Gims

Antenna Gain Contour

Service Area

Antenna Gain towards GSO orbit (AG-GSO)

Antenna Gain Contour

AP4 Annex 2 No. B.3.b.1

at least for -2, -4, -6, -10 and -20 dB and **at 10 dB intervals thereafter**, as necessary, relative to the maximum antenna gain, when any of these contours is located either totally or partially anywhere within the limit of visibility of the Earth from the given geostationary satellite

For steerable beam (No.**1.191**), if the effective boresight area is less than the global service area, the contours are the result of moving the boresight of the steerable beam around

… …

shall also include the 0 dB relative gain isoline

- For gain contours, please check manually.

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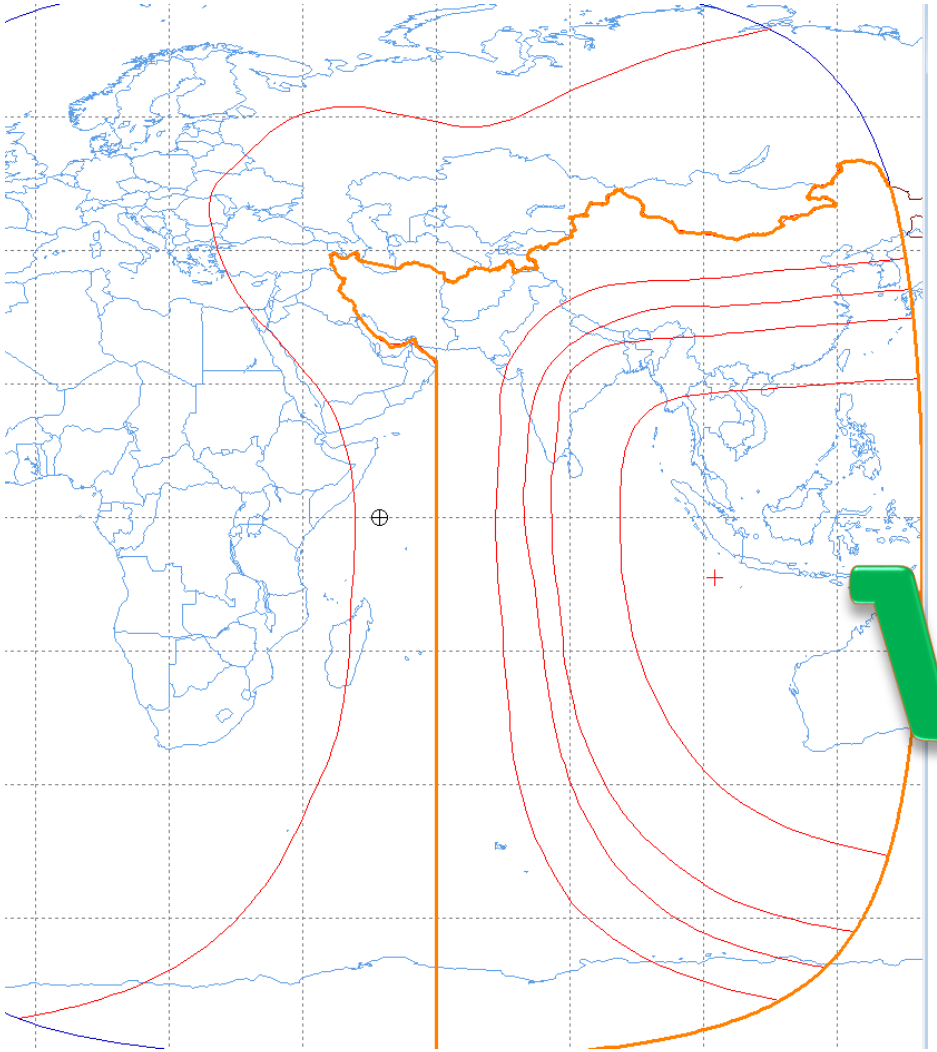
Antenna Gain Contour

AP4 Annex 2 No. B.3.b.1

Note ---
*"administrations should, to the extent practicable, **align the areas** the satellite steerable beams could cover with the service area of their networks with due regard **to their service objectives.**"*



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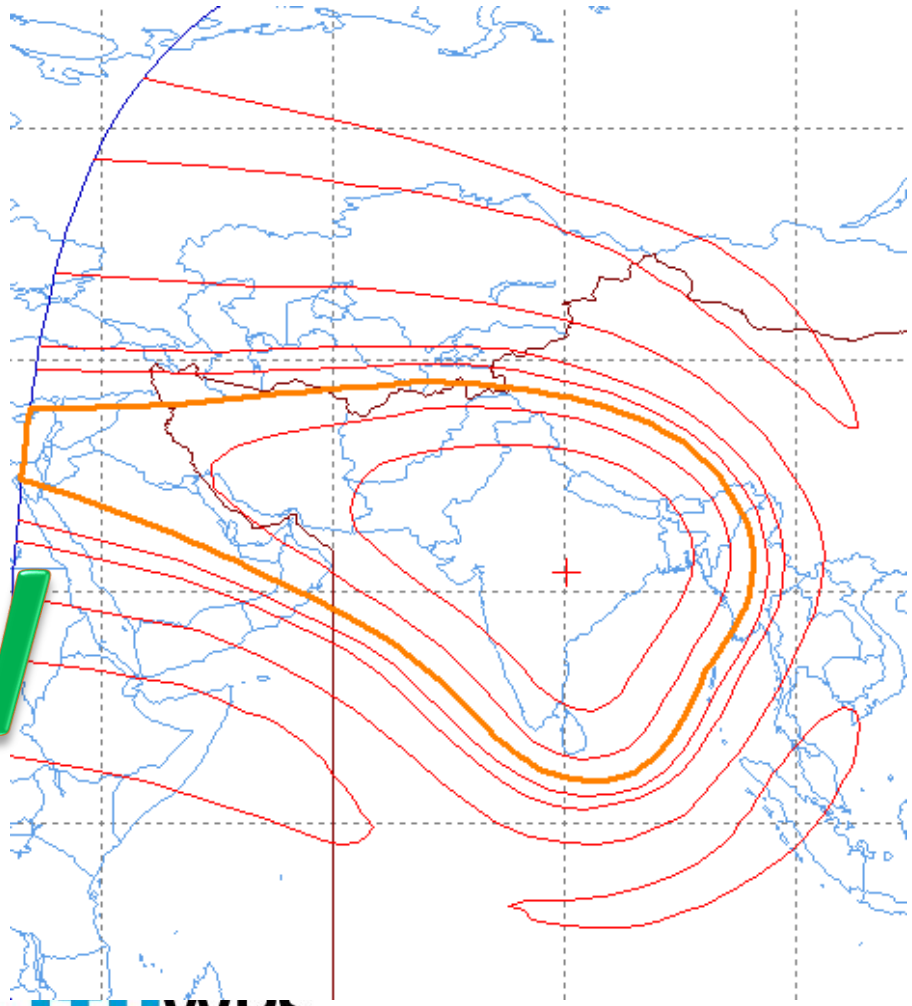
Antenna Gain Contour

AP4 Annex 2 No. B.3.b.1



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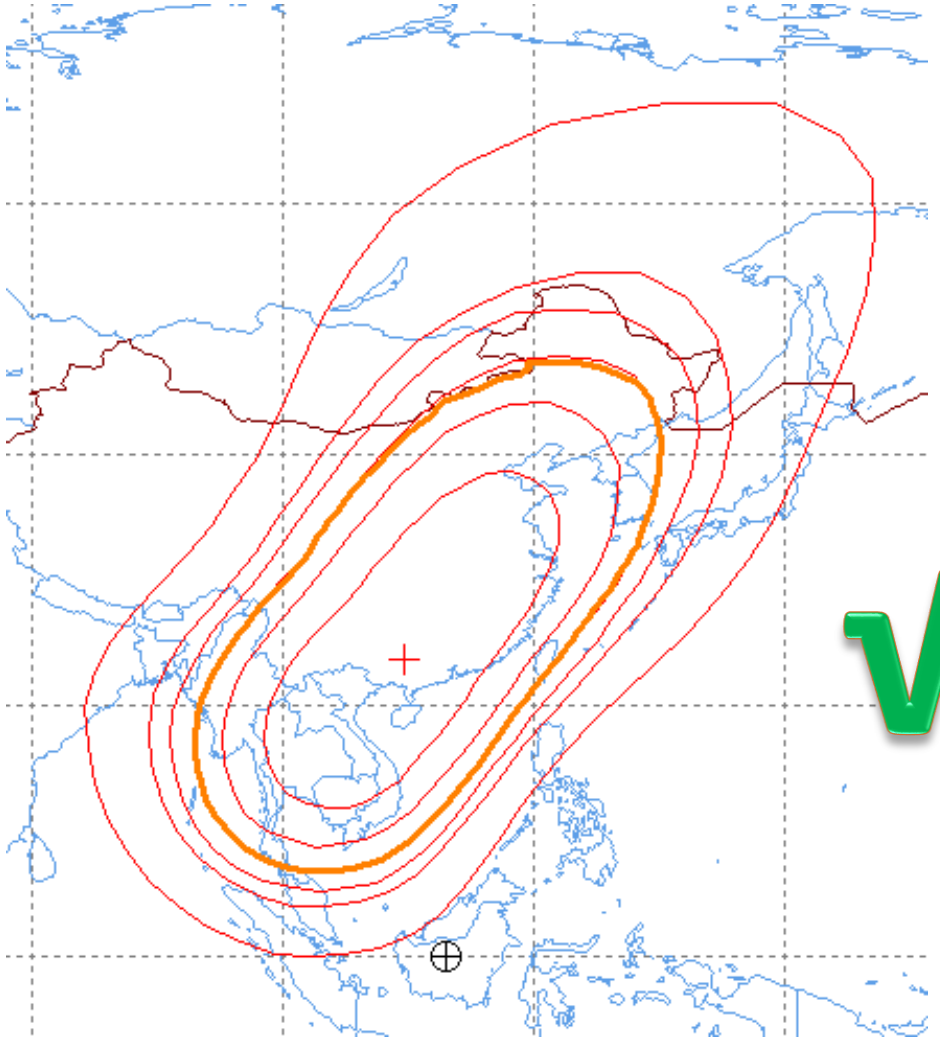


√

Antenna Gain Contour

AP4 Annex 2 No. **B.3.b.1**

The Bureau would like to request that your Administration **consider providing revised effective gain contour diagrams** for these beams, **more closely aligned with the service area concerned**, which may result in reduced coordination requirement for your network as well as improve the efficiency of the utilization of spectrum and orbit resources.

Service Area

It is recommended to use GIMS software to capture the service area

Regional limitations under Article 5

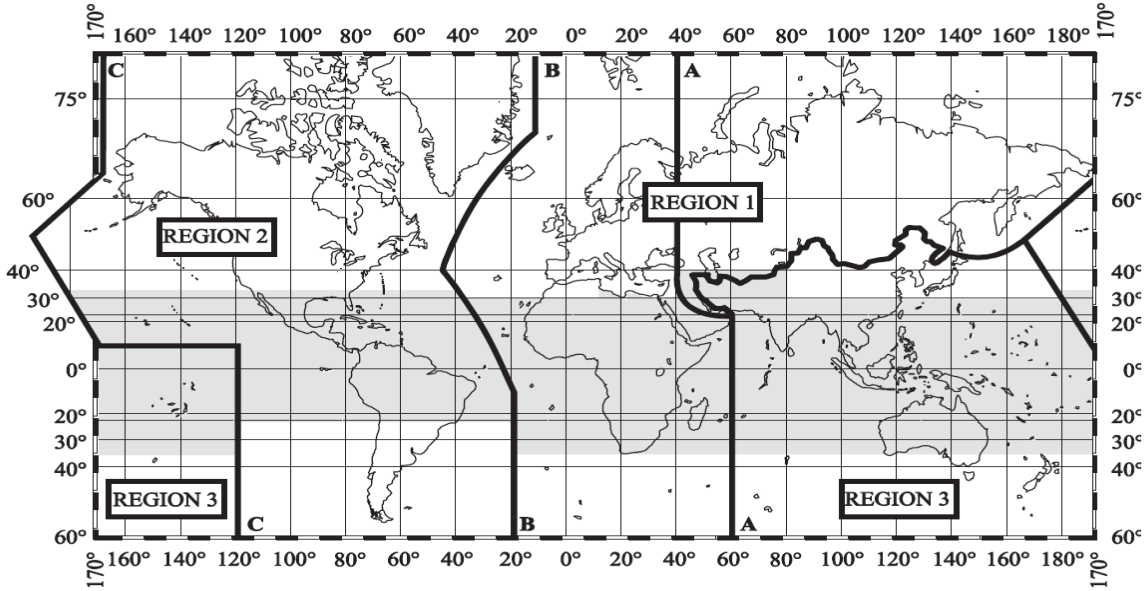
- If service area submitted is **larger than** what is allowed for under **Article 5**
- BR will **split** the service area, to the part that has an allocation, and another part that has no allocation.
- Administrations are encouraged to **exclude** regions or countries which are not allocated for the frequency bands and services concerned under **Art.5.**

Service Area

Example of limitation of SA

Letter will be sent by the Bureau to propose to limit the Service aera

Allocation to services		
Region 1	**Region 2**	**Region 3**
24.75-25.25 FIXED FIXED-SATELLITE (Earth-to-space) 5.532B MOBILE except aeronautical mobile 5.338A 5.532AB	24.75-25.25 FIXED 5.532AA FIXED-SATELLITE (Earth-to-space) 5.535 MOBILE except aeronautical mobile 5.338A 5.532AB	24.75-25.25 FIXED FIXED-SATELLITE (Earth-to-space) 5.535 MOBILE 5.338A 5.532AB
25.25-25.5	FIXED 5.534A INTER-SATELLITE 5.536 MOBILE 5.338A 5.532AB Standard frequency and time signal-satellite (Earth-to-space)	
25.5-27	EARTH EXPLORATION-SATELLITE (space-to-Earth) 5.536B FIXED 5.534A INTER-SATELLITE 5.536 MOBILE 5.338A 5.532AB SPACE RESEARCH (space-to-Earth) 5.536C Standard frequency and time signal-satellite (Earth-to-space) 5.536A	
27-27.5 FIXED INTER-SATELLITE 5.536 MOBILE 5.338A 5.532AB	27-27.5 FIXED 5.534A FIXED-SATELLITE (Earth-to-space) INTER-SATELLITE 5.536 5.537 MOBILE 5.338A 5.532AB	
27.5-28.5	FIXED 5.537A FIXED-SATELLITE (Earth-to-space) 5.484A 5.516B 5.517A 5.539 MOBILE 5.538 5.540	



With respect to receiving beam NKA1UP, group ID 1758, you have submitted the assigned frequency 27.75 GHz with an assigned bandwidth of 1 GHz, in the fixed-satellite service, with a service area that covers the visible portions of Regions 1 and 3. This frequency assignment falls partially within the band 27.0–27.5 GHz which is available for use only in Regions 2 and 3, there being no allocation in the Earth-to-space direction in the fixed-satellite service in Region 1. The Bureau proposes to limit the service area for this frequency assignment to the visible portion of Region 3, and will continue treatment of your coordination request on this basis unless you advise to the contrary within 30 days from the date of this communication.

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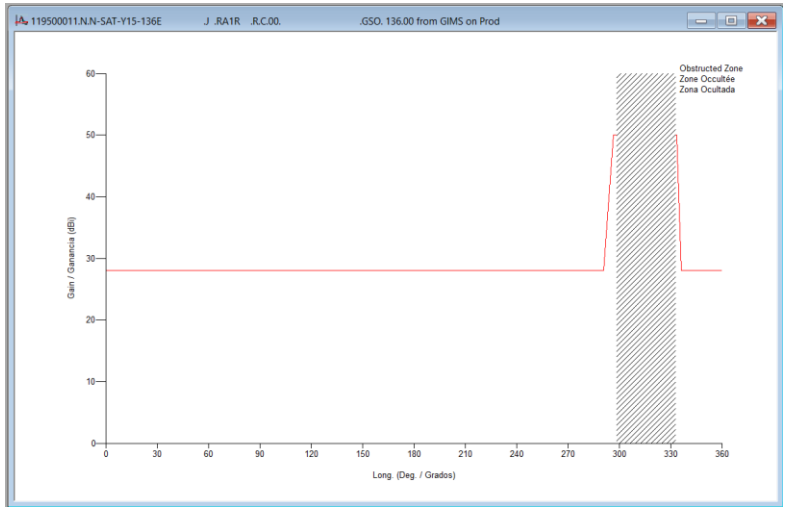
Antenna Gain towards GSO orbit (AG-GSO)

Requirement for AG-GSO diagrams
AP4 Annex 2 No. B.3.e

- if the space station is operating in a band allocated **both** in the **Earth-to-space** direction and in the **space-to-Earth** direction

- Check **validation rules** for reference
- Validate using the BRSIS Validation software with **Cross-Validation** feature



- By running **BRSIS Validation** with **Cross-val option**, if the diagram is required but missing in the notice, **fatal errors** will be reported

Graphical Data concerning Antenna Radiation Pattern

- The **co-polar** antenna radiation pattern (item **B.3.c.1** of Appendix **4**) for the space station antenna
  - In the case of geostationary space stations required **only** for an antenna radiation beam that is directed towards another satellite

- The measured **co-polar** antenna radiation pattern or the **co-polar** reference radiation pattern for the associated Earth stations (item **C.10.d.5.a** of Appendix **4**) **have to be provided either with**
  - **Pattern ids** in the notice database or
  - **Equations/tables** describing the pattern
  - diagrams in the **Gims database**

GIMS

- Diagrams must be imported into a Gims database and marked with the correct header elements
- Please follow the guide on how to capture the diagrams in Gims as shown in the website below

https://www.itu.int/ITU-R/go/space-AdditionalDataUnderAP4/en

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For non-standard Antenna Radiation Patterns

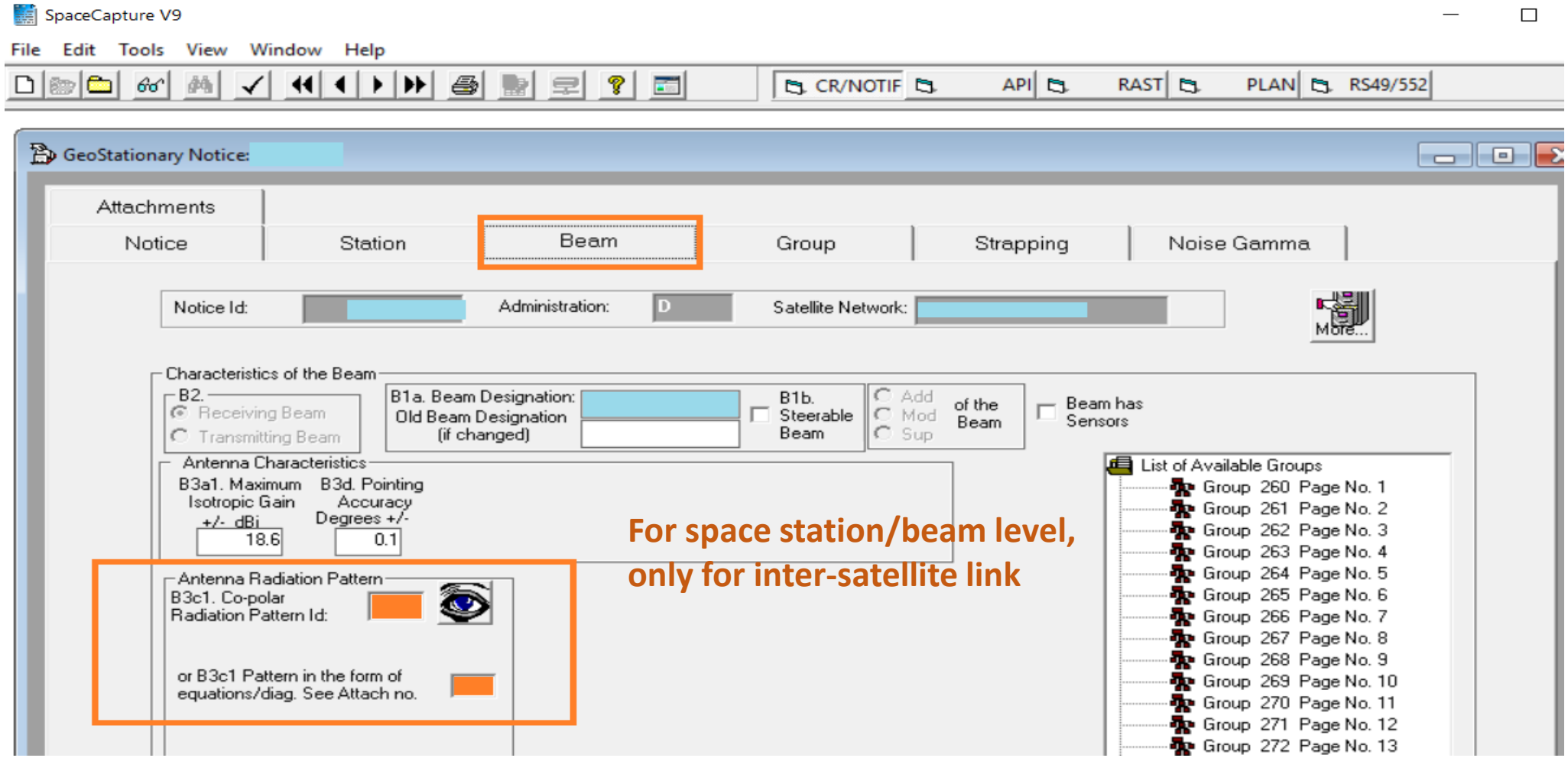
Co-polar Gain values must be provided for **all off-axis angles**

(**0 to ±180°**)

Equations/tables describing the pattern should be provided: the Bureau will assign new pattern IDs in the APL

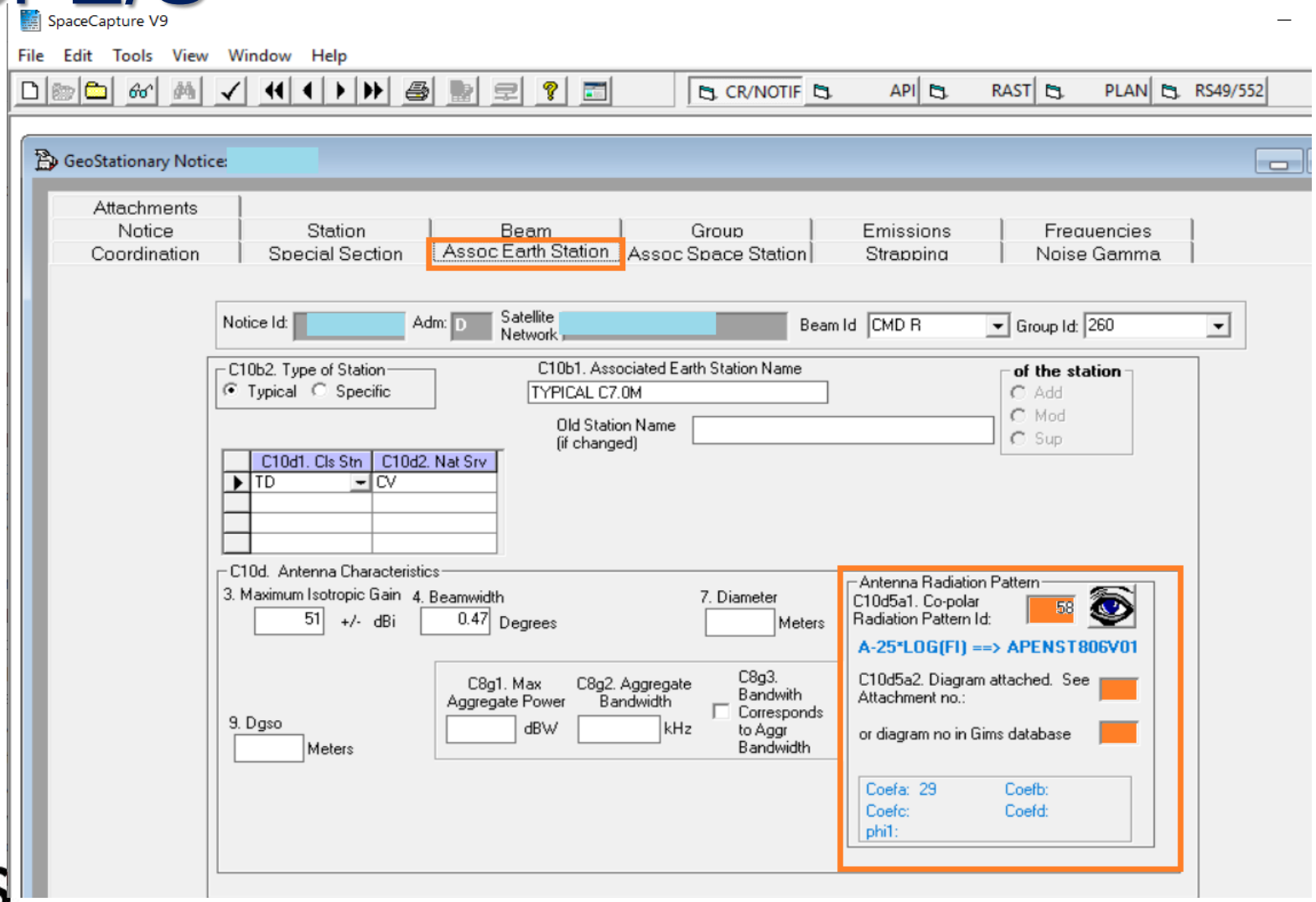
Diagrams such as images are not acceptable by BR's examination software, (default **AP8** antenna pattern will be used)

Example of SpaceCap_ Antenna Radiation Pattern for S/S



For space station/beam level, only for inter-satellite link

Example of SpaceCap_ Antenna Radiation Pattern for E/S



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For standard co-polar Antenna Radiation Patterns

Kindly indicate the antenna pattern IDs by selecting from the Antenna Pattern Library (APL) available at the webpage:

https://www.itu.int/en/ITU-R/software/Pages/ant-pattern.aspx

Eg. Earth Station co-polar Antenna Radiation Patterns

AP7	APERR_012V01	Appendix 7 Earth station antenna pattern for the determination of the coordination area around an earth station in frequency bands between 100 MHz and 105 GHz.	Receiving	32
			Transmitting	75
Non-directional	APEND_099V01	Non-directional earth station antenna pattern.	Receiving	607
			Transmitting	608

Eg. Space Station co-polar Antenna Radiation Patterns

Non-directional	APSND_499V01	Non-directional space station antenna pattern.	Receiving	610
			Transmitting	609

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See more details from the webpage

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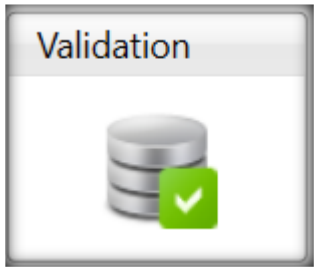
Databases to be submitted

Appendix 4

Notice Database

BR SIS



Cross validation

Diagram Database

Use the latest BR software V9.1

No fatal error !

Check completeness and **correctness**
to **establish a formal date of receipt**

CR/464 only GIMS mdb format
shall be receivable under **RES 55**.

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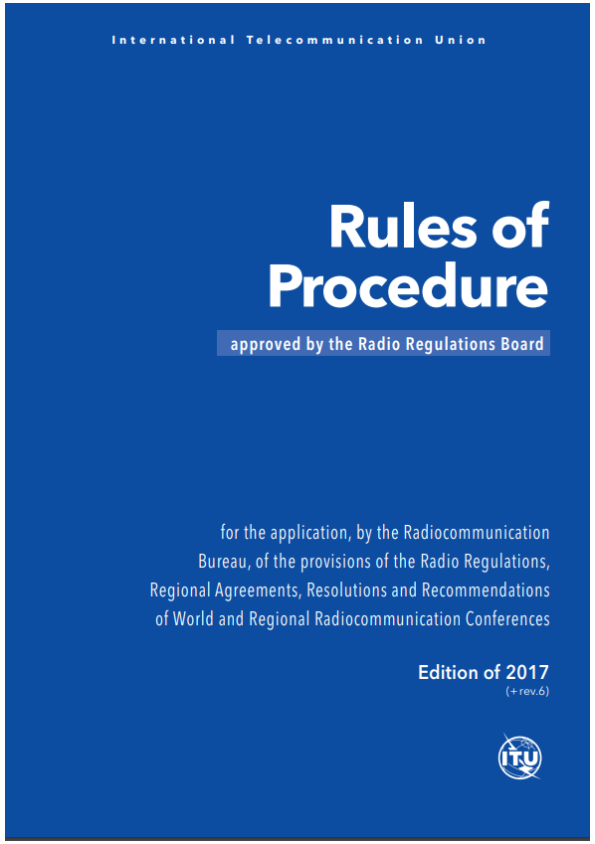
Rules of Procedure (ROP) on Receivability: Submission of information in electronic format



- All notices for satellite networks shall be submitted to the Bureau in electronic format which is compatible with the BR electronic notice form capture software (SpaceCap and GIMS), using the ITU web interface "e-Submission of satellite network filings" available at

  https://www.itu.int/itu-r/go/space-submission.

- Notices submitted using "e-Submission of satellite network filings" for space 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.
- Notices submitted using "e-Submission of satellite network filings" for space services do not require any separate confirmation by telefax or mail.
- Receipt of notices related to space services shall be acknowledged immediately

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Thank you!

ITU – Radiocommunication Bureau

Questions to brmail@itu.int or akim.falou-dine@itu.int