Notification of Radio Astronomy Station

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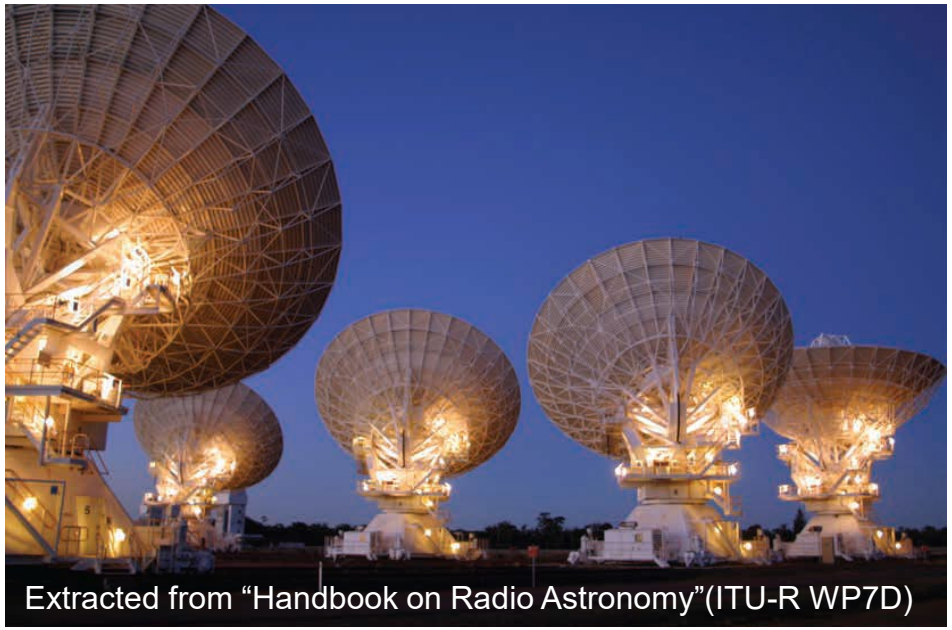
2-6 December 2024, Geneva, Switzerland

Contents

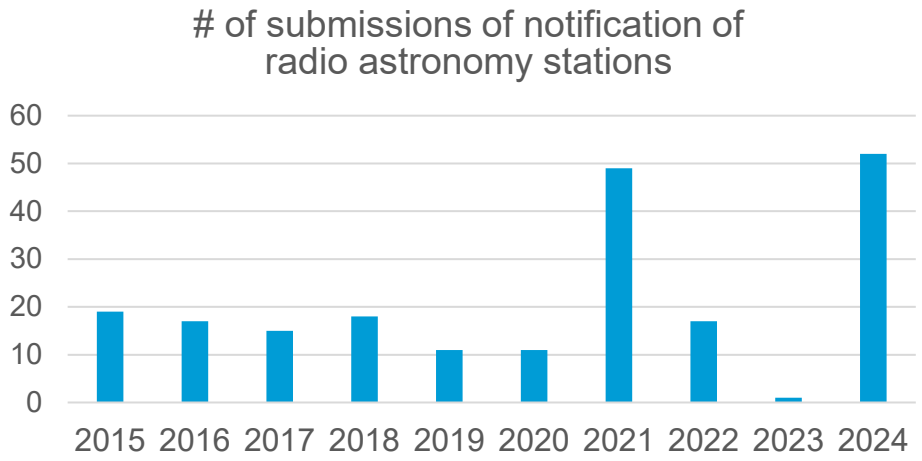
Radio Astronomy Station

- Radio astronomy stations are radio stations to provide the service of radio astronomy service defined by RR No. **1.58**.
  - **1.13** *radio astronomy:* Astronomy based on the reception of *radio waves* of cosmic origin.
  - **1.58** *radio astronomy service:* A service involving the use of *radio astronomy*.

- Any frequency to be used for reception by a radio astronomy station may be notified if it is desired that such data be included in the Master Register according to RR No. **11.12**.
  - **11.12** *Any frequency to be used for reception by a particular radio astronomy station may be notified if it is desired that such data be included in the Master Register.*
  - **29.5** §2 The locations of the radio astronomy stations to be protected and their frequencies of observation shall be notified to the Bureau in accordance with No. **11.12** and published in accordance with No. **20.16** for communication to Member States.



Extracted from "Handbook on Radio Astronomy"(ITU-R WP7D)



General regulatory process of Notification of Radio Astronomy Stations

1. Submission of a notification from Administration to ITU

1.1 An administration captures data of the characteristics of a notified radio astronomy station in SNS data format with BR Space Software **SpaceCap**.

1.2 The notice shall be submitted to BR via the **e-Submission system**.

1.3 BR has received your Notification notice for a radio astronomy station. The submitted notice is published as-received on the As-Received website.

2. Receivability examination

BR conducts a receivability examination to confirm the completeness and the correctness of the data in the submitted notice according to AP**4** of RR and RoP.

3. Publication of Part I-S

4. Regulatory examination

5. Registration of observation frequencies or return of a notice

When the examination leads to a favourable findings, Part II-S to BR IFIC is published and the observation frequencies are recorded in the Master Register.

Characteristics of Radio Astronomy Stations

All information notified to ITU shall be captured with BR Space Software **SpaceCap** and submitted to BR via **e-Submission** system.

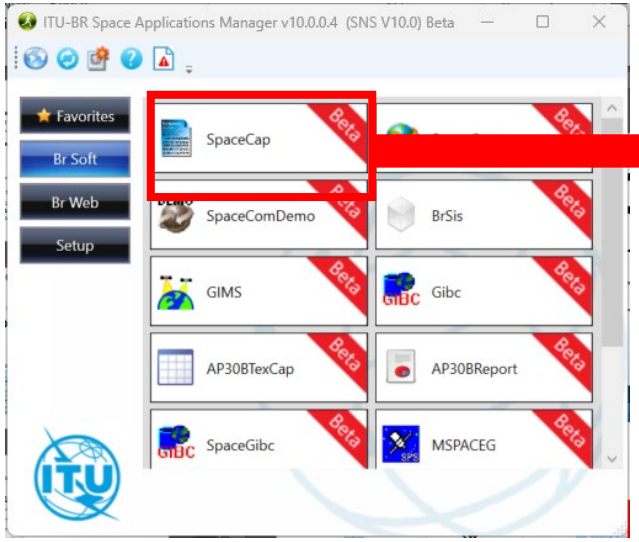
Mandatory information specified in Appendix 4

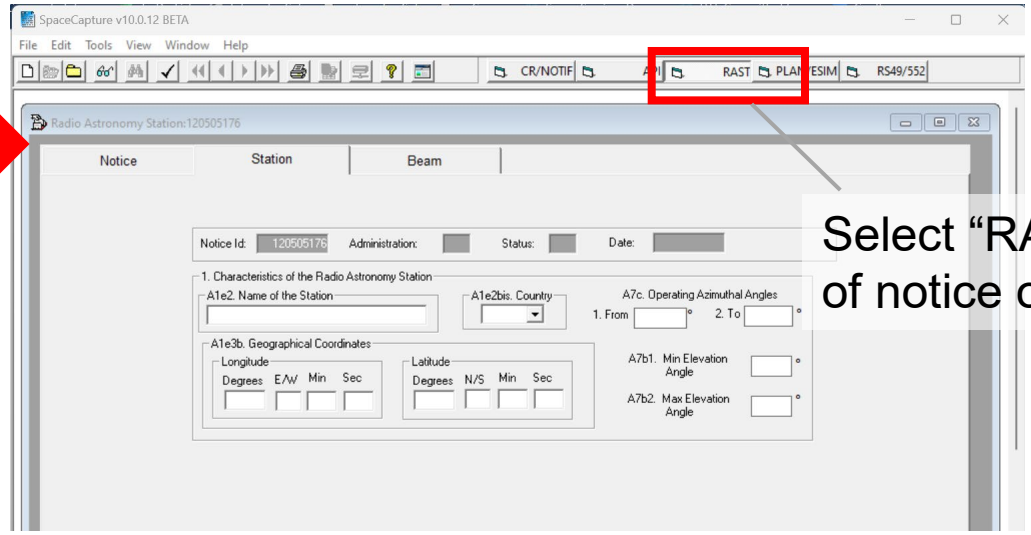
- Name of station
- Country or geographical area in which the station is located
- Geographical coordinates of each transmitting or receiving antenna site (latitude and longitude in degrees and minutes)
- Notifying administration
- Operating administration or agency
- Operating azimuths of antenna main beam
- Centre of the frequency band observed
- Bandwidth of the frequency band observed by the station
- Class of station (see the Preface)
- Characteristics of observations for radio astronomy stations
- Date of bringing into use
- Minimum/maximum antenna main beam elevation
- Antenna characteristics (see the Preface)
- Overall receiving system noise temperature

If the radio astronomy station is operated in a frequency band not allocated for radio astronomy service in the Table of Frequency Allocations of RR (Art. **5**), **the provision No.4.4 must be requested.**

Capturing AP4 data items and submission to ITU

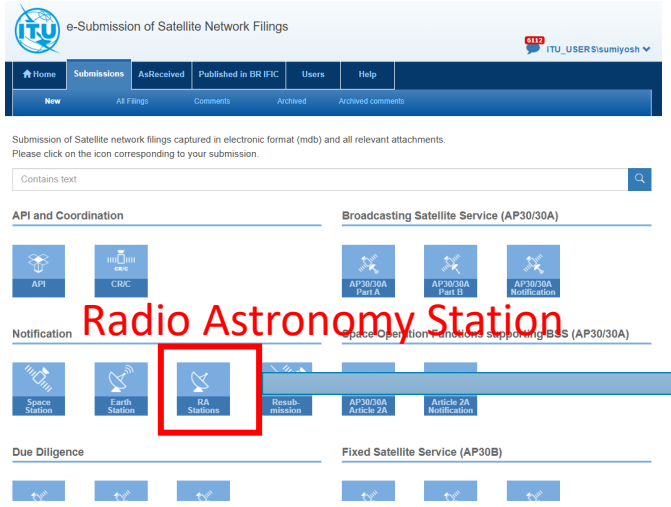
Launch **SpaceCap** and capture a notification of radio astronomy station.

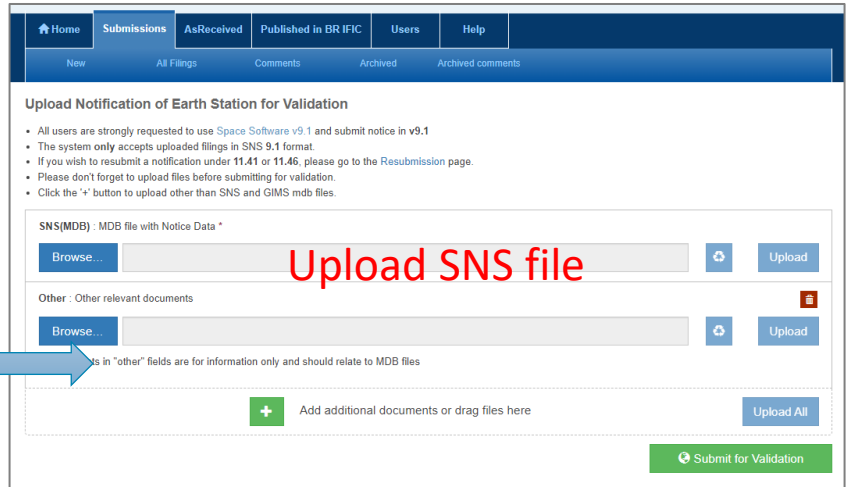




Select “RAST” as a type of notice on SpaceCap

Submit a Notification notice to BR via **e-Submission**





For submission of a notification of radio astronomy station, **user account** for e-Submission system is required.

Antenna characteristics

The antenna radiation pattern information **(antenna type, antenna dimensions, effective area of the antenna)** of a notified radio astronomy station need to be captured in the notification notice as data item **B.6** in AP **4** of RR.

B.6	RADIO ASTRONOMY STATION ANTENNA CHARACTERISTICS
B.6.a	the antenna type (see the Preface)
B.6.b	the antenna dimensions (see the Preface)
B.6.c	the effective area of the antenna (see the Preface)

On SpaceCap Ver10, antenna radiation pattern information **(antenna type, antenna dimensions, effective area**) are automatically captured when an antenna pattern ID is selected from **Table 6** in Preface.

- The interface on SpaceCap will be updated to capture **antenna type (B.6.a), antenna dimensions (B.6.b), effective area (B.6.c)** more precisely.
- Table 6 in Preface will be updated to indicate antenna pattern information properly.

Antenna pattern ID	Antenna type	Antenna Dimension	Effective Area of the antenna	Additional description
96	Parabolic	30	330	ARG1, Parabolic Diameter: 30 m, 330 square metres, Mount: Equatorial Azimuth limits: 55°S - 26°N Elevation angle limits: +30° relative to the vertical
98	Parabolic	64	1510	AUS10, 64 metres diameter steerable paraboloid, 1510 square metres; all azimuths; the angle of elevation is between 30° and 90°
99	Parabolic	64	1160	AUS11, 64 metres diameter steerable paraboloid, 1160 square metres; all azimuths; the angle of elevation is between 30° and 90°
…	…	…	…	…

Example of new Table 6: Radio astronomy station antenna characteristics in Preface to BR IFIC (Space Services)

Antenna characteristics

If an appropriate antenna characteristics of a radio astronomy station cannot be found on Table **6** to the Preface,

1. a notifying administration can submit a notification of a radio astronomy station with indicating **999** (Other) as data item **B.6** in AP **4** on the notification.
2. When capturing 999, a notifying administration is requested to provide the specific information about antenna characteristics **(antenna type, antenna dimensions, effective area of the antenna)** (items **B.6.a, B.6.b** and **B.6.c** of AP **4**) on SpaceCap interface.
3. In addition, the information on angular coverage in azimuth and elevation are required.
4. A new ID is assigned to the new antenna pattern submitted as 999 in the examination process in ITU.

Please access the following tutorial webpage for more information about antenna characteristics:

https://www.itu.int/en/ITU-R/space/Pages/Antenna_pattern_RAS.aspx

Examination of Radio Astronomy Station Notices

After the publication of Part I-S, BR conducts the regulatory examination according to No. **11.31** in the Radio Regulations and Rules of Procedure to formulate findings.

Radio Regulations

11.31 *a)* with respect to its conformity with the Table of Frequency Allocations and the other provisions of these Regulations, except those relating to conformity with the procedures for obtaining coordination or the probability of harmful interference, or those relating to conformity with a plan, as appropriate, which are the subject of the following sub-paragraphs;

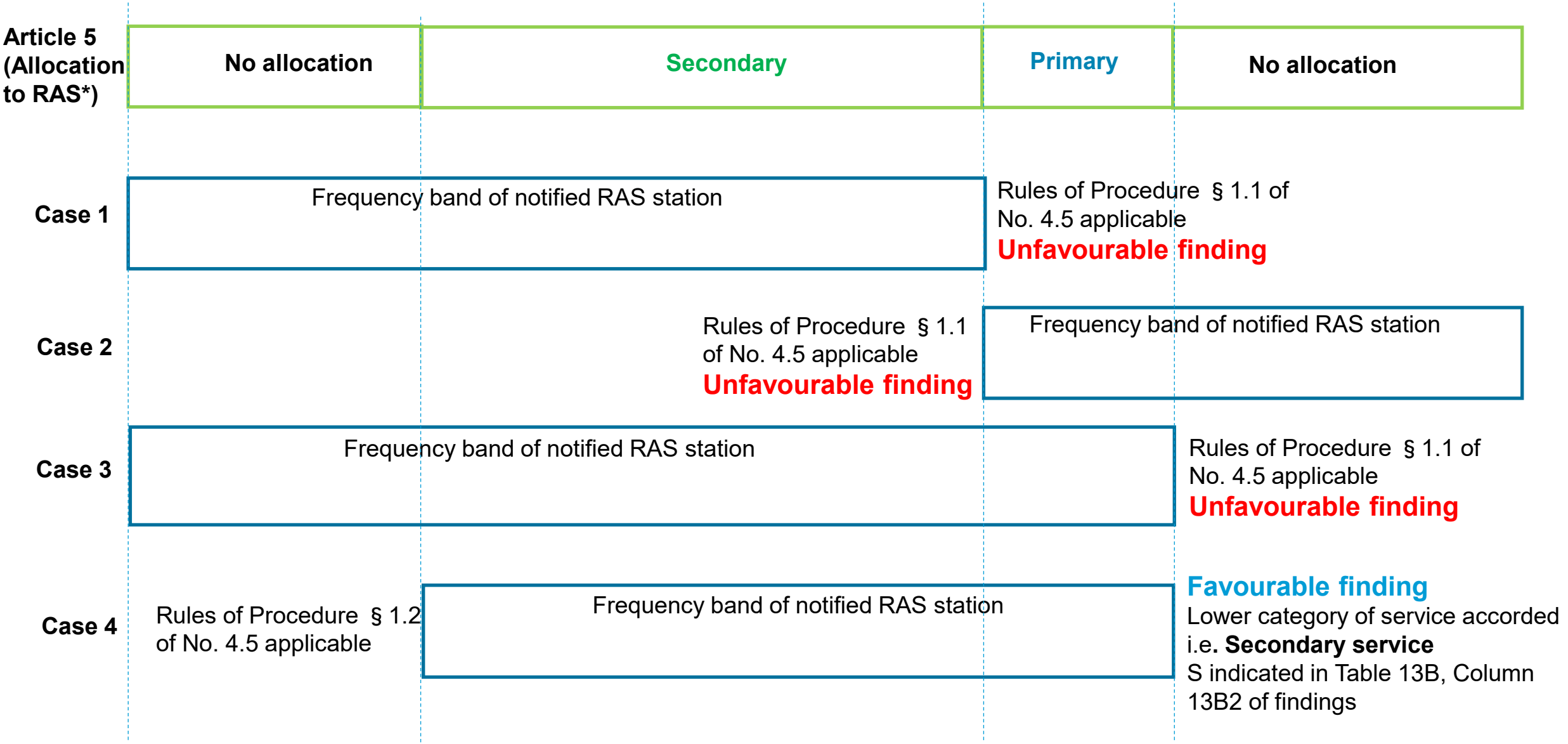
Rules of Procedure § 1 of No. 4.5 about rules concerning Article 4 of the RR

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.)

Please access the following tutorial webpage for more information about examination of radio astronomy station and frequency allocations to radio astronomy service: https://www.itu.int/en/ITU-R/space/Pages/findings_RAS.aspx

Examples of Application of the Rules of Procedure



* RAS: Radio Astronomy Service

Protection of Service

Article 5 (Allocation to RAS)

No allocation	Secondary	Primary	No allocation

Case A (Notification with one large block of frequency band)

Frequency band of notified RAS station

Rules of Procedure § 1.1 of No. 4.5 applicable
Unfavourable finding
Possible recording under No.8.4 and conditions of No.4.4

No protection accorded because the recording in the MIFR is unfavourable and for information only

Case B (Alternate notification of Case A into 4 different blocks of frequency bands)

Frequency band **1** of notified RAS station	Frequency band **2** of notified RAS station	Frequency band **3** of notified RAS station	Frequency band **4** of notified RAS station
No allocation **Unfavourable finding** Possible recording under No.8.4 and conditions of No.4.4	There is secondary allocation **Favourable finding** Accorded secondary status	There is primary allocation **Favourable finding** Accorded primary status	No allocation **Unfavourable finding** Possible recording under No.8.4 and conditions of No.4.4
No protection accorded because the recording in the MIFR is unfavourable and for information only	**Secondary status protection accorded**	**Primary status protection accorded**	**No protection accorded because the recording in the MIFR is unfavourable and for information only**

Protection Consideration at Notification of Radio Astronomy Stations

- Possible to represent a large observation frequency band to **several smaller observation frequency bands.**
  - This will allow the appropriate allocation status for radio astronomy services to be reflected in the findings when recorded in the MIFR.
  - The RAS can then benefit from the protection accorded to it according to the allocation status in the frequency band of the observation bandwidth.
- Responsibility of administrations is to prepare and submit fillings and to comply with the applicable provisions of the Radio Regulations.
- The examination of notifications of Radio Astronomy Stations will be based on
  - The information submitted by the administrations in the AP4 notice form
  - Relevant Rules of Procedure to formulate findings

Summary of Notification of Radio Astronomy Stations

According to No.**11.12,** any frequency to be used for reception by a particular radio astronomy station may be notified if it is desired that such data be included in the MIFR. The frequencies of observations recorded on MIFR will be protected.

The provision of No.**4.4** must be requested if you are operating in a band not allocated for radio astronomy service in the Table of Frequency Allocations of RR.

Antenna characteristics of Radio astronomy stations are described in Table **6** of the Preface. The characteristics of antenna type, antenna dimensions and effective area of the antenna are required.

The required data items in Appendix **4** shall be captured on BR software **SpaceCap.** A notification shall be submitted using the e-Submission system.

Regulatory examination is conducted under RR No.**11.31** and RoP.
Split a large observation frequency band to **multiple smaller bands.**

Notifications of Radio astronomy station are exempt from cost recovery fee.

Thank you !

ITU – Radiocommunication Bureau

Questions to brmail@itu.int

Please access the following tutorial page for more information about a notification of radio astronomy station

https://www.itu.int/en/ITU-R/space/Pages/RadioastronomyStations.aspx