RADIOTELECOPE REGISTRATION AT ITU-R

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RADIOTELESCOPE REGISTRATION

NOTIFICATION AND REGISTRATION OF A RADIO ASTRONOMY OBSERVATORY WITH THE ITU-R

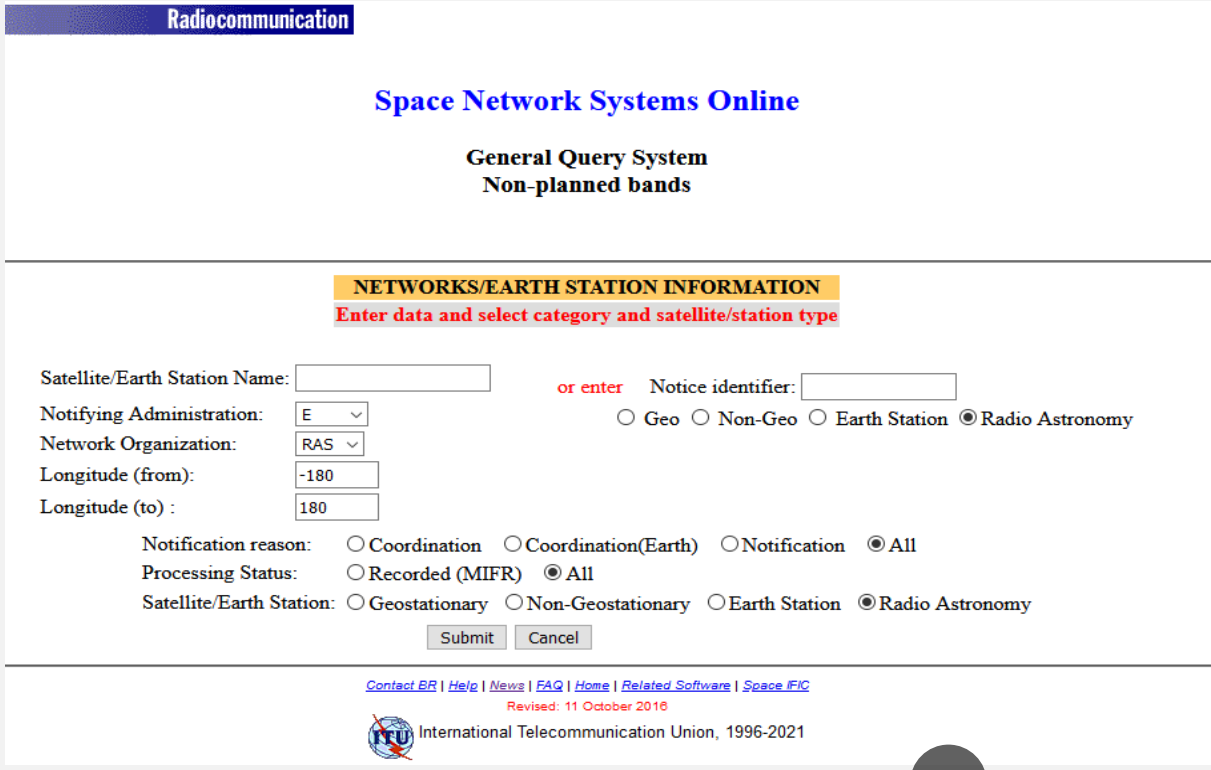
- It is important to **notify** of radio astronomy observatories use of the radio spectrum with the International Telecomunications Union Radiocommunication sector (**ITU-R)**
- Also **to register our radiotelescopes at ITU-R**

➢ It would ensure formal **regulatory protection** from interferences

RADIOTELESCOPE REGISTRATION

NOTIFICATION AND REGISTRATION OF A RADIO ASTRONOMY OBSERVATORY WITH THE ITU-R

- The CRAF management team believes that **maintenance** of accurate and **up-to-date** information on European observatories within the ITU-R is of vital importance in our efforts to **protect** European radio astronomy observatories **from interference** emitted by active radiocommunications services.
- Especially important where **cross-border** and **space-based** services co-ordintation are needed.
- Where can we **check the status** of the registration?
  - https://www.itu.int/sns/database.html



RADIOTELESCOPE REGISTRATION

ADVANTAGES OF NOTIFICATION AND REGISTRATION:

- It allows both the ITU-R and national administration to **take its presence into account** when making frequency assignments or examining proposals for future systems.
- To be taken into consideration to national administration when **protection** is needed in some **bands** that have associated a **footnote**.
- To be taken into account when new **space based services** are planned to be established (especially important when the observatory is located near a national border).
- To establish **chronological priority** in order to ask from protection (be able to ask for protection in adjacent bands to services filed at a later day).
- To probably establish an on-going **collaborative relationship** between the observatory and **its national administration**.

RADIOTELESCOPE REGISTRATION

STEPS TO REGISTER A RADIOTELESCOPE

- To **get in contact with the person in charge** at your administration related with this process
- To **prepare** the following **documentation**
  1. **Collect all the information needed to prepare the mdb files:** information related with the administration, radiotelescope and receivers.
  2. **Mdb files**
  3. **Receiver diagram pattern**
  4. **Register application letter**
- To **send all the information** to your national administration and to **check** the registration status at ITU-R database https://www.itu.int/sns/database.html

RADIOTELESCOPE REGISTRATION

STEPS TO REGISTER A RADIOTELESCOPE

1. **Collect the information needed**

   Information about points of the table (B.6.b, B.6.c, etc) are found in the **'Annex2App4.pdf'** and **'preface_e.pdf'** documents.

Item on Appendix	Characteristic					
A.1.e.2	Name of the station	YEBES RA 13.2m JORGE JUAN				
A.1.e.3.a	Country where station is located	E				
A.1.e.3.b	Geographical coordinates	40/31/24.51 N, -3/5/18.71 E				
A.1.f.1	Symbol of notifying administration	E				
A.2.c	Date (actual or foreseen, as appropriate) on which reception of the frequency band begins or on which any of the basic characteristics are modified	2015-Apr-29				
A.3.a	the symbol for the operating administration	E				
A.3.b	the symbol for the address of the administration (see the Preface) to which communication should be sent on urgent matters regarding interference, quality of emissions and questions referring to the technical operation of the network or station	E/A/117				
A.7.b.1	Planned minimum angle of elevation of the antenna's main beam, in deg, from horizontal plane	0				
A.7.b.2	Planned maximum angle of elevation of the antenna's main beam, in deg, from horizontal plane	90				
A.7.c.1	Start azimuth for the planned range of operational azimuthal angles for the antenna's main beam axis, in deg, clockwise from true north	0				
A.7.c.2	End azimuth for the planned range of operational azimuthal angles for the antenna's main beam axis, in deg, clockwise from true north	360				
B.6.a	Antenna Type (see Preface)	Paraboloid reflector, Cassegrain reflecting system				
B.6.b	Antenna dimmensions (see Preface)	13.2 metres in diameter				
B.6.c	Effective area of the antenna (see Preface)	109				

RADIOTELESCOPE REGISTRATION

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Information about points of the table (B.6.b, B.6.c, etc) are found in the **'Annex2App4.pdf'** and **'preface_e.pdf'** documents.

13 items are needed for RAS registration

C.2.b	the centre of the frequency band observed - in kHz up to 28 000 kHz inclusive - in MHz above 28 000 kHz to 10 500 MHz inclusive - in GHz above 10 500 MHz	8000 MHz	2450 MHz	8580 MHz	30,5 GHz
C.3.b	the bandwidth of the frequency band, in kHz, observed by the station	12.000.000,00	500.000,00	800.000,00	5.000.000,00
C.4.a	Class of station (see symbols from Preface)	RA			
C.4.b	Nature of service (see symbols from Preface)				
C.5.c	Tsys (Kelvin) referred to output of receiving antenna	40	50	40	100
C.13.a	the class of observations to be taken on the frequency band shown under C.3.b - Class A observations are those in which the sensitivity of the equipment is not a primary factor - Class B observations are those of such a nature that they can be made only with advanced low-noise receivers using the best techniques	Class B			
C.13.b	the type of radio astronomy station in the frequency band shown under C.3.b - Single-dish,"S", telescope used for spectral-line or continuum observations using single-dishes or closely connected arrays - Very long baseline interferometry (VLBI), "V", station used only for VLBI observations	S and V			
C.13.c	the minimum elevatio angle at which the radio astronomy station conducts single-dish or VLBI observations in the frequency band	5			

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Annex.pdf

Advance publication of a geostationary-satellite network	Advance publication of a non-geostationary-satellite network subject to coordination under Section II of Article 9	Advance publication of a non-geostationary-satellite network 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	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	Radio astronomy
									A.1	
X	X	X	X	X		X	X	X	A.1.a	
						+	+	+	A.1.b	
									A.1.e	
					X				A.1.e.1	
					X				A.1.e.2	X
									A.1.e.3	
					X				A.1.e.3.a	X
					X				A.1.e.3.b	X

RADIOTELESCOPE REGISTRATION

STEPS TO REGISTER A RADIOTELESCOPE

Information from '**preface_e.pdf**'

- Admin data:
  - A.1.e.3.a, A.1.f.1, A.3.a: **Table 1 A, Table 1B**
  - A.3.b: **Table 12A/12B**
  - C.4.a: **Table 3**
  - C.4.b: **Table 3**
- Radiotelescope data:
  - B.6.a: **Table 6**
  - C.13.b (pg 79)

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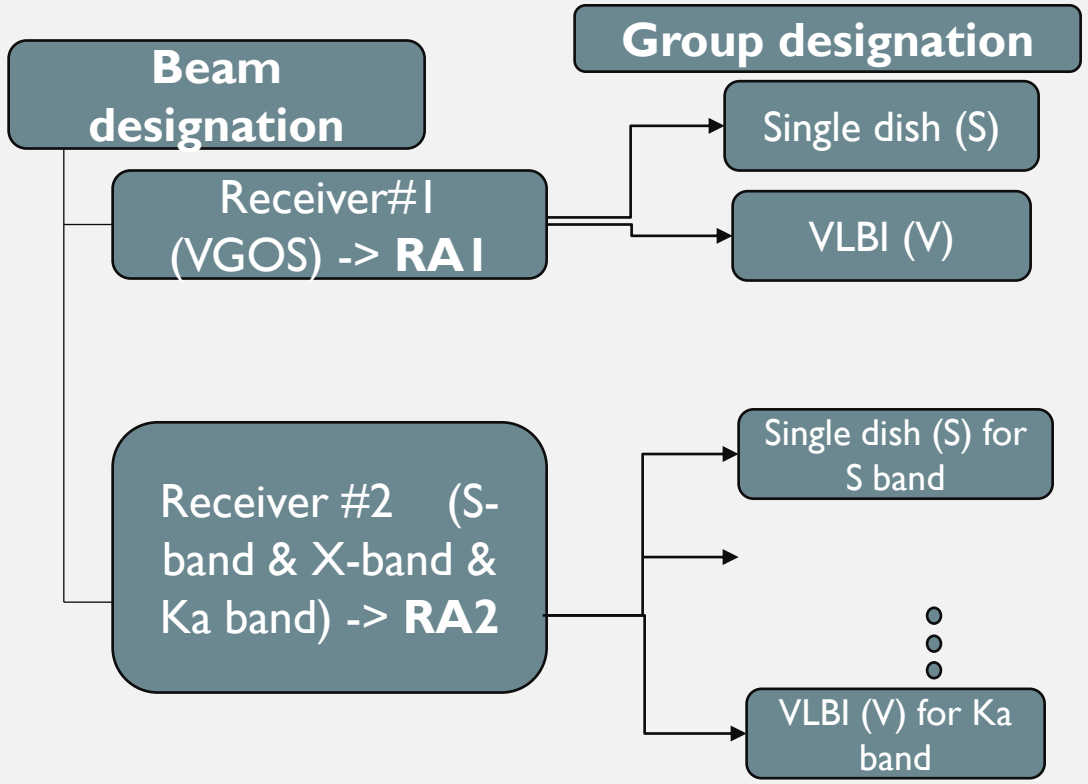
STEPS TO REGISTER A RADIOTELESCOPE

2. '*.mdb' file structure:

- Output file of the program used (SpaceCap) for the registration of the RAS stations. Your administration should generate it.
- SpaceCap software, which runs in Windows XP and is very un-friendly.
- One document for each RT.
- One "beam designation" for each receiver in the RT.



RT info

'.mdb' file example

E_TSUM Requested by: JALMAZAN Date: 13.06.2019 12:46:33 DB: YEBES_RA_13.2M_JORGE JU~ Plan Id.: Notice type: RASTRO

A	*A1e2* Station name	YEBES RA 13.2M JORGE JUAN	*A1f1* Notif. adm.	E	*A1f3* Inter. sat. org.		*BR1* Date of receipt	08.04.2019	*BR20/BR21* BR IFIC no./part	/	
BR6a/BR6b Id. no.	105500303		*BR3a/BR3b* Provision reference	11.12	N	*BR2* Adm. serial no.			RA1	R	

A1e3a Ctry: E *A1e3b* Geo. coord.: 003W05 19 40N31 25

A1f2 Submitted on behalf:

A7b1 Min. elev. angle: 0 *A7b2* Max. elev. angle: 90 *A7c1* Start azimuth: 0 *A7c2* End azimuth: 360

B1a/BR17 Beam designation: RA1 *B2* Emi-Rcp: R

'ntc_type' Pg 84 (preface_e.pdf)

B6a Co-polar antenna pattern

Ref. pat.	Coef. A	Coef. B	Coef. C	Coef. D	Phi1	Rad. diag.
						1

BR7a/BR7b Group id.: 1 *C4a* Class of station: RA *C3b* Observed freq. band: 12000000 *C5c* Noise temperature: 40 *C2c* RR No. 4.4: Y

C13a Class of observ.: B *C13b* Type of radio astronomy: S *C13c* Min. elevation angle: 5

A2c Date of bringing into use: 29.04.2015 *A3a* Op. agency: 117 *A3b* Adm. resp.: A

C2b Centre of the frequency band observed: 8000 MHz

Findings *2D* Date of protection: *13A* Conformity with RR: *13B1* Prov.: *13B2* Remarks: *13B3* Date of Review:

13C Remarks: N/080419

BR7a/BR7b Group id.: 2 *C4a* Class of station: RA *C3b* Observed freq. band: 12000000 *C5c* Noise temperature: 40 *C2c* RR No. 4.4: Y

C13a Class of observ.: B *C13b* Type of radio astronomy: V *C13c* Min. elevation angle: 5

A2c Date of bringing into use: 29.04.2015 *A3a* Op. agency: 117 *A3b* Adm. resp.: A

C2b Centre of the frequency band observed: 8000 MHz

Findings *2D* Date of protection: *13A* Conformity with RR: *13B1* Prov.: *13B2* Remarks: *13B3* Date of Review:

13C Remarks: N/080419

B1a/BR17 Beam designation: RA2 *B2* Emi-Rcp: R

B6a Co-polar antenna pattern

Ref. pat.	Coef. A	Coef. B	Coef. C	Coef. D	Phi1	Rad. diag.
						2

Receiver

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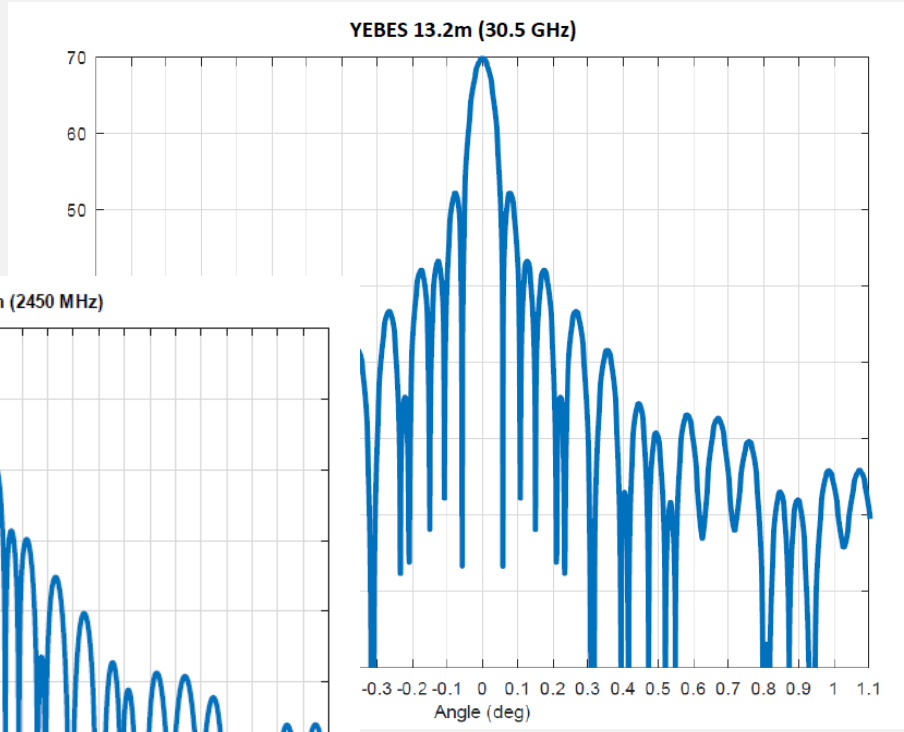
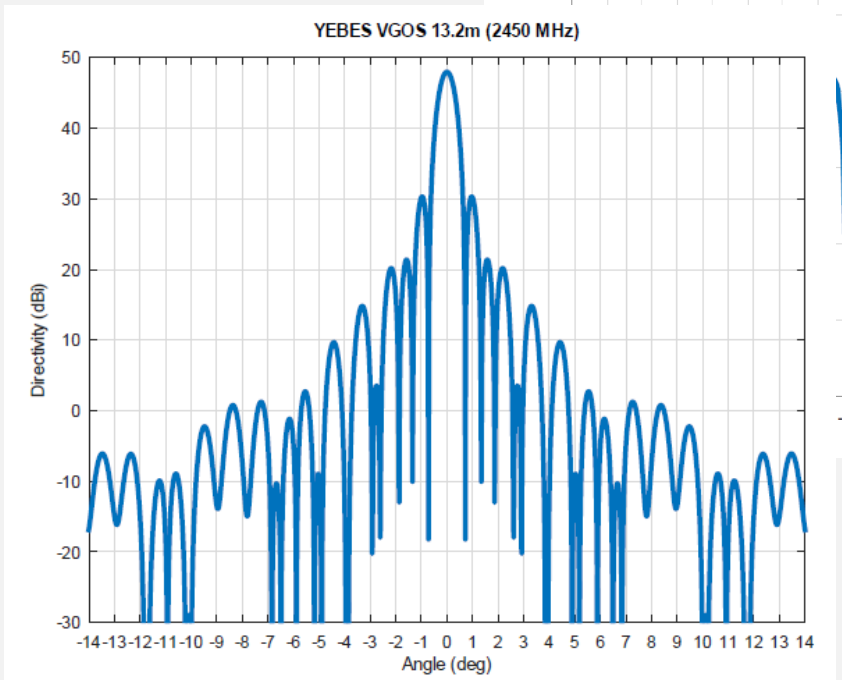
STEPS TO REGISTER A RADIOTELESCOPE

3. Receiver diagram pattern

Provide at least simulated radiation pattern (if not measured) at the center frequency of each frequency range to register.

- One pdf for each frequency





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STEPS TO REGISTER A RADIOTELESCOPE

4. Official letter applying for registration at ITU:

Elaborate an official letter applying for both RAS frequency allocation (primary and secondary) and not allocated bands used by the radiotelescopes under the 4.4. of the RR.

Your administration may claim that you can **only register RAS bands**, and not others. However, if you want to register other **non-RAS bands,** you can argue that your station will comply with the express condition stated in article 4.4 of RR.

- **Radio Regulation article 4.4**:

"4.4: 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.“

RADIOTELESCOPE REGISTRATION

FINAL STEPS TO REGISTER A RADIOTELESCOPE

- Send all these documents to the contact at your administration
- To check registration status at https://www.itu.int/sns/database.html

THANKS FOR YOUR ATTENTION

- **Marta Bautista - Yebes Observatory (Spain)**

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