ITUEvents

ITU World Radiocommunication Seminar 2018

3–7 December 2018
Geneva, Switzerland

www.itu.int/go/ITU-R/WRS-18

ITU Regulatory procedures for small satellite filings

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Radiocommunication Bureau

Legal Framework for Spectrum Access/Use

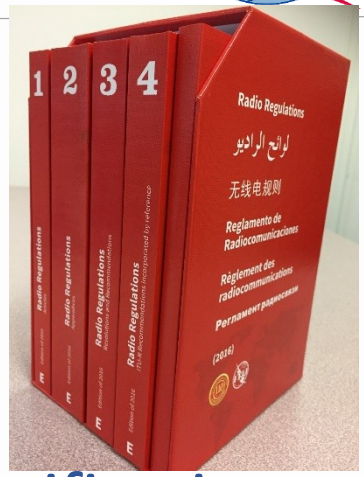
Radio Regulations

- Free download from ITU website

- Intergovernmental Treaty governing the use of spectrum/orbit resources by administrations
- Define the **rights** and **obligations** of Member States in respect of the use of these resources
- Recording of a frequency assignment in the Master Register (**MIFR**) provides international recognition and protection
- Updated every 3-4 years by World Radiocommunication Conferences
- Completed by the Rules of Procedure

Radio Regulations

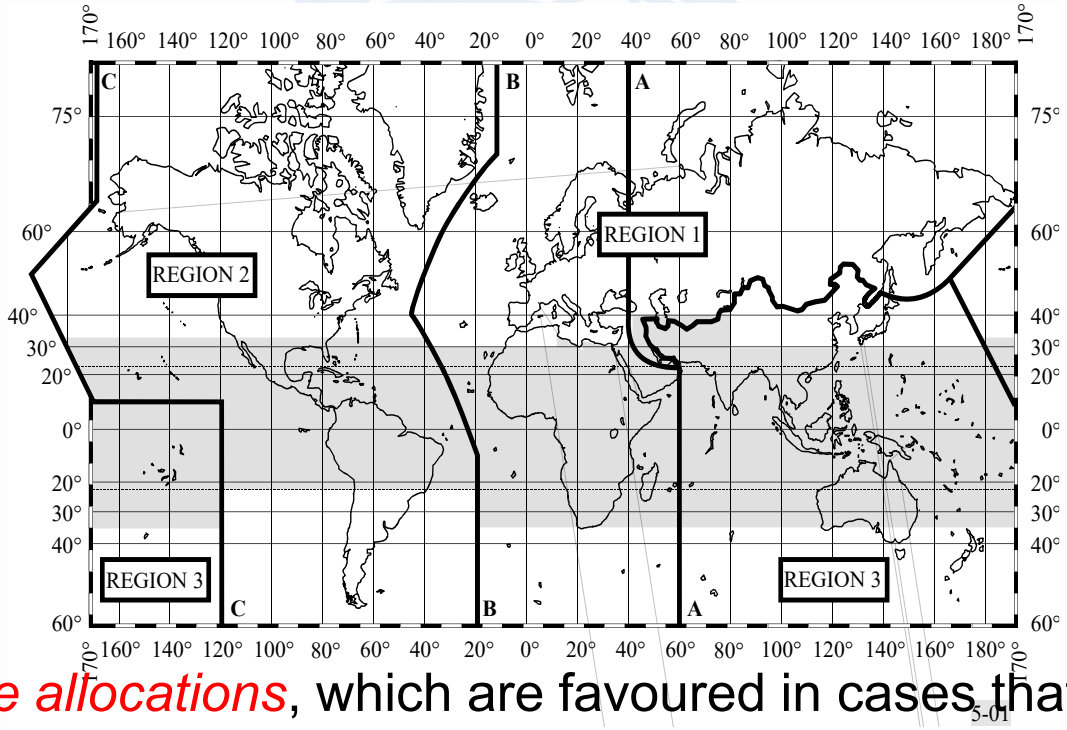
– examples of some useful sections



- **Article 1** Definitions
- **Article 5** Table of Frequency Allocations
- **Article 9** and **11** Procedures for the advance publication (**API**), coordination (**CR/C**) and notification
- **Article 21/22** Power limits
- **Article 25** Amateur and Amateur-satellite service
- **Article 29A** Radio services related to Earth observation
- **Appendix 1** Classification of emissions
- **Appendix 4** Data required for satellite filings

ART. 5 frequency allocations - 1

- **No. 5.2 - For the allocation of frequencies the world has been divided into three "radiocommunication" Regions**



- *Exclusive allocations*, which are favoured in cases that involve *broad international use of equipment*
- *Shared frequency allocations*, which are applied to maximize the use of the available spectrum when *two or more radiocommunication services can effectively utilize the same frequency band*

ART. 5 frequency allocations - 2

- **A *shared* frequency band** can be allocated to more than one service (***PRIMARY*** or **secondary**), either on a worldwide or Regional basis
- **No. 5.28 - Stations of a *secondary service*:**
  - **No. 5.29** - *shall not cause harmful interference to* stations of PRIMARY services to which frequencies are already assigned or to which frequencies may be assigned at a later date;
  - **No. 5.30 –** *can not claim protection from* harmful interference from stations of a PRIMARY service to which frequencies are already assigned or may be assigned at a later date;
  - **No. 5.31** - *can claim protection*, however, from harmful interference from stations of the same or other secondary service(s) to which frequencies may be assigned at a later date.
- **A *footnote* to a frequency band or service *may include a restriction* on the service or services concerned**
  - For example:
    - *to operate in a particular country(ies) or service area*
    - *not causing harmful interference to another service*
    - *not claiming protection from another service*

Example page of Table of frequency allocations

335.4-410 MHz

Allocation to services		
Region 1	**Region 2**	**Region 3**
335.4-387	FIXED MOBILE 5.254	
387-390	FIXED MOBILE Mobile-satellite (space-to-Earth) 5.208A 5.208B 5.254 5.255	
390-399.9	FIXED MOBILE 5.254	
399.9-400.05	MOBILE-SATELLITE (Earth-to-space) 5.209 5.220	
400.05-400.15	STANDARD FREQUENCY AND TIME SIGNAL-SATELLITE (400.1 MHz) 5.261 5.262	
400.15-401	METEOROLOGICAL AIDS METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 5.208A 5.208B 5.209 SPACE RESEARCH (space-to-Earth) 5.263 Space operation (space-to-Earth) 5.262 5.264	

Assignment of frequencies

- Assignments are to be made in accordance with the Table of Frequency Allocations and other provisions of these Regulations.
- Any new assignment shall be made in such a way as to avoid causing harmful interference to services rendered by stations using frequencies assigned in accordance with the Table of Frequency Allocations and the other provisions of these Regulations, the characteristics of which assignments are recorded in the Master International Frequency Register.

RR No. 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.”*

Rules of Procedure relating to No.4.4

- **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.

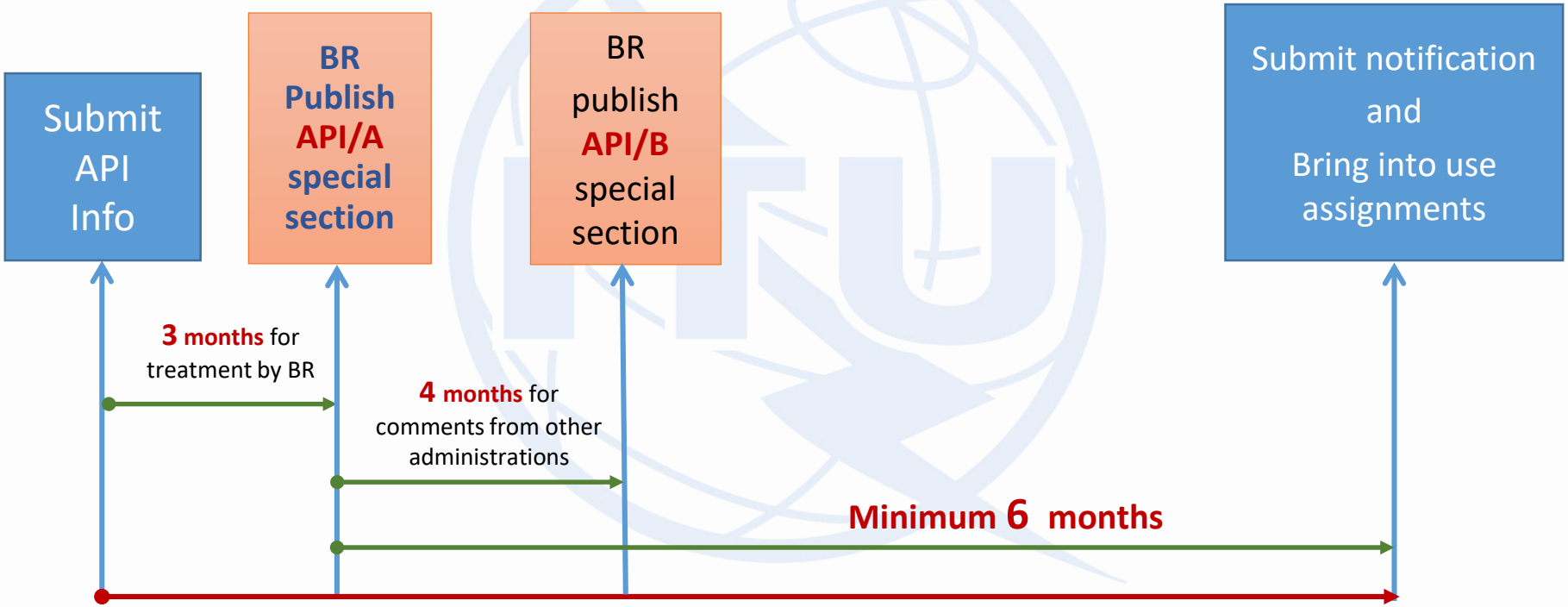
Article 18 - LICENSING

18.1 No transmitting station may be established or operated by a private person or by any enterprise without a licence issued in an appropriate form and in conformity with the provisions of these Regulations by or on behalf of the government of the country to which the station in question is subject

18.6 The government which issues a *licence shall indicate* therein in clear form *the particulars of the station*, including its name, call sign, as well as the general characteristics of the installation

18.10 The holder of the certificate [*licence*] *shall comply with the provisions of these Regulations* applicable to licence holders

Regulatory procedure for satellite networks **not subject to coordination**



MAXIMUM 7 YEARS !

In total, ≈ 9 MONTHS to 7 YEARS !

Advance Publication Information (API)

- **API** is a mandatory procedure (**No.9.1**)
  for all satellite network **not subject to coordination procedure**
- Mainly concerns Non-GSO networks
  Also for geostationary satellite networks with inter-satellite link operating with other Non-GSO space stations in bands not subject to coordination

➢ For such systems **not subject to coordination**, the provisions of **Article 9, Sub-Section IA** (API on satellite networks that are not subject to coordination procedure under Section II), are applicable.

➢ Although not subject to coordination, there is a **commenting procedure** and **resolutions** of difficulties specified **under No.9.3**

➢ Small satellites **usually** make use of frequency bands that are **not subject to** coordination

What is not subject to coordination?

- **This refers to satellite networks not subject to coordination procedure under Section II of Article 9**
- **For geostationary satellite networks, the only ones not subject to coordination are those with inter-satellite link operating with other Non-GSO space stations in bands not subject to coordination**
- **For Non-GSO satellite networks, to know whether the frequency band/service is subject to coordination, check the footnotes in the Table of Frequency Allocations**

Examples of footnote indicating coordination is required:

- **No. 5.364** *The use of the band 1 610-1 626.5 MHz by the mobile-satellite service (Earth-to-space) and by the radiodetermination-satellite service (Earth-to-space) is subject to coordination under No. **9.11A**.*

  (For coordination under No. **9.11A**, see also **Rule of Procedure**)

- **No. 5.286** *The band 449.75-450.25 MHz may be used for the space operation service (Earth-to-space) and the space research service (Earth-to-space), subject to agreement obtained under No. **9.21**.*

Regulatory procedures for comments and resolution of difficulties

Commenting procedures

- Comments to an API/A should be submitted to the notifying Administration and the SpaceCom comment file submitted to the Bureau within **4 months** from the date of publication of the API/A special section
- The Bureau publishes the list of administrations which have sent comments in an **API/B** special section in a BR IFIC

Regulatory procedures for comments and resolution of difficulties

Cooperation and Resolution of Difficulties

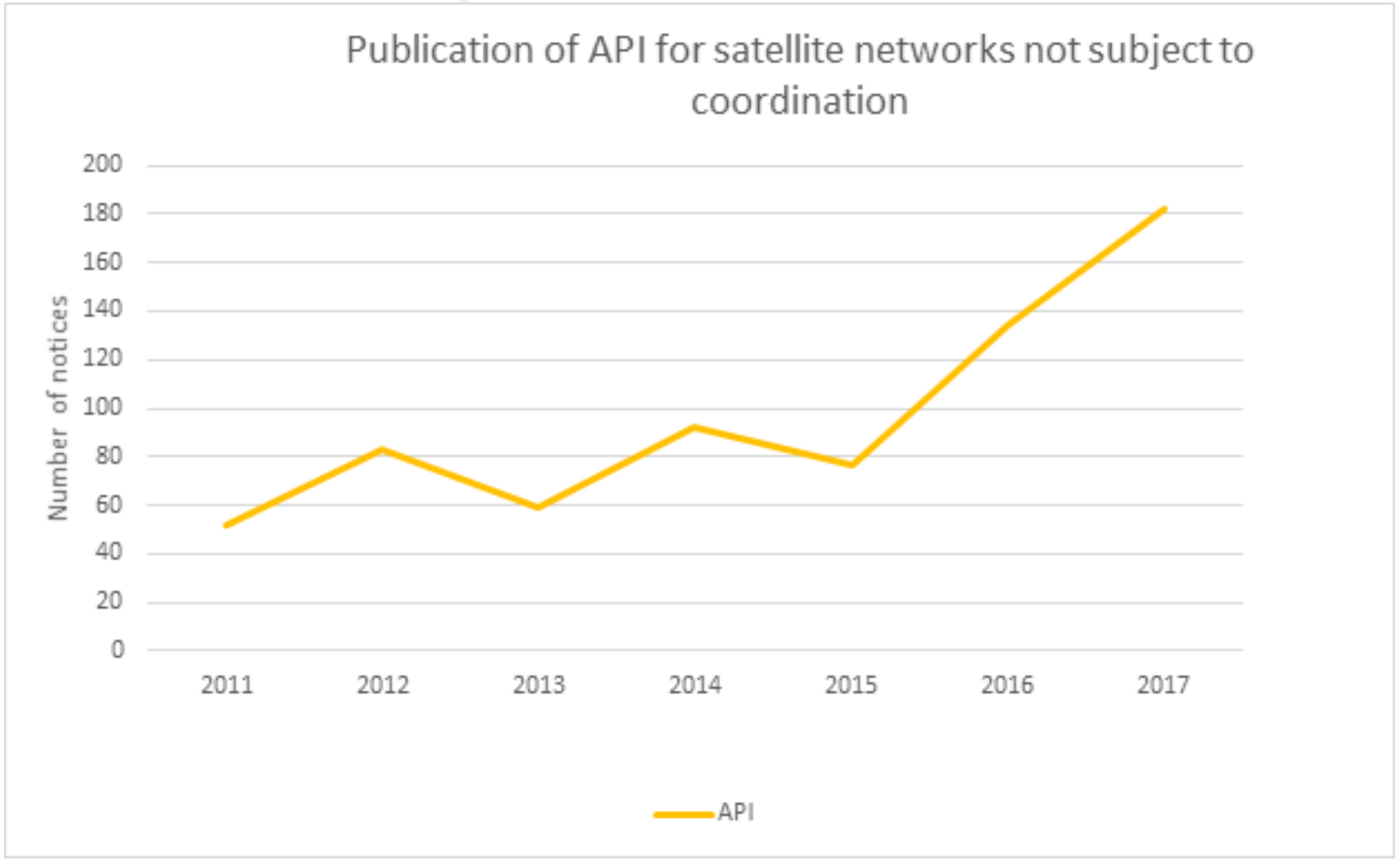
- Both administrations shall endeavor to cooperate in joint efforts to resolve any difficulties and shall exchange any additional relevant information that may be available
- Either party can request for the assistance of the Radiocommunication Bureau (No.**9.3**)
- **In case of difficulties**, the administration responsible for the planned satellite network shall explore all possible means to resolve the difficulties without considering the possibility of adjustment to networks of other administrations
- **If no such means can be found**, it may request the other administrations to explore all possible means to meet its requirements
- The administrations concerned shall make every possible effort to resolve the difficulties by means of mutually acceptable adjustments to their networks

No. 9.4 states that reports on the progress made in resolving any difficulties should be submitted to the Bureau

- However, since the Bureau does not require this information in the examination of the notification for recording, it is not necessary to provide this information except if the notifying administration wishes to keep the Bureau informed about the progress of its project.

ITU Publication of API

not subject to coordination



Notification for recording in the Master Register

- **Why notify (No.8.3)?**
  - Has the right to international recognition
  - this right means that other administrations shall take it into account when making their own assignments, in order to avoid harmful interference.
- **What assignments should be notified? (No.11.2)**
  - Any frequency assignments of transmitting and receiving earth and space stations:
    - *Capable of causing harmful interference; or*
    - *Used for international radiocommunication; or*
    - *Seeking to obtain international recognition; or*
    - *Non conforming assignment seeking to be recorded for information purposes only…..*
- Frequency assignments to earth stations in the amateur-satellite service is **not** required to be notified for recording in the MIFR (**No.11.14**)

Information required for filing (1)

- **Specified in Appendix 4 of the Radio Regulations, including:**
  - Satellite name, responsible administration and operating agency
  - Orbital characteristics
  - Antenna beam characteristics
  - Frequency band
  - Service Areas
  - Power levels/designation of emissions etc.
  - Earth stations
  - etc. …
- **All submissions should be in BR software SpaceCap compatible format (Resolution-55)**

Appendix 4 – example (1)

Items in Appendix	*C - CHARACTERISTICS TO BE PROVIDED FOR EACH GROUP OF FREQUENCY ASSIGNMENTS FOR A SATELLITE ANTENNA BEAM OR AN EARTH STATION OR RADIO ASTRONOMY ANTENNA*
C.1	**FREQUENCY RANGE**
C.1.a	the lower limit of the frequency range within which the carriers and the bandwidth of the emission will be located for each Earth-to-space or space-to-Earth service area, or for each space-to-space relay
C.1.b	the upper limit of the frequency range within which the carriers and the bandwidth of the emission will be located for each Earth-to-space or space-to-Earth service area, or for each space-to-space relay
C.2	**ASSIGNED FREQUENCY (FREQUENCIES)**
C.2.a.1	the assigned frequency (frequencies), as defined in No. **1.148** – 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 If the basic characteristics are identical, with the exception of the assigned frequency, a list of frequency assignments may be provided In the case of advance publication, required only for active sensors In the case of geostationary and non geo-stationary satellite networks, required for all space applications except passive sensors In the case of Appendix **30B**, required only for notification under Article 8
C.2.a.2	the channel number
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

Appendix 4 – example (2)

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
									C.1	
X	X	X						X	C.1.a	
X	X	X						X	C.1.b	
									C.2	
		+	+	+	X	X	X	+	C.2.a.1	
						X	X		C.2.a.2	
		+	+	+					C.2.b	X

Antenna radiation patterns

Submit antenna radiation patterns for space station beams and associated Earth stations in one of the following way:

1. **Indicate the antenna pattern IDs by selecting from the Antenna Pattern Library available at the webpage: https://www.itu.int/en/ITU-R/software/Pages/ant-pattern.aspx**
2. **Provide as a table of Gain vs off-axis angles**
3. **Describe them with equations**
4. **Provide diagrams graphical format in JPEG or PDF files**

In all cases, ensure that

- **the gain value is clearly shown for all values of off-axis angles from 0° to 180°**
- **the gain value is consistent with the maximum gain indicated in the mdb file**

Antenna radiation patterns

Eg. Earth Station Antenna 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 Antenna Patterns

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

Typical services

- Amateur-Satellite Service
- Earth Exploration-Satellite Service
- Meteorological-Satellite Service
- Space Research-Satellite Service
- Space Operation Service
- Others

Amateur-Satellite Service

- **1.56** *amateur service:* A *radiocommunication service* for the purpose of self-training, intercommunication and technical investigations carried out by amateurs, that is, by duly authorized persons interested in radio technique solely with a personal aim and without pecuniary interest.
- **1.57** *amateur-satellite service:* A *radiocommunication service* using *space stations* on earth *satellites* for the same purposes as those of the *amateur service*.

- Class of station - EA

Specific issues for Amateur-Satellite Service

- API must be submitted to ITU before coordinating frequency with IARU
- Note that frequency assignments in notification must be covered by frequency bands in API, therefore avoid submitting a very narrow frequency band at the API, in case there is a change needed during the comments/consultation process
- Administrations authorizing space stations in the amateur-satellite service shall ensure that sufficient earth command stations are established before launch to ensure that any harmful interference caused by emissions from a station in the amateur-satellite service can be terminated immediately (see No. **25.11**)
- Amateur-satellite service is exempted from cost recovery fee (please refer to **DEC 482**)

ITU-R Handbook for amateur and amateur-satellite services
https://www.itu.int/en/publications/ITU-R/pages/publications.aspx?parent=R-HDB-52-2014&media=electronic

Amateur Satellite Service
– example of frequency allocations

Frequency band	Service	Type of allocation
28-29.7 MHz	Amateur-Satellite Service	Primary
144-146 MHz	Amateur-Satellite Service	Primary
435-438 MHz	Amateur-Satellite Service	Secondary (No.5.282)
1260 – 1270 MHz	Amateur-Satellite Service (E-S)	Secondary (No.5.282)
2400 – 2450 MHz	Amateur-Satellite Service	Secondary (No.5.282)
3400 – 3410 MHz	Amateur-Satellite Service	Secondary (No.5.282)
5650 – 5670 MHz	Amateur-Satellite Service (E-S)	Secondary (No.5.282)
5830 – 5850 MHz	Amateur-Satellite Service (S-E)	Secondary
…….		

For more details and the conditions for the usage of these bands, please refer to Article **5** of the Radio Regulations.

Space Operation Service

- **1.23** *space operation service:* A *radiocommunication service* concerned exclusively with the operation of *spacecraft*, in particular *space tracking, space telemetry* and *space telecommand*.
- These functions will normally be provided within the service in which the *space station* is operating.

Circular letter CR/420 - *Application of No. 9.3 of the Radio Regulations in the bands 2 025-2 110 MHz (Earth-to-space) and 2 200-2 290 MHz (space-to-Earth)*
- Refrain from filing the entire bands *2 025-2 110 and 2 200-2 290 MHz* in the API, and from using generic parameters in API

Space Operation Service
– example of frequency allocations

Frequency band	Service	Direction
30.01 – 37.5 MHz	Space Operation Service	S-E, E-S
174 – 184 MHz	Space Operation Service	S-E
267 – 273 MHz	Space Operation Service	S-E
470 – 485 MHz	Space Operation Service	S-E
1525 – 1535 MHz	Space Operation Service	S-E
1750 – 1850 MHz	Space Operation Service	E-S
2025-2100 MHz	Space Operation Service	E-S, S-S
2200-2290 MHz	Space Operation Service	S-E, S-S
7100-7155MHz	Space Operation Service	E-S
7290-7235MHz	Space Operation Service	E-S

… …

For more details and the conditions for the usage of these bands, please refer to Article **5** of the latest Radio Regulations.

Space Operation Service

Space operation service : ET
Space operation functions: EK, ER, ED

For ET, ensure that there is an allocation for the space operation service, either in the main table or through a footnote.

For EK, ER, ED, ensure that there is a main service in the notice, and that the band selected for the space operation function has also an allocation for the main service (see Rules of procedure relating to No.1.23).

RoP No.1.23

……. space operation functions will be considered in conformity with the Table of Frequency Allocations 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).**

Space Operation Service

Space operation: ET≠EK, ER, ED

For example:

SpaceVal results:

Fatal Errors: 1 Warnings:

Beam	E/R	Grp id	Table	Field	Value	Row	Valerr	Rule	F/W	Ap4 Ref	Error Message
CRL	R	102	srv_cls	stn_cls	ET		631	7	F	C.4.a	There is no allocation for the space operation service (ET) for this band. Please use ED, EK, ER as appropriate (see No.1.23 and its related Rules of Procedure) for the space operations function

F C.4.a There is no allocation for the space operation service (ET) for this band. Please use ED, EK, ER as appropriate (see No.1.23 and its related Rules of Procedure) for the space operations function

Earth exploration-satellite service - definitions in the Radio Regulations

- **1.51** *Earth exploration-satellite service:* A *radiocommunication service* between *earth stations* and one or more *space stations*, which may include links between *space stations*, in which:
  - information relating to the characteristics of the Earth and its natural phenomena, including data relating to the state of the environment, is obtained from *active sensors* or *passive sensors* on Earth *satellites*;
  - similar information is collected from airborne or Earth-based platforms;
  - such information may be distributed to *earth stations* within the system concerned;
  - platform interrogation may be included.

  This service may also include *feeder links* necessary for its operation.

Class of station: EW

ITU-R Handbook for earth exploration satellite service
https://www.itu.int/en/publications/ITU-R/pages/publications.aspx?parent=R-HDB-56-2011&media=electronic

Earth exploration-satellite service - definitions in the Radio Regulations-2

- **1.52** *meteorological-satellite service:* An *earth exploration-satellite service* for meteorological purposes.
- **1.182** *active sensor:* A measuring instrument in the *earth exploration-satellite service* or in the *space research service* by means of which information is obtained by transmission and reception of *radio waves*.
- **1.183** *passive sensor:* A measuring instrument in the *earth exploration-satellite service* or in the *space research service* by means of which information is obtained by reception of *radio waves* of natural origin.

Earth exploration-satellite service (EESS) - Frequency usage

- **Satellite bus links for TT&C**
  - The primary functions – telemetry, tracking, and command (TT&C) are operations functions associated with the satellite bus. The satellite bus provides the necessary support functions for the operation of the instruments (payload).
  - The allocations near 2 GHz for the EESS provide reliable, weather independent links for Earth exploration satellites.
- **Sensor data downlink**
  - The transmission of sensor data to earth station, either directly or indirectly via a data relay satellite, is carried through the satellite bus and its data handling system. This data link will be called the science data or EESS data downlink.
- **Typically, the satellite bus links require relatively low bandwidths as they support a data rate of about 1 Mbit/s and often much less, while the science data rates typically are in the order of a hundred Mbit/s.**

Information required for filing - sensors

- **Additional information required for Earth exploration-satellite service (active), sensors specific information:**
  - Active Sensors
    - *Transmit beam*
      - Mean peak power and mean power density
      - Pulse length and pulse repetition frequency
    - *Receive beam*
      - Receiver noise bandwidth
      - Noise temperature at output of signal processor
  - Passive sensors
      - Observed bandwidth
      - Sensitivity
  - To capture sensor information in SpaceCap, go to Beam tab, check the box "**Beam has Sensors**"
  - For active sensors, ensure that there are corresponding transmit and receive beams with the same name
  - Class of stations – **E1, E2, E3, E4** (consult the Preface)

Symbol	Space Station Class of Station
E1	Space research (active sensor) space station
E2	Space research (passive sensor) space station
E3	Space station in the Earth exploration-satellite service (active sensor)
E4	Space station in the Earth exploration-satellite (passive sensor)

CR/420 - Application of No. 9.3 of the Radio Regulations in the bands 2 025-2 110 MHz (Earth-to-space) and 2 200-2 290 MHz (space-to-Earth)

- The frequency bands 2 025-2 110 MHz (Earth-to-space) and 2 200-2 290 MHz (space-to-Earth) are not subject to a coordination procedure under section II of Article 9 when they are used by non-GSO satellites. These bands are in fact the most common bands for space operation of non-GSO satellites networks.
- Taking into account that such operation is, in general, limited in duration and requires a limited amount of bandwidth (typically a few megahertz) and a limited number of earth stations, the process under Nos. 9.3 and 9.4 could be facilitated if specific information was provided at the API stage.
- In that case, comments under No. 9.3 might not be necessary and even though the number of satellites operating in these bands is high, the number of comments sent by administrations in relation to new API's could be relatively limited and focused on critical cases.
- This scenario is based on the assumption that an administration analyzing a new API may find enough specific and detailed information. This would allow in most cases to directly discard any risk of interference and therefore the administrative burden of generating a comment to the API and interacting with the notifying administration would be reduced.
- This simplification of the coordination activity does not work however, if the new API includes the whole allocated space operation band (2 025-2 110 MHz and 2 200-2 290 MHz), a trend that the Bureau has noted with numerous recent API submissions.

How to capture API?

Either:

Use Spacecap, start capture as a “New notice”

Or

Download an example from small satellite support page:

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

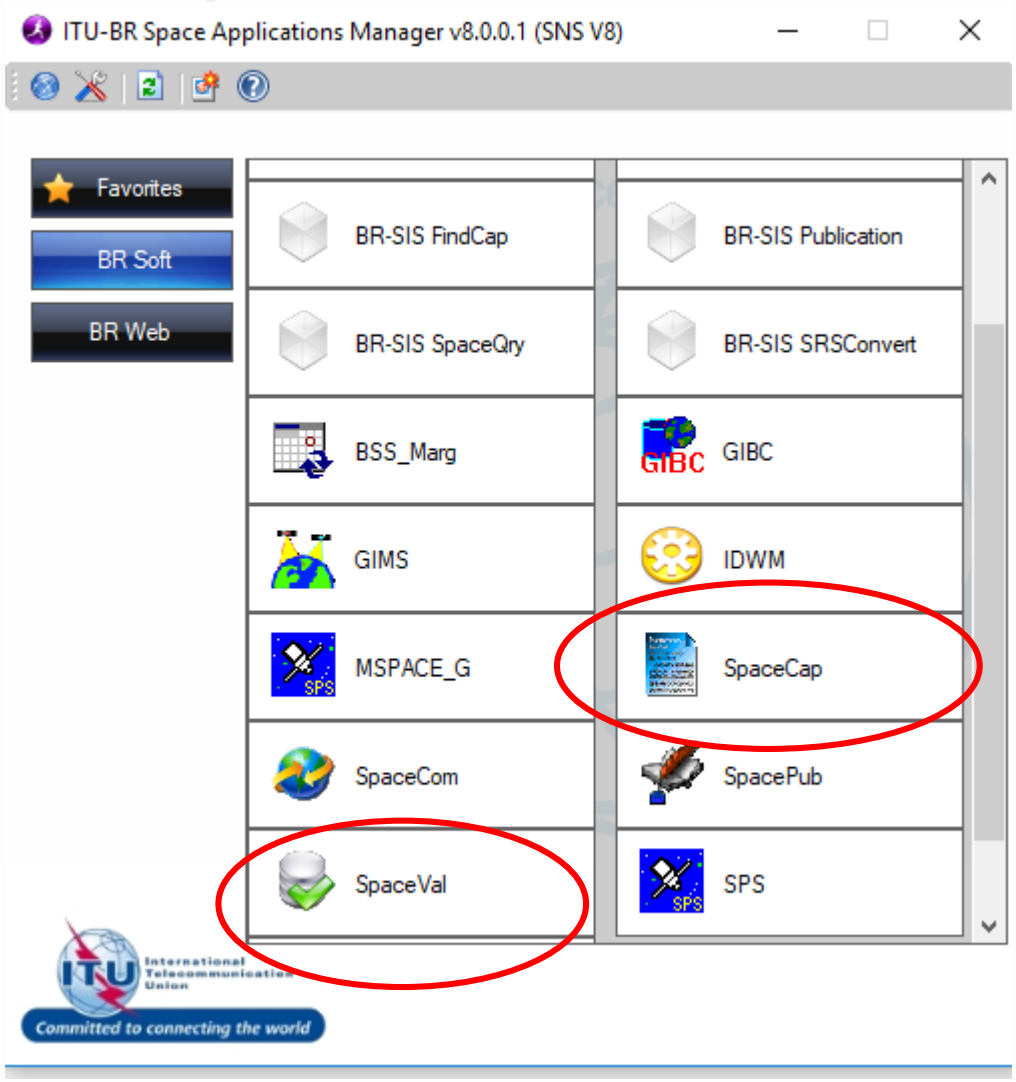
Then clone and modify as needed using SpaceCap

DO NOT ATTEMPT TO ENTER PARAMETERS DIRECTLY USING MICROSOFT ACCESS!

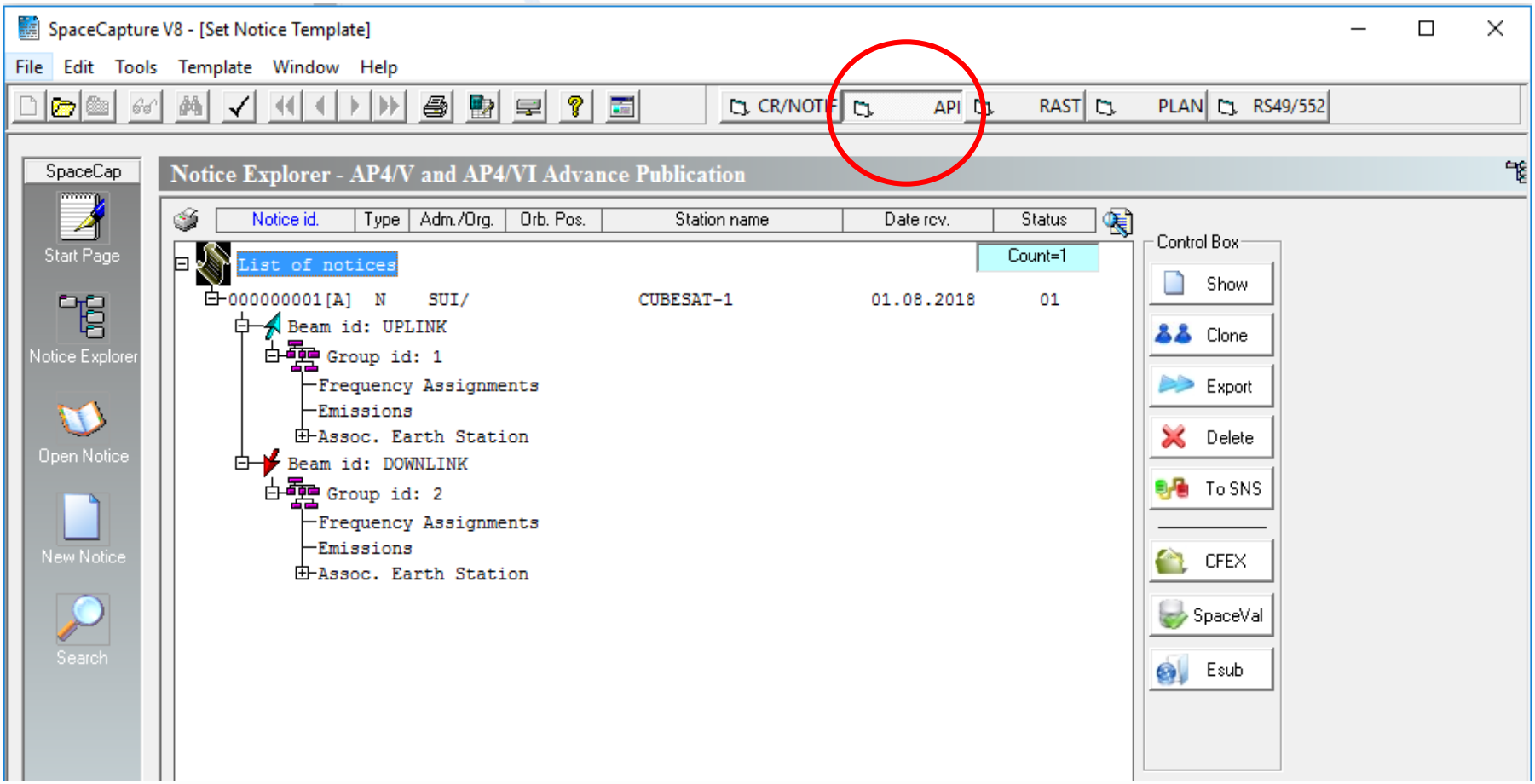
How to capture? --- BRsoft

- **The latest version of BR software** for capture and validation (**SpaceCap and SpaceVal**) of space notices are available from the ITU website (**http://www.itu.int/ITU-R/go/space-software**)
- They are also available with the **BR IFIC DVD**
- **Administrator privilege** is required to install these software.
- Can add **descriptions** in PDF or Word format to supplement the information

How to capture? --- BRsoft



SpaceCap for API



Before you submit….

- Run **Spaceval** to ensure that there are **no fatal errors**
- If there are fatal errors, try to correct them before submission
- If you are unable to resolve all fatal errors, you can **describe** them in the cover letter of your submission, the Bureau will provide assistance to address the errors
  - It is necessary to explain this when submitting any notice with fatal errors using the e-Submissions system
- Make sure that all required antenna patterns are provided
- Do not forget to add **notes/attachments** when necessary
- *Satellite filings **must be submitted by the Administration***

e-Submission system online

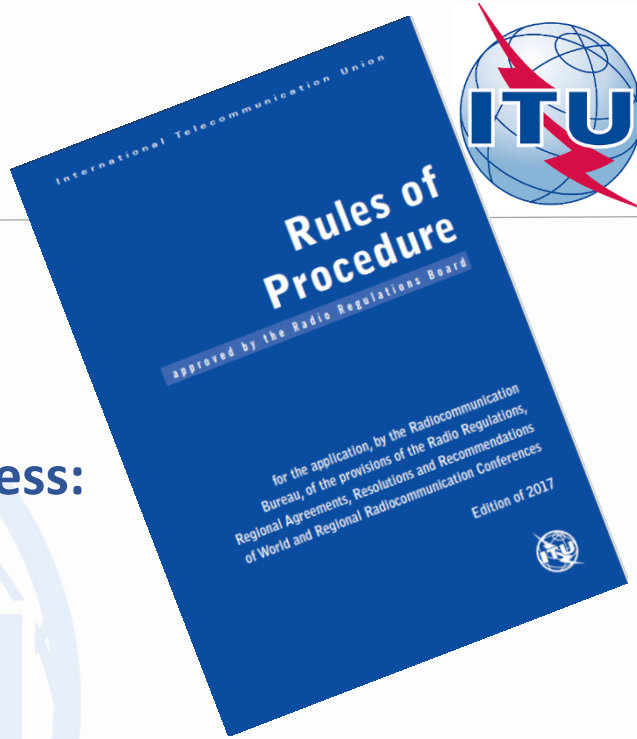
Effective: 01.08.2018

- **Upload the electronic notice via the Bureau's new online submission system "e-submission of satellite network filings" (https://www.itu.int/itu-r/go/space-submission) in accordance with the revised Rules of Procedure on Receivability**

- 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.

(see BR circular letter **CR/434** dated **1 August 2018** for more details)

Other things to note



- **Email: BRMAIL@ITU.INT**
- **Fax: +41 22 730 5785 (several lines)**
- **All mail must be sent to the following address:**

  Radiocommunication Bureau, ITU

  Place des Nations, CH-1211 Geneva 20

  Switzerland
- If a notice does not contain all of the mandatory information as defined in the AP**4** of the RR, further processing of the notice will remain in abeyance and a date of receipt will not be established until the missing information is received
- If all mandatory data have been submitted and further clarification is required concerning the correctness of the mandatory data, the Bureau shall request the ADM to provide the clarification within 30 days
- If the information is received within the 30 days period, the original date of receipt is retained, otherwise, a new date of receipt will be established

Modification of characteristics

- According to **No.9.2**, amendments to the information for NGSO filing that requires a new API are:
  - **Additional frequency band**
  - **Modification of the direction of transmission**
  - **Modification of reference body**
- However, it is a good practice to submit a modification to the API any change in characteristics including orbital characteristics, service area (adding earth stations) etc.
- This will allow other administrations/operators the chance to submit comments before the modifications are notified for recording in the Master Register.
- If during the notification, there are other changes in characteristics from the information published in API/A, other administrations can submit comments following the **Part I-S** (**No.11.28.1**).

Cost recovery

- Cost recovery framework is defined in the Council Decision 482
- Filings for amateur-satellite service is exempt from cost recovery fee
- All other services are subject to cost recovery fee
- For satellite networks not subject to coordination
  - API – flat fee of 570 CHF
  - Notification – flat fee of 7030 CHF
- Modification charged with flat fee just like a new filing
- Notification of Earth stations are not chargeable
- Each Administration has one free filing per year
- In the event of non-payment by the due date, the filing will be cancelled (RR9.2B.1 and A.11.6). However the invoice continue to be payable for the Administration

  Note also ROP relating to late payment
- http://www.itu.int/ITU-R/go/space-cost-recovery/en

API/A

UNION INTERNATIONALE DES TÉLÉCOMMUNICATIONS
BUREAU DES RADIOCOMMUNICATIONS

INTERNATIONAL TELECOMMUNICATION UNION
RADIOCOMMUNICATION BUREAU

UNIÓN INTERNACIONAL DE TELECOMUNICACIONES
OFICINA DE RADIOCOMUNICACIONES

RÉSEAU À SATELLITE SATELLITE NETWORK RED DE SATÉLITE	ZACUBE-2	SECTION SPÉCIALE Nº SPECIAL SECTION No. SECCIÓN ESPECIAL N.º	API/A/12068
		BR IFIC / DATE BR IFIC / DATE BR IFIC / FECHA	2864 / 20.02.2018
ADM. RESPONSABLE RESPONSIBLE ADM. ADM. RESPONSABLE: AFS	LONGITUDE NOMINALE NOMINAL LONGITUDE LONGITUD NOMINAL: NGSO	NUMÉRO D'IDENTIFICATION IDENTIFICATION NUMBER NÚMERO DE IDENTIFICACIÓN	117545401
RENSEIGNEMENTS REÇUS PAR LE BUREAU LE / INFORMATION RECEIVED BY THE BUREAU ON / INFORMACIÓN RECIBIDA POR LA OFICINA EL			15.12.2017

Ces renseignements reçus par le Bureau des radiocommunications, en application du numéro 9.1/9.2 du Règlement des radiocommunications, sont publiés conformément au numéro 9.2B.

This information, received by the Radiocommunication Bureau pursuant to No.9.1/9.2 of the Radio Regulations, is published in accordance with No. 9.2B.

Esta información, recibida por la Oficina de Radiocomunicaciones con arreglo al número 9.1/9.2 del Reglamento de Radiocomunicaciones, se publica de acuerdo con lo dispuesto en el número 9.2B.

Une administration qui estime que des brouillages inacceptables risquent d'être causés à ses réseaux ou à ses systèmes à satellites existants ou en projet communique à l'administration qui a demandé la publication des renseignements ses observations, avec copie au Bureau des radiocommunications, dans le délai indiqué ci-après.

Any administration which believes that unacceptable interference may be caused to its existing or planned satellite networks or systems shall communicate its comments to the publishing administration, with a copy to the Radiocommunication Bureau, by the deadline indicated below.

Cualquier administración que estime que se podría causar interferencia perjudicial a sus redes o sistemas de satélites existentes o planificados deberá comunicar sus comentarios a la administración que publica, con copia a la Oficina de Radiocomunicaciones, en el plazo que se indica más abajo.

DATE LIMITE POUR LA RÉCEPTION DES COMMENTAIRES EXPIRY DATE FOR THE RECEIPT OF COMMENTS FECHA LÍMITE PARA LA RECEPTIÓN DE LOS COMENTARIOS	20.06.2018

Contains advance publication information on a planned satellite network.

API/B

UNION INTERNATIONALE DES TÉLÉCOMMUNICATIONS
BUREAU DES RADIOCOMMUNICATIONS

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RADIOCOMMUNICATION BUREAU

UNIÓN INTERNACIONAL DE TELECOMUNICACIONES
OFICINA DE RADIOCOMUNICACIONES

RÉSEAU À SATELLITE SATELLITE NETWORK RED DE SATÉLITE	PRISMA-I1	SECTION SPÉCIALE Nº SPECIAL SECTION No. SECCIÓN ESPECIAL N.º	API/B/827
		BR IFIC / DATE BR IFIC / DATE BR IFIC / FECHA	2864 / 20.02.2018
ADM. RESPONSABLE RESPONSIBLE ADM. ADM. RESPONSABLE	I	LONGITUDE NOMINALE NOMINAL LONGITUDE LONGITUD NOMINAL	NGSO
		NUMÉRO D'IDENTIFICATION IDENTIFICATION NUMBER NÚMERO DE IDENTIFICACIÓN	117545350 / 117545350

RÉFÉRENCE DE LA SECTION SPÉCIALE (BR IFIC / DATE) SPECIAL SECTION REFERENCE (BR IFIC / DATE) REFERENCIA DE LA SECCIÓN ESPECIAL (BR IFIC / FECHA)	API/A/12034 (BR IFIC 2854 / 19.09.2017)

1. La présente Section spéciale est publiée conformément au numéro 9.5 du Règlement des radiocommunications, et concerne la demande de coordination publiée dans la section spéciale API/A indiquée ci-dessus.

2. Les administrations qui ont soumis des observations au titre du numéro 9.3 dans le délai de quatre mois suivant la date de publication de la Section spéciale API/A précitée, sont indiquées ci-dessous et le tableau contient un résumé de ces observations.

1. This Special Section is published in accordance with No. 9.5 of the Radio Regulations, in respect of the request for coordination published in the API/A Special Section referenced above.

2. Administrations that have submitted comments under No. 9.3 within four months of the date of publication of the mentioned API/A Special Section are listed below and the table contains a summary of the comments.

1. Esta Sección Especial se publica de conformidad con lo dispuesto en el número 9.5 del Reglamento de Radiocomunicaciones, en lo que respecta a la solicitud de coordinación publicada en la Sección Especial API/A antes citada.

2. Las administraciones que han presentado comentarios conforme al número 9.3 dentro de un plazo de cuatro meses a partir de la fecha de publicación de la Sección Especial API/A mencionada, se indican a continuación y en el cuadro se presenta un resumen de los comentarios.

ALG, AUS, BHR, BLR, CAN, CHN, CYP, D, E, EGY, F, HOL, J, KAZ, KOR, MLA, MRC, PAK, QAT, RUS, USA

Contains a list of administrations which have sent comments.

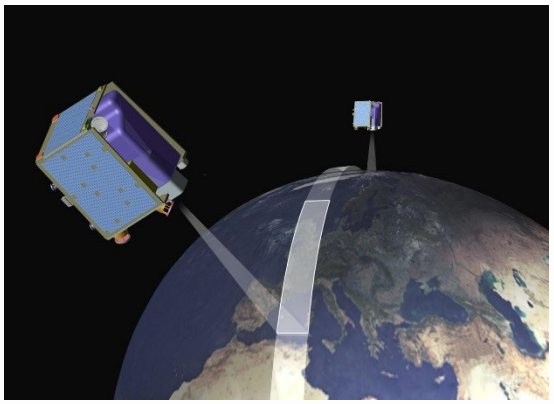
WRC-15: Earth exploration-satellite service (EESS) in 7-8 GHz

agenda item 1.11

- **Background**
  - The need for uplink large amounts of data for operations plans and dynamic spacecraft software modifications, which might not be accommodated by heavily used 2 025-2 110 MHz and 2 200-2 290 MHz TT&C bands
- **Results of WRC-15**
  - New primary EESS up link allocation limited to tracking, telemetry and command (TT&C) in the 7 190-7 250MHz band (34% increase)
  - Provision to protect existing and future stations in the fixed, mobile and space research services from the new allocation
- **Implications**
  - In combination with existing EESS downlink allocation in 8 025-8 400 MHz this new allocation will lead to simplified on-board architecture and operational concepts for future missions of EESS

WRC-15: Earth exploration-satellite service (active) in 8-9 GHz

agenda item 1.12



- **Background**
  - EESS (active) bandwidth in 8-9 GHz was 600MHz. Growing demand for higher resolution to satisfy global environmental monitoring raised the need to increase the bandwidth up to 1200 MHz in total.
- **Results of WRC-15**
  - New primary EESS(active) allocations totally of 600 MHz in the 9 200-9300MHz, 9 900-10 000MHz and 10.-10.4GHz bands (100% increase)
  - Provision to protect existing and future fixed and mobile stations
- **Implications**
  - Development of modern broadband sensing technologies and space-borne radars on active sensing EESS that provides high quality measurements in all weather conditions with enhanced applications for disaster relief and humanitarian aid, large-area coastal surveillance

WRC-15: Regulatory aspects for nano and picosatellites

- **WRC-15 Agenda Item 9.1.8 –**
  Regulatory aspects for nano- and picosatellites
  - WRC-12 adopted Resolution 757 (WRC-12) *Regulatory aspects for nanosatellites and picosatellites*.
  - This issue was studied in ITU-R WP-7B between 2012-2015, which came up with two reports:
    - ***ITU-R Report ITU-R SA.2312*** *- Characteristics, definitions and spectrum requirements of nanosatellites and picosatellites, as well as systems composed of such satellites; and*
    - ***ITU-R Report ITU-R SA.2348*** *- Current practice and procedures for notifying space networks currently applicable to nanosatellites and picosatellites;*
  - Conclusion was that there was no need for special regulatory arrangements for nano and picosatellites
- **WRC-15 Decision – Suppression of Resolution 757**

WRC-15: Resolution 659

- ***Studies to accommodate requirements in the space operation service for non-geostationary satellites with short duration missions***
  - assess the suitability of using existing allocations for the space operations service below 1 GHz to accommodate the telemetry, tracking and command (TT&C) requirements for non-geostationary satellites with short duration missions, and if those allocations are determined to be unsuitable
  - consider possible new allocations or an upgrade of the existing allocations to the SOS within the frequency ranges 150.05-174 MHz and 400.15-420 MHz while protecting the incumbent services, both in-band as well as in adjacent bands.
- **This study is being carried out in ITU-R WP-7B (http://www.itu.int/en/ITU-R/study-groups/rsg7/rwp7b/Pages/default.aspx) , and the results of the studies will be submitted for consideration by WRC-19 under Agenda item 1.7.**

WRC-19 Agenda item 1.7

- to study the spectrum needs for telemetry, tracking and command in the **space operation service** for non -GSO satellites with short duration missions, to assess the suitability of existing allocations to the space operation service and, if necessary, to consider new allocations, in accordance with Resolution **659** (WRC - 15)

- **Draft CPM report from WP7B**
  - **Method A** proposes no change to the Radio Regulations;
  - **Method B1** proposes a new SOS (Earth-to-space) allocation for NGSO SD systems in the frequency range **403-404 MHz**;
  - **Method B2** proposes a new SOS (Earth-to-space) allocation for NGSO SD systems in the frequency range **404-405 MHz**;
  - **Method C** proposes to use the SOS allocation in the frequency band **137-138 MHz** for downlink and the band **148-149.9 MHz** for uplink and to provide appropriate **associated regulatory provisions** in the Radio Regulations for telecommand links of NGSO SD missions.

WRC-19 Agenda item 7 issue M

- **Simplified regulatory regime for non-GSO satellite systems with short duration missions**

  - Draft **CPM-19-2** text
    - *Proposed a **simplified regime** through a Resolution*
    - ***Period of validity**: maximum of **3 years** with **no possibility for extension***
    - *Further proposals expected at **CPM-19-2***

2019-02-18	2019-02-28	ITU-R	CPM19-2	Second Session of the Conference Preparatory Meeting for WRC-19	Switzerland [Geneva]

Calendar of ITU Events: https://www.itu.int/en/events/Pages/Calendar-Events.aspx?sector=ITU-R

Free online ITU-R help & documents

- **Small Satellite Support**
  - http://www.itu.int/en/ITU-R/space/Pages/supportsmallsat.aspx
- **BR space website**
  - http://www.itu.int/en/ITU-R/space)
- **SNL online** ***(basic reference info concerning space stations)***
  - http://www.itu.int/ITU-R/space/snl
- **SNS online – detailed information concerning satellite networks**
  - *TIES account required, need to be an ITU member (member state, ITU-R sector member, associate or academia)*
  - http://www.itu.int/sns/

Free online ITU-R Publications

https://www.itu.int/en/publications/ITU-R/Pages/default.aspx

- **Handbook for amateur and amateur-satellite services**

https://www.itu.int/en/publications/ITU-R/pages/publications.aspx?parent=R-HDB-52-2014&media=electronic

- **Handbook for earth exploration satellite service**

https://www.itu.int/en/publications/ITU-R/pages/publications.aspx?parent=R-HDB-56-2011&media=electronic

- **Handbook for meteorological-satellite service**

https://www.itu.int/en/publications/ITU-R/Pages/publications.aspx?lang=en&media=electronic&parent=R-HDB-45-2017

- **Handbook for space research service**

https://www.itu.int/en/publications/ITU-R/pages/publications.aspx?parent=R-HDB-43-2013&media=electronic

Free online ITU-R documents & events

- **ITU Radio Regulations @ 2016**
  http://www.itu.int/pub/R-REG-RR/
- **ITU RoP** http://www.itu.int/pub/R-REG-ROP/en
- **ITU-R Recommendations**
  http://www.itu.int/publ/R-REC/
- **ITU-R Reports** https://www.itu.int/pub/R-REP/
- **WRC-19**
  https://www.itu.int/en/ITU-R/conferences/wrc/2019/
- **CPM19-2**
  https://www.itu.int/en/ITU-R/study-groups/rcpm/Pages/cpm-19.aspx#

Questions ?