30TH WORLD RADIOCOMMUNICATION SEMINAR

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Geneva, Switzerland

Earth Stations Coordination and Notification

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www.itu.int/go/wrs-22

#ITUWRS

Two Step Process

Earth Station Filing Process

Coordination

Frequency Study and Collecting data (Appendix 4)

Data capture SpaceCap (BR Software)

Data file

GIBC/AP7 (BR Software)

Coordination contours

Coordination Request send to Admins

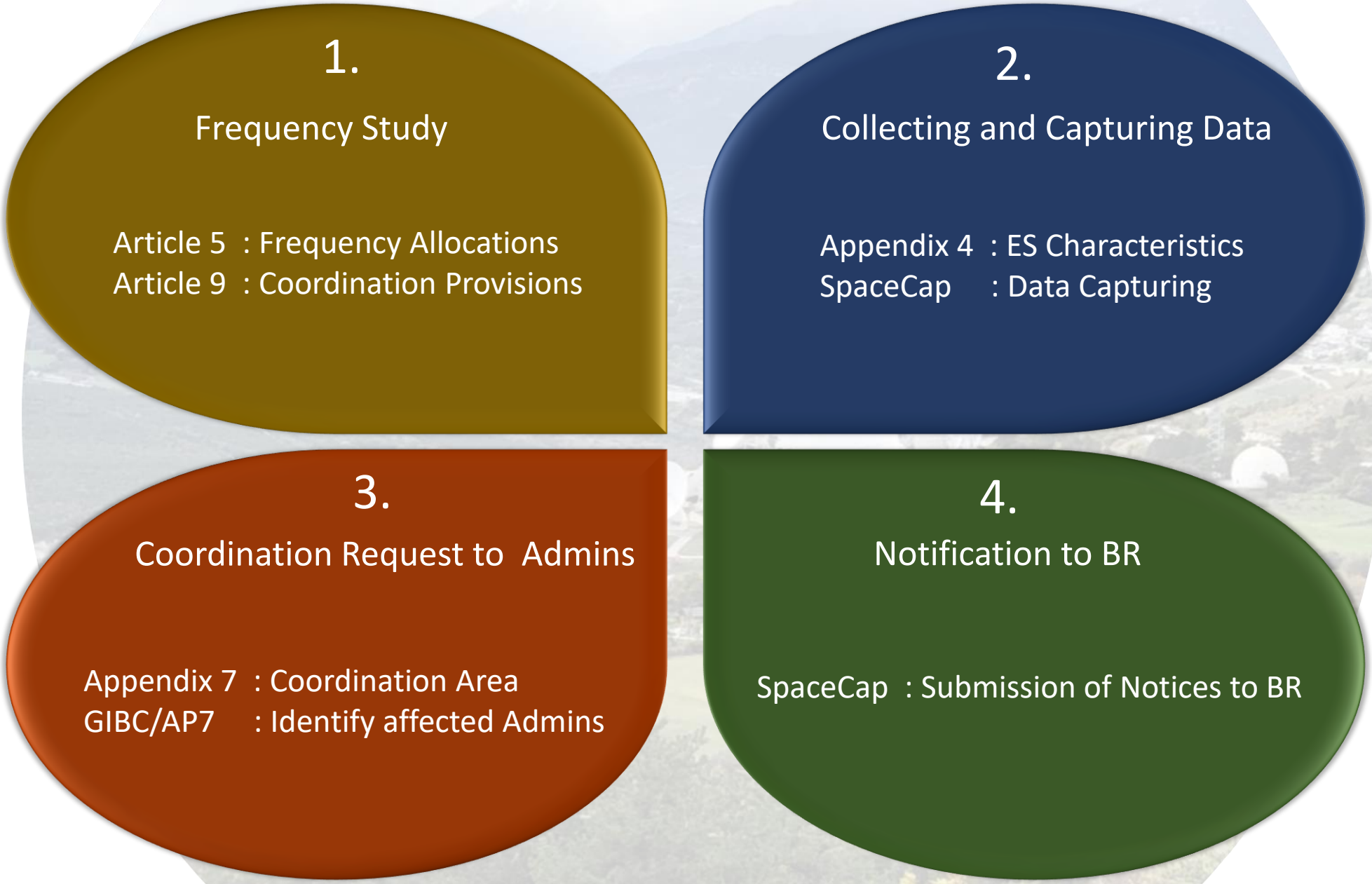
Notification

SpaceCap (BR Software)

Coordination Agreements

Notification Request send to BR

Earth Stations Filing Process



Radio Regulations- Frequency allocations

ARTICLE 5

Frequency allocations

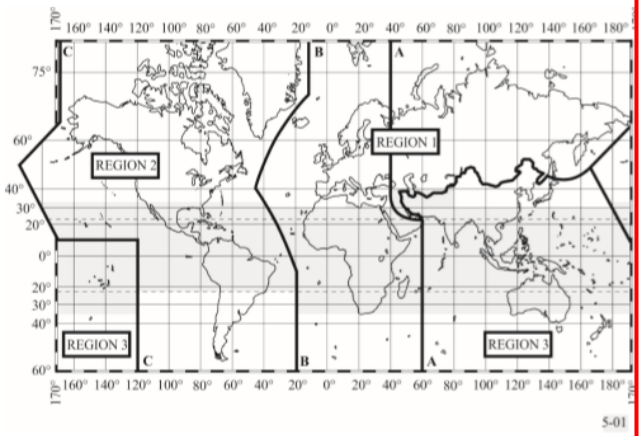
Introduction

5.1 In all documents of the Union where the terms *allocation*, *allotm* *assignment* are to be used, they shall have the meaning given them in Nos. **1.16** to **1.18**, th used in the six working languages being as follows:

Frequency distribution to	French	English	Spanish	Arabic	Chinese	Ru
Services	Attribution (attribuer)	Allocation (to allocate)	Atribución (atribuir)	توزيع (يوزع)	划分	распре (распр
Areas or countries	Allotissement (allotir)	Allotment (to allot)	Adjudicación (adjudicar)	تعيين (يعين)	分配	выде (выд
Stations	Assignation (assigner)	Assignment (to assign)	Asignación (asignar)	تخصيص (يخصص)	指配	прис (прис

Section I – Regions and areas

5.2 For the allocation of frequencies the world has been divided into three R as shown on the following map and described in Nos. **5.3** to **5.9**:



The shaded part represents the Tropical Zones as defined in Nos. **5.16** to **5.20** and **5.21**.

Section IV – Table of Frequency Allocations
(See No. **2.1**)

8.3-110 kHz

Allocation to services		
Region 1	**Region 2**	**Region 3**
Below 8.3	(Not allocated) 5.53 5.54	
8.3-9	METEOROLOGICAL AIDS 5.54A 5.54B 5.54C	
9-11.3	METEOROLOGICAL AIDS 5.54A RADIONAVIGATION	
11.3-14	RADIONAVIGATION	
14-19.95	FIXED MARITIME MOBILE 5.57 5.55 5.56	
19.95-20.05	STANDARD FREQUENCY AND TIME SIGNAL (20 kHz)	
20.05-70	FIXED MARITIME MOBILE 5.57 5.56 5.58	
70-72	**70-90**	**70-72**

Frequency Allocations - Earth Stations

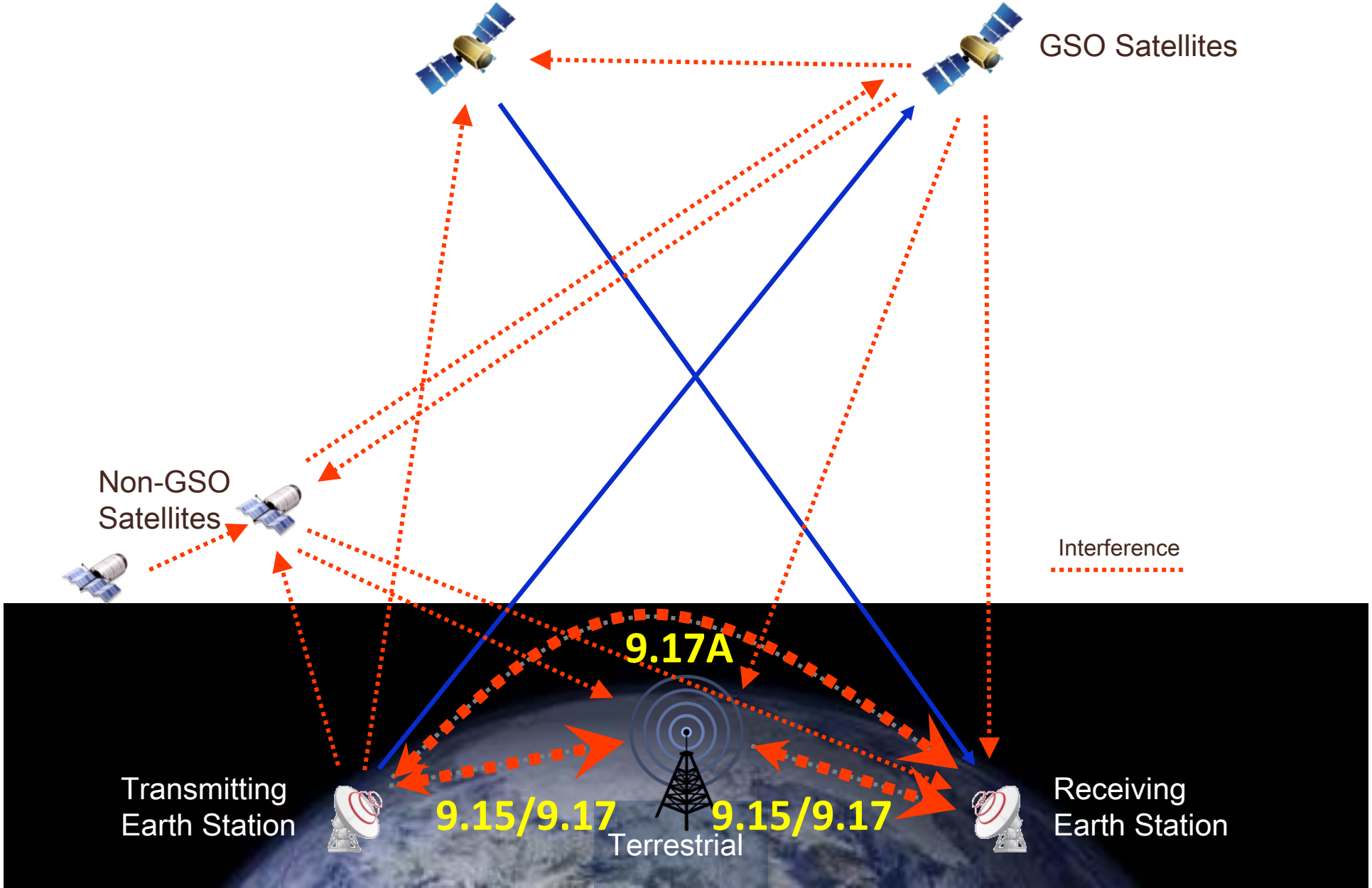
Examples

Allocation to services		
Region 1	**Region 2**	**Region 3**
7 250-7 300	FIXED FIXED-SATELLITE (space-to-Earth) MOBILE 5.461	

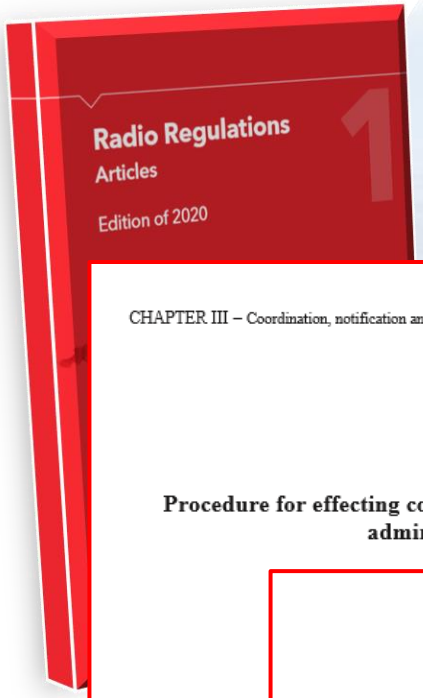
Allocation to services		
Region 1	**Region 2**	**Region 3**
8 025-8 175	EARTH EXPLORATION-SATELLITE (space-to-Earth) FIXED FIXED-SATELLITE (Earth-to-space) MOBILE 5.463 5.462A	

Allocation to services		
Region 1	**Region 2**	**Region 3**
6 700-7 075	FIXED FIXED-SATELLITE (Earth-to-space) (space-to-Earth) 5.441 MOBILE 5.458 5.458A 5.458B	

Coordination of Earth Station is ADM's duty and responsibility.



Radio Regulations – Coordination requirements



CHAPTER III – Coordination, notification and recording of frequency assignments and Plan modifications RR9-1

ARTICLE 9

Procedure for effecting coordination with or obtaining agreement of other administrations[1, 2, 3, 4, 5, 6, 7, 8] (WRC-19)

Section II – Procedure for effecting coordination[13, 14]

Sub-Section IIA – Requirement and request for coordination

9.6 Before an administration[15, 16, 17] notifies to the Bureau or b frequency assignment in any of the cases listed below, it shall effect coordination, other administrations identified under No. **9.27**: (WRC-03)

9.15 *j)* for either a specific earth station or typical earth station of a non-geostationary satellite network for which the requirement to coordinate is included in a footnote to the Table of Frequency Allocations referring to No. **9.11A**, in respect of terrestrial stations in frequency bands allocated with equal rights to space and terrestrial services and where the coordination area of the earth station includes the territory of another country; (WRC-2000)

9.16 *k)* for a transmitting station of a terrestrial service for which the requirement to coordinate is included in a footnote to the Table of Frequency Allocations referring to No. **9.11A** and which is located within the coordination area of an earth station in a non-geostationary-satellite network; (WRC-2000)

9.17 *l)* for any specific earth station or typical mobile earth station in frequency bands above 100 MHz allocated with equal rights to space and terrestrial services, in respect of terrestrial stations, where the coordination area of the earth station includes the territory of another country, with the exception of the coordination under No. **9.15**; (WRC-2000)

9.17A *m)* for any specific earth station, in respect of other earth stations operating in the opposite direction of transmission or for any typical mobile earth station in respect of specific earth stations operating in the opposite direction of transmission, in frequency bands allocated with equal rights to space radiocommunication services in both directions of transmission and where the coordination area of the earth station includes the territory of another country or the earth station is located within the coordination area of another earth station, with the exception of the coordination under No. **9.19**; (WRC-03)

9.18 *n)* for any transmitting station of a terrestrial service in the bands referred to in No. **9.17** within the coordination area of an earth station, in respect of this earth station, with the exception of the coordination under Nos. **9.16** and **9.19**; (WRC-2000)

9.19 *o)* for any transmitting station of a terrestrial service or any transmitting earth station in the fixed-satellite service (Earth-to-space) in a frequency band shared on an equal primary basis with the broadcasting-satellite service, with respect to typical earth stations included in the service area of a space station in the broadcasting-satellite service. (WRC-2000)

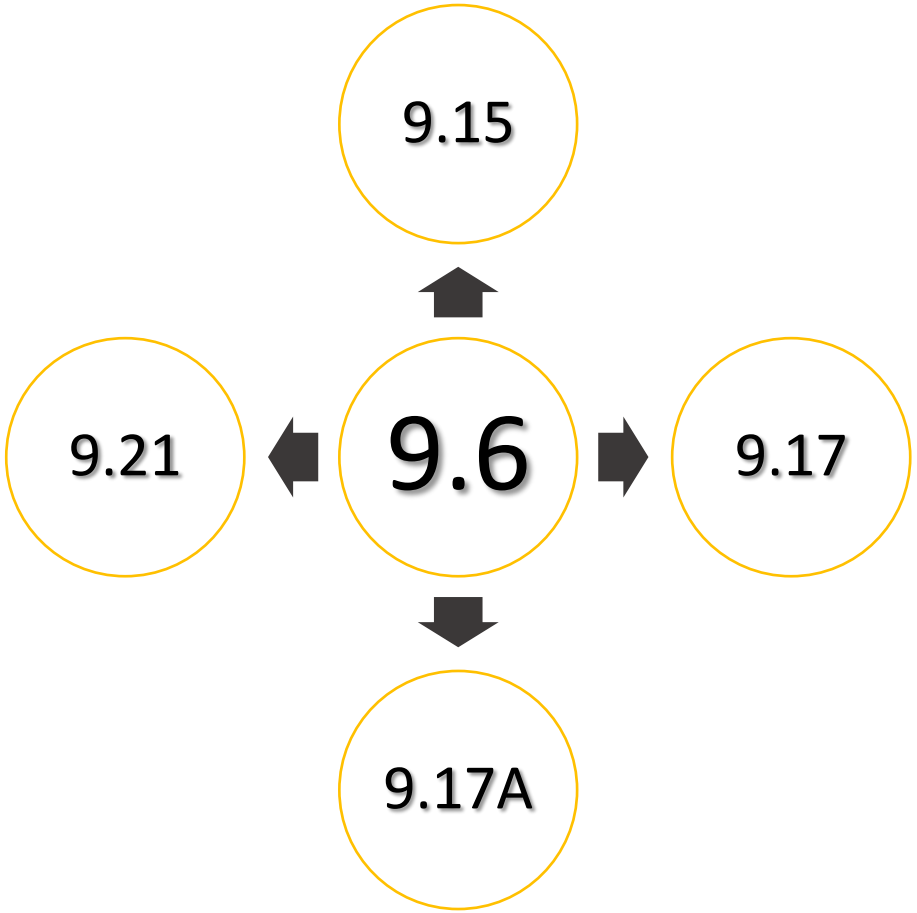
9.20 Not used;

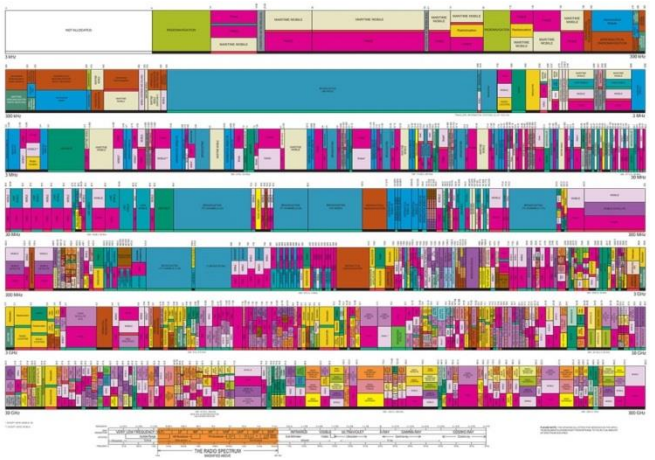
9.21 *p)* for any station of a service for which the requirement to seek the agreement of other administrations is included in a footnote to the Table of Frequency Allocations referring to this provision. (WRC-2000)

Coordination Provisions in Article 9 of RR

Volume No.1 → Article 9

9.6	Administrations **shall effect coordination before** notifying to the BR or brings into use any frequency assignment.

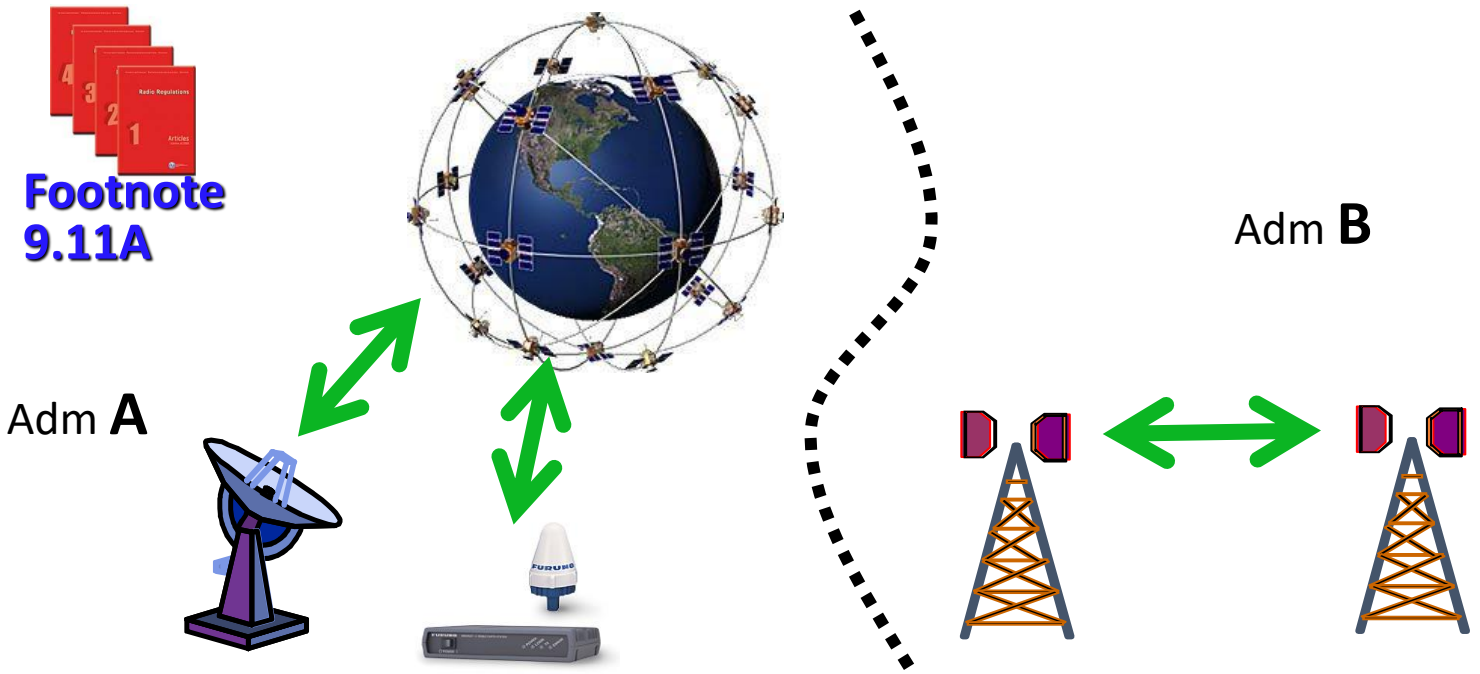




Coordination Provisions in Article 9 of RR

Volume No.1 → Article 9

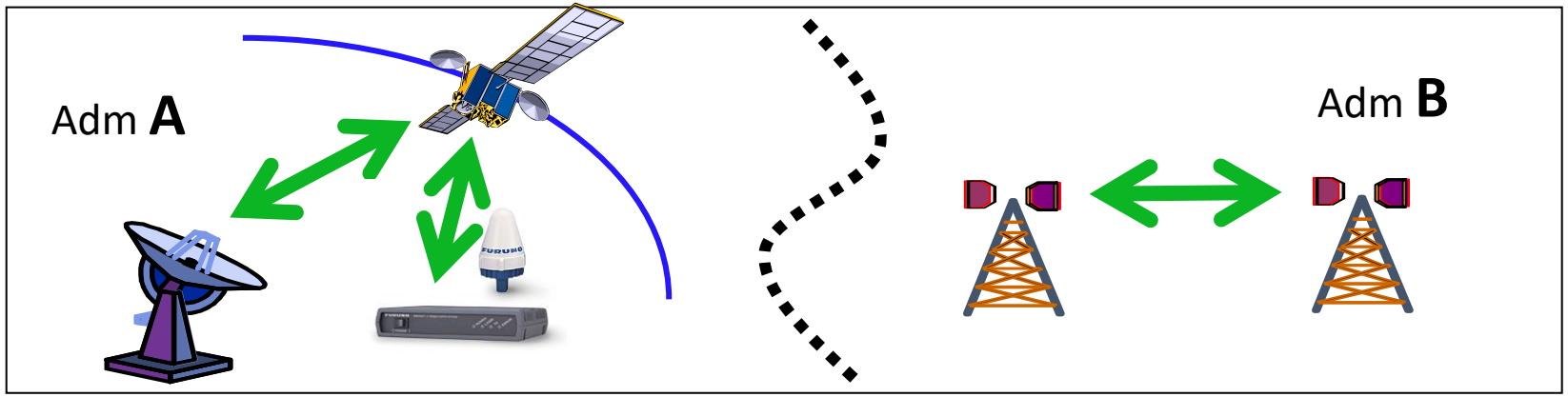
9.15	Coordination of a **Specific or Typical** Earth Station of **non-GSO** in respect of **Terrestrial Stations** (associated with Footnote - 9.11A)

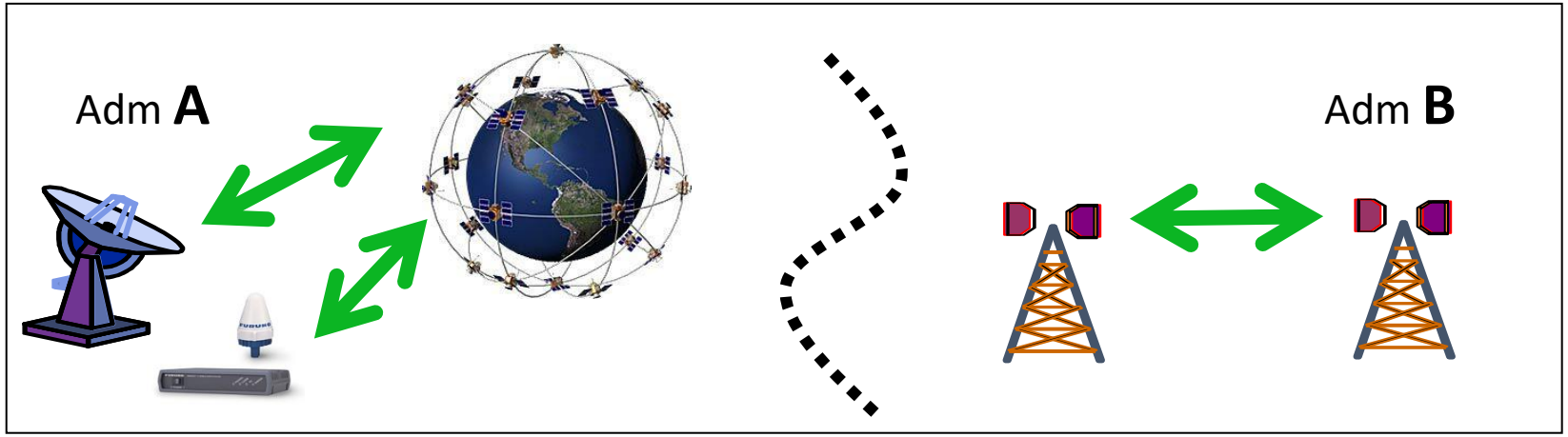


Coordination Provisions in Article 9 of RR

Volume No.1 → Article 9

9.17	Coordination of any **Specific Earth Station** or **Typical Mobile** Earth Station in frequency bands above 100 MHz, in respect of **Terrestrial Stations**, *with the exception of the coordination under 9.15*

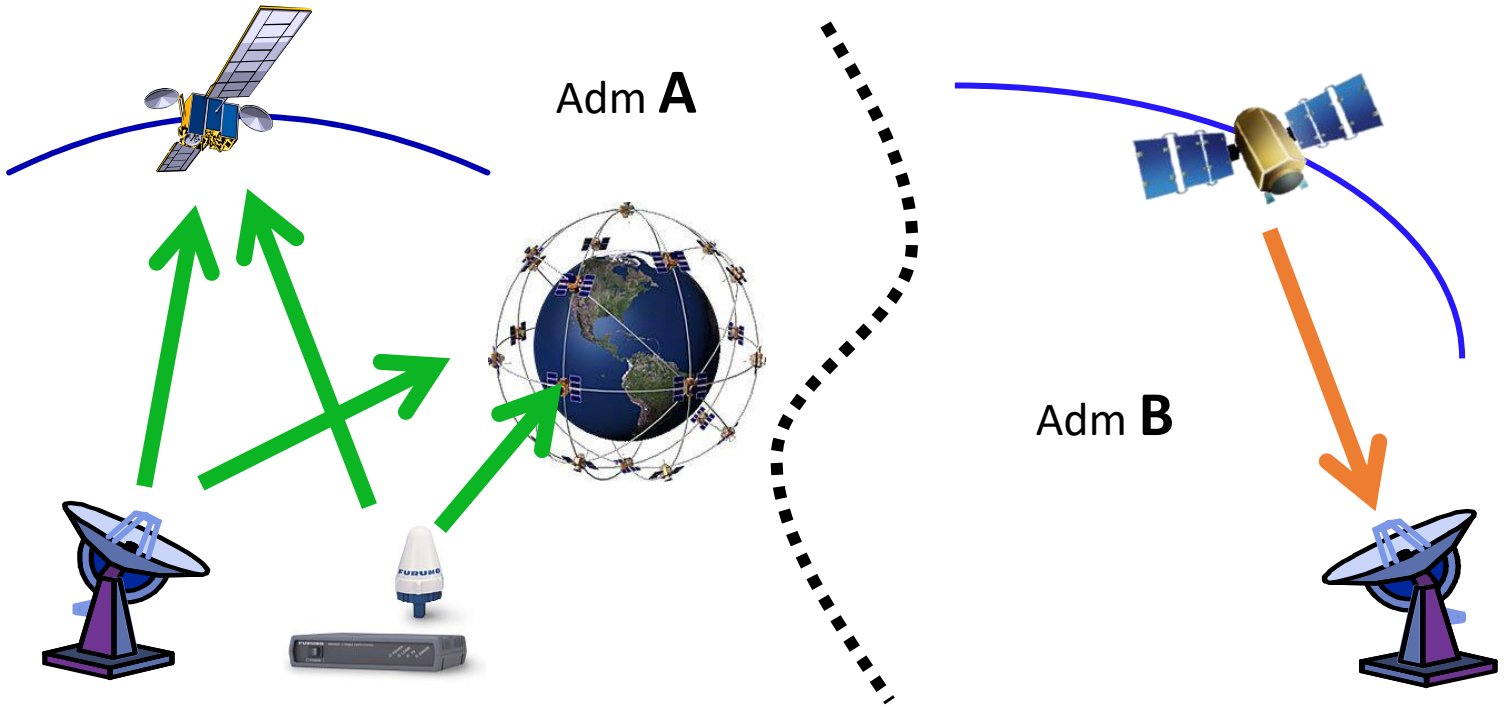




Coordination Provisions in Article 9 of RR

Volume No.1 → Article 9

9.17A	Coordination of any **Specific Earth Station** in respect of other Earth Stations operating in the **opposite direction** of transmission **(ODT)**, or any **Typical Mobile** Earth Station in respect of **Specific Earth Station (ODT)** ***Rx E/S – No methodology in AP7***



Coordination Provisions in Article 9 of RR

Volume No.1 → Article 9

9.21	Specific Earth Station of a service required to seek agreement of other administrations (under Footnotes)

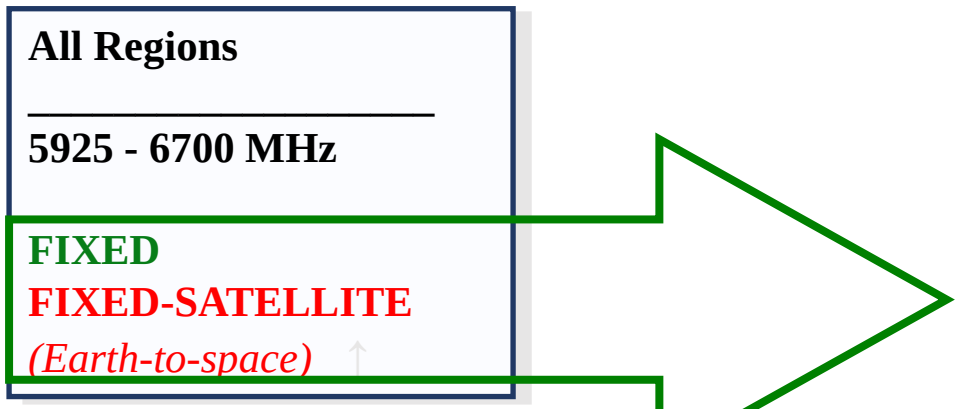
"rare case for Earth Station"

Space Service under No. 9.21 agreement

(ex: footnote 5.461 – MSS)

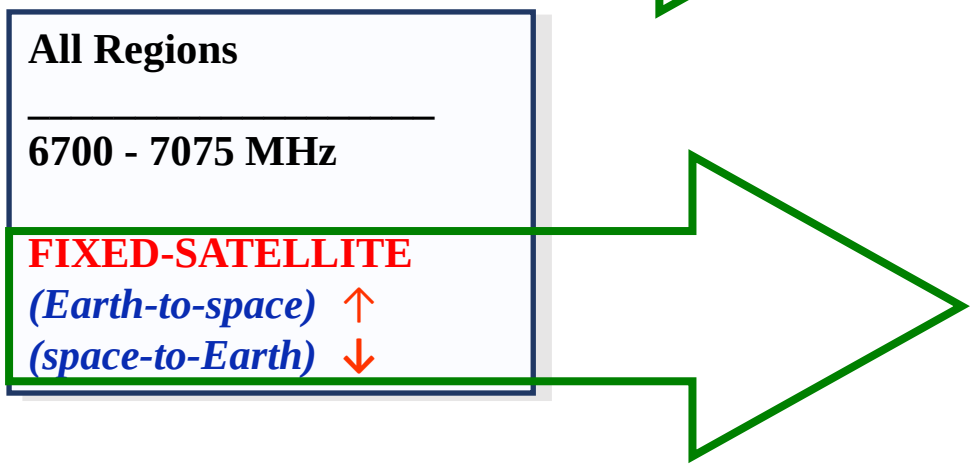
Requirement for ES Coordination

01. Frequencies are shared between Space and Terrestrial services/ES in opposite directions



equal rights

Space = Terrestrial

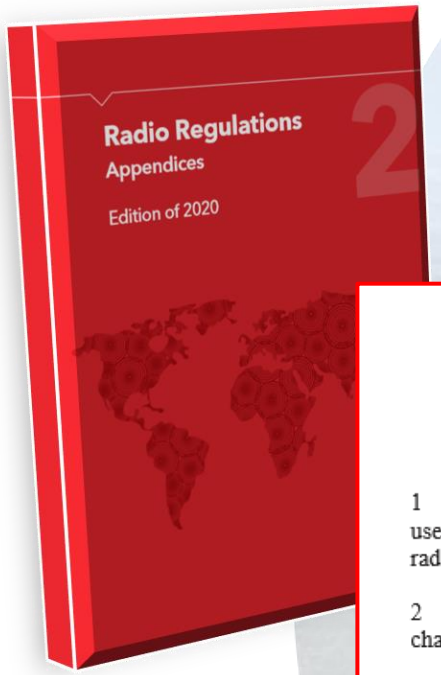


opposite direction

Uplink ↔ Downlink

02. Coordination Area includes the territory of another country

Radio Regulations –Data to be submitted



APPENDIX 4 (REV.WRC-19)

Consolidated list and tables of characteristics for use in the application of the procedures of Chapter III

1 The substance of this Appendix is separated into two parts: one concerning da use for terrestrial radiocommunication services and another concerning data and their us radiocommunication services or the radio astronomy service. (WRC-12)

2 Both parts contain a list of characteristics and a table indicating the use of characteristics in specific circumstances.

Annex 1: Characteristics of stations in the terrestrial services

Annex 2: Characteristics of satellite networks, earth stations or radio astronomy station

ANNEX 1

Characteristics of stations in the terrestrial services[1]

In application of Appendix 4 there are many cases when the data requirements involve standard symbols in submissions to the Radiocommunication Bureau. These standard sy be found in the Preface to the BR International Frequency Information Circular (BR IFIC) Services). In the Tables, this is referred to simply as "the Preface". Also additional infor be found in the guidelines published on the Bureau's website.

Key to the symbols used in Annex 1

X	Mandatory information
+	Mandatory under the conditions specified in Column 3 of Table 1 and Column 2 of T

ANNEX 2

Characteristics of satellite networks, earth stations or radio astronomy stations[2] (Rev.WRC-12)

Information relating to the data listed in the following Tables

In many cases the data requirements involve the use of standard symbols in submissions to the Radiocommunication Bureau. These standard symbols may be found in the "Preface to the BR International Frequency Information Circular", (BR IFIC) (Space Services), the ITU-R webpage and the Space Radiocommunication Stations on DVD-ROM. (In the Table, this is referred to simply as "the Preface".) Information relating to the provision of data may also be found in ITU-R Recommendations, for example, information on the mask data can be found in the most recent version of Recommendation ITU-R S.1503, and the most recent version of Recommendation ITU-R SM.1413 provides general information related to submission of data.

Key to the symbols used in Tables A, B, C and D

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

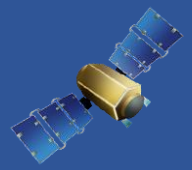
RR Volume No.2 - Appendix 4 Data

Examples: Mandatory Data

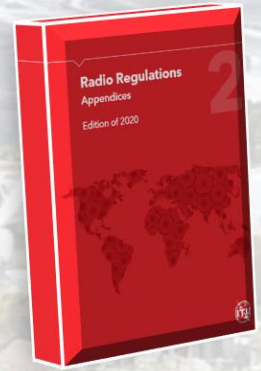
GEOGRAPHICAL DATA

Coordinates (Longitude / Latitude)
Altitude

ASSOCIATED SPACE STATION



Identification (Geo, Non-Geo)
Orbital Position (GSO)



ANTENNA

Maximum gain
Radiation pattern
Noise temperature

SIGNAL CHARACTERISTICS

Power , Maximum Power Density
Frequencies, Bandwidth
Emission Type

Coordination Area

Affected Administrations within the **Coordination Area**

Determination of the Coordination Area Around an Earth Station:
Technical and regulatory requirements
in

Appendix 7 of RR

+

Rules of Procedure

ITU-R Recommendations:

ITU-R SM. 1488
ITU-R P. 452
ITU-R P. 620

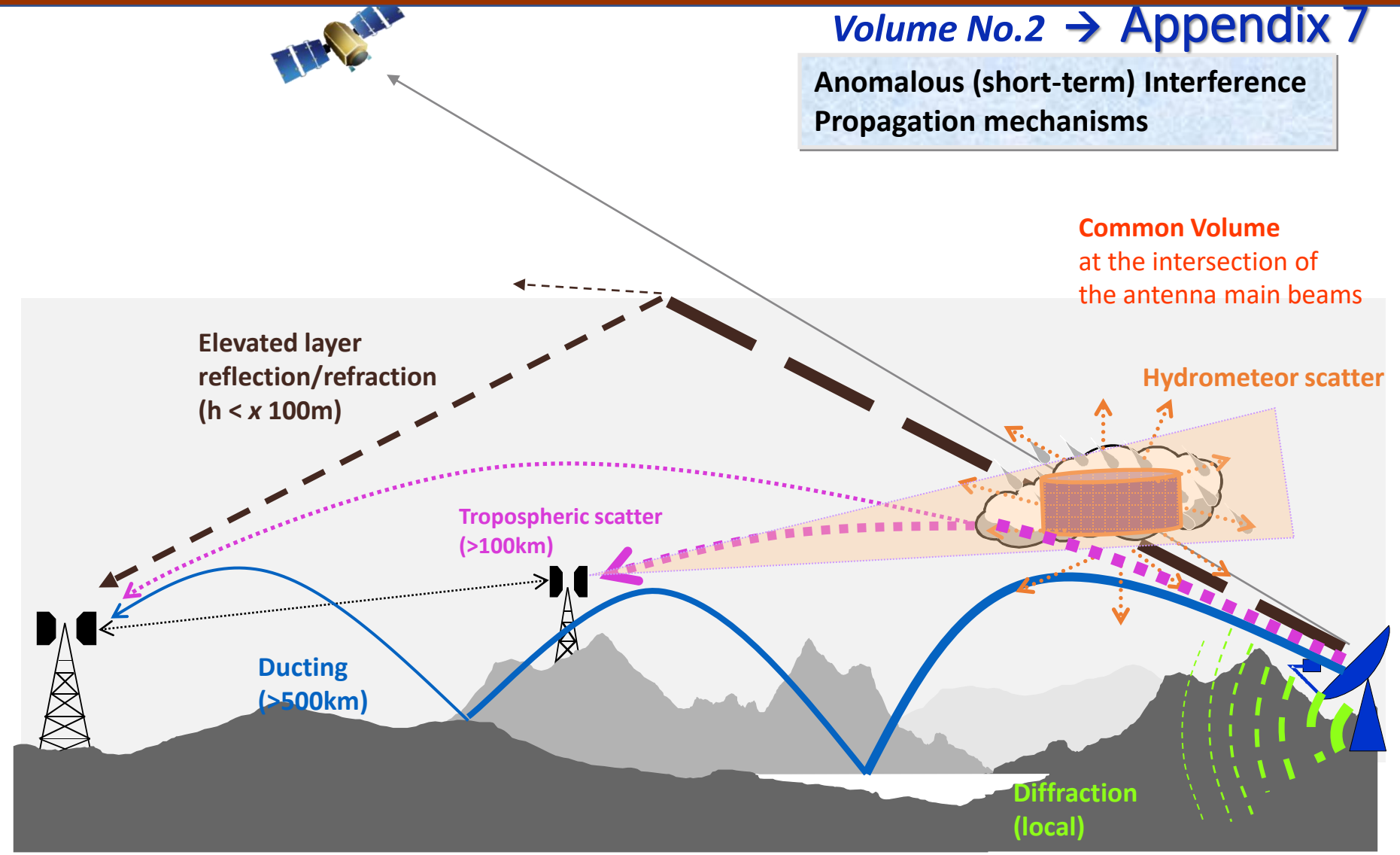
Coordination Area- Definition

The coordination area is defined as “the area surrounding an earth station *sharing the same frequency band* with terrestrial stations, or surrounding a transmitting earth station sharing the same bidirectionally allocated frequency band with receiving earth stations, beyond which the level of *permissible interference* will not be exceeded and coordination is therefore not required” (No. 1.171).

Determination of Coordination Area

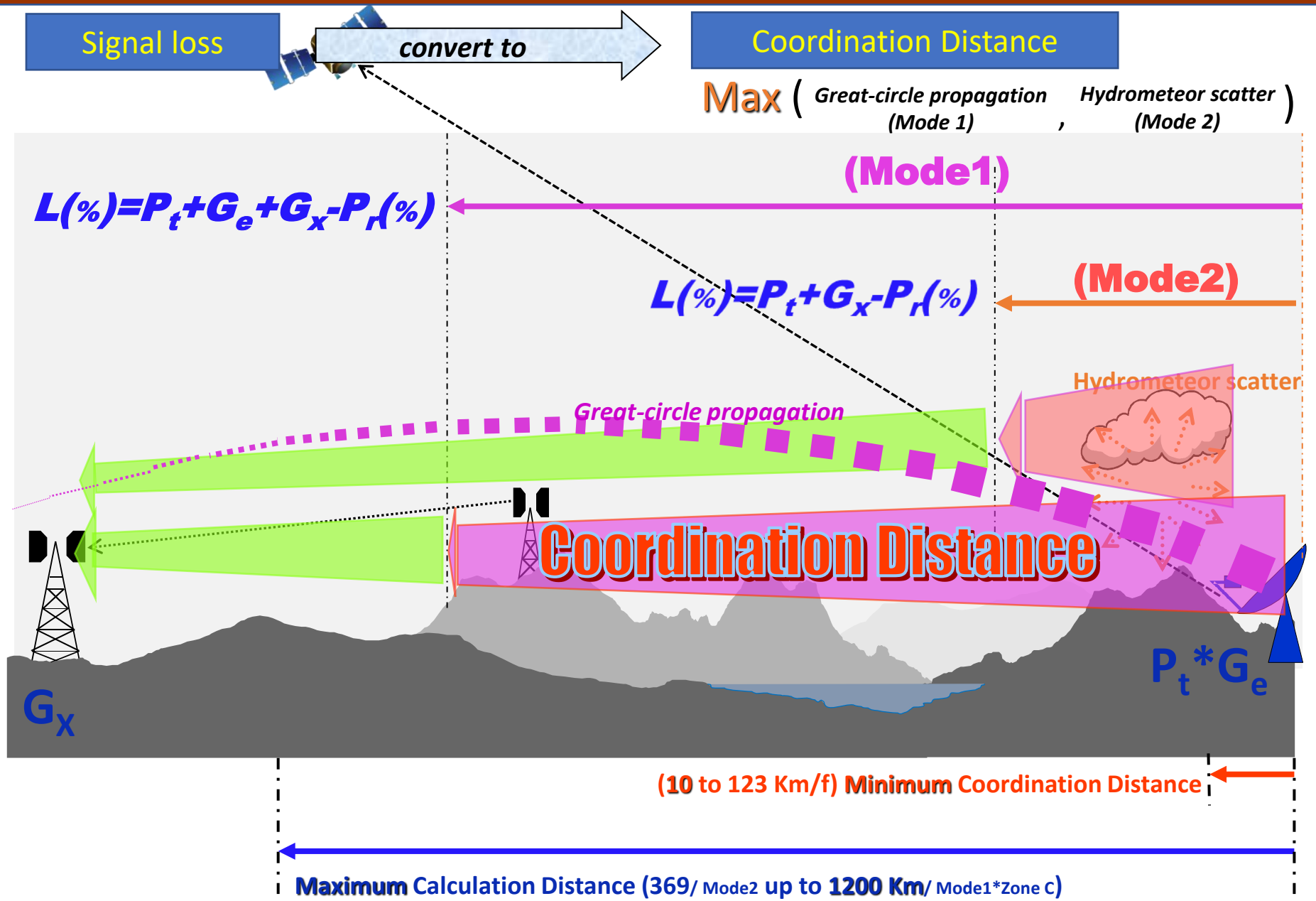
Volume No.2 → Appendix 7

Anomalous (short-term) Interference Propagation mechanisms



Great-circle propagation (Mode 1) *– 4 Radio-Clim. zone* + ***Hydrometeor scatter*** (Mode 2) *– 15 Rain zone A-Q* ⇨ **Coordination Distance**

Determination of Coordination Area



Coordination contour diagrams

Appendix 7

Parameters required are given in:

Table 7 : Tx ES sharing with Terr.

Table 8 : Rx ES sharing with Terr.

Table 9 : Tx ES sharing with Rx ES

Table 10 : Predetermined distances

Separate contour diagrams created for:

Transmitting ES and Receiving ES

Different services (Tx CoS and Rx CoS)

Different frequency bands

Orbit of Rx ES (GSO or NGSO)- BiDirectional

Coordination contour diagrams

Parameters requi

Space service designation in which the transmitting earth station operates		Mobile-satellite	Earth exploration-satellite, meteorological-satellite	
Frequency bands (GHz)		0.272-0.273	0.401-0.402	
Space service designation in which the *receiving* earth station operates		Space operation	Space operation	M
Orbit [6]		Non-GSO	Non-GSO	N
Modulation at *receiving* earth station [1]		N	N	
Receiving earth station interference parameters and criteria	p_0 (%)	1.0	0.1	
	n	1	2	
	p (%)	1.0	0.05	
	N_L (dB)	0	0	
	M_S (dB)	1	1	
	W (dB)	0	0	
Receiving earth station parameters	G_m (dBi) [2]	20	20	
	G_r (dBi) [4]	19	19	
	ε_{min} [5]	10°	10°	
	T_e (K) [7]	500	500	
Reference bandwidth	B (Hz)	10^3	1	
Permissible interference power	$P_r(p)$ (dBW) in B	−177	−208	

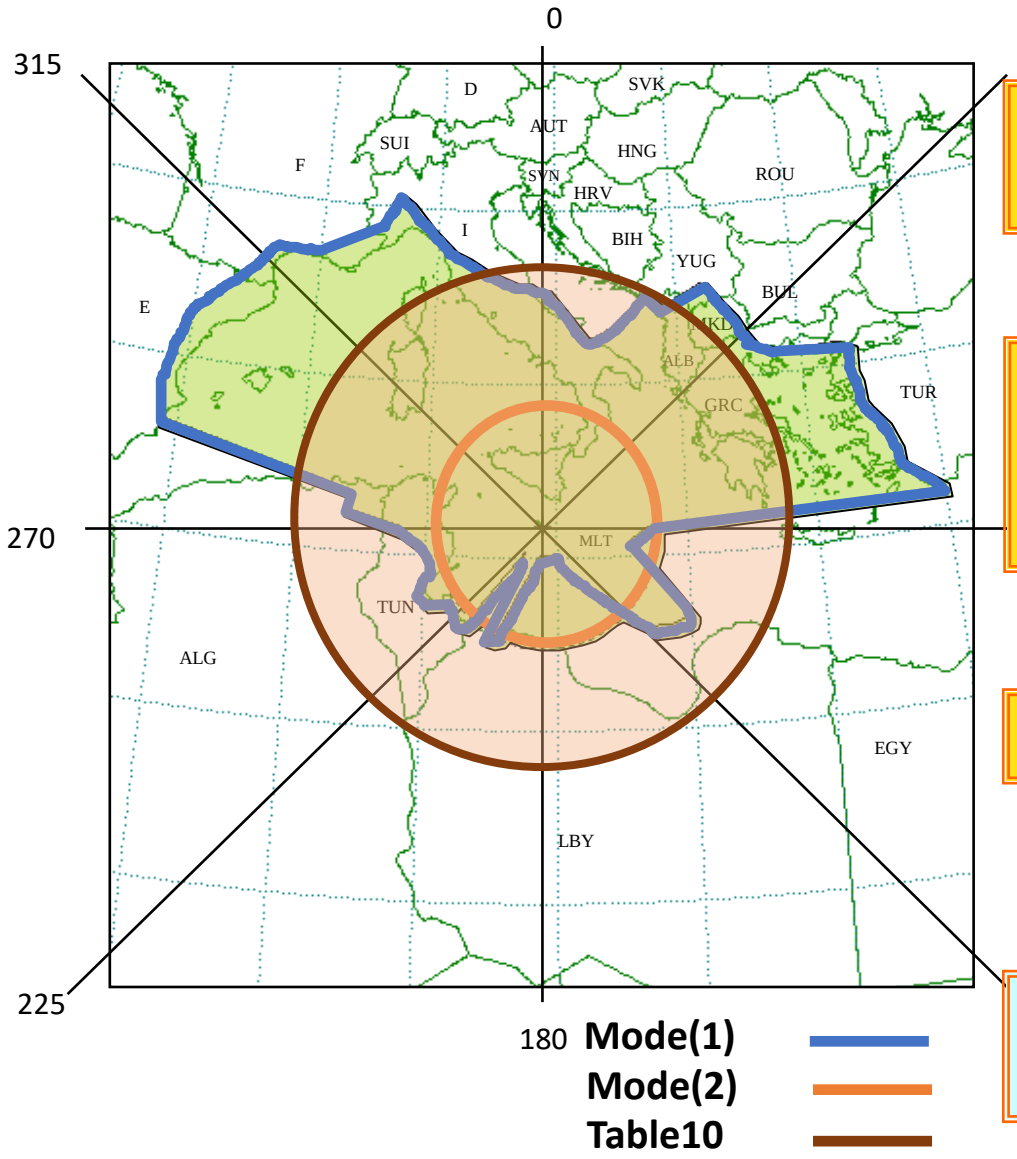
TABLE 10 (Rev.WRC-19)

Predetermined coordination distances

Frequency sharing situation		Coordination distance (in sharing situations involving services allocated with equal rights) (km)
Type of earth station	Type of terrestrial station	
Ground-based in the bands below 1 GHz to which No. **9.11A** applies. Ground-based mobile in the bands within the range 1-3 GHz to which No. **9.11A** applies	Mobile (aircraft)	500
Aircraft (all bands)	Ground-based	500
Aircraft (all bands)	Mobile (aircraft)	1 000
Ground-based in the bands: 400.15-401 MHz 1 668.4-1 675 MHz	Station in the meteorological aids service (radiosonde)	580
Aircraft in the bands: 400.15-401 MHz 1 668.4-1 675 MHz	Station in the meteorological aids service (radiosonde)	1 080
Ground-based in the radiodetermination-satellite service (RDSS) in the bands: 1 610-1 626.5 MHz 2 483.5-2 500 MHz 2 500-2 516.5 MHz	Ground-based	100
Airborne earth station in the radiodetermination-satellite service (RDSS) in the bands: 1 610-1 626.5 MHz 2 483.5-2 500 MHz 2 500-2 516.5 MHz	Ground-based	400
Receiving earth stations in the meteorological-satellite service	Station in the meteorological aids service	The coordination distance is considered to be the visibility distance as a function of the earth station horizon elevation angle for a radiosonde at an altitude of 20 km above mean sea level, assuming 4/3 Earth radius (see Note 1)
Non-GSO MSS feeder-link earth stations (all bands)	Mobile (aircraft)	500
Non-GSO MSS feeder-link earth stations in the band 5 091-5 150 MHz	Station in the aeronautical radionavigation service	Note 2
Receiving earth stations in the space research service in the band: 2 200-2 290 MHz	Mobile (aircraft)	880
Ground-based in the bands in which the frequency sharing situation is not covered in the rows above	Mobile (aircraft)	500

Fixed-satellite, meteorological-satellite	Fixed-satellite
8.025-8.400	8.025-8.400
Earth exploration-satellite	Earth exploration-satellite
Non-GSO	GSO
N	N
0.011	0.083
2	2
0.0055	0.0415
0	1
4.7	2
0	0
10	8
5°	3°
10^6	10^6
−142	−154

Coordination Area- What does it mean?



Coordination contours with the greatest coordination distance

However

It represents a regulatory concept based on Worst Cases & Conservative Assumptions.

i.e.

It's not an exclusion zone.

means

More detailed calculations and discussions **need to be performed.**

Predetermined coordination distances- New implementation

AP7 Table 10

Rows 2 & 3

Row 12

Predetermined coordination distances

Frequency sharing situation		Coordination distance (in sharing situations involving services allocated with equal rights) (km)
Type of earth station	**Type of terrestrial station**	
Ground-based in the bands below 1 GHz to which No. **9.11A** applies. Ground-based mobile in the bands within the range 1-3 GHz to which No. **9.11A** applies	Mobile (aircraft)	500
Aircraft ~~*(mobile)*~~ (all bands)	Ground-based	500
Aircraft ~~*(mobile)*~~ (all bands)	Mobile (aircraft)	1 000
Ground-based in the bands: 400.15-401 MHz 1 668.4-1 675 MHz	Station in the meteorological aids service (radiosonde)	580
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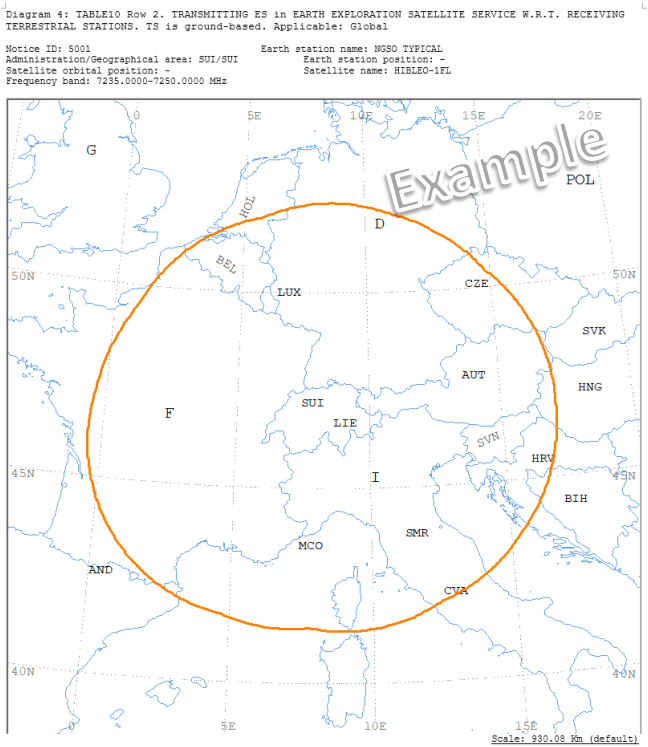
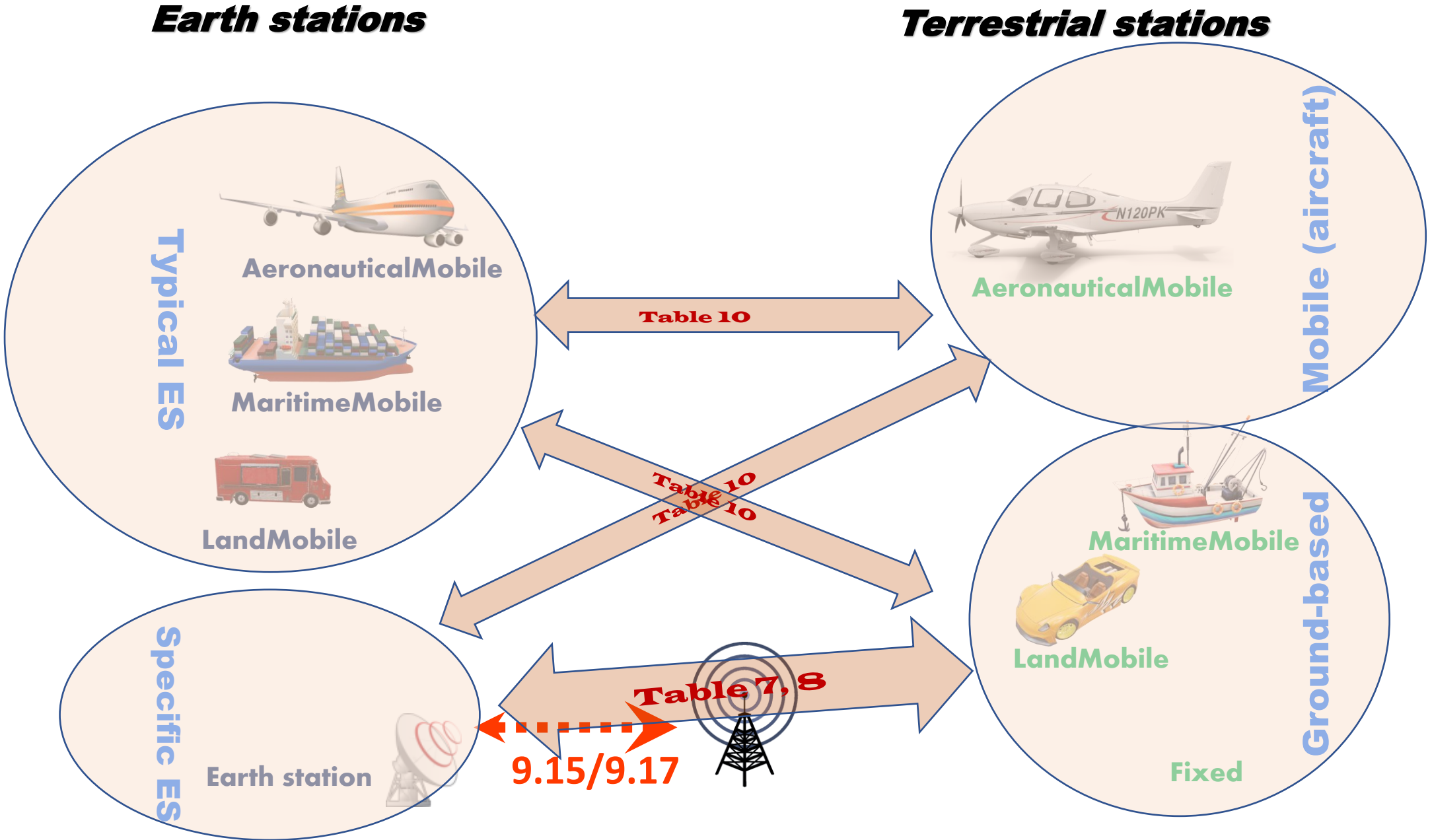
Airborne earth station in the radiodetermination-satellite service (RDSS) in the bands: 1 610-1 626.5 MHz 2 483.5-2 500 MHz 2 500-2 516.5 MHz	Ground-based	400
Receiving earth stations in the meteorological-satellite service	Station in the meteorological aids service	The coordination distance is considered to be the visibility distance as a function of the earth station horizon elevation angle for a radiosonde at an altitude of 20 km above mean sea level, assuming 4/3 Earth radius (see Note 1)
Non-GSO MSS feeder-link earth stations (all bands)	Mobile (aircraft)	500
Non-GSO MSS feeder-link earth stations in the band 5 091-5 150 MHz	Station in the aeronautical radionavigation service	Note 2
Receiving earth stations in the space research service in the band: 2 200-2 290 MHz	Mobile (aircraft)	880
Ground-based in the bands in which the frequency sharing situation is not covered in the rows above	Mobile (aircraft)	500

WRC-19 deleted '(mobile)' ➔ **Any of SS aircraft requires to apply 500/1000 km**



Definition of systems in Table10 of AP7



Implementation of Row 2 - Table 10 (500 km) based on SS Aircraft

Aircraft ~~*(mobile)*~~ (all bands)	Ground-based	500

Planning/Incoming Earth stations

Terrestrial stations

Any of Aircraft applications

- Mobile SS
- Meteorological SS
- Space Research
- Earth Exploration SS
- Space Operation
- Radionavigation SS etc.

Maritime MSS
(any ship mobile application)

Land MSS
(any land mobile application)
(Not related for Row 2)

Any ground SS Earth station
(Not related for Row 2)

Typical ES

Specific

Mandatory Coordination (500 km)

(Not related for Row 2)

MaritimeMobile

LandMobile

Fixed

Generic/Common allocation

- Radiolocation
- Meteorological Aids
- Fixed (**FX**)
- Mobile (**MS**) = LMS, MMS = excl. AMS
- RadioNavigation (**RNS**) = excl. ARNS

Mobile (aircraft)

Ground-based

Example1 - Row 2 (500 km) - (Auto creation) - all MANDATORY coordination

Region 1	Region 2	Region 3
7 235-7 250	EARTH EXPLORATION-SATELLITE (Earth-to-space) 5.460A FIXED MOBILE 5.458	

Adm/srv area: **SUI**

assoc. SS: **NGSO/GSO**

ES type: **Typical EESS**

Cls_stn code: **UW**

Diagram 4: TABLE10 Row 2. TRANSMITTING ES in EARTH EXPLORATION SATELLITE SERVICE W.R.T. RECEIVING TERRESTRIAL STATIONS. TS is ground-based. Applicable: Global

Notice ID: 5001
Administration/Geographical area: SUI/SUI
Satellite orbital position: -
Frequency band: 7235.0000-7250.0000 MHz

Earth station name: NGSO TYPICAL
Earth station position: -
Satellite name: HIBLEO-1FL

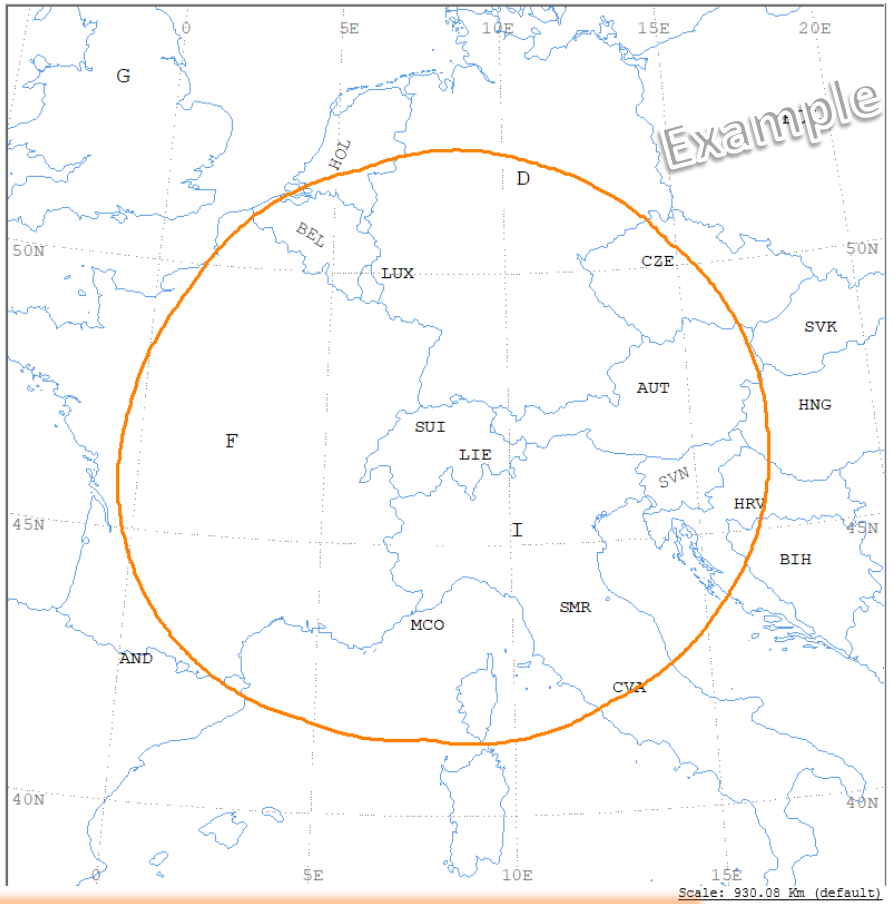


Diagram 4: TABLE10 Row 2. TRANSMITTING ES in EARTH EXPLORATION SATELLITE SERVICE W.R.T. RECEIVING TERRESTRIAL STATIONS. TS is ground-based. Applicable: Global

NOTICE ID: 5001 EARTH STATION NAME: NGSO TYPICAL EARTH STATION POSITION: - PHASE: N
ADM/GEO_AREA: SUI/SUI RAIN CLIMATICAL ZONE:
SATELLITE NAME: HIBLEO-1FL SATELLITE ORBITAL POSITION: - DEG
ANTENNA AZIMUTH: - DEG ANTENNA ELEVATION: - DEG
FREQUENCY BAND: 7235.0000-7250.0000 MHZ ASSIGNED FREQUENCY: 7242.50 MHZ PERCENTAGE OF TIME:
MAXIMUM ANTENNA GAIN: - DBI MAXIMUM POWER DENSITY: - DBW/HZ NOISE TEMPERATURE: - K
ANTENNA PATTERN: -
TABLE10 Row 2: PDD 500 KM

TRANSMISSION LOSS MODE 1:
TRANSMISSION LOSS MODE 2:

PREDETERMINED DISTANCE DIAGRAM FOR TYPICAL EARTH STATION IS IN SERVICE AREA SUI
PROBABLY AFFECTED COUNTRIES: AUT BEL BIH CVA CZE D E F HNG HOL HRV I LIE LUX MCO SMR SVN

Example2 - Row 2 - (Incoming ES by footnote allocation)- Mandatory

Region 1	Region 2	Region 3
5 650-5 725	MOBILE except aeronautical mobile 5.446A 5.450A RADIOLOCATION Amateur Space research (deep space) 5.282 5.451 5.453 5.454 5.455	

5.454

Different category of service: in Azerbaijan, Russian Federation, Georgia, Kyrgyzstan, Tajikistan, Turkmenistan, the allocation of the band 5 670-5 725 MHz to the space research service is on a primary basis (see No. **5.33**). (WRC-12)

Adm/srv area: **RUS** (5.454)

assoc. SS: **NGSO/GSO**

ES type: **Typical SRS**

Cls_stn code: **UT**

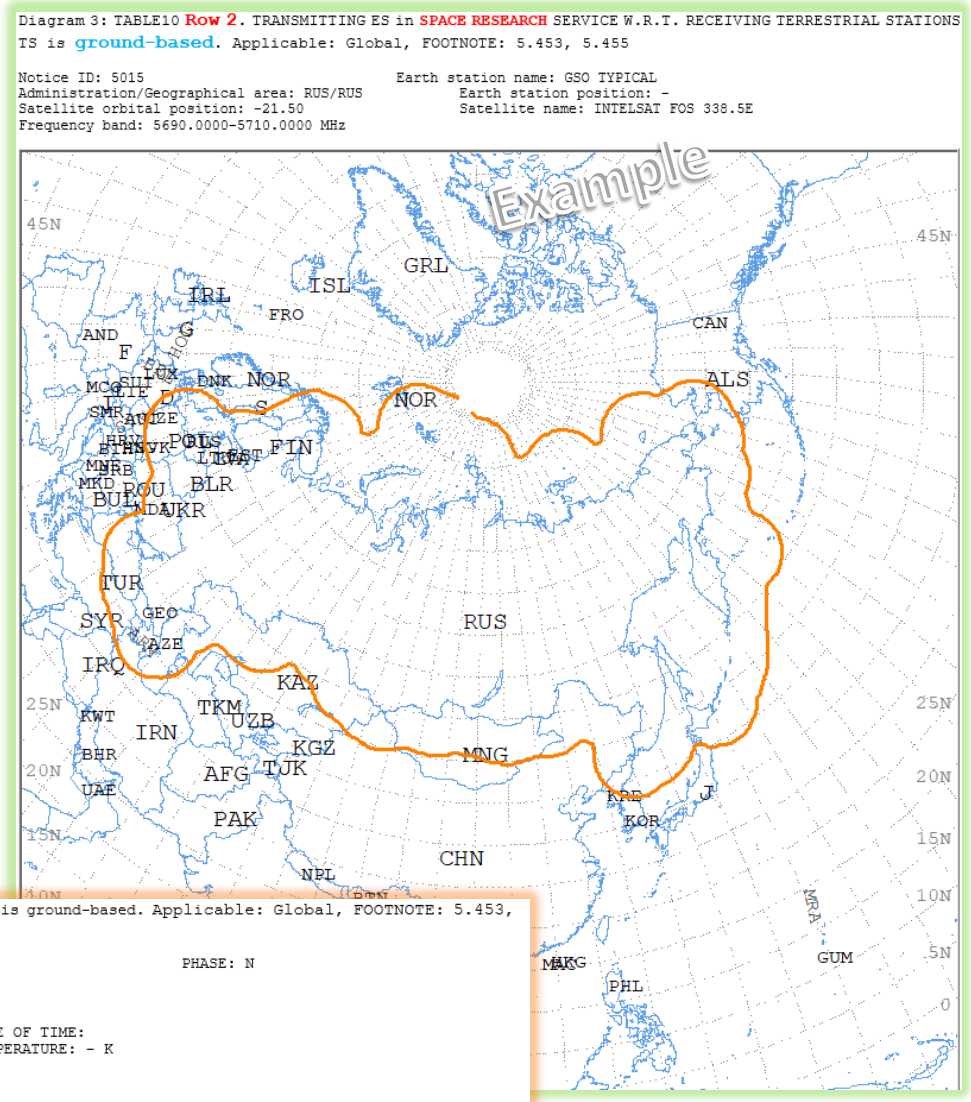


Diagram 3: TABLE10 Row 2. TRANSMITTING ES in SPACE RESEARCH SERVICE W.R.T. RECEIVING TERRESTRIAL STATIONS. TS is ground-based. Applicable: Global, FOOTNOTE: 5.453, 5.455

NOTICE ID: 5015 EARTH STATION NAME: GSO TYPICAL EARTH STATION POSITION: - PHASE: N
ADM/GEO_AREA: RUS/RUS RAIN CLIMATICAL ZONE:
SATELLITE NAME: INTELSAT FOS 338.5E SATELLITE ORBITAL POSITION: -21.50 DEG
ANTENNA AZIMUTH: - DEG ANTENNA ELEVATION: - DEG
FREQUENCY BAND: 5690.0000-5710.0000 MHZ ASSIGNED FREQUENCY: 5700.00 MHZ PERCENTAGE OF TIME:
MAXIMUM ANTENNA GAIN: - DBI MAXIMUM POWER DENSITY: - DBW/HZ NOISE TEMPERATURE: - K
ANTENNA PATTERN: -
TABLE10 Row 2: **PDD 500 KM**

TRANSMISSION LOSS MODE 1:
TRANSMISSION LOSS MODE 2:

PREDETERMINED DISTANCE DIAGRAM FOR TYPICAL EARTH STATION IS IN SERVICE AREA **RUS**
PROBABLY AFFECTED COUNTRIES: ARM AZE BLR CHN CZE D DNK EST FIN GEO IRN J KAZ
KOR KRE LTU LVA MDA MNG NOR POL S TKM TUR UKR USA/ALS

Example3 - Row 2 - (affected TX/MS by footnote allocation)- Mandatory

20.2-21.2	FIXED-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) Standard frequency and time signal-satellite (space-to-Earth) 5.524

5.524

Additional allocation: in Afghanistan, Algeria, Saudi Arabia, Bahrain, Brunei Darussalam, Cameroon, China, Congo (Rep. of the), Costa Rica, Egypt, United Arab Emirates, Gabon, Guatemala, Guinea, India, Iran (Islamic Republic of), Iraq, Israel, Japan, Jordan, Kuwait, Lebanon, Malaysia, Mali, Morocco, Mauritania, Nepal (Republic of), Nigeria, Oman, Pakistan, Philippines, Qatar, Syrian Arab Republic, Dem. Rep. of the Congo, Dem. People's Rep. of Korea, Singapore, Somalia, Sudan, South Sudan, Chad, Togo, Tunisia, the frequency band 19.7-21.2 GHz is also allocated to the fixed and mobile services on a primary basis. This additional use shall not impose any limitation on the power flux-density of space stations in the fixed-satellite service in the frequency band 19.7-21.2 GHz and of space stations in the mobile-satellite service in the frequency band 19.7-20.2 GHz where the allocation to the mobile-satellite service is on a primary basis in the latter frequency band. (WRC-15)

Adm/srv area: **INS**

assoc. SS: **NGSO/GSO**

ES type: **Typical MSS**

Cls_stn code: **UA/TJ/T5/T6**

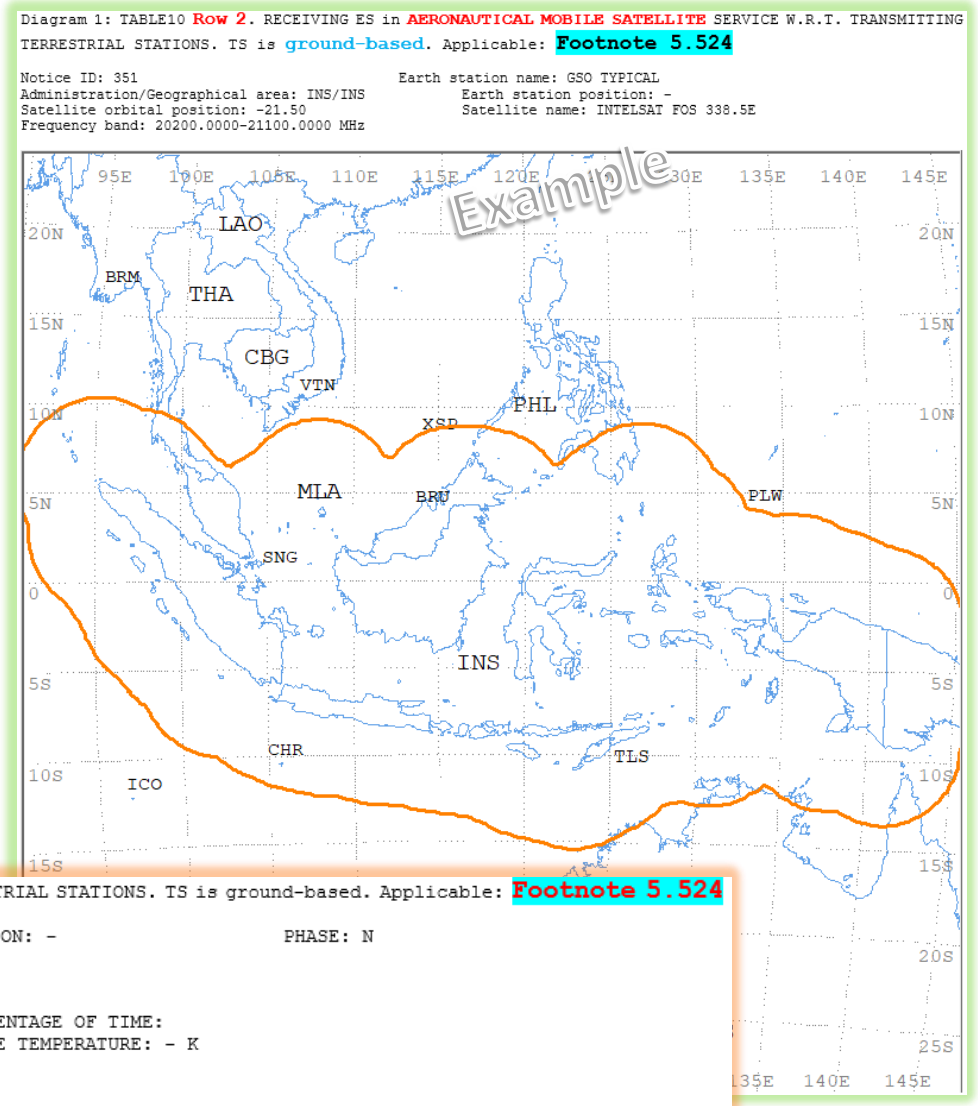


Diagram 1: TABLE10 Row 2. RECEIVING ES in AERONAUTICAL MOBILE SATELLITE SERVICE W.R.T. TRANSMITTING TERRESTRIAL STATIONS. TS is ground-based. Applicable: **Footnote 5.524**

NOTICE ID: 351 EARTH STATION NAME: GSO TYPICAL EARTH STATION POSITION: - PHASE: N
ADM/GEO_AREA: INS/INS RAIN CLIMATICAL ZONE:
SATELLITE NAME: INTELSAT FOS 338.5E SATELLITE ORBITAL POSITION: -21.50 DEG
ANTENNA AZIMUTH: - DEG ANTENNA ELEVATION: - DEG
FREQUENCY BAND: 20200.0000-21100.0000 MHZ ASSIGNED FREQUENCY: 20650.00 MHZ PERCENTAGE OF TIME:
MAXIMUM ANTENNA GAIN: - DBI MAXIMUM POWER DENSITY: - DBW/HZ NOISE TEMPERATURE: - K
ANTENNA PATTERN: -
TABLE10 Row 2: **PDD 500 KM**

TRANSMISSION LOSS MODE 1:
TRANSMISSION LOSS MODE 2:

PREDETERMINED DISTANCE DIAGRAM FOR TYPICAL EARTH STATION IS IN SERVICE AREA INS

PROBABLY AFFECTED COUNTRIES: **BRU IND MLA PHL SNG** → ***only related to 5.524*** ***(ex. AUS THA is not in the list)***

Implementation of Row 3 - Table 10 (1000 km) based on Art 5 allocation

Aircraft ~~*(mobile)*~~ (all bands)	Mobile (aircraft)	1 000

Planning/Incoming Earth stations

Typical ES

Any of Aircraft applications

- Mobile SS
- Meteorological SS
- Space Research
- Earth Exploration SS
- Space Operation
- Radionavigation SS etc.

Mandatory coord.

Optional coord.

Terrestrial stations

A: **Clear indication in RR Art.5 (inc. Footnote)**

- Aeronautical Mobile (**AMS**)
- Aeronautical RadioNavigation (**ARNS**)

B: **Generic/Common allocation**

- Mobile (**MS**) = LMS, MMS, incl. **AMS**
- RadioNavigation (**RNS**) = incl. **ARNS**

Mobile (aircraft)

Example4 - Row 3 (1000 km)- (Auto creation) - Mandatory coordination

Allocation to services		
Region 1	**Region 2**	**Region 3**
1 613.8-1 621.35 MOBILE-SATELLITE (Earth-to-space) 5.351A AERONAUTICAL RADIONAVIGATION Mobile-satellite (space-to-Earth) 5.208B 5.341 5.355 5.359 5.364 5.365 5.366 5.367 5.368 5.369 5.371 5.372	**1 613.8-1 621.35** MOBILE-SATELLITE (Earth-to-space) 5.351A AERONAUTICAL RADIONAVIGATION RADIODETERMINATION- SATELLITE (Earth-to-space) Mobile-satellite (space-to-Earth) 5.208B 5.341 5.364 5.365 5.366 5.367 5.368 5.370 5.372	**1 613.8-1 621.35** MOBILE-SATELLITE (Earth-to-space) 5.351A AERONAUTICAL RADIONAVIGATION Mobile-satellite (space-to-Earth) 5.208B Radiodetermination-satellite (Earth-to-space) 5.341 5.355 5.359 5.364 5.365 5.366 5.367 5.368 5.369 5.372

Adm/srv area: **SUI**

assoc. SS: **NGSO/GSO**

ES type: **Typical MSS**

Cls_stn code: **UA/TJ/T5/T6**

Optional selection is NOT related.

Diagram 4: TABLE10 **Row 3**. TRANSMITTING ES in **MOBILE-SATELLITE** SERVICE W.R.T. RECEIVING TERRESTRIAL STATIONS. **TS: mobile (aircraft)**. Applicable: **Global**

Notice ID: 245
Administration/Geographical area: SUI/SUI
Satellite orbital position: -21.50
Frequency band: 1615.5000-1618.5000 MHz

Earth station name: GSO TYPICAL
Earth station position: -
Satellite name: INTELSAT FOS 338.5E

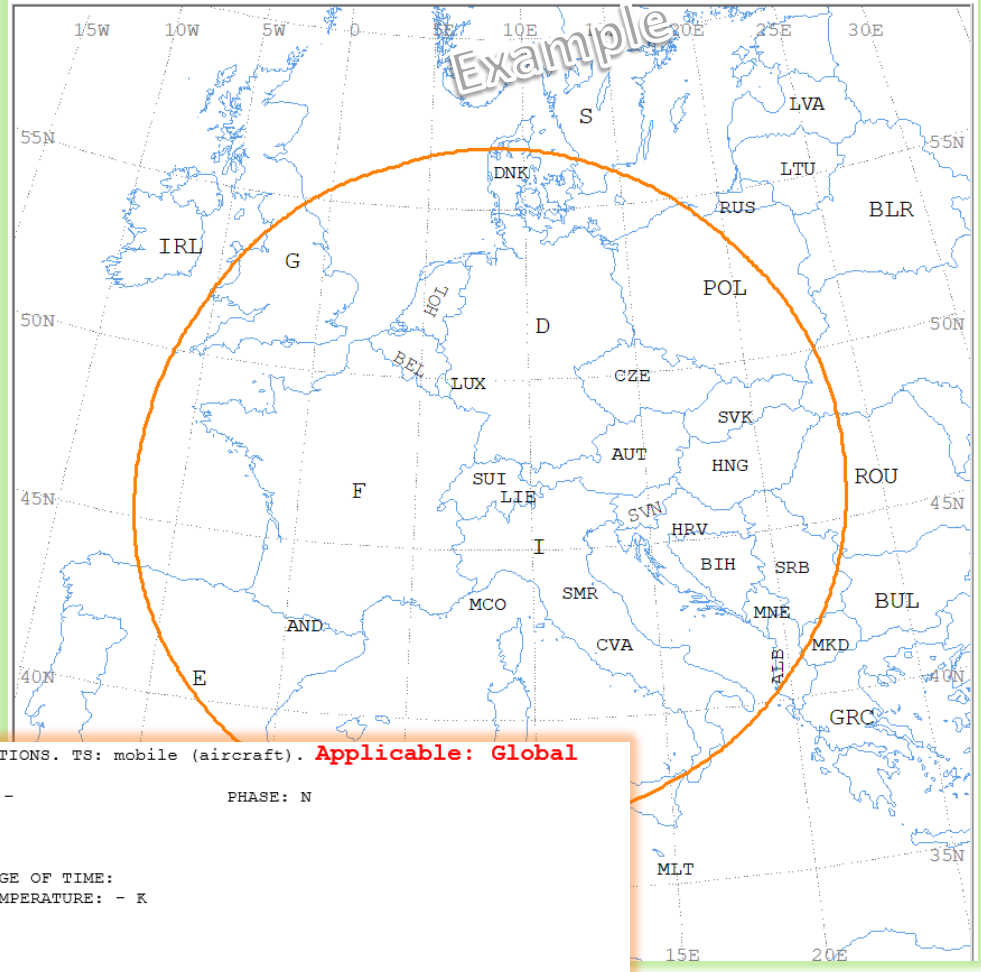


Diagram 4: TABLE10 Row 3. TRANSMITTING ES in MOBILE-SATELLITE SERVICE W.R.T. RECEIVING TERRESTRIAL STATIONS. TS: mobile (aircraft). **Applicable: Global**

NOTICE ID: 245 EARTH STATION NAME: GSO TYPICAL EARTH STATION POSITION: - PHASE: N
ADM/GEO_AREA: SUI/SUI RAIN CLIMATICAL ZONE:
SATELLITE NAME: INTELSAT FOS 338.5E SATELLITE ORBITAL POSITION: -21.50 DEG
ANTENNA AZIMUTH: - DEG ANTENNA ELEVATION: - DEG
FREQUENCY BAND: 1615.5000-1618.5000 MHZ ASSIGNED FREQUENCY: 1617.00 MHZ PERCENTAGE OF TIME:
MAXIMUM ANTENNA GAIN: - DBI MAXIMUM POWER DENSITY: - DBW/HZ NOISE TEMPERATURE: - K
ANTENNA PATTERN: -
TABLE10 Row 3: **PDD 1000 KM**

TRANSMISSION LOSS MODE 1:
TRANSMISSION LOSS MODE 2:

PREDETERMINED DISTANCE DIAGRAM FOR TYPICAL EARTH STATION IS IN SERVICE AREA SUI
PROBABLY AFFECTED COUNTRIES: **ALB ALG AND AUT BEL BIH BUL CVA CZE D DNK E F G HNG HOL HRV I LIE LUX MCO MKD MNE POL ROU S SMR SRB SVK SVN TUN UKR**

Example5 - Row 3 (1000 km)- (User's selection) - OPTIONAL coordination

Allocation to services		
Region 1	**Region 2**	**Region 3**
2 025-2 110	SPACE OPERATION (Earth-to-space) (space-to-space) EARTH EXPLORATION-SATELLITE (Earth-to-space) (space-to-space) FIXED MOBILE 5.391 SPACE RESEARCH (Earth-to-space) (space-to-space) 5.392	

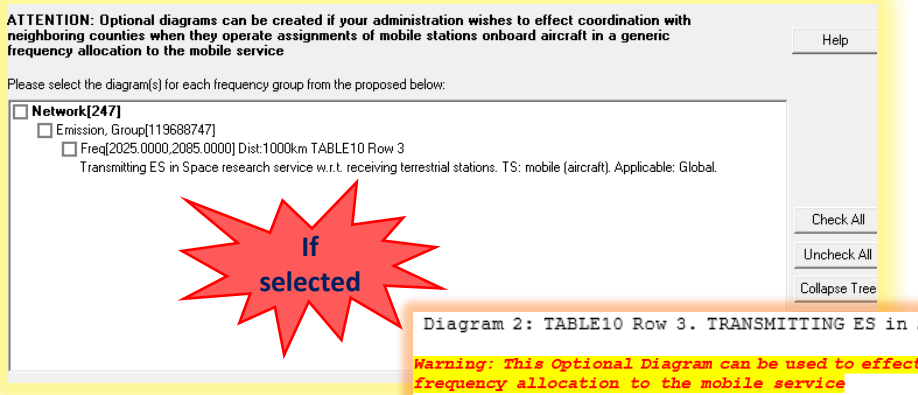
Adm/srv area: **SUI**

assoc. SS: **NGSO/GSO**

ES type: **Typical SRS**

Cls_stn code: **UH**

For User, Optional selection is presented.



If selected

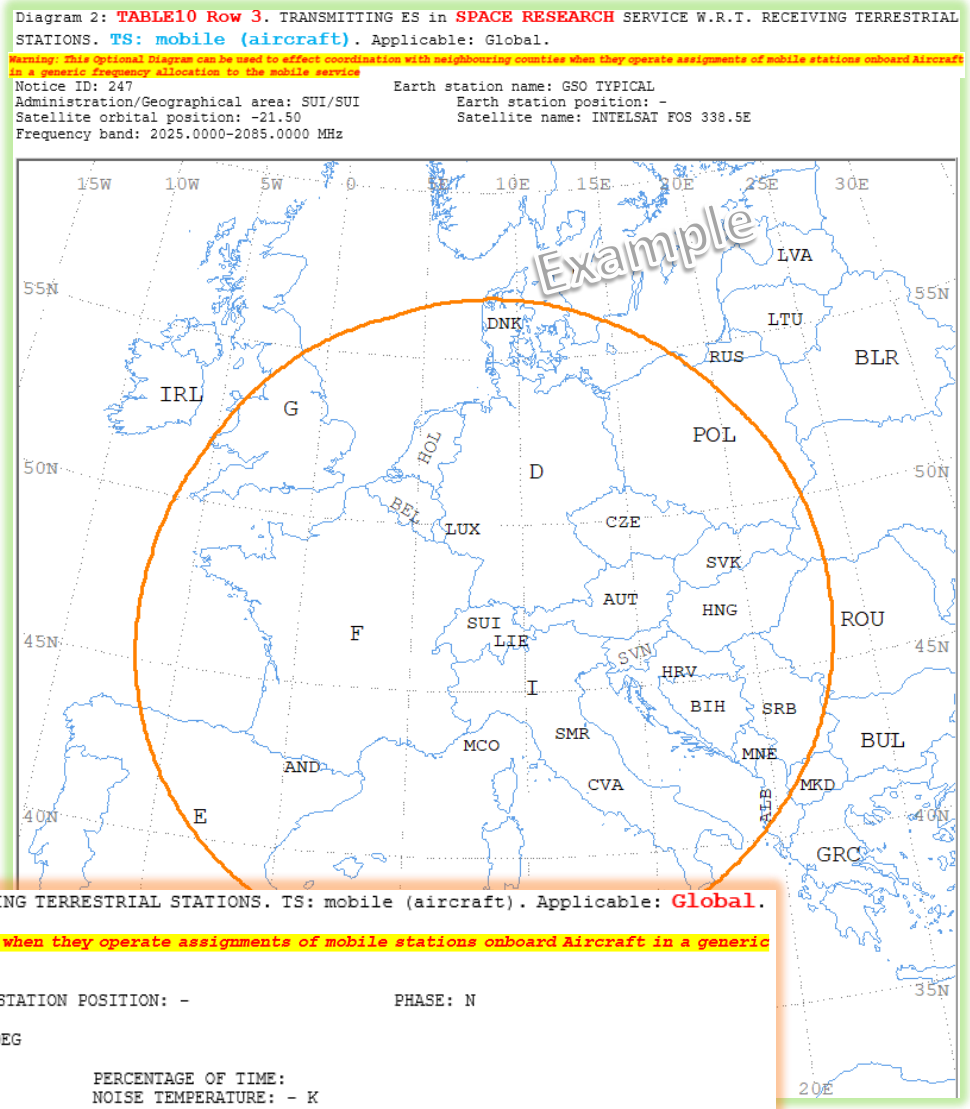


Diagram 2: TABLE10 Row 3. TRANSMITTING ES in SPACE RESEARCH SERVICE W.R.T. RECEIVING TERRESTRIAL STATIONS. TS: mobile (aircraft). Applicable: Global.

Warning: This Optional Diagram can be used to effect coordination with neighbouring counties when they operate assignments of mobile stations onboard Aircraft in a generic frequency allocation to the mobile service

NOTICE ID: 247 EARTH STATION NAME: GSO TYPICAL EARTH STATION POSITION: - PHASE: N
ADM/GEO_AREA: SUI/SUI RAIN CLIMATICAL ZONE:
SATELLITE NAME: INTELSAT FOS 338.5E SATELLITE ORBITAL POSITION: -21.50 DEG
ANTENNA AZIMUTH: - DEG ANTENNA ELEVATION: - DEG
FREQUENCY BAND: 2025.0000-2085.0000 MHZ ASSIGNED FREQUENCY: 2055.00 MHZ PERCENTAGE OF TIME:
MAXIMUM ANTENNA GAIN: - DBI MAXIMUM POWER DENSITY: - DBW/HZ NOISE TEMPERATURE: - K
ANTENNA PATTERN: -
TABLE10 Row 3: **PDD 1000 KM**

TRANSMISSION LOSS MODE 1:
TRANSMISSION LOSS MODE 2:

PREDETERMINED DISTANCE DIAGRAM FOR TYPICAL EARTH STATION IS IN SERVICE AREA **SUI**
PROBABLY AFFECTED COUNTRIES: ALB ALG AND AUT BEL BIH BUL CVA CZE D DNK E F G HNG
HOL HRV I LIE LUX MCO MKD MNE POL ROU S SMR SRB SVK SVN TUN UKR

Implementation of Row 12 - Table 10 (500 km) based on Art 5 allocation

Ground-based in the bands in which the frequency sharing situation is not covered in the rows above	Mobile (aircraft)	500

Ground-based Earth stations

Terrestrial stations

Typical ES

Maritime MSS
(any ship mobile application)

Land MSS
(any land mobile application)

Mandatory coord.

A: **Clear indication in RR Art.5 (inc. Footnote)**

- Aeronautical Mobile (**AMS**)
- Aeronautical RadioNavigation (**ARNS**)

Mobile (aircraft)

Mandatory coord.

Specific ES

Any of Ground-based ES

- Fixed SS
- Mobile SS
- Meteorological SS
- Space Research
- Earth Exploration SS
- Space Operation
- Radionavigation SS etc.

Implementation of Row 12 - Table 10 (500 km) based on Art 5 allocation

Ground-based in the bands in which the frequency sharing situation is not covered in the rows above	Mobile (aircraft)	500

Ground-based Earth stations

Terrestrial stations

Typical ES

Maritime MSS
(any ship mobile application)

Land MSS
(any land mobile application)

Optional coord.

B: **Generic/Common allocation**

- Mobile (**MS**) = LMS, MMS, AMS
- RadioNavigation (**RNS**) = incl. ARNS

Mobile (aircraft)

Optional coord.

Specific ES

Any of Ground-based ES

- Fixed SS
- Mobile SS
- Meteorological SS
- Space Research
- Earth Exploration SS
- Space Operation
- Radionavigation SS etc.

Example5 - Row 12 (500 km)- (Auto creation) - Mandatory coordination

Region 1	Region 2	Region 3
5 000-5 010	AERONAUTICAL MOBILE-SATELLITE (R) 5.443AA AERONAUTICAL RADIONAVIGATION RADIONAVIGATION-SATELLITE (Earth-to-space)	
5 010-5 030	AERONAUTICAL MOBILE-SATELLITE (R) 5.443AA AERONAUTICAL RADIONAVIGATION RADIONAVIGATION-SATELLITE (space-to-Earth) (space-to-space) 5.328B 5.443B	

Adm/srv area: **SUI**

assoc. SS: **NGSO/GSO**

ES type: **Typical** **Maritime RNSS**

Cls_stn code: **TQ**

Example

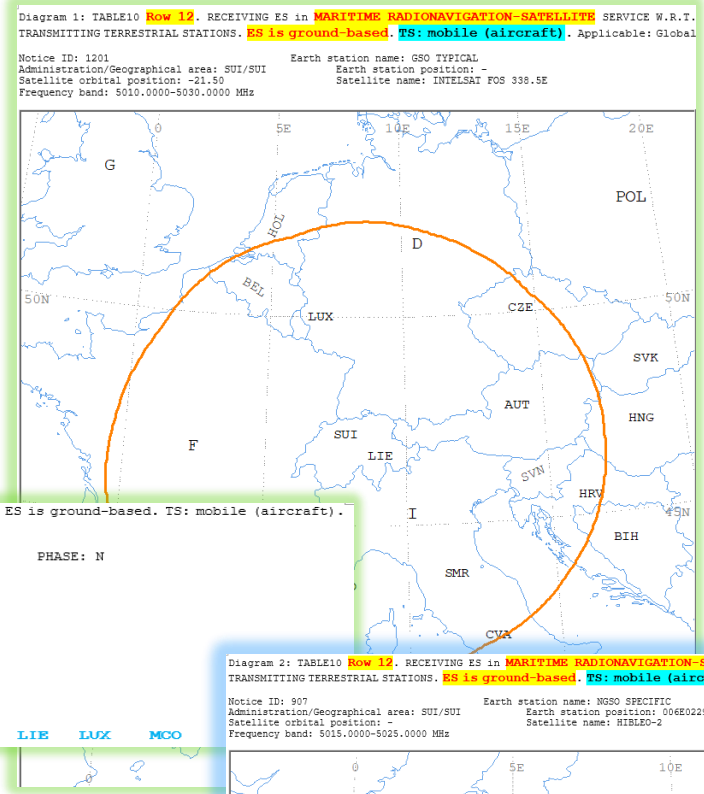


Diagram 1: TABLE10 Row 12. RECEIVING ES in MARITIME RADIONAVIGATION-SATELLITE SERVICE W.R.T. TRANSMITTING TERRESTRIAL STATIONS. ES is ground-based. TS: mobile (aircraft).
Applicable: Global

NOTICE ID: 1201 EARTH STATION NAME: GSO TYPICAL EARTH STATION POSITION: - PHASE: N
ADM/GEO_AREA: SUI/SUI RAIN CLIMATICAL ZONE:
SATELLITE NAME: INTELSAT FOS 338.5E SATELLITE ORBITAL POSITION: -21.50 DEG
ANTENNA AZIMUTH: - DEG ANTENNA ELEVATION: - DEG
FREQUENCY BAND: 5010.0000-5030.0000 MHZ ASSIGNED FREQUENCY: 5020.00 MHZ PERCENTAGE OF TIME:
MAXIMUM ANTENNA GAIN: - DBI MAXIMUM POWER DENSITY: - DBW/HZ NOISE TEMPERATURE: - K
ANTENNA PATTERN: -
TABLE10 **Row 12: PDD 500 KM**

TRANSMISSION LOSS MODE 1:
TRANSMISSION LOSS MODE 2:

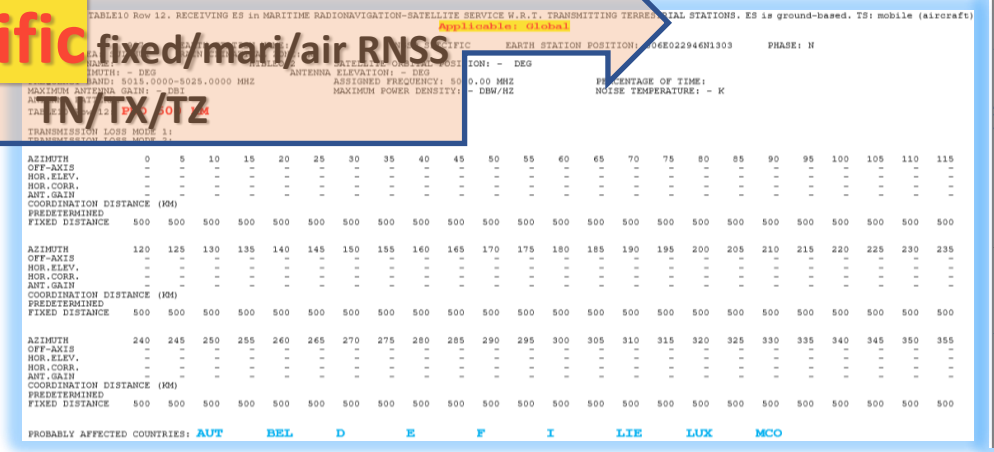
PREDETERMINED DISTANCE DIAGRAM FOR TYPICAL EARTH STATION IS IN SERVICE AREA SUI
PROBABLY AFFECTED COUNTRIES: AUT BEL BIH CVA CZE D E F HNG HOL HRV I LIE LUX MCO

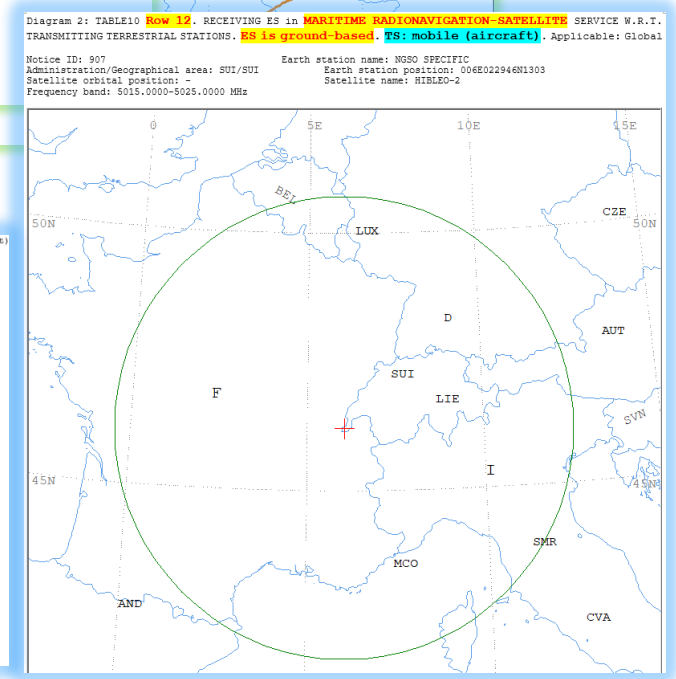
Adm/srv area: **SUI**

assoc. SS: **NGSO/GSO**

ES type: **Specific** **fixed/mari/air RNSS**

Cls_stn code: **TN/TX/TZ**





Example6 - Row 12 (500 km)- (User's selection) - OPTIONAL coordination

Region 1	Region 2	Region 3
14.5-14.75	FIXED FIXED-SATELLITE (Earth-to-space) 5.509B 5.509C 5.509D 5.509E 5.509F 5.510 MOBILE Space research 5.509G	
14.75-14.8 FIXED FIXED-SATELLITE (Earth-to-space) 5.510 MOBILE Space research 5.509G		**14.75-14.8** FIXED FIXED-SATELLITE (Earth-to-space) 5.509B 5.509C 5.509D 5.509E 5.509F 5.510 MOBILE Space research 5.509G

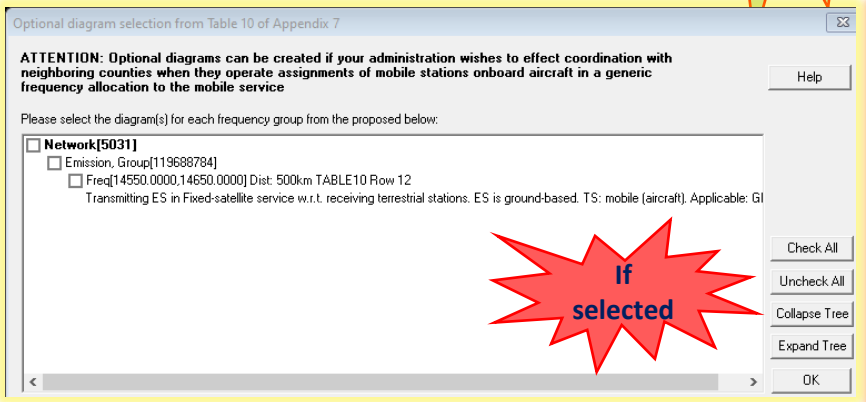
Adm/srv area: **GTM**

assoc. SS: **NGSO/GSO**

ES type: **Specific FSS**

Cls_stn code: **TC**

For User, Optional selection is presented.



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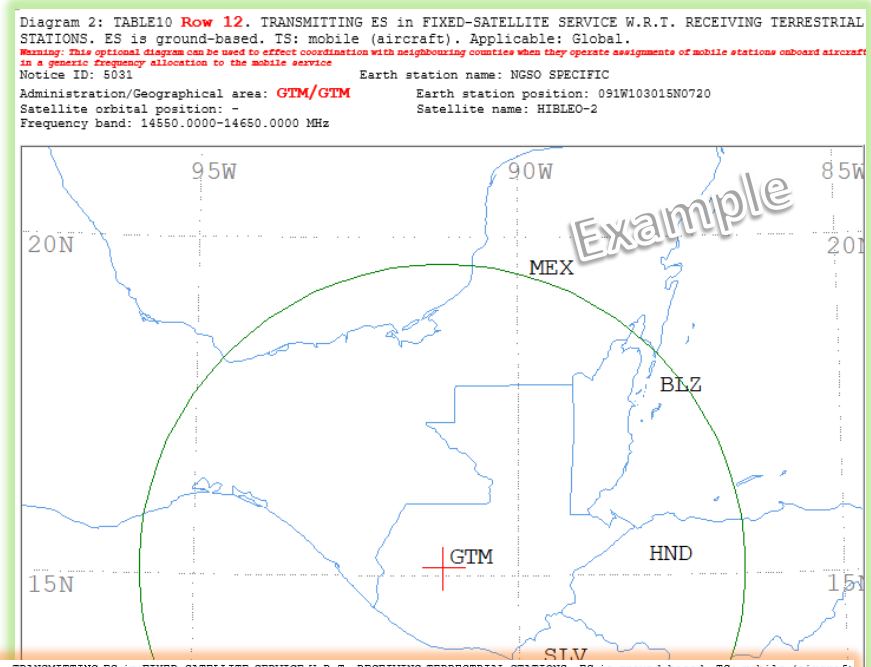
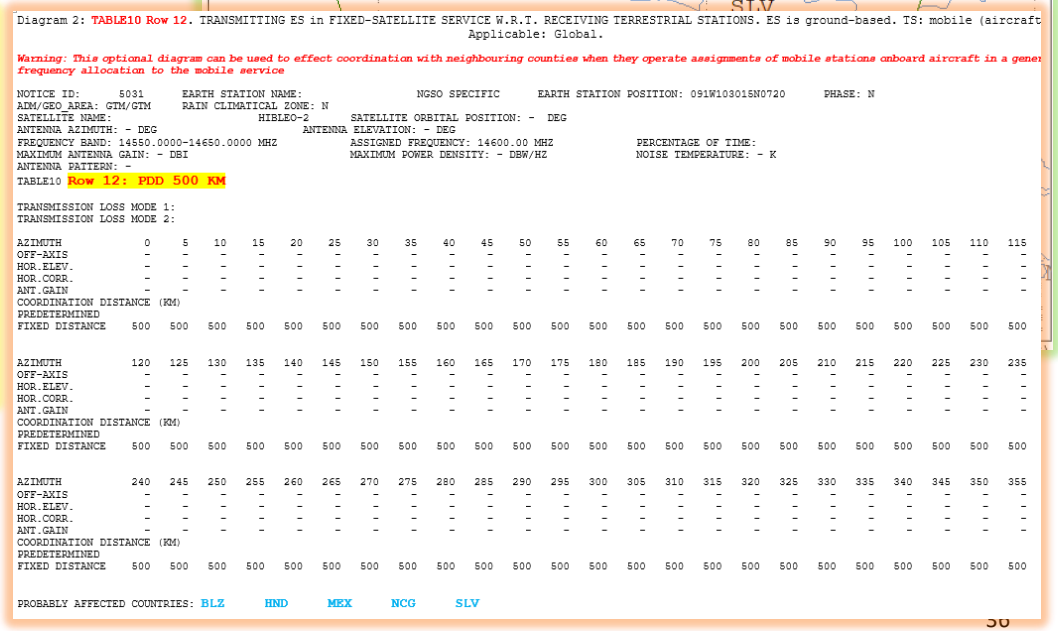
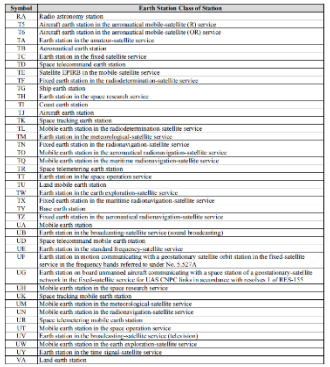




Recap for Notes in GIBC Table 10

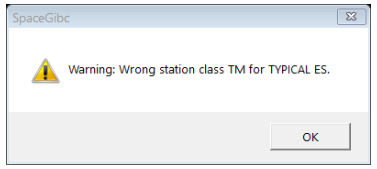
1. Importance of correct ES Code (BR-Preface, Table 3)



Symbol	Earth Station Class of Station
RA	Radio astronomy station
TS	Aircraft earth station in the aeronautical mobile-satellite (R) service
TS	Aircraft earth station in the aeronautical mobile-satellite (OR) service
TA	Earth station in the amateur-satellite service
TB	Aeronautical earth station
TC	Earth station in the fixed satellite service
TD	Space telecommand earth station
TE	Satellite LPHD in the mobile satellite service
TF	Fixed earth station in the radiodetermination-satellite service
TG	Ship earth station
TH	Earth station in the space research service
TI	Coast earth station
TJ	Aircraft earth station
TK	Space tracking earth station
TL	Mobile earth station in the radiodetermination satellite service
TM	Earth station in the meteorological-satellite service
TN	Fixed earth station in the radionavigation-satellite service
TO	Mobile earth station in the aeronautical radionavigation-satellite service
TQ	Mobile earth station in the maritime radionavigation-satellite service
TR	Space telemetering earth station
TT	Earth station in the space operation service
TU	Land mobile earth station
TW	Earth station in the earth exploration-satellite service
TX	Fixed earth station in the maritime radionavigation-satellite service
TY	Base earth station
TZ	Fixed earth station in the aeronautical radionavigation-satellite service
UA	Mobile earth station
UB	Earth station in the broadcasting satellite service (sound broadcasting)
UD	Space telecommand mobile earth station
UE	Earth station in the standard frequency-satellite service
UF	Earth station in motion communicating with a geostationary satellite orbit station in the fixed-satellite service in the frequency bands referred to under No. 5.527A
UG	Earth station on board unmanned aircraft communicating with a space station of a geostationary-satellite network in the Fixed-satellite service for UAS CNPC links in accordance with resolves 1 of RES-155
UH	Mobile earth station in the space research service
UK	Space tracking mobile earth station
UM	Mobile earth station in the meteorological-satellite service
UN	Mobile earth station in the radionavigation-satellite service
UR	Space telecontrol mobile earth station
UT	Mobile earth station in the space operation service
UV	Earth station in the broadcasting-satellite service (television)
UW	Mobile earth station in the earth exploration-satellite service
UY	Earth station in the time signal-satellite service
VA	Land earth station

If a wrong Class of Station (stn_cls) is used, No contour of Table 10.

(NB: For Table 7,8,9, a Warning Contours with red colored message is presented. ESIM is not yet valid (RES 169))



Info window only

2. Attention to List of Affected Counties (in 2nd page)

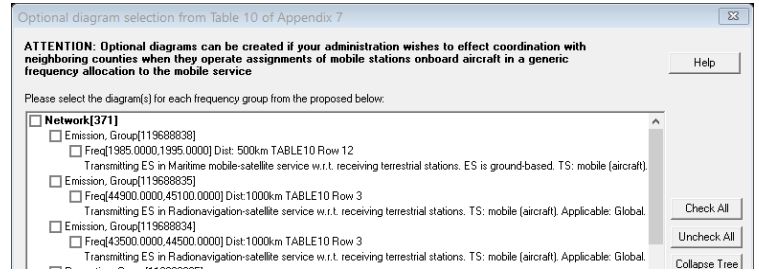
In the same coordination area, the result could be different: (for example)

1) Applicable: Global ➔ 17 ADMs

2) Footnote 5.524 : None (with below text)

No country is affected either under coordination contour of Appendix 7 or with respect to the footnotes of Article 5

3. Thoughtful selection/use on Optional Diagram



Thank you!

ITU – Radiocommunication Bureau

Questions to brmail@itu.int