

## EUROPEAN COMMON PROPOSAL

### Proposal submitted by the following administrations

[..., XX,....]

### PART A

#### Agenda Item 1.2

#### Use of the frequency band 10.6-10.68 GHz

to invite ITU-R to conduct sharing analyses between the EESS (passive) and the space research service (passive) on one hand and the fixed and mobile services on the other hand in the band 10.6-10.68 GHz to determine appropriate sharing criteria;

#### Introduction

The sharing studies performed under Agenda item 1.2 – Resolution 746 (WRC-03) have shown that EESS(passive) sensors would be able to operate in the band 10.6-10.68 GHz provided that the following sharing criteria are applied to both passive and active services.

EESS (passive)	Fixed service	Mobile service
incidence angle $\leq 60$ degrees, where the incidence angle is defined as the angle at the Earth's surface between the local vertical and the passive sensor	elevation angle $\leq 20^\circ$	
spatial resolution $\leq 50$ km, where the spatial resolution is defined as the maximum cross-section of the passive sensor -3dB contour on the Earth's surface	maximum P-P transmitter power: $\leq -15$ dBW In case ATPC is used, this power limit can be increased by a value corresponding to the ATPC range, up to a maximum of $-3$ dBW.  maximum P-MP transmitter power: $\leq -17$ dBW hub stations $\leq -10$ dBW customer stations	maximum transmitter power $\leq -17$ dBW

main beam efficiency $\geq 85\%$ , where the main beam efficiency is defined as the energy (main and cross-polarization components) within 2.5 times the $-3$ dB beamwidth region, relative to the total energy within all angles	maximum P-MP hub station eirp $\leq -4$ dBW	

### **Proposals:**

## ARTICLE 5

MOD EUR/XXA2/1

### 10-11.7 GHz

Allocation to services		
Region 1	Region 2	Region 3
<b>10.6-10.68</b>	EARTH EXPLORATION-SATELLITE (passive) FIXED MOBILE except aeronautical mobile RADIO ASTRONOMY SPACE RESEARCH (passive) Radiolocation 5.149 <u>5.RES</u>	

Deleted: 5.482

ADD EUR/XXA2/2

5.RES For sharing of the band 10.6-10.68 GHz between the Earth exploration satellite (passive) service and the fixed, mobile services, Resolution [10.6 GHz] shall apply.

SUP EUR/XXA2/3

**5.482**

**Reasons:** To add a footnote in Article 5 calling for a resolution detailing the sharing criteria. These criteria also cover the limits under 5.482 for the protection of active services between themselves. This footnote is therefore proposed for deletion.

RESOLUTION [10.6 GHz] (WRC-07)

**Use of the frequency band 10.6-10.68 GHz**

The World Radiocommunication Conference (Geneva, 2007),

*considering*

- a) that the frequency band 10.6-10.7 GHz is allocated to the Earth exploration-satellite service (EESS) (passive) and to the space research service (SRS) (passive) on a primary basis;
- b) that the band 10.6-10.7 GHz is of primary interest for the measurement of rain, snow, sea state, ocean wind and soil moisture;
- c) that this frequency band is used by passive sensors to study natural phenomena producing radio emissions at frequencies fixed by the laws of nature, and therefore shifting frequency to avoid or mitigate interference problems may not be possible;
- d) that any limitation of the operation of passive sensors to the band 10.68-10.7 GHz covered by 5.340 would degrade the sensitivity of those sensors;
- e) that the frequency band 10.6-10.68 GHz is also allocated to the mobile, except aeronautical mobile, and the fixed services on a primary basis;
- f) that experience has shown that EESS (passive) sensors currently operating in the band 10.6-10.68 GHz are facing high interference levels from the emissions of systems of active services in some parts of the World;
- g) that studies have concluded that appropriate sharing criteria applicable to both passive and active services would reduce this interference to a level that would permit passive sensors to operate successfully, while allowing continuing operation of active services in the same band,

*resolves*

- 1 that, in order to facilitate sharing between active and passive services in the band 10.6-10.68 GHz, EESS (passive) sensors brought into use after [date of entry into force of WRC-07 final acts] shall comply with the sharing criteria contained in Table 1 of Annex 1.
- 2 that, in order to facilitate sharing between active and passive services in the band 10.6-10.68 GHz, stations in the Fixed and Mobile services brought into use after [date of

entry into force of WRC-07 final acts]shall comply with the sharing criteria contained in Tables 2 and 3 of Annex 1.

## ANNEX 1

### Sharing criteria in the band 10.6-10.68 GHz

Point-to-point communication is defined as communication provided by a link, for example, a radio-relay link between two stations located at specified fixed points.

Point-to-multipoint communication is defined as communication provided by links, for example, radio-relay links between a single station located at a specified fixed point (also called hub station in this annex) and a number of stations located at specified fixed points (also called customer stations in this annex).

Automatic transmit-power control (ATPC) is a technique in which the output power of a microwave transmitter is automatically varied in accordance with path conditions. In normal path conditions, the ATPC maintains the transmitter output power at a reduced level. The ATPC is characterized by the ATPC range which is defined as the difference between the maximum and minimum value of transmitted power.

TABLE 1

### Earth Exploration Satellite Service

Parameter	Value
Incidence angle (defined as the angle at the Earth's surface between the local vertical and the passive sensor)	$\leq 60$ degrees
Spatial resolution (defined as the maximum cross-section of the passive sensor -3dB contour on the Earth's surface, see Note 1)	$\leq 50$ km
Main beam efficiency (defined as the energy (main and cross-polarization components) within 2.5 times the $-3$ dB beamwidth region, relative to the total energy within all angles, see Note 1)	$\geq 85$ %

Note 1 – the definitions are based on real aperture EESS (passive) instruments. In case synthetic aperture sensors are used, the equivalent of these two parameters needs to be met.

TABLE 2

### Fixed Service

Parameter	Value
Maximum elevation angle	20°
<b>Point-to-Point systems</b> <ul style="list-style-type: none"> <li>- Maximum transmitter power at the antenna port without ATPC</li> <li>-</li> </ul>	-15 dBW (Note 1)
<b>Point-to-Multipoint systems</b> <ul style="list-style-type: none"> <li>- Maximum transmitter power at the antenna port of hub stations</li> <li>- Maximum transmitter power at the antenna port of customer stations</li> </ul>	-17 dBW  -10 dBW

NOTE 1 – In the case of FS Point-to-Point systems using ATPC, the maximum transmitter power may be increased by a value corresponding to the ATPC range up to a maximum of –3 dBW.

TABLE 3  
Mobile Service

Parameter	Value
Maximum transmitter power at the antenna port	-17 dBW (Note 1)

Note 1 - the limits applicable to mobile stations have been derived assuming outdoor applications with an activity factor of 0.3 %

**Reasons:** *The studies performed under Resolution 746 (WRC-07) and Agenda Item 1.2 have shown that these sharing criteria would allow EESS(passive) sensors to operate successfully in the band 10.6-10.68 GHz.*

SUP EUR/XXA2/5

## RESOLUTION 746 (WRC-03)

### **Issues dealing with allocations to science services**

**Reasons:** *Completion of studies required under this resolution. This proposal should be taken into consideration in conjunction with the extension of the METSAT allocation at 18 GHz, which is also part of this resolution*

## PART B

### Agenda Item 1.2

#### **Extension of the Meteorological Satellite Service in the band 18.1 – 18.3 GHz**

**WRC-2007 agenda item 1.2: In accordance with Resolution 746 (WRC-03), conduct sharing analyses between geostationary meteorological satellites operating in the space-to-Earth direction and the fixed, fixed-satellite and mobile services in the band 18-18.4 GHz to define appropriate sharing criteria with a view to extending the current 18.1-18.3 GHz geostationary meteorological satellites allocation in the space-to-Earth direction to 300 MHz of contiguous spectrum.**

#### **Introduction**

In order to provide the necessary frequency spectrum for the next generation geostationary meteorological satellite (MetSat) systems an extension of the existing 18 GHz MetSat allocation by 100 MHz preferably on a world-wide basis is required.

Studies for the two possible extension bands 18.0 – 18.1 GHz and 18.3 – 18.4 GHz indicated that sharing in both of the considered extension bands is feasible with all the other allocated services (fixed and mobile service, fixed-satellites service (GSO and NGSO) and BSS feederlinks).

The main difference in the allocation situation between the two possible extension bands is the fact that the band 18.0 – 18.1 GHz is subject to Appendix 30A. Since an extension in the band 18.3 – 18.4 GHz does not require to take into account the BSS feeder link plan and list (Appendix 30A) and its possible associated difficulties as it is the case for the band 18.0 – 18.1 GHz, an extension into the band 18.3 – 18.4 GHz is proposed.

In case an extension of the MetSat allocation in the band 18.3 – 18.4 GHz should not be possible on a world-wide basis and thus the inter-operability of MetSat systems between ITU-R Regions should be hindered, an extension into the band 18.0 – 18.1 GHz would be the alternative option.

Coordination within an arc of  $\pm 8^\circ$  of the nominal orbital position of a planned network in the MetSat service is proposed for Appendix 5 as this would result in the same coordination process already applicable to networks of the FSS and reduce the workload of the Bureau in identifying affected administrations and the number of unnecessary coordinations. Studies have shown that insignificant interference is caused by GSO satellite networks separated by more than 8 degrees.

Parameters for coordination between terrestrial services and the meteorological satellite service have not yet been established for frequencies near 18 GHz. It is therefore proposed that Table 8d of Appendix 7 of the Radio Regulations be amended with data for meteorological satellite systems.

#### **Proposals:**

#### **MOD EUR/XXA2/1**

**5.519** *Additional allocation:* the band 18.1-18.4 GHz is also allocated to the meteorological-satellite service (space-to-Earth) on a primary basis. Its use is limited to geostationary satellites and shall be in accordance with the provisions of Article 21, Table 21-4.

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**Reasons:** *In order to provide the required spectrum for the next generation meteorological satellite (MetSat) systems, an extension on a world-wide basis of the existing allocation to the MetSat Service by 100 MHz under the same regulatory conditions that apply in the already allocated frequency band 18.1 – 18.3 GHz is proposed. Studies for the band 18.3 – 18.4 GHz conclude that sharing between the MetSat Service and the other allocated services (FSS, FS and MS) is feasible.*

#### **MOD EUR/XXA2/2**

#### **ARTICLE 5**

15.4-18.4 GHz

Allocation to services		
Region 1	Region 2	Region 3
...		
18.1-18.4	FIXED FIXED-SATELLITE (space-to-Earth) 5.484A 5.516B (Earth-to-space) 5.520 MOBILE <a href="#">MOD.5.519</a> 5.521	

**Reasons:** *Consequential modifications to the table of allocations to reflect the proposed modification of FN 5.519 (EUR/XXA2/1) for the extension of the 18 GHz allocation to the Meteorological Satellite Service.*



## APPENDIX 5 (REV.WRC-07)

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**Identification of administrations with which coordination is to be effected or  
agreement sought under the provisions of Article 9**

TABLE 5-1 (REV.WRC-07)

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**Technical conditions for coordination**  
(see Article 9)

TABLE 5-1 (CONTINUED) (REV.WRC-07)

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Reference of Article 9	Case	Frequency (and Region) of the service for which coordination is sought	Threshold/condition	Calculation method	Remarks
No. 9.7 GSO/GSO (cont.)		3) 17.7-20.2 GHz, (Regions 2 and 3), 17.3-20.2 GHz (Region 1) and 27.5-30 GHz	i) Bandwidth overlap, and  ii) any network in the FSS and any associated space operation functions (see No. 1.23) with a space station within an orbital arc of $\pm 8^\circ$ of the nominal orbital position of a proposed network in the FSS		
		4) 18.1-18.4 GHz	i) Bandwidth overlap, and  ii) any network in the FSS or MetSat service and any associated space operation functions (see No. 1.23) with a space station within an orbital arc of $\pm 8^\circ$ of the nominal orbital position of a proposed network in the FSS or MetSat service		
		5) Bands above 17.3 GHz,	i) Bandwidth overlap, and		

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Reference of Article 9	Case	Frequency bands (and Region) of the service for which coordination is sought	Threshold/condition	Calculation method	Remarks
No. 9.7 GSO/GSO (cont.)		except those defined in § 3) <a href="#">and 4)</a>	ii) any network in the FSS and any associated space operation functions (see No. 1.23) with a space station within an orbital arc of $\pm 8^\circ$ of the nominal orbital position of a proposed network in the FSS (see also Resolution 901 (WRC-03))		
		<a href="#">6</a> Bands above 17.3 GHz	i) Bandwidth overlap, and		
		<a href="#">7</a> All frequency bands, other than those in 1), 2), 3), 4), <a href="#">5</a> and <a href="#">6</a> , allocated to a space service, and the bands in 1), 2), 3), 4), <a href="#">5</a> and <a href="#">6</a> where the radio service of the proposed network or affected networks is other than the space services listed in the threshold/condition column, or in the case of coordination of space stations operating in the opposite direction of transmission	ii) any network in the FSS or BSS, not subject to a Plan, and any associated space operation functions (see No. 1.23) with a space station within an orbital arc of $\pm 16^\circ$ of the nominal orbital position of a proposed network in the FSS or BSS, not subject to a Plan, except in the case of a network in the FSS with respect to a network in the FSS (see also Resolution 901 (WRC-03))		
			i) Bandwidth overlap, and		
			ii) Value of $\Delta T/T$ exceeds 6%	Appendix 8	In application of Article 2A of Appendix 30 for the space operation functions using the guardbands defined in § 3.9 of Annex 5 of Appendix 30, the threshold/condition specified for the FSS in the bands in 2) applies.  In application of Article 2A of Appendix 30A for the space operation functions using the guardbands defined in § 3.1 and 4.1 of Annex 3 of Appendix 30A, the threshold/condition specified for the FSS in the bands in 4) applies

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Reason: ITU studies have concluded that insignificant interference would be caused by satellite networks on the GSO separated by more than 8 degrees. Application of the same coordination procedure to both FSS networks and networks of the meteorological satellite service would reduce the workload of the Bureau in identifying affected administrations and the number of unnecessary coordinations for such systems.

**Methods for the determination of the coordination area around an earth station  
in frequency bands between 100 MHz and 105 GHz**

**ANNEX 7**

**System parameters and predetermined coordination distances for determination of  
the coordination area around an earth station**

TABLE 8d

## Parameters required for the determination of coordination distance for a receiving earth station

Receiving space radiocommunication service designation	Meteoro-logical-satellite	Fixed-satellite	Fixed-satellite <sup>3</sup>	Broad-casting-satellite	Earth exploration-satellite <sup>4</sup>	Earth exploration-satellite <sup>5</sup>	Space research (deep space)	Space research		Fixed-satellite <sup>6</sup>	Fixed-satellite <sup>5</sup>	Mobile-satellite	Broadcasting-satellite, fixed-satellite	Mobile-satellite	Radio-navigation	Broadcasting-satellite
								Unman-ned	Manned							
Frequency bands (GHz)	18.1-18.4	18.8-19.3	19.3-19.7	21.4-22.0	25.5-27.0	25.5-27.0	31.8-32.3	37.0-38.0		37.5-40.5	37.5-40.5	39.5-40.5	40.5-42.5	43.5-47.0	43.5-47.0	84-86
Transmitting terrestrial service designations	Fixed, mobile	Fixed, mobile	Fixed, mobile	Fixed, mobile	Fixed, mobile	Fixed, mobile	Fixed, radio-navigation	Fixed, mobile		Fixed, mobile	Fixed, mobile	Fixed, mobile	Broadcasting, fixed	Mobile	Mobile	Fixed, mobile, broadcasting
Method to be used	§ 2.1	§ 2.1, § 2.2	§ 2.2	§ 1.4.5	§ 2.2	§ 2.1	§ 2.1, § 2.2	§ 2.1, § 2.2		§ 2.2	§ 2.1	§ 1.4.6	§ 1.4.5, § 2.1	§ 1.4.6	–	§ 1.4.5
Modulation at earth station <sup>1</sup>	N	N	N		N	N	N	N		N	N	N	–	N		
Earth station interference parameters and criteria	$p_0$ (%)	0.05	0.003	0.01		0.25	0.25	0.001	0.1	0.001	0.02	0.003				
	$n$	2	2	1		2	2	1	1	1		2				
	$p$ (%)	0.025	0.0015	0.01		0.125	0.125	0.001	0.1	0.001		0.0015				
	$N_L$ (dB)	0	0	0		0	0	0	0	0	1	1				
	$M_s$ (dB)	18.8	5	5		11.4	14	1	1	6.8	6					
	$W$ (dB)	0	0	0		0	0	0	0	0	0					
Terrestrial station parameters	$E$ (dBW) in $B$ <sup>2</sup>	A	–	–		–	–	–	–	–	–	–	–	–	–	–
		N	40	40	40	40	42	42	–28	–28	35	35	35	44	40	40
	$P_t$ (dBW) in $B$	A	–	–		–	–	–	–	–	–	–	–	–	–	–
		N	–7	–7	–7	–7	–3	–3	–81	–73	–10	–10	–10	–1	–7	–7
	$G_x$ (dBi)	47	47	47	47	45	45	53	45	45	45	45	45	47	47	
Reference bandwidth <sup>6</sup>	$B$ (Hz)	10 <sup>7</sup>	10 <sup>6</sup>	10 <sup>6</sup>		10 <sup>7</sup>	10 <sup>7</sup>	1	1	10 <sup>6</sup>	10 <sup>6</sup>	10 <sup>6</sup>	10 <sup>6</sup>			
Permissible interference power	$P_f(p)$ (dBW) in $B$	–115	–140	–137		–120	–116	–216	–217	–140						

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- <sup>1</sup> A: analogue modulation; N: digital modulation.
- <sup>2</sup>  $E$  is defined as the equivalent isotropically radiated power of the interfering terrestrial station in the reference bandwidth.
- <sup>3</sup> Non-geostationary mobile-satellite service feeder links.
- <sup>4</sup> Non-geostationary-satellite systems.
- <sup>5</sup> Geostationary-satellite systems.
- <sup>6</sup> Non-geostationary fixed-satellite service systems.

Reason: Parameters are required for coordination between terrestrial services and the meteorological satellite service near 18 GHz.

## PART C

### Agenda Item 1.2

### Use of the frequency band 36-37 GHz

**to invite ITU-R to conduct sharing studies between the passive services and the fixed and mobile services in the band 36-37 GHz in order to define appropriate sharing criteria.**

#### Introduction

The sharing studies performed under Agenda item 1.2 – Resolution 742 (WRC-03) have shown that EESS(passive) sensors would be able to operate in the band 36-37 GHz provided that the following sharing criteria are applied to both passive and active services.

EESS (passive)	Fixed service	Mobile service
incidence angle $\leq 60$ degrees, where the incidence angle is defined as the angle at the Earth's surface between the local vertical and the passive sensor	elevation angle range $\leq 20^\circ$	
spatial resolution $\leq 50$ km, where the spatial resolution is defined as the maximum cross-section of the passive sensor -3dB contour on the Earth's surface	maximum P-P transmitter power $\leq -10$ dBW (Note 1) maximum P-MP transmitter power: $\leq -5$ dBW hub stations $\leq -10$ dBW customer stations	maximum transmitter power $\leq -10$ dBW maximum transmitter power $\leq -3$ dBW (if activity factor less than 40%)
main beam efficiency $\geq 92$ %, where the main beam efficiency is defined as the energy (main and cross-polarization components) within 2.5 times the $-3$ dB beamwidth region, relative to the total energy within all angles	maximum P-MP hub station eirp $\leq +12$ dBW	

NOTE 1 – In the case of FS P-P systems using ATPC, the maximum transmitter power may be increased by a value corresponding to the ATPC range up to a maximum of  $-7$  dBW.

#### Proposals:

## ARTICLE 5

MOD EUR/XXA2/1

### 34.2-40 GHz

Allocation to services		
Region 1	Region 2	Region 3
36-37	EARTH EXPLORATION-SATELLITE (passive) FIXED MOBILE SPACE RESEARCH (passive) 5.149 <u>5.RES</u>	

ADD EUR/XXA2/2

5.RES For sharing of the band 36-37 GHz between the Earth exploration satellite (passive) service and the fixed, mobile services, Resolution [36 GHz] shall apply.

**Reasons:** *To add a footnote in Article 5 calling for a resolution detailing the sharing criteria.*

ADD EUR/XXA2/3

### RESOLUTION [36 GHz] (WRC-07)

#### Use of the frequency band 36-37 GHz

The World Radiocommunication Conference (Geneva, 2007),

*considering*

a) that the frequency band 36-37 GHz is allocated to the Earth exploration-satellite service (EESS) (passive) and to the space research service (SRS) (passive) on a primary basis;

b) that the band 36-37 GHz is of primary interest to measure rain, snow, ocean ice and water vapour;



- c) that this frequency band is used by passive sensors to study natural phenomena producing radio emissions at frequencies fixed by the laws of nature, and therefore shifting frequency to avoid or mitigate interference problems may not be possible;
- d) that the frequency band 36-37 GHz is also allocated to the fixed service and to the mobile service on a primary basis;
- e) that the EESS (passive) operating in the band 36-37 GHz may suffer from interference from the emissions of systems of active services;
- f) that studies have concluded that appropriate sharing criteria applicable to both passive and active services would reduce this interference to a level that would permit passive sensors to operate successfully in this band, while allowing continuing operation of active services in the same band,

*resolves*

- 1 that, in order to facilitate sharing between active and passive services in the band 36-37 GHz, EESS (passive) sensors brought into use after the [date of entry into force of WRC-07 final acts] shall comply with the sharing criteria contained in Table 1 of Annex 1.
- 2 that, in order to facilitate sharing between active and passive services in the band 36-37 GHz, stations in the Fixed and Mobile services brought into use after the [date of entry into force of WRC-07 final acts] shall comply with the sharing criteria contained in Tables 2 and 3 of Annex 1.

## ANNEX 1

### **Sharing criteria in the band 36-37 GHz**

Point-to-point communication is defined as communication provided by a link, for example, a radio-relay link between two stations located at specified fixed points.

Point-to-multipoint communication is defined as communication provided by links, for example, radio-relay links between a single station located at a specified fixed point (also called hub station in this annex) and a number of stations located at specified fixed points (also called customer stations in this annex).

Automatic transmit-power control (ATPC) is a technique in which the output power of a microwave transmitter is automatically varied in accordance with path conditions. In normal path conditions, the ATPC maintains the transmitter output power at a reduced level. The ATPC is characterized by the ATPC range which is defined as the difference between the maximum and minimum value of transmitted power.

TABLE 1

### **Earth Exploration Satellite Service**

Parameter	Value
Incidence angle (defined as the angle at the Earth's surface between the local vertical and the passive sensor)	$\leq 60$ degrees
Spatial resolution (defined as the maximum cross-section of the passive sensor -3dB contour on the Earth's surface, see Note 1)	$\leq 50$ km
Main beam efficiency (defined as the energy (main and cross-polarization components) within 2.5 times the -3 dB beamwidth region, relative to the total energy within all angles, see Note 1)	$\geq 92$ %

Note 1 – the definitions are based on real aperture EESS (passive) instruments. In case synthetic aperture sensors are used, the equivalent of these two parameters needs to be met.

TABLE 2  
Fixed Service

Parameter	Value
Maximum elevation angle	20°
<b>Point-to-Point systems</b>	
- Maximum transmitter power at the antenna port	-10 dBW (Note 1)
<b>Point-to-Multipoint systems</b>	
- Maximum transmitter power at the antenna port of hub stations	-5 dBW
- Maximum transmitter power at the antenna port of customer stations	-10 dBW

NOTE 1 – In the case of FS Point-to-Point systems using ATPC, the maximum transmitter power may be increased by a value corresponding to the ATPC range up to a maximum of -7 dBW.

TABLE 3  
Mobile Service

Parameter	Value
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Maximum transmitter power at the antenna port (Activity factor 100%)	-10 dBW
Maximum transmitter power at the antenna port (Activity factor ≤ 40%)	-3 dBW

**Reasons:** *The studies performed under Resolution 742 (WRC-07) and Agenda Item 1.2 have shown that these sharing criteria would allow EESS(passive) sensors to operate successfully in the band 36-37 GHz.*

SUP EUR/XXA2/4

#### RESOLUTION 742 (WRC-03)

#### **Use of the frequency band 36-37 GHz**

**Reasons:** *Completion of studies required under this resolution.*