



Electronic Communications Committee (ECC)  
within the European Conference of Postal and Telecommunications Administrations (CEPT)

## **ECC RECOMMENDATION (10)01**

### **ON GUIDELINES FOR COMPATIBILITY BETWEEN COMPLEMENTARY GROUND COMPONENTS (CGC) OPERATING IN THE BAND 2170-2200 MHz AND EESS/SOS/SRS EARTH STATIONS OPERATING IN THE BAND 2200-2290 MHz**

Recommendation approved by Working Group “Frequency Management” (FM)

#### **INTRODUCTION**

The ECC has adopted Decision (06)09 on “*the Designation of the bands 1980-2010 MHz and 2170-2200 MHz for use by systems in the Mobile-Satellite Service (MSS) including those supplemented by a Complementary Ground Component (CGC)*” so as to facilitate the introduction of mobile satellite systems in the 2 GHz MSS bands.

In the adjacent frequency band 2200-2290 MHz space agencies around the world have deployed earth stations to receive telemetry and ranging signals from nearly all their satellites operating under the SRS/EESS. Most of the SRS/EESS satellites operating in this band are non GSO satellites and operating down to 5 degrees elevation. This fact, combined with the low pfd limits imposed by Article 21, makes the receiving earth station rather sensitive to interference from terrestrial systems. As a consequence the out-of-band emission levels from CGC base stations operating below 2200 MHz can cause harmful interference.

For this purpose, it was considered useful for CEPT administrations to develop common guidelines with respect to the compatibility between Complementary Ground Component (CGC) operating in the band 2170-2200 MHz and EESS/SOS/SRS Earth stations operating in the band 2200-2290 MHz.

The technical and regulatory solution for coordinating the CGC base station deployment with EESS/SOS/SRS receiving earth stations above 2200 MHz was studied the results are the guidelines in this document which propose a coordination area around the EESS/SOS/SRS earth stations within which coordination should be achieved with those CGC base stations having a power level above a given threshold which is a function of the distance from the receiving earth station.

For the purpose of this Recommendation the word *coordination* is intended to mean the process, involving all the relevant parties, of ensuring the protection of existing EESS/SOS/SRS receiving earth stations from unwanted emissions of CGC base stations.

This Recommendation provides such guidelines.

“The European Conference of Postal and Telecommunications Administrations,

*considering*

- a) that the ECC has adopted Decision (06)09 on “*the Designation of the bands 1980-2010 MHz and 2170-2200 MHz for use by systems in the Mobile-Satellite Service (MSS) including those supplemented by a Complementary Ground Component (CGC)*”;
- b) that the [draft]<sup>1</sup> harmonised standard ETSI EN 302 574-1 specifies maximum unwanted emission levels in the form of spectrum emission masks for different values of maximum output power of CGC base stations operating in the 2170-2200 MHz bands;
- c) that earth stations of the Earth Exploration Satellite Service, Space Research Service or Space Operation Service operate in the CEPT in the band 2200-2290 MHz;
- d) that CGC base stations operating in the frequency band 2170-2200 MHz may have out-of-band emissions which could cause harmful interference to receiving earth stations operating above 2200 MHz;
- e) that compatibility between CGC base stations operating in the band 2170-2200 MHz and earth stations in the Earth Exploration Satellite Service, Space Research Service or Space Operation Service in the adjacent band 2200-2290 MHz, can be achieved through a coordinated process between affected operators and administrations;
- f) that a list of receiving earth stations in CEPT countries is provided at Annex 2
- g) that the use of CGC base station output power levels higher than that referred to in the [draft] harmonised standard ETSI EN 302 574-1 would not impact the assessment of compatibility since the unwanted emission level is required to be the same;

*recommends*

that, to ensure the compatibility between CGC in the band 2170-2200 MHz and the earth stations, listed in Annex 2, in the Earth Exploration Satellite Service, Space Research Service or Space Operation Service operating in the CEPT in the adjacent band 2200-2290 MHz, administrations should use the guidelines described in Annex 1.”

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<sup>1</sup> This may need to be reviewed following the conclusion of the ETSI public consultation on draft EN 302 574-1

## Annex 1

### **GUIDELINES FOR COMPATIBILITY BETWEEN COMPLEMENTARY GROUND COMPONENT (CGC) OPERATING IN THE BAND 2170-2200 MHz AND EESS/SOS/SRS EARTH STATIONS OPERATING IN THE BAND 2200-2290 MHz**

The following guidelines are recommended:

- 1 Exclude from any coordination all CGC base stations operating according to the harmonised standard ETSI EN 302 574-1 which are at a distance greater than 60 km from the receiving earth stations listed in Annex 2.
- 2 Coordinate all CGC base stations operating in the band 2170-2200 MHz, whose distance from the earth stations listed in Annex 2 is less than, or equal to, 60km whose unwanted emissions above 2200 MHz have a level above the threshold mask indicated below. This process applies also to CGC base stations impacting earth stations in territories of neighbouring CEPT countries.

The threshold mask is defined by the following equation:

$$\text{EIRP} = -95.9 + 20 \log (d) \quad \text{for} \quad d < 60 \text{ km}$$

where d (km) is the separation distance between the CGC and the EESS/SRS/SOS earth station, and EIRP is expressed in dBW/30 kHz, at any location within a geographical area of 60km around each of the earth stations listed in Annex 2

- 3 Exclude from this process the CGC base stations whose unwanted emissions are below the threshold mask defined in guideline 2.
- 4 This process should be based on a harmful interference level at the antenna port of the receiving EESS/SRS/SOS Earth station of -181 dBW/30 kHz (-216 dBW/Hz from recommendation ITU-R SA.1154, 10% apportionment among services, single interferer)..
- 5 In the frame of this process, calculation refinements should be considered taking account of terrain elevation, shielding, and actual antenna height and gain for both systems, and any other documentation deemed relevant by the concerned administrations.

**Annex 2**

**LIST OF STATIONS USED BY ESA OR COOPERATING SPACE AGENCIES IN EUROPE\***

<b>Location</b>	<b>Latitude</b>	<b>Longitude</b>	<b>Country</b>	<b>Operator</b>
Kiruna/Salamijärvi	67° 51' 26" N	20° 57' 57" E	Sweden	ESA/SSC
Kiruna/Estrange	67° 53' N	21° 4' E	Sweden	ESA/SSC
Svalbard	78° 13' 18" N	15° 24' 03" E	Norway	KSAT
Villafranca	40° 26' 33" N	03° 57' 06" W	Spain	ESA
Cebreros	40° 27' 15" N	04° 22' 03" W	Spain	ESA
Robledo	40° 25' 43" N	04° 14' 57" W	Spain	NASA
Maspalomas	27° 45' 46" N	15° 38' 02" W	Spain (Canary Islands)	INTA
Redu	50° 00' 07" N	05° 08' 43" E	Belgium	ESA
Monte da Flores	36° 59' 49" N	25° 08' 09" W	Portugal (Azores)	
Aussaguel	43° 25' 26" N	01° 30' 22" E	France	CNES
Neustrelitz	53° 19' 47" N	13° 04' 12" E	Germany	DLR
Weilheim	47° 52' 55" N	11° 04' 54" E	Germany	DLR
Berlin-Adlershof	52° 26' 16" N	13° 32' 51" E	Germany	DLR
Usingen	50° 20' 03" N	08° 29' 00" E	Germany	Media/broadcast/Eumetsat
Brandenburg	52° 24' 37" N	12° 33' 51" E	Germany	Rapid Eye
Gelsdorf	50° 34' 09" N	07° 02' 09" E	Germany	Government
Leeheim	49° 51' 14" N	08° 23' 58" E	Germany	Government
Fucino	42° 03' 32" N	13° 37' 30" E	Italy	Eumetsat
Torrejón de Ardoz	40° 27' 32" N	03° 28' 18" W	Spain	Eumetsat
Cheia	45° 28' 01" N	25° 18' 03" E	Romania	Eumetsat

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\* This List is updated by Working Group FM based on information from administrations