

# EUROPEAN COMMUNICATIONS COMMITTEE

ECC Decision  
of 1 December 2006  
on the designation of the bands  
1980-2010 MHz and 2170-2200 MHz  
for use by systems in the Mobile-Satellite Service  
including those supplemented by  
a Complementary Ground Component (CGC)

(ECC/DEC/(06)09)  
(2007/98/EC)  
amended 5 September 2007



## EXPLANATORY MEMORANDUM

### 1 INTRODUCTION

In March 2004, the ECC decided to review the regulatory framework for the Mobile-Satellite Service in the bands 1980-2010 MHz and 2170-2200 MHz. This review has been undertaken to accommodate a new generation of mobile satellite systems planning to operate in the bands 1980-2010 MHz / 2170-2200 MHz, some of which intending to provide commercial services by 2009.

### 2 BACKGROUND

WARC-92 allocated additional spectrum to Mobile-Satellite Service on a world-wide basis in two band pairs: one at 1610-1626.5MHz (Earth-to-space) / 2483.5-2500 MHz (space-to-Earth) and the other at 1980-2010 MHz (Earth-to-space) / 2170-2200 MHz (space-to-Earth).

In addition, WARC-92 identified the frequency bands 1885-2025 MHz and 2110-2200 MHz for IMT-2000, including 1980-2010 MHz (Earth-to-space) and 2170-2200 MHz (space-to-Earth) for the satellite component of IMT-2000.

To meet the expected growing demand of the mobile telecommunications market, WRC-2000 identified additional spectrum for IMT-2000 in the 2500-2690 MHz frequency range, and the possible use of the 2500-2520 MHz and 2670-2690 MHz frequency bands for the satellite component, as stated in *resolves* 2 of Resolution 225 (Rev.WRC-03). In 2005, the ECC adopted ECC/DEC/(05)05 which designates these 2x20 MHz for the terrestrial component of IMT-2000 in Europe. The same ECC Decision recognizes the need for the remaining Mobile-Satellite Service bands in the 1-3 GHz range for the development of innovative Mobile-Satellite Services.

Within CEPT, a regulatory scheme applicable for Satellite Personal Communications Services (S-PCS) was established in 1997. The four CEPT Decisions which provided the basis for authorising S-PCS systems throughout Europe were:

- ERC Decision 97(03)<sup>1</sup> relating to the Harmonised Use of Spectrum for Satellite Personal Communications Services (S-PCS) operating within the bands 1610-1626.5 MHz, 2483.5-2500 MHz, 1980-2010 MHz and 2170-2200 MHz;
- ERC Decision 97(04)<sup>2</sup> relating to the Transitional Arrangements for the Fixed Service and the Mobile-Satellite Service in the Bands 1980-2010 MHz and 2170-2200 MHz in order to Facilitate the Harmonised Introduction and Development of Satellite Personal Communications Services;
- ERC Decision 97(05)<sup>3</sup> on Free Circulation, Use and Licensing of Mobile Earth Stations of Satellite Personal Communications Services (S-PCS) operating within the bands 1610-1626.5 MHz, 2483.5-2500 MHz, 1980-2010 MHz and 2170-2200 MHz within the CEPT; and
- ECTRA Decision (97)02<sup>4</sup> on Harmonisation of Authorisation Conditions and Co-ordination of Procedures in the field of Satellite Personal Communications Services (S-PCS) in Europe, operating within the bands 1610-1626.5 MHz, 2483.5-2500 MHz, 1980-2010 MHz and 2170-2200 MHz.

By 2004, a number of mobile-satellite systems have been proposed to operate in the 2 GHz bands with the view to offer a variety of services, such as point-to-point ubiquitous mobile connectivity, broadcast/multicast to handset terminals, security services (population alert and rescue support), data collection, fleet tracking, etc. Most of the proposed systems rely on a ground-based infrastructure to enhance satellite coverage in highly shadowed areas. It should be noted that similar developments have occurred in Asia and in North-America where appropriate regulatory frameworks have been set-up. In this Decision, such a ground based infrastructure operating within the bands 1980-2010 / 2170-2200 MHz is named a Complementary Ground Component (CGC). The 1997 set of Decisions covered the bands 1.6/2.4 GHz and 2 GHz. The 1.6/2.4 GHz bands are occupied by operational mobile-satellite systems offering commercial service.

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<sup>1</sup> ERC/DEC/(97)03 has been withdrawn on 26 June 2011

<sup>2</sup> ERC/DEC/(97)04 has been withdrawn on 1 December 2006

<sup>3</sup> ERC/DEC/(97)05 has been withdrawn on 21 December 2010

<sup>4</sup> ECTRA/DEC/(97)02 has been withdrawn on 03 March 2017

There are a number of reasons for which that set of Decisions is not suitable for new systems intending to operate in the 1980-2010 MHz and 2170-2200 MHz frequency bands:

- The applicability of the 1997 set of Decisions to systems to be brought into use after 1 January 2001 is unclear.
- The 1997 set of CEPT Decisions applied to S-PCS systems only. New services may not fit within the definition of S-PCS. Therefore, there is a need to broaden the scope to encompass an extended range of applications.
- The band splitting arrangements contained in the 1997 framework for the 2 GHz bands may contradict a technology neutral approach to regulation.
- The use of a complementary ground component for mobile-satellite systems was not envisaged in 1997.

New, innovative mobile-satellite systems with complementary ground components aim at two objectives:

- Universal access to the service by removing the restriction resulting from lack of satellite signal availability in highly shadowed areas.
- Increase the efficient spectrum usage. In recent years, spectrum demand for new communication services in the “mobility bands” below 3 GHz has increased drastically, resulting in added pressure to use the spectrum in more efficient ways.

In the following, some different network architectures are described through examples which are based on systems under development or already in commercial operation.

One example is the case where ground based stations provide an extension of the same information carried on the mobile-satellite system, through direct interconnection with the mobile-satellite system, and so using the same frequencies as the satellite, into areas where blockage or other factors would otherwise result in unsatisfactory reception from the mobile-satellite system. This type of technical implementation is used in the band 2320-2345 MHz in the USA with the XM-Radio (GSO) and Sirius Radio (N-GSO) systems. In such a case, there is no return link.

A variation of this example is the case, as for MBSAT launched in April 2004 and operating in the 2.5 GHz band in Japan and Korea, where the information is transmitted to the ground based stations in the Ku band and not directly in the 2.5 GHz band.

An example within CEPT is the possible use of terrestrial repeaters in S-DAB systems operating in the band 1452-1492 MHz, covered by ECC DEC(03)02. In this case, the ground based stations are used to extend the same information carried on the satellite but without necessarily using the same frequencies as the space station. The E-SDR system (European Satellite Digital Radio) plans to operate in this band with terrestrial repeaters according to this latter configuration.

Among the systems operating both in the Earth-to-space and space-to-Earth directions, several architectures are being developed. Those being developed in North America use additional ground stations (Ancillary Terrestrial Component – ATC – in the FCC regulation) operating at frequencies in the Mobile-Satellite Service bands (1.5/1.6 GHz, 2 GHz or 1.6/2.4 GHz) which have been assigned to the particular mobile-satellite system. Some of these systems are expected to start commercial operation in the 2 GHz bands before November 2007. So as to optimise the use of the spectrum, all the information carried through the ATC does not need to pass through the space station.

### **3 REQUIREMENT FOR AN ECC DECISION**

The ECC recognises that a harmonised framework for the implementation of Mobile-Satellite Service in the bands 1980-2010 MHz and 2170-2200 MHz will be beneficial to satellite operators and manufacturers, and will benefit to the public with the availability of innovative new services.

The ECC recognises that for Mobile-Satellite Service to develop, manufacturers and operators must be given the confidence to make the necessary investment. In particular, satellite systems require high upfront investment which can only be achieved if a long term visibility on the regulatory environment exists.

The ECC believes that the trans-national nature of satellite services necessitates the harmonised use of the considered frequency bands across the CEPT, and a commitment by CEPT member countries to implement this

Decision will provide a clear framework to National Regulatory Authorities and operators to enable the implementation of these satellite services.

The issue of trans-border frequency coordination between two CGC networks and between CGC and terrestrial stations operating in adjacent bands is outside the scope of this Decision and will be addressed by the ECC in future works as necessary.

This ECC Decision provides the necessary provisions for the designation and the conditions of use of the bands 1980-2010 MHz and 2170-2200 MHz by systems in the Mobile-satellite service including those supplemented by a complementary ground component.

**ECC Decision  
of 1 December 2006**

**on the designation of the bands  
1980-2010 MHz and 2170-2200 MHz for use by systems in the Mobile-Satellite Service  
including those supplemented by a Complementary Ground Component (CGC)**

**(ECC/DEC/(06)09)**

**(2007/98/EC)**

**amended 5 September 2007**

Comparable technical specifications to those given in this ECC Decision are given in Commission Decision 2007/98/EC of 14 February 2007. EU/EFTA Member States and, if so approved by the EEA Joint Committee, Iceland, Liechtenstein and Norway are obliged to implement the EC Decision.

“The European Conference of Postal and Telecommunications Administrations,

*considering*

- a) that WARC-92 allocated the bands 1980-2010 MHz (Earth-to-space) and 2170-2200 MHz (space-to-Earth) to the Mobile-Satellite Service on a co-primary basis with fixed and mobile services;
- b) that in ERC Report 25<sup>5</sup>, it is indicated that the major utilisation expected beyond 2008 in the bands 1980-2010 MHz / 2170-2200 MHz is for applications in the Mobile-satellite service including the satellite component of the IMT-2000;
- c) that CEPT adopted in 1997 a set of ERC and ECTRA Decisions dealing with satellite systems providing Satellite Personal Communication Service (S-PCS) which cover, *inter alia*, the bands mentioned in *considering a*);
- d) that *considering r*) of the ECC DEC(05)05 mentions that the Mobile-Satellite Service including the satellite component of IMT-2000 will, *inter alia*, need the bands 1980-2010 MHz / 2170-2200 MHz for their development and in order to support new innovative mobile-satellite services;
- e) that there is a need to adjust the regulation set mentioned in *considering c*) for a number of reasons, including the introduction of provisions in the bands 1980-2010 MHz and 2170-2200 MHz to facilitate the implementation of mobile satellite systems which may incorporate a complementary ground component (CGC);
- f) that the period of time mentioned in condition 5 of Annex 1 may be difficult to meet in case of particular circumstances;
- g) that adjacent band compatibility between mobile satellite systems in the bands 1980-2010 MHz / 2170-2200 MHz and terrestrial systems in the mobile service in the bands below 1980 MHz and between 2010 and 2170 MHz should be duly taken into account;
- h) that the use of the bands 1980-2010 MHz and 2170-2200 MHz by mobile satellite systems is subject to coordination provisions under the Radio Regulations;
- i) that, under the ITU Radio Regulations provisions, the use of the bands 1980-2010 MHz and 2170-2200 MHz by the Mobile-satellite service is open to any type of technology and any type of satellite orbit;
- j) that the use of the bands 1980-2010 MHz and 2170-2200 MHz by mobile satellite systems is subject to frequency coordination with the fixed service and that the migration of the fixed-service stations from the

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<sup>5</sup> The European Table of Frequency allocations and utilisations covering the frequency range 9 kHz to 275 GHz

bands concerned is addressed by Resolution 716 (Rev.WRC-2000) (see RR No. 5.389A) and, as applicable, ECC DEC(06)10;

- k) that the ERC DEC/(97)04 dealing with the migration of the fixed service systems from the bands 1980-2010 MHz and 2170-2200 MHz was widely implemented and that this ERC Decision is superseded by ECC DEC(06)10 on “*transitional arrangements for the Fixed Service and tactical radio relay systems in the bands 1980-2010 MHz and 2170-2200 MHz in order to facilitate the harmonised introduction and development of systems in the Mobile-Satellite Service including those supplemented by a Complementary Ground Component*”;
- l) that the co-frequency operation of mobile satellite systems with respect to terrestrial mobile systems has been studied in similar frequency bands within the ECC and has proven to be unfeasible (see ECC Report 45) unless there are separation distances, in the order of several hundreds of kilometres, between the respective service areas;
- m) that for EU/EFTA countries, such systems or networks shall comply with the RTTE Directive;

#### DECIDES

- 1. that the frequency bands 1980-2010 MHz (Earth-to-space) and 2170-2200 MHz (space-to-Earth) are designated for systems of the Mobile-satellite service;
- 2. that these mobile satellite systems may incorporate a Complementary Ground Component (CGC);
- 3. that, for the purpose of this ECC Decision, CGC is defined as follows:

CGC is an integral part of a mobile satellite system and consists of ground based stations used at fixed locations to improve the availability of the mobile satellite system in zones where the communications with one or several space stations cannot be ensured with the required quality. CGC uses the same portions of the Mobile-satellite service frequency bands (1980-2010 / 2170-2200 MHz) as authorised for the associated space station(s);
- 4. that mobile satellite systems incorporating a CGC shall meet the conditions given in Annex 1;
- 5. that mobile satellite systems operating in accordance with this Decision shall ensure compatibility with terrestrial systems operating in the mobile service in the adjacent bands below 1980 MHz and between 2010 MHz and 2170 MHz;
- 6. that mobile satellite systems operating in accordance with this Decision shall ensure that the interference between a mobile-satellite system implementing CGC and another mobile-satellite system is duly considered during the inter-system coordination, taking into account relevant CEPT studies and including assessment of unwanted emissions;
- 7. that this Decision shall enter into force on 1 December 2006;
- 8. that the preferred date for implementation for this Decision shall be 1 June 2007;
- 9. that CEPT Member administrations shall communicate the national measures implementing this Decision to the ECC Chairman and the Office when the Decision is nationally implemented.”

#### Note:

Please check the Office web site ([www.ero.dk](http://www.ero.dk)) under “Documentation / Implementation” for the up to date position on the implementation of this and other ECC Decisions.

## ANNEX 1

### **Conditions for mobile satellite systems incorporating a complementary ground component**

- 1) The frequency band to be used by the CGC of a particular satellite system shall be accommodated within the same portions of the frequency band used by the satellite component of that satellite system.
- 2) The use of CGC shall not increase the spectrum requirement of the satellite component of that particular mobile satellite system.
- 3) The CGC shall only be deployed in the geographical areas where the mobile Earth stations of the associated mobile-satellite system are also authorised to operate.
- 4) The same direction of transmission by CGC and the satellite component shall be used so as to decrease the number and complexity of compatibility issues.
- 5) The CGC shall not operate independently from the satellite resource/network management system.
- 6) The satellite segment shall be re-established as soon as possible in case of failure of the satellite segment, and no later than 18 months after such a failure, unless justified otherwise on considerations based on reasonableness and/or proportionality. Otherwise, CGC shall cease operation.
- 7) Compatibility with terrestrial IMT-2000/UMTS operational systems in adjacent bands should be ensured.