EUROPEAN RADIOCOMMUNICATIONS COMMITTEE

ERC Decision
of 29 November 1999
on the harmonised utilisation of spectrum
for terrestrial Universal Mobile Telecommunications System
(UMTS) operating within the bands 1900 - 1980 MHz,
2010 - 2025 MHz and 2110 - 2170 MHz

(ERC/DEC/(99)25)

EUROPEAN CONFERENCE OF POSTAL AND TELECOMMUNICATIONS ADMINISTRATION

EXPLANATORY MEMORANDUM

1 INTRODUCTION

In this Decision Universal Mobile Telecommunications System (UMTS) means UMTS Terrestrial Radio Access (UTRA) as approved by ETSI. Technical details in **Annex1** are based on the UTRA parameters and may not be applicable to other IMT-2000 technologies.

UMTS is likely to be introduced around the year 2002, providing mobile users with a wide range of services including full interactive multimedia capabilities at data rates up to 2 Mbit/s, bringing mobile networks significantly closer to the capabilities of fixed networks.

The aim of this Decision is to provide a common approach for CEPT administrations:

- for the planning of spectrum within the bands 1900 - 1980 MHz, 2010 - 2025 MHz and 2110 - 2170 MHz ;
- to make available spectrum for use in FDD and TDD modes in a timely way to ensure efficient and effective use of the frequency bands identified for UMTS within the CEPT.

This Decision is one of a series of Decisions regarding the implementation of UMTS. Related CEPT Decisions concern:

- Frequency bands for the introduction of UMTS (ERC/DEC/(97)07);
- Harmonised use of bands 1980-2010 MHz and 2170-2200 MHz by the mobile-satellite service including satellite UMTS (ERC/DEC/(97)03);
- Global circulation of IMT2000 terminals, ERC Report No. 60;
- Extending ERC/DEC/(97)07 on the frequency bands for introduction of terrestrial Universal Mobile Telecommunications System (UMTS).

2 BACKGROUND

WARC'92 identified a total of 230 MHz spectrum for third generation mobile radio systems, known as IMT-2000 (then known as FPLMTS) at 2 GHz.

The core frequency bands for UMTS in Europe are those identified by the CEPT in ERC/DEC/(97)07. This Decision designates 155 MHz of spectrum to terrestrial UMTS applications with an additional 60 MHz for UMTS satellite services. In Europe, the 15 MHz spectrum at 1885 – 1900 MHz identified by WARC'92 for IMT2000 is not designated for UMTS in ERC/DEC/(97)07 due to current usage of this band by DECT. The Decision requires that administrations make available at least 2 x 40 MHz from within these bands by 2002.

The UMTS terrestrial radio access (UTRA) is being developed with 2 modes of operation; a Frequency Division Duplex (FDD) mode and a Time Division Duplex (TDD). The FDD mode will provide efficient operation in many UMTS environments, providing wide area coverage and full mobility applications. The TDD mode however may allow operators flexibility in network deployment and to support the predicted traffic asymmetry in an efficient way.

UMTS is envisaged to encompass a range of operating environments, including operation in spectrum designated for an operator as well as self provided applications, such as in the private or business environments, operating in a self-coordinating mode in shared spectrum. For the purposes of this Decision, spectrum designated for an operator is taken to mean that spectrum which is allocated by national administrations to public UMTS networks and operated in a coordinated manner. Shared spectrum is taken to mean spectrum where private cordless or business/office systems are deployed in a self-coordinating manner. This shared spectrum is outside the spectrum allocated to public operators.

The purpose of this Decision is to facilitate efficiency in utilisation of the UMTS bands across the CEPT by identifying a common approach to spectrum planning, encompassing spectrum allocated for public UMTS networks as well as spectrum identified for shared use by self coordinating UMTS systems.

The values used in **Annex 1** of this Decision have been based on the inter-service compatibility studies which were undertaken within CEPT ERC TG1 Working Group 1 (ERC Report 65 rev1), and intra-service carrier spacing studies undertaken within ETSI SMG02.

3 REQUIREMENT FOR AN ERC DECISION

The ERC recognises that a harmonised implementation of UMTS will be of greatest benefit to operators, manufacturers as well as users and will facilitate the successful introduction of UMTS across Europe.

4 SCOPE OF THE DECISION

The ERC recognises that for UMTS to be introduced successfully and in accordance with the global IMT-2000 definition, manufacturers and operators must be given the confidence to make the necessary investment in UMTS. The ERC believes that the successful introduction of UMTS will be facilitated by harmonised use of the UMTS spectrum across the CEPT, and a commitment by CEPT member countries to implement this Decision will provide a clear indication that the required paired and unpaired frequency bands will be made available for UMTS in a timely manner and on a Europe-wide basis.

In considering use of the UMTS spectrum for FDD and TDD modes of UMTS, it is necessary to consider the nature of traffic expected to be carried by UMTS networks and the need to accommodate asymmetric traffic. Flexibility in the use of FDD and TDD modes in the frequency bands identified for UMTS may be desirable to enable operators to provide additional capacity in the downlink direction. Based on technical considerations, such use is not likely in the initial phase of deployment of UMTS.

Annex 1 of the ERC Decision has however been developed on the basis that the use of the band 1920-1980 MHz for TDD mode should not precluded, to enable the UMTS frequency plan to be adapted to meet future requirements. This Decision does not therefore preclude this type of operation on regulatory grounds.

This Decision does not deal with satellite applications using the frequency bands 1980–2010 MHz/2170–2200 MHz.

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for terrestrial Universal Mobile Telecommunications System (UMTS)
operating within the bands 1900 - 1980 MHz, 2010 - 2025 MHz and 2110 - 2170 MHz

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The European Conference of Postal and Telecommunications Administrations,

considering

a) that there is a growing demand for interoperable mobile voice services and interoperable mobile data services (up to 2 Mbit/s);

b) that UMTS Terrestrial Radio Access UTRA is being developed to meet this demand;

c) that UMTS will provide third generation mobile services, forming part of the International Mobile Telecommunications 2000 (IMT-2000) global family of standards;

d) that ETSI is standardising UMTS with the aim of having specifications ready by the year 2000;

e) that the UMTS terrestrial radio interface is being defined by ETSI with two modes of operation; Frequency Division Duplex (FDD) and Time Division Duplex (TDD). In the initial phase of UMTS, it is likely, based on technical considerations, that these modes are used in separate bands. However, techniques to support future asymmetric traffic demand may be required, such as the use of TDD in the FDD uplink band to increase capacity in the downlink direction;

f) that the frequency bands 1900 - 1980 MHz, 2010 - 2025 MHz and 2110 - 2170 MHz are designated in Europe for terrestrial UMTS applications according to ERC/DEC/(97)07 and that ERC/DEC/(97)03 harmonises the use of, inter alia, the bands 1980 – 2010 MHz and 2170 – 2200 MHz by the mobile-satellite service including satellite UMTS;

g) that a harmonised spectrum scheme for UMTS, taking due account of the protection requirements of UMTS and other radio services, allows efficient use of the spectrum, in particular in border areas;

h) that expansion of UMTS in the future is predicted to require additional spectrum, based on market demand, when the bands identified in f) above are fully utilised;

j) that UMTS systems using the bands identified in f) above are likely to encompass a variety of operating environments, including public network provision in non-shared spectrum and self provided applications operating in a self coordinating mode in shared spectrum;

DECIDES

1. that for the purpose of this Decision, the Universal Mobile Telecommunications System (UMTS) shall mean equipment complying with standards approved or developed by ETSI for UMTS;

2. that Administrations make provisions to allow the harmonised utilisation of spectrum in the bands 1900 - 1980 MHz, 2010 - 2025 MHz and 2110 - 2170 MHz for terrestrial UMTS, as identified in **Annex 1** to this Decision;

3. that the frequency bands as identified in **Annex 1** of this Decision shall be designated by Administrations, subject to market demand, for the provision of public UMTS services;

4. that, subject to market demand, Administrations also make provisions to allow the operation of UMTS self provided applications in a self coordinated mode in the frequency band identified in **Annex 1** of this Decision. However, the ERC may review this "Decides" within two years after the date of entry into force;

5. that this Decision shall enter into force 31 January 2000;

6. that CEPT Member Administrations shall communicate the national measures implementing this Decision to the ERC Chairman and the ERO when the Decision is nationally implemented.

Note:
Please check the ERO web site (www.ero.dk) under "Documentation / Implementation" for the up to date position on the implementation of this and other ERC Decisions.

ANNEX 1:

HARMONISED SPECTRUM SCHEME FOR UMTS

1. The channel raster is 200 kHz and the carrier frequency is an integer multiple of 200 kHz.
2. The frequency band 1920 – 1980 MHz is paired with 2110 – 2170 MHz for FDD operation.
3. The duplex direction for FDD carriers in these bands is mobile transmit within the lower band and base transmit within the upper band.
4. FDD carrier spacing between public operators is a minimum of 5.0 MHz. FDD carrier spacing within a public operators spectrum is variable, based on a 200 kHz raster, and may be less than 5.0 MHz.
5. The frequency bands 1900 – 1920 MHz and 2010 – 2025 MHz are unpaired bands for TDD operation.
6. The frequency band 2010 – 2020 MHz is identified for self provided applications operating in self coordinating mode.
7. The frequency band 1920 – 1980 MHz may also be used for TDD operation.
8. TDD carrier spacing between public and self provided applications is a minimum of 4.8 MHz.
9. TDD carrier spacing between public operators is a minimum of 5.0 MHz. TDD carrier spacing within a public operators spectrum is variable, based on a 200 kHz raster, and may be less than 5.0 MHz.
10. Carrier spacing between TDD and FDD carriers is a minimum of 5.0 MHz between public operators.
11. TDD carrier spacing between self provided applications is a minimum of 4.4 MHz, based on a 200 kHz raster.
12. The carrier nearest to 1900 MHz should be centred at 1902.4 MHz or above[1]
13. The carrier nearest to 1980 MHz should be centred at 1977.2 MHz or below[2]
14. The carrier nearest to 2010 MHz should be centred at 2013.0 MHz or above
15. The carrier nearest to 2025 MHz should be centred at 2022.2 MHz or below
16. The carrier nearest to 2110 MHz should be centred at 2112.8 MHz or above
17. The carrier nearest to 2170 MHz should be centred at 2167.2 MHz or below

[1] If the top DECT channel is used for DECT WLL, additional mitigation techniques might be necessary
[2] Use of the TDD here would require a greater frequency separation, or other mitigation techniques such as increased filtering, or a combination of these