

**EUROPEAN RADIOCOMMUNICATIONS COMMITTEE**

ERC Decision  
of 29 November 1999  
on the harmonised frequency bands  
to be designated for the introduction of  
High Performance Radio Local Area Networks  
(HIPERLANs)

(ERC/DEC/(99)23)





## EXPLANATORY MEMORANDUM

### 1 INTRODUCTION

HIPERLANs (High Performance Radio Local Area Networks) are radio based local area networking (RLAN) solutions, intended for connectivity between traditional business products such as PCs, laptops, workstations, servers, printers and other networking equipment as well as digital consumer electronic equipment in the wireless home network environment. HIPERLANs thus enable the replacement of physical cables for the connection of data networks within a building, providing a more flexible and, possibly, a more economic approach to the installation, reconfiguration and use of such networks within the business and industrial environments.

Existing RLANs and other wide band data transmission systems are already operating in the ISM frequency bands. In order to ensure high reliability and high data transfer rates HIPERLANs, however, require a predictable sharing environment. The ISM bands are, therefore, not suitable to meet the requirement of HIPERLANs and other frequency bands have been identified for these kinds of services.

In 1996, the ERC adopted ERC/DEC/(96)03, "on the harmonised frequency band to be designated for the introduction of High Performance Radio Local Area Networks (HIPERLANs)". This Decision harmonised the use of the band 5150-5250 MHz for HIPERLANs.

In 1998, at the request of ETSI, the ERC recognised the need to take into account spectrum requirements for new multimedia applications of HIPERLANs and so initiated compatibility studies leading to the revision of ERC/DEC/(96)03. This new Decision designates several frequency bands in the 5 GHz range and stipulates specific conditions to be applied to HIPERLANs operating in the range.

### 2 BACKGROUND

The European Radiocommunications Committee (ERC), in co-operation with ETSI and after further analysis and spectrum engineering studies, identified suitable spectrum in the 5 GHz and the 17 GHz frequency ranges to meet the requirements of HIPERLANs. Based on this the ERC approved CEPT Recommendation T/R 22-06 in 1992. The Recommendation was revised in the beginning of 1994, based on a request from ETSI. The restriction with regard to integral antennas was removed, thus allowing both integral and external antennas to be used.

The Detailed Spectrum Investigation Phase I (DSI I) completed in 1994, identified HIPERLANs as the major utilisation in the 5150-5250 MHz band and in the 5250-5300 MHz band on a national basis. The ERC decision ERC/DEC(96)03 was adopted in 1996 and designated the band 5150-5250 MHz for HIPERLANs. Furthermore ERC Recommendation CEPT/ERC/REC 70-03 on short range devices recommended the use of the bands 5150-5250 MHz, 5250-5300 MHz (on a national basis) and 17.1-17.3 GHz for HIPERLANs.

The ETSI standards ETS 300 652 and ETS 300 836 for HIPERLANs Type 1 in the 5 GHz band have been adopted. An ETSI standard for HIPERLANs in the 17 GHz frequency range has not yet been initiated.

In the meantime, WRC 95 allocated the band 5150-5250 MHz to the Fixed-Satellite Service (FSS) on a primary basis for use by feeder links of Non-Geostationary-Satellite systems in the Mobile Satellite Service (NGSO MSS). This band has also been allocated via footnote S5.447 of the Radio Regulations to the mobile service on a co-primary basis in a number of countries, mainly CEPT members, subject to agreement under S9.21.

Detailed compatibility studies (Results of the studies are summarised in ERC Report 67) between HIPERLANs (Type 1 and Type 2) and MSS feeder links have shown that the sharing is feasible with some restrictions on HIPERLANs (i.e. indoor use, mean EIRP limited to 200 mW). Those restrictions would have to be taken into account in the development of ETSI Standards for HIPERLAN Type 2 as well as in the revision of ETSI Standards for HIPERLAN Type 1.

In the ERC Report 72 the need for additional frequency spectrum for indoor and partly for outdoor use of HIPERLANs in the order of 330 MHz is recognised and in order to identify additional spectrum for HIPERLANs in the range 5250 – 5875 MHz compatibility studies were conducted with existing services (Results of the studies are summarised in ERC Report 72).

As a result of these sharing studies and spectrum investigations, the following bands were identified for use by HIPERLANs under prescribed conditions:

- 5250-5350 MHz (indoor use, mean<sup>1</sup> EIRP limited to 200 mW, use of Dynamic Frequency Selection and of transmitter power control);
- 5470-5725 MHz (mean<sup>1</sup> EIRP limited to 1W, outdoor and indoor use allowed, use of Dynamic Frequency Selection and of transmitter power control).

It was also recognised that HIPERLAN equipment must be capable of avoiding occupied channels by employing a Dynamic Frequency Selection mechanism and ensuring a uniform spreading of the devices over all the available channels for HIPERLANs. In addition a transmitter power control process capable of ensuring a mitigation factor of at least 3 dB is also required. These constraints do not apply to the already standardised HIPERLANs Type 1 in the band 5150 – 5250 MHz.

By their nature, HIPERLANs will certainly move across borders. Moreover, the European industry must be in a position to market its products anywhere else in the world, and especially in major markets such as the USA and Japan. Therefore, a worldwide harmonisation must be envisaged. Such harmonisation should be supported by the provision of allocations of an appropriate regulatory status in the Radio Regulations to be considered at a future WRC.

The long term market potential for HIPERLANs is not yet known but if the growth is substantial there could be a conflict with NGSO MSS feeder links using the same spectrum. Therefore a review process is required to review this Decision in the light of market developments.

Due to the reduction of the available band for FSS feeder links to NGSO MSS after 2010, from 5091-5250 MHz to 5150-5250 MHz, a future WRC should also consider the requirements for FSS frequency allocations beyond 2010, in the light of market developments of the MSS, HIPERLANs and other services in this band.

### **3 REQUIREMENT FOR AN ERC DECISION**

The allocation or designation of a frequency band for its use by a service or a system under specified conditions in CEPT member countries is laid down by law, regulation or administrative action. The ERC recognises that for HIPERLANs to be introduced successfully throughout Europe, manufacturers and operators must be encouraged to make the necessary investments in this pan-European radiocommunication system and service. The ERC, therefore, believes it will be necessary to designate frequency bands for HIPERLANs under specified conditions. A commitment by CEPT member countries to implement an ERC Decision will depend on a clear indication that the required frequency bands will be made available on time and on a European-wide basis.

The ERC Rules of Procedure state that if an ERC Decision is amended, it must be replaced and the old Decision abrogated. Therefore this Decision dictates abrogation of ERC/DEC/(96)03.

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<sup>1</sup> The mean EIRP refers here to the EIRP averaged over the transmission burst at the highest power control setting.

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**on the harmonised frequency bands to be designated for the introduction of  
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The European Conference of Postal and Telecommunications Administrations,

*considering:*

- a) that the use of stationary as well as portable computer equipment, computer terminals and peripheral equipment by the business and industrial community, and the penetration of network enabled digital consumer electronic equipment is rapidly increasing;
- b) that there is an increasing requirement to exchange information between such equipment through Local Area Networks (LANs);
- c) that existing LANs consist of equipment interconnected by cable resulting in a rigid hardware structure;
- d) that LANs using radio (RLANs) enable a more flexible approach to the installation, reconfiguration and use of such networks, thus minimising the costs of cable and rewiring required to handle changes to and updates of the network;
- e) that there is a need to provide harmonised spectrum which enables the rapid deployment of High Performance RLANs;
- f) that ETSI has developed standards for High Performance Radio Local Area Networks Type 1 (HIPERLANs Type 1), (EN 300 652 and ETS 300-836-1);
- g) that ETSI is developing standards for High Performance Radio Local Area Networks Type 2 which is intended to broaden the applications of HIPERLANs, including broadband access to public networks;
- h) that frequency management parameters, which include channel bandwidth and power limits of any emissions outside the designated frequency bands, shall be decided by ERC in consultation with ETSI;
- i) that the frequency band 5000-5250 MHz is allocated to the Aeronautical Radionavigation Service to be used for the Microwave Landing System (MLS) but there are no international plans for use of the frequency band 5150-5250 MHz by the aeronautical community;
- j) that, with effect from 1 January 1997, WRC-95 allocated the frequency band 5150-5250 MHz to the Fixed Satellite Service (Earth-to-Space) for Mobile-Satellite feeder links, on a co-primary basis with the Aeronautical Radionavigation Service. The band 5091-5150 MHz was similarly allocated on a temporary basis until 2010, subject to conditions designed to protect the International Standard Microwave Landing System which has precedence in the band 5000-5150 MHz;
- k) that the band 5150-5250 MHz is also allocated via footnote S5.447 of the Radio Regulations to the Mobile Service on a co-primary basis in a number of countries, mainly CEPT member countries, subject to agreement under S9.21;
- l) that a future WRC will have to reconsider the long term requirements (beyond 2010) for Fixed Satellite Service (Earth-to-Space) for Mobile-Satellite feeder links and for the Mobile Service in the light of market developments of FSS for MSS feeder links and HIPERLANs;
- m) that compatibility studies and spectrum investigations have shown that sharing between HIPERLANs and MSS feeder links in the band 5150-5250 MHz is feasible under certain conditions;

- n) that in many countries there is an essential military need for the operation of land, airborne and maritime radars in the bands between 5250 and 5850 MHz. In those countries priority is given to military radars and therefore protection from interference cannot be requested by HIPERLANs;
- o) that additional frequency spectrum for HIPERLANs is required in bands above 5250 MHz in order to accommodate the increased spectrum requirements for HIPERLANs;
- o) that the availability of additional spectrum for HIPERLANs enables a random choice of available channels to provide a spread of the channel loading over the designated spectrum, thus reducing the interference potential in the individual bands;
- p) that compatibility studies and spectrum investigations have shown that sharing between HIPERLANs and all existing services is possible and practicable in the bands 5250 – 5350 MHz and 5470 – 5725 MHz under conditions specified in ERC Reports 72 and 67,

*noting:*

- a) that the implementation of transmitter power control in up- and downlink will significantly reduce the interference effect caused by HIPERLANs to ensure a mitigation factor of at least 3 dB on the average output power of the devices under the coverage area of a satellite;
- b) that HIPERLAN equipment will employ a Dynamic Frequency Selection (DFS) mechanism to detect interference from other systems and therefore is able to avoid co-channel operation with other systems, notably radar systems;
- c) that this DFS mechanism as described in noting b) will also be required to provide a spread of the loading across a minimum of 14 channels (or 330 MHz) to further facilitate sharing with satellite services;
- d) that frequency sharing based on active avoidance of co-channel operation requires an adequate amount of spectrum for HIPERLANs;
- e) that the frequency designations and operational conditions for HIPERLANs in the 5 GHz range will have to be reviewed in the long term in the light of market evolution;
- f) that a world wide frequency harmonisation for HIPERLANs will be beneficial and should therefore be supported through an appropriate regulatory status in the Radio Regulation;

**DECIDES**

1. that for the purpose of this Decision High Performance Radio Local Area Networks (HIPERLANs Types 1 and 2) shall mean equipment complying with the relevant European Telecommunications Standards;
2. to designate the frequency bands 5150-5350 MHz and 5470-5725 MHz for the use of HIPERLANs;
3. that the use of HIPERLANs in the band 5150-5350 MHz shall be restricted to indoor use with a maximum mean EIRP<sup>1</sup> of 200 mW;
4. that the indoor and outdoor use of HIPERLANs in the band 5470-5725 MHz shall be restricted to a maximum mean EIRP<sup>1</sup> of 1 W;
5. that, in addition to the conditions described in decides 3 and 4 and also noting decides 6 below, the use of HIPERLANs shall only be allowed when the following mandatory features are realised: a) transmitter power control to ensure a mitigation factor of at least 3 dB; b) Dynamic Frequency Selection associated with the channel selection mechanism required to provide a uniform spread of the loading of the HIPERLANs across a minimum of 330 MHz, or 255 MHz in the case of equipment used only in the band 5470 – 5725 MHz.;

6. that the features a) and b) described in decides 5 shall not be mandatory for HIPERLAN Type 1 equipment operated in the band 5150 - 5250 MHz. These exceptions should be reviewed in the light of market development of HIPERLANs;
7. that the ERC will review this Decision within 2 years of the date of entry into force or earlier if necessary in the light of market development of HIPERLANs;
8. that this Decision shall enter into force on 31 January 2000.
9. 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](http://www.ero.dk)) under "Documentation / Implementation" for the up to date position on the implementation of this and other ERC Decisions.*