



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

ECC Recommendation (09)01

## USE OF THE 57 - 64 GHz FREQUENCY BAND FOR POINT-TO-POINT FIXED WIRELESS SYSTEMS

Recommendation approved by the Working Group "Spectrum Engineering" (SE)

### INTRODUCTION

The band 57 - 64 GHz is allocated to fixed service (FS) on a worldwide primary basis. In particular, this band, in conjunction to the adjacent 64 - 66 GHz band (subject of ECC/REC/(05)02), seems very suitable for short distances (approximately 1 km), high capacity links deployed in dense scenarios. This recommendation provides an approach for deployment of point-to-point (PP) systems in coexistence with other services and applications in various parts of this band, e.g. Intelligent Transport Systems (ITS) in 63 - 64 GHz. It should be considered that FLANE (Fixed Local Area Network Extension, i.e. infrastructure for RLAN Multi-Gigabit Wireless Systems (MGWS)) systems are technically equal to any PP application and are considered to be part of the Fixed Services.

It should be noted that ECC Reports 113 and 114 have examined MGWS coexistence issues including FLANE applications

It is considered that the physical propagation features in this band make possible a license exempt, "light licensing" or similar mechanisms still ensuring highly efficient re-use of the frequency band which may include access to spectrum through the use of flexible frequency arrangements. On this subject, ECC Report 80 describes a "light licensing regime" summarised as: "*Light licensing regime, where the position and characteristics of the stations are recorded on a database on a first-come first-served basis, with responsibility for subsequent users to ensure the compatibility with previously notified stations*".

The choice of the appropriate assignment method and licensing regime remains a decision for national administrations.

"The European Conference of Postal and Telecommunications Administrations,

*considering*

- a) that the band 57 - 62 GHz is allocated to the Fixed Service on Primary Basis in the European Common Allocation table and the ITU Radio Regulations (RR);
- b) that the band 62 - 64 GHz is allocated to the Fixed Service on Primary Basis in the ITU Radio Regulations (RR) and some CEPT countries may also wish to use it for FS applications;
- c) that the 64 - 66 GHz band is allocated to the Fixed Service on a Primary Basis in the European Common Allocation table and the ITU Radio Regulations (RR) and may be used for pairing systems with 57 - 64 GHz band;
- d) that the band 57 - 59.3 GHz is allocated to the Earth Exploration Satellite Service (EESS) (passive) in which sensors and instruments are already deployed and used ;
- e) that radio astronomy observations may be present in the bands 58.2 - 59 GHz under national arrangements;

- f) that the high oxygen absorption attenuation will favour a high frequency reuse factor within these bands without coordination or with “light licensing” (as identified in ECC Report 80);
- g) that the impact assessment of new links on existing links in the 57 – 59 GHz would need to be carried out;
- h) that in the band 57 - 59 GHz a number of analogue and digital PP systems are already deployed in the 50 MHz or 100 MHz channel arrangements provided by ERC/REC 12-09;
- i) that ITU RR No. 5.547 (WRC-2000) identifies the 57 - 59 GHz and 64 - 66 GHz band for High Density applications in the FS (HDFS);
- j) that the band 57 - 64 GHz is also allocated to other radiocommunications services on a co-primary basis;
- k) that ECC Report 114 identifies the possible coexistence methodology between PP applications and other services and applications in the band 57 - 66 GHz;
- l) that some CEPT countries have co-primary radiolocation systems operating in the 59 - 64 GHz band and their coexistence can be managed on national basis;
- m) that ECC/DEC/(02)01 and ECC/DEC/(09)01 designated on a non-exclusive basis the band 63 - 64 GHz for the use of RTTT
- n) that ECC Report 113 identifies precautionary measures that would be required to ensure the coexistence in the band 63 - 64 GHz between ITS and PP (FLANE) applications;
- o) that ETSI is revising ETSI EN 302 217-3 for the FS point-to-point equipment for including this frequency band;
- p) that there are still on-going studies within CEPT about the flexible use of the band 57 - 59 GHz;
- q) that equipment may listen for a free channel before transmission to recognise existing transmissions in order to minimise interference problems and to ensure continued operation of existing transmissions;

*recommends*

1. that the use of PP FS systems in the whole or part of the 57 - 64 GHz band may be provided within the technical parameters stated in Annex 1 to provide coexistence with other services (e.g. Intelligent Transport System);
2. that administrations preferring to assign pre-defined 50 MHz slots or their multiple aggregation, either paired or unpaired, may consider the basic slot arrangements illustrated in the Annex 2 and with a maximum aggregated bandwidth up to 2500 MHz;
3. that administrations may choose either to allow assignments in this band without a specific channel plan, or establish a channel plan based on the aggregation of basic frequency slots arrangement as described in Annex 2;
4. that for administrations or operators wishing to determine the impact of new links on existing links, single and aggregate interference criteria may be derived using guidance given in ECC/REC/(01)05 and applied in ECC Report 113 and ECC Report 114;
5. that administrations who wish to implement a self-coordination mechanism similar to “light licensing” for FS in the 57 - 64 GHz band may refer to the example provided in Annex 3.”

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 Recommendations.

## Annex 1

### TECHNICAL PARAMETERS OF PP FS IN THE FREQUENCY RANGE 57 - 64 GHz

#### *Equipment description*

This annex offers a basic description of the PP FS systems. The requirements are stated below:

- Maximum EIRP +55 dBm
- Minimum antenna gain +30 dBi
- Maximum transmitter output power +10 dBm

An additional limit on the transmit output power density (-10dBm/MHz) in the 59 - 64 GHz can be implemented to support the deployment of wideband systems (i.e. bandwidth higher than 100 MHz) by consequently limiting the maximum transmitter output power for narrow band systems (i.e. bandwidth lower than 100 MHz) below that of the maximum (+10dBm) allowed in the 59 - 64 GHz band. This limit will not apply if administrations wish to implement narrowband systems in the band.

**Annex 2**

**EXAMPLES OF POSSIBLE FREQUENCY SLOT ARRANGEMENTS  
IN THE BAND 57 - 64GHz**

This annex gives examples of frequency slot arrangements for both FDD and TDD applications.

Let

- $f_r$  be the reference frequency of 56950 MHz,
- $f_n$  be the centre frequency of a radio-frequency slot in the band 57 - 64 GHz,

then the centre frequencies of individual slots are expressed by the following relationships:

$$f_n = f_r + 25 + 50 n \quad \text{MHz}$$

where:

$$n = 1, 2, 3, \dots, 140$$

Note that slot n=1, 2 should only be used for temporary purposes or equipment alignment and propagation tests;

In the upper band edge, there is no need for guard band (GB) because the same system may also operate in the adjacent 64 - 66 GHz band.

Bands limits (GHz) →	57-59								59-63						63-64							
50 MHz Slot number	1	2	3	4	→	→	→	39	40	41	42	→	→	→	→	119	120	121	→	→	→	140
	G	B			→	→	→					→	→	→					→	→	→	

Note 1: The separation into three major frequency ranges is indicative only. Regulatory considerations at national level may differ. Based on these national considerations, the administrations may choose to deploy radio systems within channels overlapping these boundaries as well as be paired within these bands.

Note 2: Administration may wish to combine the use of PP radio systems in the 57 - 64 GHz band with the 64 - 66 GHz band according to ECC/REC/(05)02. These radio systems may also be deployed within a channel overlapping the boundary with the 57 - 64 GHz band as well as being paired within these bands. Different regulatory provisions between these bands are to be taken into account at national level.

### Annex 3

#### EXAMPLE OF TECHNICAL BACKGROUND FOR IMPLEMENTING A SELF-COORDINATION APPROACH FOR PP FS

To assist the planning of PP fixed links, self-coordination approach, similar to the “light licensing”, described in ECC Report 80, can be considered. Such regimes do not mean “licence exempt” use, but rather using a simplified set of conventional licensing mechanisms and attributes within the scope decided by administration. This planning is delegated to the licensee.

Administrations intervene for protecting a limited number of sensitive sites while giving greater flexibility elsewhere than it could be allowed without the geographical limitation.

This process requires to record for instance the following set of simple criteria for each authorised link and makes the data available publicly to assist in the identification of operational parameters and to conduct interference analyses:

- Date of application (In order to assign priority);
- Transmit, receive centre frequencies and occupied bandwidth;
- Equipment type, specifying relevant transmitter/receiver parameters;
- Link location (geographic coordinates, height/direction of antenna, etc...);
- The antenna gain and radiation pattern.

Subject to the conditions set by the administration, it is left to the operator to conduct any compatibility studies or coordinate as necessary to ensure that harmful interference is not caused to existing links registered in the database. For example, an operator wishing to install a new link could calculate the interference that the new link will create to the existing links in the database. Then it will be possible to determine whether this new link will interfere with existing links. If so, the new link could be re-planned to meet the interference requirements of existing links in the database. Otherwise, the new link may be also co-ordinated with existing operators, who might suffer from the interference.

To assist with the resolution of disputes, licences are issued with a “date of priority”: interference complaints between licensees may therefore be resolved on the basis of these dates of priority (as with international assignments).