



OfW48 UK Frequency Allocations for Fixed (Point-to-Point) Wireless Services and Scanning Telemetry

Version 1.1

1 November 2010

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Section 1

Introduction

This document shows the current bands managed by Ofcom that are available for fixed terrestrial (point to point) links and scanning telemetry in the UK.

Section 2

Technical regulations

The Radio Equipment and Telecommunications Terminal Equipment Directive 99/5/EC (R&TTED) has been implemented in 'The Radio Equipment and Telecommunications Terminal Equipment Regulations 2000, Statutory Instrument (SI) 730. In accordance with Articles 4.1 and 7.2 of the R&TTED the:

- IR2000: The UK Interface Requirement 2000 contains the requirements for the licensing and use of fixed (point-to-point) wireless services in the UK.
- IR2037: The UK Interface Requirement 2037 applies for scanning telemetry services.
- Draft IR2078: The Draft UK Interface Requirement 2078 applies for the 60 GHz band

Section 3

Notes specific to the frequency charts

The first column describes each available frequency band, represented by a diagram (not to scale). The frequency band limits are listed below the diagram; frequencies below 10 GHz are represented in MHz, while those above 10 GHz are in GHz. The width of each guard band is shown above the diagram, and is always specified in MHz.

The channel arrangements in some bands are staggered, so that the width and position of the guard band vary for different channel spacings. In these cases, a table underneath gives details of the guard bands for different spacings (with all frequencies in MHz).

The first column also includes the title of the relevant international recommendations for each band, produced by the European Conference of Postal and Telecommunications (CEPT) or the International Telecommunication Union (ITU). CEPT recommendations are available at <http://www.ero.dk> and ITU Recommendations at <http://www.itu.int>.

The final column contains the channel spacing for duplex operation in each frequency band except for bands above 60 GHz.

Details of standard systems assigned in the UK are shown in the relevant technical frequency assignment criteria.

Section 4

Notes specific to frequency bands

450 MHz band

The Scanning Telemetry Band is used by fixed terrestrial point to multipoint radio based System Control and Data Acquisition (SCADA) networks which control and monitor remote applications (i.e. telecontrol, telemetry, data distribution and gathering systems).

4 GHz

The frequency ranges 3.605 to 3.641 GHz paired with 3.925 to 3.961 GHz and 3.641 to 3.689 GHz paired with 3.961 to 4.009 are block licensed for BWA applications and are not available from Ofcom for point to point links .

18 GHz

The Soft Boundary Frequency Assignment (SBFA) method is employed at 18 GHz. This approach to frequency assignment encourages the development of link communities on the basis of modulation order with the aim of reducing inequalities between link assignments.

For more information on the 'Soft Boundary Assignment Approach' refer to the Technical Frequency Assignment Criteria for this band, available from <http://www.ofcom.org.uk>.

60 GHz

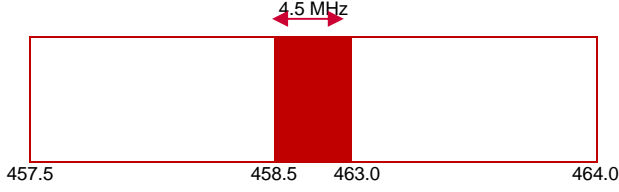
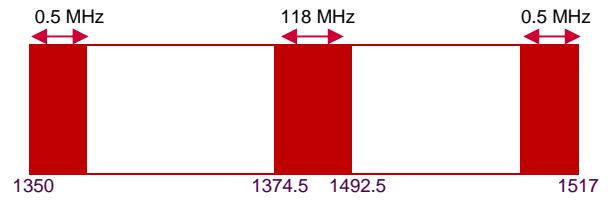
FWS systems conforming to IR2078 are exempt from licensing in this band.

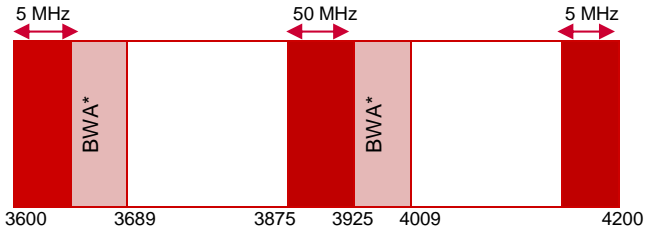
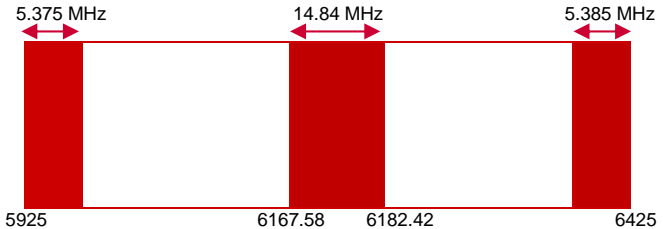
65GHz, 70 GHz, 80 GHz

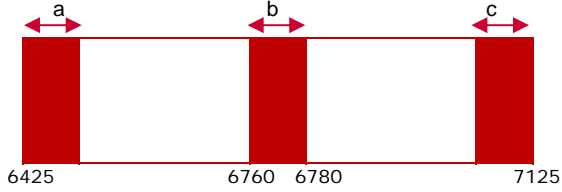
These are self coordinated bands.

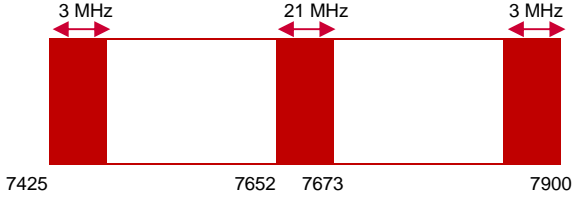
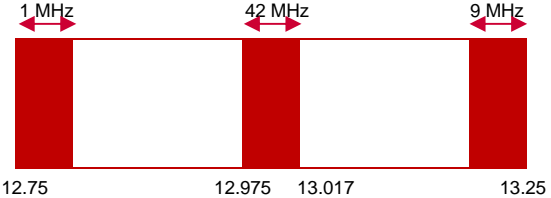
Section 5

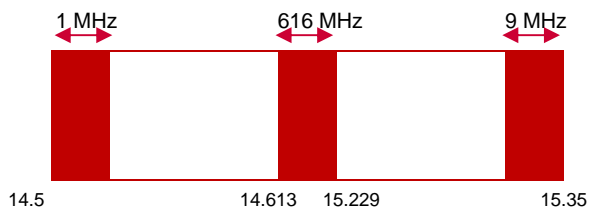
Frequency Allocations

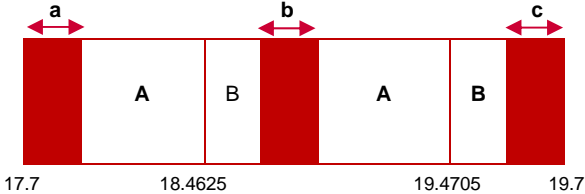
450 MHz	Data Transmission Range (kbit/s)	Cell Structure	Basic parameters
 <p>Channel Duplex Spacing: 5.5 MHz</p>	<p>1200 to 2400</p>	<p>6 channels per cell giving 2 channels per utility</p> <p>12 channels per cluster giving a co-channel re-use distance of 150 km</p> <p>A potential channel re-use of 23 times across the UK</p>	<p>System availability approaching 99.9%; and</p> <p>typical co-channel carrier to interference ratio of 26 dB.</p>
1.4 GHz Radio Channels Available in the UK			
 <p>CEPT Recommendation T/R 13-01 E Annex A</p> <p>Channel Duplex Spacing: 142 MHz</p>	<p>960 x 0.025 MHz</p> <p>320 x 0.075 MHz</p> <p>96 x 0.25 MHz</p> <p>48 x 0.5 MHz</p> <p>24 x 1 MHz</p> <p>12 x 2 MHz</p> <p>3 x 3.5 MHz</p>		

4 GHz	Radio Channels Available in the UK
 <p>CEPT/ERC/REC 12-08 E Annex A Part 2 Channel Duplex Spacing: 320 MHz</p> <p><i>*not available from Ofcom for point to point fixed links</i></p>	<p>12 x 15 MHz 6 x 30 MHz</p>
Lower 6 GHz	Radio Channels Available in the UK
 <p>CEPT/ERC/REC 14 - 01 E Annex 1 Channel Duplex Spacing: 252.04 MHz</p>	<p>8 x 29.65 MHz</p>

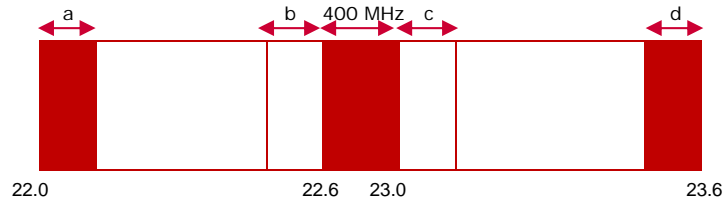
Upper 6 GHz	Radio Channels Available in the UK																				
 <p style="text-align: center;">CEPT/ERC/REC 14 – 02 E For 20 and 40 MHz channel arrangements Channel Duplex Spacing: 340 MHz</p> <table border="0" style="margin-left: auto; margin-right: auto;"> <tr> <td>Channel Spacing:</td> <td>20</td> <td>40</td> </tr> <tr> <td>a:</td> <td>5</td> <td>15</td> </tr> <tr> <td>b:</td> <td>20</td> <td>20</td> </tr> <tr> <td>c:</td> <td>35</td> <td>25</td> </tr> </table> <p style="text-align: center;">ITU-R F.384-10 Channel Duplex Spacing: 340 MHz for 30 MHz channel arrangements</p> <table border="0" style="margin-left: auto; margin-right: auto;"> <tr> <td>Channel Spacing:</td> <td>30</td> </tr> <tr> <td>a:</td> <td>20</td> </tr> <tr> <td>b:</td> <td>40</td> </tr> <tr> <td>c:</td> <td>40</td> </tr> </table>	Channel Spacing:	20	40	a:	5	15	b:	20	20	c:	35	25	Channel Spacing:	30	a:	20	b:	40	c:	40	<p>16 x 20 MHz 10 x 30 MHz 8 x 40 MHz</p>
Channel Spacing:	20	40																			
a:	5	15																			
b:	20	20																			
c:	35	25																			
Channel Spacing:	30																				
a:	20																				
b:	40																				
c:	40																				

7.5 GHz	Radio Channels Available in the UK
 <p data-bbox="465 584 725 608">ITU-R F.385-9 Annex 4</p> <p data-bbox="427 628 763 652">Channel Duplex Spacing: 245 MHz</p>	<p data-bbox="1581 349 1709 373">32 x 7 MHz</p> <p data-bbox="1581 394 1709 418">16 x 14 MHz</p> <p data-bbox="1581 438 1709 462">8 x 28 MHz</p>
13 GHz	Radio Channels Available in the UK
 <p data-bbox="389 1193 804 1217">CEPT/ERC/REC 12 – 02 E – Annex A</p> <p data-bbox="427 1238 763 1262">Channel Duplex Spacing: 266 MHz</p>	<p data-bbox="1563 900 1731 924">128 x 1.75 MHz</p> <p data-bbox="1574 944 1720 968">64 x 3.5 MHz</p> <p data-bbox="1581 989 1709 1013">32 x 7 MHz</p> <p data-bbox="1581 1034 1709 1058">16 x 14 MHz</p> <p data-bbox="1581 1078 1709 1102">8 x 28 MHz</p>

15 GHz	Radio Channels Available in the UK
 <p>The diagram shows a frequency spectrum from 14.5 GHz to 15.35 GHz. Three red bars represent allocated channels. The first bar is 1 MHz wide, starting at 14.5 GHz. The second bar is 616 MHz wide, starting at 14.613 GHz. The third bar is 9 MHz wide, starting at 15.229 GHz. The x-axis is labeled with 14.5, 14.613, 15.229, and 15.35.</p> <p>CEPT/ERC/REC 12 – 07 E Channel Duplex Spacing: 728 MHz</p>	<ul style="list-style-type: none">128 x 1.75 MHz64 x 3.5 MHz32 x 7 MHz16 x 14 MHz8 x 28 MHz

18 GHz	Radio Channels Available in the UK																								
 <p>The diagram shows a frequency spectrum from 17.7 GHz to 19.7 GHz. It is divided into three main sections: a red guard band 'a' (17.7-18.4625 GHz), a white channel 'A' (18.4625-18.875 GHz), a white channel 'B' (18.875-19.4705 GHz), another white channel 'A' (19.4705-19.6375 GHz), another white channel 'B' (19.6375-19.7 GHz), and a final red guard band 'c' (19.7-19.7 GHz). A red guard band 'b' is shown between the two 'A' channels (18.875-19.4705 GHz).</p> <table border="1" data-bbox="141 587 705 742"> <tr> <td>Channel Spacing:</td> <td>3.5</td> <td>7</td> <td>13.75</td> <td>27.5</td> <td>55</td> </tr> <tr> <td>a:</td> <td>-</td> <td>-</td> <td>6.875</td> <td>13.75</td> <td>27.5</td> </tr> <tr> <td>b:</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>c:</td> <td>19.5</td> <td>26.5</td> <td>-</td> <td>-</td> <td>-</td> </tr> </table> <p>Note: The dimensions of Guard Bands are variable and dependent on the channel raster used. Dimensions are given here where channel rasters are adjacent to the lower or upper Guard Bands.</p> <p>Area A: CEPT/ERC/REC 12 – 03 E For 13.75MHz, 27.5MHz and 55MHz Channels Channel Duplex Spacing: 1010 MHz</p> <p>Area B: ITU_R Rec. F.595 For 3.5MHz and 7MHz Channels Channel Duplex Spacing: 1008 MHz</p>	Channel Spacing:	3.5	7	13.75	27.5	55	a:	-	-	6.875	13.75	27.5	b:	-	-	-	-	-	c:	19.5	26.5	-	-	-	<p>54 x 13.75 MHz 27 x 27.5 MHz 13 x 55 MHz 61 x 3.5 MHz 30 x 7 MHz</p>
Channel Spacing:	3.5	7	13.75	27.5	55																				
a:	-	-	6.875	13.75	27.5																				
b:	-	-	-	-	-																				
c:	19.5	26.5	-	-	-																				

23 GHz **Radio Channels Available in the UK**



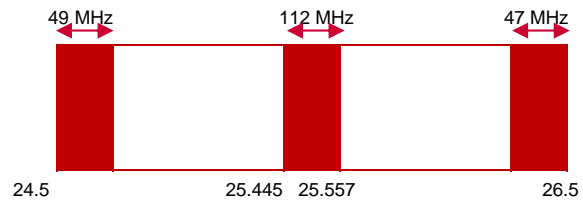
CEPT Recommendation T/R 13 – 02 E Annex A (modified)

Channel Duplex Spacing: 1008 MHz

Channel Spacing:	3.5	7	14	28	56
a:	2.75	8	8	8	8
b:	9.25	11	18	32	32
c:	10.75	16	16	16	16
d:	1.25	3	10	24	24

- 168 x 3.5 MHz
- 83 x 7 MHz
- 41 x 14 MHz
- 20 x 28 MHz
- 10 x 56 MHz

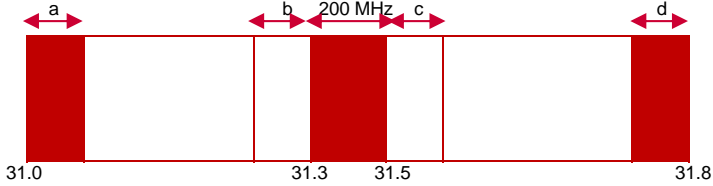
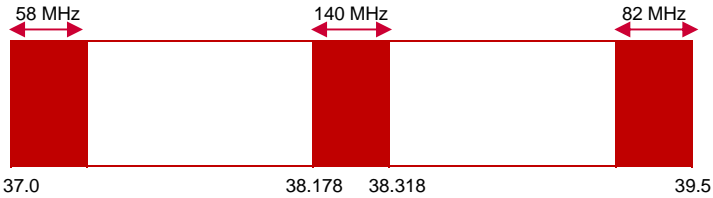
26 GHz **Radio Channels Available in the UK**

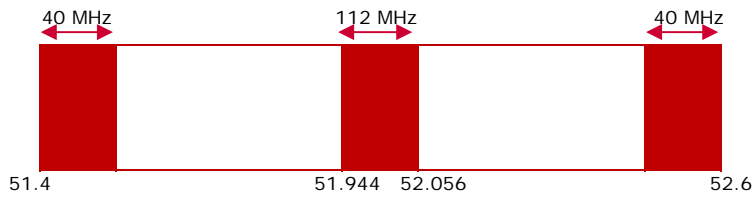
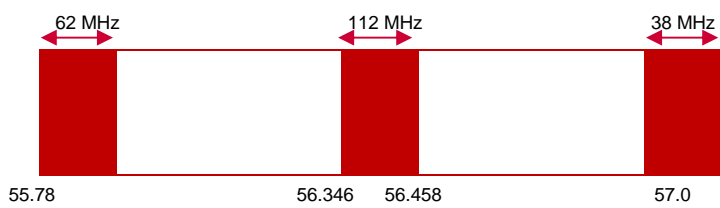


CEPT Recommendation T/R 13 – 02 E Annex B

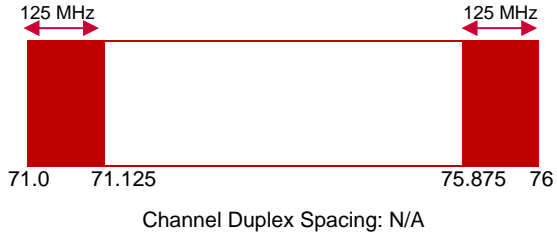
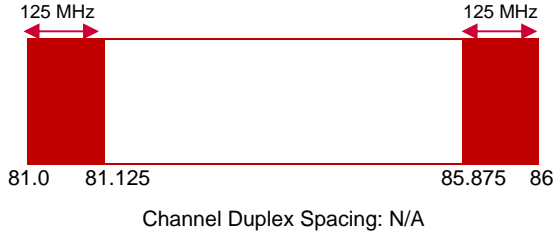
Channel Duplex Spacing: 1008 MHz

- 256 x 3.5 MHz
- 128 x 7 MHz
- 64 x 14 MHz
- 32 x 28 MHz
- 16 x 56 MHz

31 GHz	Analogue Baseband (MHz)	Polarisation Options	Radio Channels Available in the UK															
 <p>National Channel Plan based on 28 MHz raster Channel Duplex Spacing: 500.5 MHz</p> <table border="1" data-bbox="69 691 555 799"> <thead> <tr> <th></th> <th>a</th> <th>b</th> <th>c</th> <th>d</th> </tr> </thead> <tbody> <tr> <td>Vertical polarisation:</td> <td>10</td> <td>10</td> <td>10.5</td> <td>9.5</td> </tr> <tr> <td>Horizontal polarisation:</td> <td>24</td> <td>24</td> <td>24.5</td> <td>23.5</td> </tr> </tbody> </table>		a	b	c	d	Vertical polarisation:	10	10	10.5	9.5	Horizontal polarisation:	24	24	24.5	23.5	FM in 28 MHz	V	10 x 28 MHz
	a	b	c	d														
Vertical polarisation:	10	10	10.5	9.5														
Horizontal polarisation:	24	24	24.5	23.5														
	FM in 28 MHz	H	9 x 28 MHz															
38 GHz	Radio Channels Available in the UK																	
 <p>CEPT Recommendation T/R 12 – 01 E Channel Duplex Spacing: 1260 MHz</p>	<ul style="list-style-type: none"> 320 x 3.5 MHz 160 x 7 MHz 80 x 14 MHz 40 x 28 MHz 20 x 56 MHz 																	

52 GHz	Radio Channels Available in the UK
 <p style="text-align: center;">CEPT/ERC/REC 12 - 11 E Channel Duplex Spacing: 616 MHz</p>	<ul style="list-style-type: none"> 144 x 3.5 MHz 72 x 7 MHz 36 x 14 MHz 18 x 28 MHz 9 x 56 MHz
55 GHz	Radio Channels Available in the UK
 <p style="text-align: center;">CEPT/ERC/REC 12 - 12 E Channel Duplex Spacing: 616 MHz</p>	<ul style="list-style-type: none"> 144 x 3.5 MHz 72 x 7 MHz 36 x 14 MHz 18 x 28 MHz 9 x 56 MHz

60 GHz	Radio Channels Available in the UK
 <p>Channel Duplex Spacing: N/A</p>	Channel arrangements are not specified for these bands in the UK.
65 GHz	Radio Channels Available in the UK
 <p>Channel Duplex Spacing: N/A</p>	Channel arrangements are not specified for these bands in the UK.

70/80 GHz	Radio Channels Available in the UK
 <p>125 MHz</p> <p>125 MHz</p> <p>71.0 71.125 75.875 76</p> <p>Channel Duplex Spacing: N/A</p>  <p>125 MHz</p> <p>125 MHz</p> <p>81.0 81.125 85.875 86</p> <p>Channel Duplex Spacing: N/A</p>	<p>Channel arrangements are not specified for these bands in the UK.</p>

Section 6

Abbreviations

CEPT	European Conference of Postal and Telecommunications Administrations
EIRP	Equivalent Isotropically Radiated Power
H	Horizontal Polarisation
ITU	International Telecommunication Union
N/A	Not applicable
Ofcom	Office of Communications
R&TTED	Radio Equipment and Telecommunications Terminal Equipment Directive
V	Vertical Polarisation

Document History

Version	Published Date	Comments
Version 1.0	27 August 2010	New Document Published
Version 1.1	1 October 2010	Edits to show new 60 GHz band open.

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