



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

Version 2.0

23 December 2013

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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.
- IR2078: The 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.cept.org/ecc/> 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>.

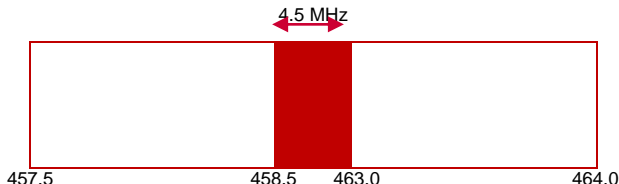
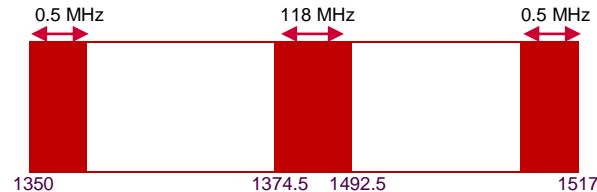
60 GHz

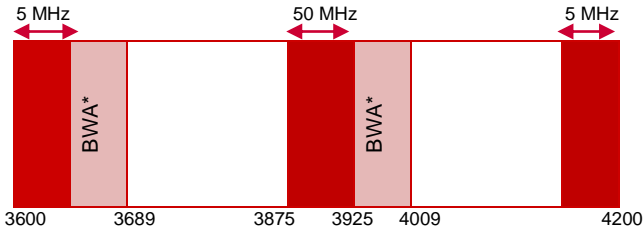
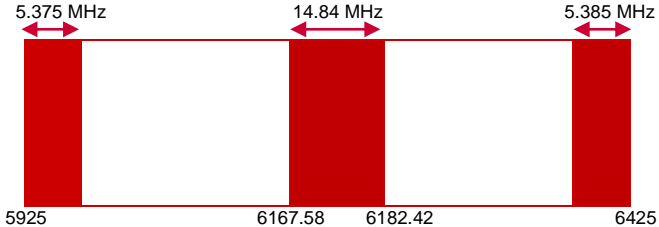
FWS systems conforming to IR2078 are exempt from licensing in this band.

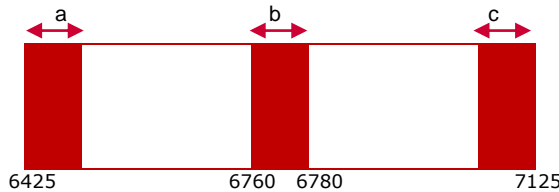
65 GHz, 73.375 –75.875 GHz and 83.375-85.875 GHz

These are self coordinated bands.

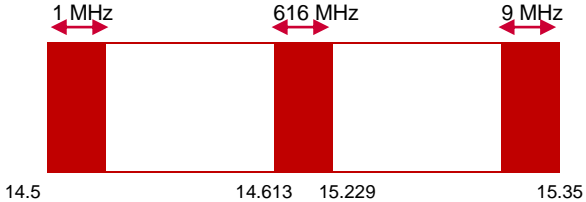
Section 5
Frequency Allocations

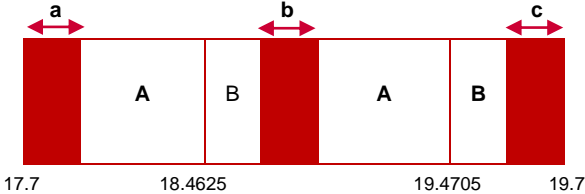
450 MHz	Data Transmission Range (kbit/s)	Cell Structure	Basic parameters
<div><p>Channel Duplex Spacing: 5.5 MHz</p></div>	1200 to 2400	<p>6 channels per cell giving 2 channels per utility</p> <p>12 channels per cluster giving a co-channel re-use distance of 150 km</p> <p>A potential channel re-use of 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>
Radio Channels Available in the UK			
<div><p>Channel Duplex Spacing: 142 MHz</p></div> <p>CEPT Recommendation T/R 13-01 E Annex A</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>		

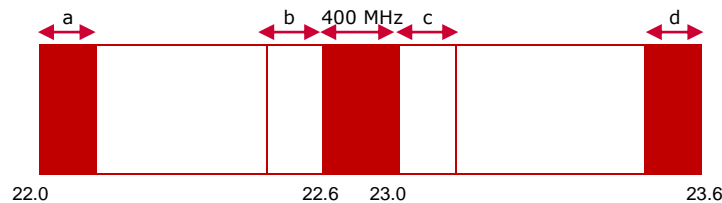
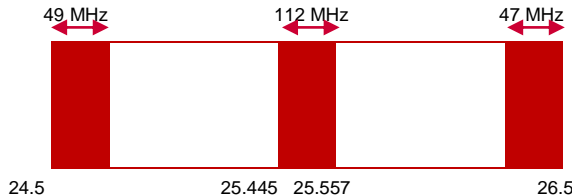
4 GHz	Radio Channels Available in the UK
 <p>CEPT/ERC/REC 12-08 E Annex A Part 2 Channel Duplex Spacing: 320 MHz</p> <p><i>*not available from Ofcom for point to point fixed links</i></p>	<p>12 x 15 MHz 6 x 30 MHz</p>
Lower 6 GHz	Radio Channels Available in the UK
 <p>CEPT/ERC/REC 14 – 01 E Annex 1 Channel Duplex Spacing: 252.04 MHz</p>	<p>8 x 29.65 MHz 7 x 59.3 MHz</p>

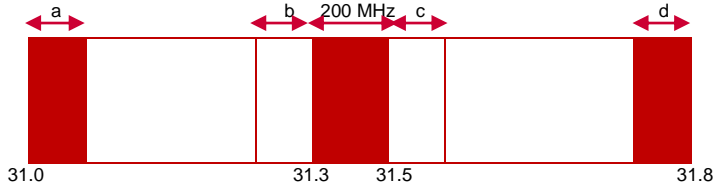
Upper 6 GHz	Radio Channels Available in the UK																				
<div><p>CEPT/ERC/REC 14 – 02 E For 20 and 40 MHz channel arrangements Channel Duplex Spacing: 340 MHz</p><table><tr><td>Channel Spacing:</td><td>20</td><td>40</td></tr><tr><td>a:</td><td>5</td><td>15</td></tr><tr><td>b:</td><td>20</td><td>20</td></tr><tr><td>c:</td><td>35</td><td>25</td></tr></table><p>ITU-R F.384-10 Channel Duplex Spacing: 340 MHz for 30 MHz channel arrangements</p><table><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></div>	Channel Spacing:	20	40	a:	5	15	b:	20	20	c:	35	25	Channel Spacing:	30	a:	20	b:	40	c:	40	<div><p>16 x 20 MHz 10 x 30 MHz 8 x 40 MHz 9 x 60 MHz</p></div>
Channel Spacing:	20	40																			
a:	5	15																			
b:	20	20																			
c:	35	25																			
Channel Spacing:	30																				
a:	20																				
b:	40																				
c:	40																				

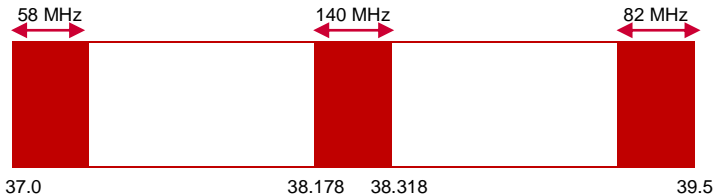
7.5 GHz	Radio Channels Available in the UK
<div><p>The diagram shows a frequency spectrum from 7425 to 7900 MHz. It features three red rectangular channels, each labeled '3 MHz' with a double-headed arrow above it. The first channel is between 7425 and 7652 MHz. The second channel is between 7673 and 7900 MHz. There is a 21 MHz gap between 7652 and 7673 MHz, indicated by a double-headed arrow labeled '21 MHz'.</p><p>ITU-R F.385-9 Annex 4 Channel Duplex Spacing: 245 MHz</p></div>	<div><p>32 x 7 MHz</p><p>16 x 14 MHz</p><p>8 x 28 MHz</p><p>7 x 56 MHz</p></div>
13 GHz	Radio Channels Available in the UK
<div><p>The diagram shows a frequency spectrum from 12.75 to 13.25 GHz. It features three red rectangular channels, each labeled with a value and a double-headed arrow above it. The first channel is between 12.75 and 12.975 GHz, labeled '1 MHz'. The second channel is between 13.017 and 13.25 GHz, labeled '9 MHz'. There is a 42 MHz gap between 12.975 and 13.017 GHz, indicated by a double-headed arrow labeled '42 MHz'.</p><p>CEPT/ERC/REC 12 – 02 E – Annex A Channel Duplex Spacing: 266 MHz</p></div>	<div><p>128 x 1.75 MHz</p><p>64 x 3.5 MHz</p><p>32 x 7 MHz</p><p>16 x 14 MHz</p><p>8 x 28 MHz</p><p>7 x 56 MHz</p></div>

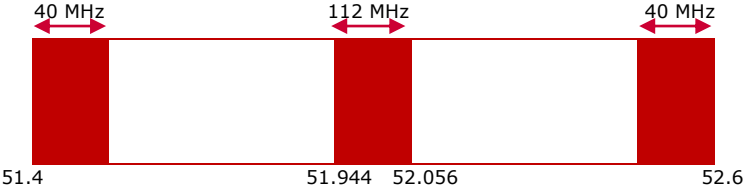
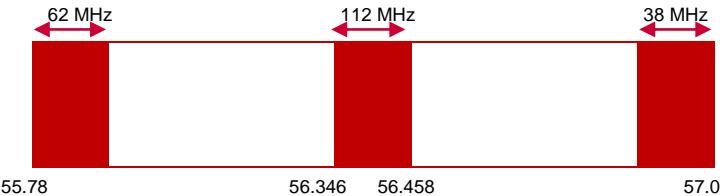
15 GHz	Radio Channels Available in the UK
<div><p>1 MHz 616 MHz 9 MHz</p><p>14.5 14.613 15.229 15.35</p><p>CEPT/ERC/REC 12 – 07 E Channel Duplex Spacing: 728 MHz</p></div>	<div><p>64x 1.75 MHz</p><p>32x 3.5 MHz</p><p>16x 7 MHz</p><p>8 x 14 MHz</p><p>4 x 28 MHz</p><p>2 x 56 MHz</p></div>

18 GHz	Radio Channels Available in the UK
<div><p>17.7 18.4625 19.4705 19.7</p></div> <div><p>Channel Spacing: 3.5 7 13.75 27.5 55</p><p>a: - - 6.875 13.75 27.5</p><p>b: - - - - -</p><p>c: 19.5 26.5 - - -</p></div> <div><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></div> <div><p>Area A: CEPT/ERC/REC 12 – 03 E</p><p>For 13.75MHz, 27.5MHz and 55MHz Channels</p><p>Channel Duplex Spacing: 1010 MHz</p></div> <div><p>Area B: ITU_R Rec. F.595</p><p>For 3.5MHz and 7MHz Channels</p><p>Channel Duplex Spacing: 1008 MHz</p></div>	<div><p>54 x 13.75 MHz</p><p>27 x 27.5 MHz</p><p>13 x 55 MHz</p><p>61 x 3.5 MHz</p><p>30 x 7 MHz</p><p>6 x 110 MHz</p></div>

23 GHz	Radio Channels Available in the UK																														
<div><p>The diagram shows a frequency spectrum from 22.0 to 23.6 GHz. It is divided into segments labeled a, b, c, and d. Segment 'a' is from 22.0 to 22.6 GHz, 'b' is from 22.6 to 23.0 GHz, 'c' is from 23.0 to 23.6 GHz, and 'd' is from 23.6 to 24.0 GHz. A 400 MHz gap is indicated between segments b and c.</p></div> <p>CEPT Recommendation T/R 13 – 02 E Annex A (modified) Channel Duplex Spacing: 1008 MHz</p> <table><tr><td>Channel Spacing:</td><td>3.5</td><td>7</td><td>14</td><td>28</td><td>56</td></tr><tr><td>a:</td><td>2.75</td><td>8</td><td>8</td><td>8</td><td>8</td></tr><tr><td>b:</td><td>9.25</td><td>11</td><td>18</td><td>32</td><td>32</td></tr><tr><td>c:</td><td>10.75</td><td>16</td><td>16</td><td>16</td><td>16</td></tr><tr><td>d:</td><td>1.25</td><td>3</td><td>10</td><td>24</td><td>24</td></tr></table>	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	<div><p>168 x 3.5 MHz</p><p>83 x 7 MHz</p><p>41 x 14 MHz</p><p>20 x 28 MHz</p><p>10 x 56 MHz</p><p>5 x 112 MHz</p></div>
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																										
26 GHz	Radio Channels Available in the UK																														
<div><p>The diagram shows a frequency spectrum from 24.5 to 26.5 GHz. It is divided into segments labeled 49 MHz, 112 MHz, and 47 MHz. The 49 MHz segment is from 24.5 to 25.445 GHz, the 112 MHz segment is from 25.445 to 25.557 GHz, and the 47 MHz segment is from 25.557 to 26.5 GHz.</p></div> <p>CEPT Recommendation T/R 13 – 02 E Annex B Channel Duplex Spacing: 1008 MHz</p>	<div><p>256 x 3.5 MHz</p><p>128 x 7 MHz</p><p>64 x 14 MHz</p><p>32 x 28 MHz</p><p>16 x 56 MHz</p><p>8 x 112 MHz</p></div>																														

31 GHz	Analogue Baseband (MHz)	Polarisation Options	Radio Channels Available in the UK															
<div><p>31.0 31.3 31.5 31.8</p><p>National Channel Plan based on 28 MHz raster</p><p>Channel Duplex Spacing: 500.5 MHz</p><table><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></div>		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
<div><p>37.0 38.178 38.318 39.5</p><p>CEPT Recommendation T/R 12 – 01 E</p><p>Channel Duplex Spacing: 1260 MHz</p></div>	<div>320 x 3.5 MHz</div> <div>160 x 7 MHz</div> <div>80 x 14 MHz</div> <div>40 x 28 MHz</div> <div>20 x 56 MHz</div> <div>10 x 112 MHz</div>

52 GHz	Radio Channels Available in the UK
 <p data-bbox="450 587 741 611">CEPT/ERC/REC 12 – 11 E</p> <p data-bbox="430 632 761 655">Channel Duplex Spacing: 616 MHz</p>	<p data-bbox="1570 304 1722 328">144 x 3.5 MHz</p> <p data-bbox="1581 349 1711 373">72 x 7 MHz</p> <p data-bbox="1576 394 1715 418">36 x 14 MHz</p> <p data-bbox="1581 438 1711 462">18 x 28 MHz</p> <p data-bbox="1581 483 1711 507">9 x 56 MHz</p>
55 GHz	Radio Channels Available in the UK
 <p data-bbox="450 1249 741 1273">CEPT/ERC/REC 12 – 12 E</p> <p data-bbox="430 1294 761 1318">Channel Duplex Spacing: 616 MHz</p>	<p data-bbox="1570 960 1722 984">144 x 3.5 MHz</p> <p data-bbox="1581 1005 1711 1029">72 x 7 MHz</p> <p data-bbox="1576 1050 1715 1074">36 x 14 MHz</p> <p data-bbox="1581 1094 1711 1118">18 x 28 MHz</p> <p data-bbox="1581 1139 1711 1163">9 x 56 MHz</p>

60 GHz	Radio Channels Available in the UK
<div><div><div><div><div></div><div></div></div><div><div></div><div></div></div></div><div><div></div><div></div></div><div><div></div><div></div></div></div><div><div>100 MHz</div><div></div><div>100 MHz</div></div><div><div>57.0</div><div>57.1</div><div>63.9</div><div>64.0</div></div><div>Channel Duplex Spacing: N/A</div></div>	Channel arrangements are not specified for these bands in the UK.
65 GHz	Radio Channels Available in the UK
<div><div><div><div></div><div></div></div></div><div><div></div><div></div></div></div> <div><div>64</div><div>66</div></div> <div>Channel Duplex Spacing: N/A</div>	Channel arrangements are not specified for these bands in the UK.

70/80 GHz*		Radio Channels Available in the UK	
<div><div><div><div>125 MHz</div><div>71</div><div>71.125</div></div><div>Ofcom Coordinated lower sub band</div><div><div>250 MHz</div><div>73.125</div><div>73.375</div></div><div>Self Coordinated Block</div><div><div>125 MHz</div><div>75.875</div><div>76</div></div></div><div><div><div>125 MHz</div><div>81</div><div>81.125</div></div><div>Ofcom Coordinated upper sub band</div><div><div>250 MHz</div><div>83.125</div><div>83.375</div></div><div>Self Coordinated Block</div><div><div>125 MHz</div><div>85.875</div><div>86</div></div></div><div>Channel Duplex Spacing for Self Coordinated Block: N/A</div><div>Channel Duplex Spacing for Ofcom Coordinated Block: 10 GHz</div><div>CEPT ECC Recommendation (05)07 (Cross band duplex)</div></div>		<div>Self Coordinated Blocks</div> <div>channel arrangements are not specified for these bands in the UK for the self coordinated block</div>	<div>Ofcom Coordinated Blocks</div> <div>4 x 250 MHz</div> <div>2 x 500 MHz</div> <div>1 x 750 MHz</div> <div>1 x 1000 MHz</div>

* The 70/80GHz band has two separate authorisation approaches: i) Ofcom Coordinated & ii) Self Coordinated. The diagram above shows the frequency band splits and separation gap between the two approaches.

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 November 2010	Edits to show new 60 GHz band open.
Version 2.0	23 December 2013	Edits to show: <ol style="list-style-type: none">1. The new authorisation in the 70/80 GHz band2. Adding wider channels in the L6, U6, 7.5G, 23G, 18G, 23G, 26G and 38G bands3. Adding the 56 MHz channels in the 15G band

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