

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

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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 Directive (Directive 2014/53/EU) was implemented in the United Kingdom (UK) by the Radio Equipment Regulations 2017. In accordance with Articles 8 and 7 of Directive 2014/53/EU, 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.

From 25 July 2017, channels within the frequency ranges of 3.695 GHz to 3.815 GHz paired with 4.015 GHz to 4.135 GHz, i.e. channels 4,...,7 on the 30 MHz channel raster and channels 7,.. 14 on the 15 MHz channel raster are not available for point to point assignments. For further details see the statement and consultation on improving consumer access to mobile services at 3.6GHz to 3.8GHz.

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>.

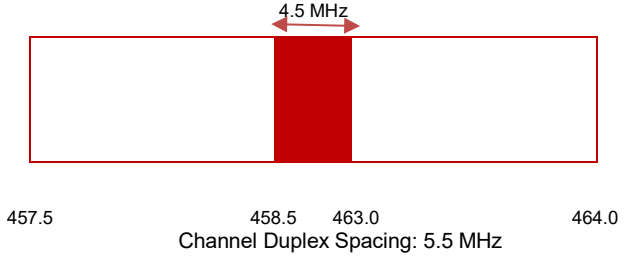
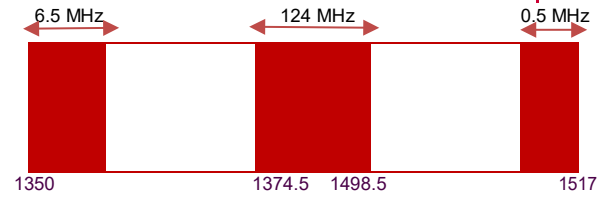
60 GHz

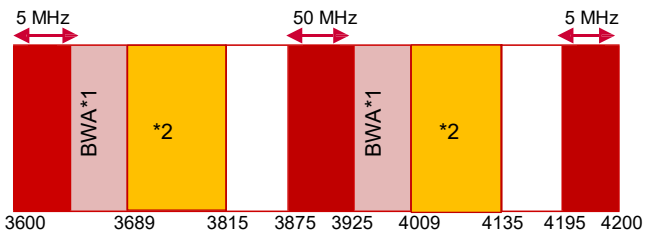
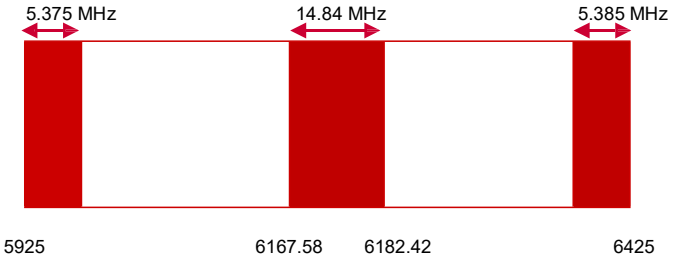
Fixed wireless systems conforming to IR2078 are exempt from licensing in this band.

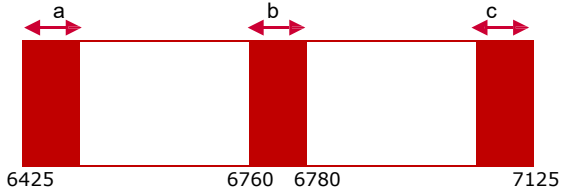
73.375 –75.875 GHz and 83.375-85.875 GHz

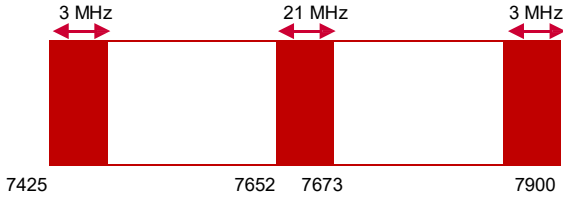
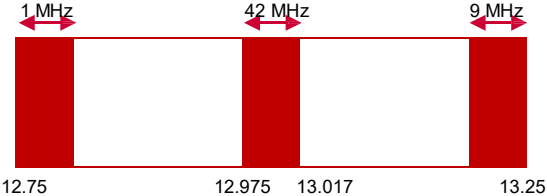
These are self coordinated bands.

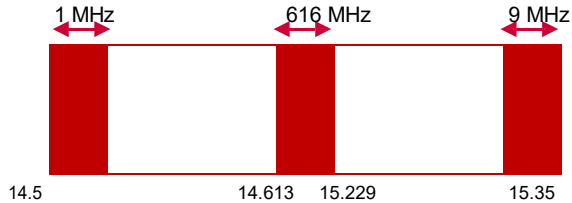
Section 5 Frequency Allocations

450 MHz	Data Transmission Range (kbit/s)	Cell Structure	Basic parameters
 <p>457.5 458.5 463.0 464.0</p> <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>Please note that this band will no longer be available for new fixed wireless links or technical variations from 5 January 2019</p>  <p>1350 1374.5 1498.5 1517</p> <p>CEPT Recommendation T/R 13-01 E Annex A</p> <p>Channel Duplex Spacing: 142 MHz</p>		<p>720 x 0.025 MHz</p> <p>240 x 0.075 MHz</p> <p>72 x 0.25 MHz</p> <p>36x 0.5 MHz</p> <p>18 x 1 MHz</p> <p>9 x 2 MHz</p> <p>1x 3.5 MHz</p>	

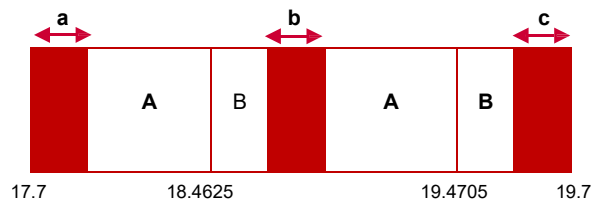
4 GHz	Radio Channels Available in the UK
 <p>CEPT/ERC/REC 12-08 E Annex A Part 2 Channel Duplex Spacing: 320 MHz</p> <p><i>*1 not available from Ofcom for point to point fixed links</i> <i>*2 not available for point to point fixed links</i></p>	<p>4 x 15 MHz 2 x 30 MHz</p>
Lower 6 GHz	Radio Channels 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																				
 <p>6425 6760 6780 7125</p> <p>CEPT/ERC/REC 14 – 02 E</p> <p>For 20 and 40 MHz channel arrangements</p> <p>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</p> <p>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>	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</p> <p>10 x 30 MHz</p> <p>8 x 40 MHz</p> <p>9 x 60 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>ITU-R F.385-9 Annex 4</p> <p>Channel Duplex Spacing: 245 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>
13 GHz	Radio Channels Available in the UK
 <p>CEPT/ERC/REC 12 – 02 E – Annex A</p> <p>Channel Duplex Spacing: 266 MHz</p>	<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>

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 9 MHz wide, starting at 14.613 GHz. The third bar is 9 MHz wide, starting at 15.229 GHz. The spacing between the start of the first and second bars is 616 MHz. The x-axis labels are 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">64x 1.75 MHz32x 3.5 MHz16x 7 MHz8 x 14 MHz4 x 28 MHz2 x 56 MHz

18 GHz



Channel Spacing:	3.5	7	13.75	27.5	55
a:	-	-	6.875	13.75	27.5
b:	-	-	-	-	-
c:	19.5	26.5	-	-	-

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.

Area A: CEPT/ERC/REC 12 – 03 E

For 13.75MHz, 27.5MHz and 55MHz Channels

Channel Duplex Spacing: 1010 MHz

Area B: ITU_R Rec. F.595

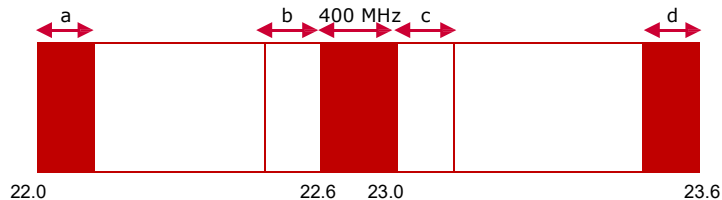
For 3.5MHz and 7MHz Channels

Channel Duplex Spacing: 1008 MHz

Radio Channels Available in the UK

- 61 x 3.5 MHz
- 30 x 7 MHz
- 54 x 13.75 MHz
- 27 x 27.5 MHz
- 13 x 55 MHz
- 6 x 110 MHz

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



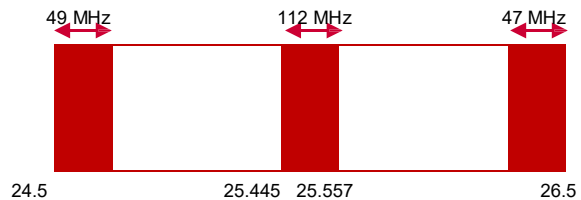
CEPT Recommendation T/R 13 – 02 E Annex A (modified)

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
- 5 x 112 MHz

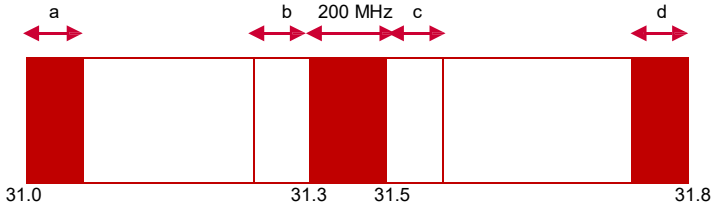
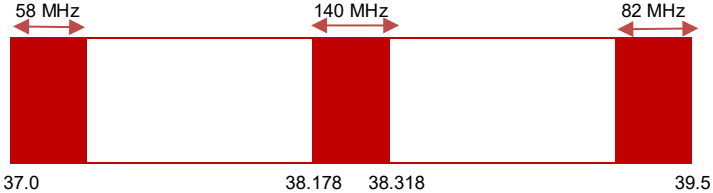
26 GHz **Radio Channels Available in the UK**



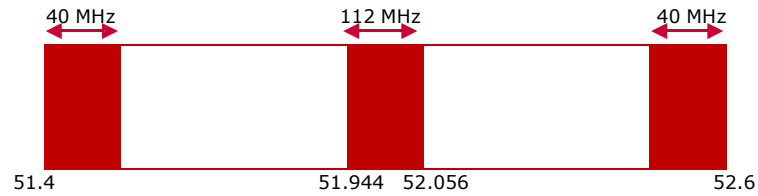
CEPT Recommendation T/R 13 – 02 E Annex B

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
- 8 x 112 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"> <tr> <td></td> <td>a</td> <td>b</td> <td>c</td> <td>d</td> </tr> <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> </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 10 x 112 MHz 																	

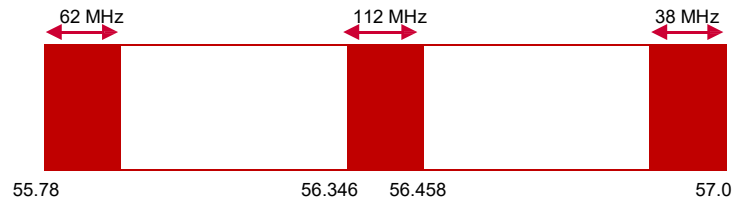
52 GHz	Radio Channels Available in the UK
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CEPT/ERC/REC 12 – 11 E
Channel Duplex Spacing: 616 MHz

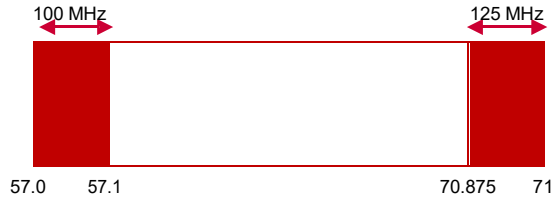
- 144 x 3.5 MHz
- 72 x 7 MHz
- 36 x 14 MHz
- 18 x 28 MHz
- 9 x 56 MHz

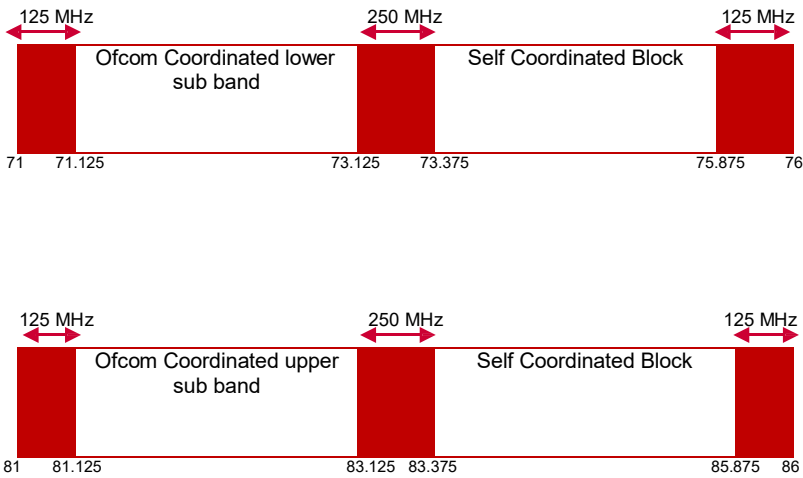
55 GHz	Radio Channels Available in the UK
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CEPT/ERC/REC 12 – 12 E
Channel Duplex Spacing: 616 MHz

- 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>The diagram shows two frequency blocks in the 60 GHz range. The first block is a red rectangle from 57.0 to 57.1 GHz, with a double-headed arrow above it labeled '100 MHz'. The second block is a red rectangle from 70.875 to 71 GHz, with a double-headed arrow above it labeled '125 MHz'. Below the diagram, the text 'Channel Duplex Spacing: N/A' is centered.</p> <p>Channel Duplex Spacing: N/A</p>	<p>Channel arrangements are not specified for these bands in the UK.</p>

70/80 GHz*	Radio Channels Available in the UK	
 <p>The diagram illustrates the frequency allocation for the 70/80 GHz band. It is divided into three main sections: an Ofcom Coordinated lower sub band (71-73.125 GHz), a Self Coordinated Block (73.125-75.875 GHz), and an Ofcom Coordinated upper sub band (75.875-86 GHz). Each sub band is 125 MHz wide, and the Self Coordinated Block is 250 MHz wide. The channel duplex spacing for the Self Coordinated Block is N/A, and for the Ofcom Coordinated Block, it is 10 GHz.</p> <p>CEPT ECC Recommendation (05)07 (Cross band duplex)</p>	<p>Self Coordinated Blocks</p> <p>channel arrangements are not specified for these bands in the UK for the self coordinated block</p>	<p>Ofcom Coordinated Blocks</p> <ul style="list-style-type: none"> 16 x 62.5 MHz 8 x 125 MHz 4 x 250 MHz 2 x 500 MHz 1 x 750 MHz 1 x 1000 MHz
<p>* 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.</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
RED	Radio 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 band 2. Adding wider channels in the L6, U6, 7.5G, 23G, 18G, 23G, 26G and 38G bands 3. Adding the 56 MHz channels in the 15G band
Version 3.0	29 May 2015	Changes to reflect the reduced availability of channels for new assignments in the 1.4 GHz band
Version 4.0	27 July 2015	Adding 62.5 MHz and 125 MHz channel rasters to the 7080 GHz band Ofcom coordinated block.
Version 5.0	6 October 2016	Changes to reflect changes to the 4 GHz band.
Version 6.0	28 July 2017	Updating channels availability in the 4GHz band to reflect changes to the 4 GHz band.
Version 7.0	5 July 2018	Edits to remove reference to R&TTE Directive replaced by RED and note future changes to 1.4 GHz and 60/65 GHz.
Version 8.0	27 November 2018	Changes related to licence exemption of 57-71 GHz

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