UK Radio Interface Requirement 2040 for Broadband Fixed Wireless Access Multipoint Radio Systems in the 28 GHz Frequency Band Administered by the Radiocommunications Agency

(Version 5.0)

98/34/EC Notification Number: **2000/702/UK**

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1. Foreword

1.1 The Radio Equipment and Telecommunications Terminal Equipment Directive 99/5/EC (R&TTE Directive) was implemented in the United Kingdom (UK) on the 8 April 2000 by The Radio Equipment and Telecommunications Terminal Equipment Regulations, Statutory Instrument (SI) 730 of 13 March 2000. In accordance with Articles 4.1 and 7.2 of Directive 1999/5/EC, this document contains the requirements for the licensing and use of terrestrial Broadband Fixed Wireless Access in the specified frequency bands.

1.2 Nothing in this UK Radio Interface Requirement shall preclude the need for equipment and antennas to comply with the requirements of Directive 1999/5/EC.

1.3 It is required by the Wireless Telegraphy Act 1949 that no radio equipment is installed or used in the UK, except under the authority of a licence granted by or otherwise exempted by regulations made by the Secretary of State. It is a condition of such a licence or exemption regulations as appropriate that the equipment must meet the minimum requirements specified in this document for the stated equipment types and for the stated frequency bands.

1.4 The requirements given in the main body of this UK Radio Interface Requirement will apply in the licensing of terrestrial Broadband Fixed Wireless Access radio systems in the 28 GHz band.

1.5 This UK Radio Interface Requirement will be revised as necessary to follow current technology developments for reasons related to the effective and appropriate use of the spectrum in particular maximising spectrum utilisation.

1.6 The RA has publicly consulted with manufacturers and operators on all aspects of this UK Radio Interface Requirement, including any assumptions made for the criteria and parameter values necessary to facilitate inter-operator coexistence as detailed in RA 390. All UK Radio Interface Requirements notified under Directive 98/34/EC will be published and will be made available free of charge from the RA Information and Library Service and/or the RA web-site. The addresses for both the Library and the web-site are given on the back cover of this document.

1.7 Further information on this UK Radio Interface Requirement can be obtained from the technical enquiry contact given on the back of this document.

2. Minimum Equipment and Antenna Requirements for Operation within the UK

2.1 The minimum radio requirements in this document are made for reasons related to the effective and appropriate use of the radio spectrum, in particular maximising spectrum utilisation and to facilitate inter-operator coexistence.

2.2 Traditionally, coexistence standards produced by European Telecommunications Standards Institute (ETSI) have catered for a particular technology in terms of both architecture (point-to-multipoint) and duplexing method (frequency division duplexing). However, developments in Fixed Wireless Access technology and deployment scenarios have resulted in work on going within ETSI to address how the standards can be made applicable to these developments. The minimum equipment and antenna requirements within this UK Radio Interface Requirement do not intend to preclude technologies using other architectures or duplexing methods.

2.3 This UK Radio Interface Requirement does not prescribe a technical interpretation of the 'essential requirements' of Directive 1999/5/EC.

2.4 The candidate Harmonised Standard EN 301 753 [1] is the generic Harmonised Standard that implements the 'essential requirements' under Article 3.2 of Directive 1999/5/EC for radio systems that can provide terrestrial Broadband Fixed Wireless Access. ETSI has the responsibility for developing and maintaining this generic Harmonised Standard. Conformance with the Harmonised Standard gives a presumption of compliance with those relevant 'essential requirements' of Directive 1999/5/EC as covered by the said harmonised standard.

2.5 This UK Radio Interface Requirement stipulates the minimum equipment and antenna requirements necessary to allow terrestrial Broadband Fixed Wireless Access radio systems to be licensed in the UK. Tables 2.1, 2.2, 2.3, 2.4, 2.5, and 2.6 respectively contain the relevant minimum equipment parameters and antenna reference codes with associated parameters from the standards, permissible within the frequency band identified for terrestrial Broadband Fixed Wireless Access in the UK. These together with the 'essential requirement' prescribed in Article 3.2 of the Directive 1999/5/EC constitute the minimum system requirements for terrestrial Broadband Fixed Wireless Access radio operation within the UK.

2.6 'Non-essential parameters' are those parameters contained in any Reference Standard shown in tables 2.1, 2.2, 2.3, 2.4, 2.5, and 2.6 respectively, which are not cross-referenced to the generic Harmonised Standard [1]. The assumption that radio systems that comply with the 'essential requirements' detailed in Article 3.2 of Directive 1999/5/EC, with this UK Radio Interface Requirement and the 'non-essential parameters' will be made for the purposes of facilitating inter-operator co-existence in accordance with the guidelines in RA 390.

2.7 Radio systems that comply with the 'essential requirements' detailed in Article 3.2 of Directive 1999/5/EC and with the UK Interface Requirement but not with the 'non-essential parameters', may require re-evaluation of the guidelines to facilitate inter-operator coexistence. Therefore, they will be licensed on the condition that the system shall not cause any harmful interference, increase the inter-operator co-ordination burden or degrade the co-existence environment over and above that resulting from adherence to the coexistence guidelines detailed in RA 390.

2.8 It is assumed that equipment and antennas are assessed using the test methods contained in EN 301 126-2/3 [10][11][12][13][14] and EN 301 390 [15]. However, manufacturers are free to choose alternative methods for assessing their equipment providing they can equate their results to the limits stated.

2.9 This UK Radio Interface Requirement provides the necessary technical information which facilitates access to terrestrial Broadband Fixed Wireless Access radio services in the 28 GHz band by making clear the assumptions that are made in planning the use of this spectrum in the UK. It is not the intention of this UK Radio Interface Requirement to duplicate or impose any additional 'essential

requirements’ of the Directive 1999/5/EC on products. Any specified parameters within this document are for the purpose of identifying product options and not as a de facto national product requirement.

Table 2.1: Minimum Equipment Requirements; Basic Parameters

Reference Standards Assumed to be fulfilled for effective frequency planning and defining the equipment type Note 1	Frequency Ranges (GHz)	Channel plan Note 2	Channel Spacing (MHz) Note 3	Maximum Mean Radiated Power (dBW EIRP) Note 4	Comments
EN 301 213-1 [2] Fixed Radio Systems; Point-to-multipoint equipment; Point-to-multipoint digital radio systems in frequency bands in the range 24.25 GHz to 29.5 GHz using different access methods; Part 1: Basic Parameters.	28.0525 to 28.4445 paired with 29.0605 to 29.4525	In accordance with CEPT Recommendation T/R 13-02 Annex C [7].	3.5	Repeater Station (RS)/ Central Station (CS) =+21	Note 1: Although the standard specifies point to multi-point systems, mesh systems are not excluded from the specification. Note 2: Although this plan assumed an FDD system, TDD systems will also be allowed. Note 3: 56 and 112 MHz channel spacing will not be used. Note 4: For some deployment situations, the EIRP may need to be decreased in certain directions for the purposes of facilitating coexistence between operators as detailed in RA 390.
			7	Repeater Station (RS)/ Terminal Station (TS) =+31	
			14		
			28		

Table 2.2: Minimum Equipment Requirements; FDMA

Reference Standards Assumed to be fulfilled for effective frequency planning and defining the equipment type Note 1	Frequency Ranges (GHz)	Channel plan Note 2	Channel Spacing (MHz) Note 3	Comments
EN 301 213-2 [3] Fixed Radio Systems; Point-to-multipoint equipment; Point-to-multipoint digital radio systems in frequency bands in the range 24.25 GHz to 29.5 GHz using different access methods; Part 2: Frequency Division Multiple Access.	28.0525 to 28.4445 paired with 29.0605 to 29.4525	In accordance with CEPT Recommendation T/R 13-02 Annex C [7].	3.5	Note 1: Although the standard specifies point to multi-point systems, mesh systems are not excluded from the specification. Note 2: Although this plan assumed an FDD system, TDD systems will also be allowed. Note 3: 56 and 112 MHz channel spacing will not be used.
			7	
			14	
			28	

Table 2.3: Minimum Equipment Requirements; TDMA

Reference Standards Assumed to be fulfilled for effective frequency planning and defining the equipment type Notes 1 & 2	Frequency Ranges (GHz)	Channel plan Note 3	Channel Spacing (MHz) Note 4	Comments
EN 301 213-3 [4] Fixed Radio Systems; Point-to-multipoint equipment; Point-to-multipoint digital radio systems in frequency bands in the range 24.25 GHz to 29.5 GHz using different access methods; Part 3: Time Division Multiple Access (TDMA) methods.	28.0525 to 28.4445 paired with 29.0605 to 29.4525	In accordance with CEPT Recommendation T/R 13-02 Annex C [7].	3.5 7 14 28	Note 1: Although the standard specifies point to multi-point systems, mesh systems are not excluded from the specification. Note 2: Draft v1.2.1 is currently on the ETSI one step approval process. Changes may be needed depending on the outcome of the process. Note 3: Although this plan assumed an FDD system, TDD systems will also be allowed. Note 4: 56 and 112 MHz channel spacing will not be used.

Table 2.4: Minimum Equipment Requirements; DS-CDMA

Reference Standards Assumed to be fulfilled for effective frequency planning and defining the equipment type Note 1	Frequency Ranges (GHz)	Channel plan Note 2	Channel Spacing (MHz) Notes 3 and 4	Comments
EN 301 213-4 [5] Fixed Radio Systems; Point-to-multipoint equipment; Point-to-multipoint digital radio systems in frequency bands in the range 24.25 GHz to 29.5 GHz using different access methods; Part 4: Direct Sequence – Code Division Multiple Access (DS – CDMA) methods.	28.0525 to 28.4445 paired with 29.0605 to 29.4525	In accordance with CEPT Recommendation T/R 13-02 Annex C [7].	3.5 7 14 28	Note 1: Although the standard specifies point to multi-point systems, mesh systems are not excluded from the specification. Note 2: Although this plan assumed an FDD system, TDD systems will also be allowed. Note 3: 56 and 112 MHz channel spacing will not be used. Note 4: Channel spacing is determined by the chip rate. For the purposes of the present standard, these channel spacings have been defined. Other channel spacing may also be employed up to 28 MHz.

Table 2.5: Minimum Equipment Requirements; MC-TDMA

Reference Standards Assumed to be fulfilled for effective frequency planning and defining the equipment type Note 1	Frequency Ranges (GHz)	Channel plan Note 2	Channel Spacing (MHz) Note 3	Comments
EN 301 213-5 [6] Fixed Radio Systems; Point-to-multipoint equipment; Point-to-multipoint digital radio systems in frequency bands in the range 24.25 GHz to 29.5 GHz using different access methods; Part 5: Multi-carrier Time Division Multiple Access (MC – TDMA) methods.	28.0525 to 28.4445 paired with 29.0605 to 29.4525	In accordance with CEPT Recommendation T/R 13-02 Annex C [7].	3.5 7 14 28	Note 1: Although the standard specifies point to multi-point systems, mesh systems are not excluded from the specification. Note 2: Although this plan assumed an FDD system, TDD systems will also be allowed. Note 3: 56 and 112 MHz channel spacing will not be used.

Table 2.6: Minimum Antenna Requirements; 24 – 30 GHz

Reference Standards Assumed to be fulfilled for effective frequency planning and defining the antenna type [8][9]	Frequency Ranges (GHz)	Clauses and antenna codes from reference standard Note 1	Comments
EN 301 215-2 [9] Fixed Radio systems; Point to Multipoint Antennas; Antennas for point-to-multipoint fixed radio systems in the 11 GHz to 60 GHz band; Part 2: 24 GHz to 30 GHz	28.0525 to 28.4445 paired with 29.0605 to 29.4525	4.1.1 & 4.1.2 Class TS 1 (terminal station = TS)	Note 1: These are the antennas assumed to be used in determining coexistence guidelines RA 390.
		4.2.1 Class CS 1 sectored (central station = CS) (azimuth)	
		4.2.1 Class CS 2 sectored (central station = CS) (azimuth)	
		4.4 Class CS (central station = CS) (elevation)	

3. References

3.1 References - equipment

[1] EN 301 753 "Fixed Radio Systems; Point-to-multipoint equipment and antennas; Generic harmonised standard for point-to-multipoint digital fixed radio systems and antennas covering the essential requirements under Article 3.2 of Directive 1999/5/EC"

[2] EN 301 213-1 "Fixed Radio Systems; Point-to-multipoint equipment; Point-to-multipoint digital radio systems in frequency bands in the range 24.25 GHz to 29.5 GHz using different access methods; Part 1: Basic parameters"

[3] EN 301 213-2 "Fixed Radio Systems; Point-to-multipoint equipment; Point-to-multipoint digital radio systems in frequency bands in the range 24.25 GHz to 29.5 GHz using different access methods; Part 2: Frequency Division Multiple Access (FDMA) methods"

[4] EN 301 213-3 "Fixed Radio Systems; Point-to-multipoint equipment; Point-to-multipoint digital radio systems in frequency bands in the range 24.25 GHz to 29.5 GHz using different access methods; Part 3: Time Division Multiple Access (TDMA) methods"

[5] EN 301 213-4 "Fixed Radio Systems; Point-to-multipoint equipment; Point-to-multipoint digital radio systems in frequency bands in the range 24.25 GHz to 29.5 GHz using different access methods; Part 4: Direct Sequence – Code Division Multiple Access (DS – CDMA) methods"

[6] EN 301 213-5 "Fixed Radio Systems; Point-to-multipoint equipment; Point-to-multipoint digital radio systems in frequency bands in the range 24.25 GHz to 29.5 GHz using different access methods; Part 5: Multi-Carrrier Time Division Multiple Access (MC – TDMA) methods"

[7] ERC Recommendation T/R 13-02 E "Preferred Channel Arrangements for Fixed Services in the Range 22.0 – 29.5 GHz"

3.2 References - antennas

[8] EN 301 215-1 "Fixed Radio Systems; Point to Multipoint Antennas; Antennas for point-to-point fixed radio systems in the 11 GHz to 60 GHz band; Part 1: General aspects"

[9] EN 301 215-2 "Fixed Radio Systems; Point to Multipoint Antennas; Antennas for point-to-multipoint fixed radio systems in the 11 GHz to 60 GHz band; Part 2: 24 GHz to 30 GHz"

3.3 References - equipment & antennas

[10] EN 301 126-2-1 "Fixed Radio Systems; Conformance Testing; Part 2-1: Point-to-multipoint Equipment – Definitions, General Requirements and Test Procedures"

11] EN 301 126-2-2 “Fixed Radio Systems; Conformance Testing; Part 2-2: Point-to-multipoint Equipment – Test Procedures for FDMA systems”

12] EN 301 126-2-3 “Fixed Radio Systems; Conformance Testing; Part 2-3: Point-to-multipoint Equipment – Test Procedures for TDMA systems”

13] EN 301 126-2-5 “Fixed Radio Systems; Conformance Testing; Part 2-5: Point-to-multipoint Equipment – Test Procedures for DS-CDMA systems”

14] EN 301 126-3-2 “Fixed Radio Systems; Conformance Testing; Part 3-2: Point-to-multipoint Antennas – Definitions, General Requirements and Test Procedures”

15] EN 301 390 “Fixed Radio Systems; Point-to-point & Point-to-multipoint systems; Spurious emissions and receiver immunity at equipment / antenna port of Digital Fixed Radio Systems”

Note: These references are included for information purposes only. Compliance with these referenced standards is not mandatory.

Document history

Draft	Date	Changes
1.0	Aug 2000	First draft submitted to the BFWA technical group
2.0	Sept 2000	Second draft submitted to the BFWA technical group
3.0	Sept 2000	Third draft submitted to the BFWA technical group by e-mail and submitted to the EU for approval
4.0	Feb 2001	Re-submitted to the EU for approval
5.0	Oct 2001	Reference to RA 390 added, draft removed, minor editorials

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