



Decision to make the Wireless
Telegraphy (Ultra-Wideband
Equipment) (Exemption)
Regulations 2015

Statement

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About this document

This document advises that Ofcom has gone ahead and made the Wireless Telegraphy (Ultra-Wideband Equipment) (Exemption) Regulations 2015. These amend the existing Wireless Telegraphy licence exemption criteria for Ultra-Wideband (UWB) devices. UWB Devices use very large bandwidth so are able to transmit high data rates over short distances but transmit at very low powers so not to interfere with other devices.

The regulations will implement a European Commission Decision on UWB devices that harmonises the technical parameters for equipment across all Member States. The regulations come into force on 25 March 2015.

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Section 1

Executive summary

- 1.1 This document confirms that after consultation Ofcom has made the Wireless Telegraphy (Ultra-Wideband Equipment) (Exemption) Regulations 2015 (the “UWB Regulations”). The UWB Regulations replace previous exemption criteria for UWB devices as set out in the Wireless Telegraphy (Ultra-Wideband Equipment) (Exemption) Regulations 2009 (the “2009 Regulations”)¹ and come into force on 25 March 2015.
- 1.2 The UWB Regulations implement the requirements of the European Commission Implementation Decision of 7 October 2014 (2014/702/EU) (the “UWB Amendment Decision”)².
- 1.3 Ultra-wideband (UWB) is a generic term for technologies typically characterised by the emission of very low power radiation spread over a very large radio bandwidth. This is unlike other wireless systems, which use spectrum in discrete narrow frequency bands. UWB can transfer large amounts of data wirelessly over short distances, typically less than ten metres. Using mitigation techniques multiple pieces of UWB equipment are able to operate in the same area.
- 1.4 The UWB Amendment Decision amends Decision 2007/131/EC on allowing the use of the radio spectrum for equipment using ultra-wideband technology in a harmonised manner in the Community (the “UWB Decision”)³. All European Member States are required to implement the UWB Amendment Decision.
- 1.5 The UWB Regulations revoke the 2009 Regulations and the Wireless Telegraphy (Ultra-Wideband Equipment) (Exemption) (Amendment) Regulations 2010⁴ (the “Amending Regulations”), and make a new set of regulations. We believe that this will reduce the regulatory burden on stakeholders and simplify the legislation. If we had proposed to amend the 2009 Regulations, manufactures would have needed to refer to three sets of regulations in order to understand the technical parameters required for the UK. By revoking the 2009 Regulations and making a new Statutory Instrument, stakeholders will only need to consult one set of regulations.
- 1.6 The UWB Regulations replace the existing technical parameters for the establishment, installation or use of UWB devices and will enable new equipment to use UWB technology. For the purpose of this statement the word “use” in the context of UWB devices also includes establishing or installing such equipment. The changes introduced in the UWB Regulations:
 - permit the use of UWB equipment on Aircraft;
 - permit the use of UWB equipment in Location Tracking Systems;
 - in some frequency bands, allow enhanced permitted transmit power, provided the Low Duty Cycle (LDC) mitigation technique or the Detect and Avoid (DAA)

¹ http://www.legislation.gov.uk/uksi/2009/2517/pdfs/uksi_20092517_en.pdf

² <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014D0702&from=EN>

³ <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2007:055:0033:0036:EN:PDF>

⁴ <http://www.legislation.gov.uk/uksi/2010/2761/made/data.pdf>

mechanism are employed. These mitigation techniques are described in Section 3 of CEPT Report 45⁵;

- relax the limits for the use of material sensing devices (used to detect and take images of objects in walls such as pipes and wires); and
- Replaces the definitions of some terms defined previously in the 2009 Regulations and includes some new definitions.

1.7 Before deciding to make regulations, in accordance with the requirements of section 122(4) of the WT Act, we published the Notice setting out our proposals to make them. The Notice also contained a draft of the UWB Regulations and invited comments from stakeholders on the drafting of the regulations. We received 3 non-confidential responses to the Notice. These mainly agreed with our proposals but did raise a number of additional comments.

1.8 We considered these comments in accordance with section 122(4)(c) of the WT Act. After doing so, and for the reasons set out in this document, we have decided to adopt the UWB Regulations with some amendments. The details of all the changes made to the draft regulations can be found in section 3. Copies of the Regulations can be obtained through the National Archives⁶.

⁵ <http://www.ero-docdb.dk/Docs/doc98/official/pdf/CEPTREP045.PDF>

⁶ A link to the online version can be found at <http://www.legislation.gov.uk/>

Section 2

Background

Regulatory Framework

- 2.1 We are responsible for authorising civil use of the radio spectrum and achieve this by granting wireless telegraphy licences under the WT Act and by making regulations exempting users of particular equipment from the requirement to hold such a licence.
- 2.2 Under section 8(1) of the WT Act, it is an offence to install or use equipment to transmit without holding a licence granted by us unless the use of such equipment is exempted. We can exempt the installation or use of wireless telegraphy equipment by making Regulations under section 8(3) of the WT Act.
- 2.3 Under section 8(4) of the WT Act, we have to make regulations to exempt equipment if its installation or use is not likely to:
- involve undue interference with wireless telegraphy;
 - have an adverse effect on technical quality of service;
 - lead to inefficient use of the part of the electromagnetic spectrum available for wireless telegraphy;
 - endanger safety of life;
 - prejudice the promotion of social, regional or territorial cohesion; or
 - prejudice the promotion of cultural and linguistic diversity and media pluralism.
- 2.4 In accordance with the requirements of section 8(3B) of the WT Act, the terms, provisions and limitations specified in the regulations must be:
- objectively justifiable in relation to the wireless telegraphy stations or wireless telegraphy apparatus to which they relate;
 - not such as to discriminate unduly against particular persons or against a particular description of persons;
 - proportionate to what they are intended to achieve; and
 - transparent in relation to what they are intended to achieve.
- 2.5 Before making any regulations we are required by section 122(4) of the WT Act to give notice of our proposal to do so. Under section 122(5), the notice must state that we propose to make the regulations in question, set out their general effects, specify an address from which a copy of the proposed regulations or order may be obtained, and specify a time of at least one month before which any representations with respect to the proposal must be made to us.

Policy Background

- 2.6 In February 2007 the European Commission harmonised, across the European Union (EU), the technical conditions for UWB equipment.⁷ This was in order to eliminate barriers to the uptake of UWB equipment and created a single market that would allow manufacturers to benefit from economies of scale and allow consumers and citizens to benefit from new technologies and cheaper prices.
- 2.7 To implement this into UK law we made the Wireless Telegraphy (Ultra-Wideband Equipment) (Exemption) Regulations 2007⁸. These Regulations were amended on 17 August 2007 to correct an error⁹.
- 2.8 Due to changes in technologies since the UWB Decision was adopted, the European Commission issued mandates to the European Conference of Postal and Telecommunications Administrations (CEPT), to undertake further compatibility studies of UWB technologies. This resulted in the European Commission amending the UWB Decision in 2009¹⁰.
- 2.9 This was implemented in the UK via the 2009 Regulations and the Amending Regulations in 2010.

European Commission Decision on UWB

- 2.10 As part of the ongoing work on UWB the European Commission issued a Fifth Mandate, to CEPT on UWB technology, to clarify technical parameters in the light of a potential update to Decision 2007/131/EC.
- 2.11 In response to this, CEPT Report 45 was produced and approved on 21 June 2013. CEPT advised the European Commission to take a more streamlined approach on subsequent amendments of the UWB Decision, taking into account the description of mitigation techniques with all the relevant detailed parameters within the harmonised European standards developed by the European Telecommunications Standards Institute (ETSI).
- 2.12 CEPT Report 45 also clarified the technical conditions under which specific mitigation techniques enable UWB equipment to be operated with higher transmission powers, while offering equivalent protection for existing UWB limits on generic use, automotive and railway vehicles use and location-tracking equipment.
- 2.13 Based on CEPT Report 45, the European Commission decided to change the UWB Decision by making the UWB Amendment Decision.¹¹ All European Member States are required to implement the UWB Amendment Decision.

Statutory Notice

- 2.14 Under sections 122(4) to (6) of the WT Act, we are required to publish a notice of any proposal to make regulations. The notice must state that Ofcom proposes to make the regulations in question, must set out their general effect, say where a copy may

⁷ <http://www.erodocdb.dk/docs/doc98/official/pdf/2007131EC.pdf>

⁸ <http://www.legislation.gov.uk/uksi/2007/2084/made/data.pdf>

⁹ <http://www.legislation.gov.uk/uksi/2007/2440/made/data.pdf>

¹⁰ <http://www.erodocdb.dk/Docs/doc98/official/pdf/2009343EC.PDF>

¹¹ <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014D0702&from=EN>

be obtained and give any person or party an opportunity to make representations about them.

- 2.15 We published the Notice, meeting the statutory requirements, on 17 December 2014. The Notice included a copy of the UWB Regulations. The Notice gave any person or party who wished to do so until 20 January 2015 to make representations.
- 2.16 The Notice proposed to revoke and replace the conditions in the 2009 Regulations (setting out the existing technical parameters for the establishment, installation or use of UWB equipment) with the UWB Regulations which in addition would:
- permit the use of UWB equipment on Aircraft;
 - permit the use of UWB equipment in Location Tracking Systems;
 - in some frequency bands, allow enhanced permitted transmit power, provided the Low Duty Cycle (LDC) mitigation technique or the Detect and Avoid (DAA) mechanism are employed. These mitigation techniques are described in Section 3 of CEPT Report 45¹²;
 - relax the limits for the use of material sensing devices (used to detect and take images of objects in walls such as pipes and wires); and
 - replace the definitions of some terms defined previously in the 2009 Regulations and include some new definitions.
- 2.17 We received three non-confidential responses to the Notice which agreed with our proposals but did raise additional comments. These have been addressed and resulted in some changes to the Proposed Order. These are detailed in the next section of this document along with our response

¹² <http://www.erodocdb.dk/Docs/doc98/official/pdf/CEPTREP045.PDF>

Section 3

Responses to the Notice

Introduction

- 3.1 This section outlines the comments that we received to the Notice and our response to these. We also outline some further amendments that have been made.
- 3.2 We received 3 non-confidential responses. The responses are published in full on our website¹³. Following consideration of the responses as outlined below, we have decided to proceed with our proposal to make the regulations subject to some changes.

Stakeholders' responses to the Notice and Ofcom's response

- 3.3 One respondent asked for the emission limits for building materials detection and analysis (Sections 5.1 and 5.2 of the Annex to the UWB Amendment Decision and Regulations 23 and 24 of the proposed regulations) below 1.73 GHz be aligned with those below <1.6 GHz 90 dBm/MHz in accordance with other categories.
- 3.4 The limits set out in the proposed regulations were as described in the UWB Amendment Decision. These limits were set as a result of technical work carried out in CEPT. Ofcom is required to implement the emission limits as set out in the UWB Amendment Decision and our decision is therefore to make the UWB Regulations in line with the UWB Amendment Decision and not to change the emission limits.
- 3.5 NATS raised a couple of issues in relation to the drafting. NATS highlighted a possible error in the presentation of the Annex Table of the UWB Amendment Decision. In Section 4 (Row – 6.6752 < f < 8.5 GHz) they highlighted that footnotes 9 and 10 as referenced under 'mitigation techniques', stipulate more stringent maximum power spectral density levels within this band than stated in the main table row.. NATS believed this possible error has been reflected in Proposed Regulation 18 and therefore suggested a review of Proposed Regulation 18 is considered and amended as necessary.
- 3.6 They also advised that the Proposed Regulation 17(4) did not reflect the intention of the Proposed Regulation and may be a consequence of the possible issues within Proposed Regulation 18, as described above. As written, NATS believed "17 (4) The ultra-wideband equipment must - (a) ...; OR (b)" could be interpreted as permitting equipment transmissions levels without restriction below 6.0 GHz and above 7.9 GHz. With reference to the potential issues within Proposed Regulation 18, NATS suggested a review of Proposed Regulation 17(4) is considered and amended as necessary.
- 3.7 Having reviewed the UWB Amendment Decision and our proposed regulations we have decided to make a number of changes when making the UWB Regulations.
- 3.8 Regarding Regulation 18 we have decided that there is no need to amend the substance of the text implementing footnotes 9 and 10. Ofcom's understanding is that the more stringent limits are intentional above 1000m. The UWB Amendment Decision was based on analysis undertaken in CEPT ECC. When operating on the

¹³ <http://stakeholders.ofcom.org.uk/consultations/uwb-regulations/?showResponses=true>

ground, clutter is assumed to reduce the chance of interference. Once in line of sight, there is a larger chance of interference occurring. This likelihood decreases with greater altitude thereafter. For this reason we believe that the footnotes are correctly implemented in the UWB Regulations

- 3.9 In relation to the comments made concerning Regulation 17(4) we have amended the structure and drafting in part 5 in order to make it clear that equipment transmission levels without restriction are not allowed below 6.650 GHz and above 7.9 GHz.
- 3.10 Mr Gilliver disagreed with our drafting of the Proposed Regulations and highlighted that a clear and easy to understand table has been converted into a very lengthy and impenetrable set of sections. He did agree that this was consistent with previous regulations however he noted it reinforces Ofcom's reputation of stuffiness. Mr Gilliver suggested that Regulation 7 in particular could be shortened. He also suggested a number of changes to the definitions set out in the regulations including "e.i.r.p.", "equivalent transmission level", "Location tracking systems type 1", "material sensing devices" and "onboard aircraft". In section 5 (3), Mr Gilliver advises that the term "undue" needs either removal or definition.
- 3.11 As we acknowledged in our Notice, we recognise that following a similar format to the previous UWB Regulations and not using tables has led to a lengthy document, but our view remains that this format will make the requirements clearer for all stakeholders. When making legislation the obligations imposed on stakeholders must be clearly defined and unambiguous and our view is that the format of the UWB Regulations enables this.
- 3.12 Regarding Regulation 7, we have amended it by defining harmonised standard in Regulation 3 and removing the unnecessary detail from Regulation 7. This has led us to make some further additional minor drafting changes throughout the regulations to reflect this change.
- 3.13 As a result of Mr Gilliver's comments on the definitions we have reviewed all the definitions and have made the following changes: We have added definitions of "horizontal plane" and "ETSI", removed the definitions of "onboard aircraft" and "shielded portholes" and amended the definitions for "listen before talk", "maximum mean power spectral density" and "peak power". , In respect of those definitions we have not amended, we are satisfied that these terms are already defined in European legislation and other technical documents and we do not believe that we should deviate from them. The definitions set out in European legislation ensure consistency across Member States. In regards to the term "undue" we do not believe that it needs to be defined here as it is already set out in the WT Act.
- 3.14 Mr Gilliver and NATS highlighted some minor editorial errors in drafting. Mr Gilliver advised that in 7 (a) and (b), and subsequent sections, "is" should be "are". NATS advised that the text "[x]dBm" should be replaced with "[x]dBm/MHz in a number of areas along with a number of other changes.
- 3.15 We would like to thank Mr Gilliver and NATS for highlighting these issues. We have corrected the errors identified by NATS. As mentioned above, we have made a number of changes to Regulation 7 and no longer use the word "is" in 7(a) or (b).

Further Editorial Changes to the Proposed Order

- 3.16 When drafting the Proposed Regulations we became aware of a potential typographical error in the UWB Amendment Decision. In section 5.2(2) of the Annex, reference is made to a “representative wall” as defined in EN 302 498-2. We believed that the reference should read “EN 302 498-1 as there is no reference to “representative wall” in the part 2 of the ETSI standard and this was reflected in the proposed regulations.
- 3.17 We raised this with the European Commission and they confirmed that the correct approach is to delete the reference to EN302 498-2 altogether when implementing the UWB Amendment Decision. Therefore we have amended proposed regulation 26(4) to take out the reference to EN 302 498-1.
- 3.18 When we reviewed Part 5 of the proposed regulations as a result of NATS comments, we recognised that Regulation 17(1)(b) needed to be clarified to make it clear that it applies where an aircraft is situated in, as well as flying over, the British Islands and the territorial waters adjacent thereto. Therefore, we have made necessary drafting changes to Regulation 17 to reflect this.
- 3.19 When reviewing the proposed regulations following stakeholder comments, we also became aware of a number of typographical errors and drafting improvements that needed to be made to the UWB Regulations. We have not set out the detail of all of these changes here as we do not believe that they change the substance of the Regulations.

Section 4

Scope of the regulations

- 4.1 This section describes the final scope of the UWB Regulations. On 9 March 2015 Ofcom made the UWB Regulations as proposed, subject to the changes described in section 3 above. The Amendment Order comes into force on 25 March 2015. They are summarised below.

Extent of application

- 4.2 The Regulations apply to the United Kingdom, the Channel Islands and the Isle of Man.

Final scope of the Limitations Order

- 4.3 Regulation 1 sets out the date when the UWB Regulations will come into force.
- 4.4 Regulation 2 revokes the 2009 Regulations and the Amending Regulations.
- 4.5 Regulation 3 sets out the meaning of defined terms used in the UWB Regulations. Regulation 3 includes replacement definitions of some terms defined previously in the 2009 Regulations (including “e.i.r.p” and “peak power”) and some new definitions (including “maximum mean power spectral density” and “total radiated power spectral density”).
- 4.6 Part 2 sets out the technical provisions for the use of generic UWB equipment:
- 4.6.1 Regulation 5 sets out the restrictions in use including use outdoors providing it is not at a fixed location.
 - 4.6.2 Regulation 6 sets out the transmission limits.
 - 4.6.3 Regulation 7 provides information on appropriate mitigation techniques.
- 4.7 Part 3 sets out the technical provisions for the use of location tracking system UWB devices.
- 4.7.1 Regulation 9 states the terms and limitations of the exemption.
 - 4.7.2 Regulation 10 sets out the transmission limits.
 - 4.7.3 Regulation 11 provides information on an appropriate mitigation technique.
- 4.8 Part 4 sets out the technical provisions for the use of UWB used in automotive and railway vehicles.
- 4.8.1 Regulation 13 states the terms and limitations of the exemption.
 - 4.8.2 Regulation 14 sets out the transmission limits.
 - 4.8.3 Regulation 15 provides information on appropriate mitigation techniques.
- 4.9 Part 5 sets out the technical provisions for the use of UWB used onboard aircraft.

- 4.9.1 Regulation 17 states the terms and limitations of the exemption.
- 4.9.2 Regulation 18 sets out the transmission limits.
- 4.9.3 Regulation 19 sets out emission requirements for the frequency band 7.25 GHz to 7.75 GHz.
- 4.9.4 Regulation 20 sets out an alternative emission requirement for the frequency band 7.25 GHz to 7.75 GHz.
- 4.9.5 Regulation 21 sets out emission requirements for the frequency band 7.75 GHz to 7.9 GHz.
- 4.9.6 Regulation 22 sets out an alternative emission requirement for the frequency band 7.75 GHz to 7.9 GHz.
- 4.9.7 Regulation 23 provides information on appropriate mitigation techniques.
- 4.10 Part 6 sets out the technical provisions for the use of UWB material sensing devices.
 - 4.10.1 Regulations 25 and 26 state the terms and limitations of the exemption.
 - 4.10.2 Regulation 27 sets out the transmission limits for fixed installations.
 - 4.10.3 Regulation 28 sets out the transmission limits for non-fixed installations.
- 4.11 Part 7 sets out the technical provisions for the use of UWB building material analysis devices.
 - 4.11.1 Regulation 30 states the terms and limitations of the exemption including provisions that the equipment is operated manually with a non-locking switch and only in close proximity to the material being analysed.
 - 4.11.2 Regulation 31 sets out the transmission limits.

Annex 1

Respondents

J.P. Gilliver

Name withheld

NATS