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Proposals to amend the authorisation conditions for the use of certain Short-Range Devices

Proposed changes to technical conditions

CONSULTATION:

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Annex

1. Overview

Ofcom is responsible for authorising use of the radio spectrum in the UK. We permit the use of the radio spectrum by granting wireless telegraphy licences under the Wireless Telegraphy Act 2006 (the "WT Act") or by making statutory regulations exempting users of particular equipment from the requirement to hold such a licence.

What we are consulting on - in brief

We propose a number of changes to the technical conditions which apply to Short-Range Devices (SRDs) widely used in consumer Wi-Fi and multimedia equipment, as well as transport and industrial applications. The proposed changes would align the technical conditions applicable to SRDs in the UK with international harmonisation decisions, allowing UK consumers and industry to benefit from economies of scale, among other benefits. The proposals are to:

- **Provide an additional 20 MHz of spectrum for safety-related Intelligent Transport System (ITS)**: To extend the current spectrum assignment from 5875 to 5905 MHz by 20 MHz to 5875 to 5925 MHz;
- **Liberalise the use of 5150 to 5250 MHz for Wireless Access Systems including Radio Local Area Networks (WAS/RLAN) for example Wi-Fi**: Liberalise the use of 5150 to 5250 MHz to allow outdoor mobile/nomadic use; permit airborne use of the 5170 to 5250 MHz part of the band; and clarify that there is no requirement for Dynamic Frequency Selection (DFS) and transmitter power control (TPC) in the 5150 to 5250 MHz band;
- **Liberalise some of the technical conditions for some Ultra-Wideband (UWB) devices**: These are to allow UWB material-sensing devices and secure low-power vehicle keyless access systems;
- **Close the 24 GHz Automotive Short-Range Radar (SRR) band to new applications**: We propose to close the current authorisation for new deployments in 24.25 to 26.65 GHz; and
- **Make some technical and minor editorial changes to SRD applications in the 870/915 MHz bands**: Amendments to liberalise the use of fixed SRD network devices in the bands 870 to 874.4 MHz, 917.3 to 918.9 MHz and 917.4 to 919.4 MHz, as well as some minor editorial amendments.

1.1 This document sets out a range of proposals to extend and modify the existing arrangement for SRDs in the UK. These proposals would allow the use of certain SRD technologies without the need to hold a licence and remove restrictions that are no longer required for existing licence exempt SRDs.

1.2 SRDs are typically low powered, mass-market and/or portable products. Due to their low power, they are usually licence exempt as the radio signals do not travel far, which means that risk of interference between users is very low. Therefore, in most cases they meet the criteria under the WT Act that require Ofcom to make the devices licence exempt.

1.3 Ofcom works closely with other European countries via the European Conference of Postal and Telecommunications Administrations (CEPT) to develop harmonised conditions for SRD equipment. CEPT's technical work forms the basis for many of the European Commission's

harmonisation decisions and the proposals in this document. Ofcom has been integral to developing much of this work.

1.4 The proposals would increase the amount of spectrum available for various SRD uses including for road safety, low power Wi-Fi, more spectrum for drones, keyless entry systems to name a few. We consider that these proposals would benefit UK businesses, manufacturers and consumers.

1.5 Where possible, we seek to harmonise our SRD equipment conditions with other countries. Differences in spectrum access conditions would prevent the free movement of SRDs across borders, increase their production costs and create risks of harmful interference with other radio equipment. Ofcom has the job of ensuring that we can support these types of wireless services that are widely used by people and businesses every day. This is to enable economies of scale which would then lead to lower prices for UK citizens and consumers. The harmonisation of devices also reduces the risk that other devices allowed in the rest of Europe cause undue interference to other systems that may be already operating in the band in the UK. It would also encourage more efficient use of the spectrum.

1.6 If these policy changes are agreed, we would proceed with drafting regulations to implement these decisions. As required by section 122(4) of the WT Act, we would need to give statutory notice of our intention to make regulations.

1.7 The overview section in this document is a simplified high-level summary only. The proposals we are consulting on and our reasoning are set out in the full document.

1.8 We invite any comments on the proposals in this document by 5pm on 4 July 2022.

2. Introduction

2.1 SRDs are typically low powered, mass-market and/or portable devices. Most of us use one or more SRDs such as keyless entry fobs/cards, baby monitors, garage door openers and Wi-Fi systems on a daily basis. Due to their low power, the radio signals do not travel far meaning that risk of interference between users is very low.

2.2 This negates the need for us to coordinate use between users by issuing a WT Act licence. In these circumstances, the WT Act gives Ofcom powers to make regulations that exempt the need for the user of a device to hold a WT Act licence. The regulations must specify the type of equipment and the technical parameters it must meet in order for the exemption to apply.

2.3 SRDs play an important role in the economy, with many mass market radio devices that people use every day falling into this category. As SRD technology develops and more uses for SRDs are found, it is key that our regulations keep up with the pace of change. This requires us to regularly review the technical conditions for the equipment and propose changes when necessary. The aim of these reviews is to establish a predictable environment for sharing the use of spectrum, to improve existing SRD uses and to encourage the development of new uses. This benefits both businesses and consumers, helps facilitate easy access to spectrum and enables innovation.

2.4 This document sets out for consultation a number of proposals to amend the current regulations for a range of devices. Details of these changes are set out in section 3 of this document.

The legislative framework

2.5 Ofcom is responsible for authorising use of the radio spectrum. We permit the use of the radio spectrum either by granting wireless telegraphy licences under the WT Act or by making statutory regulations exempting users of particular equipment from the requirement to hold such a licence. It is unlawful and an offence to install or use wireless telegraphy apparatus without holding a licence granted by Ofcom, unless the use of such equipment is exempted.

2.6 Under section 8 (1) of the WT Act, it is unlawful to establish or use a wireless telegraphy station or install or use wireless telegraphy apparatus except under and in accordance with a wireless telegraphy licence granted under the WT Act.

2.7 Under section 8 (3) of that Act, Ofcom may make regulations exempting from the licensing requirements under section 8 (1) the establishment, installation or use of wireless telegraphy stations or wireless telegraphy apparatus of such classes or description as may be specified in the regulations, either absolutely or subject to such terms, provisions and limitations as may be specified.

2.8 Under section 8(4) of the WT Act, we must 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.

2.9 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.

2.10 Before making any exemption regulations, we are required by section 122(4) of the WT Act to give statutory notice of our proposal to do so. Under section 122(5), such notice must state that we propose to make the regulations in question, set out their general effect, specify an address from which a copy of the proposed regulations or order may be obtained, and specify a time period of at least one month during which any representations with respect to the proposal must be made to us.

Impact Assessment

2.11 This document represents an impact assessment as defined in section 7 of the Communications Act 2003. Impact assessments provide a valuable way of assessing different options for regulation. They form part of best practice policy making.

2.12 In preparing this document, we have considered the citizen and consumer interests relating to SRDs. We have also considered the impact on existing users, and on service providers, manufacturers and users of devices and applications.

2.13 Ofcom is an evidence-based organisation and welcomes responses to this consultation. Any comments about our assessment of the impact of our proposals should be sent to us by the closing date for this consultation. We will consider all comments before deciding whether to implement our proposals. For further information about our approach to impact assessments, see the guidelines 'Better policy making: Ofcom's approach to impact assessments' on our website.

2.14 The analysis presented in this document as a whole constitutes our impact assessment.

Equality Impact Assessment

2.15 Ofcom is separately required by statute to assess the potential impact of all our functions, policies, projects and practices on the following equality groups: age, disability, gender,

gender reassignment, pregnancy and maternity, race, religion or belief, and sexual orientation. Equality impact assessments also assist us in making sure that we are meeting our principal duty of furthering the interests of citizens and consumers regardless of their background or identity. We consider that our proposals would not be detrimental to any of these equality groups.

2.16 The proposals set out in this document would apply equally to all users of SRDs. We have not identified any differential impact of our proposals in relation to the identified equality groups and, in our assessment, they would not disproportionately affect any group of consumers.

2.17 We have not carried out separate equality impact assessments in relation to the additional equality groups in Northern Ireland: religious belief, political opinion and dependents. This is because we anticipate that our proposals would not have a differential impact in Northern Ireland compared to consumers in general. We welcome any stakeholder views on this assessment.

3. Our proposals

3.1 The following section sets out our proposals to:

i) Extend the spectrum available for safety-related Intelligent Transport System (ITS) by 20 MHz, from 5905 to 5925 MHz;

ii) Liberalise the use of 5150 to 5250 MHz for Wireless Access Systems including Radio Local Area Networks (WAS/RLAN) to allow mobile/nomadic use[1] outdoor, and airborne use of the 5170 to 5250 MHz part of the band; and clarify that there is no requirement for Dynamic Frequency Selection (DFS) and transmitter power control (TPC) in the 5150 to 5250 MHz band;

iii) Liberalise some of the technical conditions for some Ultra-Wide Band (UWB) devices;

iv) Close the 24 GHz Automotive Short-Range Radar (SRR) band to new applications; and

v) Make some technical and minor editorial changes to SRD applications in the 870/915 MHz bands.

3.2 These proposals are supported by the recommendations from the CEPT on harmonised standards for SRDs. Ofcom has been integral to the work of CEPT and the technical parameters necessary for SRDs developed by CEPT help to ensure the efficient use of spectrum and the avoidance of interference.

We propose to extend the spectrum available for safety related ITS by 20 MHz from 5905 MHz to 5925 MHz

3.3 Safety related ITS is the term used to describe a number of transport related applications, such as driver aids intended to mitigate against accidents, by providing drivers with additional information and giving an early warning of potential dangers. This provides an early warning to the driver and becomes increasingly time-critical as the vehicle approaches the site of an incident or potential accident. These road ITS systems, includes equipment enabling communication between cars and between the cars and roadside infrastructure.[2]

3.4 Currently, the UK designates the band between 5875 MHz and 5905 MHz for safety related ITS. The technical parameters for safety related ITS equipment are set out in the Wireless Telegraphy (Intelligent Transport Systems) (Exemption) Regulations 2011 (the "2011 Exemption Regulations"). [3]However, for information purposes only, we also publish on our website, "IR 2086 – UK Interface Requirement 2086 Safety Related Applications of

[1] Nomadic use means the device can be move around but is stationary when used, for example, moving a laptop from one location and having to reconnect to the Wi-Fi hotspot in the new location.
[2] In certain cases, such road ITS equipment may also be used off-road (e.g. on industrial, agricultural, or construction sites).
[3] https://www.legislation.gov.uk/uksi/2011/2949/pdfs/uksi_20112949_en.pdf

Intelligent Transport Systems" (IR 2086).[4] IR 2086 has no legal impact but mirrors the technical specifications as set out in the 2011 Exemption Regulations.

3.5 In October 2020, the European Union (EU) published Decision 2020/1426 on the harmonised use of radio spectrum in the 5875 to 5935 MHz frequency band for safety related applications of ITS (the "ITS Decision").[5] The aim of the ITS Decision was to continue to improve and support road safety across Europe with the goal of reducing the number of road fatalities each year. The ITS Decision extended the designated band for safety related ITS from 5905 MHz to 5935 MHz. The ITS Decision extended road ITS up to 5925 MHz and included an additional 10 MHz of spectrum from 5925 to 5935 MHz exclusively for urban rail ITS systems. [6]

3.6 The technical coexistence studies for the ITS Decision had been carried out by CEPT. Throughout the CEPT work, the UK did not support the proposal to provide an additional 10 MHz of spectrum for urban rail in 5925 to 5935 MHz. At CEPT, Ofcom raised concerns over lack of evidence to justify the demand for the additional spectrum for urban rail ITS services as these services are already operating in the 2.4 GHz band in the UK. We did not see the benefit in spectrum efficiency for UK citizens and consumers, as this allocation was specifically to cater for existing and future metro systems located in other parts of Europe. However, we indicated that we could support the implementation of an EU Decision to cover road ITS use up to 5925 MHz.

3.7 On 24 July 2020, prior to the ITS Decision, and in light of increasing demand for wireless connectivity and the new Wi-Fi technologies, the UK designated the lower 6 GHz band, 5925 MHz to 6425 MHz, for Wi-Fi use and other RLAN devices on a licence-exempt basis, enabling indoor and very low power (VLP) outdoor use.[7]

3.8 We are proposing to extend the spectrum available in the UK for safety related ITS by 20 MHz, from the current 5875 to 5905 MHz to a new allocation of 5875 to 5925 MHz.

3.9 The 5905 to 5925 MHz band is already being used by a number of SRDs alongside uses in programme-making and special events, satellite services and military uses. The same users currently share spectrum in the existing safety related ITS allocation in 5875 to 5905 MHz. In light of this, and the technical studies undertaken by CEPT, we believe that extending this use to 5925 MHz would not have a negative impact on other existing users in this band.

3.10 Given the harmonisation of the band for road ITS use across Europe and in the US, we consider that our proposed allocation may provide further improvements in road safety, road transport system efficiency, road-users' experience and encourage innovation. In addition, UK stakeholders may be able to take advantage of the economies of scale that harmonisation of this use would bring.

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[4] https://www.ofcom.org.uk/__data/assets/pdf_file/0033/84948/IR_2086.pdf
[5] https://docdb.cept.org/download/166
[6] Urban rail ITS are systems applied to railway lines guided by at least one control and management system, separated from road and pedestrian traffic.
[7] https://www.ofcom.org.uk/__data/assets/pdf_file/0036/198927/6ghz-statement.pdf

3.11 Should we decide to implement these proposed changes to ITS, we would need to update the legislation. For this, we could either revoke the 2011 Exemption Regulations and incorporate the changes into the Wireless Telegraphy (Exemption) Regulations 2021 (the "2021 Exemption Regulations")[8] or amend the 2011 Exemption Regulations. If we were to revoke the existing 2011 Exemption Regulations, we would look to incorporate all technical conditions for safety related ITS in an updated Interface Requirement (IR) 2030 or IR2086. A copy of the proposed amendments if included in IR 2030, can be found in Annex A1.

Question 1: Do you agree with our proposal to extend safety related ITS by 20 MHz from 5905 MHz to 5925 MHz? If you disagree, please provide the evidence that would support any disagreement with the proposals.

We propose to liberalise the use of 5150 to 5250 MHz for WAS/RLAN and clarify that there is no requirement for DFS and TPC in the band

3.12 Wi-Fi is a short-hand phrase to describe a type of Wireless Local Area Network (WLAN) or (alternatively) Radio Local Area Network (RLAN). WLAN/RLAN systems allow the extension of a local area computer network without needing cables (e.g. wireless internet access in airports or other hotspots, or wireless networks within an individual home). The technical parameters for Wi-Fi applications to be used on a licence exempt basis are set out in IR 2030.

3.13 In July 2021, the ECC Decision (04)08 on the harmonised use of the 5 GHz frequency bands for WAS/RLAN (the "5 GHz Decision") was published.[9] This followed on from the approval of CEPT Report 79[10] which reviewed and revised the technical conditions for the 5 GHz band.

3.14 The 5 GHz Decision made some changes to 5150 to 5350 MHz band which is already designated and harmonised for WAS/RLAN.[11] The 5 GHz Decision relaxed some of the restrictions in the 5150 to 5250 MHz portion of the band and set out some changes. The changes are to:

- allow mobile/nomadic outdoor use but not fixed outdoor use in the 5150 to 5250 MHz part of the band; and
- allow airborne use in the 5170 to 5250 MHz part of the band.

3.15 In line with the 5 GHz Decision, we propose to make changes in relation to the 5150 to 5250 MHz part of the band. We propose to relax the outdoor restrictions by allowing mobile/nomadic use in the 5150 to 5250 MHz part of the band. The changes would

[8] https://www.legislation.gov.uk/uksi/2021/493/pdfs/uksi_20210493_en.pdf ; amended by https://www.legislation.gov.uk/uksi/2021/948/pdfs/uksi_20210948_en.pdf
[9] https://docdb.cept.org/download/3450
[10] https://docdb.cept.org/download/3453
[11] With a maximum mean e.i.r.p of 200 mW and maximum mean e.i.r.p density of 10 mW/MHz in any 1 MHz band.

liberalise the conditions on WAS/RLAN use in the 5150 to 5250 MHz band and will enable the development of new, innovative applications. Given this, and based on technical studies carried out at CEPT, we consider that the relaxation of the outdoor use for non-fixed operations as proposed, would not negatively impact incumbent services.

3.16 Airborne use is not currently permitted in the 5150 to 5350 MHz band in the UK. In line with the 5 GHz Decision, we are proposing to allow airborne use in the 5170 to 5250 MHz part of the band. We are not proposing to permit airborne use in 5150 to 5170 MHz due to the protection requirements of the aeronautical radionavigation service. We believe that permitting airborne use in 5170 to 5250 MHz band would increase the amount of spectrum that devices such as drones would be able to use.

3.17 In addition to the liberalised use of 5150 to 5250 MHz, we are also proposing to clarify that there is no requirement for Dynamic Frequency Selection (DFS) and transmitter power control (TPC) for WAS/RLAN use in the 5150 to 5250 MHz band. In the current version of IR 2030, the channel access and occupation rules (which includes the mention of DFS and TPC) are presented in the same row, making it appear that DFS and TPC apply to the whole of the 5150 to 5350 MHz frequency range. This does not make it clear that the requirement for DFS and TPC only applies to the 5250 to 5350 MHz range. To remove this potential for confusion, we are proposing to present the requirements for the 5150 to 5250 MHz and 5250 to 5350 MHz bands in separate rows in IR 2030.

3.18 Should we decide to make the proposed changes, we would amend the technical conditions in IR2030; a draft of the proposed changes can be found in Annex A1.

Question 2: Do you agree with our proposal to permit outdoor mobile/nomadic use of 5150 to 5250 MHz and airborne use in 5170 to 5250 MHz bands for WAS/RLAN applications, as well as our proposal to clarify the DFS and TPC requirement in the 5250 to 5350 MHz band? If you disagree, please provide the evidence that would support any disagreement with the proposals.

We propose to liberalise some of the technical conditions in some UWB devices

3.19 UWB devices use very large bandwidths and are able to transmit high data rates over short distances but transmit at very low power levels. As a result of this, they are able to operate spectrum used by other devices without causing interference. Applications of UWB devices include wireless streaming of videos and connecting cameras to TVs, as well as sensing of objects behind walls, in the ground or analysis of materials. The technical provisions for UWB devices are set out in exemption regulations (the "2015 UWB Regulations"),[12] as amended.[13]

[12] https://www.legislation.gov.uk/uksi/2015/591/pdfs/uksi_20150591_en.pdf
[13] https://www.legislation.gov.uk/uksi/2018/44/pdfs/uksi_20180044_en.pdf

3.20 On 14 May 2019, the European Commission harmonised the technical conditions across the EU for UWB equipment (the "UWB Decision").[14] The UWB Decision liberalised some of the technical conditions for UWB material-sensing devices and set a power limit for all material-sensing devices, including building material analysis (BMA) in the 8.5 to 10.6 GHz band to– 65 dBm/MHz. It also introduced a trigger-before-transmit mitigation for operating vehicle keyless entry systems in the 3.8 to 4.2 GHz and 6 to 8.5 GHz frequency bands.

3.21 We propose to amend technical conditions for material sensing including BMA as set out in the UWB Decision by describing these devices in a more neutral way in order to allow for innovative uses. This would also clarify the possibility for generic UWB to be used for material sensing applications without conflicting with the technical requirements for generic UWB applications. As for the power limit of – 65 dBm/MHz, this would ensure consistency of limits by aligning material sensing devices including BMA with more generic material sensing devices.

3.22 Our proposal also introduces new technical conditions based on UWB technology for vehicle keyless entry systems. It will enable the use of a new approach to key fob access which involves an in-car transceiver and key fob using UWB technology rather than traditional passive narrowband systems. The trigger-before-transmit mitigation technology for operating vehicle keyless entry systems enables more secure low-power keyless access to cars compared to the current keyless entry systems. It ensures that UWB transmissions only occur when necessary, particularly where UWB devices are nearby.

3.23 This UWB technology improves safety and would, over time, reduce the risk of opportunistic vehicle thefts through 'relay attacks'. We expect that these devices will slowly begin to apply to new vehicles (expected to be with high-end vehicles to start) coming onto market, when a harmonised European Telecommunications Standards Institute (ETSI) standard is developed. The addition of the trigger-before-transmit requirement will encourage efficiency in the use of the spectrum by helping to reduce the occupancy of the channel and noise in the spectrum.

3.24 The changes to the technical conditions, if introduced, would support the overall harmonisation of the UWB technology across Europe. It would help eliminate barriers to the take-up of UWB technology; promote innovation of UWB technology; obtain the benefits of economies of scale; and reduce risk of interference which could help reduce the cost of equipment to consumers and prevent or limit interference to other devices.

3.25 Should we decide to implement these proposed changes to UWB, we would need to update the legislation. For this, we could either revoke the 2015 UWB Regulations, as amended, and incorporate the changes into new exemption regulations or amend the 2021 Exemption Regulations. If we were to revoke the existing 2015 UWB Regulations, as amended, we would look to see if it is possible to include the technical provisions in an IR.

[14] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32019D0785&from=EN

3.26 The new IR would not be making any substantive changes to the existing UWB technical conditions as set out in our regulations, instead it would be transposing the technical conditions to provide greater clarity and ease of accessing UWB technical conditions. A copy of a potential draft IR on UWB can be found in Annex A2.

Question 3: Do you agree with our proposal to liberalise some of the technical conditions in some UWB devices? If you disagree, please provide the evidence that would support any disagreement with the proposals.

We propose to close the 24 GHz Automotive SRR band to new SRR applications

3.27 The use of automotive SRR equipment has been identified as one of the ways of improving road safety. Cars with onboard radars can detect possible collisions, such as with other cars, walls or pedestrians. If a potential collision is detected, the system can alert the driver as well as trigger some automatic safety measures, if fitted.

3.28 In March 2005, in line with the European Commission (EC) Decision 2004/545/EC, [15]Ofcom designated the 79 GHz band (77 to 81 GHz) as the permanent band for development and deployment of automotive SRR equipment on a licence-exempt basis.[16] However, in June of that year,[17] following EC Decision 2005/50/EC,[18] we permitted the licence-exempt use of automotive SRR in the 24 GHz band, from 21.65 to 26.65 GHz, on a temporary basis.[19] This band was viewed as an immediate cost-effective solution for enabling quick rollout of automotive SRR.

3.29 The CEPT conducted studies, set out in ECC Report 023,[20] on the compatibility of 24 GHz automotive SRR band with other services, such as fixed service, radio astronomy service and earth exploration satellite service. The report concluded that the deployment of 24 GHz SRR is not feasible in the long term. CEPT recognised that the 79 GHz band is the most suitable for SRR equipment in the long term. Given this, the EC originally expected that, by 1 July 2013, the technology for the systems in the 79 GHz band would be ready for lower cost, mass market distribution and the use of the 24 GHz band would be phased out.

3.30 In June 2013, Ofcom implemented an EC Decision[21] by making regulations (SRR Regulations).[22] We closed the 24 GHz band from 21.65 to 24.25 GHz to new automotive SRR uses but permitted certain SRR equipment in the 24 GHz band from the 24.25 to 26.65

[15] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32004D0545&from=en
[16] https://www.legislation.gov.uk/uksi/2005/353/pdfs/uksi_20050353_en.pdf
[17] https://www.legislation.gov.uk/uksi/2005/1585/made/data.pdf
[18] https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2005:021:0015:0020:EN:PDF
[19] https://www.legislation.gov.uk/uksi/2005/1585/pdfs/uksi_20051585_en.pdf
[20] https://docdb.cept.org/download/271
[21] https://www.legislation.gov.uk/eudn/2011/485/pdfs/eudn_20110485_adopted_en.pdf
[22] https://www.legislation.gov.uk/uksi/2013/1437/pdfs/uksi_20131437_en.pdf amended by https://www.legislation.gov.uk/uksi/2020/1583/pdfs/uksi_20201583_en.pdf

GHz band on a temporary basis after 30 June 2013.[23] Thus, after 30 June 2013, all new SRR equipment could use the smaller band 24.25 to 26.65 GHz until the 1 January 2018 (this date was extended by 4 years until 1 January 2022 for certain types of SRR equipment).[24]

3.31 In March 2021, the ECC Decision (04)10 relating to the 24 GHz automotive SRR (the "ECC Decision)[25] was published. The ECC Decision on automotive SRR looked to phase out the deployment of wideband automotive SRR equipment in the 24 GHz (24.25 to 26.65 GHz) band, as planned. It set out a date of 1 January 2022 for this to occur.

3.32 In line with other European countries, we are proposing to close the 24 GHz band for any new SRR applications or deployments. This would mean that no further SRR application would be permitted to be installed in the 24 GHz band after the regulations come into force. Users of existing equipment may however continue to use it for so long as they wish to maintain the originally installed equipment (e.g. providing spare parts, etc.).

3.33 Although we note that our consultation is taking place after the January deadline, should we proceed with our proposal, we do not believe this will have a significant impact on the use of this band or on stakeholders. As this is a harmonisation decision and applies across all European administrations, we believe that most vehicle manufacturers would have already taken steps to switch over to the 79 GHz band or use an alternative technology.

3.34 This change will provide car manufacturers and consumers with certainty that deployment of road safety systems is aligned across Europe. After this date, across Europe, automotive manufacturers would have to use the 79 GHz band, which has been earmarked as the permanent band for automotive SRR equipment since 2005.

Question 4: Do you agree with our proposal to close the 24 GHz SRR band to new applications? If you disagree, please provide the evidence that would support any disagreement with the proposals.

We propose to make some technical and minor editorial changes to SRD applications in the 870/915 MHz bands

3.35 SRD applications in the 870/915 MHz bands are typically used for tracking, tracing and data acquisition. As part of the ongoing process to continue to review technical parameters of SRDs, CEPT produced on 5 March 2021 Report 77 (CEPT Report 77),[26] which sets out the conditions relating to SRDs that operate in the 874 to 876 MHz and 915 to 921 MHz frequency bands. The report proposed to amend the definition in relation to certain SRDs, in order to avoid ambiguity and ensure consistency with EC Decision 2006/771/EC. It also

[23] The SRR Regulations also revoked the use of part of the 24 GHz band between 21.65 and 24.25 GHz for automotive SRR equipment except where the existing equipment was already installed or was replacing spare parts that were originally installed between 1 July 2005 and 30 June 2013.
[24] This covers SRR equipment mounted on motor vehicles for which a type-approval application has been submitted and had been granted before 1 January 2018.
[25] https://docdb.cept.org/download/1678
[26] https://docdb.cept.org/download/139

proposed to re-assess of some technical parameters for categories of SRDs covered by EU Decision 1538.[27]

3.36 The proposals relaxed some of the requirements applicable to fixed devices in three bands (870 to 874.4 MHz, 917.3 to 918.9 MHz and 917.4 to 919.4 MHz). Specifically, the proposals relaxed the requirement that all such devices be controlled by network access points, and proposed instead that only mobile and nomadic devices should be controlled by a "master" network access point. In addition, it made technical changes to introduce a minimum channel bandwidth in 917.4 to 919.4 MHz to provide clarity and ensure that it aligns with the parameters already set for non-specific SRD[28] bands.

3.37 Based on the proposals set out in CEPT Report 77, we are proposing to implement the changes set out above. We believe that the proposed changes would clarify the text in a couple of existing licence exemptions and relax some rules for fixed SRD network devices in the 870/915 MHz bands. These changes should help reduce barriers to access to these bands and enable the deployment of a wider range of equipment. Since we are not proposing amendment of technical parameters, we do not expect a negative impact on existing users of the bands.

3.38 The technical provisions for these changes are currently set out in IR 2030. A copy of the proposed amendments to IR 2030 can be found in Annex A1.

Question 5: Do you agree with our proposal to make some technical and minor editorial changes to SRD applications in the 870/915 MHz bands? If you disagree, please provide the evidence that would support any disagreement with the proposals.

Next Steps

3.39 Stakeholders are invited to provide their feedback on the proposals set out in this document by 4 July 2022.

3.40 We will carefully consider the responses. Should we decide to proceed with our proposals, we would then:

- publish a statement setting out our decision and describing the actions needed to implement it; and
- consult on changes to the legislation, as set out in section 122(4) of the WT Act, which allows user equipment to be exempt from the need to hold a licence.

[27] CEPT Report 77 constitutes the technical basis for the EU Decision 2022/172 published on 7 February 2022 - https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32022D0172&from=EN

[28] Non-specific SRDs are generic SRDs that can be used for any application.

Proposed changes to the UK Radio IR 2030 for SRDs

A1.1 This annex shows the changes that we are proposing to make to IR 2030. We have taken the following approach to show the changes that we are proposing to make:

a) the words written in bold and highlighted in yellow are those that we are proposing to insert (e.g. "**example**");

b) the words struck through are those that we are proposing to delete (e.g. "~~example~~").

Table: Minimum requirements for the use of Short-Range Devices

	Normative Part								Informative Part
Interface / Notification number / Date	**Application**	**Comments to application**	**Frequency band**	**Comments to frequency band**	**Maximum transmit power / Power spectral density / Field strength**	**Comments to Maximum transmit power / Power spectral density / Field strength**	**Channelling**	**Channel access and occupation rules**	**Reference**
IR 2030/1/47	Non-specific short- range devices	This set of usage conditions is only available **for short range devices in** data networks. All **mobile and nomadic** devices within the data network ~~under the control of~~ **controlled by a master** network access **point** ~~points~~. Airborne use is not permitted.	870 - 874.4 MHz		500 mW e.r.p.	Adaptive Power Control (APC) required, alternatively other mitigation techniques which achieve at least an equivalent level of spectrum compatibility.	Bandwidth: ≤ 200 kHz	Duty cycle: ≤ 10 % for network access points, ≤ 2.5 % otherwise. Techniques to access spectrum and mitigate interference that provide at least equivalent performance to the techniques described in relevant designated standards specified in the notice of publication must be used.	
IR2030/1/49	Non-specific short- range devices	This set of usage conditions is only available for short- range devices in data	917.3 - 918.9 MHz		500 mW e.r.p.	Transmissions only permitted within thefrequency ranges 917.3 - 917.7 MHz,	Bandwidth: ≤ 200 kHz Duty cycle: ≤ 10 % for	Techniques to access spectrum and mitigate interference that provide at least	

		networks. All **mobile and nomadic** devices within the data network shall be ~~under the control of~~ **controlled by a master** network access **point** ~~points.~~ Airborne use is not permitted.				918.5 - 918.9 MHz Adaptive Power Control (APC) required, alternatively other mitigation techniques which achieve at least anequivalent level ofspectrum compatibility	network access points Duty cycle: ≤ 2.5 % otherwise	equivalent performance to the techniques described in designated standards specified in the notice of publication must be used.	
IR2030/1/48	Non-specific short- range devices	This set of usage conditions is only available for **short-range devices in** data networks. All **mobile and nomadic** devices within the data network shall be ~~under the control of~~ **controlled by a master** network access **point** ~~points~~	917.4 - 919.4 MHz		25 mW e.r.p.		Bandwidth: ≤ 600 kHz	Duty cycle: ≤ 1 % Techniques to access spectrum and mitigate interference that provide at least equivalent performance to the techniques described in designated standards specified in the notice of publication must be used.	
IR 2030/7/5	Wideband Data Transmission Systems	This set of usage conditions is only available for wideband short-range devices in data networks. . All **mobile and nomadic** devices	917.4 - 919.4 MHz		25 mW e.r.p.	**Bandwidth ≥ 600 kHz**	Bandwidth: ≤ 1 MHz Duty cycle: ≤ 10 % for network access points	Techniques to access spectrum and mitigate interference that provide at least equivalent performance to the techniques described in designated standards specified in	

		within the data network shall be ~~under the control of~~ **controlled by a master** network access **point** ~~points~~					Duty cycle: ≤ 2.8 % otherwise	the notice of publication must be used.	
~~IR2030/8/1~~	~~Wireless Access Systems (WAS)~~	~~Aeronautical mobile use is not permitted.~~ ~~The apparatus may only be used within abuilding or aircraft orany other enclosed space with attenuation characteristics at least as strong as those of either a~~	~~5150 – 5350 MHz~~		~~200 mW mean e.i.r.p/10 mW/MHz mean e.i.r.p~~			~~Techniques to access spectrum and mitigate interference, including Dynamic Frequency Selection (DFS) and Transmit Power Control, that provide at least equivalent performance to the techniques described indesignated standards specified in the notice of publication for 5150 – 5250 must be used.~~	~~EN 301 893~~ ~~Nominal Centre Frequency (MHz)~~ ~~5180~~ ~~5200~~ ~~5220~~ ~~5240~~ ~~5260~~ ~~5280~~
IR2030/8/1a	**Wireless Access Systems (WAS)**	**Airborne use outside of an aircraft is only permitted in 5170 – 5250 MHz.** **The apparatus may only be used**	**5150-5250 MHz**		**Maximum mean e.i.r.p of 200 mW and maximum mean e.i.r.p**			**Techniques to access spectrum and mitigate interference that provide at least equivalent performance to the techniques**	**EN 301 893**

		within abuilding or aircraft orany other enclosed space with attenuation characteristics at least as strong as those of either a building or an aircraft, and only to establish a connection with a station or apparatus within the same building or aircraft orother enclosed space.			density of 10 mW/MHz in any 1 MHz band.			described in designated standards specified in the notice of publication must be used.	
IR2030/8/1b	Wireless Access Systems (WAS)	Aeronautical mobile use is not permitted. The apparatus may only be used within abuilding or aircraft orany other enclosed space with attenuation characteristics at least as strong as those of either a building or an	5250-5350 MHz		Maximum mean e.i.r.p of 200 mW and maximum mean e.i.r.p density of 10 mW/MHz in any 1 MHz band.			Techniques to access spectrum and mitigate interference, including Dynamic Frequency Selection (DFS) and transmit power control (TPC), that provide at least equivalent performance to the techniques described in designated standards specified in the notice of	EN 301 893

		aircraft, and only to establish a connection with a station or apparatus within the same building or aircraft orother enclosed space.						publication must be used.	
IR2030/14/23	Safety Related Applications of Intelligent Transport Systems		5875 – 5925 MHz		33 dBm e.i.r.p. and 23 dBm/MHz e.i.r.p.			Techniques to access spectrum and mitigate interference including, transmit power control (TPC) range of at least 30dB that provide at least equivalent performance to the techniques described in designated standards specified in the notice of publication must be used.	EN 302 571

Proposed new UK Radio IR 2108 for UWB devices

A2.1 The UWB technical conditions are not currently included in any IR, instead they are set out in the 2015 UWB Regulations, as amended.

A2.2 Should we proceed with implementing our proposed changes by incorporating an IR into legislation, the proposed new IR 2108 for UWB, would not be making any substantive changes to the existing UWB technical conditions as set out in our regulations, instead it would be transposing the technical conditions to provide greater clarity and ease of accessing UWB technical conditions. If we amend the 2015 UWB Regulations, these provisions will be incorporated into the legislation.

A2.3 For ease of reference, we have set out below the potential draft IR 2108 for UWB.

Table 3.1: Minimum requirements for the use of Ultra-Wide Band devices

Mandatory (1-10)		
1	Frequency band(s)	9kHz – 275 GHz
2	Radiocommunication Service	N/A
3	Application	UWB
4	Channelling	N/A
5	Modulation / Occupied bandwidth	See tables
6	Direction / Separation	See tables
7	Maximum Transmit Power	See tables
8	Channel access and occupation rules	See tables
9	Authorisation regime	Licence exempt
10	Additional essential requirements	N/A
Informative (11-13)		
11	Frequency planning assumptions	N/A
12	Planned changes	None planned
13	Reference	CEPT Report 69
14	Notification	-
15	Remarks	

1. **GENERIC ULTRA-WIDEBAND (UWB) USAGE**

Technical requirements

Frequency range	Maximum mean power spectral density (e.i.r.p.)	Maximum peak power (e.i.r.p.) (defined in 50 MHz)
f ≤ 1.6 GHz	– 90 dBm/MHz	– 50 dBm
1.6 < f ≤ 2.7 GHz	– 85 dBm/MHz	– 45 dBm
2.7 < f ≤ 3.1 GHz	– 70 dBm/MHz	– 36 dBm
3.1 < f ≤ 3.4 GHz	– 70 dBm/MHz or – 41.3 dBm/MHz using LDC (1) or DAA (2)	– 36 dBm or 0 dBm
3.4 < f ≤ 3.8 GHz	– 80 dBm/MHz or – 41.3 dBm/MHz using LDC (1) or DAA (2)	– 40 dBm or 0 dBm
3.8 < f ≤ 4.8 GHz	– 70 dBm/MHz or – 41.3 dBm/MHz using LDC (1) or DAA (2)	– 30 dBm or 0 dBm
4.8 < f ≤ 6 GHz	– 70 dBm/MHz	– 30 dBm
6 < f ≤ 8.5 GHz	– 41.3 dBm/MHz	0 dBm
8.5 < f ≤ 9 GHz	– 65 dBm/MHz or – 41.3 dBm/MHz using DAA (2)	– 25 dBm or 0 dBm
9 < f ≤ 10.6 GHz	– 65 dBm/MHz	– 25 dBm
f > 10.6 GHz	– 85 dBm/MHz	– 45 dBm

(1) Within the 3.1 GHz to 4.8 GHz band. The Low Duty Cycle ('LDC') mitigation technique and its limits are defined in clauses 4.5.3.1,
4.5.3.2 and 4.5.3.3 of ETSI Standard EN 302 065-1 V2.1.1. Alternative mitigation techniques may be used if they ensure at least an equivalent performance and level of spectrum protection in order to comply with the corresponding essential requirements of The Radio Equipment Regulations 2017 (SI 2017/1206).

(2) Within the 3.1 GHz to 4.8 GHz and 8.5 GHz to 9 GHz bands. The Detect and Avoid ('DAA') mitigation technique and its limits are defined in clauses 4.5.1.1, 4.5.1.2 and 4.5.1.3 of ETSI Standard EN 302 065-1 V2.1.1. Alternative mitigation techniques may be used if they ensure at least an equivalent performance and level of spectrum protection in order to comply with the corresponding essential requirements of The Radio Equipment Regulations 2017 (SI 2017/1206).

2. **LOCATION TRACKING SYSTEMS Type 1 (LT1)**

Technical requirements

Frequency range	Maximum mean power spectral density (e.i.r.p.)	Maximum peak power (e.i.r.p.) (defined in 50 MHz)
f ≤ 1.6 GHz	– 90 dBm/MHz	– 50 dBm
1.6 < f ≤ 2.7 GHz	– 85 dBm/MHz	– 45 dBm

Technical requirements

Frequency range	Maximum mean power spectral density (e.i.r.p.)	Maximum peak power (e.i.r.p.) (defined in 50 MHz)
2.7 < f ≤ 3.4 GHz	– 70 dBm/MHz	– 36 dBm
3.4 < f ≤ 3.8 GHz	– 80 dBm/MHz	– 40 dBm
3.8 < f ≤ 6.0 GHz	– 70 dBm/MHz	– 30 dBm
6 < f ≤ 8.5 GHz	– 41.3 dBm/MHz	0 dBm
8.5 < f ≤ 9 GHz	– 65 dBm/MHz or – 41.3 dBm/MHz using DAA ([1])	– 25 dBm or 0 dBm
9 < f ≤ 10.6 GHz	– 65 dBm/MHz	– 25 dBm
f > 10.6 GHz	– 85 dBm/MHz	– 45 dBm

([1]) The DAA mitigation technique and its limits are defined in clauses 4.5.1.1, 4.5.1.2 and 4.5.1.3 of ETSI Standard EN 302 065-2 V2.1.1. Alternative mitigation techniques may be used if they ensure at least an equivalent performance and level of spectrum protection in order to comply with the corresponding essential requirements of The Radio Equipment Regulations 2017 (SI 2017/1206).

3. **UWB DEVICES INSTALLED IN MOTOR AND RAILWAY VEHICLES**

Technical requirements

Frequency range	Maximum mean power spectral density (e.i.r.p.)	Maximum peak power (e.i.r.p.) (defined in 50 MHz)
f ≤ 1.6 GHz	– 90 dBm/MHz	– 50 dBm
1.6 < f ≤ 2.7 GHz	– 85 dBm/MHz	– 45 dBm
2.7 < f ≤ 3.1 GHz	– 70 dBm/MHz	– 36 dBm

3.1 < f ≤ 3.4 GHz	– 70 dBm/MHz or – 41.3 dBm/MHz using LDC (1) + e.l. (4)or – 41.3 dBm/MHz using TPC (3)+ DAA (2) + e.l. (4)	– 36 dBm or ≤ 0 dBm or ≤ 0 dBm
3.4 < f ≤ 3.8 GHz	– 80 dBm/MHz or – 41.3 dBm/MHz using LDC (1) + e.l. (4)or – 41.3 dBm/MHz using TPC (3)+DAA (2) + e.l. (4)	– 40 dBm or ≤ 0 dBm or ≤ 0 dBm
3.8 < f ≤ 4.8 GHz	– 70 dBm/MHz or – 41.3 dBm/MHz using LDC (1) + e.l. (4)or – 41.3 dBm/MHz using TPC (3)+DAA (2) + e.l. (4)	– 30 dBm or ≤ 0 dBm or ≤ 0 dBm
4.8 < f ≤ 6 GHz	– 70 dBm/MHz	– 30 dBm

Technical requirements

Frequency range	Maximum mean power spectral density (e.i.r.p.)	Maximum peak power (e.i.r.p.) (defined in 50 MHz)
6 < f ≤ 8.5 GHz	– 53.3 dBm/MHz or – 41.3 dBm/MHz using LDC (1) + e.l. (4)or – 41.3 dBm/MHz using TPC (3) + e.l. (4)	– 13.3 dBm or ≤ 0 dBm or ≤ 0 dBm
8.5 < f ≤ 9 GHz	– 65 dBm/MHz or – 41.3 dBm/MHz using TPC (3)+DAA (2) + e.l. (4)	– 25 dBm or ≤ 0 dBm
9 < f ≤ 10.6 GHz	– 65 dBm/MHz	– 25 dBm
f > 10.6 GHz	– 85 dBm/MHz	– 45 dBm

(1) The LDC mitigation technique and its limits are defined in clauses 4.5.3.1, 4.5.3.2 and 4.5.3.3 of ETSI Standard EN 302 065-3 V2.1.1. Alternative mitigation techniques may be used if they ensure at least an equivalent performance and level of spectrum protection in order to comply with the corresponding essential requirements of The Radio Equipment Regulations 2017 (SI 2017/1206)..

(2) The DAA mitigation technique and its limits are defined in clauses 4.5.1.1, 4.5.1.2 and 4.5.1.3 of ETSI Standard EN 302 065-3 V2.1.1. Alternative mitigation techniques may be used if they ensure at least an equivalent performance and level of spectrum pro tection in order to comply with the corresponding essential requirements of The Radio Equipment Regulations 2017 (SI 2017/1206)..

(3) The Transmit Power Control ('TPC') mitigation technique and its limits are defined in clauses 4.7.1.1, 4.7.1.2 and 4.7.1.3 of ETSI Standard EN 302 065-3 V2.1.1. Alternative mitigation techniques may be used if they ensure at least an equivalent

performance and level of spectrum protection in order to comply with the corresponding essential requirements of The Radio Equipment Regulations 2017 (SI 2017/1206).

(4) The exterior limit (e.l.) ≤ – 53,3 dBm/MHz is required. The exterior limit is defined in clauses 4.3.4.1, 4.3.4.2 and 4.3.4.3 of ETSI Standard EN 302 065-3 V2.1.1. Alternative mitigation techniques may be used if they ensure at least an equivalent performance and level of spectrum protection in order to comply with the corresponding essential requirements of The Radio Equipment Regulations 2017 (SI 2017/1206).

Technical requirements to be used within the bands 3,8-4,2 GHz and 6-8,5 GHz for vehicular access systems using trigger-before-transmit are defined in the following table.

Technical requirements

Frequency range	Maximum mean power spectral density (e.i.r.p.)	Maximum peak power (e.i.r.p.) (defined in 50 MHz)
3.8 < f ≤ 4.2 GHz	– 41.3 dBm/MHz with trigger-before-trans-mit operation and LDC ≤ 0.5 % (in 1h)	0 dBm
6 < f ≤ 8.5 GHz	– 41,3 dBm/MHz with trigger-before-trans- mit operation and LDC ≤ 0.5 % (in 1h) or TPC	0 dBm

'Trigger-before-transmit' mitigation is defined as a UWB transmission that is only initiated when necessary, specifically where the system indicates that UWB devices are nearby. The communication is either triggered by a user or by the vehicle. The subsequent communication can be considered as 'triggered communication'. The existing LDC mitigation applies (or alternatively TPC in the 6 GHz to 8.5 GHz range). An exterior limit requirement must not be applied when using the trigger-before-transmit mitigation technique for vehicular access systems.

Trigger-before-transmit mitigation techniques that provide an appropriate level of performance in order to comply withthe essential requirements of The Radio Equipment Regulations 2017 (SI 2017/1206) shall be used for vehicular access systems. If relevant techniques are described in designated standards or parts thereof specified in the notice of publication.

4. **UWB ONBOARD AIRCRAFT**

The values for maximum mean power spectral density (e.i.r.p.) and maximum peak power (e.i.r.p.) for short-range devices using UWB technology, with or without use of mitigation techniques are listed in the table below.

Technical requirements

Frequency range	Maximum mean power spectral density (e.i.r.p.)	Maximum peak power (e.i.r.p.) (defined in 50 MHz)	Requirements for mitigation techniques
f ≤ 1.6 GHz	– 90 dBm/MHz	– 50 dBm	
1.6 < f ≤ 2.7 GHz	– 85 dBm/MHz	– 45 dBm	
2.7 < f ≤ 3.4 GHz	– 70 dBm/MHz	– 36 dBm	

3.4 < f ≤ 3.8 GHz	– 80 dBm/MHz	– 40 dBm	
3.8 < f ≤ 6.0 GHz	– 70 dBm/MHz	– 30 dBm	
6.0 < f ≤ 6.650 GHz	– 41.3 dBm/MHz	0 dBm	
6.650 < f ≤ 6.6752 GHz	– 62.3 dBm/MHz	– 21 dBm	notch of 21 dB should be implemented to meet the – 62.3 dBm/MHz (1) level
6.6752 < f ≤ 8.5 GHz	– 41.3 dBm/MHz	0 dBm	7.25 to 7.75 GHz (FSS and MetSat (7.45to 7.55 GHz) protection) (1) (2) 7.75 to 7.9 GHz (MetSat protection) (1) (3)
8.5 < f ≤ 10.6 GHz	– 65 dBm/MHz	– 25 dBm	
f > 10.6 GHz	– 85 dBm/MHz	– 45 dBm	

(1) Alternative mitigation techniques, such as the use of shielded portholes, may be used if they ensure at least an equivalent performance.

(2) 7.25 to 7.75 GHz (Fixed Satellite Service) and 7.45 to 7.55 GHz (Meteorological Satellite) protection: $– 51.3 – 20 \times \log_{10}(10[km]/x[km])$(dBm/MHz) for heights above ground of over 1 000 m, where x is the aircraft height above ground in kilometres, – 71.3 dBm/MHz for heights above ground of 1 000 m and below.

(3) 7.75 to 7.9 GHz (Meteorological Satellite) protection:
$– 44,3 – 20 \times \log_{10}(10$ [km]/x[km]) (dBm/MHz) for heights above ground of over 1 000 m, where x is the aircraft height above ground in kilometres, and – 64.3 dBm/MHz for heights above ground of 1 000 m and below.

5. MATERIAL SENSING DEVICES USING UWB TECHNOLOGY

5.1. Introduction

UWB material sensing devices are split into two classes:

— Contact based UWB material sensing devices, for which the UWB transmitter is only switched on when in direct contact with the material under investigation;

— Non-contact based UWB material sensing devices, for which the UWB transmitter is only switched on when it is near the investigated material and the UWB transmitter is directed towards the material under investigation (for example manually by using a proximity sensor or by mechanical design).

Material sensing devices based on UWB technology shall comply either with the generic UWB regulation based on technical conditions specified in section 1 of this Annex or with the specific limits for material sensing devices as defined in sections 5.2 and 5.3.

The generic UWB regulation excludes fixed outdoor installations. Emissions radiated by a material sensing device must not exceed the limits of the regulation for generic UWB usage specified in section 1. Material sensing devices must fulfil the requirements of mitigation techniques specified for the generic use of UWB in section 1.

The specific limits for material sensing devices including the mitigation techniques are listed in the following tables. Emissions radiating from material sensing devices permitted under this Decision must be kept to a minimum andin any case not exceed the emission limits within the following tables. Compliance with the specific limits must be ensured by the device placed on a representative structure of the investigated material. The specific limits listed in the following tables are applicable in all

environments for material sensing devices, except those to which note 5 of these tables, which excludes fixed outdoor installation in certain applicable frequency ranges, applies.

5.2. **Contact based material sensing devices**

The specific limits for maximum mean power spectral density (e.i.r.p.) and maximum peak power (e.i.r.p.) for contact based material sensing devices using UWB technology are defined in the table below.

Technical requirements for contact based UWB material sensing devices

Frequency range	Maximum mean power spectral density (e.i.r.p.)	Maximum peak power (e.i.r.p.) (defined in 50 MHz)
f ≤ 1.73 GHz	– 85 dBm/MHz (1)	– 45 dBm
1.73 < f ≤ 2.2 GHz	– 65 dBm/MHz	– 25 dBm
2.2 < f ≤ 2.5 GHz	– 50 dBm/MHz	– 10 dBm
2.5 < f ≤ 2.69 GHz	– 65 dBm/MHz (1) (2)	– 25 dBm
2.69 < f ≤ 2.7 GHz (4)	– 55 dBm/MHz (3)	– 15 dBm
2.7 < f ≤ 2.9 GHz	– 70 dBm/MHz (1)	– 30 dBm
2.9 < f ≤ 3.4 GHz	– 70 dBm/MHz (1) (6) (7)	– 30 dBm
3.4 < f ≤ 3.8 GHz (4)	– 50 dBm/MHz (2) (6) (7)	– 10 dBm
3.8 < f ≤ 4.8 GHz	– 50 dBm/MHz (6) (7)	– 10 dBm
4.8 < f ≤ 5.0 GHz (4)	– 55 dBm/MHz (2) (3)	– 15 dBm
5.0 < f ≤ 5.25 GHz	– 50 dBm/MHz	– 10 dBm
5.25 < f ≤ 5.35 GHz	– 50 dBm/MHz	– 10 dBm
5.35 < f ≤ 5.6 GHz	– 50 dBm/MHz	– 10 dBm
5.6 < f ≤ 5.65 GHz	– 50 dBm/MHz	– 10 dBm
5.65 < f ≤ 5.725 GHz	– 50 dBm/MHz	– 10 dBm
5.725 < f ≤ 6.0 GHz	– 50 dBm/MHz	– 10 dBm
6.0 < f ≤ 8.5 GHz	– 41.3 dBm/MHz (5)	0 dBm
8.5 < f ≤ 9.0 GHz	– 65 dBm/MHz (7)	– 25 dBm

Technical requirements for contact based UWB material sensing devices

Frequency range	Maximum mean power spectral density (e.i.r.p.)	Maximum peak power (e.i.r.p.) (defined in 50 MHz)
9.0 < f ≤ 10.6 GHz	– 65 dBm/MHz	– 25 dBm
f > 10.6 GHz	– 85 dBm/MHz	– 45 dBm

(1) Devices using the Listen Before Talk ('LBT') mechanism are permitted to operate in the 1.215 GHz to 1.73 GHz frequency range with a maximum mean e.i.r.p. spectral density of -70 dBm/MHz and in the 2.5 GHz to 2.69 GHz and 2.7 GHz to 3.4 GHz frequency ranges with a maximum mean e.i.r.p. spectral density of – 50 dBm/MHz and a maximum peak e.i.r.p. of
– 10 dBm/50 MHz. The LBT mechanism is defined in clauses 4.5.2.1, 4.5.2.2 and 4.5.2.3 of ETSI Standard EN 302 065-4 V1.1.1. Alternative mitigation techniques may be used if they ensure at least an equivalent performance and level of spectrum protection in order to comply with the corresponding essential requirements of The Radio Equipment Regulations 2017 (SI 2017/1206).

(2) To protect the radio services, non-fixed installations must fulfil the following requirement for total radiated power:
  (a) In the 2.5 GHz to 2.69 GHz and 4.8 GHz to 5 GHz frequency ranges, the total power spectral density must be 10 dB belowthe maximum e.i.r.p. spectral density.
  (b) In the 3.4 GHz to 3.8 GHz frequency range, the total power spectral density must be 5 dB below the maximum e.i.r.p. spectral density.

(3) To protect the Radio Astronomy Service (RAS) in the 2.69 GHz to 2.7 GHz and 4.8 GHz to 5 GHz bands, the total power spectraldensity must be below -65 dBm/MHz.

(4) Limitation of the Duty Cycle to 10 % per second.

(5) No fixed outdoor installation is permitted.

(6) Within the 3.1 GHz – 4.8 GHz band, devices implementing LDC mitigation technique are permitted to operate with a maximum mean e.i.r.p. spectral density of -41.3 dBm/MHz and a maximum peak e.i.r.p. of 0 dBm defined in 50 MHz. The LDC mitigation technique and its limits are defined in clauses 4.5.3.1, 4.5.3.2 and 4.5.3.3 of ETSI Standard EN 302 065-1 V2.1.1. Alternative miti gation techniques may be used if they ensure at least an equivalent performance and level of spectrum protection in order to com- ply with the corresponding essential requirements of The Radio Equipment Regulations 2017 (SI 2017/1206).When LDC is implemented, note 5 applies.

(7) Within the 3.1 GHz – 4.8 GHz and 8.5 GHz - 9 GHz bands, devices implementing DAA mitigation technique are permitted to op erate with a maximum mean e.i.r.p. spectral density of – 41.3 dBm/MHz and a maximum peak e.i.r.p. of 0 dBm defined in
50 MHz. The DAA mitigation technique and its limits are defined in clauses 4.5.1.1, 4.5.1.2 and 4.5.1.3 of ETSI Standard EN 302 065-1 V2.1.1. Alternative mitigation techniques may be used if they ensure at least an equivalent performance and level ofspectrum protection in order to comply with the corresponding essential requirements of The Radio Equipment Regulations 2017 (SI 2017/1206). When DAA is implemented, note 5 applies.

5.3 **Non-contact based material sensing devices**

The specific limits for maximum mean power spectral density (e.i.r.p.) and maximum peak power (e.i.r.p.) for non-contact based material sensing devices using UWB technology are defined in the table below.

Technical requirements for non-contact based UWB material sensing devices

Frequency range	Maximum mean power spectral density (e.i.r.p.)	Maximum peak power (e.i.r.p.) (defined in 50 MHz)
f ≤ 1.73 GHz	– 85 dBm/MHz (1)	– 60 dBm

1.73 < f ≤ 2.2 GHz	– 70 dBm/MHz	– 45 dBm
2.2 < f ≤ 2.5 GHz	– 50 dBm/MHz	– 25 dBm
2.5 < f ≤ 2.69 GHz	– 65 dBm/MHz (1) (2)	– 40 dBm
2.69< f ≤ 2.7 GHz (4)	– 70 dBm/MHz (3)	– 45 dBm
2.7 < f ≤ 2.9 GHz	– 70 dBm/MHz (1)	– 45 dBm
2.9 < f ≤ 3.4 GHz	– 70 dBm/MHz (1) (6) (7)	– 45 dBm
3.4 < f ≤ 3.8 GHz (4)	– 70 dBm/MHz (2) (6) (7)	– 45 dBm
3.8 < f ≤ 4.8 GHz	– 50 dBm/MHz (6) (7)	– 25 dBm

Technical requirements for non-contact based UWB material sensing devices

Frequency range	Maximum mean power spectral density (e.i.r.p.)	Maximum peak power (e.i.r.p.) (defined in 50 MHz)
4.8 < f ≤ 5.0 GHz (4)	– 55 dBm/MHz (2) (3)	– 30 dBm
5.0 < f ≤ 5.25 GHz	– 55 dBm/MHz	– 30 dBm
5.25 < f ≤ 5.35 GHz	– 50 dBm/MHz	– 25 dBm
5.35 < f ≤ 5.6 GHz	– 50 dBm/MHz	– 25 dBm
5.6 < f ≤ 5.65 GHz	– 50 dBm/MHz	– 25 dBm
5.65 < f ≤ 5.725 GHz	– 65 dBm/MHz	– 40 dBm
5.725 < f ≤ 6.0 GHz	– 60 dBm/MHz	– 35 dBm
6.0 < f ≤ 8.5 GHz	– 41.3 dBm/MHz (5)	0 dBm
8.5 < f ≤ 9.0 GHz	– 65 dBm/MHz (7)	– 25 dBm
9.0 < f ≤ 10.6 GHz	– 65 dBm/MHz	– 25 dBm
f > 10.6 GHz	– 85 dBm/MHz	– 45 dBm

(1) Devices using the Listen Before Talk ('LBT') mechanism are permitted to operate in the 1.215 GHz to 1.73 GHz frequency range with a maximum mean e.i.r.p. spectral density of – 70 dBm/MHz and in the 2.5 GHz to 2.69 GHz and 2.7 GHz to 3.4 GHz frequency ranges with a maximum mean e.i.r.p. spectral density of – 50 dBm/MHz and a maximum peak e.i.r.p. of

– 10 dBm/50 MHz. The LBT mechanism is defined in clauses 4.5.2.1, 4.5.2.2 and 4.5.2.3 of ETSI Standard EN 302 065-4 V1.1.1. Alternative mitigation techniques may be used if they ensure at least an equivalent performance and level of spectrum protection in order to comply with the corresponding essential requirements of The Radio Equipment Regulations 2017 (SI 2017/1206). To protect the radio services, non-fixed installations must fulfil the following requirement for total radiated power:

(a) In the 2.5 GHz to 2.69 GHz and 4.8 GHz to 5 GHz frequency ranges, the total power spectral density must be 10 dB below the maximum e.i.r.p. spectral density.

(b) In the 3.4 GHz to 3.8 GHz frequency range, the total power spectral density must be 5 dB below the maximum e.i.r.p. spectral density.

(2) To protect the Radio Astronomy Service (RAS) in the 2.69 GHz to 2.7 GHz and 4.8 GHz to 5 GHz bands, the total power spectral density must be below – 65 dBm/MHz.

(3) Limitation of the Duty Cycle to 10 % per second.

(4) No fixed outdoor installation is permitted.

(5) Within the 3.1 GHz – 4.8 GHz band, devices implementing LDC mitigation technique are permitted to operate with a maximum mean e.i.r.p. spectral density of – 41.3 dBm/MHz and a maximum peak e.i.r.p. of 0 dBm defined in 50 MHz. The LDC mitigation technique and its limits are defined in clauses 4.5.3.1, 4.5.3.2 and 4.5.3.3 of ETSI Standard EN 302 065-1 V2.1.1. Alternative mitigation techniques may be used if they ensure at least an equivalent performance and level of spectrum protection in order to comply with the corresponding essential requirements of The Radio Equipment Regulations 2017 (SI 2017/1206). When LDC is implemented, note 5 applies.

(6) Within the 3.1 GHz – 4.8 GHz and 8.5 GHz - 9 GHz bands, devices implementing DAA mitigation technique are permitted to operate with a maximum mean e.i.r.p. spectral density of – 41.3 dBm/MHz and a maximum peak e.i.r.p. of 0 dBm defined in 50 MHz.

The DAA mitigation technique and its limits are defined in clauses 4.5.1.1, 4.5.1.2 and 4.5.1.3 of ETSI Standard EN 302 065-1 V2.1.1. Alternative mitigation techniques may be used if they ensure at least an equivalent performance and level of spectrum protection in order to comply with the corresponding essential requirements of The Radio Equipment Regulations 2017 (SI 2017/1206). When DAA is implemented, note 5 applies.

Peak power threshold values for the LBT mechanism to ensure the protection of radio services listed below are definedin the following table.

Technical requirements of the LBT mechanism for material sensing devices

Frequency range	Radio service to be detected	Peak power threshold value
1.215 <f ≤ 1.4 GHz	Radiodetermination service	+ 8 dBm/MHz
1.61<f ≤ 1.66 GHz	Mobile satellite service	– 43 dBm/MHz

Technical requirements of the LBT mechanism for material sensing devices

Frequency range	Radio service to be detected	Peak power threshold value
2.5 < f ≤ 2.69 GHz	Land mobile service	– 50 dBm/MHz
2.9 < f ≤ 3.4 GHz	Radiodetermination service	– 7dBm/MHz

Additional requirements for radar detection: continuously listening and automatic switch-off within 10 ms for the related frequency range if the threshold value is exceeded (table with LBT mechanism). A silent time of at least 12 s while listening continuously is necessary before the transmitter can be switched on again. This silent time during which only the LBT receiver is active must be ensured even after the device is switched off.

A3. Responding to this consultation

How to respond

A3.1 Ofcom would like to receive views and comments on the issues raised in this document, by 5pm on 4 July 2022.

A3.2 You can download a response form https://www.ofcom.org.uk/consultations-and-statements/category-1/authorisation-conditions-for-short-range-devices. You can return this by email or post to the address provided in the response form.

A3.3 If your response is a large file, or has supporting charts, tables or other data, please email it to SRD@ofcom.org.uk, as an attachment in Microsoft Word format, together with the cover sheet. This email address is for this consultation only, and will not be valid after 30 June 2022.

A3.4 Responses may alternatively be posted to the address below, marked with the title of the consultation:

Eniola Awoyale
Ofcom
Riverside House
2A Southwark Bridge Road
London SE1 9HA

A3.5 We welcome responses in formats other than print, for example an audio recording or a British Sign Language video. To respond in BSL:

- Send us a recording of you signing your response. This should be no longer than 5 minutes. Suitable file formats are DVDs, wmv or QuickTime files. Or
- Upload a video of you signing your response directly to YouTube (or another hosting site) and send us the link.

A3.6 We will publish a transcript of any audio or video responses we receive (unless your response is confidential)

A3.7 We do not need a paper copy of your response as well as an electronic version. We will acknowledge receipt if your response is submitted via the online web form, but not otherwise.

A3.8 You do not have to answer all the questions in the consultation if you do not have a view; a short response on just one point is fine. We also welcome joint responses.

A3.9 It would be helpful if your response could include direct answers to the questions asked in the consultation document. The questions are listed at Annex A6. It would also help if you could explain why you hold your views, and what you think the effect of Ofcom's proposals would be.

A3.10 If you want to discuss the issues and questions raised in this consultation, please contact Eniola Awoyale on 020 7783 4680 or by email to SRD@ofcom.org.uk.

Confidentiality

A3.11 Consultations are more effective if we publish the responses before the consultation period closes. In particular, this can help people and organisations with limited resources or familiarity with the issues to respond in a more informed way. So, in the interests of transparency and good regulatory practice, and because we believe it is important that everyone who is interested in an issue can see other respondents' views, we usually publish all responses on the Ofcom website as soon as we receive them.

A3.12 If you think your response should be kept confidential, please specify which part(s) this applies to, and explain why. Please send any confidential sections as a separate annex. If you want your name, address, other contact details or job title to remain confidential, please provide them only in the cover sheet, so that we don't have to edit your response.

A3.13 If someone asks us to keep part or all of a response confidential, we will treat this request seriously and try to respect it. But sometimes we will need to publish all responses, including those that are marked as confidential, in order to meet legal obligations.

A3.14 Please also note that copyright and all other intellectual property in responses will be assumed to be licensed to Ofcom to use. Ofcom's intellectual property rights are explained further in our Terms of Use.

Next steps

A3.15 Following this consultation period, Ofcom plans to publish a statement in Summer 2022.

A3.16 If you wish, you can register to receive mail updates alerting you to new Ofcom publications.

Ofcom's consultation processes

A3.17 Ofcom aims to make responding to a consultation as easy as possible. For more information, please see our consultation principles in Annex A4.

A3.18 If you have any comments or suggestions on how we manage our consultations, please email us at consult@ofcom.org.uk. We particularly welcome ideas on how Ofcom could more effectively seek the views of groups or individuals, such as small businesses and residential consumers, who are less likely to give their opinions through a formal consultation.

A3.19 If you would like to discuss these issues, or Ofcom's consultation processes more generally, please contact the corporation secretary:

Corporation Secretary
Ofcom
Riverside House
2a Southwark Bridge Road
London SE1 9HA
Email: corporationsecretary@ofcom.org.uk

A4. Ofcom's consultation principles

Ofcom has seven principles that it follows for every public written consultation:

Before the consultation

A4.1 Wherever possible, we will hold informal talks with people and organisations before announcing a big consultation, to find out whether we are thinking along the right lines. If we do not have enough time to do this, we will hold an open meeting to explain our proposals, shortly after announcing the consultation.

During the consultation

A4.2 We will be clear about whom we are consulting, why, on what questions and for how long.

A4.3 We will make the consultation document as short and simple as possible, with a summary of no more than two pages. We will try to make it as easy as possible for people to give us a written response. If the consultation is complicated, we may provide a short Plain English / Cymraeg Clir guide, to help smaller organisations or individuals who would not otherwise be able to spare the time to share their views.

A4.4 We will consult for up to ten weeks, depending on the potential impact of our proposals.

A4.5 A person within Ofcom will be in charge of making sure we follow our own guidelines and aim to reach the largest possible number of people and organisations who may be interested in the outcome of our decisions. Ofcom's Consultation Champion is the main person to contact if you have views on the way we run our consultations.

A4.6 If we are not able to follow any of these seven principles, we will explain why.

After the consultation

A4.7 We think it is important that everyone who is interested in an issue can see other people's views, so we usually publish all the responses on our website as soon as we receive them. After the consultation we will make our decisions and publish a statement explaining what we are going to do, and why, showing how respondents' views helped to shape these decisions.

A5. Consultation coversheet

BASIC DETAILS

Consultation title:

To (Ofcom contact):

Name of respondent:

Representing (self or organisation/s):

Address (if not received by email):

CONFIDENTIALITY

Please tick below what part of your response you consider is confidential, giving your reasons why

Nothing ☐

Name/contact details/job title ☐

Whole response ☐

Organisation ☐

Part of the response ☐

If there is no separate annex, which parts? _____

_____

If you want part of your response, your name or your organisation not to be published, can Ofcom still publish a reference to the contents of your response (including, for any confidential parts, a general summary that does not disclose the specific information or enable you to be identified)?

DECLARATION

I confirm that the correspondence supplied with this cover sheet is a formal consultation response that Ofcom can publish. However, in supplying this response, I understand that Ofcom may need to publish all responses, including those which are marked as confidential, in order to meet legal obligations. If I have sent my response by email, Ofcom can disregard any standard e-mail text about not disclosing email contents and attachments.

Ofcom seeks to publish responses on receipt. If your response is non-confidential (in whole or in part), and you would prefer us to publish your response only once the consultation has ended, please tick here.

Name Signed (if hard copy)

A6. Consultation questions

A6.1 This annex lists the questions we are consulting on.

Question 1: Do you agree with our proposal to extend safety related ITS by 20 MHz from 5905 MHz to 5925 MHz?

Question 2: Do you agree with our proposal to permit outdoor mobile/nomadic use of 5150 to 5250 MHz and airborne use in 5170 to 5250 MHz band for WAS/RLAN applications, as well as our proposal to clarify the DFS and TPC requirement in the 5250 to 5350 MHz band?

Question 3: Do you agree with our proposal to liberalise some of the technical conditions in some UWB devices?

Question 4: Do you agree with our proposal to close the 24 GHz SRR band to new applications?

Question 5: Do you agree with our proposal to make some technical and minor editorial changes to SRD applications in the 870/915 MHz bands?

If you disagree with any of the questions, please provide the evidence that would support any disagreement with the proposals.