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# **Decision to make the Wireless Telegraphy (Mobile Repeater) (Exemption) Regulations 2018**

Implementing Ofcom's decision on mobile repeaters

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**Statement:**

**Publication Date:** 22 March 2018

## About this document

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This document sets out Ofcom's decision to make new regulations by statutory instrument. These regulations allow the use of certain low powered mobile phone repeaters without the need to obtain a licence.

Mobile phone repeaters are devices which amplify mobile phone signals, enabling users to make calls. The regulations implement the decision Ofcom made in October 2017 to allow the use of certain mobile phone repeaters without the need for a licence. In particular, some kinds of static repeaters for use inside buildings and repeaters that can be used in vehicles.

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# 1. Executive summary

## Notice of proposals

- 1.1 This statement confirms that, following consultation, we have decided to make regulations to amend the licence exemption authorisation in relation certain mobile phone repeaters for static indoor use and for low gain in-vehicle use. On 22 March 2018 we made the Wireless Telegraphy (Mobile Repeater) (Exemption) Regulations 2018 (the “Regulations”) which will come into force on 12 April 2018. An unofficial copy of the text of the Regulations is in Annex A2 to this statement.
- 1.2 On 20 November 2017, we published the “Notice of proposal to make the Wireless Telegraphy (Exemption and Amendment) (Amendment) Regulations 2018” (the “Notice”)<sup>1</sup> in accordance with sections 122(4) and (5) of the Wireless Telegraphy Act 2006 (the “2006 Act”). The Notice set out how we intended, by way of the (proposed) regulations, to create licence exemption authorisations in relation to certain Short-Range Devices (SRDs) and mobile repeaters.
- 1.3 Recently we published a statement<sup>2</sup> setting out our decision to separate the regulations covering SRDs and mobile repeaters, both subject of the Notice, into two Statutory Instruments. The statement set our decision in relation to our SRD proposals and said that on 27 February 2018 we made the Wireless Telegraphy (Exemption and Amendment) (Amendment) Regulations 2018<sup>3</sup>. The substance and general effect of the exemptions in that instrument (for SRDs) and in the Regulations (for mobile repeaters) is nonetheless the same as consulted upon in the Notice (subject to the specific amendments we have made in the Regulations, as set out in this statement).

## Comments and representations

- 1.4 The proposed regulations were designed, in relation to mobile repeaters, to implement the decision we made in October 2017 (the “Repeater Decision”)<sup>4</sup> to create an exemption from the need for a licence, under the 2006 Act, to establish, install and use (“deploy”<sup>5</sup>) certain kinds of repeater device. In accordance with the requirements of sections 122(4) and (5) of the 2006 Act, the Notice gave statutory notice of our proposal to make the regulations and asked for comments on whether they correctly implement our decision.

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<sup>1</sup> [https://www.ofcom.org.uk/data/assets/pdf\\_file/0025/107935/Implementing-decisions-SRDs.pdf](https://www.ofcom.org.uk/data/assets/pdf_file/0025/107935/Implementing-decisions-SRDs.pdf)

<sup>2</sup> [https://www.ofcom.org.uk/data/assets/pdf\\_file/0023/111677/Implementing-the-Commission-Decision-on-Short-Range-Devices.pdf](https://www.ofcom.org.uk/data/assets/pdf_file/0023/111677/Implementing-the-Commission-Decision-on-Short-Range-Devices.pdf)

<sup>3</sup> <http://www.legislation.gov.uk/uksi/2018/263/made/data.pdf>

<sup>4</sup> [https://www.ofcom.org.uk/data/assets/pdf\\_file/0019/107254/Repeaters-Statement-2017.pdf](https://www.ofcom.org.uk/data/assets/pdf_file/0019/107254/Repeaters-Statement-2017.pdf)

<sup>5</sup> For ease of reference in this statement, we refer to the establishment, installation and use of devices as “deployment” unless otherwise stated.

- 1.5 We received four responses relating to the authorisation of certain mobile phone repeaters. These are discussed further in Section 3 of this document.

## Decision

- 1.6 Taking carefully into account the responses we received, we have decided to make the Regulations permitting the licence exempt deployment of mobile repeaters for static indoor and low gain in-vehicle use. The format, but not the overall substance and general effect, of the Regulations has changed from that proposed, and we have made a small number of changes relating to the deployment of certain mobile phone repeaters for static indoor use.
- 1.7 In particular, in light of the consultation responses, we have decided to restrict the exemption for mobile phone repeaters for static indoor deployment so as not to permit the deployment of 4G only repeaters. That is, repeaters which only amplify signals to be carried by Long Term Evolution (LTE) and WIMAX technologies (often known as “4G”). This is a precautionary approach. We propose to consider further specific issues relating to 4G only repeaters, as appropriate.
- 1.8 We also decided to amend the Regulations to define the term “indoors.” The amendment clarifies that these devices can only be used inside a building which has a ceiling or a roof, and which, except for doors, windows and passageways, is wholly enclosed.

## Regulations

- 1.9 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 2006 Act or by making regulations exempting the use 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.
- 1.10 The Regulations we have made authorise the use of certain mobile phone repeaters for static indoor use and for low gain in-vehicle use, as set out in Ofcom’s Repeater Decision.
- 1.11 The Regulations were made on 22 March 2018 and will enter force on 12 April 2018. Copies of the Regulations can be obtained from <http://www.legislation.gov.uk/>.

## 2. Background

### The legislative framework

- 2.1 Ofcom's responsibilities for spectrum management are set out primarily in two Acts of Parliament which confer on us our specific functions, powers and duties: The Communications Act 2003 (the "2003 Act") and the 2006 Act. Amongst our functions and powers are the making available of frequencies for use for particular purposes and the granting of rights of use of spectrum through wireless telegraphy licences and licence exemptions.
- 2.2 Our principal duties under the 2003 Act, when carrying out our functions and exercising our powers, are to further the interests of citizens and consumers, where appropriate by promoting competition. In doing so, we are also required (among other things) to secure the optimal use of spectrum and the availability throughout the United Kingdom of a wide range of electronic communications services.
- 2.3 We must also have regard to (i) the desirability of promoting competition in relevant markets; (ii) the desirability of encouraging investment and innovation in relevant markets; (iii) the different needs and interests, so far as the use of the electro-magnetic spectrum for wireless telegraphy is concerned, of all persons who may wish to make use of it; and (iv) the different interests of persons in the different parts of the United Kingdom, of the different ethnic communities within the United Kingdom and of persons living in rural and in urban areas.
- 2.4 Additionally, in carrying out our spectrum functions we have a duty under section 3 of the 2006 Act to have regard in particular to: (i) the extent to which the spectrum is available for use or further use for wireless telegraphy; (ii) the demand for use of that spectrum for wireless telegraphy; and (iii) the demand that is likely to arise in future for such use.
- 2.5 We also have a duty to have regard to the desirability of promoting: (i) the efficient management and use of the spectrum for wireless telegraphy; (ii) the economic and other benefits that may arise from the use of wireless telegraphy; (iii) the development of innovative services; and (iv) competition in the provision of electronic communications services.
- 2.6 Ofcom's powers in relation to spectrum licences and exemptions include those in section 8 of the 2006 Act. Under section 8 (1), 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 2006 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 2006 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 2006 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 We make exemption regulations by means of a statutory instrument. Before making any such regulations, we are required by section 122(4) of the 2006 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 period of at least one month during which any representations with respect to the proposal must be made to us.

## Low power mobile phone repeaters

- 2.11 Accessing the mobile network within their own home can be troublesome for some consumers, particularly where they live towards the edge of mobile network coverage. The same can be said of accessing the network from within a vehicle. In both cases, the penetration loss involved can mean that, where the mobile phone signal is weak outdoors, it falls below a usable level once inside. One potential solution to this problem is to use a device called a mobile phone repeater (sometimes also referred to as signal boosters or signal enhancers). These are devices which amplify signals so as to enable users to access the mobile network.

- 2.12 In our April 2017 consultation, “Mobile Phone Repeaters Indoor and in-vehicle” (the “Repeater Consultation”)<sup>6</sup> we consulted on a set of technical requirements for mobile phone repeaters that would allow them to be deployed on a licence-exempt basis. These proposed technical requirements followed discussions with the mobile network operators and equipment manufacturers on what provisions were necessary for mobile phone repeaters which could be self-deployed by consumers. The goal of setting these technical requirements was to ensure that undue interference or other impacts on technical quality of service was unlikely; thus, in turn, avoiding the risk of harm to other consumers.
- 2.13 In the Repeater Consultation, we considered the technical requirements that would allow consumers to deploy two categories of mobile phone repeaters on a licence-exempt basis:
- a) static mobile phone repeaters for indoor use; and
  - b) low gain mobile phone repeaters for in-vehicle (in-car) use.
- 2.14 On 24 October 2017, we published our Repeater Decision: to make regulations to allow the deployment of these types of mobile phone repeater on a licence-exempt basis, subject to conditions set out in that decision. The Notice set out that the proposed regulations would implement this decision.

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<sup>6</sup> [https://www.ofcom.org.uk/\\_data/assets/pdf\\_file/0017/100277/Mobile-phone-repeaters.pdf](https://www.ofcom.org.uk/_data/assets/pdf_file/0017/100277/Mobile-phone-repeaters.pdf)



## 3. Comments received and Ofcom's response

### The Notice

- 3.1 In accordance with sections 122(4) and 122(5) of the 2006 Act, the Notice, which we published on 20 November 2017, set out that we proposed to make the regulations, their general effects and an address from which a copy of them could be obtained. It also included a copy of the draft regulations and gave any person or party who wished to do so until 24 December 2017 to make representations.
- 3.2 As explained in Section 1, we received four sets of comments relating to mobile repeaters. These are detailed below.

### Responses to the Notice

#### In-vehicle repeaters

- 3.3 A confidential respondent raised a number of questions relating to the proposed regulations. It generally agreed with the maximum permitted gain limitation but submitted that this limitation should be extended to 25 dB for all frequency bands, so as to take account of mobile phones with poor antenna performance. It also queried whether the connector cables included in the product should be considered within the gain calculation used as part of the technical conditions accompanying the proposed licence exemption.
- 3.4 The respondent also asked for the definition of "no fixed installations," set out in the proposed technical conditions, to be clarified. It assumed that the definition was intended to mean that, although the device is fixed within the vehicle, it would not be classified as a fixed installation since the vehicle will move (as opposed to remaining permanently in one place).
- 3.5 Additionally, the respondent sought an estimated date when Ofcom would make a decision about the authorisation of repeaters in the 2.6 GHz band (LTE2600) (which we did not include in the Repeater Consultation or the Repeater Decision).
- 3.6 Finally, the respondent also requested a transition period of 12 months to develop devices for the UK market. It said it is not possible to make product changes and go through the relevant product approval processes with car manufacturers any quicker.

#### Our Response

- 3.7 We have considered these points carefully. The maximum gain limits we proposed were set following detailed technical analysis, so as to avoid the adverse effects described in section 8(4) of the 2006 Act. In particular, for overcoming the coupling loss between the cradle of an in-vehicle repeater and the relevant mobile phone handset, but not giving rise to undue interference to wireless telegraphy or other adverse effects on technical quality of service. Nothing in this respondent's submission supports the setting of different limits.

- 3.8 We have clarified in the Regulations that the maximum gain limit is a limit on the gain of the whole system. That is, inclusive of the external antenna gain, amplifier gain and cable losses up to, but not including, the cradle and air gap. This clarification is consistent with how we have defined the maximum system gain limit for in-building licence exempt mobile phone repeaters.
- 3.9 The prohibition, in the technical conditions accompanying the exemption, of the deployment of in-vehicle repeaters in “fixed installations” means that their deployment in such a way that they are permanently in one place (by virtue of the structure to which they attached being permanently static) does not fall within the exemption. The effect of this prohibition is that their deployment in a vehicle is the only manner of use authorised by the licence exemption.
- 3.10 As to the other points this respondent made, we currently have no plans to make regulations which would allow deployment of 2.6 GHz LTE mobile phone repeaters on a licence exempt basis. We will keep this under review. A transition period is not required for the introduction of the Regulations to exempt repeaters of a certain description from the need for a licence. Prior to their being in force, the use of mobile phone repeaters, other than those supplied directly by the mobile network operators (MNOs), was unlawful. Users may deploy repeaters falling within the exemption as soon as they are available.
- 3.11 We have also made one other clarification to the in-vehicle exemption. We have added a definition of “motor vehicle” to make clear the exemption applies to the deployment of repeaters in motorised vehicles falling within that definition.

## Static indoor repeaters

### General

- 3.12 Quantel 2011 Ltd supported the drafting of the proposed regulations as an important step in giving consumers of mobile networks increased access to services. They noted that, by defining the rules and requirements for mobile repeaters, manufacturers can have a clear idea of what is required and can then provide a solution.

### Emergency calls

- 3.13 BT/EE was concerned about the proposed licence-exemption for low power mobile phone repeaters (both in building and vehicular). It observed that, under certain circumstances, a mobile phone repeater could prevent a user from using national roaming for emergency calling. National roaming allows users who are out of range of their own mobile network to roam onto any mobile network to make such calls.

- 3.14 BT/EE went on to explain that some users have mobile phones which are capable of 4G data connections but not 4G voice (using VoLTE - Voice Over Long-Term Evolution). When these users want to make a voice call they have to be “handed over” from the 4G network to either of the Circuit Switched Fall Back (CSFB) networks (2G and 3G, using GSM (Global System for Mobile Communications) and UMTS (Universal Mobile Telecommunications System) technologies, respectively). However, in the situation where there is 4G coverage from the consumer’s network operator, but no 3G or 2G coverage, a non-VoLTE mobile phone will remain attached to the 4G network but will be unable to make a voice call. Furthermore, because the non-VoLTE mobile phone is attached to that 4G network, it will not be able to use national roaming to attach to another mobile network operator’s network for emergency calling.
- 3.15 BT/EE said the risk of failed emergency calls occurs if a repeater which only repeats a 4G signal is installed where either:
- a household has a mix of VoLTE and non-VoLTE devices; or
  - a homeowner has a VoLTE device, and considers the repeater to be working, but is unaware of the potential impact on a visitor to the premises using the same network with a non-VoLTE device.
- 3.16 For this reason, BT/EE said, it is in discussions with its repeater supplier to ensure that the repeaters deployed in its mobile network will not repeat a 4G signal unless they can also repeat a 3G signal at the same time. It said we should consider modifying the regulations to prevent the scenario it described arising. It also said we should consider whether to require the labelling of repeaters to make users aware of this risk.

### Our Response

- 3.17 BT/EE’s response raises important points about potential risks to consumer safety. We have therefore taken careful account of them, notwithstanding that they relate more to the substance of the policy that was the subject of the Repeater Decision than the question of whether the proposed regulations give effect to that decision.
- 3.18 We note that the scenario described by BT/EE can only occur under a specific set of circumstances which might, in practice, be infrequent. Nevertheless, we acknowledge that the scenario it described could occur and that in those specific circumstances a 4G-only indoor repeater could prevent users with non-VoLTE phones from nationally roaming in order to make emergency calls. That is something that we are concerned to avoid.
- 3.19 Our initial investigations have shown that mobile phones which support 4G but not VoLTE were released between mid-2012 and mid-2014 (e.g. the iPhone 5 and Samsung Galaxy S5). So, they likely represent a diminishing but significant proportion of the mobile phone handsets in use in the UK.

- 3.20 Taking all these points into account, we consider that there is a small risk the scenario BT/EE described could arise. Even so, given the nature of the risk, we judge it appropriate to take a precautionary approach. We have therefore decided to amend the Regulations to ensure that indoor licence exempt mobile phone repeaters which repeat a 4G signal must also repeat a 2G or 3G signal at the same time. If a repeater cannot repeat a 2G or 3G signal for any reason,<sup>7</sup> it must not repeat a 4G signal. Only repeaters which meet these requirements will be exempt. This will prevent the scenario described by BT/EE from arising.
- 3.21 We acknowledge that this stipulation may slightly increase the complexity of in-building licence-exempt mobile phone repeater design. Nonetheless, it is our understanding that mobile phone repeater manufacturers would be able to produce such repeaters. We are minded to examine the risk described by BT/EE in more detail, as appropriate, and may revise the Regulations in future. For example, if we consider that alternative technical solutions can effectively mitigate the risk or if the risk does not warrant maintaining the stipulation.
- 3.22 This amendment to the Regulations does not change our analysis of the potential for aggregate interference from large numbers of mobile phone repeaters into base stations. In the Repeater Statement we modelled a scenario where all repeaters were repeating two carriers simultaneously and found that the risk of causing harmful interference to the mobile network or reducing the quality of service remained very low.
- 3.23 We do not judge it necessary to require 4G in-vehicle licence-exempt mobile phone repeaters also to repeat a 2G or 3G signal. This is because only mobile phones in the cradle of a 4G-only in-vehicle repeater could be at risk of not being able to use national roaming for emergency calls, not those of other users inside or near to the vehicle. The user of a 4G-only in-vehicle mobile phone repeater would become aware very quickly if their mobile phone was not VoLTE-enabled because they would be unable to make any voice calls. In this scenario, the user could remedy the problem by buying a 2G or 3G in-vehicle mobile phone repeater or upgrading their mobile phone to a VoLTE-enabled handset.

## Vodafone's submissions

- 3.24 Vodafone recognised that there is some customer demand to use mobile repeaters but criticised Ofcom's approach to their authorisation. It reiterated the type of concern it had raised in its response to the Repeater Consultation, that the line between lawful and unlawful repeaters would become blurred. It contended that creating a framework to legitimise the use of certain repeaters would lead to an increase in the use of unlawful devices. It submitted that Ofcom is creating an untested regime where our theoretical assumptions will be proven correct or not by field testing in a live environment on a national scale.
- 3.25 Vodafone also said again, as it had in response to the Repeater Consultation, that Ofcom should put the following mitigation measures in place:

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<sup>7</sup> Perhaps because the equipment is not capable or there is no 2G or 3G signal available.

- an approval scheme whereby equipment could be validated as compliant with the applicable technical specifications and which could facilitate the use of compliance branding promoted by Ofcom; and
- a registration scheme whereby users would register with the host mobile network operator so that, should networks experience interference and/or raising of the noise floor in a given area, it would be easier for operators and Ofcom to locate the source.

3.26 Vodafone also made a number of other points:

- One concerned possible interference to GSM-R<sup>8</sup> technology which uses the 900 MHz band. It noted that a condition of its spectrum licence is that it must coordinate its use of the 900MHz band around rail transport corridors. This means its transmit power must be reduced, due to the relatively poor filtering performance of GSM-R terminals installed on trains. It said three points need to be addressed:
  - i) The reduction in its transmit powers could lead to a greater density of mobile repeaters in properties alongside railway lines, with consequent risk to the operation of GSM-R;
  - ii) The impact of interference to GSM-R on railway users (passengers) is more extreme than to public mobile networks, as the core use of GSM-R communications is for safety of life matters. It also noted that GSM-R equipment is not as modern as that in public networks and is operating in a stressed environment (e.g. at high speed), increasing the probability of interference;
  - iii) If interference is caused to GSM-R, Network Rail asks Vodafone to help it with its investigations and, if found to be the source, it modifies its network. However, no amount of changes to the network would eliminate a problem caused by a third-party repeater. Instead, reducing the transmit power of its network, in the belief it was causing the problem, would be likely to increase the prevalence of repeaters (due to the consequently poorer signal reception) and hence cause more interference. Absent a registration scheme, Vodafone would have no knowledge of the presence of repeaters.
- Another submission was that mobile services provided to 'blue light' emergency service users rely on a high level of network availability and interference caused by an illegal device can have a significant impact on the emergency services. Vodafone contended that this will increase once the Airwave network is switched off and the emergency services rely on the new Emergency Services Network using mobile spectrum frequencies. It cited an example of a case in which interference caused by illegal repeater use resulted in its network being unable to operate in a considerable area. This, it said, coincided with reports of a serious crime in that area, and the inability of the police to communicate using its network hampered their work.

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<sup>8</sup> Global System for Mobile Communications – Railway, the technology used for mobile communications in the rail network.

- A further contention was that the Repeater Consultation was aimed at liberalising the deployment of repeaters in an indoor domestic context. However, the proposed regulations would permit their deployment in commercial and enterprise environments. Vodafone said that, in a commercial environment, the resulting interference effects on network performance would differ markedly from a domestic environment.
- A final submission questioned the use of the term "indoor" in the proposed regulations. Vodafone said Ofcom's proposals would permit the use of repeaters in structures such as stadia, which in the most part are not indoor environments. It said Ofcom's analysis assumed building losses analogous to fully-enclosed domestic properties and not partially open commercial structures.

### Our response

- 3.27 The majority of the points made by Vodafone concerned matters relating to the substance of Ofcom's policy decision – whether or not and with what scope to create a licence exemption for repeaters – rather than whether the proposed regulations give effect to that decision. These matters were the subject of the Repeater Consultation and are matters on which Ofcom made its decision as set out in the Repeater Statement in October 2017. Vodafone made representations on, or relevant to, those matters in response to the Repeater Consultation and Ofcom carefully considered them in making the Repeater Decision.
- 3.28 In particular, Vodafone's comments about approval and registration schemes re-iterated those it made in response to the Repeater Consultation. Ofcom's consideration of them and the decision we made is explained in paragraphs 3.14 – 3.25 of the Repeater Statement. The decision we made in October 2017 was that approval and registration schemes would not aid in enforcement against illegal repeaters and are unnecessary.
- 3.29 A similar point applies to Vodafone's representations about interference to GSM-R and emergency services communications. In the Repeater Consultation, we consulted on the basis of a wide-ranging assessment of power limits, technical requirements and usage scenarios.
- 3.30 Those limits, requirements and scenarios were, as we set out in the Repeater Consultation and the Repeater Decision, assessed and set such that an exempt repeater would have no more potential to cause interference than a mobile handset.<sup>9</sup> Specifically, we made a

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<sup>9</sup> See, for example, paragraph 3.22 of the Repeater Consultation, in which we said:

"The proposed technical requirements set out in Table 1 above reflect the following considerations:

#### Power

It is already clearly established that the power limits applicable to handsets are not likely to cause undue interference or adverse technical effects. It would therefore be important, in avoiding these effects, that the mobile phone repeater, as seen by a base station, appears as if it were a handset."

decision in October 2017, on the basis of our analysis, to limit the uplink transmit power to the same level as mobile user equipment and to limit the downlink powers to 10 dBm/5 MHz capped at 17 dBm (which is less than mobile user equipment). Additionally, we decided to impose requirements that the use of downlink frequencies must be indoors or in-vehicle, providing additional signal losses.

- 3.31 These decisions took into account that mobile handsets operating within these parameters are not likely to cause interference and are themselves subject to a licence exemption. They are similarly unlikely to cause interference, and the same exemption applies, when they are used near railways lines.
- 3.32 The assessments and decisions we made were therefore broad enough to cover scenarios in which repeaters may be used close to railway lines. Likewise, to be applicable to the effect of repeater use on emergency services communications. We made the decision in October 2017 that the power limits and other technical requirements were set at the appropriate levels to ensure that undue interference to services in adjacent bands, such as GSM-R, and adverse effects on their technical quality, are not likely.
- 3.33 In its response to the Repeater Consultation (which set the proposed power limits, technical requirements and usage scenarios), Vodafone said the proposed technical specification was, on the whole, acceptable to it. It did not refer to GSM-R nor emergency services communications.
- 3.34 We also note that we set out in the Repeater Statement, “Our judgment [is] that creating the licence exemption will streamline enforcement activities by making a clear distinction between legal and illegal products and ultimately stem consumer demand and the availability of illegal repeaters.” In other words, we made the judgment then that the use of illegal repeaters that have the potential to cause harm and disruption to services such as GSM-R or ‘blue light’ services is likely to diminish as a result of making the licence exemption.
- 3.35 The decision to create an exemption for indoor repeaters that may be used in residential or non-residential buildings is another we made in the Repeater Statement. Our technical analysis in the both the Repeater Consultation and Decision included analysis of a high call volume situation (that might typically be found in a commercial or enterprise environment).
- 3.36 In particular, we “stress tested” the impact of a very large number of active repeaters in the “Urban Tower Blocks” scenario presented in Annex A2 of the Repeater Statement. Our

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Likewise, paragraph 3.89 of the Repeater Statement, in which we said:

“We acknowledge that mobile networks are complex and dynamic systems and recognise that mobile phone repeaters must be able to operate appropriately in this environment. Ofcom’s judgment is that the technical requirements we have decided to impose are appropriate for the operation of mobile phone repeaters on a licence exempt basis whilst ensuring that undue interference to, or adverse effects on the technical quality of service of, mobile networks is not likely. They will, essentially, exempt the use of repeaters that have similar effects on mobile networks to mobile handsets (which are the subject of a licence exemption without being likely to involve undue interference or have other adverse technical effects on technical quality of service).”

analysis also assumed that up to 70% of repeaters might be active during the busy hour. For a domestic residential environment this is very high but would in our view be reflective of the likely level of use in the context of a commercial or enterprise environment. In addition, we decided to limit the operation of exempt repeaters to the frequencies of a single MNO, restricting their potential for interference.

- 3.37 In other words, we did a technical analysis which, though framed in terms of domestic residential premises, was concerned with likely usage scenarios in relation to things like the amount of repeater use and its effects. It could therefore apply also to commercial premises and, on that basis, we made the decision in the Repeater Statement that the exemption should apply in that context too. Our judgment was that the interference risk in a commercial environment is not materially different to that in the very high use residential scenario we assessed.
- 3.38 Vodafone's submissions about the term 'indoor' in the proposed Regulations did bear on the question of whether those Regulations would give effect to the Repeater Decision. On the basis that the decision was predicated on analysis relating to enclosed premises, not partially open structures like stadia, we have amended the Regulations such that they adopt the following definition:

““indoors” means inside premises which have a ceiling or a roof; and, except for doors, windows and passageway, are wholly enclosed.”

The effect is that repeaters are only exempt where their transmissions made using downlink frequencies are made indoors within this definition (although those made using uplink frequencies may be made indoors or outdoors).

### Other matters - simplification

- 3.39 As noted in section 1 above, we made the statutory instrument relating to SRDs, which was one part of the draft regulations which were the subject of the Notice, on 27 February 2018. We made that at the earliest time we could, so as to come into EU law as quickly as possible, whilst we continued carefully to consider the points BT/EE made about repeaters and emergency calls in its consultation response.
- 3.40 As we are now making the instrument insofar as it relates to relevant mobile repeater devices only, we have considered the most appropriate and straightforward way to do so. We have taken account that it is not necessarily any longer part of an instrument amending earlier regulations providing for licence exemption. Likewise, that it creates an exemption designed to stimulate the development by manufacturers of new devices capable of lawful use and directly to benefit consumers.
- 3.41 As a result, we have decided not only that the exemption for repeaters should be in an instrument separate from that for SRDs, but that the regulations creating that exemption should be free-standing. That is, a separate instrument (supported by Interface Requirements), rather than a set of provisions to be added by amendment to earlier exemption regulations (made in 2003). That way, the conditions for licence exemption are in a format which is accessible and clear to device manufacturers and consumers alike.



## Our decision

3.42 We have decided to make the Regulations largely as proposed, and with the same general effect, but subject to the following changes:

- altering their form, such that they are in a separate, free-standing instrument;
- excluding the use of 4G only repeaters;
- clarifying that for in-vehicle repeaters the gain value is for the total system gain; and
- including a definition of “indoors” to make clear that the use is restricted to wholly enclosed premises.

3.43 The terms, provisions and limitations of the Regulations are consistent with the requirements to be objectively justified, proportionate, not unduly and transparent, and consistent with our spectrum management duties, for the reasons set out in the Repeater Decision.<sup>10</sup> Their general effect was set out in the Notice and in this statement.

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<sup>10</sup> Paragraphs 4.6 – 4.8, in particular.

## 4. General effect of the Regulations

- 4.1 We have summarised in Section 2 of this document the legal framework that is relevant to the Regulations, including our role in licence exempting the deployment of wireless telegraphy apparatus by making regulations under section 8(3) of the 2006 Act.
- 4.2 In this section, we set out the general effects of the Regulations as required by section 122(5) of the 2006 Act.

### Extent of application

- 4.3 The Regulations apply in the United Kingdom, the Channel Islands and the Isle of Man.

### Regulations

#### Overall general effect

- 4.4 The overall general effect of the Regulations is to implement Ofcom's October 2017 decision to allow certain mobile phone repeaters for static indoor use and for low gain in-vehicle use. They enable the establishment, installation and use of mobile phone repeaters without the need for a licence under section 8 of the 2006 Act. They contain terms, provisions and limitations to which that licence exemption is subject. Devices that do not meet those terms, provisions and limitations do not fall within the exemption and their establishment, installation and use without a licence will continue to be a criminal offence.
- 4.5 Regulation 2 defines terms used in the licence exemption.
- 4.6 Regulation 3(1) provides that the establishment, installation and use of a static indoor mobile phone repeater is exempt from the need for a licence under section 8 of the 2006 Act where it meets the terms, provisions and limitations in the rest of Regulation 3.
- 4.7 Regulation 3(2) sets out the requirement for a static indoor repeater, and its establishment, installation and use, to comply with IR 2102.1.
- 4.8 Regulation 3(3) sets out that, to qualify for licence exemption, a static indoor mobile repeater must only be established, installed and used where the transmissions it makes using specified downlink frequencies are made indoors (as defined in Regulation 2(d)) (although those made using uplink frequencies may be made indoors or outdoors).
- 4.9 Regulation 3(4) sets out that a repeater may amplify signals carried over a 4G system (LTE or WiMAX) only where it also amplifies signals carried over a 2G (GSM) or a UMTS (3G) system. It excludes 4G only repeaters from the licence exemption and their use continues to be unlawful.
- 4.10 Regulation 3(5) sets out the additional requirement for exemption that a repeater device, and its establishment, installation and use must not cause or contribute to any undue interference to any wireless telegraphy.

- 4.11 Regulation 4(1) provides that the establishment, installation and use of a mobile phone repeater in a motor vehicle is exempt from the need for a licence under section 8 of the 2006 Act where it meets the terms, provisions and limitations in the rest of Regulation 4.
- 4.12 Regulation 4(2) sets out the requirement for a mobile phone repeater, and its establishment, installation and use, in a motor vehicle to comply with IR 2102.2.
- 4.13 Regulation 4(3) sets out that, to qualify for licence exemption, an in-vehicle mobile phone repeater must only be established, installed and used in a motor vehicle (as defined in Regulation 2(d)).
- 4.14 Regulation 4(4) sets out the additional requirement for exemption that a repeater device, and its use establishment, installation and use in a motor vehicle must not cause or contribute to any undue interference to any wireless telegraphy.

# A1. List of respondents

**BT/EE**

**Vodafone**

**Quintel 2011**

**Name withheld**



## A2. (Unofficial) Copy of the text of The Wireless Telegraphy (Mobile Repeater) (Exemption) Regulations 2018

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### STATUTORY INSTRUMENTS

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2018 No.

#### ELECTRONIC COMMUNICATIONS

The Wireless Telegraphy (Mobile Repeater) (Exemption) Regulations 2018

*Made* - - - - - *22nd March 2018*

*Coming into force* - - - - - *12th April 2018*

The Office of Communications (“OFCOM”), in exercise of the powers conferred by sections 8(3) and section 122(7) of the Wireless Telegraphy Act 2006<sup>(11)</sup> and in exercise of those sections of the Act<sup>(12)</sup> as extended to the Bailiwick of Guernsey, to the Bailiwick of Jersey and to the Isle of Man, make the following Regulations.

Before making these Regulations, OFCOM have given notice of their proposal to do so in accordance with section 122(4)(a) of the Act, published notice of their proposal in accordance with section 122(4)(b) of the Act, and have considered the representations made to them before the time specified in the notice in accordance with section 122(4)(c) of the Act.

#### Citation and commencement

1. These Regulations may be cited as the Wireless Telegraphy (Mobile Repeater) (Exemption) Regulations 2018 and shall come into force on 12th April 2018.

#### Interpretation

2. In these Regulations—

- (a) “downlink frequencies” means the frequency bands 791-721 MHz, 925-960 MHz, 1805-1880 MHz and 2110-2170 MHz;

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<sup>(11)</sup> 2006 c. 36.

<sup>(12)</sup> Section 8(3) and section 122(7) were extended to the Bailiwick of Guernsey by article 2 of the Wireless Telegraphy (Guernsey) Order 2006 (S.I. 2006/3325); to the Bailiwick of Jersey by article 2 of the Wireless Telegraphy (Jersey) Order 2006 (S.I. 2006/3324); and to the Isle of Man by article 2 of the Wireless Telegraphy (Isle of Man) Order 2007 (S.I. 2007/278).

- (b) “ETSI” means the European Telecommunications Standards Institute;
- (c) “GSM system” means an electronic communications network that complies with standards EN 301 502<sup>(13)</sup> and EN 301 511<sup>(14)</sup> published by ETSI for the Global System for Mobile Communications (also known as GSM);
- (d) “indoors” means inside premises which—
  - (i) have a ceiling or a roof; and
  - (ii) except for any doors, windows or passageways, are wholly enclosed;
- (e) “IR2102.1” means section “2102.1: minimum requirements for the use of: static mobile phone repeaters for indoor use” contained within the document with title “UK Interface Requirements IR2102 - Licence exempt static indoor and low gain mobile phone repeaters” published by Ofcom on 22 March 2018;
- (f) “IR2102.2” means section “2102.2: minimum requirements for the use of: low gain mobile phone repeaters for in-vehicle use” contained within the document with title “UK Interface Requirements IR2102 - Licence exempt static indoor and low gain mobile phone repeaters” published by Ofcom on 22 March 2018;
- (g) “LTE system” means an electronic communications network that complies with standards EN 301 908—1<sup>(15)</sup>, EN 301 908—13<sup>(16)</sup> and EN 301 908—14<sup>(17)</sup> published by ETSI for the Long Term Evolution telecommunication system (also known as LTE);
- (h) “MHz” means megahertz;
- (i) “mobile repeater device” means a wireless telegraphy station or wireless telegraphy apparatus which amplifies the radio signals carried over a GSM system, a LTE system, a UMTS system or a WiMAX system;
- (j) “motor vehicle” means a mechanically propelled vehicle intended or adapted for use on roads;
- (k) “UMTS system” means an electronic communications network that complies with standards EN 301 908—1, 301 908—2<sup>(18)</sup> and EN 301 908—3<sup>(19)</sup> published by ETSI for the Universal Mobile Telecommunications System (also known as UMTS);
- (l) “uplink frequencies” means the frequency bands 832-862 MHz, 880-915 MHz, 1710-1785 MHz and 1920-1980 MHz; and
- (m) “WiMAX system” means an electronic communications network that complies with standards EN 301 908—1, EN 301 908—21<sup>(20)</sup> and EN 301 908—22<sup>(21)</sup> published by ETSI for the Worldwide Interoperability for Microwave Access telecommunication system (also known as WiMAX).

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<sup>(13)</sup> EN 301 502 (version 12.5.2) published in OJEU No C180, 8.6.2017, p.14.

<sup>(14)</sup> EN 301 511 (version 9.0.2) published in OJEU No C180, 8.6.2017, p.14.

<sup>(15)</sup> EN 301 908—1 (version 11.1.1) published in OJEU No C180, 8.6.2017, p.17.

<sup>(16)</sup> EN 301 908—13 (version 11.1.1) published in OJEU No C180, 8.6.2017, p.18.

<sup>(17)</sup> EN 301 908—14 (version 11.1.2) published in OJEU No C180, 8.6.2017, p.18.

<sup>(18)</sup> EN 301 908—2 (version 11.1.1) published in OJEU No C180, 8.6.2017, p.17.

<sup>(19)</sup> EN 301 908—3 (version 11.1.3) published in OJEU No C180, 8.6.2017, p.17.

<sup>(20)</sup> EN 301 908—21 (version 6.1.1) published in OJEU No C180, 8.6.2017, p.19.

<sup>(21)</sup> EN 301 908—22 (version 6.1.1) published in OJEU No C180, 8.6.2017, p.19.

### **Exemption for indoor use**

**3.—**(1) The establishment, installation and use of a mobile repeater device is exempt from the provisions of section 8(1) of the Act where the terms, provisions and limitations in this regulation are met.

(2) The mobile repeater device and its establishment, installation and use must comply with IR2102.1.

(3) The mobile repeater device must only be established, installed and used where the transmissions it makes using downlink frequencies are made indoors.

(4) The mobile repeater device may amplify signals carried over a GSM system, a UMTS system, an LTE system or a WiMAX system or more than one of them. Where it amplifies signals carried over an LTE system or a WiMAX system or both, it must also amplify signals carried over a GSM system or a UMTS system or both.

(5) The establishment, installation and use must not cause or contribute to any undue interference to any wireless telegraphy.

### **Exemption for use in a motor vehicle**

**4.—**(1) The establishment, installation and use of a mobile repeater device is also exempt from the provisions of section 8(1) of the Act where the terms, provisions and limitations in this regulation are met.

(2) The mobile repeater device and its establishment, installation and use must comply with IR2102.2.

(3) The mobile repeater device must only be established, installed and used in a motor vehicle.

(4) The establishment, installation and use must not cause or contribute to any undue interference to any wireless telegraphy.

22nd March 2018

*Philip Marnick*  
Group Director Spectrum Group  
For and by the authority of the Office of Communications



## EXPLANATORY NOTE

*(This note is not part of the Order)*

These Regulations exempt the establishment, installation and use of certain wireless telegraphy stations or apparatus, known as “mobile repeaters,” which comply with certain terms, provisions and limitations, from the requirement to be licensed under section 8(1) of the Wireless Telegraphy Act 2006 (c 36).

The mobile repeaters that are exempted are those used indoors and which amplify signals transmitted using GSM and/or UMTS technologies, known as “2G” and “3G” respectively, in addition to any amplification they make of signals transmitted using LTE (“4G”) technology, and also those which are used in vehicles. In each case, the mobile repeaters must comply with technical specifications and conditions set out in Interface Requirements published by the Office of Communications (“Ofcom”).

Interface Requirements are documents containing technical specifications and conditions which are published by OFCOM in accordance with Article 8.1 of Directive 2014/53/EU of the European Parliament and of the Council of 16 April 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of radio equipment and repealing Directive 1999/5/EC. The Interface Requirements are published by Ofcom and available to the public on its official website at <https://www.ofcom.org.uk/> and from its library at Riverside House, 2a Southwark Bridge Road, London SE1 9HA.

The Official Journal of the European Union (OJEU) publishes a list of the most recent and relevant versions of the ETSI standards referred to in the Regulations. That list is available to the public from the official website of the European Union at <http://eur-lex.europa.eu/oj/direct-access.html> or from the EU Bookshop (as managed by the Publications Office of the European Union) by emailing: [bookshop@publications.europa.eu](mailto:bookshop@publications.europa.eu), or from the Publications Office of the European Union at 2 rue Mercier, 2985 Luxembourg, Luxembourg. The ETSI standards themselves are available to the public from ETSI on their website at <http://www.etsi.org> or from the ETSI Secretariat at 650 Route des Lucioles, 06921 Sophia-Antipolis CEDEX, France (Tel: +33 4 92 94 42 00).

A full regulatory impact assessment of the effect that these Regulations will have on cost to business is available to the public from OFCOM’s website at <http://www.ofcom.org.uk> or from the OFCOM library at Riverside House, 2a Southwark Bridge Road, London SE1 9HA. Copies of this assessment have also been placed in the library of the House of Commons.