Licence Exemption of Wireless Telegraphy Devices

Proposed changes

Consultation

Publication date: 26 July 2012

Closing Date for Responses: 20 September 2012

Contents

Section 1

Executive Summary

1.1 On a daily basis most of us use a radio device that has been made exempt from the need to hold a Wireless Telegraphy Act 2006 (the 'WT Act') licence, be it a mobile phone, car key-fob or wireless router. Without exemption, the use of any of these devices would have required the user to hold a WT Act licence issued by Ofcom. As this would place an unnecessary burden on citizens and consumers we make the use of such devices (which we do not expect will interfere with the use of other radio equipment) licence exempt wherever possible. This document consults on proposals to make changes to the existing licence exemption authorisation for some devices in the UK.

1.2 Under section 8(1) of the WT Act, it is an offence to establish, install or use equipment to transmit without holding a licence granted by us, unless the use of such equipment is exempted by regulations. As technology develops we regularly review our exemption regulations to allow new devices (typically low power with a low risk of causing interference) to be made available on a licence-exempt basis or to amend the current provisions to take into account technology changes. This consultation proposes the following changes to the existing arrangements for licence exemption by:

- setting a date to close the 10.675 to 10.699 GHz band after which no new Short Range Device (SRD) devices will be able to be deployed. Equipment in use prior to the closure date will continue to be licence exempt. We are proposing to give industry 18 months notice of this decision; and

- extending the licence exemption for Mobile Satellite System (MSS) user terminals to include the 1518 to 1525 MHz, 1525 MHz to 1559 MHz, 1626.5 MHz to 1660.5 MHz and 1670 to 1675 MHz bands.

1.3 The analysis presented in this document represents an Impact Assessment, as defined in section 7 of the Communications Act 2003 (the Act). Further copies may be obtained from www.ofcom.org.uk or from Ofcom at Riverside House, 2a Southwark Bridge Road, London SE1 9HA. Comments on the proposals outlined in this document are invited by **5pm 20 September 2012**. We expect to release a Statement on this consultation in November 2012, having taken into account stakeholder responses to our proposals.

Section 2

Introduction

What is licence exemption

2.1 Ofcom is responsible for authorising civil use of the radio spectrum and achieves this by granting wireless telegraphy licences under the WT Act or by making regulations exempting users of particular equipment from the requirement to hold such a licence. Under section 8(1) of the WT Act, it is an offence to establish, install or use equipment to transmit without holding a licence granted by us unless the use of such equipment is exempted. We can exempt users from the need to hold a licence for the establishment, installation or use of wireless telegraphy equipment by making regulations under section 8(3) of the WT Act.

2.2 Under section 8(4) of the WT Act, we have to make regulations to exempt equipment if its installation or use meets all of the following criteria:

- is not likely to involve undue interference with wireless telegraphy;
- is not likely adversely to affect technical quality of service;
- is not likely to lead to inefficient use of the part of the electromagnetic spectrum available for wireless telegraphy;
- does not endanger safety of life;
- does not prejudice the promotion of social, regional or territorial cohesion; and
- does not prejudice the promotion of cultural and linguistic diversity and media pluralism.

2.3 In making a device exempt from licensing we specify the characteristics of the equipment that can be used. Licence-exempt devices are commonly low power/ short range devices (SRDs) or handsets that are controlled by a licensed network (e.g. mobile phone handsets). Large numbers of devices are able to use the same frequencies due to their low transmitting power and limited range. By defining the maximum transmit power, along with other characteristics, the probability of them causing undue interference is low.

2.4 Unlike many licensed services, users of licence-exempt devices need to be aware that there are no guarantees that the spectrum will be free of interference. Devices operate on a non-interference non-protection basis. This means that no claim of protection can be made if interference is received from another authorised device or service.

Deciding on licence exemption proposals

2.5 When appropriate we introduce measures to permit the use of a range of new technologies and applications without the need for users to obtain a licence from us. When making a decision on what may qualify for an exemption a number of factors influence whether we should go ahead and exempt, these include:

- the frequency of transmission;
- the power of transmission;
- the use of the equipment;
- the estimated number of deployments;
- the likelihood of undue inference;
- the impact on the technical quality of service; and
- the existence of relevant technical standards.

2.6 A key issue is a device's transmitting power. Radio signals from high-powered devices travel further, increasing the chances of interference with others using the same frequencies. If this occurs, the frequencies will become of limited use to other users in the geographic area.

2.7 Most of the technical studies undertaken to understand whether devices can share frequencies with one another are carried out by the Conference of Postal and Telecommunications Administrations (CEPT). CEPT is the European regional organisation dealing with postal and telecommunications issues and presently has members from 47 countries. It is made up of representatives of the postal and telecommunications administrations of European countries including Ofcom for UK radio matters.

2.8 In addition to its role advising the European Commission (EU) on radio spectrum matters, CEPT produces a range of other outputs that inform the development of spectrum management across CEPT member countries. The work done in CEPT is also used by European Standardisation Organizations such as the European Telecommunications Standards Institute (ETSI)[1] and European Committee for Electrotechnical Standardisation (CENELEC)[2] to develop harmonised European standards for equipment. It is on the basis of much of this work that many SRDs can be considered for licence exemption.

Our 2012 proposals

2.9 We are proposing to make the following changes to the use of licence-exempt equipment:

- setting a date to close the 10.675 to 10.699 GHz band after which no new Short Range Device (SRD) devices will be able to be deployed. Equipment in use prior to the closure date will continue to be licence exempt. We are proposing to give industry 18 months notice of this decision; and
- to extend the licence exemption of Mobile Satellite System (MSS) handsets to the bands 1518 to 1525 MHz and 1670 to 1675 MHz.

2.10 This consultation contains proposals to change the existing regulations for a number of reasons:

[1] http://www.etsi.org/WebSite/AboutETSI/AboutEtsi.aspx
[2] http://www.cenelec.eu/Cenelec/About+CENELEC/default.htm

- to implement measures to harmonise the UK regulations with the International Telecommunications Union (ITU);
- to support the introduction of innovative radio technologies and applications; and
- to reflect the evolution of existing technologies and Ofcom's spectrum policy.

2.11 The detail of, and rationale for, each of the new exemption propositions is explained more fully in sections 3 and 4 of this document. For further detailed technical information, where appropriate, we reference additional supporting documents.

Impact assessment

2.12 The analysis presented in this document represents an impact assessment, as defined in section 7 of the Act[3]. Impact assessments provide a valuable way of assessing different options for regulation and showing why the preferred option was chosen. They form part of best-practice policy-making. This is reflected in section 7 of the Act, which means that generally we have to carry out impact assessments where our proposals would be likely to have a significant effect on businesses or the general public or when there is a major change in our activities. However, as a matter of policy, we are committed to carrying out and publishing impact assessments in relation to the great majority of our policy decisions. For further information about our approach to impact assessments, see the guidelines "Better policy-making: Ofcom's approach to impact assessment"[4].

The citizen and/or consumer interest

2.13 Our principal duty under section 3 of the Act is to further the interests of citizens in relation to communications matters; and of consumers in relevant markets, where appropriate by promoting competition. We take account of the impact of our decisions upon both citizen and consumer interests in the markets we regulate. We must, in particular, secure the optimal use for wireless telegraphy of spectrum and have regard to the principle under which all regulatory activities should be targeted only at cases in which action is needed.

2.14 In addition to section 3 we must have regard to the desirability of encouraging investment and innovation in relevant markets as well as to further the interests of citizens and consumers.

Our policy objective

2.15 We seek wherever possible, to reduce the regulatory burden upon our stakeholders, in this instance users of the radio spectrum. One way in which we can do this is to remove the need for spectrum users to apply for individual licences to authorise the use of radio equipment. As stated in paragraph 2.2 we must exempt equipment if it meets the criteria of 8(4) of the WT Act.

2.16 Ofcom also has a duty to ensure the optimal use for wireless telegraphy. Part of this involves working with international administrations and bodies on regional and global spectrum allocation decisions. From time to time this may require us to change our allocation policy in order to promote optimal use of the spectrum.

[3] www.opsi.gov.uk/acts/acts2003/pdf/ukpga_20030021_en.pdf .
[4] Which are on our website at http://www.ofcom.org.uk/about/policies-and-guidelines/better-policy-making-ofcoms-approach-to-impact-assessment/

2.17 Exemption is realised by describing the details of equipment and the parameters under which it may be used in a Statutory Instrument (secondary legislation called regulations) that exempts users of such equipment from the need to hold a WT Act licence provided they comply with the terms of the regulations.

2.18 There are one-off administrative costs associated with making a Statutory Instrument. We considered the implementation costs to be low and offset by the potential benefits. There may be a slight reduction in spectrum management costs in certain areas.

Equality Impact Assessment

2.19 Following an initial assessment of our policy proposals we considered that it was reasonable to assume that any impacts on consumers and citizens arising from these proposals would not differ significantly between groups or classes of UK consumers and citizens, all of whom would have access to these services, potentially at end-user prices reflective of all general input costs, including opportunity costs of spectrum used.

2.20 We do not consider that there is evidence to suggest that costs imposed on stakeholders, would differ significantly by these aforementioned groups of consumers and citizens relative to consumers in general. This is because one would not expect the impact of supplying these consumers and citizens to differ significantly between these groups and consumers in general.

2.21 Therefore we have not carried out a full Equality Impact Assessment in relation to race equality or equality schemes under the Northern Ireland and disability equality schemes. This was because we were not aware that our decision was intended (or would, in practice) have a significant differential impact on different gender or racial groups, on consumers in Northern Ireland or on disabled consumers compared to consumers in general.

Document Structure

2.22 The document is structured as follows:

- Sections 3 and 4 outline our proposals to modify the current regulations for licence exemption;
- Annexes 1 – 3 explain our consultation principles and how to respond to this consultation;
- Annex 4 sets out the consultation questions;
- Annex 5 contains a draft copy of IR 2030;
- Annex 6 contains a draft copy of IR 2016.6 and 2016.7;
- Annex 7 details the technical analysis of the impact of MSS on other services; and
- Annex 8 contains a glossary of abbreviations.

Next steps

2.23 We welcome stakeholder feedback to this consultation document. The deadline to submit responses to us is 5pm on 20 September 2012. We expect to release a statement on this consultation in December 2012, having taken into account stakeholder responses to our proposals.

2.24 In order to implement any licence exemption proposals we are required to make regulations. If we go ahead and make regulations we may also use this opportunity to review the existing legislation with a view to consolidate where appropriate. We believe that this could make it easier for stakeholders to understand the regulatory environment and reduce the administrative burden.

2.25 In addition to the proposals set out in this document any proposed regulations may also implement other decisions that Ofcom has or is currently consulting on. This is likely to include LTE and WiMAX handsets that connect to networks awarded as part of the 800 MHz and 2.6 GHz release programme[5]. We also may take this opportunity to carry out some housekeeping and update references where appropriate e.g. to update the references related to Business Radio network user stations.

2.26 It is a statutory requirement, under section 122(4) of the WT Act, that we give one month's notice of any proposed regulations. It is our current expectation that we will publish our draft regulations by December 2012. We would then hope to have the new regulations in place by February 2013.

[5] Further information on these proposals can be found at http://stakeholders.ofcom.org.uk/spectrum/spectrum-awards/awards-in-preparation/800MHz_2_6_combined/

Section 3

10.68 to 10.7 GHz Short Range Devices

3.1 Given the 10.68 to 10.7 GHz band designation as an internationally recognised quiet band we are to close the band, in line with ITU Radio Regulations (RR) footnote 5.340, for new deployments of SRDs. In this section we are only seeking views on the period of notice to give before the band is closed permanently to new deployments.

Background on the 10.68 to 10.7 GHz band

3.2 Since 1979 the 10.68 to 10.70 GHz band ('10.68 GHz band') has been internationally recognised in the ITU RR as a quiet band (RR footnote 5.340), where administrations need to ensure emissions are prohibited. This quiet band is intended for Earth Exploration Satellite Services (EESS) monitoring of atmospheric, land, oceanic conditions including precipitation, sea surface temperatures, ice concentrations, snow water equivalent, surface wetness, wind speed, atmospheric cloud water, and water vapour. This data is then used to help model the Earth's climate and assist with weather forecasting. The band is also allocated to radio astronomy and space research (passive).

3.3 However, preceding the ITU RR by some years the UK had already established licence exemption for two classes of SRD in the band 10.675 to 10.699 GHz. These allocations are unique to the UK:

- Radio Determination - in the UK the primary use of this equipment is in domestic home intruder alarms and home automation systems. The indoor radio determination devices are the sensors of intruder alarm systems typically installed in domestic housing or the sensors for automatic door openers; and

- Short Range Indoor Data Links - an old technology largely superseded by WiFi.

3.4 Although the 10.68 GHz band was designated a quiet band in 1979 for EESS the first satellites did not enter orbit until 2002. Preceding this more recent launch of satellites, there has not been the need to avoid interference to actual live satellites. However since the EESS (AMRS) satellites became operational they have demonstrated the ability to see emissions in the band emanating from the UK.

Removal of exemption

3.5 Once a device has been made licence-exempt and is in widespread use it is very difficult to reverse this decision. As equipment was legally brought into use then any decision to reverse this would require giving notice of the change to allow people time to replace existing equipment.

3.6 It is rare for Ofcom to remove a service allocation. In most cases where this has previously occurred this was for a licensed service. The last example was when clearing frequencies in the 790 to 862 MHz band (the '800 MHz band') of some services. However unlike the 800 MHz band, where users were required to hold a WT Act licence, the precise number of 10.68 GHz devices deployed in the UK is

unknown (as no licence is required we do not hold any information). As these systems are not licensed it is highly unlikely that consumers would know whether their system comprise of any 10.68 GHz detectors.

3.7 It is estimated that around 41%[6] of UK households have an intruder alarm fitted but the actual number with 10.68 GHz sensors is not known. For this reason we are unable to accurately assess the cost of removing devices in the UK. We estimate that the cost of clearing the band of all 10.68 GHz equipment immediately and replacing it with 10.5 GHz equipment is likely to be disproportionate to the benefits it would bring[7].

3.8 In addition, any such decision to clear the band would require almost all consumers with 10.68 GHz equipment fitted to participate. This raises a number of issues relating to how any such decision could be effectively communicated to consumers. For the 800 MHz band we were able to write to all licensees and provide them with the necessary information, in this instance we are not able to do this. Making consumers aware of the decision and providing sufficient information to prevent consumer confusion would likely be costly and could not guarantee the clearance of 10.68 GHz devices. For all of these reasons we do not believe this to be a viable and cost effective option.

3.9 Instead of clearing the band of all existing equipment we are to close the band to new deployments, after giving a period of notice. As 10.68 GHz equipment falls out of service it would be replaced by equipment operating at an alternative frequency. This would reduce the impact on EESS overtime and bring the UK in line with ITU RR footnote 5.340. However, we acknowledge that the potentially long life span this equipment could mean that EESS may continue to detect emissions from the UK in the short to medium term.

3.10 Our proposal would no longer authorise, via licence-exemption, any new devices brought into use after a given date. Existing equipment already deployed would continue to be authorised under the licence exemption but when it falls out of service it can not be replaced by equipment operating in the 10.68 GHz band. Although we appreciate the EESS communities' concerns about the continued operation of devices in the band we need to strike a balanced approach which gives appropriate notice, to equipment manufacturers and retailers, of the closure of the band to new deployments. We believe that this is in line with our duties under the section 3 of the Communications Act 2003 that requires Ofcom to perform its duties in a transparent, proportionate, consistent and targeted way.

18-month notice period of the 10.68 GHz band closure to new devices

3.11 We believe that it is appropriate to provide advance warning of the closure of the band. This would give manufacturers time to switch to alternative frequencies, develop new products and dispose of any existing stock.

3.12 We have only closed an SRD licence exemption allocation three times in the last 15 years, in the 418 MHz band for car keys fobs, the 888 MHz band for Radio Determination and the 2275 Hz band for Avalanche Victim detectors. These

[6] Friedland Home Security Week Report 2010.
[7] Estimated cost range of between £27.5 - £82.5 million (based 5% of households with alarms fitted having one 10.68 GHz sensor replaced with a cost of between £50 - £150 including installation).

applications vary widely and their particular circumstances do not provide a precedent for this discussion of an appropriate notice period.

3.13 We have therefore based our proposal on an 18 month notice period used as a benchmark by the SRD industry, when adopting new production methods when there is a revision to a relevant Harmonised Standard. As new standards come into force, equipment needs to be adapted and production processes amended to meet the requirement of the new standard. In this instance, the old Harmonised Standard typically has a sunset date of 18 months following the reference to the new Harmonised Standard in the Official Journal of the European Union (EU OJ). Given the SRD industries' familiarity with this kind of notice period, we feel that 18 months is a reasonable period of notice for removing this allocation to new SRD apparatus.

3.14 We believe that we are acting in a proportionate manner to provide regulatory certainty to stakeholders. By giving 18 months notice we will be providing stakeholders with adequate time for them to modify their manufacturing processes and dispose of any existing stock.

3.15 We propose to implement this proposal by amending the UK national radio interfaces for SRDs, IR 2030/9/3 and IR 2030/12/6[8], to indicate the closure of the band. After the closure date, new SRD equipment using the 10.68 GHz band may no longer be installed in the UK. Equipment already in use may continue to operate.

Impact of the proposal

Consumer

3.16 One of the issues we considered when making our decision to close the band for new installations was the potential impact on those consumers and citizens that already have systems installed. A particular concern after the closure of the 10.68 GHz band is whether one detector becoming defective would require the whole system to be replaced.

3.17 The nature of these alarm and automation systems, in the most part, is that they are built on a modular basis whereby different components from different manufacturers can be assembled together to make a system. As a result of this there are a wide number of detectors available for consumers including systems that use infra red, X band radars (8 to 12 GHz) and K band radars (18 to 27 GHz). This is in part a result of the non-harmonised nature of the spectrum they use and requires installations to be able to be configured depending on the country of operation. In most cases if a detector fails, providing the system is still supported, it can be replaced by another variant of detector.

3.18 As outlined in paragraph 3.7, the cost to consumers of requiring them to replace all of their 10.68 GHz equipment could be in the region of £27.5 to £82.5 million. By proposing the continued exemption for existing devices and ensuring that sufficient replacement equipment would be available we believe that this would limit the impact on consumers.

EESS community

3.19 The presence of detectable signals means that the EESS community would like the UK to prevent the installation of further SRD in the 10.68 GHz band immediately.

[8] See Annex 5

Given the average life span of equipment is 10 to 15 years we are aware that our proposal would not immediately resolve the issue of emissions being detected. Until a majority of devices in the 10.68 GHz band have been replaced EESS could potentially continue to detect signals over the UK. As a result of this EESS data for the UK could potentially continue to be corrupted. Our proposals would ensure that over time as equipment falls out of service and is replaced by 10.5 GHz or other frequency detectors, the impact on the EESS service will gradually diminish.

Manufacturers

3.20 The use of Radio Determination equipment is not well harmonised throughout Europe and each country has its own designation. There are a number of bands that are used for movement detection systems throughout Europe and these include the bands 9.9 to 10.6 GHz and 24.05 to 24.25 GHz (the '24 GHz band'). The UK has already has an allocation for this use at 10.577 to 10.597 GHz (the '10.5 GHz band') and the 24 GHz band. Although we note that the 10.5 GHz band has a slightly lower bandwidth of 20 MHz compared to the 24 MHz available in 10.68 GHz allocation and as a result of this in some limited cases may lead to a loss in performance.

3.21 Given the close proximity of the 10.5 GHz band to the current 10.68 GHz allocation and the fact that some manufacturers already supply equipment at this frequency, we believe that this is an appropriate substitute for the loss of the 10.68 GHz band. However, we acknowledge the concerns of some stakeholders regarding the problems that reduced bandwidth may have with some specific instances of co-location and are currently investigating whether it is possible to gain access to more spectrum in the X band for low power radio determination services.

3.22 We are aware that closing the band to 10.68 GHz equipment could impose some one-off costs on manufacturers who do not currently have equipment in the 10.5 GHz band. This may also include costs associated with retesting equipment to ensure it complies with all necessary technical requirements, for example ETSI standard EN 300 440. As the 10.68 GHz band was a UK only allocation and alternative bands are used in other countries, we do not believe that this proposal would cause manufacturers to have significantly increased ongoing costs. Initial discussions with some manufacturers of 10.68 GHz SRD equipment has indicated that they are able, with little disruption, to shift manufacture to the existing 10.5 GHz band allocation.

Question 1): Do you agree with Ofcom's proposal to give an 18-month notice period for the closure of the 10.68 to 10.7 GHz band to new SRD deployments?

Section 4

Mobile Satellite System User Terminals

4.1 Mobile Satellite Systems (MSS) enable users to transfer data and voice information between satellite communication networks and portable "user terminal" devices such as phones or computer notebooks. The most common type of applications for these devices is for voice calls and for broadband connections. MSS terminals are already licence-exempt in the bands 1626.5 MHz to 1660.5 MHz (transmitting) and 1525 MHz to 1559 MHz (receiving). We are proposing to extend licence exemption to MSS satellite terminals operating in 1518 to 1525 MHz and 1670 to1675 MHz bands.

4.2 Within this section, we use the following terms for the components of a MSS system:

- "Extended L band" refers to satellite user terminals operating in the band 1518 to 1525 MHz (space to Earth), with the terminal transmitting to the satellite in the band 1670 to 1675 MHz (Earth to space).

- "User Terminals (UT)" are the portable devices carried by users of the MSS, which will effectively become free circulating within the European Union.

4.3 The United Kingdom supported proposals to allow MSS to use the extended L band radio spectrum allocations at 1518 to 1525 MHz and 1668 to 1675 MHz (1670 to 1675 MHz allowed in Europe). These proposals were discussed at the ITU World Radio Conference (WRC) 2003 and finalised at the 2007 WRC. Since 2007, satellite operators have funded and built satellites, the first of which is scheduled for deployment in 2013.

4.4 In 2012, CEPT adopted an ECC Decision (12)01[9] on exemption from individual licensing and free circulation and use of terrestrial and satellite mobile terminals operating under the control of networks generic ECC Decision on mobile and satellite use, that decision stated:

- "that administrations, with the exception of satellite terminals installed permanently on maritime vessels or aircraft, shall exempt from individual licensing and allow the free circulation and use of the terrestrial and satellite mobile terminals operating under the control of terrestrial or satellite networks, capable of providing electronic communications services in the frequency bands, or parts of the frequency bands, listed in its Annex 1 (this includes the band 1518-1525 1670-1675 MHz)"

4.5 The CEPT ECC Decision (12)01 looks towards harmonised use across CEPT and provides a framework for the authorisation. ECC decisions are not mandatory and do not cover the national decisions on authorisation of user terminals. This UK policy consultation aims to support harmonisation of the satellite usage.

Proposed technical parameters for licence exemption

4.6 ETSI updated its standards to include the MSS bands that we are proposing to licence-exempt. These harmonised standards are EN 301 681 and EN 301 444. They have been the subject of public consultation and have now completed the

[9] http://www.erodocdb.dk/Docs/doc98/official/pdf/ECCDEC1201.PDF

harmonised standards process. They were cited in the EU Official Journal on the 11th April 2012[10].

4.7 We are proposing that land mobile satellite terminals operating under conditions set out in Table 1 will be made licence-exempt. These technical parameters are broadly in line with the updated ETSI standards. We understand that most satellite user terminals will operate at the new ETSI EN e.i.r.p levels that are 33dBW and below. However, in the UK for a number of years we have permitted the use of higher power satellite user terminals of 37dBW. We do not plan to remove the existing exemption authorisation as there are already mobile satellite terminal equipment operating at those limits in the UK and will continue to be authorised. Further information on all technical parameters for land mobile satellite systems can be found in our draft IR 2016 contained in Annex 6.

Table 1: Technical parameters

Earth to space frequency	1626.5 – 1645.5 MHz 1646.5 MHz – 1660.5 MHz 1670 - 1675 MHz
Space to earth frequency	1518.0 MHz - 1544.0 MHz 1555.0 MHz - 1559.0 MHz
Transmit Power Density	+37dBW e.i.r.p[11]
Reference standards	EN 301 444 and EN 301 681[12]

4.8 Mobile satellite system user terminals already operate in many other bands on a licence exempt basis. Given the harmonisation decisions taken by the ITU and CEPT we are proposing to permit the licence-exempt use of MSS terminals in the 1518 to 1525 MHz and 1670 to1675 MHz bands.

Impact of proposal

4.9 Before making these proposals, we considered the impact that this proposal could have on in band and adjacent users of the spectrum. Highlighted below are the conclusions to our analysis. The full technical analysis of the impact of MSS services can be found in Annex 7 of this document.

4.10 In considering the impact, we assumed that user terminals would radiate up to the same maximum power as authorised for the existing licence-exempt MSS equipment in the band 1626.5 to 1660.5 MHz. This is specified in the existing version of IR 2016 dated September 2008[13].

Satellite Downlink Band and its impact on Programme Making and Special Events

4.11 In the UK, the satellite downlink frequencies 1518 to 1525 MHz share the radio spectrum with Programme Making and Special Events (PMSE) users. PMSE usage

[10] http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2012:104:0001:0037:EN:PDF
[11] We understand that most satellite user terminals will operate at the new ETSI EN e.i.r.p levels that are 33dBW and below.
[12] The use of harmonised standards is not mandatory under the R&TTE Directive.
[13] http://stakeholders.ofcom.org.uk/binaries/spectrum/spectrum-policy-area/spectrum-management/research-guidelines-tech-info/interface-requirements/IR2016final.pdf

of this band consists mainly of audio applications such as wireless microphones and audio links. This proposal will not alter the PMSE use of the band.

4.12 In Annex 7 we provide our full technical assessment of MSS operation in the frequency band 1518 to 1525 MHz and the impacts it may have on PMSE. We conclude that the probability and effect of MSS interference to PMSE is small. In addition, from the parameters used the resultant Power Flux Density (PFD) of the MSS satellite necessary to protect PMSE was found to be around -112 dBW/(m^2 MHz). The expected worst case downlink PFD from satellites in view to the UK were identified as in the range -117 to -125 dBW/(m^2 MHz). Therefore the MSS PFD is compatible with PMSE.

4.13 We did note that in some cases where PMSE is used outside (i.e. no building loss) then its operation might see a small increase in noise and a consequential loss of range. However this would only occur if the PMSE link was operating at its absolute range limit.

4.14 We recognise that there is a small risk of an interference scenario to the MSS terminal receiver on the downlink frequencies. However, this interference risk is small because of the expected low deployment density of MSS near to PMSE use. Noting that the proposed licence exempt conditions of the MSS terminal means that their operation is on a non-protected basis.

Satellite Uplink Band and its impact on other services

4.15 There are a number of other services that are allocated in or adjacent to the satellite uplink band, these are:

- 1668·4 to 1670MHz[14] Meteorological aids, Fixed, and Mobile (except aeronautical mobile) and Radio Astronomy;
- 1670 to 1675 MHz Meteorological aids, Fixed, and Mobile and Radio Astronomy; and
- 1675 to 1690MHz Meteorological aids, Fixed, Meteorological-Satellite (space-to-Earth) and Mobile except aeronautical mobile.

4.16 We concluded that there would be no impact on the most of the services identified above. However, there is a small risk of interference to the three existing legacy Fixed Links operating in the 1670 to 1675 MHz band. This band is closed to new fixed link assignments in the UK for a number of years. The risk of interference to these existing three fixed links is considered to be small since it is expected that MSS terminal usage will be low in the UK and the directional nature of antennas used by both fixed links and MSS terminals could also assist in mitigation of interference.

4.17 We note that the basis on these proposals are that the deployment density of MSS terminals in the UK is expected to be low and the risk of interference with another service would be unlikely. However, we will monitor the situation and if cases of interference do increase then we will review our policy on these bands.

Question 2): Do you agree with Ofcom's proposal to licence-exempt MSS user terminals operating in the 1518 to 1525 MHz and 1670 to 1675 MHz bands?

[14] The Mobile-Satellite (Earth-to-space) allocation 1668-1670 MHz is not operational in the UK.

Annex 1

Responding to this consultation

How to respond

A1.1 We invite written views and comments on the issues raised in this document, to be made **by 5pm** on **20 September 2012**.

A1.2 We strongly prefer to receive responses using the online web form at http://stakeholders.ofcom.org.uk/consultations/wireless-telegraphy-devices-2/, as this helps us to process the responses quickly and efficiently. We would also be grateful if you could assist us by completing a response cover sheet (see Annex 3), to indicate whether or not there are confidentiality issues. This response coversheet is incorporated into the online web form questionnaire.

A1.3 For larger consultation responses - particularly those with supporting charts, tables or other data - please email Paul.Chapman@ofcom.org.uk attaching your response in Microsoft Word format, together with a consultation response coversheet.

A1.4 Responses may alternatively be posted or faxed to the address below, marked with the title of the consultation.

Paul Chapman
Spectrum Policy Group
Ofcom
Riverside House
2A Southwark Bridge Road
London SE1 9HA

A1.5 Note that we do not need a hard copy in addition to an electronic version. Ofcom will acknowledge receipt of responses if they are submitted using the online web form but not otherwise.

A1.6 It would be helpful if your response could include direct answers to the questions asked in this document, which are listed together at Annex 4. It would also help if you can explain why you hold your views and how our proposals would impact on you.

Further information

A1.7 If you want to discuss the issues and questions raised in this consultation, or need advice on the appropriate form of response, please contact Paul Chapman on 020 7981 3069.

Confidentiality

A1.8 We believe it is important for everyone interested in an issue to see the views expressed by consultation respondents. We will therefore usually publish all responses on our website, www.ofcom.org.uk, ideally on receipt. If you think your response should be kept confidential, can you please specify what part or whether

all of your response should be kept confidential, and specify why. Please also place such parts in a separate annex.

A1.9 If someone asks us to keep part or all of a response confidential, we will treat this request seriously and will try to respect this. But sometimes we will need to publish all responses, including those that are marked as confidential, in order to meet legal obligations.

A1.10 Please also note that copyright and all other intellectual property in responses will be assumed to be licensed to Ofcom to use. Ofcom's approach on intellectual property rights is explained further on its website at http://www.ofcom.org.uk/about/accoun/disclaimer/

Next steps

A1.11 Following the end of the consultation period, we intend to publish a statement in December 2012.

A1.12 Please note that you can register to receive free mail Updates alerting you to the publications of relevant Ofcom documents. For more details please see: http://www.ofcom.org.uk/static/subscribe/select_list.htm

Ofcom's consultation processes

A1.13 Ofcom seeks to ensure that responding to a consultation is easy as possible. For more information please see our consultation principles in Annex 2.

A1.14 If you have any comments or suggestions on how Ofcom conducts its consultations, please call our consultation helpdesk on 020 7981 3003 or e-mail us at consult@ofcom.org.uk . We would particularly welcome thoughts on how Ofcom could more effectively seek the views of those groups or individuals, such as small businesses or particular types of residential consumers, who are less likely to give their opinions through a formal consultation.

A1.15 If you would like to discuss these issues or Ofcom's consultation processes more generally you can alternatively contact Vicki Nash, Director Scotland, who is Ofcom's consultation champion:

Vicki Nash
Ofcom
Sutherland House
149 St. Vincent Street
Glasgow G2 5NW

Tel: 0141 229 7401
Fax: 0141 229 7433

Email vicki.nash@ofcom.org.uk

Annex 2

Our consultation principles

A2.1 We have published the following seven principles that we will follow for each public written consultation:

Before the consultation

A2.2 Where possible, we will hold informal talks with people and organisations before announcing a big consultation to find out whether we are thinking in the right direction. 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

A2.3 We will be clear about who we are consulting, why, on what questions and for how long.

A2.4 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 to give us a written response. If the consultation is complicated, we may provide a shortened Plain English Guide for smaller organisations or individuals who would otherwise not be able to spare the time to share their views.

A2.5 We will consult for up to 10 weeks depending on the potential impact of our proposals.

A2.6 A person within Ofcom will be in charge of making sure we follow our own guidelines and reach out to the largest number of people and organisations interested in the outcome of our decisions. Ofcom's 'Consultation Champion' will also be the main person to contact with views on the way we run our consultations.

A2.7 If we are not able to follow one of these principles, we will explain why.

After the consultation

A2.8 We think it is important for everyone interested in an issue to see the views of others during a consultation. We would usually publish all the responses we have received on our website. In our statement, we will give reasons for our decisions and will give an account of how the views of those concerned helped shape those decisions.

Annex 3

Consultation response cover sheet

A3.1 In the interests of transparency and good regulatory practice, we will publish all consultation responses in full on our website, www.ofcom.org.uk.

A3.2 We have produced a coversheet for responses (see below) and would be very grateful if you could send one with your response (this is incorporated into the online web form if you respond in this way). This will speed up our processing of responses, and help to maintain confidentiality where appropriate.

A3.3 The quality of consultation can be enhanced by publishing responses before the consultation period closes. In particular, this can help those individuals and organisations with limited resources or familiarity with the issues to respond in a more informed way. Therefore Ofcom would encourage respondents to complete their coversheet in a way that allows Ofcom to publish their responses upon receipt, rather than waiting until the consultation period has ended.

A3.4 We strongly prefer to receive responses via the online web form which incorporates the coversheet. If you are responding via email, post or fax you can download an electronic copy of this coversheet in Word or RTF format from the 'Consultations' section of our website at http://stakeholders.ofcom.org.uk/consultations/consultation-response-coversheet/.

A3.5 Please put any parts of your response you consider should be kept confidential in a separate annex to your response and include your reasons why this part of your response should not be published. This can include information such as your personal background and experience. If you want your name, address, other contact details, or job title to remain confidential, please provide them in your cover sheet only, so that we don't have to edit your response.

Cover sheet for response to an Ofcom consultation

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 ☐

Whole response ☐

Part of the response ☐

Name/contact details/job title ☐

Organisation ☐

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)

Annex 4

Consultation questions

A4.1 A list of the questions proposed in this consultation can be found below:

Question 1): Do you agree with Ofcom's proposal to give an 18-month notice period for the closure of the 10.68 to 10.7 GHz band to new SRD deployments?

Question 2): Do you agree with Ofcom's proposal to licence exempt MSS user terminals operating in the 1518 to 1525 MHz and 1670 to 1675 MHz bands?

Annex 5

Revisions to IR 2030

Interface Number/Notification number/Date	Normative Part								Informative Part
	Application	Comments to application	Frequency band	Comments to Frequency band	Transmit power / Power density	Comment to Transmit power / Power density	Channelling	Channel access and occupation rules	Reference
IR2030/9/3 2010/0168/UK Oct 2010	Short Range Indoor Data Links	After [dd/mm/yy], equipment in the 10.675 – 10.699 GHz band can no longer be taken into service. However existing equipment may continue to operate within the band provided that interference is not caused to authorised services. Music and speech are only permitted when using a digitised signal.	10.675 – 10.699 GHz		1 W e.i.r.p.				EN 300 440
IR2030/12/6 2010/0168/UK Oct 2010	Radio determination applications	After [dd/mm/yy], equipment in the 10.675 – 10.699 GHz band can no longer be taken into service. However existing equipment may continue to operate within the band provided that interference is not caused to authorised services. Applications are for indoor use only.	10.675 - 10.699 GHz		1 W e.i.r.p.				EN 300 440

Annex 6

Revision to IR 2016

Draft IR 2016.6

Minimum equipment requirements for the use of land mobile satellite systems		
Mandatory Elements (1-9)		
1	Radiocommunication Service	Land mobile satellite
2	Application	Land mobile satellite
3	Frequency band (or bands)	Earth to space 1626.5 - 1645,5 MHz 1646,5 MHz - 1660,5 MHz 1670-1675 MHz Space to earth 1518,0 MHz- 1544,0 MHz 1555,0 MHz - 1559,0 MHz
4	Channelling	N/A
5	Modulation/Occupied Bandwidth	N/A
6	Direction/separation	N/A
7	Transmit power Power Density	+33dBW e.i.r.p
8	Channel access and occupation rules	N/A
9	Authorisation Regime	Licence Exempt in accordance with requirements of Exemption Regulations.
10	Additional essential requirements According to Art 3.3 of R&TTE	Operation with a Geostationary satellite system
11	Frequency planning assumptions	N/A
Informative Elements (10-13)		
12	Planned Changes	
13	References	EN 301 444
14	Notification Number	
15	Remarks	Ofcom may impose additional restrictions on the maximum power used for specific frequencies and locations.

Draft IR 2016.7

Minimum equipment requirements for the use of land mobile satellite systems		
Mandatory Elements (1-9)		
1	Radiocommunication Service	Land mobile satellite
2	Application	Land mobile satellite
3	Frequency band (or bands)	Earth to space 1626,5 MHz- 1645,5 MHz 1646,5 MHz - 1660,5 MHz 1670-1675 MHz Space to Earth 1518,0 MHz- 1544,0 MHz 1555,0 MHz - 1559,0 MHz
4	Channelling	N/A
5	Modulation/Occupied Bandwidth	N/A
6	Direction/separation	N/A
7	Transmit power Power Density	+15dBW e.i.r.p
8	Channel access and occupation rules	N/A
9	Authorisation Regime	Licence Exempt in accordance with requirements of Exemption Regulations.
10	Additional essential requirements According to Art 3.3 of R&TTE	Operation with a Geostationary satellite system
11	Frequency planning assumptions	N/A
Informative Elements (10-13)		
12	Planned Changes	
13	References	EN 301 681
14	Notification Number	
15	Remarks	Ofcom may impose additional restrictions on the maximum power used for specific frequencies and locations.

Annex 7

Technical analysis of MSS impact

Introduction

A7.1 This annex sets out the background of the bands 1518 to 1525 MHz and 1670 to 1675 MHz:

- we list the adjacent services; and
- we identify if the MSS user terminals creates a risk of interference.

Radiated Power assumptions for MSS type user terminals

A7.2 The power levels required for a terminal to communicate with a satellite vary depending on a number of factors, including the design of the satellite antenna and the bandwidth.

A7.3 IR2016 (dated September 2008) has a maximum e.i.r.p. of up to 37dBW within it for the MSS satellite bands 1626.5 to 1660.5 MHz. For this consultation, we assume that MSS terminals using the extended L band (1670 to 1675 MHz) may also operate up to similar powers.

A7.4 Recent revisions to the ETSI standards indicate a new maximum power limit for user terminals, of up to 33dBW e.i.r.p, whereas previously the ETSI harmonised standards for these bands did not specify a maximum power level.

A7.5 Ofcom do not plan to retrospectively remove the IR2016 (2008) exemption authorisation for higher power satellite user terminals of 37dBW, as in the market there are some mobile satellite terminal equipment operating to the September 2008 IR 2016 limits. Although we do understand, most current satellite user terminals will operate at the new ETSI EN e.i.r.p levels that are 33dBW and below.

1518 to 1525 MHz MSS and Programme Making and Special Events

Background

A7.6 This section provides an overview of the MSS downlink signals and Programme Making and Special Events (PMSE) services in the UK. PMSE usage of this band consists mainly of audio applications such as wireless microphones and audio links. For the band 1518 to 1525 MHz, there are two interference sharing scenarios of the MSS to PMSE and PMSE to MSS. In the UK, PMSE users have been in operating in the band prior to the new MSS allocations and this PMSE operation will continue.

A7.7 The UK supported the band 1518 to 1525 MHz for new MSS allocations at WRC 2003, even though the existing UK use of PMSE might cause potential interference to MSS usage. WRC 2003 agreed to allocate to MSS in this band. The UK basis for supporting the new allocations at WRC 2003 recognised that MSS terminals would be of a licence-exempt status and that the MSS terminals would operate on a non-protection basis to interference caused by PMSE.

- There is a small risk of an interference scenario occurring to the MSS terminal due to expected low deployment density of MSS near to PMSE use.
- Where PMSE use is indoors, building losses will attenuate the PMSE signals at the MSS location and MSS signals at the PMSE receiver.
- If there is no building loss, MSS signals at the PMSE receiver will be much lower than that of the local PMSE transmitter and the satellite signal interference will not be apparent.

MSS transmissions toward PMSE (wireless microphone) services

A7.8 Ofcom note that satellites using the band 1518 to 1525 MHz will launch in 2013. Table A1 sets out the assumed PMSE (wireless microphone) parameters.

Table A1: Assumed PMSE (wireless microphone) parameters

PMSE link parameters	
Frequency	1518 MHz
Reception Bandwidth (B)	200kHz
Antenna gain	Omni 0 dBi
Noise Figure dB	4dB
Noise PWMS dBW (N) (kTB) (with T=438K) (200kHz)	-149dBW
Interference threshold dBW (I) (1dB change from I/N = -6dB) in 200kHz	-155dBW
Assumed Building attenuation dB	10dB
PFD to protect PWMS dBW/(m^2 MHz)	-112 dBW/(m^2 MHz)

A7.9 Table A2 contains the assumed MSS characteristics, taken from CEPT ECC Reports 121 and 147[15], which considered Professional Wireless Microphones Systems and MSS in this and other adjacent frequency bands.

Table A2: Assumed MSS parameters

Carrier Parameters			
Carrier Type		**Max EIRP***	**BW**
		dBW	**kHz**
60 kHz		31.3	60
200kHz		44.8	200

* Typical operational beam peak levels

PFD Calculations			
Slant Range to Satellite		40000	km
Spreading loss		163.0	dBm^2
PFD's			
60 kHz		-125.5	dB(W/m^2/MHz)
200kHz		-117.2	dB(W/m^2/MHz)

A7.10 Table A3 indicates that the worst case Power Flux Density (PFD) will have a signal level of -159.3 dBW at the PMSE receiver.

[15] CEPT reports 121 and 147 "Compatibility studies between PWMS and other services" available at http://www.erodocdb.dk/doks/doccategoryECC.aspx?doccatid=4

Table A3: Power FLux Density

Worst case PFD dBW/(m^2 MHz)	-117.2
Received power $\lambda^2/(4(\pi)$	-25.1dB
Bandwidth 200 kHz	-7dB
Building attenuation dB	10
Received Interference dBW 200kHz (I)	-159.3 dBW

A7.11 Therefore in the above case a MSS PFD will have interference to noise ratio (I/N) of -10dB and not cause interference to PMSE services.

Table A4: PWMS range

PWMS range to maintain same C/N			Without MSS	With MSS (-149.3dBW)
PWMS Tx power 50mW		-13dBW		
PWMS Typical Receiver sensitivity -95dBm		-125dBW		
Tx and Rx Antenna's gain dB		0 dB		
Maximum free space path loss dB		112dB		
$C/N_{effective}$ for Noise -149dBW		24dB		
$C/N_{effective}$ for Interference + Noise -146dBW		21dB		
Maximum urban propagation Ikegami model (@1500MHz) – Two ray LOS model L = 42.6 + 26log(dkm) + 20log(fMHz)		112dB 109dB	1.6km	 1.3 km

A7.12 If outside use of PMSE occurs (i.e. no building loss) then PMSE operation might see a small increase in noise and a consequential small loss of range but only if the PMSE link was operating at its absolute range limit as shown in Table A4.

Overall Conclusions for PMSE and MSS in the 1518 to 1525 MHz band

A7.13 Based on the assessment in this annex, the probability and effect of MSS interference to PMSE is small. In addition from the parameters, the resultant PFD of the MSS satellite necessary to protect PMSE was found to be around -112 dBW/(m2 MHz). The expected worst case downlink PFD from satellites in view to the UK were identified as in the range -117 to -125 dBW/(m^2 MHz). Therefore the MSS PFD is compatible with PMSE.

1670 to 1675 MHz - mobile satellite service terminals and other services

A7.14 Listed below are the services that could be affected by the Mobile Satellite System (MSS) user terminal transmissions in the band 1670 to 1675 MHz.

- 1668·4 to 1670 MHz[16] METEOROLOGICAL AIDS, FIXED, and MOBILE (except aeronautical mobile) and RADIO ASTRONOMY; and

- 1675 to 1690 MHz METEOROLOGICAL AIDS, FIXED, METEOROLOGICAL-SATELLITE (space-to-Earth) and MOBILE except aeronautical mobile.

METEOROLOGICAL AIDS and METEOROLOGICAL-SATELLITE Service

A7.15 Within the UK the use of meteorological aids and meteorological-satellite moved above 1675 MHz from the band 1670 to 1675 MHz, because of the World Radio Conference (WRC) 2003 & 2007 decisions allocating new radio spectrum for MSS. Therefore there are no sharing issues with these services and MSS uplink transmissions. This is especially the case for any adjacent band compatibility as we expect MSS user terminals to have a low density of use and be away from areas where users launch and receive transmissions from these meteorological aids.

FIXED Service in 1670 MHz - 1675 MHz band

A7.16 Within the UK, the fixed service radio spectrum between 1670 to 1675 MHz is no longer available for new fixed link assignments. There remain three fixed links in the band 1670 to 1675 MHz. However, the risk of interference to these remaining links is expected to be small, because:

- The implementation and use of mobile satellite terminals in these new bands is expected to be low within the UK.

- The satellite terminals and fixed link use directional antennas further reducing the probability of interference.

A7.17 The three links are identifiable in the Wireless Telegraphy Register[17] on the Ofcom website.

MOBILE below 1670 MHz - above 1675 MHz

A7.18 The UK does not operate mobile services immediately adjacent to 1670 to 1675 MHz and therefore we have no adjacency issues with this service.

RADIO ASTRONOMY below 1670 MHz

A7.19 CEPT, UK and Ofcom recognise the importance and use of the band 1668 MHz to 1670 MHz for Radio Astronomy. Consequently to protect Radio Astronomy the UK will not authorise the band 1668 to 1670 MHz for mobile satellite service use. CEPT and the UK considered that the use of part of the Extended L band 1670 to 1675 MHz would be adequate for the European region.

[16] The MOBILE-SATELLITE (Earth-to-space) allocation 1668 to 1670 MHz is not operational in the UK.
[17] http://spectruminfo.ofcom.org.uk/spectrumInfo/licences

Annex 7

Glossary of abbreviations

CENELEC	European Committee for Electrotechnical Standardisation
CEPT	European Conference of Postal and Telecommunications Administrations
dBm	Decibels relative to one Milliwatt (0 dBm is equivalent to one Milliwatt)
EC	European Commission
EU	European Union
ECC	Electronic Communications Committee
EIRP	Equivalent isotropic radiated power
ERP	Effective radiated power
ETSI	European Technical Standards Institute
EU	European Union
FAT	Frequency Allocation Table
FSS	Fixed Satellite Service
GHz	Gigahertz (a frequency of one billion Hz)
Hz	Hertz (one complete cycle of a radio signal per second)
IR	UK Radio Interface Requirement
ITU	International Telecommunication Union
kHz	Kilohertz (a frequency of one thousand Hz)
LMSS	Land Mobile Satellite Service
LTE	Long Term Evolution
MHz	Megahertz (a frequency of one million Hz)
MSS	Mobile Satellite Service
mW	Milliwatt (one thousandth of a watt)
nW	Nanowatt (one billionth of a watt)
OJEU	Official Journal of the European Union
PFD	Power Flux Density
PMSE	Programme Making & and Special Events
R&TTE	Radio and Telecommunications Terminal Equipment
SRD	Short Range Device
UHF	Ultra high frequency
VHF	Very high frequency
WiMAX	Worldwide Interoperability for Microwave Access
WSD	White Space Device
WT Act	Wireless Telegraphy Act 2006