

Making Spectrum Available in the 71-76GHz & 81-86GHz Bands

A consultation on a light licensed approach for
broadband fixed wireless systems in the higher millimetre
wave bands

Consultation

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Section 1

Summary

- 1.1 This document sets out Ofcom's proposals to open the 71-76 GHz and 81-86 GHz spectrum bands (the "Spectrum Bands") for point to point broadband fixed wireless systems ("FWS") on a light licensed basis.
- 1.2 The Spectrum Bands currently have little or no use and are therefore available for a wide range of wireless applications. Technology is now emerging which can be used to provide a broad range of new products and applications such as high capacity fixed point to point wireless area networks and broadband internet access which could potentially be used as an alternative to fibre based solutions.
- 1.3 The proposals contained in this document have been developed in light of increasing interest from the market in use of these frequencies for systems of this kind.
- 1.4 Ofcom's statutory duties include securing the optimal use of the electro-magnetic spectrum, and the availability throughout the United Kingdom of a wide range of electronic communication services. Ofcom must have regard to a number of considerations in performing its duties, including the principles of transparency and proportionality, the desirability of promoting competition, of encouraging investment and innovation, and the availability of high-speed data transfer services.
- 1.5 Ofcom's strategy for the management of spectrum is to keep regulation to the minimum necessary, and to give a much greater role to the market in determining how spectrum is used, and by whom, rather than these decisions being determined by the regulator.
- 1.6 The proposals in this document have been prepared in light of Ofcom's spectrum strategy and duties, as well as other relevant considerations such as the international framework for use of these frequencies.
- 1.7 In particular, Ofcom has considered evidence of demand for use of these frequencies, and how optimal use could be secured through an appropriate regulatory framework. The evidence available to Ofcom suggests that:
 - There is increasing demand from a variety of commercial users for access to these frequencies for FWS. This is consistent with commercial and regulatory developments internationally, in the US and other parts of Europe.
 - The technical characteristics of the FWS that are likely to be deployed (notably, 'pencil beam' signal characteristics) are such that multiple different users of FWS could co-exist without causing adverse interference, provided there is a registration and self-coordination mechanism in place.
 - It would therefore be in the interest of better use of the spectrum to open the bands for FWS use, but given the expected conditions of supply and demand this can be done on a first come first served basis.
 - There is little or no evidence of similar demand from other potential types of use or user, such as mobile use, amateur applications or satellite services.
- 1.8 In order to maximise the opportunities for effective use of the spectrum and keep regulation to a minimum, Ofcom intends to adopt a light licensed process for these

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bands to enable the authorisation and deployment of point to point FWS in a rapid, self assigned, self co-ordinated and flexible way.

- 1.9 The Spectrum Bands offer the possibility of high capacity wide bandwidth applications with 10GHz (2 x 5GHz) of spectrum available.
- 1.10 Within the Spectrum Bands potential data speeds currently quoted range from 1Gbit/s to 10Gbits/s for short hop (1-2km) high availability (>99.9%) FWS access and infrastructure applications. Currently, such data speeds in the lower microwave bands are not possible due to bandwidth constraints.
- 1.11 In relation to co-ordination requirements and the assignment of links, the proposals in this consultation move away from the traditional, centralised assignment approach Ofcom currently undertakes in the lower Fixed Link point to point bands (1.5 GHz to 55 GHz). Instead, taking into account the properties of these higher millimetre wave bands, Ofcom is proposing to adopt a more flexible, light licensed approach so that co-ordination obligations rest with the licensee. Ofcom is also proposing that licensees register links on a first come first served basis in order to establish priority.
- 1.12 The approach put forward in this consultation is aimed at encouraging innovative use of the Spectrum Bands, stimulating further technological development and promoting competition in communication services while imposing only the minimum amount of regulation necessary to achieve these aims.
- 1.13 The key proposals are:

Spectrum	Ofcom Proposals
71-76 GHz and 81-86 GHz	To make spectrum available in the 71-76 GHz and 81-86 GHz for point to point broadband fixed wireless applications on a light licensed basis. Specifically 2 x 4.75GHz which takes into account adjacent band compatibility issues.
Amateur and Amateur Satellite Allocations at 75.5-76 GHz	To continue to permit amateur and amateur satellite use between 75.5-76 GHz on a secondary basis.
Wireless Telegraphy Rights and Obligations	Ofcom Proposals
Licence	To provide non exclusive national licences subject to revocation on 5 years notice. The number of licences issued will be unlimited. Each licence may contain an unlimited number of assignments.
Link Registration	To develop and implement a link registration system which records the technical details of each link registered on a database. Priority will be established on a first come first served basis. To make the data on this database available to all licensees and on a public basis.
Fees	For each link registered a fee based on £50 per year will be charged.

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Spectrum Trading	The licences will be tradable. All types of trades i.e. partial or total, concurrent or outright permitted.
Flexibility	The licences will contain the minimum necessary technical conditions.
Interference Management and Technical Issues	Ofcom Proposals
Coordination	Licensees will self coordinate links using the technical parameters available from the database. For each coordination situation, the licensee with the link registered first will have priority.

Section 2

Background

Introduction

- 2.1 Within the UK the Spectrum Bands are not currently available for commercial FWS. The highest band currently available for commercial broadband point to point FWS is the 64-66 GHz band. Access to the bands above 66 GHz for FWS is currently only permitted through the provision of a non-operational licence for test and development purposes (see OFW 225 at www.ofcom.org.uk/radiocomms/ifi/licensing/classes/noperational/applications/) .
- 2.2 The lower frequency bands currently available for commercial point to point FWS are given in OFW 48 at www.ofcom.org.uk/radiocomms/ifi/licensing/classes/fixed/information/ . However, out of the 16 open bands in the UK the maximum amount of bandwidth available is small (up to around 2 GHz) in these bands when compared to the 10GHz (2 x 5GHz) of spectrum which is the subject of this consultation. Bands below 64GHz are also rigidly structured and defined by set channel plans which, although providing a clear structure for deployment and co-ordination of FWS, can constrain the type and capacity of application deployed.

Commercial Use of the Higher Millimetre Wave Bands

- 2.3 The millimetre wave spectrum above 70 GHz is becoming the subject of increasing interest for commercial use due to its unique propagation characteristics and the wide bandwidth available for carrying communications traffic. New technology is now starting to emerge that offers the possibility of using these higher bands, thereby taking advantage of the wide bandwidths available to support applications such as extremely high speed data transmission (e.g. in the range 1 GBit/s to 10 GBits/s) for short hop (1 - 2km) communication.
- 2.4 The nature of the propagation in the millimetre wave bands and the possibility of employing highly directional 'pencil beam' signal characteristics mean that applications can be implemented with minimal interference concerns, allowing a potentially highly efficient re-use of the spectrum.
- 2.5 The availability of wide bandwidths also provides an option to cater for future market demands for increasingly high capacity access, in particular for internet-based applications.
- 2.6 The main features of operating fixed radio systems in the Spectrum Bands can be summarised as follows:
- Availability of wide bandwidths supporting large capacity data rates exceeding those in the lower Fixed Service bands between 1 and 55GHz, with sufficient bandwidth for terrestrial fixed links to compete or complement fibre optic based access networks.
 - Fixed Service equipment operating at distances of 1-2km with high (>99.9%) availability.

- Possibility of extensive channel re-use, due to the propagation conditions and the highly directional ‘pencil beam’ signal characteristics which reduce the co-ordination requirements.
- Probable use of lower order modulation schemes allowing low cost equipment.
- Reduced installation time compared to other methods of broadband delivery. Fixed radio links can often be deployed more quickly than either wired or fibre networks,

International & UK Frequency Allocations

- 2.7 During the World Radio Radiocommunication Conference in 2000 (“WRC-2000”) a number of changes were made to the international frequency allocations above 71GHz, primarily to cater for the current and future requirements of the passive science services. Allocations were essentially rearranged taking into account the long term passive service protection requirements. However, while there were a number of significant changes to specific allocations the amount of spectrum for the active services generally remained the same. Table 1 below shows the current ITU Radio Regulation Article 5 table entries for the two frequency ranges which are the subject of this consultation, 71 – 76GHz and 81– 86GHz.
- 2.8 WRC-2000 also moved the primary Amateur and Amateur-Satellite allocation from 75.5-76GHz to 77.5-78GHz and introduced footnote 5.559A. Footnote 5.559A provides a regulatory provision to allow the primary Amateur and Amateur-Satellite allocation to remain in the band 75.5-76GHz until the year 2006.

Table 1

Radio Regulations Article 5: Allocation to Services	
71-74 GHz FIXED FIXED-SATELLITE (space-to-Earth) MOBILE MOBILE-SATELLITE (space-to-Earth)	81-84 GHz FIXED FIXED-SATELLITE (Earth-to-space) MOBILE MOBILE-SATELLITE Space research (space-to-Earth) 5.149 5.561A
74-76 GHz FIXED FIXED-SATELLITE (space-to-Earth) MOBILE BROADCASTING BROADCASTING-SATELLITE Space research (space-to-Earth) 5.559A 5.561	84-86 GHz FIXED FIXED-SATELLITE (Earth-to-space) MOBILE RADIO ASTRONOMY 5.561B 5.149

- 2.9 The UK Frequency Allocation Table incorporates all of the above allocations in the UK table. International Radio Regulation footnote 5.559A is dealt with via a separate UK footnote, UK7, and currently permits Amateur and Amateur-Satellite use on a primary basis until 31st December 2006. Footnote 5.561A also allocates the Amateur and Amateur-Satellite service on a secondary basis in the 81-81.5GHz band. However, this allocation is not available to the amateur service in the UK.

Availability of the 71-76GHz & 81-86GHz bands in the UK for FWS

- 2.10 As described above, the international and UK frequency allocation tables allocate the Spectrum Bands to Fixed Services along with other services. Within the UK, parts of the Spectrum Bands (i.e. the 71-74GHz and 81-84GHz bands) are jointly managed by Ofcom and the Ministry of Defence ("MoD") who have requested that their rights to use these bands in the future are protected. However, there is no immediate requirement for co-ordination with the MoD and with the proposed method of light licensing coupled with a link registration process, flexibility will be retained for the future should other requirements emerge.
- 2.11 The radio amateur allocations in the 75.5-76GHz band have recently been the topic of discussion with respect to the 79GHz automotive short range radar consultation; "Notice of Ofcom's proposal to exempt automotive short range radar users at 79GHz from Wireless Telegraphy licensing" published on 9th December 2004. During this consultation, comments were received from several respondents requesting that the Radio Amateur allocations should remain in this band on a primary basis. Ofcom believes that while the Amateur allocations should remain in the band after 31st December 2006, it would not be practical to allow this operation on a co-primary basis. Ofcom therefore proposes to continue to allow the Amateur and Amateur-Satellite allocations after 31st December 2006 in the 75.5-76GHz band but on a secondary basis in the UK Frequency Allocation Table.

Question 1

Do you agree that the Amateur and Amateur-Satellite allocations in the 75.5 – 76 GHz band should remain in the UK Frequency Allocation Table after 31st December 2006 on a secondary basis? If not, what would you suggest as an alternative approach?

Also, what is your view on permitting the secondary Amateur and Amateur-Satellite allocation in the 81 – 81.5GHz band within the UK Frequency Allocation Table?

European Standardisation & Regulatory Developments

- 2.12 Within Europe, the European Telecommunications Standards Institute ("ETSI") has recently developed a draft technical specification for equipment operating in the 71-76GHz and 81-86GHz bands. This is currently going through the ETSI approval process. The specification has been developed for radio equipment and antennas for use in point to point millimetre wave applications in the fixed service and covers a range of modulation types and radio interface capacities. Maximum power levels are also specified with an EIRP limit of 55dBW and a transmit power limit (at the antenna port) of +30dBm.
- 2.13 CEPT has recently approved and adopted a channel plan for the Spectrum Bands (CEPT Rec (05)07). The channel plan is based on subdividing each of the bands into nineteen, 250 MHz channels with the possibility of allowing up to all of the channels from each band to be aggregated to form single larger blocks.

Section 3

Development of a Light Licensed Product

Introduction

- 3.1 For Fixed Service applications in the Spectrum Bands Ofcom intends to move away from the traditional centralised planning and assignment (command & control) approach currently carried out in the lower Fixed Service point to point bands (1.5 GHz to 55 GHz). Instead, taking into account the unique properties of these higher millimetre wave bands, it is proposed that a more flexible and lighter licensing approach is established whereby operators themselves conduct the necessary interference analysis and co-ordination of links as required.
- 3.2 Ofcom believes that to provide maximum flexibility and to allow technology development of higher capacity systems (towards 10 GBit/s which will require large amounts of bandwidth) the division of the Spectrum Bands into smaller blocks would not be appropriate in these circumstances. Also, under the light licensing process described below, spectrum scarcity is not considered to be an issue within the Spectrum Bands. Ofcom considers that deployment under a licence exempt basis could result in unacceptable interference and would be unlikely to lead to optimal use of the spectrum, particularly considering the high availability applications proposed to be used in the Spectrum Bands. Also, as mentioned in section 2.10 the MoD has requested that their rights to use parts of the Spectrum Bands in the future are maintained. It is therefore necessary that the location of existing terminals is recorded to facilitate coordination and address any future requirements of the MoD. Ofcom therefore considers that taking into account these points licensing on a first come first served basis is the appropriate way forward, rather than either licence exemption or release by way of auction.
- 3.3 To date, discussions with stakeholders have indicated that due to the types of high availability applications envisaged in these Spectrum Bands, link operators will require links to be protected from interference. While Ofcom believes that the potential for interference is likely to be small in the Spectrum Bands (due to the 'pencil beam' signal characteristics of the FWS) a simple mechanism to enable individual 70/80GHz links to gain protection from interference can be accomplished by the implementation of a centralised database (the "Database") with a registration system with a first come first served date and time record essentially forming the basis for this protection. Under this arrangement Ofcom would only become directly involved in managing the co-ordination of links in the Spectrum Bands if an interference dispute case arose.
- 3.4 To implement such a process three main elements are proposed:
 - i) Applicants are granted a non-exclusive national licence.
 - ii) The Database is made available to all licensees with a date, time protection rule. The date and time record is made in order to ensure that links registered on the Database take priority over others registered later.
 - iii) All licensees are given access to an e-enabled user interface so that they are able to access the Database, examine the technical details of existing links, register their new links and modify or cancel their existing ones.

Each of these three elements is considered in more detail below.

Question 2

Do you agree that a light licensed approach is appropriate to facilitate access to the 71-76 GHz and 81-86 GHz bands?

What are your views on the need to provide a regulatory mechanism for interference protection of fixed links operating in the 71-76GHz and 81-86GHz bands?

Do you agree that links registered in the database require a date/ time priority rule for establishing interference protection of links?

Non-Exclusive National Licence

- 3.5 Under section 1 of the Wireless Telegraphy Act 1949 it is a criminal offence to establish or use equipment for wireless telegraphy (transmission) except under the authority of a wireless telegraphy licence granted by Ofcom, unless an exemption has been granted from licensing. Therefore, in order to use the Spectrum Bands operators will require a licence. It is proposed that prospective licensees will complete a one off licence application form for a non-exclusive licence to operate in the Spectrum Bands within the United Kingdom.
- 3.6 To encourage commercial development of the Spectrum Bands and to give the necessary market certainty for operators, manufacturers and investors, Ofcom is proposing to grant licences of indefinite duration which are subject to revocation on five years notice. It is proposed that the licence application process itself would not attract a fee. Instead, licensees would be charged a nominal annual fee for each link registered (see further section 3.8 below). The licences would permit licensees to register and operate fixed point to point links anywhere within the United Kingdom. Licensees would not be permitted to commence commercial operations until they have registered their links and obtained a valid site clearance certificate (to the extent necessary – see section 4 below).
- 3.7 Ofcom is proposing that licensees are granted a unique reference number, user name and password enabling 'write' ability on the Database via the e-enabled user interface application described in sections 3.16 to 3.17 below.
- 3.8 For the 65 GHz band which is also available via a light licensed process, a fee of £50 per year is charged. It is therefore proposed that the licensees in the Spectrum Bands are charged based on a fee of £50 per year for each new link added to their licence. Ofcom believes that a fee is necessary on spectrum efficiency grounds to discourage the registration of 'paper' links that could otherwise sit in the Database with protected rights, unnecessarily sterilising the use of the Spectrum Bands. The exact way in which this will be applied is currently being considered along with consideration of how to simplify and reduce administrative costs. This will be addressed further in the context of a general fees implementation consultation anticipated in the coming months.

Question 3

Do you agree that a fee based on £50 per link per year provides the right balance between allowing access to spectrum and discouraging the hoarding of 'paper' links within the registration Database. If not, what would you suggest as an appropriate fee to achieve these aims?

Centralised Link Database

- 3.9 Ofcom proposes to establish the Database by making regulations in accordance with its powers under section 170 of the Communications Act 2003. The Database would hold and make available the relevant information required to enable licensees to plan and self co-ordinate links in the Spectrum Bands. The Database would be provided and maintained by Ofcom.
- 3.10 As part of the light licensing process, data entered onto the Database would need to be made available to licensees on a general basis in order to allow self co-ordination. Therefore, as part of the licence application process all applicants for a licence to operate in the Spectrum Bands would need to consent to Ofcom making the data provided by applicants (including operator name and assignment details) available to other licensees and on a public basis.
- 3.11 The Database would also serve as the reference point for the date and time a link is registered, thereby establishing the priority of that link over another link that a licensee attempts to register at a later time. The priority of a link would be based on a first come first served basis. Data fields required for the Database would include specific site data, antenna data and equipment data. A full set of the proposed data fields is set out in Annex 6.

Self Coordination and Dispute Resolution

- 3.12 It is proposed that the Database would contain all relevant details of each registered link and provide sufficient information to enable a new licensee to conduct a search of the Database to determine whether or not a proposed new link would cause harmful interference to any existing links or suffer interference itself before a registration is made.
- 3.13 To allow licensees to carry out detailed co-ordination and planning of links prior to link registration it will be necessary to make the Database available to all licence holders in the Spectrum Bands. It is also proposed that a read-only version of the Database would be made available on the open part of the Ofcom website for access by the general public. Licensees would then be free to conduct their own analysis and enter into co-ordination arrangements with other operators as appropriate. Priority and protection would be date and time based, so licensees would be required to ensure that a new link causing harmful interference to an earlier registered link is closed down or its technical parameters are modified to eliminate any harmful interference.
- 3.14 In order to remove uncertainty as to what constitutes an 'unacceptable/harmful' level of interference, Ofcom is considering specifying an overall maximum threshold degradation policy for the Spectrum Bands. In fixed link planning it is common practice to set this parameter to 1dB, which is an aggregate interference criterion. However, as it is considered that there is only a small risk of interference occurring, the full 1dB criteria could be used as a threshold value for a single interferer.
- 3.15 Under this type of arrangement Ofcom would only become involved in resolving interference disputes should licensees not be able to agree on a specific interference case. Under these circumstances Ofcom would carry out an interference calculation using a specified/agreed method and determine if the interference threshold had been breached. If the level had been exceeded and no inter-operator solution could

be found then Ofcom would remove the later installed interfering link from the Database. It is noted here that it is highly unlikely that disputes of this nature arise due to the characteristics of these higher millimetre bands and the 'pencil beam' signal characteristics of the fixed wireless transmissions. By creating such an environment, licensees will have an incentive to co-operate and make sure that interference does not occur otherwise they will run the risk of their infringing links being removed from the Database.

e-Enabled User Interface

- 3.16 Ofcom proposes to provide licensees with an e-enabled User Interface Application ("UIA") in order to enable them to register links and make amendments and cancellations. The UIA would enable licensees to access the Database which would display all registered links with associated technical parameters
- 3.17 Licensees would be given read access to all technical data pertaining to individual links including operator contact details. Licensees would also be granted write access to the Database for the purpose of registering their own links. However, the UIA would not perform detailed link budget and assignment calculations. These would be for the licensee to perform. It is envisaged here that the licensees could carry out this function themselves or employ the services of a third party to advise them in relation to interference management.

Spectrum Trading

- 3.18 We propose to extend spectrum trading to licences in these bands. Spectrum trading is the transfer of rights and obligations arising by virtue of a WT Act licence.
- 3.19 It is Ofcom's statutory duty to secure the optimal use of spectrum for the benefit of UK consumers and citizens. Spectrum trading plays an important part in securing this objective, because it enables spectrum to migrate to users that will use it most efficiently.

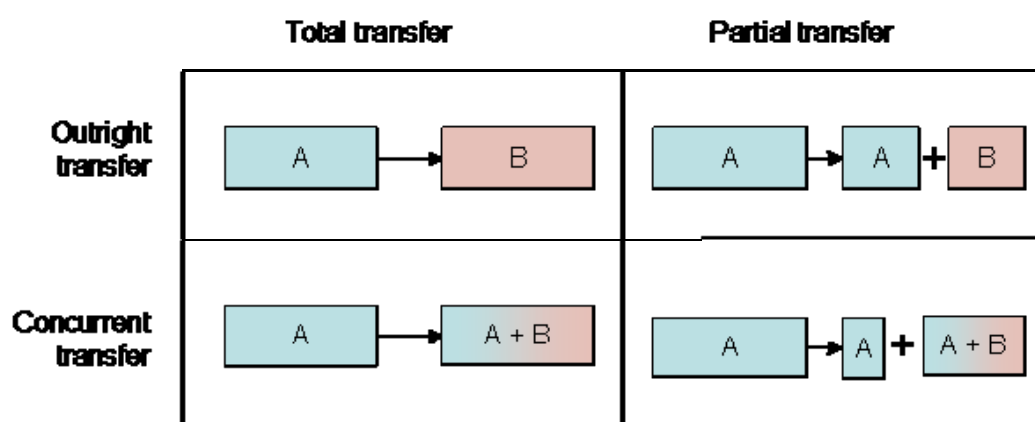
The Legislative Framework

- 3.20 The European Commission Framework Directive enables Member States to introduce spectrum trading. It permits a range of approaches, subject to the need to ensure that:
- competition is not distorted as a result of any trade; and
 - the use of spectrum harmonised under Community measures does not change.
- 3.21 The Framework Directive is implemented in UK law by the Communications Act 2003. Section 168 of this Act contains provisions allowing Ofcom to establish a spectrum trading regime in the UK by making regulations ("the Trading Regulations"). Under that section, transfers that fail to comply with the Trading Regulations will be void.
- 3.22 The Wireless Telegraphy (Spectrum Trading) Regulations 2004 (hereafter referred to as "the Trading Regulations"), which entered into force on 23rd December 2004, implemented this possibility with regulations detailing the licence classes that could be traded, possible types of transfers and the relevant procedure.
- 3.23 The framework established in 2004 was designed to cater for a range of different types of transactions that involved the transfer of rights to use radio spectrum from

one organisation to another. In addition to an outright total transfer (where all the rights and obligations of a licence transfer from one party to another), the Trading Regulations permit other transfer options. These are:

- concurrent transfers – the transfer of the rights and obligations under the licence such that the transferred rights and obligations become rights and obligations of the transferee while continuing to be rights and obligations of the person making the transfer; and
- partial transfers – the transfer of only some rights and obligations under the licence. This will result in a licence being partitioned (divided) into two distinct licences. Partial transfers may be outright or concurrent.

3.24 The exhibit below gives some illustrative example of the types of transfers that are currently possible. The types of transfer options available will be determined by the licence class.



3.25 As set out in its August 2004 Statement on Spectrum Trading Ofcom intends to expand the range of licences that can be traded, with the majority of licences tradable well before the end of the decade.

Spectrum Trading for the Spectrum Bands

3.26 In line with the spectrum trading statement we propose to amend these regulations to permit for licences in the Spectrum Bands:

- The transfers of all rights and obligations of licences;
- The concurrent transfer of all rights and obligations of a licence;
- Partial and partial concurrent transfers of individual links authorised under a licence.

Publication of information by Ofcom to facilitate trading and more efficient use of spectrum

In general terms Ofcom believe that there are a number of benefits to be accrued from publishing relevant information about licences. These include:

- It supports spectrum trading because markets function most efficiently when the maximum amount of information is available, because they benefit from the transparency and certainty this brings.

- It can promote spectrum access and efficient spectrum use by facilitating user self-coordination and interference planning.
- 3.27 Under Section 170 of the Communications Act Ofcom has powers to make regulations enabling licensing information to be published in a register. In December 2004 Ofcom made the Wireless Telegraphy (Register) Regulation 2004, which enabled Ofcom to establish a register (“WT Register”) of relevant information. These regulations extend only to those licences which are currently tradable. The WT Register has been realised in the form of an on-line database which is available at <http://www.ofcom.org.uk/radiocomms/isu/ukpfa/intro>. As set out in the August 2004 Spectrum Trading statement Ofcom intends to extend the scope of the WT Register to a wider range of classes, and in line with this statement Ofcom now proposes to extend the scope of the WT Register to include the licence classes that are proposed as the subject of this consultation.
- 3.28 In order to support the proposed light licensing approach for the Spectrum Bands, Ofcom proposes to enable licensees to access the Database of registered links which will provide sufficient information to enable a new link to be adequately co-ordinated. Sections 3.9 – 3.17 provide details of the centralised Database and the self-coordination process. As mentioned in section 3.11 the information required to support this approach will be detailed and include specific site data, antenna data and equipment data. A full set of the proposed information is set out in Annex 6.

Publication of Trading Information.

- 3.29 Ofcom currently publishes information about proposed transfers that have been notified to Ofcom for approval; this information is contained within the Trade Notification Register, which is available on-line at <http://146.101.202.225/public-tnr/tradeDetails.do>. This meets the requirement under the Authorisation Directive to make information about spectrum trades public. If the transfer is approved by Ofcom, and assuming the parties decide to continue with the transfer, then the fact that is has been put into effect will also be noted.
- 3.30 Ofcom believes that publication of trading information will enable interested parties to find out about the number of transactions that have taken place and the spectrum which is being traded. The information contained on the Trade Notification register includes:
- Details of the licence being traded;
 - Licensee’s name and buyer’s name;
 - Date of provision of information required by Ofcom to consider whether or not to consent to the transfer; and
 - In the case of a partial transfer a description of which rights under the licence are proposed to be transferred.
- 3.31 Ofcom proposes to also extend this arrangement to the new licence class proposed in this consultation.

Implementation

- 3.32 The implementation of the light licensed process described in this consultation requires the development of a database and user interface. Ofcom is currently in the process of transitioning its existing IS systems to new and consolidated systems. Part of the transition process is to include e-enabled light licence functionality to

deliver light licensed products such as the one described in this consultation. Ofcom is currently working on the basis of delivering the e-enabled light licensed functionality in March 07.

Section 4

Technical and Regulatory Considerations

A Flexible Band Plan

- 4.1 In October 2005 CEPT adopted Recommendation ECC/Rec/(05)07, “Radio Frequency Channel Arrangements for Fixed Service Systems Operating in the Bands 71-76 GHz and 81-86 GHz”. The recommendation defines a set channel arrangement for the Spectrum Bands. Within each 5 GHz bandwidth, nineteen 250 MHz channels are defined, with a 125 MHz guard band at the top and bottom of each 5 GHz band. Aggregation of any number of channels, from 1 to 19, is permitted under the recommendation. However, in order to provide the maximum flexibility for fixed wireless applications, Ofcom proposes that the channel plan is not mandated. Instead, Ofcom proposes simply to define two 4.75GHz blocks of spectrum with no defined channel arrangement as shown in Figure 1 below. The only compliance with the CEPT recommendation would be to establish the 125MHz guard bands at the end of each block to ensure adjacent band compatibility.
- 4.2 Under this flexible arrangement licensees would be free either to configure their system in one block, using an internal duplex spacing or to use both blocks with a larger duplex spacing. By not insisting on using a specific channel plan Ofcom believes that manufacturers will have the freedom to produce equipment utilising a variety of modulation schemes, rather than those that just fit within a ‘narrow’ channel, thus encouraging technological development.

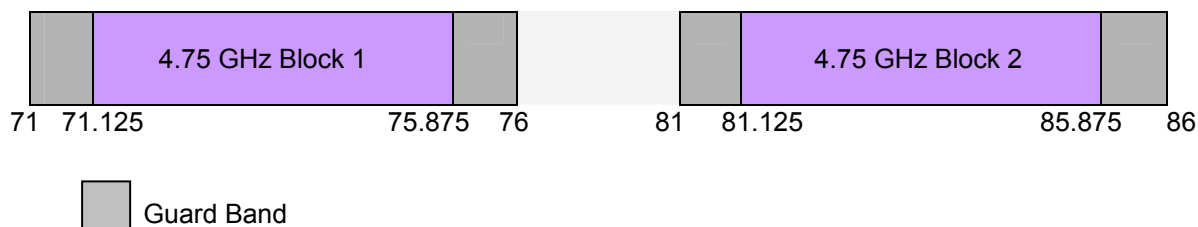


Figure 1

- 4.3 Under the above configuration equipment would be permitted to operate anywhere in the Spectrum Bands providing that the occupied bandwidth of a given application does not stray into the guard band area.

Question 4

Do you agree that the CEPT channel plan ECC/Rec(05)07 should not be mandated and that a flexible band structure comprising of two national spectrum blocks of 4.75GHz is appropriate for facilitating access to the 71-76GHz and 81-86GHz bands?

Equipment and Antennas

- 4.4 Point to point FWS equipment eligible for registration and operation would have to be compliant with the essential requirements of the RTTE Directive 1995/5/EC (CE marked). This is a requirement for all radio equipment in the European Community.
- 4.5 In line with the wider objective of pursuing technology neutrality, Ofcom does not intend to apply technological restrictions to the equipment that may be deployed e.g. channel bandwidth, modulation type, link capacity.

Maximum Effective Isotropic Radiated Power (EIRP) and Transmitter Power

- 4.6 It is proposed to allow the maximum permitted power levels as given in Article 21 of the Radio Regulations, i.e. +55dBW Max EIRP for the Spectrum Bands.
- 4.7 For transmitter power it is proposed to follow the recent draft ETSI Technical Specification for these bands which specifies a maximum output power of +30dBm (0dBW) delivered by the transmitter to the antenna of a station.

Interference Criteria

- 4.8 In order to provide a clear reference point in which to determine unacceptable interference Ofcom is considering specifying a maximum interference policy for the bands. This could be used by Ofcom if an interference dispute case arose and was referred to Ofcom.
- 4.9 The interference level could also be used by operators when making an interference calculation to determine whether the introduction of a new link was likely to cause an interference problem. If interference was above this threshold then registration of a subsequent link may still be possible but the operator would run the risk of the link being removed if an agreement from the affected operator(s) had not been given, therefore providing an incentive for operators to co-operate and reach an agreement. Under this arrangement it would be for the concerned operators to seek a negotiated arrangement as appropriate. The date/time protection principle would be applied but only if Ofcom needed to become involved in a dispute situation.
- 4.10 Typical practice for planning fixed links is to specify a 1dB degradation of Noise on the basis of aggregate interference. However, as discussed in section 3.14, it is considered that a figure of 1dB could be used as the single entry protection criterion, thus allocating the full 1dB budget to a single interferer. This approximately equates to specifying an I/N not exceeding -6dB.

Question 5

In addition to the date/time priority rule do you think it would be beneficial for Ofcom to set a maximum interference threshold policy for the 71-76GHz and 81-86GHz bands?

If so, do you have suggestions for the criteria and how this could be assessed?

Co-ordination With Other Services & UK National Frequency Register

- 4.11 Details regarding the UK National Frequency Register are given in OFW 197 at www.ofcom.org.uk/radiocomms/isu/. As the Spectrum Bands are not currently used by other services it is intended that the Spectrum Bands become block cleared

frequency bands. Block cleared frequency bands enable assignment requests to be fast tracked and entered directly onto the UK National Frequency Register (NFR) without the need to go through the formal National Frequency Assignment Panel (NFAP) Procedure, which can be a lengthy process. In order to achieve this status the bands need to be considered by the National Frequency Planning Group (NFPG). Ofcom is currently in the process of submitting a proposal to the NFPG to include the 71-76 GHz & 81-86 GHz bands as part of the fast track process.

Site Clearance

- 4.12 Site clearance of FWS will be required if the specified site clearance thresholds are exceeded. These are given in OfW 191 at www.ofcom.org.uk/radiocomms/isu/ and reproduced below:
- If the Effective Isotropically Radiated Power (EIRP) greater than or equal to +45dBW.
 - If the antenna height above ground level (AGL) is greater than 30 metres.
 - If mounted to an existing site cleared structure, and the change increases the height by 5 metres or more.
- 4.13 Therefore if the planned equipment / installation triggers any of these thresholds a site clearance certificate will be required before the operator is permitted to register a link. This could be carried out by a simple declaration on registration.

Question 6

Are there any regulatory impacts or other considerations not otherwise mentioned in this consultation that you believe are relevant to the 71-76GHz and 81-86GHz bands?

Annex 1

Responding to this consultation

How to respond

Ofcom invites written views and comments on the issues raised in this document, to be made by **5pm on 2 August 2006**

Ofcom strongly prefers to receive responses as e-mail attachments, in Microsoft Word format, 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), among other things to indicate whether or not there are confidentiality issues. The cover sheet can be downloaded from the 'Consultations' section of our website.

Please can you send your response to alex.dixon@ofcom.org.uk.

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

Alex Dixon
Ofcom
Riverside House
2A Southwark Bridge Road
London SE1 9HA

Fax: 020 7783 4303

Note that we do not need a hard copy in addition to an electronic version. Also note that Ofcom will not routinely acknowledge receipt of responses.

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 Ofcom's proposals would impact on you.

Further information

If you have any questions and want to discuss the issues and questions raised in this consultation, or need advice on the appropriate form of response, please contact Alex Dixon on 020 7981 3193.

Confidentiality

Ofcom thinks 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, <http://www.ofcom.org.uk>, ideally on receipt (when respondents confirm on their response cover sheet that this is acceptable).

All comments will be treated as non-confidential unless respondents specify that part or all of the response is confidential and should not be disclosed. Please place any confidential parts of a response in a separate annex, so that non-confidential parts may be published along with the respondent's identity.

Ofcom reserves its power to disclose any information it receives where this is required to carry out its legal requirements. Ofcom will exercise due regard to the confidentiality of information supplied.

Please also note that copyright and all other intellectual property in responses will be assumed to be licensed to Ofcom to use, to meet its legal requirements. Ofcom's approach on intellectual property rights is explained further on its website, at www.ofcom.org.uk/about_ofcom/gov_accountability/disclaimer.

Next steps

Following the end of the consultation period, Ofcom intends to publish a statement around towards the end of the year

Please note that you can register to get automatic notifications of when Ofcom documents are published, at http://www.ofcom.org.uk/static/subscribe/select_list.htm.

Ofcom's consultation processes

Ofcom is keen to make responding to consultations easy, and has published some consultation principles (see Annex 2) which it seeks to follow, including on the length of consultations.

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, whose views are less likely to be obtained in a formal consultation.

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 (Scotland)
Sutherland House
149 St. Vincent Street
Glasgow G2 5NW
Tel: 0141 229 7401
Fax: 0141 229 7433
E-mail: vicki.nash@ofcom.org.uk

Annex 2

Ofcom's consultation principles

A2.1 Ofcom has published the following seven principles that it 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 version for smaller organisations or individuals who would otherwise not be able to spare the time to share their views.

A2.5 We will normally allow ten weeks for responses to consultations on issues of general interest.

A2.6 There will be a person within Ofcom who 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. This individual (who we call the 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. This may be because a particular issue is urgent. If we need to reduce the amount of time we have set aside for a consultation, we will let those concerned know beforehand that this is a 'red flag consultation' which needs their urgent attention.

After the consultation

A2.8 We will look at each response carefully and with an open mind. 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, we will publish all consultation responses in full on our website, <http://www.ofcom.org.uk>, unless a respondent specifies that all or part of their response is confidential. We will also refer to the contents of a response when explaining our decision, without disclosing the specific information that you wish to remain confidential.
- A3.2 We have produced a cover sheet for responses (see below) and would be very grateful if you could send one with your response. This will speed up our processing of responses, and help to maintain confidentiality by allowing you to state very clearly what you don't want to be published. We will keep your completed cover sheets confidential.
- 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 cover sheet 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 in the form of a Microsoft Word attachment to an email. Our website therefore includes an electronic copy of this cover sheet, which you can download from the 'Consultations' section of our website.
- A3.5 Please put any confidential parts of your response in a separate annex to your response, so that they are clearly identified. 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

What do you want Ofcom to keep confidential?

Nothing	<input type="checkbox"/>	Name/contact details/job title	<input type="checkbox"/>
Whole response	<input type="checkbox"/>	Organisation	<input type="checkbox"/>
Part of the response	<input type="checkbox"/>	If there is no separate annex, which parts?	

If you want part of your response, your name or your organisation to be confidential, 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. It can be published in full on Ofcom's website, unless otherwise specified on this cover sheet, and I authorise Ofcom to make use of the information in this response to meet its legal requirements. 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

Question 1

Do you agree that the Amateur and Amateur-Satellite allocations in the 75.5 – 76 GHz band should remain in the UK Frequency Allocation Table after 31st December 2006 on a secondary basis? If not, what would you suggest as an alternative approach?

Also, what is your view on permitting the secondary Amateur and Amateur-Satellite allocation in the 81 – 81.5GHz band within the UK Frequency Allocation Table?

Question 2

Do you agree that a light licensed approach is appropriate to facilitate access to the 71-76 GHz and 81-86 GHz bands?

What are your views on the need to provide a regulatory mechanism for interference protection of fixed links operating in the 71-76GHz and 81-86GHz bands?

Do you agree that links registered in the database require a date/ time priority rule for establishing interference protection of links?

Question 3

Do you agree that a fee based on £50 per link per year provides the right balance between allowing access to spectrum and discouraging the hoarding of ‘paper’ links within the registration Database. If not, what would you suggest as an appropriate fee to achieve these aims?

Question 4

Do you agree that the CEPT channel plan ECC/Rec(05)07 should not be mandated and that a flexible band structure comprising of two national spectrum blocks of 4.75GHz is appropriate for facilitating access to the 71-76GHz and 81-86GHz bands?

Question 5

In addition to the date/time priority rule do you think it would be beneficial for Ofcom to set a maximum interference threshold policy for the 71-76GHz and 81-86GHz bands?

If so, do you have suggestions for the criteria and how this could be assessed?

Question 6

Are there any regulatory impacts or other considerations not otherwise mentioned in this consultation that you believe are relevant to the 71-76GHz and 81-86GHz bands?

Annex 5

Impact assessment

- A5.1 The analysis presented here, when read in conjunction with the rest of this document, represents an Impact Assessment ("IA"), as defined by section 7 of the Communications Act 2003 (the "Act"). You should send any comments on this IA to Ofcom by the closing date for this consultation. Ofcom will consider all comments before deciding whether to implement the proposals.
- A5.2 IAs 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 and are commonly used by other regulators. This is reflected in section 7 of the Act, which means that generally Ofcom will carry out IAs where proposals would be likely to have a significant effect on businesses or the general public, or when there is a major change in Ofcom's activities. In accordance with section 7 of the Act, in producing the IA in this document Ofcom has had regard to such general guidance as it considers appropriate, including related Cabinet Office guidance.

Policy, purpose and intended effect

- A5.3 Ofcom's objective is to exercise its functions in relation to spectrum used for the Fixed Service in a way that complies with international obligations and makes optimal use of the spectrum in accordance with its statutory duties.
- A5.4 The intended purpose of the proposed regulations is to encourage innovative use of these higher millimetre wave bands, stimulating further technological development and promoting competition in wide range of communication services while imposing only the minimum amount of regulation necessary to achieve these aims.
- A5.5 Ofcom is proposing to open the Spectrum Bands to point to point FWS on a light licensed basis. The following discusses the specific options considered.

Options and assessment

- A5.6 The following analyses the options considered, the benefits, costs and risks and mitigating measures associated with the proposals discussed in this document.

Providing access to 71-76/81-86GHz bands

- A5.7 Ofcom has considered carefully the merits of providing access to these bands. Within Europe, the UK has been promoting light touch regulation and the Spectrum Bands offer an opportunity to put in place a process to facilitate broadband point to point systems and stimulate technological development in the higher millimetre wave bands. It is considered that providing access to these bands for fixed links will therefore encourage technological innovation and development and make available the possibility of extremely high speed data rates (up to 10Gbits/s) to businesses and consumers via a wireless interface. These extremely high data rates cannot be achieved in the lower frequency bands due to the limited bandwidth available. If access to these bands were not provided UK businesses/consumers could be disadvantaged by a lack of an early introduction of new innovative Fixed Wireless technology.

Light licensing for fixed links in the 71-76/81- 86GHz bands

A5.8 Ofcom has considered the licensing options for the Spectrum Bands. The bands have several different service allocations and parts of the Spectrum Bands (71-74GHz and 81-84GHz) are also jointly managed by the MoD. Since the MoD has requested that their right to use these bands in the future is retained it is not considered appropriate to exempt them from licensing. Also from initial discussions with stakeholders, the expressed requirement in these bands is for high availability links which will require an adequate interference management process to be implemented. It is considered that this can be achieved by the establishment of a simple link registration process with a date/time rule. The light licence product coupled with a link registration process also has the benefit of allowing flexibility in the future if the requirements change as well as offering a means of adequate interference management.

Amateur and Amateur Satellite allocations in the 75.5 – 76GHz

A5.9 Ofcom has considered the options with respect to amateur allocations in the 75.5 – 76GHz band. Removing amateur allocations from the UK allocation table in the band 75.5-76GHz has the benefit of allowing new innovative commercial point to point fixed wireless technology to develop in these bands without risk of interference from amateur stations, but at a cost of denying spectrum access to amateur radio stations. Maintaining a primary status for the amateur allocations in the UK allocation table after 2006 would require coordination between FWS and the amateur stations. This could unduly constrain development of commercial point to point fixed wireless technology and place an administrative burden, of coordination, on businesses. Allowing the amateur allocations on a secondary basis in the 75.5-76GHz band in the UK allocation table has the benefit of maintaining continued access to spectrum for the amateur services after 2006 while allowing fixed wireless technology to develop in these bands. Under this basis however, amateur services would have to accept any interference from fixed wireless stations and operate unprotected. Maintaining secondary amateur allocations could also lead to interference from amateur stations to FWS. However, the secondary amateur operations would be required to cease operation if interference did occur.

Use of a flexible band structure for the 71-76/81-86GHz bands

A5.10 Ofcom has considered the options for a channel plan for these bands. While a pre defined channel plan has the benefit of ease of coordination of links from an interference management point of view there is less flexibility for the deployment of fixed wireless equipment. A single national block arrangement provides a more flexible arrangement and allows manufacturers to develop fixed wireless equipment without narrow channel restrictions. However, it is recognised that while gaining increased flexibility a more challenging environment for the coordination of links is created.

Applying an Annual Fee for links in the 71-76/81-86GHz bands

A5.11 Ofcom has considered the options to achieve spectrum efficiency and wish to discourage the registration of paper links. Paper links would be registered links that could sit in the Database with protected rights but not exist in practice and therefore sterilise spectrum unnecessarily. The same applies to registered links that subsequently get decommissioned and may otherwise be left in the Database. Application of an annual fee together with the database of links has the benefit of encouraging the utilisation of the spectrum in an efficient manner. By not applying an annual fee businesses and consumers would benefit from reduced costs, however, an

unlimited number of paper links could be registered which could sterilise spectrum in geographical areas and prevent further deployment.

Interference protection of links and implementation of an Interference management policy

A5.12 Ofcom has considered the options with respect to interference protection of links and an associated interference management policy. Implementing just the registration Database without a date / time priority rule has the benefit of being a simple solution however links would not be protected from interference from other links. Implementing the registration Database together with a date and time priority rule for links has the benefit of being a simple solution together with an assurance of protection for first in links. However, this approach does not provide a clear reference point for interference analysis and relies on operators to reach agreement themselves. In addition to specifying a date and time priority rule, specifying an interference threshold has the benefit of a clear reference point for interference management. However, this adds complexity to the process and requires a clearly defined method in order calculate specific interference levels.

A5.13 The table below summarises the option assessments with benefits, costs and risks.

Option	Benefits	Costs	Risks
Providing spectrum access to the Spectrum Bands for commercial FWS.	Allows the facilitation of commercial broadband point to point FWS with extremely high capacity potential. Stimulates technology developments in the higher millimetre wave bands.	If limited interest, Ofcom will have incurred costs to facilitate access to these bands.	Market at 70/80 GHz may not develop very quickly. If new or more value added technologies are still developing, risk that early licensing of bands could complicate transition to higher value use later.
Light Licence Product. Link registration database and date/time priority rule for interference protection.	Facilitates licensed access to these bands while maintaining flexibility for future use of the bands, i.e. Terminal locations & technical characteristics known. Interference protection achieved through a simple	Interference calculations required by licensee to ensure interference is not caused to other links. Cost for Ofcom in setting up IT system. Ofcom may have to address dispute	Potential disagreement over what is considered an acceptable level of interference, leading to possibility of dispute. Delay of delivery of IT system to facilitate the light licence product.

Option	Benefits	Costs	Risks
	<p>mechanism.</p> <p>More open and transparent process whereby operators can retrieve data and self assign links.</p> <p>Ofcom only needs to get involved if there is an interference dispute.</p>	cases	
Permitting secondary Amateur and Amateur-Satellite allocations in the 75.5-76GHz band after 31 st Dec 2006.	<p>Maintains spectrum access in this band for Radio Amateurs.</p> <p>Allows both Amateur and FWS to operate in the band without the need for co-ordination.</p>	<p>Amateur services will be required to operate on a non-interference non-protected basis and will incur the cost of operating unprotected. However, there is little or no amateur use known at present and no material use is expected in the foreseeable future.</p>	<p>There is a potential interference risk to commercial FWS from Amateur stations. However, this is considered small due to the characteristics of these bands and the low number of Amateur stations anticipated that would use these bands.</p>
Implementation of a flexible band structure.	<p>Flexible arrangement. Licensees will not be constrained to a set channel plan.</p> <p>Licensees will be able to choose their own duplex spacing to suit their requirements.</p> <p>Manufacturers will have freedom to develop equipment which is not confined to 'narrow' channels.</p>	<p>More challenging co-ordination environment created by FWS not conforming to a set arrangement.</p> <p>Increased complexity in assessing interference.</p>	<p>Operators may not operate in a spectrally efficient manner.</p>
Applying an annual fee.	Helps maintain an efficient use of the	Annual cost to licensee, based on the number of	If an annual fee is not set at the correct value

Option	Benefits	Costs	Risks
	<p>spectrum.</p> <p>Discourages the registration of 'paper' links.</p>	<p>terminals registered.</p>	<p>potential risks are:</p> <p>i) Fee too high: could discourage use of Spectrum Bands</p> <p>ii) Fee too low: could result in large numbers of paper links.</p>
Applying an Interference Management policy to the Spectrum Bands.	<p>Clarifies what is considered as 'unacceptable' interference.</p> <p>Assists self co-ordination by providing a clear technical interference management framework.</p>	<p>Adds a level of complexity to the process.</p>	<p>Licensees registering links that do not comply with the interference criteria and do not have an agreement in place with the other licensees links run the risk of their links being removed from the register if an interference complaint is lodged.</p>
Block frequency clearance.	<p>Removes need to go through a slow paper based frequency clearance process for each link.</p> <p>Assists rapid deployment of FWS.</p>	<p>Additional National Frequency Planning Group (NFPG) process to complete to achieve block frequency clearance.</p>	<p>Risk that block frequency clearance is not achieved which would result in licensing delays with each link being required to be submitted to the National Frequency Assignment Panel (NFAP) for approval.</p>

Proposals

The analysis set out above supports Ofcom's proposals to open the Spectrum Bands on a light licensed basis as described in this consultation document.

Annex 6

Data Fields Required For Link Registration

- 1) Ofcom Reference Number (System Generated)
- 2) Date / Time registered (System Generated)
- 3) Licensee Name
- 4) Path Length (m)
- 5) Site A NGR
- 6) Site B NGR
- 7) Site A ground height (mAGL/mASL)
- 8) Site B ground height (mAGL/mASL)
- 9) Site A antenna height (mAGL/mASL)
- 10) Site B antenna height (mAGL/mASL)
- 11) Equipment manufacturer
- 12) Equipment model number
- 13) Bit rate
- 14) Bandwidth
- 15) Receiver Sensitivity Level for $BER \leq 10^{-6}$
- 16) Site A antenna manufacturer
- 17) Site B antenna manufacturer
- 18) Site A antenna model number
- 19) Site B antenna model number
- 20) Site A antenna maximum boresight gain
- 21) Site B antenna maximum boresight gain
- 22) Site A antenna elevation angle
- 23) Site B antenna elevation angle
- 24) Site A antenna azimuth angle
- 25) Site B antenna azimuth angle
- 26) Site A transmit power (EIRP)
- 27) Site B transmit power (EIRP)
- 28) Site A transmit frequency (MHz)
- 29) Site B transmit frequency (MHz)
- 30) Modulation scheme (i.e. 4 PSK)
- 31) Technical contact details (name, address, telephone number of contact for planning/co-ordination)
- 32) Radio Site Clearance confirmation

Annex 7

Glossary

Band

A defined range of frequencies that may be allocated for a particular radio service, or shared between radio services.

CEPT

Conference of European Postal and Telecommunications administrations, comprising over 40 European administrations.

Coordination

This term refers to the process under which a new user seeks the agreement of existing users to share access to a particular range of frequencies while avoiding harmful interference.

dB

decibel

dBW

A logarithmic representation of radio frequency power with respect to one Watt.

ECC

Electronic Communications Committee, A European committee that reports to CEPT

ETSI

European Telecommunications Standards Institute, a European based industry group that addresses equipment standards for radio and telecommunications equipment.

EIRP

Effective Isotropic Radiated Power

Fixed Service

A service involving the transmission, emission and/or reception of radio waves for specific telecommunication purposes between specified fixed points.

FWS

Fixed Wireless Systems

GHz

Gigahertz: a unit of frequency equal to 1000 million Hz or cycles per second.

Interference

The effect of unwanted signals upon the reception of a wanted signal in a radio system, resulting in degradation of performance, misinterpretation or loss of information compared with that which would have been received in the absence of the unwanted signal.

MHz

Megahertz: a unit of frequency, equal to 1,000,000 (1×10^6) Hz or cycles per second.

Primary

This is a term used to indicate that a frequency allocation for a particular service has priority over other services in the same band. It is quite frequent to have several services that are

Making Spectrum Available in the 71-76GHz & 81-86GHz Bands

co-primary' (e.g. fixed and mobile) where both services have equal priority. See paragraphs 5.23 to 5.33 of the ITU Radio Regulations.

RTTE

Radio Equipment and Telecommunications Terminal Equipment