OFFICE OF COMMUNICATIONS

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

Statement on Ofcom provisions for a light licensed approach for broadband fixed wireless systems in the higher millimetre wave bands

Statement

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Contents

Section 1

Executive Summary

1.1 This document provides the Ofcom Statement with respect to making the 71-76 GHz and 81-86 GHz bands (the "Spectrum Bands") available for point to point fixed wireless systems (FWS) on a light licensed basis in the UK.

1.2 Ofcom publicly consulted from 24 May 2006 to 2 August 2006 on proposals to make the Spectrum Bands available to the UK market. The consultation was conducted in light of increasing interest from the UK market to use of the Spectrum Bands for broadband point to point FWS.

1.3 The consultation sought views on the following:

- Amateur and Amateur Satellite allocations in the 75.5-76 GHz (beyond 31 December 2006) and 81-81.5 GHz bands.
- The appropriateness of a light licensed approach to facilitate access to the Spectrum Bands.
- The need to provide a regulatory mechanism for interference protection of fixed links operating in the Spectrum Bands.
- The implementation of a date/time priority protection rule for establishing interference protection of links.
- A fee based on £50 per link registered to provide the balance of providing access to the band and prevent hoarding of 'paper' links.
- Whether the CEPT channel plan (ECC Recommendation(05)07) should not be mandated and that a flexible band structure comprising 2 blocks of 4.75GHz would be appropriate to facilitate access to the Spectrum Bands.
- Whether a maximum interference threshold policy should be implemented and suggestions as to how this might implemented.
- Any other regulatory considerations relevant to the Spectrum Bands.

1.4 In response to the proposals set out in the consultation document Ofcom received 14 non-confidential responses. These are listed in Annex 1 and are published on Ofcom's website at http://www.ofcom.org.uk/consult/condocs/71-86ghz/responses/. In addition Ofcom received one confidential response to the proposals.

1.5 Of these 15 responses the large majority supported Ofcom's plans for opening the Spectrum Bands on a light licensed basis. Two responses indicated that they preferred the more traditional way for managing the bands i.e. a fully licensed and co-ordinated approach, similar to the lower fixed link bands. This consideration however, has not caused Ofcom to change its overall approach in these bands and Ofcom has therefore decided to make the Spectrum Bands available in the UK for point to point FWS on a light licensed basis, using a registration system with an interference protection date to establish priority in the band.

1.6 Ofcom is grateful to the consultation respondents and has carefully considered the comments in developing the UK policy for the Spectrum Bands. In developing the policy, Ofcom has also taken into account a number of other considerations, 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.

1.7 The UK policy also takes into account Ofcom's strategy of keeping regulation to the minimum necessary and that a greater role should be given to the market in determining how spectrum is used, and by whom, rather than these decisions being determined by the regulator.

1.8 It is Ofcom's intention to facilitate access to the Spectrum Bands through a light licensed and online registration system. While Ofcom develops such a system, interim procedures based on a manual system of licensing and registration will be implemented to facilitate access to the Spectrum Bands at the earliest possible time.

1.9 The table below summarises the key points of the Ofcom policy for the Spectrum Bands:

Issue	**Policy**
Available Spectrum	Ofcom will make available two bands, specifically 71.125-75.875 GHz and 81.125-85.875 GHz for broadband point to point fixed wireless links
Block/Channel Size	A 4.75 GHz block in each band.
Licence	An unlimited number of non-exclusive national licences will be available, subject to revocation on a standard 5 year notice period. Each licence may contain an unlimited number of assignments.
Fees	Licence fee – free of charge. Each link assignment - £50 per link registered per year or part year (where applicable).
Licensing Process	Light licensed and e-enabled link registration process. To open the band at the earliest possible time, an interim procedure will be implemented while Ofcom's online facility (currently under development) is completed. Links will be registered on a publicly accessible register with first in time priority.
Coordination between links	Links will be self co-ordinated i.e. coordinating between links will be the responsibility of the licence holder.
Trading	All forms of transfer will be permitted.
Frequency Block Clearance	The Spectrum Bands have been block cleared to permit fast track frequency clearance (see OfW 197) i.e. link assignments will not be required to undergo the full

	three week National Frequency Assignment Panel (NFAP) process and be considered at NFAP meetings.
Site Clearance	Links breaching thresholds given in OfW 191 will require site clearance. Licensees will be required to declare that site clearance thresholds are met/ links have been site cleared before a registration can be made.
Equipment and Antennas	Must conform to essential requirements of the RTTE Directive and UK Interface Requirement 2000.
Maximum EIRP	Maximum Radio Regulations limit, 55dBW.
Max Transmit Power delivered to the antenna	0 dBW
Other Users of the Band	Ofcom will permit the operation of the Amateur and Amateur Satellite allocations on a primary basis within the upper guard band of the 71-76 GHz block i.e. 75.875-76 GHz band. Amateur and Amateur Satellite use between 75.5 – 75.875 GHz will be permitted on a secondary basis.
Review of the interference approach	It is intended that a review of the interference approach is undertaken when sufficient experience has been gained to assess if any refinements to the approach are necessary.

Section 2

Introduction

2.1 On 24 May 2006 Ofcom published a consultation document on making spectrum available for broadband point to point fixed wireless applications in the 71-76 GHz and 81-86 GHz bands (www.ofcom.org.uk/consult/condocs/71-86ghz/). The consultation ran from 24th May to 2nd August 2006 and received 15 responses in total; 14 non confidential and one confidential. Of these 15 responses the large majority supported Ofcom's plans for opening the Spectrum Bands on a light licensed basis. Two responses indicated that they preferred the more traditional way for managing the bands i.e. a fully licensed and co-ordinated approach, similar to the lower fixed link bands. This consideration however, has not caused Ofcom to change its overall approach in these bands and Ofcom has therefore decided to make the Spectrum Bands available in the UK for point to point FWS on a light licensed, self co-ordinated basis using a registration system with an interference protection date to establish priority in the band.

2.2 In coming to this decision and the policy detailed in this statement Ofcom has carefully considered all issues raised in the responses to the consultation and believes that the policy developed will enable the deployment of fixed wireless systems in a rapid and flexible way within the Spectrum Bands, promote competition in communication services and create an environment that will stimulate further technological development. Annex 2 sets out Ofcom's responses to the individual issues raised.

2.3 The policy developed for the Spectrum Bands is also consistent with Ofcom's wider spectrum management policy of keeping 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.

2.4 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 applications and the propagation conditions in these higher bands, the policy is a move away from the traditional centralised interference planned and managed assignment approach which Ofcom currently undertakes in the lower fixed link bands. As noted by several respondents to the consultation a light licensed flexible approach can potentially generate more risk with respect to the interference environment and places the responsibility on the licensee to ensure that unacceptable interference will not occur. Ofcom accepts this and in light of the interference concerns raised, has decided that it would be beneficial to conduct a review of the approach when suitable evidence and experience has been gained. It is therefore intended that a review of the interference approach is undertaken after when sufficient experience has been gained to assess if any refinements to the approach are necessary.

Section 3

Spectrum and Regulatory Requirements

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

3.1 Both the international and UK frequency allocation tables allocate the Spectrum Bands to the 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, as there is no immediate requirement for co-ordination with the MoD and with the method of light licensing to be implemented coupled with a link registration process (see section 4), flexibility will be retained for the future should other requirements emerge. Ofcom has therefore decided to make the full 2 x 4.75GHz of bandwidth available within the Spectrum Bands for point to point fixed wireless systems.

Amateur & Amateur Satellite Allocations

3.2 The consultation sought views specifically on the Amateur and Amateur Satellite allocations in the 75.5 – 76GHz and 81-81.5GHz bands. These allocations are covered by international footnote regulations 5.559A and 5.561A respectively. In addition the 75.5-76GHz band is also covered by the European Table of Frequency Allocations footnote EU35, which states that the band 75.5-76 GHz is in Europe also allocated to the Amateur and Amateur Satellite services after year 2006, whilst the UK Frequency Allocation Table footnote UK7 currently permits Amateur and Amateur Satellite operation in the UK on a primary basis until 31st December 2006.

3.3 With respect to the Amateur and Amateur Satellite Allocations in the 75.5-76 GHz band, the majority of respondents to the consultation were supportive of the Ofcom proposal for permitting continued amateur use of the 75.5-76 GHz band on a secondary basis after 31st December 2006. There was support from one joint respondent (comprising the Radio Society of Great Britain, UK Microwave Group & Amsat-UK) to permit the Amateur allocations on a co primary basis with the fixed service after 31st December 2006. The support to maintain primary amateur allocations in the 75.5-76GHz band was based on recent CEPT allocation discussions concerning 79GHz automotive short range radar systems and the associated frequency allocation issues.

3.4 Ofcom considers that it would not be practical to allow the Amateur and Amateur Satellite services to operate in the 75.5-76GHz band on a co-primary basis where commercial fixed wireless systems will be operating. Retaining primary allocations for the amateur services would require commercial fixed wireless operators to co-ordinate their assignments with the amateur services so as to ensure protection to individual amateur stations. Ofcom does not consider this to be an appropriate way forward and wishes to minimise co-ordination requirements to allow rapid and flexible deployment.

3.5 Ofcom has noted that the proponents of primary amateur allocations operate narrow band CW/SSB systems at 75.976GHz which is outside of the main FWS data block and inside a guard band. Ofcom has therefore decided to permit the use of the 75.875-76GHz band on a primary basis by the Amateur and Amateur Satellite services and on a secondary basis in the 75.5 -75.875 GHz band (see Figure 1). We believe this will substantially benefit future fixed wireless systems and not pose a

major inconvenience to the amateur services. The UK Frequency Allocation Table will be modified accordingly to reflect this decision.

3.6 As part of the light licensed approach within the Spectrum Bands and to enable a self co-ordinated approach Ofcom will publish a public register (as described in Section 4) containing the location and technical details of all fixed wireless links registered in the band. The publicly available fixed link register will enable Amateur and Amateur Satellite users to see where fixed links are located in order to avoid causing harmful interference to links operating in the 75.5- 75.875 GHz band.

3.7 Responses to the consultation did not indicate a strong requirement for Amateur/amateur satellite use in the 81 – 81.5 GHz band noting that the services are not currently available in the UK. Coexistence was only supported if it was managed by Ofcom, which would not be consistent with the approach that Ofcom is taking in the Spectrum Bands. Amateur/Amateur Satellite use in the 81-81.5GHz band will therefore not be permitted.

Co-ordination with other services & UK National Frequency Assignment Panel

3.8 As the Spectrum Bands are not currently used by other commercial services the bands have been block cleared by the National Frequency Planning Group (NFPG). This means that assignments do not have to go through the standard 3 week National Frequency Assignment Panel (NFAP) procedure.

Structure of the Spectrum Bands

3.9 Regarding the structure of the bands, the consultation responses generally supported Ofcom proposals for flexibility. While a few responses tended towards specification of a formal channel plan structure, supporting harmonisation and full coordination Ofcom is of the view that in order to achieve maximum flexibility with the minimum possible amount of restrictions a channel plan should not be mandated in the Spectrum Bands. Ofcom also believes that in not mandating a channel plan innovation will be encouraged.

3.10 Ofcom will make available 2 x 4.75 GHz of spectrum for fixed point to point wireless links in the 71-76GHz and 81-86 GHz bands as shown in Figure 1. The position of the guard bands is in line with the CEPT arrangement (ECC Rec(05)07) for this band. While CEPT Recommendation (05)07 will not be mandated, Ofcom will reference this arrangement for spectrum management purposes and licensees will be free to use it if they wish.

3.11 In addition, to also create a flexible environment and stimulate innovation in equipment developed for this band, duplex arrangements will be permitted within one block or both blocks. The only requirement will be that licensees will be required to ensure that their links operate within the specific limits of 71.125-75.875 GHz and 81.125-85.875 GHz. Systems will therefore not be permitted to operate within the guard bands.

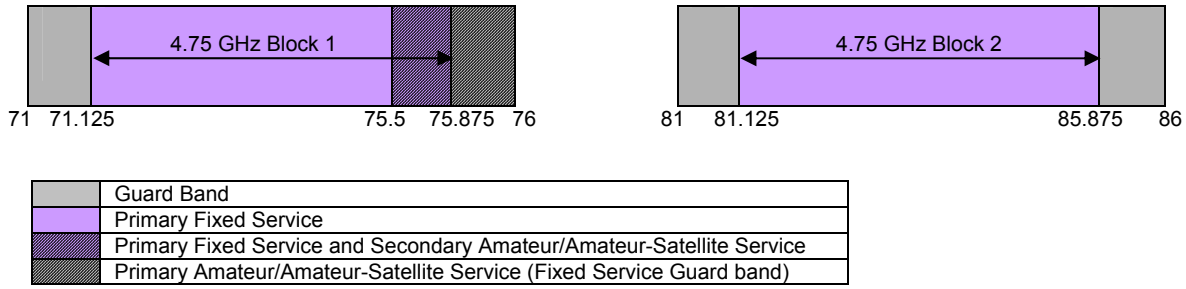

Diagram not to scale

Figure 1

Equipment and Antennas

3.12 Equipment and Antennas deployed in the Spectrum Bands will be required to fully comply with the essential requirements of the R&TTE Directive 1995/5/EC and UK Interface Requirement 2000.

Maximum Transmit Power EIRP

3.13 In line with the recently published ETSI Technical Specification (TS 102 524), the maximum output power delivered by the transmitter to the antenna will be limited to 0 dBW.

3.14 As specified in Article 21 of the Radio Regulations, the maximum allowable EIRP in the 71.125-75.875 GHz and 81.125-85.875 GHz bands will be 55dBW.

Site Clearance

3.15 Links breaching thresholds given in OfW 191 will require site clearance. Licensees will be required to declare that site clearance thresholds are met/ links have been site cleared before a registration can be made.

Coordination and Interference Criteria

3.16 Some respondents were keen for Ofcom to take the responsibility of coordinating registered links and set a minimum interference threshold. (In particular, two replies proposed full coordination and assignment similar to the current procedures for the lower fixed link bands). Ofcom has however concluded that it would not be appropriate for Ofcom to set fixed criteria and coordinate the links which could limit flexibility and the innovative development of the Spectrum Bands and which would impose additional regulation. Ofcom believes that for the Spectrum Bands the market should be given the flexibility and responsibility of managing the coordination between links as described below.

3.17 Ofcom will introduce a policy of self coordination for the Spectrum Bands whereby the link operators/licensees will be responsible for coordinating between individual fixed links. To facilitate this, Ofcom will hold a publicly viewable online register of registered links. Licensees would be given read access to all technical data pertaining to individual links including operator contact details. Licensees will be granted write access to the Database for the purpose of registering their own links.

Licensees will be required to register their link details using the online facility which is currently being developed by Ofcom. Links registered on the Ofcom online register will be date and time stamped on registration. The date/time record will be used to primarily establish priority in the band. Therefore links registered later shall not cause unacceptable interference to links registered with an earlier date/time stamp. Operators/licensees will be encouraged to coordinate between existing links on the register that may have the potential to be interfered by their links.

3.18 The Ofcom online facility will not perform detailed link budget and assignment calculations. These would be for the licensee to perform. It is expected that the licensees would carry out this function themselves or employ the services of a third party to advise them in relation to interference management.

3.19 Ofcom will not advise on a specific method for coordinating between links. In cases where coordination is not possible, then the earlier registered link will have priority. If an interference case results, then the later link will be removed from the register

3.20 In order to give as much control as possible to the market, Ofcom will not specify interference criteria for the Spectrum Bands. Instead the licensees will have the responsibility to assess the interference potential to existing links. This together with the ability to self coordinate gives the licensees the freedom to plan and negotiate with other users of the band based on their specific systems. Ofcom believes that such an approach is possible in the Spectrum Bands and regulator defined limits could have an adverse impact on innovative use of the band.

Section 4

Authorisation Procedures

Licensing Process and Conditions

4.1 Ofcom will develop a light licensed arrangement for the Spectrum Bands. All potential licensees intending to use the Spectrum Bands will be required to obtain a national licence from Ofcom. The licence term will be indefinite with a 5 year notice period for revocation. The possession of a valid licence will be a pre requisite to permitting a licensee to register links on the Ofcom register. Ofcom intends for the light licensing and registration process to be online.

4.2 Once a licence is issued by Ofcom, the licensee will be permitted to register links on the link register. Link information that will be made public on the register is given in Annex 4. The register will contain details of all links registered with Ofcom. The link details on the register will enable existing and potential licensees to plan their new links based on the existing registered links. Prior to the implementation of a fully online system Ofcom will implement a manual light licence process that will consist of a spreadsheet acting as the register being published on the Ofcom website.

4.3 Links recorded on the register will have first in time priority and will be date and time stamped. This assigned date/time record will form the basis of the regulatory mechanism for the purpose of interference protection.

4.4 In the interim period while an online system is developed, Ofcom will implement a manual registration process in order to offer the Spectrum Bands to the UK market as quickly as possible.

4.5 Any technical amendments to registered links will be treated as a new link and result in a new date/time of registration being assigned to that link.

4.6 Ofcom will issue guidance on specific procedures prior to making the Spectrum Bands available in the UK.

Interim Licensing and Registration Process

4.7 Ofcom is currently developing a system that will enable online registration of links in the Spectrum Bands. Once a licence has been issued a unique reference number for each licensee will be provided to enabling the licensee write access to the online link register for the purpose of registering and managing links via an e-enabled user interface application. Licensees will not be permitted to amend/register links of other licensees.

4.8 In the interim period during which a complete e-enabled system is established, Ofcom will set up an interim licensing and link registration process. This will be a manual process that will consist of a spreadsheet acting as the register. The link register will be publicly available on the Ofcom website but the management of links on the register will be Ofcom's responsibility during the period when the interim procedures are in place.

4.9 Licensees will be required to make paper or email applications to obtain their national licence and register links. Applications for registering links will be date stamped by Ofcom upon receipt of the application.

4.10 Ofcom will release detailed guidance on the interim procedures prior to opening the Spectrum Bands.

Fees

4.11 The majority of respondents to the consultation were supportive of the fee of £50 per link registered per year. Some concerns were raised as to whether this fee was high enough to discourage hoarding of links of spectrum particularly in prime geographic locations. Ofcom believes that the fee should not be higher as this could discourage access to the band particularly for small operators. Ofcom intends to review the operation of this system when there is sufficient take up of the Spectrum Bands to assess if any refinements to the approach are necessary.

4.12 The national licence will be free of charge. Ofcom will charge a fee of £50 per year or part year (if applicable) for each unidirectional or bidirectional link registered. Part years will be applicable to links that are registered during the first year following a licence being granted by Ofcom and the year during which a licence/link registration is cancelled. Licensees will be billed annually on the date when their licence was issued.

Spectrum Trading

4.13 Ofcom will allow licensees in the new class to be able to trade. Spectrum trading is the transfer of rights and obligations arising by virtue of a WT Act licence.

4.14 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

4.15 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:

i) competition is not distorted as a result of any trade; and

ii) the use of spectrum harmonised under Community does not change.

4.16 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.

4.17 The Wireless telegraphy (Spectrum Trading) Regulations 2004 (hereafter referred to as "the Trading Regulations"), which entered into force on 23rd December 2004, actually implemented this possibility with regulations detailing the licence classes that could be traded, possible types of transfers and the relevant procedure.

4.18 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:

i) 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

ii) 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.

4.19 Figure 2 below gives some illustrative example of the types of transfers that are currently possible. The types of transfer options available are determined by the licence class.

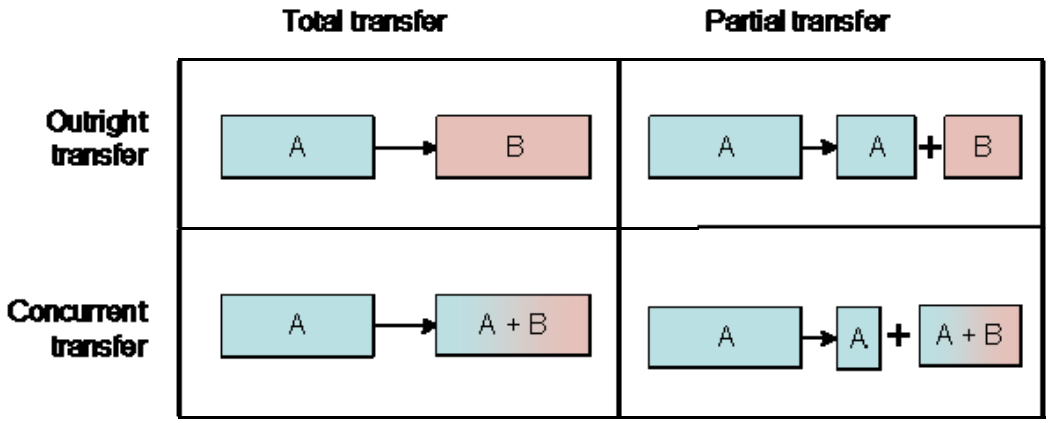

Figure 2

4.20 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

4.21 In line with the spectrum trading statement we plan to amend these regulations to permit for licences in the Spectrum Bands. This will be the subject of a separate statutory consultation which will propose:

i) The transfers of all rights and obligations of licences;

ii) The concurrent transfer of all rights and obligations of a licence;

iii) 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

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

i) 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.

ii) It can promote spectrum access and efficient spectrum use by facilitating user self-coordination and interference planning.

4.23 Under Section 170 of the Communications Act, Ofcom has the power 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 online 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 plans to extend the scope of the WT Register to include the licence class covered in this statement. This will be the subject of a separate statutory consultation.

Publication of Trading Information.

4.24 Ofcom currently publishes information about proposed transfers that have been notified to Ofcom for approval; this information is contained within the Transfer Notification Register, which is available online 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 it has been put into effect will also be noted.

4.25 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 Transfer Notification register includes:

i) Details of the licence being traded;

ii) Licensee's name and buyer's name;

iii) Date of provision of information required by Ofcom to consider whether or not to consent to the transfer; and

iv) In the case of a partial transfer a description of which rights under the licence are proposed to be transferred.

4.26 Ofcom plans to also extend this facility to newly tradable licence classes.

Interference and Dispute Resolution

4.27 Ofcom believes that the market should be given a greater role in establishing criteria for interference which best suits their systems and requirements. Systems are now capable of various methods of interference mitigation and by setting generic interference criteria, Ofcom could indirectly prevent certain systems capable of such interference mitigation from operating in the band and also prevent operators the freedom to negotiate interference levels with other users of the band. Ofcom has therefore reconsidered the issue of specifying an interference criterion and believes that a specific criterion should not form part of the policy for the Spectrum Bands. Instead licensees will be responsible for ensuring that unacceptable interference does not occur to links that have an earlier date/time priority. Should a dispute arise and the issue cannot be resolved between the parties concerned then Ofcom will remove the later registered link. Ofcom believes that this will provide an incentive for operators to co-operate and find mutually acceptable solutions otherwise they will run the risk of links being removed from the register.

Review

4.28 The respondents to the consultation indicated the need for a review to re evaluate if required the policies put in place particularly with respect to issues such as interference management and spectrum hoarding. While Ofcom believes that the potential for interference is small and that the annual fee mechanism will reduce the risk of spectrum hoarding, Ofcom agrees that a review would be beneficial. It is therefore intended that a review of the interference approach and fees is undertaken once sufficient experience has been gained to assess if any refinements to the approach are necessary.

Implementation

4.29 The implementation of the light licensed process described in this statement requires the development of a database and user interface. Ofcom is currently in the process of transitioning its existing information 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 statement. Ofcom is currently developing these systems.

4.30 In the interim period, to facilitate access to the Spectrum Bands, ahead of the delivery of the online system, Ofcom is developing a manual process which will include a publicly available spreadsheet. Ofcom is currently planning to make this process available in or before March 2007.

4.31 In addition to the development of the necessary information systems and in order for the Spectrum Bands to be made available the following regulations require amendment, all of which require separate consultations:

- Interface Requirement IR2000
- Register Regulations
- Trading Regulations

4.32 Ofcom is currently in the process of making these amendments.

Annex 1

List of Respondents

Mr A Brennan

Cable & Wireless

Gigabeam

Huber and Suhner

MLL Telecom Ltd

Net Tek Ltd

Orange

Mr D.J. Payne

Radio Waves

Radio Society of Great Britain, UK Microwave Group and Amsat-UK

SIAE Microelettronica

T-Mobile

telent

Welsh Assembly

(Respondents who have requested confidentiality have not been listed)

Annex 2

Issues raised in responses to the Ofcom consultation

1. Do you agree that the Amateur and Amateur-Satellite allocations in the 75.5 – 76GHz 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? **The majority of respondents were supportive of Ofcom proposals to retain the Amateur and Amateur Satellite allocations on a secondary basis in the 75.5-76 GHz band beyond 31 December 2006.**	
Issue Raised	**Ofcom's Response**
The Amateur and Amateur Satellite allocations in the band 75.5-76GHz should remain in the UK allocation table on a primary basis after 31st December 2006. This would be in line with the European Allocation table footnote EU35. UK Amateur Systems are low power narrow band CW/SSB at 75.976 GHz which is in the guard band of the fixed service spectrum.	Ofcom considers that it would not be practical to enable the Amateur and Amateur Satellite services to operate in the 75.5-76GHz band on a co-primary basis where commercial fixed wireless systems will be operating. Retaining primary allocations for the amateur services would require commercial fixed wireless operators to co-ordinate assignments with the amateur services so as to ensure protection to individual amateur stations. Ofcom does not consider this to be an appropriate way forward and wishes to minimise FWS co-ordination requirements to allow rapid and flexible deployment. Ofcom has noted that the proponents of primary amateur allocations operate narrow band CW/SSB systems at 75.976GHz which is outside of the main FWS data block and inside a guard band. Ofcom has therefore decided to permit the use of the 75.875-76GHz band on a primary basis by the Amateur and Amateur Satellite services and on a secondary basis in the 75.5 -75.875 GHz band. We believe this will substantially benefit future fixed wireless systems and not pose a major inconvenience to the amateur services. The UK Frequency Allocation Table will be modified accordingly to reflect this decision. As part of the light licensed process a public database will be made available

1. Do you agree that the Amateur and Amateur-Satellite allocations in the 75.5 – 76GHz 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?

The majority of respondents were supportive of Ofcom proposals to retain the Amateur and Amateur Satellite allocations on a secondary basis in the 75.5-76 GHz band beyond 31 December 2006.

Issue Raised	**Ofcom's Response**
	containing the location and technical details of all fixed wireless links. Availability of this database will also assist amateurs to avoid causing interference to commercial links operating in the 75.5-75.875GHz band.

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?

Respondents were generally supportive of the light licensing and the date/time priority approach proposed by Ofcom but felt that a regulatory mechanism of interference should be put in place to coordinate registered fixed links.

Issue Raised	**Ofcom's Response**
A light approach is not appropriate for any application in the Radio Frequency Spectrum. This light licensing approach seems to be an acronym for Ofcom not policing activities of users and do not seem interested in maintaining a responsibility for investigating and dealing with interference.	The policy developed for the Spectrum Bands is consistent with Ofcom's wider spectrum management policy and regulatory duties of keeping 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.
A light licensing approach seems reasonable and is preferable to the licence exemption we have seen in adjacent frequencies for Car Radar applications	Ofcom agrees that a light licensed approach for the Spectrum Bands provides the right balance to allow spectrum access in a rapid and flexible way, while at the same time setting a simple regulatory framework to allow interference protection.
Although the likelihood for interference is small, an interference mechanism is an	Ofcom agrees that the likelihood for interference is small and believes that

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?

Respondents were generally supportive of the light licensing and the date/time priority approach proposed by Ofcom but felt that a regulatory mechanism of interference should be put in place to coordinate registered fixed links.

Issue Raised	**Ofcom's Response**
important and necessary part of the licensing process due to the critical nature of the information transported across the radio links.	the market is best placed to coordinate and manage the interference between different types of systems in the band given the environment that is being created to stimulate innovation. This is in line with Ofcom's strategy to keep regulation to a minimum and give a greater role to the market in determining how spectrum is used.
A fully licensed approach should be used for this band. This band is very interesting for emergency Services and Telecom Operators and the same approach used in licensing the 38 GHz band and lower FWS bands should be adopted.	While a licensed approach similar to the 38 GHz band would provide greater interference certainty by assigning on a link by link basis using assignment criteria set by Ofcom, it would limit the use of the a band for specific types of systems which leaves limited opportunities for innovation and provides no flexibility for the market in assessing and managing the interference environment. Ofcom is facilitating a flexible means for providing greater control to the market in planning their systems and using a variety of fixed broadband point to point applications within the Spectrum Bands. We believe that the light licensed approach will foster innovation and provide licensees the opportunity to make use of technological advances in the Spectrum Bands.
The light licensing mechanism should be reviewed either when or before usage of the band increases to a level where incidents of interference or localised congestion are suspected. Therefore it is important that sufficient technical details of deployed links are recorded on the database to introduce an assignment process without having to retrospectively	Ofcom agrees that the light licensed approach is relatively new for fixed service applications. Ofcom therefore intends to review the process when suitable evidence and experience has been gained to assess if any refinements to the approach are necessary.

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? **Respondents were generally supportive of the light licensing and the date/time priority approach proposed by Ofcom but felt that a regulatory mechanism of interference should be put in place to coordinate registered fixed links.**	
Issue Raised	**Ofcom's Response**
obtain these details from operators.	
Some simple form of guidance should be developed and agreed for the light licensing mechanism. This guidance should be based on a simplified method of assessing interference levels and requiring protection. Without such guidance, it would seem that each licensee would have to set their own basic criteria irrespective of their knowledge and expertise in this area. This guidance should be agreed with operators prior to the band being opened up.	It is Ofcom's intention to provide guidance material on the licence and registration process for the band. However, the responsibility for interference management will be the licensee's. This will allow much greater flexibility for operators to assess and agree between themselves suitable arrangements. Ofcom will be responsible for allocating the interference protection date /time of registration. All the link information will be publicly available on the link register to assist licensees with their interference calculations.
The light licensed approach for the 71-76GHz and 81-86 GHz bands is strongly supported. A non exclusive light licensed process, keeping regulation to a minimum will encourage the adoption of competitive radio services in a rapid and flexible manner. A light licensing registration should be conducted online and make link registration quick and easy.	Ofcom intends to implement an online registration and licensing system on a permanent basis. In the interim period, while a permanent solution is developed, Ofcom will implement a manual licensing and registration procedure.
The date/time priority should be subject to the existing link being generally in accordance with details logged on the database and also not being poorly designed or engineered such that susceptibility to interference is not unreasonably high e.g. from poor receiver filtering.	Ofcom is intending as part of the licensing conditions for licensees to declare that their links will be constructed and engineered as per the details that have been logged on the register.
Clear interference definition and process rules need to be established to ensure precedence is claimed on the basis of due diligence and assessment of	Ofcom believes that the market should be given a greater role in establishing criteria for interference which best suits their systems and requirements. Systems

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?

Respondents were generally supportive of the light licensing and the date/time priority approach proposed by Ofcom but felt that a regulatory mechanism of interference should be put in place to coordinate registered fixed links.

Issue Raised	**Ofcom's Response**
interference to surrounding systems. These process rules and interference should be clearly established before release of the spectrum	are now capable of various methods of interference mitigation and by setting generic interference criteria, Ofcom could indirectly prevent certain systems capable of such interference mitigation from operating in the band and also prevent operators the freedom to negotiate interference levels with other users of the band. Ofcom has therefore reconsidered the issue of specifying an interference criterion and believes that a specific criterion should not form part of the Spectrum Bands policy. Instead licensees will be responsible for ensuring that unacceptable interference does not occur to links that have an earlier date/time priority. Should a dispute arise and the issue cannot be resolved between the parties concerned then Ofcom will remove the later registered link. Ofcom believes that this will provide an incentive for operators to co-operate and find mutually acceptable solutions otherwise they will run the risk of links being removed from the register. While Ofcom believes that the potential for interference is small it is accepted that by not specifying a specific interference criterion there is a potential increased risk of interference. Ofcom therefore intends to review the process when suitable evidence and experience has been gained to assess if any refinements to the approach are necessary. Ofcom intends to define procedures for licensing and link registration prior to making the Spectrum Bands available.

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? **The majority of the respondents supported the fee based on £50 per link registered per year to encourage access to the spectrum. Some respondents felt that £50 was not enough to discourage the hoarding of links and sterilisation of spectrum. Respondents indicated that further regulation should be put in place to discourage hoarding. Two respondents felt that this fee was too high.**	
Issue Raised	**Ofcom's Response**
There should be a limit to the number of registrations a particular company can put in at one time, or a timed entry where multiple entries cost substantially more if submitted at the same time. This would discourage a single entity putting in 'paper' links just to stop competition.	In making the Spectrum Bands available on a light licensed basis Ofcom is creating a self coordinated environment. While the issue of hoarding could potentially arise, Ofcom believes that implementing limits on the number of links registered could indirectly affect genuine businesses from building out networks. Therefore Ofcom believes that it is not appropriate to place limits on the number of links that can be registered by a licensee. Given there is no strong reason to believe that the demand for links may exceed supply, applicants are unlikely to have an incentive to hoard links. As Ofcom intends to undertake a review of this process, it will also be in a position to monitor any such behaviour.
Further conditions should be placed that these links must be used for commercial use. Otherwise sterilisation of the bands is a real possibility through the use of paper links	Ofcom believes that a fee of £50 provides the right balance to encourage use of the Spectrum Bands while providing an incentive not to hoard links. Ofcom intends to review the process when suitable evidence and experience has been gained to assess if any refinements to the approach are necessary.
A rule can be appended to licences that require links to be installed within a suitable time period to discourage the hoarding of 'paper' links. The FCC enforces such a rule in the USA giving licensees 1 year to use any licenses else the licence is forfeited.	Ofcom does not support mandatory build out clauses for the Spectrum Bands. Instead Ofcom believes that the market is best placed to decide on how to and when to use the spectrum.
A fully coordinated approach should be applied for the 80 GHz band and that a	The majority of the respondents to the consultation were in favour of a light

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The majority of the respondents supported the fee based on £50 per link registered per year to encourage access to the spectrum. Some respondents felt that £50 was not enough to discourage the hoarding of links and sterilisation of spectrum. Respondents indicated that further regulation should be put in place to discourage hoarding. Two respondents felt that this fee was too high.

Issue Raised	**Ofcom's Response**
fee appropriate to such an approach should be adopted. It should be less than the fee presently charged for the 38 GHz band.	licensed approach with a simple method of registration to establish priority in the band. While Ofcom agrees that the light licensed approach introduces an increase in the risk of interference, Ofcom believes that the band will be utilised by a professional market that will be able to manage assignments and interference assessments.
The fee of £50 is appropriate but should be subject to annual review of demand and hoarding activity The fee is very modest and unlikely to discourage hoarding.	Ofcom agrees that the fee should be reviewed when suitable experience has been gained.

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?

Several respondents supported the Ofcom proposal for not mandating the CEPT arrangement for this band. Some respondents felt that the CEPT arrangement for the Spectrum Bands provided an appropriate level of flexibility for innovative use of the band and this provided an appropriate balance of having an easier coordination environment than if there were no rules within the 4.75 GHz blocks.

Issue Raised	**Ofcom's Response**

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?

Several respondents supported the Ofcom proposal for not mandating the CEPT arrangement for this band. Some respondents felt that the CEPT arrangement for the Spectrum Bands provided an appropriate level of flexibility for innovative use of the band and this provided an appropriate balance of having an easier coordination environment than if there were no rules within the 4.75 GHz blocks.

Issue Raised	**Ofcom's Response**
The CEPT channel plan maintains a common approach across CEPT area and it is important that 'we keep in line.' In the interests of harmonisation and economies of scale the CEPT channel plan should be mandated. Sufficient flexibility still exists with this recommendation for innovation to occur with the possibility of channel aggregation under this plan. A flexible approach will encourage the adoption of innovative broadband solutions. It is noted that the CEPT arrangement defines 19x250 MHz channels and permits aggregation of up to all 19 channels in each band. As such the Ofcom proposal of 2x4.75 GHz is equivalent to the limits of the CEPT recommendation. The CEPT recommendation should be mandated in order to manage coexistence problems easily. The Ofcom proposal to implement sub-duplex arrangements within each band of the primary duplex is not supported. We do not believe that this will lead to the most efficient use of the spectrum and will not enable operators to implement harmonised systems.	Ofcom is of the view that in order to achieve maximum flexibility with the minimum possible amount of restrictions a channel plan should not be mandated in the Spectrum Bands. Licensees will be free to utilise the CEPT channel plan if they wish. Ofcom intends to refer to the CEPT arrangements for guidance purposes only.
Suitable harmonised standards should be used as part of the interface regulations.	Equipment will need to be compliant with the essential requirements of the RTTE directive 1995/5/EC.

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?

Most respondents agreed that interference may not be an issue in the short tem but felt that a maximum interference threshold policy should be set. Some suggestions as to how this might be done were provided.

Issue Raised	**Ofcom's Response**
It is important to have a maximum interference threshold policy. Data transmitted over these links will be critical for our customers over these links and therefore such a policy is a reasonable step to ensure the integrity of our/our customers' transmissions. The CEPT recommendation and ETSI TS do not focus on a single modulation scheme. This means that higher order modulation schemes could be deployed in the 80 GHz band. A maximum interference threshold is not sufficient to guarantee a proper coexistence policy in this frequency band. An aggregate maximum level of interference of I/N of -6dB should be defined not a single entry to prevent excessive cumulative degradation of quality of service in areas of heavy use	Ofcom believes that the market should be given a greater role in establishing criteria for interference which best suits systems and requirements. Systems are now capable of various methods of interference mitigation and by setting generic interference criteria, Ofcom could indirectly prevent certain systems capable of such interference mitigation from operating in the band and also prevent operators the freedom to negotiate interference levels with other users of the band. Ofcom has therefore reconsidered the issue of specifying an interference criterion and believes that a specific criterion should not form part of the policy for the Spectrum Bands. Instead licensees will be responsible for ensuring that unacceptable interference does not occur to links that have an earlier date/time priority. Should a dispute arise and the issue cannot be resolved between the parties concerned then Ofcom will remove the later registered link. Ofcom believes that this will provide an incentive for operators to co-operate and find mutually acceptable solutions otherwise they will run the risk of links being removed from the register. While Ofcom believes that the potential for interference is small it is accepted that by not specifying a specific interference criterion there is a potential increased risk of interference. Ofcom therefore intends to review the process when suitable evidence and experience has been gained to assess if any refinements to the approach are necessary.

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?	
Issue Raised	**Ofcom's Response**
The 59-66 GHz band should be considered as complimentary to the 70/80 GHz and that this lower band should be allocated for HDFS unlicensed applications for short distance, less than 1 km feeder links or customer access connections to higher capacity facilities. The 70/80 GHz band should not be seen as a replacement for the 59-66 GHz band as the propagation characteristics are totally different.	Ofcom has already made available the 57-59 GHz band on a licence exempt basis and the 64-66 GHz band on a light licensed basis.
We would like to strongly make the point that many users could not contemplate using a band in which potential interference can arise as a result of another user commencing operation in the vicinity. Without the excellent protection offered by full coordination, users who require fixed service levels of operation, particularly the Police, Fire, NHS and telecom operators, users will not be able to utilise the excellent traffic bandwidth offered by these new frequencies at 71-76 GHz and 81-86 GHz	Ofcom believes that the proposals set out in this statement provide a framework in which broadband fixed wireless systems can be deployed in a flexible manner and achieve protection through a simple date/time registration process.
The proposals for opening these bands are welcomed and the level of proposed fees should encourage interest in the use of these bands	Ofcom agrees.
The costs associated with trading a link appear to be high compared with a licence cost of £50. This would not be efficient and in particular that a combination of trading with a few incentives to prevent hoarding could lead to substantially higher administrative purchase cost for operators compared with a proposal to return unused links to Ofcom and removing them from the database. We also consider that link licensed under a light licensed scheme with no published or agreed guidance have questionable justifiable value when traded because the 'assignment' may well have been inappropriately made.	The licence cost of £50 is intended to cover Ofcom's administrative costs and does not reflect the true value of the fixed link. Efficiency in the use of spectrum is brought about when the users pay the true value – given this; the market is in a better position than Ofcom to reveal the value of the links through the trades that take place. This is one of the main objectives behind Ofcom retaining only light touch regulation and giving control to the market and to the users of the spectrum themselves. Indeed trades in the secondary market have the potential to correct any primary assignments that may not have been made efficiently, since a user with higher value would be

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?	
Issue Raised	**Ofcom's Response**
	willing pay a price higher than the licence cost to the incumbent user, and the latter would be incentivised to trade. As discussed earlier, Ofcom does not believe that the risk of hoarding is high and is of the view that any such behaviour can be monitored in its review. Ofcom also intends to provide guidance on the registration process in order to aid trading.
Ofcom has not performed an impact assessment on the option of trading links. The cost of buying links on a secondary market with the sole purpose of profitability reselling them, might represent a significant burden for operators, while the benefits associated with this possibility are not made clear.	Ofcom has considered trading for all uses in spectrum in its Statement on Trading in November 2004. Trading allows the market to determine the most efficient allocation of spectrum. An impact assessment on enabling trading in these bands will be part of a separate statutory consultation when the WT (Spectrum Trading) Regulations 2004 are revised. With respect to the Spectrum Bands, Ofcom believes that there is little risk to opening up the licences to trading as holders do not need to trade. There would be additional benefits in trading licences to those who are willing to pay a higher value than the cost of the licence to the incumbent user. Given this, there would seem to be little incentive to hoard the spectrum.
Ofcom is urged to consider, prior to implementation of these proposals the areas that still not have been resolved such as spectrum usage rights and dispute resolution so that players who wish to operate in this market understand and are able to meet their obligations.	Ofcom believes that the proposals set out in this statement provide a framework in which broadband fixed wireless systems can be deployed in a flexible manner and achieve protection through a simple date/time registration process.
ETSI Standard EN-301-091 has 0dBm/MHz Spurious Out-of-Band emissions permitted as low as 73.5GHz which is well outside of its regulated 76-77GHz range. As band usage rises this inordinately high level would create	Amendment of this standard is a matter for ETSI and was not part of this consultation, however, Ofcom has noted the comments made and will keep this issue under review.

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?	
Issue Raised	**Ofcom's Response**
undue harmful interference to both Commercial Links and Amateur systems. Whilst this specification may have been acceptable at an earlier stage of Car-Radar maturity, it would be deleterious in future as equipment numbers rise. We request that Ofcom comments on this to ETSI and asks them to consider a more typical OOB level such as the -41dBm/MHz figure promulgated by UWB proponents as minimising interference	
The UK Microwave Group has recently participated in Ofcom Study SES2006-10 (by Quotient Associates) and a shorter but similar EU survey regarding lighter regulation and/or licence-exemption at all frequencies above 30GHz. Whilst we are pleased to have been engaged at an early stage this has created some nervousness and uncertainty. We would appreciate an interim statement by Ofcom on its thinking as this licensed spectrum does fall within the SES Study remit.	The policy for the Spectrum Bands is contained within this Statement. This policy takes into account Ofcom's strategy of keeping regulation to the minimum necessary.
The mechanisms to prevent hoarding require further investigation	Ofcom intends to review the process when suitable evidence and experience has been gained to assess if any refinements to the approach are necessary.

Annex 3

Impact assessment

A3.1 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").

A3.2 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.

A3.3 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 vs. not providing access to the Spectrum band for 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 in the Spectrum Bands may not develop very quickly. If new or more value added technologies are still developing, there is a risk that premature licensing of the Spectrum Bands could result in a lower value user.
Light Licence Product vs. conventionally licensed/licence exemption. Publicly accessible link register 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. Light licensing also gives greater flexibility than the conventionally	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 cases	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
	licensed option. Interference protection achieved through a simple mechanism as opposed to no protection under a licence exemption option. More open and transparent process whereby operators can retrieve data and self assign links. Ofcom only needs to get involved if there is an interference dispute.		
Permitting Primary Amateur and Amateur-Satellite allocations in the upper guard band of the fixed service in the 71-76 GHz block i.e. 75.875-76GHz band after 31st December 2006 and Secondary Amateur and Amateur Satellite allocations in the 75.5-75.875 GHz after 31st December 2006 vs. Permitting secondary Amateur and Amateur-Satellite allocations within 75.5-76GHz after 31 December 2006.	Maintains spectrum access in this band for Radio Amateurs. Allows both Amateur and FWS to operate in the band without the need for co-ordination. The continued primary and secondary Amateur use will benefit future fixed wireless systems and not pose a major inconvenience to the amateur services	Amateur services will be required to operate on a non-interference non-protected basis in the 75.5-75.875 GHz band and will incur the cost of operating unprotected.	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.

Option	Benefits	Costs	Risks
Implementation of a flexible band structure vs. a fixed channel plan	Flexible arrangement. Licensees will not be constrained to a set channel plan. Licensees will be able to choose their own duplex spacing to suit their requirements. Manufacturers will have freedom to develop equipment which is not confined to 'narrow' channels.	More challenging co-ordination environment created by FWS not conforming to a set arrangement. Increased complexity in assessing interference.	Operators may not operate in a spectrally efficient manner.
Applying an annual fee vs. not applying any charges	Helps maintain an efficient use of the spectrum. Discourages the registration of 'paper' links.	Annual cost to licensee, based on the number of terminals registered.	If an annual fee is not set at the correct value potential risks are: i) Fee too high: could discourage use of Spectrum Bands ii) Fee too low: could result in large numbers of paper links.
No interference management policy vs. Applying an Interference Management policy to the Spectrum Bands	Provides flexibility to the licensee who can determine what is considered as 'unacceptable' interference. Provides a simple solution without an added level of complexity to the process.	licensees will be required to self coordinate	Does not provide a clear reference point for interference management and relies on licensees to reach agreement between themselves
Block frequency clearance vs. NFAP process	Removes need to go through a slow paper based frequency clearance process for each link.	Additional National Frequency Planning Group (NFPG) process to complete to achieve block frequency	Risk that block frequency clearance is not achieved which would result in licensing delays with each link

Option	Benefits	Costs	Risks
	Assists rapid deployment of FWS.	clearance.	being required to be submitted to the National Frequency Assignment Panel (NFAP) for approval.

Annex 4

Data Fields Required for Link Registration

Ofcom Reference Number (System Generated)

Date / Time registered (System Generated)

Licensee Name

Path Length (m)

Site A NGR

Site B NGR

Site A ground height (mAGL/mASL)

Site B ground height (mAGL/mASL)

Site A antenna height (mAGL/mASL)

Site B antenna height (mAGL/mASL)

Site A Equipment manufacturer

Site A Equipment model number

Site B Equipment manufacturer

Site B Equipment model number

Bit rate

Bandwidth

Receiver Sensitivity Level for BER ≤ 10^{-6}

Site A antenna manufacturer

Site B antenna manufacturer

Site A antenna model number

Site B antenna model number

Site A antenna maximum boresight gain

Site B antenna maximum boresight gain

Site A antenna elevation angle

Site B antenna elevation angle

Site A antenna azimuth angle

Site B antenna azimuth angle

Site A transmit power (EIRP)

Site B transmit power (EIRP)

Site A transmit frequency (MHz)

Site B transmit frequency (MHz)

Modulation scheme (i.e. 4 PSK)

Technical contact details (name, address, telephone number of contact for planning/co-ordination)

Annex 5

Glossary

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

CEPT
European Conference of 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
Equivalent 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.

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 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

Secondary
This is a term used to indicate that a frequency allocation for a particular service which operates on the basis that its stations cannot cause harmful interference to existing and future stations of a primary service and cannot claim protection from harmful interference from primary service stations in the same band. See paragraphs 5.28-5.31 the ITU Radio Regulations.