

# **A Statement on Spectrum Trading**

**Implementation in 2004 and beyond**

**Statement**

**Issued: 6 August 2004**

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## Section 1

# Summary

- 1.1 This Statement follows a public consultation by Ofcom and the Radiocommunications Agency on proposals for the introduction of spectrum trading in the United Kingdom<sup>1</sup>. The consultation, which was published in November 2003, explained that the introduction of spectrum trading and liberalisation would help to encourage efficient use of spectrum by enabling it to be transferred to, and used by, the user that values it most.
- 1.2 Ofcom's overall approach to spectrum management will be set out in the Spectrum Framework Review, one of Ofcom's three major reviews, due to be published in Q4 of this year. Spectrum trading and liberalisation fit within the Framework Review as the key mechanisms in the implementation of a market forces approach to spectrum management.
- 1.3 In recent years substantial progress has been made in relation to spectrum management, most notably through the development of proposals to implement spectrum trading and liberalisation. Ofcom is committed to continue the implementation of this more dynamic and market-oriented approach.
- 1.4 Ofcom is taking forward its reform programme through three inter-related projects. These are:
  - Spectrum Trading – mechanisms for allowing spectrum to change hands;
  - Spectrum Liberalisation – relaxation of constraints on the use of spectrum;
  - Spectrum Pricing – updating of annual fees for spectrum not acquired through auction.
- 1.5 This document sets out Ofcom's conclusions on spectrum trading. It explains how, in the light of the generally favourable responses received to the proposals set out in the November consultation, Ofcom intends to continue with its plans for the phased introduction of spectrum trading over the next four years. Further documents will be published in the next few months on each of the other areas.

### Spectrum Trading

- 1.6 Spectrum Trading – the transfer of rights and associated obligations to use spectrum – represents a new approach to spectrum management. It will allow holders of wireless telegraphy (WT Act) licences to transfer some or all of the rights and associated obligations that they enjoy as a result of those licences, to third parties. This will enable spectrum to migrate to users that will use it most efficiently, thus benefiting the economy. Trading will be entirely voluntary and no licensee will be forced to trade by Ofcom.
- 1.7 Ofcom will authorise spectrum trading through the publication of Trading Regulations. Ofcom intends to publish the first set of such regulations in November 2004, thus allowing the commencement of spectrum trading for

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<sup>1</sup> [http://www.ofcom.org.uk/consultations/past/spec\\_trad/spectrum\\_trading/?a=87101](http://www.ofcom.org.uk/consultations/past/spec_trad/spectrum_trading/?a=87101)

certain licence classes from December 2004. Ofcom expects to publish further regulations in each of the subsequent three years, extending the range of licence classes authorised to trade, and potentially also expanding the range of types of transfer permitted.

1.8 Different types of transfer will be authorised by the Trading Regulations:

- transfers for all or only certain parts of the rights and associated obligations under a licence – i.e. ‘total’ or ‘partial’ transfers;
- transfers such that the acquirer of the rights and associated obligations holds them to the exclusion of the original holder, or concurrently with them – i.e. ‘outright’ or ‘concurrent’ transfers.

1.9 Ofcom believes that such a flexible approach will support various commercial arrangements between parties which can be adapted as necessary to reflect market conditions.

1.10 The licence classes for which Ofcom intends that trading be introduced in 2004 and Ofcom’s proposals for the extension of trading to other licence classes in subsequent years are set out in Section 4 and in Annex C. A summary of these proposals is set out in Table 1 below. This timetable will be subject to review and consultation, especially in relation to some of the plans for later years. In particular, Ofcom is still considering the appropriate timing for the introduction of spectrum trading in 2G and 3G mobile spectrum, and expects to confirm its proposals in this area later this year.

**Table 1: Timetable for the phased introduction of spectrum trading**

2004	2005	2006	2007	Other
Analogue PAMR	Wide area PBR	Emergency services	2G and 3G mobile	Mobile satellite
National paging	On-site PBR		PMSE	Satellite shared with terrestrial services
Data networks	Digital PAMR		Aviation and maritime communication	Radio broadcasting
National and regional PBR	10 GHz FWA		Radionavigation (Radar)	Television broadcasting
Common Base Stations	32 GHz			
Fixed wireless access	40 GHz			
Scanning telemetry				
Fixed				

terrestrial links				
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- 1.11 It is Ofcom's intention to introduce a simple, quick and predictable process to support spectrum trades. This should encourage take-up of trading and maximise the benefits that can be obtained. Ofcom has set out the limited set of circumstances under which it may refuse to consent to a trade in Section 3 of this statement. Section 3 also describes the arrangements for notifying Ofcom of a proposed trade.
- 1.12 Ofcom has also proposed that existing competition law is sufficient to deal with distortions of competition that may arise following the introduction of spectrum trading and that further new controls are unnecessary. This issue has been the subject of a separate consultation<sup>2</sup>.
- 1.13 Finally, as a further incentive to trade, Ofcom will not impose, at the current time, any charges in connection with the transfer of rights and associated obligations.

### **Liberalisation**

- 1.14 In parallel with the introduction of spectrum trading, Ofcom will be open to licensees requesting a change in the use of their licence. This is referred to in this document as liberalisation and will exist in parallel to the procedures for spectrum trading. Spectrum trading and liberalisation are separate developments. However, it is anticipated that liberalisation will provide an additional impetus for spectrum trading and generate additional benefits. Further details about liberalisation will be set out in a separate consultation which Ofcom will publish later this summer.

### **Licence term and period of notice**

- 1.15 Ofcom will modify certain wireless telegraphy licences to give them a rolling term. In addition, Ofcom will clarify the circumstances under which licences will be revocable by Ofcom, and the periods of notice that Ofcom will give in each case. The reasons for revocation, which are set out in Section 6 of this statement, will include the power to revoke a licence on 5 years minimum notice for spectrum management reasons.
- 1.16 Ofcom will review any non-spectrum licence conditions before the introduction of trading in each licence class. If Ofcom concludes that any such conditions are no longer objectively justifiable or proportionate, then Ofcom will propose changes accordingly.
- 1.17 Ofcom will start to implement these changes later this year, beginning with those licence classes scheduled for trading in 2004. This will be done through the usual licence variation process, including consultation with the affected licensees.

### **Administrative Incentive Pricing**

- 1.18 Ofcom intends to continue charging Administrative Incentive Pricing (AIP) on both tradable and non-tradable spectrum after the introduction of

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<sup>2</sup> See [http://www.ofcom.org.uk/consultations/current/effective\\_competition/](http://www.ofcom.org.uk/consultations/current/effective_competition/)

trading later this year. A further consultation on detailed arrangements for AIP from April 2005 will be published towards the end of the summer.

### **Intermediaries**

- 1.19 Ofcom believes that intermediaries could bring benefits to trading markets by facilitating trading between disparate and otherwise unconnected parties. Ofcom will leave it to the market to establish intermediaries and does not intend to include any specific legislation to regulate their activities through the Trading Regulations. Intermediaries will therefore be subject to no more control than other licensees, but equally they will have to abide by the same rules as everyone else, and will not receive any special treatment. Ofcom will monitor the development of intermediaries as spectrum trading develops and will keep policies under review.

### **Spectrum 'hires'**

- 1.20 As well as trading, Ofcom will also permit a wider range of short term hiring arrangements than previously allowed. This will provide spectrum access to users who may be unwilling directly to assume the rights and obligations of a spectrum licence.

### **Publication of information and monitoring of the market**

- 1.21 Ofcom recognises that access to a range of accurate and up-to-date information is a prerequisite for a successful market. At the same time Ofcom appreciates the concerns raised by some licensees that harm could result from the release of sensitive information about the configuration of their networks. Ofcom will therefore publish a range of information about licences, transfers, variations, and Ofcom's own future plans, but will, in some cases, limit the level of detail provided to minimise the risk of harm.
- 1.22 This information will be disseminated through different channels, including a Register of Licences and a trading web page, as described in Section 7 of this document. Ofcom may also, from time to time, publish aggregated statistics on trading to allow interested parties to monitor the development of the trading market, whilst ensuring that confidentiality of individual transactions and parties is preserved. Ofcom believes that this approach will leave scope for the private sector to develop value added information and monitoring services in line with market requirements.

### **Next steps**

- 1.23 Ofcom intends to publish the draft Trading Regulations in September. At the same time, Ofcom will publish draft Register Regulations which will enable Ofcom to publish information about individual licences. Following a one month statutory consultation, it is expected that the final regulations will be made in November so that they enter into force in December 2004. In the meantime, preliminary drafts of the Regulations are included at Annexes A and B to this statement. Initial comments on these preliminary drafts are invited by 31 August 2004<sup>3</sup>.

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<sup>3</sup> Any comments should be sent to [spectrumtrading@ofcom.org.uk](mailto:spectrumtrading@ofcom.org.uk)

- 1.24 Later this year, Ofcom intends to begin its programme of varying WT Act licences, as described in this statement, starting with those classes identified for trading in 2004.
- 1.25 Ofcom expects to take similar steps in 2005 to extend trading to further licence classes.

## Section 2

# Background

### Ofcom's approach to management of the radio spectrum

- 2.1 This document forms one of a series setting out Ofcom's new approach to management of the radio spectrum, which is intended to promote innovation and competition in the provision of wireless services across the UK. Radio spectrum is a key raw material for the communications sector. Consumers, equipment manufacturers and network operators all stand to benefit from us managing spectrum in a way that can respond more quickly to technological and market change.
- 2.2 Ofcom's overall approach to spectrum management will be set out in the Spectrum Framework Review, one of Ofcom's three major reviews, due to be published in Q4 of this year. This will describe Ofcom's intended balance between command & control, market forces and licence-exempt spectrum, as well as covering areas such as ultra-wideband and harmonisation and the mechanisms by which the overall framework will be cascaded down into specific policy. Spectrum trading and liberalisation fit within the Framework Review as the key mechanisms in the implementation of a market forces approach to spectrum management.
- 2.3 Since the Cave report in 2002, substantial progress has been made to this end, most notably through the development of proposals to implement spectrum trading and liberalisation. Ofcom is committed to continue the implementation of this more dynamic and market-oriented approach. Ofcom is taking forward its reform programme through three inter-related projects. These are:
- Spectrum Trading – mechanisms for allowing spectrum to change hands;
  - Spectrum Liberalisation – relaxation of constraints on the use of spectrum;
  - Spectrum Pricing – updating of annual fees for spectrum not acquired through auction.
- 2.4 Alongside these documents we will also be publishing a "Mobile and Broadband Spectrum Roadmap" – a joined-up approach to some immediate issues in the mobile and broadband wireless areas.
- 2.5 This document sets out Ofcom's conclusions on spectrum trading. Further documents will be published in the next few months on each of the other areas, as described below.

### Spectrum Trading

- 2.6 This statement sets out details of the arrangements by which spectrum licence holders will be able to transfer some or all of their rights to third parties. It builds on proposals set out in a consultation document which Ofcom issued in November 2003<sup>4</sup> and takes account of respondents'

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<sup>4</sup> [http://www.ofcom.org.uk/consultations/past/spec\\_trad/?a=87101](http://www.ofcom.org.uk/consultations/past/spec_trad/?a=87101)



comments on the consultation. It sets out the classes to which spectrum trading will be introduced in 2004 and describes plans for how this should be extended to further licence classes in future years. The statement also sets out some other steps that Ofcom will be taking in order to facilitate spectrum trading, including variation of licences in certain classes and publication of information.

### **Spectrum Liberalisation**

- 2.7 A consultation to be published shortly will put forward detailed proposals for the extent to which and how liberalisation will be implemented over the next 2-3 years. The consultation will consider the relaxation of constraints currently imposed on licensees as to the way in which they can operate under their licence – for example on the technology they can use and the service they can offer. It will also consider the extent to which licensees can expect to be protected from interference and describe Ofcom's role in enforcement and interference investigations. The document will propose a process through which liberalisation will be managed in the short-term and will consider whether such arrangements can be simplified in the longer term, for example by granting licences which are more neutral in terms of permitted technology and use.

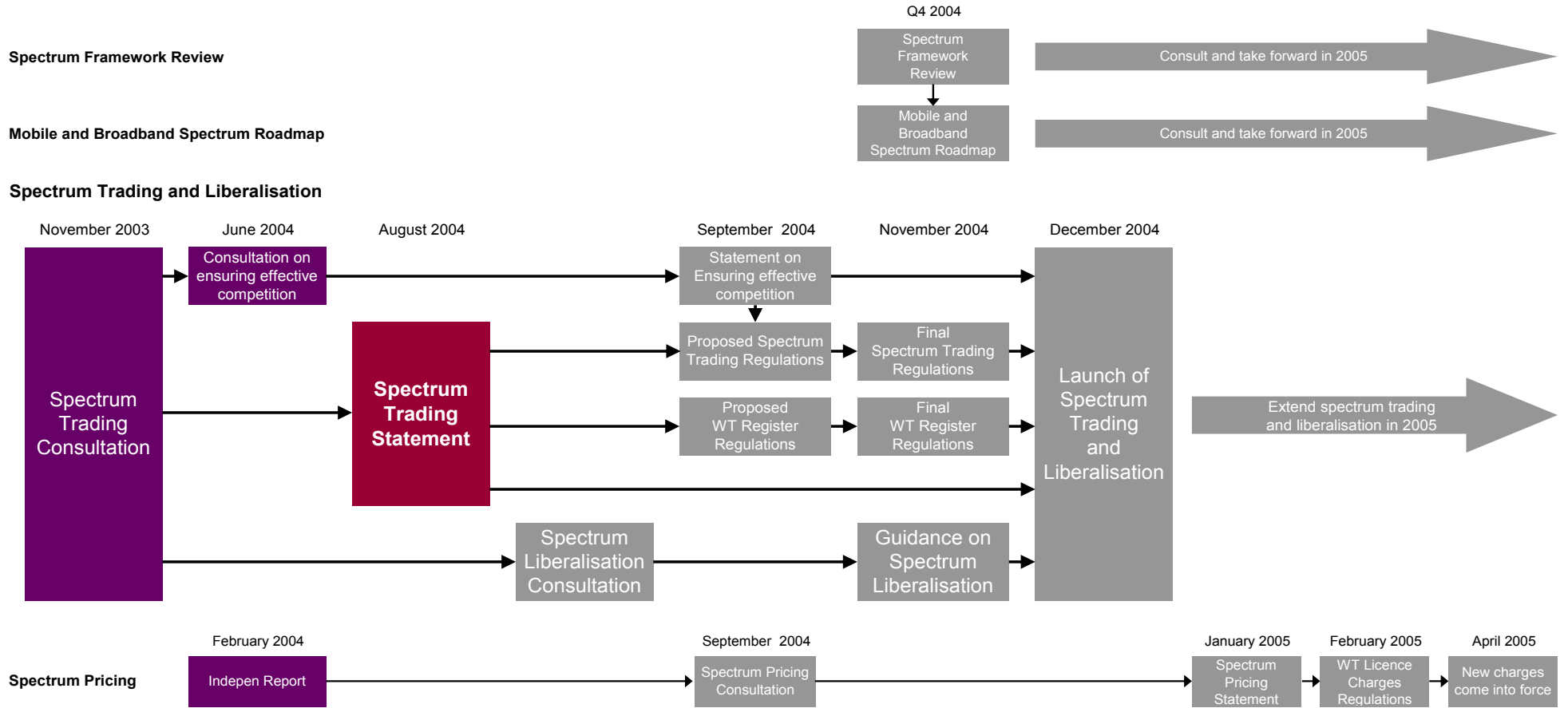
### **Spectrum Pricing**

- 2.8 A consultation scheduled for September will put forward proposals for revisions to Administrative Incentive Pricing (AIP), the fees charged for WT licences that were not acquired through auction. This will outline the economic fundamentals of the approach and consider the policy issues involved in setting AIP. It will provide initial estimates of the marginal valuation of spectrum by band for use from April 2005 and will outline initial proposals for the application of AIP to broadcasting. It will also consider the appropriate frequency for reviewing the level of AIP.

### **Timetable**

- 2.9 A consultation document on ensuring effective competition following the introduction of spectrum trading was published in June. Other documents are currently scheduled for publication according to the timetable illustrated below.

**Spectrum Strategy : Ofcom Roadmap of Activities**



## **Need for spectrum trading and liberalisation**

- 2.10 The November consultation document explained how the introduction of spectrum trading and liberalisation would enable spectrum to be transferred to, and used by, the user that values it most, thus bringing greatest benefit to the economy. Ofcom believes that the introduction of spectrum trading and liberalisation should have a positive impact on consumers through:
- lower prices for the most profitable and popular wireless services as wider availability of spectrum increases competition and supply;
  - greater choice as alternative suppliers enter the market by acquiring rights to use spectrum; and
  - innovation as entrepreneurs acquire rights to use spectrum and offer new services.
- 2.11 However, Ofcom also acknowledged in the document that the introduction of spectrum trading, in parallel with liberalisation, could have some less welcome side-effects for consumers. It will increase the opportunity costs of using spectrum to suppliers of less profitable services, because it will offer them the opportunity of selling their spectrum for alternative uses which may be valued more highly. Therefore, consumers - who in some cases may have invested in expensive radio equipment - may find that their equipment is no longer supported by the supplier of a commercial service.
- 2.12 Ofcom explained in the November consultation document that it believed that spectrum trading and liberalisation will benefit spectrum users of all types. It explained that:
- Large users of spectrum, such as telecommunications companies, will benefit from a greater certainty over the term of their rights to use spectrum, the opportunity to improve returns from under-used spectrum resources, and the potential to access more spectrum for expanding technologies.
  - Small users of spectrum, such as private business radio users, will benefit from the opportunity to profit from investing in new equipment and selling any spectrum that is released as a result, or to purchase more spectrum if they require it due to the expansion of their business.
  - Firms will have more opportunity to compete for spectrum for new technologies or services with incumbents. Spectrum trading and opportunities to change the use of spectrum will also remove barriers to entry in markets where lack of access to spectrum previously restricted entry by new players.

## **Consistency with broader spectrum management strategy**

- 2.13 The introduction of spectrum trading and liberalisation extends Ofcom's policy of using market based mechanisms (e.g. auctions and incentive pricing) to manage the radio spectrum. Trading will complement a number of other spectrum management processes that will continue to be used. These include:

- Primary assignments of spectrum. Ofcom expects to continue to use market-based methods (such as auctions) as its preferred mechanism for making primary assignments. These may be complex auctions for large assignments, or single round auctions for smaller blocks of spectrum, such as new spectrum for private business radio systems. Where auctions are not suitable, other mechanisms, such as first come-first served will continue to be employed.
- Exemption from licence obligations. Where Ofcom is satisfied that particular radio equipment is not likely to cause any undue interference with wireless telegraphy, Ofcom will continue to exempt the use of that radio equipment operating on particular frequencies from requirements to obtain a licence. In future, as technologies such as spectrally 'polite' radio become more widespread, Ofcom may make greater use of licence exemption as a spectrum management tool.
- Administrative incentive pricing. Annual fees designed to encourage users to make efficient use of spectrum have applied to certain licence classes for some time. The economic study to review spectrum pricing, which was undertaken by the consulting firms Indepen and Aegis, and Warwick Business School on behalf of the RA, was published in February 2004<sup>5</sup>. Further details on the role of administrative incentive pricing following the introduction of spectrum trading are set out in Section 7 of this Statement.
- International harmonisation and interference agreements. The international harmonisation of spectrum use may take place as a result of certain binding EC measures or as a result of other international agreements and arrangements to which the UK is a party. Under these arrangements, the UK commits to allocate particular frequency bands for particular purposes. Spectrum trading will be designed to work within the constraints that current and future international arrangements impose.
- Administrative spectrum management. Certain spectrum classes will either require some delay before trading can be introduced, or appear to be unsuitable for trading, at least for the foreseeable future. For example, it is not envisaged that on-board maritime and aviation licences will be made tradable<sup>6</sup>.
- Interference from neighbouring countries. Ofcom will continue to operate site clearance procedures, investigate interference, enforce licence conditions, act against unauthorised transmitters and use the international machinery to deal with interference from neighbouring countries.

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[http://www.ofcom.org.uk/research/industry\\_market\\_research/m\\_i\\_index/spectrum\\_research/independent\\_review/spectrum\\_pricing.pdf](http://www.ofcom.org.uk/research/industry_market_research/m_i_index/spectrum_research/independent_review/spectrum_pricing.pdf)

<sup>6</sup> In the case of on-board use Ofcom is exploring with CAA and MCA whether certain types of use in this category might lend themselves to deregulation in the form of exemption from individual licensing. Ofcom intends to announce further plans in this area later in the year.

- 2.14 Spectrum trading alone may also be insufficient in cases where it is known that extraordinarily large amounts of spectrum will be required for a major event. A trading market may be able to meet some of this demand but, in some instances, it may not provide sufficient certainty that all will be met, particularly if plans need to be confirmed far in advance. In such circumstances, spectrum trading may need to be supplemented by other approaches to spectrum management.
- 2.15 Ofcom's intention is to introduce spectrum trading and liberalisation in ways that provide maximum scope for licensees and potential licensees to take advantage of advances in technology. It is providers in the market, not a central regulator like Ofcom, who are in the best position to apply the latest technology and adapt to a rapidly changing environment. Ofcom, through light touch regulation, aims to provide maximum scope for spectrum users to innovate and business creativity to flourish.

### **Consistency with EC spectrum trading study**

- 2.16 In May 2004, the European Commission published a 'Study on conditions and options in introducing secondary trading of radio spectrum in the European Community'<sup>7</sup>. This study, conducted by Analysys, DotEcon and Hogan & Hartston, recommends the Commission mandates the introduction of both spectrum trading and liberalisation across the EU. In its analysis, the study identifies a net economic benefit of 8-9 billion Euros per year, as a result of this recommendation. In contrast, a regime that restricts liberalisation across Europe would result in a loss of several billion Euros per year.
- 2.17 Ofcom's proposals to implement spectrum trading and liberalisation are in line with the recommendations of this study. The findings of this study provide some additional support for Ofcom's proposals to move towards increased use of market mechanisms – and of spectrum trading and liberalisation in particular. Ofcom's proposals regarding specific aspects of its national spectrum trading framework (such as protection of competition, classes of licence for implementation, and types of transfers allowed) are also broadly in agreement with the study's recommendations.

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[http://europa.eu.int/information\\_society/topics/radio\\_spectrum/useful\\_info/studies/secondtrad\\_study/index\\_en.htm](http://europa.eu.int/information_society/topics/radio_spectrum/useful_info/studies/secondtrad_study/index_en.htm)

## Section 3

# Spectrum trading

## The legislative framework

- 3.1 The European Commission Framework Directive enables Member States to introduce spectrum trading<sup>8</sup>. 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.
- 3.2 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.
- 3.3 Ofcom has included a preliminary draft of the Trading Regulations at Annex A to this statement. This draft reflects the policy outlined in this statement and is included in order for readers to understand more clearly how this policy may be implemented by legislation. The draft may change after publication of this statement as the detailed elements of Ofcom’s plans for trading are further developed. Stakeholders will be able to comment on a further draft under the formal statutory consultation, scheduled for early autumn, which must take place before the regulations are made. In the meantime, comments are invited on this preliminary draft by Tuesday 31 August 2004<sup>9</sup>.
- 3.4 The first (2004) Trading Regulations will not extend to Guernsey. In addition, they cannot extend to Jersey or the Isle of Man because there has not been an Order in Council which extends the application of the Communications Act to these places. Hence the plans for transfers contained in this statement will not apply to Guernsey, Jersey or the Isle of Man. However the plans for liberalisation will apply so far as they are independent of transfers. These plans will be explained further in a consultation document on liberalisation which Ofcom intends to publish later in the summer.

## What is spectrum trading?

- 3.5 Spectrum trading is the transfer of rights and associated obligations arising by virtue of a WT Act licence<sup>10</sup>. Associated obligations are those obligations that are necessarily and properly associated with a right, for example a limitation not to operate outside prescribed power levels. Grants of recognised spectrum access (RSA) may also be tradable but RSA has not yet been introduced. Ofcom intends to consult separately later this year on its plans for RSA, including on whether RSA should be made tradable.

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<sup>8</sup> Article 9(3) and (4) of the EC Framework Directive 2002/21/EC

<sup>9</sup> Any comments should be sent to [spectrumtrading@ofcom.org.uk](mailto:spectrumtrading@ofcom.org.uk)

<sup>10</sup> Granted under the Wireless Telegraphy Act 1949

- 3.6 Ofcom believes that spectrum trading will help to optimise the use of the finite spectrum resource for the benefit of UK consumers and citizens. It may, for example, enable spectrum users to amalgamate new spectrum with existing spectrum to expand the range or level of services they offer. Alternatively, it may allow users to partition spectrum enabling them to sell spectrum rights they do not need to another party that will use them more efficiently.
- 3.7 In the November 2003 consultation document, Ofcom set out its intention to develop a flexible approach to trading, making the widest possible range of transfers available. This, we explained, would maximise the benefits that can be obtained through trading. We sought the views of the industry on a proposed set of procedures and processes, including proposals for transfers covering outright sale, lease or hire.
- 3.8 Respondents to the consultation generally supported Ofcom's proposals. They emphasised that the trading arrangements must allow for maximum flexibility to the industry and maximum certainty as to the rights and associated obligations transferred under a WT Act licence.

### **Types of transfer that will be authorised by the Trading Regulations**

- 3.9 Ofcom envisages that transfers can be broadly categorised in four different ways under the Trading Regulations. This reflects the two different ways of holding a licence (i.e. sole holding or concurrent holding) and the two different ways in which a licence can be transferred (total or partial transfer). The four types of transfer are:
- a) an outright transfer of all of the rights and obligations arising under a licence to a third party (outright total transfer);
  - b) a transfer (of all of the rights and obligations arising under a licence) to a third party which results in a concurrent holding of those rights and obligations by the transferor and the transferee(s) (concurrent total transfer);
  - c) an outright transfer of some of the rights and obligations arising under a licence to a third party (outright partial transfer);
  - d) a transfer of some of the rights and obligations arising under a licence to a third party which results in a concurrent holding of those partial rights and obligations by the transferor and the transferee(s) (concurrent partial transfer).
- 3.10 Further details about these different types of transfer are set out below.

#### Outright and concurrent transfers

- 3.11 Under an outright transfer, the rights and obligations being traded are transferred in their entirety from one party to another. Thus the original licensee (that traded the spectrum) no longer has any rights to use the traded spectrum.
- 3.12 Concurrent transfers, on the other hand, enable licensees to share rights to use spectrum as they see fit over a period of time without the need to undertake further transfers between themselves to effect that sharing. In line

with its policy of providing licensees with maximum flexibility, Ofcom has decided to offer concurrent transfers from the commencement of trading.

- 3.13 The Trading Regulations do not limit the number of concurrent licence holders so, for example, joint holdings by three or more licensees may result from a trade. Where a licence is held concurrently by a number of licensees, the agreement of all those licensees will be necessary to complete a trade.
- 3.14 The concept of concurrent licence holding is new to the system of UK Wireless Telegraphy licensing. Under such a holding each of the concurrent licensees will jointly hold the same rights and obligations under a licence. They will therefore both (or all) be responsible for complying with licence obligations, including the obligation to pay the licence fee<sup>11</sup>. A significant breach of licence obligations by one or more licensees could, as in the case of a sole licensee, lead to licence revocation or the application of other Ofcom sanctions.

#### Total and partial transfers

- 3.15 Total transfers relate to the transfer of all rights and obligations held under a licence. In addition, Ofcom will introduce the possibility of two types of partial transfers, under which some of the rights and obligations under the licence will be transferred, to allow the “splitting” of a licence by frequency or geography. However, only certain types of licence will qualify for partial transfers from the commencement of spectrum trading as described below:
- Transfers of the rights and associated obligations relating to a part of the range of frequencies will be permitted for all the licence classes which are to be tradable in 2004 other than Fixed Wireless Access licences operating in the 3.6 GHz band. This would mean, for example, a licensee may transfer rights and obligations relating to a 5MHz frequency range within the overall range of frequencies authorised by his licence. Some restrictions will apply to the exact nature of frequency partitioning permitted in each licence class. These are set out in Section 4 of this document.
  - Transfers of the rights and associated obligations relating to a geographical area will be permitted for Fixed Wireless Access licences operating in the 3.4 GHz and Broadband Fixed Wireless Access licences in the 28 GHz band. For example, a licensee may transfer rights and obligations relating to Scotland where a licence permits rights to transmit across the UK. Ofcom plans to extend the availability of geographical partitioning to a wider range of licence classes in 2005 and more details of these plans are also set out in Section 4 of this document.
- 3.16 Ofcom recognises that companies may wish to partition licences in other ways and then sell on partitioned parts. Other types of partial transfer may be possible, but will have to be effected by first partitioning the licence into two or more licences using the licence variation process, followed by the transfer of one or more of the resulting parts. This two stage process is required to enable Ofcom to consider fully the interference impact of the proposed

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<sup>11</sup> An additional obligation to pay the licence fee exists under legislation. Ofcom will not accept partial payments of the fee from different parties and will require that one licensee is nominated to be responsible for the payment of the entire licence fee to Ofcom.



partition on other users of the spectrum. By necessity this process will take longer than partitions covered by the Trading Regulations and Ofcom must make decisions in accordance with statutory duties and general legal principles.

#### Transfers which are limited in time

- 3.17 When making a transfer outlined above, the parties may agree between themselves that the transfer is to be for a certain period of time only, and at the end of that period of time there will be a transfer back to the original holder. Ofcom considers that there are a variety of contractual mechanisms which the trading parties can construct to reflect such arrangements and Ofcom would not envisage being involved in their development. From Ofcom's perspective, time limited transfers of this nature can be viewed as two separate and independent transfers.
- 3.18 Although re-transfer may be possible, Ofcom considers that it could increase licensees' commercial certainty by permitting total or partial transfers of rights and associated obligations for a defined period of time. Thus the transferee would hold the rights and obligations concerned for a defined "transfer period". For the period leading up to the transfer period and for periods after the transfer period, the transferor will hold the rights and associated obligations.
- 3.19 Ofcom believes that such a transfer would be beneficial for companies as it will remove the requirement for a retransfer at the end of the relevant period which would otherwise have to occur. There will therefore be no risk of re-transfer failing to occur since the return of licensed rights and associated obligations will be achieved automatically by virtue of the operation of law rather than by the exercise of contractual rights.
- 3.20 Ofcom also believes that licensees could benefit from being able to transfer recurring transmission periods. For example, a licensee may wish to transfer the right of use between the hours of midnight and 6am only.
- 3.21 Changes to Ofcom's internal licensing systems mean that Ofcom will not be able to introduce time limited transfers as part of its plans for 2004. However Ofcom intends to amend the Trading Regulations to permit such transfers as part of its plans for 2005.

#### Expanding the range of transfers available

- 3.22 Ofcom believes that the range of permitted transfers, as described above, will support a variety of commercial arrangements between parties. Ofcom recognises, however, that the market may in future seek to create new types of trading transaction, which would benefit from the availability of further types of transfer in addition to those that are authorised by the Trading Regulations that Ofcom will publish this year. Provided that such new types of transfer can be accommodated within the Trading Regulations, and there is sufficient evidence of the benefits of such additional transfer types, Ofcom would be willing to consider amending the Trading Regulations to authorise such additional types of transfer at a later date.

### **The transfer process**

### Notification of a trade

- 3.23 Once a transfer has been agreed, the licence holder or concurrent holders must notify Ofcom about the proposed trade. Ofcom intends to introduce the least administratively burdensome process to support effectively the transfer of licences.
- 3.24 Ofcom proposes to require that it receives a document confirming that all parties to the trade have consented to the proposed transfer. This should be signed by or on behalf of:
- the holder or each concurrent holder of a licence; and
  - the transferee or transferees to whom rights and obligations are to be transferred.
- 3.25 Ofcom will also require other information such as the name and address of the proposed transferee, a description of the type of transfer which is to be effected and any information necessary for Ofcom to determine whether it shall consent to the transfer. Parties who give false information or who seek to implement transfers without obtaining the necessary consent will be in breach of the Trading Regulations and the transfer could therefore be void.
- 3.26 Ofcom will also request parties to trades to provide other information on a voluntary basis which may be useful to Ofcom in order to monitor the success of spectrum trading. Such voluntary information might include details of the underlying commercial transactions (such as price) but this will not be made public. However, Ofcom will analyse the data and may, from time to time, publish details of our conclusions, including aggregated figures though anonymity and confidentiality will be preserved.
- 3.27 Once all the information is provided, Ofcom will check the documentation in order to ensure that the mandatory information requirements have been met and that the proposed transfer is consistent with the information held by Ofcom. Ofcom will then publish a notice stating the names of the transferor and the transferee and setting out basic information about the licence. Both notification to Ofcom of proposed transfers and publication of transfers are requirements of the Framework Directive<sup>12</sup>.

### Giving consent to a trade

- 3.28 A transfer of a licence will be allowed subject to Ofcom's consent. In order to provide as much commercial certainty as possible, Ofcom intends to limit the reasons under which it will not consent to a trade to the minimum necessary. These reasons will be set out in the Trading Regulations and will enable Ofcom to prevent trades in circumstances including where:
- parties are attempting to gain a licence which they otherwise would be ineligible to apply for (such as where they would be unable to meet the terms, provisions or limitations of the licence);
  - parties are attempting to escape licence obligations or enforcement action by Ofcom;

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<sup>12</sup> Article 9(4)

- Ofcom may have to meet national security concerns, comply with European Community or international obligations or a direction by the Secretary of State.
- 3.29 Where a licence to be transferred includes a non-spectrum licence condition (such as a roll out obligation) Ofcom will assess the ability of the transferee to fulfil the condition. If Ofcom is of the opinion that the non-spectrum licence condition will not be fulfilled, then Ofcom may refuse to consent to the transfer<sup>13</sup>.
- 3.30 Ofcom anticipates that in some circumstances it may be able to consent to a transfer but give a direction to the parties to the trade that the transfer will only be put into effect when certain of the above matters are resolved. Ofcom will keep the Trading Regulations up-to-date as new licence classes are made tradable and commits to keeping the reasons under which it will not consent to a trade to the minimum required.

#### Enacting the transfer

- 3.31 If satisfied that the parties comply with all requirements for a trade, Ofcom will contact the parties to the trade and inform them that it consents. Ofcom may request a date by or on which the transfer is to be formally completed.
- 3.32 In order to effect a transfer, the transferor's licence will need to be surrendered. In the case of a total transfer, Ofcom will then grant a new licence on exactly the same terms and conditions to the transferee. In the case of a partial transfer Ofcom will grant new licences with the appropriate terms and conditions to both the transferor and the transferee.
- 3.33 Once the transfer has been effected, Ofcom will update its public notice of the transfer to indicate that the transfer was completed. We will also update the Register of Licences to ensure that the new licence holdings are reflected<sup>14</sup>.

#### Licence fees

- 3.34 Ofcom has decided that the transfer of rights and obligations under a licence should not trigger the payment to Ofcom of additional licence fees nor the repayment to a transferor of any fees already paid. The rights transferred under a licence will include the transferor's rights which arise from having paid a licence fee. The renewal time when further licence payments may be due (under the licence charges regulations) will remain the same, notwithstanding the transfer.
- 3.35 As a consequence of the fact that there will be no additional payment, Ofcom will ensure that all fees which are owing to it under the licence have been paid in full before a transfer can take place. This will leave the parties free to take account of licence fees which have already been paid by the transferor when agreeing the price to be paid in relation to the transfer.

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<sup>13</sup> If changing circumstances mean that the condition is no longer appropriate then Ofcom may consider removing it by a variation process post transfer. See Section 6 for further details.

<sup>14</sup> See Section 7 for further information about the Register of Licences.

## Protection of competition

- 3.36 Ofcom considered how to ensure that competition is not distorted as a result of any spectrum trade in the November Consultation Document and sought comments on the optimal approach. Ofcom received a large number of responses on this topic, offering a wide range of views. As a result, Ofcom has published a further consultation<sup>15</sup> which describes in detail the various mechanisms available to prevent distortion of competition and makes a proposal as to how Ofcom should move forward. The consultation document explains that we do not believe it is necessary to develop new regulations to prevent distortion of competition and that existing controls are sufficient. Ofcom is currently considering responses to this proposal and consequently the issue is not considered further in this statement.

## Charges for transfers

- 3.37 Ofcom has considered whether it would be appropriate to charge a fee for its work in transacting and facilitating spectrum trading. Having taken account of views expressed in response to the November consultation, Ofcom has decided that no fee will be raised during the first year of operation. However, Ofcom intends to keep this position open for review in future years, by which time we will know more about the take up of trading and the associated resource demands on Ofcom. Ofcom believes that this approach will help to minimise the administrative burden of introducing trading and to encourage take-up of trading. Any proposal to introduce fees for trading would be subject to further consultation and would be based on cost-recovery principles.
- 3.38 Some respondents raised concerns that those classes not yet trading may be subsidising those that do trade if no charge is made for trading. In fact, this is not the case. Except for a small number of licences based on cost-recovery, licence fees are determined by spectrum management considerations as required by statute. Those fees will not be affected by trading costs in any way.
- 3.39 Ofcom also proposes to place its new Register of Licences and information about transfers on the Ofcom website at no charge for searching. However if searchers wish to request paper copies then Ofcom may charge a fee to cover the additional cost of any such provision.

## Respondents' views on the transfer process

- 3.40 Most respondents to the November consultation were broadly supportive of Ofcom's proposals in relation to the procedure for carrying out spectrum trades. A number emphasised that Ofcom must establish a clear and comprehensive trading framework which provides transparency, consistency and regulatory certainty. This is what Ofcom has sought to achieve through the process described above.
- 3.41 A few specific issues were identified by respondents. Some of these have already been mentioned earlier in the text while other points are identified below. A more comprehensive overview of the comments raised by respondents and Ofcom's response is set out at Annex E.

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<sup>15</sup> [http://www.ofcom.org.uk/consultations/current/effective\\_competition/](http://www.ofcom.org.uk/consultations/current/effective_competition/)

### Period for consultation

- 3.42 Some respondents suggested that Ofcom should allow for an appropriate consultation period following the publication of information on an intended transfer. This, it was argued, would allow third parties the opportunity to express their views on the technical and/or competition issues involved in an intended transfer. However, Ofcom is of the view that, at least in the case of a transfer of rights and obligations, there is no need for a consultation stage to be incorporated within the trading process. As far as the competition issues are concerned, this issue is discussed in the separate consultation document which Ofcom published on 10 June.

### Complex and time-consuming procedure

- 3.43 Some respondents considered that the trading procedure could be less complex and subsequently less time-consuming and bureaucratic. They proposed that Ofcom should opt for electronic based rather than paper-based systems for approving transfers especially when no application to change the terms of the licence was made.
- 3.44 Ofcom has set out its intention to introduce the least complex and burdensome process for approving transfers of licences possible, whilst taking account of the necessary legal requirements and the practical constraints of what can be introduced this year. Ofcom will continue to refine and improve its trading processes and systems as our experience develops. We fully anticipate that this will allow us to offer an e-enabled trading process in future.

### **Taxation of trades**

- 3.45 The November consultation document explained that trading activities, like all business activities, may give rise to incomes and gains which will be subject to tax in the normal way. This includes income tax, corporation tax, value added tax and other taxes as appropriate. A few respondents requested further clarification on taxation in relation to transfers of licences. However, this is not an issue on which Ofcom is qualified to comment. Trading parties who have tax-related queries are advised to refer them to the Inland Revenue or Customs and Excise or to seek their own professional advice.

## Section 4

# Introduction of spectrum trading by licence class

## Timetable

- 4.1 The majority of respondents were broadly in favour of Ofcom's proposed timetable for the introduction of trading. Some considered that trading should be introduced more rapidly with maximum flexibility, possibly in a wider range of licence classes than suggested in the consultation. A smaller number of respondents thought that trading should be introduced less rapidly than suggested.
- 4.2 A couple of manufacturers thought that trading should be postponed, especially where change of use was proposed, until an interpretation of EU law was elaborated and the need for EU co-ordination and harmonisation in trading was clarified. On the other hand a number of other respondents, including at least one manufacturer, thought that trading should be introduced as early as possible.
- 4.3 Ofcom is working closely with our European colleagues. We believe that the programme for the introduction of trading set out below is in tune with developments in European spectrum management. Ofcom's proposals for the introduction of trading are broadly consistent with the recent study prepared for the European Commission by Analysys, DotEcon and Hogan & Hartson<sup>16</sup>.
- 4.4 Ofcom believes that its approach strikes an appropriate balance between establishing a market with significant trading opportunities as quickly as possible, and ensuring proper preparation and practical organisation of process issues. It takes account of the views of respondents and allows for the steady and progressive roll-out of trading. Ofcom believes this approach is the best way to realise the benefits of trading while allowing the circumstances of different licences and licence classes to be fully taken into account. It will also enable experience to be gained as the scope of trading is progressively extended to more licence classes.
- 4.5 Ofcom intends to enact the first set of Trading Regulations in November 2004, thus allowing trading in the first group of licences from December 2004. Ofcom expects to amend these Regulations in each of the subsequent three years, extending the range of licence classes authorised to trade.

## Classes of licence that will be authorised to trade

- 4.6 The proposed scope for the introduction of trading in late 2004, which largely follows that presented in the November consultation document,

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<sup>16</sup>

[http://europa.eu.int/information\\_society/topics/radio\\_spectrum/useful\\_info/studies/secondtrad\\_study/index\\_en.htm](http://europa.eu.int/information_society/topics/radio_spectrum/useful_info/studies/secondtrad_study/index_en.htm)

encompasses a wide range of different types of radio use. The proposals have been slightly modified to take account of responses received to the consultation, and to reflect developments since publication. In most cases these modifications, which are described below, are designed to allow Ofcom to explore the possibility of implementing alternative authorisation regimes (e.g. licence exemption).

- 4.7 In 2004 Ofcom intends to introduce trading to over 50,000 radio assignments across a wide range of different types of radio use. Along with enabling total transfers of all tradable licences, Ofcom also proposes to introduce options for geographical and frequency partitioning for some licence classes. These options will vary from class to class and, where permissible, are described in detail later in this chapter.
- 4.8 Ofcom plans to extend the range of options available as trading is rolled-out over the coming years. In particular, we aim to introduce new options for partial transfers in 2005, for a range of licence classes which will be made tradable in 2004, as set out below:
- **Frequency Partitioning** – Frequency assignment procedures for certain licence classes in the Public Mobile Operator and Private Business Radio class use a predefined channel plan in order to minimise interference between different users of this spectrum. For this reason Ofcom has limited partitioning options in these classes for 2004 in a way that supports these existing arrangements (e.g. to 12.5 kHz blocks within the existing channelling arrangement<sup>17</sup>). Ofcom intends to explore if more flexible options for partitioning could be supported (e.g. 6.25 kHz blocks) and to introduce them progressively over the coming years.
  - **Geographical Partitioning** – Ofcom intends to extend the range of licences where geographical partitioning is permitted to include the Analogue PAMR, National Paging, Data Network and National and Regional PBR licences (full details are set out later in this chapter). In order to support this facility Ofcom is developing new licensing systems and ways of capturing the technical details of these licence types that better support the flexibility offered by geographical partitioning. Ofcom plans to have these new arrangements in place in 2005.
  - **Temporal Partitioning** – Ofcom plans to permit the partitioning of licences by time once changes to our licensing systems have been made. Temporal transfers could be in the form of time-limited transfers of spectrum (e.g. for 3 months continuous use); or be for set times of the weeks (e.g. partitioning at weekends) or in real time (e.g. by use of dynamic time division technology). Ofcom will consult on the licence fee charging principles that will be applied to licences partitioned in this way in the forthcoming consultation on pricing.

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<sup>17</sup> The limit of partitioning to a 12.5 kHz block does not prevent the amalgamation of adjacent channels by licensees in order to operate wider bandwidth equipment. Ofcom would require that the emission characteristic at the edge of the block (i.e. that to spectrally adjacent users) was equivalent to that required for 12.5 kHz equipment.

## **Classes of licence for which trading will be introduced in 2004**

- 4.9 The following describes the licence classes that will be made tradable in 2004. An overview of these plans is set out at Annex C.

### **Public Mobile Operator**

#### Analogue PAMR

- 4.10 Ofcom will permit transfers of all rights and obligations for analogue PAMR for both national and regional channels from the commencement of trading (scheduled for the end of 2004). Ofcom will also permit licences to be spectrally partitioned, within existing channelling arrangements to a minimum channel width of 12.5 kHz. Ofcom is currently exploring if more flexible options for frequency partitioning could be supported (e.g. 6.25 kHz blocks) and would hope to introduce such facilities progressively over the next few years.

#### National Paging

- 4.11 Ofcom will permit transfers of all rights and obligations for National Mobile Operator for Public Wide Area Paging for both national and regional channels in the 153 MHz and 450-470 MHz bands from the commencement of trading. Within these bands Ofcom will also permit partial transfers of licences by frequency, within existing channelling arrangements to a minimum channel width of 12.5 kHz. Ofcom is currently exploring if more flexible options for frequency partitioning could be supported (e.g. 6.25 kHz blocks) and would hope to introduce such facilities progressively over the next few years.
- 4.12 The 450-470 MHz band is included in the trading portfolio following a notice issued by Ofcom on 21 July 2004. This announced the withdrawal of the Band Alignment project under which notices had previously been served by the Radiocommunications Agency to give warning of the intention to replace the existing frequency assignments in this band with new assignments. Over the coming months, Ofcom will consider further how to create an opportunity for the market to access this band and will engage with stakeholders to seek their views on any new proposals.
- 4.13 There are now no licences on issue in the ERMES paging bands (169 MHz paired with 870 – 871 MHz). The use of this band is currently under review within Europe and a variety of alternative harmonised European applications are being considered. A decision on this band is expected to be in place by early 2005, and this will probably be confirmed by a European Directive, which will be legally binding on the UK. Ofcom intends to review plans for this spectrum once the European situation has been clarified in 2005.
- 4.14 The national paging band (449-450 MHz) has been removed from trading plans for 2004, as have all paging licences operating in the band 420-450 MHz (UHF 1 band), due to the sharing requirements in this band.

#### Data Networks

- 4.15 Ofcom will permit transfers of all rights and obligations for Public Mobile Data, Non-Voice only operation licences for both national and regional channels in all licensed UHF and VHF bands other than the UHF 1 Band (420-450 MHz) from the start of trading. Assignments in the UHF1 band have been excluded



from these plans for the introduction of trading due to sharing requirements in this band.

- 4.16 Within these bands Ofcom will also permit licences to be spectrally partitioned, within existing channelling arrangements to a minimum channel width of 12.5 kHz. Ofcom is currently exploring if more flexible options for frequency partitioning could be supported (e.g. 6.25 kHz blocks) and would hope to introduce such facilities progressively over the next few years.
- 4.17 A single licensee operates asset tracking in the HF band (133.477 kHz and 146.705 kHz) using extremely narrow band transmission. Ofcom proposes to introduce transfers of all rights and obligations for this type of licence.
- 4.18 The licence awarded for CDMA Spread Spectrum Data/Asset Tracking systems covers transmission in two frequency bands: a fixed transmitter element in the band 174 – 225 MHz; and a mobile low power asset tag element in the band 866 – 868 MHz. Ofcom may consult later this year on proposals to make the band 866 – 868 MHz available on a licence exempt basis to asset tracking and radio frequency identification (RFID) applications. Current asset tracking activity in this band would continue but would no longer require a licence as it would be covered by the proposed exemption for this band. In view of these plans, Ofcom does not currently propose to make the band 866 – 868 MHz available for trading. It does however intend to permit trading in this licence class for assignments in the band 174 – 225 MHz from the end of 2004. Within these bands Ofcom will also permit licences to be spectrally partitioned, within existing channelling arrangements to a minimum channel width of 12.5 kHz. Ofcom is currently exploring if more flexible options for frequency partitioning could be supported (e.g. 6.25 kHz blocks) and would hope to introduce such facilities progressively over the next few years.

#### Common Base Stations

- 4.19 Ofcom intends to permit transfers of all rights and obligations for Common Base Station licences operating in the majority of the available spectrum from the commencement of trading. The UHF1 band (420 – 450 MHz) will not be made available for trading due to the sharing requirements in this band.
- 4.20 For licences where trading is introduced, Ofcom will permit licences to be spectrally partitioned, within existing channelling arrangements to a minimum channel width of 12.5 kHz. Ofcom is currently exploring if more flexible options for frequency partitioning could be supported (e.g. 6.25 kHz blocks) and would hope to introduce such facilities progressively over the next few years.

#### **Fixed Wireless Access (including Broadband Fixed Wireless Access)**

- 4.21 The Fixed Wireless Access licence grouping is designed to provide a regulatory framework for radio links that can be used to link the home or the office from a cell site or base station, replacing the traditional wired local loop for telecommunication network connectivity. Recent liberalisation means that this licence class can also be used for the provision of telecommunications backhaul infrastructure.
- 4.22 Ofcom has decided that trading will be permitted from the commencement of trading for licences in the 3.4 GHz, 3.6 GHz and 28 GHz bands. In the 40

GHz band it is Ofcom's intention to make licences in this band tradable upon award. Geographical and frequency partitioning of licences will be permitted in all tradable bands except the 3.6 GHz band. Use of the 3.6GHz band for fixed wireless access is subject to co-ordination with fixed satellite and fixed point-to-point users. This limits the scope for reconfiguration and consequently Ofcom will initially permit transfers of all rights and obligations only. Nevertheless, the division of licences by spectrum and/or geography could be enabled through the licence variation process and the proposals will be set out in the planned consultation on spectrum liberalisation.

- 4.23 As regards the 10 GHz band, Ofcom is exploring the future use of this band and does not propose to introduce trading before 2005. There is currently only one fixed wireless access licensee in this band and Ofcom is considering whether the spectrum surrendered by other licensees should be re-assigned.
- 4.24 Respondents to the November consultation indicated a desire for the early introduction of trading in this licence sector as well as care with any necessary changes to the licensing regime ahead of trading. Ofcom's proposals are in line with these requests. Changes to the licensing regime required to permit partitioning will be carried out with careful attention to the spectrum planning arrangements in each band. This is described in more detail in Section 6 of this document.

#### **Private Business Radio (PBR)**

- 4.25 For this group of licence classes, respondents identified interference concerns, band alignment and the introduction of Ofcom's planned Mobile Technical Assignment Tool (MASTS) as needing resolution before the start of trading. Ofcom appreciates these concerns and will introduce trading so as to minimise possibilities for interference and not to prejudice any band realignment. For those licence classes for which MASTS will be an important assignment tool (most notably the Wide Area PBR licence class) the introduction of trading is planned to take place after MASTS has been brought into service. This is expected to be in 2005 and Ofcom will keep this situation under review.

#### **National and Regional PBR**

- 4.26 Ofcom will permit transfers of all rights and obligations for National and Regional PBR licences operating in the majority of the available spectrum from the commencement of trading. The UHF1 band (420 – 450 MHz) will not be made available for trading due to the sharing requirements in this band. Ofcom also does not intend to permit trading of licences held by the Emergency Services in 2004. This is in line with the proposals set out in the November consultation document not to introduce trading to the Emergency Services before 2006, thus allowing time for questions regarding the future organisation and allocation of spectrum for the emergency services to be resolved.
- 4.27 For licences in this class where trading is introduced, Ofcom will permit partial frequency transfers within existing channelling arrangements to a minimum channel width of 12.5 kHz. Ofcom is currently exploring if more flexible options for frequency partitioning could be supported (e.g. 6.25 kHz blocks) and would hope to introduce such facilities progressively over the next few years.

### Fixed Services (Terrestrial)

- 4.28 Some respondents to the November consultation requested that no trading be permitted in fixed terrestrial link spectrum, as they considered it unlikely that another party would require a licence for exactly the same radio link as an existing link. Others requested that trading be introduced as soon as practicable.
- 4.29 Ofcom does not believe it would be appropriate to refrain from introducing trading just because of doubts about trading activity. Activity or lack of activity in the market will be the real indicator of whether gains from trading are realisable or not. In the case of fixed links it seems possible that particular links on busy routes may be of interest for trading. Alternatively, there may be scope for partitioning links by frequency through the licence variation process and transferring a partitioned part, especially if more spectrum efficient equipment becomes available. Therefore, having considered the consultation responses, Ofcom has decided to provide scope for licensees in this class to trade.

#### Point to Point Fixed Links

- 4.30 Ofcom will permit transfers of all rights and obligations for Point to Point Fixed Link licences from the commencement of trading. Partial trades will also be permitted of individual links authorised under a licence.
- 4.31 A number of frequency bands plans have previously been announced to cease fixed link use of the band to enable it to be used for other services. These bands have now been closed to new applications for assignments. The bands in question are:

<b>BAND</b>	<b>DETAIL</b>
1.5 GHz	1450 – 1492 MHz and 1512.5 – 1517 MHz 1672 – 1676 MHz paired with 1686 – 1690 MHz No new fixed link assignments in these bands. Fixed links to cease operation by April 2007 at which point the spectrum will revert to Ofcom.
11 GHz	10.7 – 11.2 GHz paired with 11.2 – 11.7 GHz No new fixed link assignments in this band.
14 GHz	14.25 – 14.36 GHz paired with 14.39-14.5 GHz No new fixed link assignments in this band.
17 GHz	17.3 -17.7 GHz No new fixed link assignments in this band. Fixed links to cease operation by April 2010 at which point the spectrum will revert to Ofcom.
22 GHz	21.2 – 22 GHz No new fixed link assignments in this band.
50 GHz	49.2 – 50.2 GHz No new fixed link assignments in this band.

- 4.32 Ofcom is content to allow trading of licences and links within these bands but the existing deadline for vacating the spectrum will remain (and transfer with any trade).
- 4.33 The third of the 32 GHz band (32.319-32.571 GHz /33.131-33.383 GHz) currently used for point-to-point fixed links, will be made tradable under the same conditions as other point-to-point spectrum. The other two thirds of the available spectrum is vacant but is currently not available for assignment. Ofcom is considering an appropriate award process for this spectrum and it is our intention that any licences issued for this spectrum be tradable upon issue.

#### Scanning Telemetry

- 4.34 Ofcom will permit transfers of all rights and obligations for Scanning Telemetry licences operating from the commencement of trading. Ofcom will also permit partial frequency transfers within existing channelling arrangements to a minimum channel width of 12.5 kHz. Ofcom is currently exploring if more flexible options for frequency partitioning could be supported (e.g. 6.25 kHz blocks) and would hope to introduce such facilities progressively over the next few years.
- 4.35 Frequencies for scanning telemetry are currently licensed to the water, electricity and gas companies. The management of these frequencies is contracted out to agents; JRC (the Joint Radio Company, a joint venture between National Grid Transco and the Electricity Association) in the case of gas and electricity; and CSS (a private company) in the case of the water companies. Currently, CSS and JRC process assignments and schedule documentation required by Ofcom. Responsibility for these administrative processes will remain with the licensees and their spectrum managers when trading commences.

#### **Ofcom's plans for the extension of trading to other licence classes in 2005 and beyond**

- 4.36 Ofcom proposes to continue with the steady and progressive introduction of trading beyond 2004. This will broadly follow the timetable set out in the November consultation document, with slight variation to reflect comments received from respondents. This timetable may be further adapted to reflect experience gained from the classes in which trading is introduced in 2004. An overview of these plans is included at Annex C.
- 4.37 The introduction of the MASTS tool to the management of a wide range of mobile licence classes in 2005 will facilitate the introduction of trading into the complex environment of wide area PBR. MASTS replaces current arrangements for the assignment of mobile radio licences, which rely heavily on engineering expertise and local knowledge, with a computer based system that takes into account complex radio propagation phenomena, terrain information, and radio usage characteristics to manage the available spectrum efficiently. It is anticipated that MASTS will come into service in 2005.

- 4.38 Ofcom also intends to use the capabilities of the MASTS tool, once available, to enable the geographic partitioning of the following licences due to become tradable in 2004:
- Analogue PAMR
  - National Paging
  - Data Networks
  - National & Regional PBR
- 4.39 As previously discussed in paragraph 4.10, Ofcom also intends to introduce a greater range of partitioning options to all tradable licence classes in 2005.

### **Classes of licence for which trading will be introduced in 2005 and beyond**

- 4.40 The following licence classes have been identified by Ofcom as being appropriate for trading from, or after, 2005. The extension of trading to these new classes will require amendment to the Trading Regulations. Ofcom will consult on any such amendments. This will give stakeholders the opportunity to comment before trading is extended to any of the classes set out below.

#### **On-Site Private Business Radio**

- 4.41 Ofcom believes there is considerable potential for further deregulation or lighter licensing of on-site services. Nonetheless, we also recognise that further deregulation must be balanced against the needs of some on-site service users who require a surety of quality which would be incompatible with a more liberalised approach to authorisation. For this reason, Ofcom has decided to launch a consultation later this year exploring how on-site services might be managed in future to ensure all types of user requirement are accommodated with the minimum requirement for regulation and the maximum level of flexibility.
- 4.42 In view of these plans, Ofcom believes it would be inappropriate to introduce trading into any on-site licence class until this review is complete as it is Ofcom's intention to make a proportion of the spectrum available on a licence exempt or more lightly licensed basis. On completion of the review, spectrum use that remains subject to individual licensing will be made tradable (subject to any changes to frequency arrangements as a result of the review, this should happen in 2005).

#### **Wide-area PBR**

- 4.43 Most assignments in this category are shared, so trading will require recourse to MASTS to ensure that the potential for interference between users can be properly managed. Therefore it is proposed that trading be introduced from 2005 once the MASTS tool is in place. Ofcom also intends to introduce a more generic approach to business radio licensing in this licence class.

#### **Radio Broadcasting**

- 4.44 Current arrangements for the licensing of Radio Broadcasting effectively permit the transfer of WT Act licences which are associated with the transfer of corresponding Broadcasting Act licences. Consequently, the absence of a WT Act licence trading facility is, in practice, not an impediment to change of

ownership in this sector. However, Ofcom intends to keep this situation under review.

### **32GHz**

- 4.45 Ofcom plans to introduce trading into the one third of the 32 GHz band currently used for point-to-point fixed links by the end of 2004 under the same conditions as other point-to-point spectrum. The remaining two thirds of this band is currently vacant and Ofcom is considering an appropriate award process for this spectrum. It is Ofcom's intention that this band be tradable from award. Ofcom will also endeavour to ensure that the maximum level of flexibility is available to licensees.

### **31GHz**

- 4.46 Ofcom intends to extend tradability to the 31 GHz CCTV band used by local authorities. However, this needs to be done in a way that does not compromise the ability of local authorities to fulfil their duties. Ofcom therefore intends to review spectrum use in this band prior to developing plans for trading.

### **Digital PAMR**

- 4.47 As set out in the November consultation document, trading will not be introduced in this class until completion of the spectrum realignment exercise being carried out in conjunction with the Ministry of Defence. This work is likely to be completed in 2005; Ofcom intends to introduce trading soon after.

### **Emergency Services**

- 4.48 Respondents were concerned to ensure adequate protection for all spectrum used by emergency services prior to the start of trading. Having considered the views of respondents, Ofcom has decided that it will not introduce trading in Emergency Services spectrum before 2006. This will allow questions regarding the future organisation and assignment of spectrum to be resolved.

### **Programme making and special events (PMSE)**

- 4.49 In the November consultation document Ofcom set out plans to introduce spectrum trading in PMSE spectrum in April 2005. However, a number of concerns were raised by the programme making community in relation to the complex radio environment in which PMSE activity takes place. In addition, some suggested that the timetable for introducing trading in broadcasting spectrum should be linked to the timetable for digital switchover. As a result of these concerns, Ofcom will delay the introduction of trading to the PMSE class until 2007 by which time future planning of the interleaved TV spectrum should be clearer. Ofcom also intends to carry out an assessment, including consultation in due course, of alternative approaches to managing PMSE spectrum.
- 4.50 The JFMG referred to various issues that need to be taken into account in introducing spectrum trading in this area, not least how trading could work in this area given the amount of spectrum, shared with primary users such as the MoD and TV Broadcasting, that faces major usage restrictions. A number of organisations raised concerns about the adverse consequences of fragmented SMOs, and the potential for spectrum hoarding by the larger programme-makers. Broadcasters were particularly concerned about

adequate access to spectrum, for programme-making purposes, to allow them to meet their public service obligations. Ofcom will take all these points into account in developing plans for PMSE spectrum.

### **Television Broadcasting**

- 4.51 Some respondents suggested that the timetable for introducing trading in broadcasting spectrum, especially TV broadcasting spectrum, should be linked to the timetable for digital switchover. They also thought that the proposed timeframes were unreasonably optimistic. These respondents proposed that Ofcom's priority should be the Public Sector Broadcasting (PSB) review, the full implementation of digital switchover and then the introduction of spectrum trading in TV broadcasting spectrum. They also suggested that Ofcom should at least commit to reviewing the 2007 proposal in light of its experience of the outcome of trading in other areas of the spectrum.
- 4.52 Ofcom agrees that it is important to have clarity about the wider policy framework in relation to television broadcasting - including digital switchover - before taking any decisions on the introduction of trading. Ofcom will therefore keep the situation under review and will re-assess the proposed date for the introduction of spectrum trading once greater clarity has been achieved.

### **2G and 3G Mobile spectrum**

- 4.53 Some respondents suggested that trading of 2G and 3G mobile spectrum should be introduced earlier, but others thought the proposed timetable outlined by Ofcom in the November consultation was practical and acceptable. There are a number of key issues to be resolved concerning the future of 2G re-farming and the release of the 3G expansion band. Ofcom is currently considering these issues further. Ofcom may bring forward further proposals in the near future on the implementation of spectrum trading in these bands.

### **Aeronautical and Maritime radio**

- 4.54 Ofcom, the Civil Aviation Authority (CAA) and Maritime and Coastguard Agency (MCA) will work together to decide on the feasibility of trading for ground-based aviation and maritime coastal communication rights of use. A decision will be made by 2007.
- 4.55 In the Radio-navigation (radar) licence class, it is expected that tradability of radio navigation rights of use will be introduced between 2007 and 2009. In all cases, tradability will be permitted within the constraints of international harmonisation and agreements, safety of life considerations, and with the agreement of sector regulators, the CAA and MCA.

### **5.8 GHz Band C**

- 4.56 In light of responses received to the consultation and further analysis by Ofcom, we do not now propose to introduce trading in 5.8 GHz band C.
- 4.57 At the current time it is necessary for Ofcom to license activity in this band as there are a number of exclusion zones and the proximity of other users makes it essential for Ofcom to know the location of each terminal. However,

there is no limit on the number of terminals that can be registered and consequently no scarcity – making the benefits of trading minimal. Ofcom also believes the sharing environment may change in coming years and it is planned that current authorisation arrangements will be reviewed in 2007.

### **Satellite services**

- 4.58 Ofcom's plans to introduce trading for satellite services are contingent on the introduction of recognised spectrum access (RSA). As space-to-earth transmissions are unlicensed tradable rights will not exist until RSA is introduced. Ofcom intends to consult on the timetable for introducing RSA for satellite services later this year.

### **Ministry of Defence (MoD) Spectrum**

- 4.59 Some respondents requested that MoD spectrum be included in the timetable for trading. However, this spectrum is not managed by Ofcom although Ofcom works in close liaison with MoD, in particular when spectrum is shared. Ofcom also works with MoD to explore and identify spectrum that can be used for civil use. Some spectrum may from time to time be released to Ofcom by MoD to make primary assignments and these may in turn be traded. But if the spectrum is still used for military purposes, the MoD may impose restrictions or co-ordination requirements which may affect the potential for trading.

### **Non-Operational Development and Temporary Use Licences**

- 4.60 Ofcom is in the process of initiating a review of all Non-Operational Development and Non-Operational Temporary Use Licences (formerly known as Test and Development Licences) including the processes and procedures for their issue. This may not be structured as a formal consultation but the views of stakeholders will nevertheless be welcome. Until the review is completed, Ofcom will continue with current practice. This is that Ofcom makes assignments in these classes on the basis of an assessment of interference risk and issues licences on a non-interference, non-protected basis.



## Section 5

# Liberalisation

## Introduction

- 5.1 As explained in the November consultation document, Ofcom, in parallel with the introduction of trading, will be open to licensees requesting a change in the use of their licence. This is referred to in this document as liberalisation and is being introduced in parallel to the procedures for spectrum trading described in the previous section. It is anticipated that liberalisation will provide an additional impetus for spectrum trading and generate additional benefits.
- 5.2 The introduction of liberalisation poses complex issues for Ofcom, particularly in relation to interference management. Ofcom will shortly issue a consultation document which will set out detailed proposals as to the processes that Ofcom will follow to permit changes to the terms of licences. Consequently this statement simply sets out the main principles of Ofcom's approach to liberalisation.

## Overview of Ofcom's approach to liberalisation

- 5.3 Ofcom generally believes that it is desirable to give spectrum users as much freedom as possible to adopt new technologies and offer new services. Spectrum trading combined with liberalisation will, over time, enable the market to decide how much spectrum should be allocated to different uses and maximise the economic value of the spectrum. It will also provide an environment of faster access to spectrum and foster a more entrepreneurial approach to developing spectrum-based products and services.
- 5.4 Responses to the November consultation indicate that spectrum users generally favour liberalisation and believe Ofcom should move in this direction, although there were differing views on the speed of transition. There was also support for Ofcom's proposal that changes in spectrum usage should be subject to prior checking and clearance through the licence variation procedure.
- 5.5 Ofcom acknowledges concerns expressed by some respondents about the risk of increased interference and is committed to ensuring that the introduction of spectrum trading and liberalisation does not result in an interference free-for-all. In the fixed wireless access sector, spectrum use has already been liberalised with relatively few restrictions on type of service. However, responses to the consultation confirm that, in general, the complexity of defining emission rights and spectrum quality in a technology-neutral manner while avoiding increases in interference makes it prudent to adopt a phased approach. This will enable restrictions to be removed in a controlled manner and for experience to be gained before proceeding further.
- 5.6 Initially, licences will not be fundamentally altered to allow more flexibility of use but it will be open to individual users to apply to Ofcom for licence characteristics to be varied on a case-by-case basis. As proposed in the November consultation, this will involve clearance by Ofcom before the

change is permitted in order to guard against excessive increases in interference.

- 5.7 As explained previously, where rights of use can be divided on the basis of frequency or geography without significant risk of harmful interference, this will be allowed by means of a partial transfer in accordance with the Trading Regulations.

### **Interference investigation and enforcement**

- 5.8 If interference arises as a consequence of a licence variation, Ofcom's usual interference investigation and enforcement procedures will apply. Ofcom will investigate to establish whether the source is operating within the limits of the relevant licence terms and conditions.
- 5.9 Further details on Ofcom's continuing role in interference investigations and enforcement following the introduction of spectrum trading and liberalisation will be set out in the forthcoming consultation to be published later this summer.

## Section 6

# Licence term and period of notice

## Introduction

- 6.1 The November consultation document proposed that, in general, tradable licences that had not been auctioned be amended to have a rolling term, that is to continue in force subject to certain rights which Ofcom would have to terminate them. Ofcom proposed that the standard minimum notice period for revocation of such licences for spectrum management reasons should be five years. It was noted that this approach was designed to respect the current rights of licensees, and to articulate these in a clear fashion, not to be a grant of a substantial new right or value. The terms of auctioned licences would remain unchanged.
- 6.2 Most respondents welcomed the concept that there should be a defined minimum notice period for revocation of tradable licences. In general, they considered it better than the current position whereby notice periods can be based on an estimate of the reasonable expectations of the licensee. This can create uncertainty and a number of respondents considered that a defined minimum notice period would be preferable as it would articulate rights more explicitly. This increased certainty would, it was argued, encourage investment.
- 6.3 However, opinions of respondents were split on the appropriate length of minimum notice period for revocation of a licence for spectrum management reasons. Some agreed with Ofcom's proposal that a notice period of at least five years would be adequate, but others considered that longer periods were necessary, particularly where substantial infrastructure investment had been made or where investment in new technology needs to be encouraged.
- 6.4 Several respondents suggested that Ofcom should agree different notice periods for each licence class, in order to reflect different types of use and investment. Some respondents argued that notice periods should be up to 20 years in certain licence classes. However, others considered that lengthy notice periods would raise concerns about the potential for spectrum hoarding and would leave Ofcom with insufficient flexibility for spectrum management purposes.
- 6.5 Ofcom has considered the comments made by respondents and remains of the view that 5 years is an appropriate minimum notice period for revocation of existing non-auctioned licences for spectrum management reasons. This, together with the need for any such revocation decision to be objectively justified, should, we believe, give adequate security to licensees to encourage efficient use of spectrum and promote investment and innovation, while at the same time giving Ofcom the ability to recover spectrum if necessary for spectrum management reasons. Ofcom continues to retain the option of issuing new licences for, inter alia, a fixed term, or for a rolling term but with a longer period of notice during the initial period of the licence, both of which would allow Ofcom to offer new licensees greater certainty and hence support investment.

- 6.6 Ofcom considered carefully the suggestion made by some respondents that notice periods should be defined on a licence class by licence class basis. However, Ofcom believes that such an approach would restrict flexibility for future re-arrangements of licence classes as technology develops and applications change. Further, we also believe that a 5 year minimum notice period reflects the reasonable expectations of existing licensees prior to the introduction of trading. This means that their security of tenure remains approximately the same as now.
- 6.7 Ofcom therefore intends to vary certain licences, starting with those that will be authorised to be tradable in 2004 and that were not originally auctioned, to give them a rolling term, with a 5 year minimum notice period for revocation for spectrum management reasons. Ofcom intends to vary such licences in the autumn, before the commencement of trading. The terms of auctioned licences will not be changed.

### **Circumstances for revocation**

#### Immediate revocation

- 6.8 The November consultation document explained that, under the WT Acts, Ofcom has the power to revoke a WT Act licence with immediate effect or on short notice for specific reasons. Ofcom considered in the consultation document whether breach of the Trading Regulations should be added to this list of reasons as further grounds for revocation. Having taken account of the responses, Ofcom has decided that, in general, licences will be varied at an appropriate time, before or when they become tradable, to incorporate breach of the Trading Regulations as a ground for revocation.

#### Revocation following notice period

- 6.9 Ofcom set out in the November consultation document four circumstances in which it considered it may be necessary to revoke a licence after a defined notice period for spectrum management reasons. These were:
- a) Community measure or international requirement;
  - b) to follow a direction from the Secretary of State;
  - c) to remedy fragmentation; and
  - d) to secure statutory duties including furthering the interests of consumers.
- 6.10 There was relatively little comment from respondents in relation to revocation for a Community measure, international requirement or to follow a direction from the Secretary of State, although a few respondents felt there should be long lead times leading up to such changes and suggested consultation prior to the UK signing up to such agreements.
- 6.11 In relation to the last two reasons, some respondents questioned the circumstances under which Ofcom would intervene in cases of spectrum fragmentation and others considered that allowing Ofcom to revoke in order to “further the interests of consumers” was too vague and needed to be more explicitly defined. One or two respondents suggested additional reasons for revocation, such as misuse of shared bands.

- 6.12 A key point raised by many respondents was the need for Ofcom to have transparent revocation processes, accompanied by clear guidelines and backed by enforcement powers.
- 6.13 In the light of these comments Ofcom has reconsidered the circumstances under which it might need to act to revoke licences. Ofcom can foresee a number of circumstances under which it might be necessary for it to revoke licences in order to fulfil its statutory spectrum management duties. Examples include:
- Failure of the market to allow the establishment of new technologies and services;
  - ‘Hold out’ by certain players in the market delaying beneficial developments;
  - Fragmentation of spectrum holdings inhibiting the introduction of new technologies and services; and
  - Behaviour by market players that is having an adverse impact on consumers (for example as discussed in Ofcom’s recent consultation paper on ensuring effective competition following the introduction of spectrum trading).
- 6.14 Consequently Ofcom has decided to remove explicit references to “fragmentation” and “furthering the interests of consumers” from the description of circumstances under which it might revoke licences, and to use instead a wider expression to extend the circumstances for revocation to cover all aspects of spectrum management. Ofcom considers that a minimum five year notice period for revocation under such circumstances, together with the need for any such revocation decision to be objectively justified, should provide spectrum users with sufficient certainty on which to base investment decisions.
- 6.15 Ofcom has further decided that, in order to provide the clarity and certainty that the market seeks, it will implement this policy through amendment of WT licences to restrict the circumstances under which they may be terminated. Ofcom will include these restrictions in licences through the normal licence variation process. To the extent that other more restrictive conditions already exist in WT licences that will be authorised to trade, Ofcom will not remove such more restrictive conditions.
- 6.16 Decisions on revocation will be taken by Ofcom on a case by case basis in the light of all circumstances that prevail at the time.

#### Summary of reasons for revocation

- 6.17 Following the introduction of trading and liberalisation, it is proposed that the circumstances under which Ofcom may revoke tradable WT Act licences will be as follows:
- i) With the consent of the licensee.
  - ii) For non payment or late payment of the relevant licence fee.

- iii) If there has been a breach of any of the terms of the licence.
- iv) If the licensee has not complied with any requirement of the Trading Regulations.
- v) In accordance with section 4(5) of the Wireless Telegraphy Act 1998. That section provides that notwithstanding any terms or provisions in a WT Act licence which restrict the exercise by Ofcom of its power to revoke licences, Ofcom may at any time, by notice in writing, revoke or vary licence terms if it appears to be requisite or necessary or expedient to do so in the interests of national security, or for the purposes of complying with a Community obligation of the UK or with any international agreement or arrangements to which the UK is party.
- vi) If it appears requisite or necessary or expedient to do so for the purpose of complying with a direction by the Secretary of State to Ofcom under section 5 or section 156 of the Communications Act 2003.
- vii) For reasons related to the management of radio spectrum, provided that in such case the power to revoke may only be exercised after five years notice is given in writing.

6.18 In addition existing licence terms which permit Ofcom to close down all or part of a network for harmful interference or emergency reasons will remain unchanged.

### **Non-spectrum licence conditions**

6.19 The November consultation document proposed that Ofcom should retain the power to prevent a trade where it believed that the trade would compromise the fulfilment of a non-spectrum licence condition (such as a roll out obligation). However, it also said that, as far as possible, Ofcom would aim to remove non-spectrum conditions in advance of the start of trading, in order to facilitate the trading process. It was proposed that licensees should be able to trade those parts of their licences they do not require to meet their licence obligations.

6.20 Certain respondents, including some radio broadcasters and mobile phone operators, considered that non-spectrum licence conditions should be removed from licences prior to the introduction of trading. Others, including other public network operators, argued for their retention because of a perception that important public service requirements were embedded in such conditions.

6.21 Concerns were also raised about spectrum-based asset stripping as a result of leaving non spectrum licence conditions in place after the introduction of trading. It was felt that it may be possible for a licensee to buy licences with non-spectrum licence conditions and sell parts of them at a profit, effectively selling on obligations that they knew would not be fulfilled.

6.22 In fact, there are only a few licence classes that contain any form of non-spectrum licence conditions. Ofcom believes that, in some cases, an evaluation of the conditions now may reveal that there could be more appropriate ways of achieving the underlying objectives of non-spectrum licence conditions. Indeed, in relation to certain conditions, the development

of trading may provide a new incentive which means that certain obligations could be removed from licences. Having considered the responses to the November consultation, Ofcom expects to review any remaining conditions over the next few years to consider whether these conditions remain objectively justifiable and proportionate. This review should facilitate the trading process and may help to reduce market distortions that could arise if licences with non-spectrum licence conditions are thereby made less valuable and more difficult to trade.

- 6.23 In the November consultation document, Ofcom proposed that non-spectrum licence conditions would not necessarily be transferred with any spectrum trade. This means that, if a network provider can fulfil its licence obligations with a smaller amount of spectrum than was originally assigned to them, then it may be permitted to transfer any excess part of the spectrum that it does not require through a partial transfer.
- 6.24 Ofcom continues to support this approach. Where a licence to be traded includes a non-spectrum licence condition Ofcom will assess the impact of the trade on the fulfilment of the conditions. If Ofcom is of the opinion that the transferor or transferee is unlikely to be able to meet the terms, provisions or limitations in the licence under which rights and obligations are to be transferred, Ofcom will not consent to the trade. This is in line with the approach suggested by a number of respondents to the consultation.

#### Licences that will become tradable in 2004

- 6.25 The only non-spectrum licence condition in relation to those licences scheduled to become tradable in 2004 concerns the Common Base Station (CBS) class. All licences in this class contain an obligation to reach a minimum loading level within the first two years of holding the licence. Subsequently there is a requirement to maintain a channel loading of at least 3 subscribers and a requirement to provide Ofcom with an annual statement of the number of CBS customers no later than six months before the renewal date. Although these requirements do not appear in the CBS licences they are published in the accompanying information sheets that are issued for prospective licensees. With the introduction of trading, Ofcom will abolish these requirements.

#### Licence classes to become tradable from 2005 onwards

- 6.26 As explained above, non-spectrum licence conditions will be reviewed before the introduction of trading in each licence class. If Ofcom concludes that any licence conditions are no longer objectively justifiable or proportionate then Ofcom will propose changes accordingly. In undertaking this review, Ofcom will consider whether individual non-spectrum licence conditions may act as a barrier to trading.

## Section 7

# Related Issues

### Licence fees payable for tradable licences

- 7.1 In the November consultation, Ofcom proposed that Administrative Incentive Pricing (AIP) and spectrum trading should continue in parallel. It also proposed a five year review period and that the AIP should be fixed for each block of spectrum during this period, even if the use of a licence within a frequency block changed - lest the uncertainty caused by fluid prices created disincentives to trade and for reasons of practicality.
- 7.2 The key arguments that the consultation document proposed for running AIP and spectrum trading in parallel can be summarised as follows:
- the volume of trading may initially be low in some markets - judging by experience in Australia and New Zealand - and therefore will not fully promote efficiency;
  - the ability to trade may not be sufficient to promote efficiency because it does not impose an economic cost, whereas AIP does;
  - if the value of spectrum is appreciating, licensees may hold unused spectrum, in the expectation of future gains;
  - some spectrum users are not driven by profits, therefore an opportunity to make a financial gain will not provide a strong incentive to their efficient use of the spectrum;
  - AIP is complementary to trading if it is set conservatively, in that it will not harm trading if it is set somewhat below the market clearing level.
- 7.3 Response to the November consultation document was divided on whether AIP should continue to be levied. Some of those who were in favour of AIP, including some equipment manufacturers and smaller users such as PMR licensees, argued that AIP should be retained in order to discourage hoarding. A few respondents argued that AIP should be used to take into account social benefits (such as those generated by public safety services) which would not be included within private market valuations of spectrum.
- 7.4 Those who were against continuing AIP, largely the mobile network operators, argued that the case put forward in the consultation document did not justify AIP in the presence of a fully functioning spectrum trading market, because:
- in the case of thin markets, incomplete information and hoarding relied on trading being less efficient than AIP which they believed was unlikely to be the case;
  - as for trading providing weak incentives for non-commercial users, this only implied that AIP should be applied to non-commercial sectors not to commercial users;
  - showing that AIP can exist alongside trading does not prove that it can bring additional benefits to trading.
- 7.5 As a result, these respondents concluded that AIP should not be continued once trading was introduced. This was because they believed that a market



solution should be better at promoting efficiency than a regulatory mechanism. In addition they considered that it had not been proved that AIP would bring increases in efficiency over and above those that spectrum trading would bring.

7.6 In the event that AIP were continued, those respondents who were against its continuation proposed that there should be a sunset clause for phasing out AIP once trading had begun to be successful.

7.7 Having considered the responses, Ofcom is of the opinion that AIP should continue to apply after spectrum trading and liberalisation are introduced later this year. Ofcom is concerned that spectrum trading alone, while an important aid to more optimal use of the spectrum, may not be fully effective at promoting efficiency. Ofcom considers that for the foreseeable future the benefits of maintaining AIP should exceed the costs. Ofcom therefore considers that AIP should be maintained for the foreseeable future.

7.8 In its early stages of development the spectrum market may be less than fully effective at promoting efficiency because:

- if transaction costs are higher than the difference between the buyer's and the seller's valuation of the spectrum, trades will not take place;
- equally, trades may not happen if there is asymmetric information between buyers and sellers, i.e. they have differing views of what the spectrum is worth. This means that in some circumstances they will not be able to negotiate a trade, as it may not be apparent to both parties that each would benefit;
- if the value of spectrum is appreciating, licensees may hold unused spectrum in the expectation of future gains. Under such circumstances it may not be attractive to sell spectrum if the expected future price is significantly greater than the current market price;
- good information about the possible valuations of spectrum by potential buyers and sellers is necessary for the efficient functioning of a spectrum trading market. If this information is limited or incomplete, trades may be deterred.

7.9 It was acknowledged by some respondents to the consultation that in a less than fully effective market, AIP may promote economic efficiency over and above spectrum trading. Ofcom also considers that, if set conservatively, AIP cannot have any harmful effects on the efficient use of spectrum. Ofcom believes therefore that it is reasonable to continue to impose AIP after the introduction of trading. In particular, Ofcom considers it likely that AIP on public sector spectrum holdings will need to be retained indefinitely to maintain the incentive for the public sector to maximise spectrum efficiency.

7.10 Ofcom received some detailed arguments on the relative effectiveness of AIP compared to trading, when trading is not fully effective. These focused on:

- concerns over the administrative costs of maintaining AIP and whether trading would be more efficient; and
- concerns about whether Ofcom had enough information on values of spectrum to accurately set the AIP.

- 7.11 Ofcom has considered these points in depth and does not believe that they change the above conclusion that AIP should continue for the foreseeable future. Ofcom will continue to seek to keep the administrative costs associated with AIP to a minimum and notes that these costs are spread over a number of spectrum bands as well as over the AIP review period. Transaction costs in relation to trades, on the other hand, could be quite high if the seller is negotiating with several parties. Moreover, if the transaction costs of a putative trade are too high then the trade will not happen and the potential economic benefit will be lost. Whereas, if AIP is set near the right level, the economic benefit of re-assigning the spectrum could be realised, even if the total cost of administering AIP is greater than the actual transaction costs of spectrum trading.
- 7.12 Further, if the parties to a trade are in different markets, they may know little of the supply and demand conditions in the other's market and the cost of gathering this information may be a disincentive to trade. In such situations Ofcom may not be at an informational disadvantage to the participants to a trade.
- 7.13 Ofcom intends to publish a consultation on AIP later in the year. This will outline the economic fundamentals of the approach, the policy issues involved in setting AIP and initial estimates of the marginal valuation of spectrum by band.

### **The role and regulation of intermediaries in the market**

- 7.14 The November consultation document explained that Ofcom envisaged that a broad range of market institutions could potentially emerge following the introduction of spectrum trading. These might include:
- Brokers who link buyers and sellers wishing to trade spectrum but do not actually own spectrum themselves during the trade;
  - Market-makers who hold inventories of licences, taking positions with a view to trading out to a long-term buyer, or another trader;
  - Spectrum Management Organisations (SMOs) who undertake the management of certain blocks of spectrum. These are discussed in more detail below.
- 7.15 Most respondents to the consultation agreed with Ofcom that intermediaries were likely to emerge, although some suggested that their emergence would be slow and limited, at least in the initial stages of trading. A number of respondents felt that the emergence of intermediaries would be a positive development which would bring benefits to the market, for example, in facilitating hiring arrangements for spectrum. This view was not shared by all however, with a few respondents concerned that any benefits intermediaries might bring would be outweighed by an additional cost burden. Users of PMSE spectrum had significant misgivings about the emergence of Spectrum Management Organisations in the PMSE sector in particular. This point is discussed in more detail below.
- 7.16 Ofcom believes that intermediaries could bring benefits to the trading market by overcoming the asymmetries of information that exist in bilateral trades and facilitating trading between disparate and otherwise unconnected parties. Although we will not pro-actively encourage the establishment of any

intermediaries, we will aim to facilitate their emergence by creating an open trading regime.

- 7.17 Most respondents were of the view that intermediaries should not warrant any specific regulation by Ofcom. One key point, however, was that respondents wanted to ensure that appropriate competition rules would be applicable to intermediaries to prevent them from distorting competition. There was a concern, in particular, that SMOs may be well placed to assume dominant positions in certain spectrum markets.
- 7.18 Ofcom is committed to ensuring that competition is not distorted as a result of any spectrum trade and has issued a consultation document explaining how we propose to prevent distortion of competition<sup>18</sup>. The proposals set out in this document will apply to all spectrum licensees, including intermediaries, such as SMOs.
- 7.19 Another concern raised by respondents was that the emergence of intermediaries may result in a lack of clarity over who has responsibility and liability for particular spectrum. This could, for example, make resolution of disputes more difficult if it becomes less clear who is responsible for meeting given obligations or, alternatively, who should be responsible for carrying out any remedial measures. Ofcom believes that since Ofcom will grant a new licence to reflect the position after each transfer, companies should be clear as to which licence obligations apply to them.
- 7.20 A question was raised by some respondents as to whether intermediaries should be licensed or alternatively whether they would need to be registered with Ofcom. Some raised questions about how Ofcom would ensure compliance with regulatory obligations. In addition, a couple of respondents expressed concern over the technical capabilities of SMOs entering the market and indicated that Ofcom should have some sort of role in ensuring that they meet certain standards.
- 7.21 Ofcom believes that it is unnecessary to introduce any special approval, registration or licensing regime for intermediaries. This will give intermediaries maximum flexibility to emerge under whatever model is most appropriate for the market, which should help to maximise the benefits of trading. However, all spectrum users, whether or not they operate through an SMO, will still be subject to normal licensing procedures. This means it will continue to be a criminal offence to transmit illegally, either without any licence or outside the bounds of an existing licence. Further, as explained above, Ofcom will not allow the emergence of trading to cloud the issue of who has responsibility for complying with licence conditions.

### **Role of Spectrum Management Organisations**

- 7.22 Spectrum Management Organisation (SMO) is a generic term for an operator who undertakes the management of certain blocks of spectrum. This spectrum may be particularly dynamic or complex in its management requirements – for example, spectrum commonly used for programme-making and special events (PMSE) or private business radio (PBR). SMOs may acquire rights to use blocks of spectrum, which they would then through

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<sup>18</sup> [http://www.ofcom.org.uk/consultations/current/effective\\_competition/](http://www.ofcom.org.uk/consultations/current/effective_competition/)

trading allow others to use as required. Ofcom considers that SMOs could evolve to offer an important and complementary role in relation to Ofcom's spectrum management functions.

- 7.23 Ofcom does not intend to introduce any specific regulation in relation to SMOs. Such an approach appears to have the support of most respondents to the consultation, many of whom indicated that the market will develop most effectively if SMOs are given freedom to emerge. Nonetheless, Ofcom accepts that the emergence of SMOs may be limited at first and that we will need to be vigilant in monitoring the development of the market. In particular, and as explained in the separate consultation document, Ofcom is ready to apply competition law to any SMO that we believe is behaving anti-competitively.

### **Existing organisations**

- 7.24 Ofcom explained in the November consultation that third party organisations already exist, managing spectrum on behalf either of Ofcom or the licensee in three licence categories – programme making and special events; scanning telemetry; and aviation. We also explained that we envisaged that Ofcom's relationship with these organisations may need to change so that they can adapt to a trading environment.
- 7.25 Some of the responses to the November consultation considered the issue of how spectrum trading should be introduced in these three licence classes. These responses tended to confirm Ofcom's view that it is necessary to treat the three cases separately with regard to the introduction of trading. The approach we will follow in each case and a summary of the key arguments put forward by respondents is set out below.

#### **Programme-making and special events**

- 7.26 Considerable concern was expressed by a number of respondents about the potential for the emergence of multiple SMOs operating in the PMSE sector. Their main concern, which was partially based on previous experience when two PMSE SMOs existed prior to their replacement by a single organisation, was that fragmentation would lead to spectrum inefficiency. Concern was also raised that spectrum trading would lead to increased interference and higher costs in the PMSE sector, that small freelance organisations would find it more difficult to operate, and that trading would be detrimental to news-gathering and special events coverage.
- 7.27 Given the strong depth of feeling on this issue, Ofcom has agreed that we should postpone the introduction of spectrum trading to the PMSE sector until 2007 by which time future planning of the interleaved TV spectrum should be clearer.

#### **Scanning telemetry**

- 7.28 Frequencies for scanning telemetry are currently licensed to the water, electricity and gas companies. Ofcom's assignment arrangements for these frequencies are performed jointly with two intermediary companies: JRC (the Joint Radio Company, a joint venture between National Grid Transco and the Electricity Association) in the case of gas and electricity; and CSS (a private company) in the case of the water companies.

- 7.29 Ofcom proposed in the November consultation document that it should confer tradability to the current licensees, namely the utility companies. Both the JRC and CSS support this proposal and Ofcom will therefore introduce tradability. Currently, CSS and JRC process assignments and schedule documentation required by Ofcom. Responsibility for these administrative processes will remain with the licensees and their spectrum managers when trading commences.

#### Aeronautical spectrum

- 7.30 Aeronautical spectrum is currently administered by the CAA on behalf of Ofcom, which remains the licensing authority. The CAA and Ofcom are currently working together to consider options for the licensing of aircraft radio stations. The CAA will continue to administer aeronautical licences under contract for Ofcom and will, as currently, be responsible for the spectrum and frequency management for aeronautical bands. The CAA and Ofcom have agreed to work together to consider the implementation of trading for ground based frequency usage, where feasible within the constraints of international harmonisation decisions and safety of life issues.

#### **Spectrum 'hires'**

- 7.31 This statement has already explained how it will be possible to use spectrum for time limited periods under a variety of different arrangements through the trading process. Such arrangements (akin to leasing) could involve either a complete transfer of rights and associated obligations, or see them held concurrently by the trading parties.
- 7.32 In addition, Ofcom intends that it should be possible to 'hire' spectrum for short periods in a number of licence classes, distinct from the formal trading process. This will in effect be an extension of arrangements that already exist in the Private Business Radio Suppliers (PBRs) licence class where hiring of spectrum is currently permitted for up to one year. Under such arrangements the licensee maintains responsibility for ensuring compliance with the licence, although the user (i.e. the 'hirer') also has a legal responsibility to ensure they do not transmit illegally.
- 7.33 Ofcom considers that hiring arrangements on these lines could be a valuable means of offering spectrum access to users who may not wish to take on directly the rights and obligations of a spectrum licence. We also consider that intermediaries may have an interest in co-ordinating the hiring out of certain spectrum bands which will allow more flexible approaches to spectrum management to evolve to suit market requirements. Consequently Ofcom considers that it would be beneficial to extend short term hiring arrangements to a wider range of licence classes.
- 7.34 Hires must be for short periods and Ofcom will require that a finite hire period be specified in the contract between the parties. In addition, Ofcom will impose obligations on licensees engaged in hiring activities to:
- keep details of who they hire to and provide these details to Ofcom on request;
  - inform hiring parties of their obligations under the licence and that these must be complied with; and

- inform hiring parties of any changes to the licence, or notices to vary the licence.

7.35 Licensees will need to have their licences varied in order to permit them to hire spectrum to third parties as described above. It is Ofcom's intention to make these amendments as a generic change to relevant licence classes rather than require licensees to apply to Ofcom on an individual basis.

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

7.36 The November consultation document outlined plans for the publication of information and sought respondents' views on the level of information that Ofcom was proposing to publish.

7.37 Under the Communications Act, Ofcom has powers to require that specific information be published in connection with spectrum trades. We also have the ability under the Act to make regulations concerning the provision and publication of information about licences and trades. In order to facilitate trading, Ofcom will publish as much relevant information as it can, but in so doing we will address concerns raised by respondents on issues of security and commercial sensitivity.

7.38 In general, markets function most efficiently when the maximum amount of information is available, because they benefit from the transparency and certainty this brings. In the case of spectrum markets, this includes information about individual spectrum assignments, notifications of trades and completed trades.

7.39 Ofcom anticipates that making such information available will greatly facilitate trading, not least by enabling the parties to a trade to conduct the appropriate due diligence prior to drawing up a contract.

7.40 Most respondents were in favour of the proposals to publish information, including licence information. However, a number of respondents raised specific concerns about certain aspects of the proposals. Some requested more information, including contextual information about the use of specific bands to allow a full assessment of the interference environment, and a few wanted specific information about trading deals, including price. Other respondents wanted less specific information to be published particularly concerning information held in licences that could be security or commercially sensitive. These respondents include emergency services, some national networks, utilities, transport operators and broadcasters, who raised fears that publishing too much specific information about individual transmitters could make their infrastructure more vulnerable to attack by terrorists, protesters or vandals. Some private users, who mainly expressed their views through trade bodies, requested the names of licensees not to be made public, partly for privacy reasons and partly because of commercial sensitivity concerns. Some respondents also specifically requested trade-price information not to be disclosed for commercial reasons.

7.41 Clearly, Ofcom needs to strike a balance between safeguarding the security of existing licence holders and providing information to potential new licence holders and those who want to trade. Consequently, Ofcom will aim to provide as much information as possible, taking account of these

considerations, and will adapt its approach as experience is gained. Thus future regulations may lead to fuller disclosure than in the first year.

7.42 Ofcom intends to structure the provision of the new information in four ways:

- a new Register of Licences;
- publishing basic information about proposed transfers;
- developing a system to assist due diligence by a purchaser; and
- developing and widening the scope of the UK Plan for Frequency Authorisation.

7.43 All these facilities will be closely linked together to avoid overlap. They will be rolled out progressively, initially in parallel with trading, though it is proposed that they should cover all licence classes by 2007.

7.44 All information will be made available free of charge through the Ofcom website.

### **Register of Licences**

7.45 The Communications Act<sup>19</sup> enables Ofcom to make regulations in order to establish and maintain a register of relevant information. A preliminary draft of these Wireless Telegraphy (Register) Regulations is included at Annex B (the "Register Regulations"). As with the Trading Regulations, this draft reflects the policy outlined in this statement and is included in order for readers to understand more clearly how the policy may be implemented by legislation. The draft may change after the publication of this statement as the detailed elements of Ofcom's plans for trading are further developed. Stakeholders will be able to comment on a further draft under the formal statutory consultation, scheduled for early autumn, which must take place before the regulations are made. In the meantime, comments are invited on this preliminary draft by Tuesday 31 August 2004.

7.46 This new power in the Act enables information that was previously regarded as confidential to be published. Nonetheless, Ofcom intends to introduce this register with appropriate safeguards to reflect the concerns of respondents.

7.47 The Register of Licences will provide basic information about licensees such as names, contact details, class of licence, the band(s) of frequencies and where relevant the geographical area of operation. It will not provide precise details about individual transmitters. This limitation reflects some of the concerns raised by respondents with providing more detailed information. Initially information will be limited only to the classes that will become tradable in 2004.

7.48 Ofcom would like to move towards providing more information over the next two years, by widening the information to all classes and by adding greater detail to specific licence classes. However, in doing so, further consultation is likely to be appropriate. Any changes would need to be reflected in the

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<sup>19</sup> See Section 170

Register Regulations which will need updating from time to time as roll out progresses.

- 7.49 Table 2 provides an indication of the data fields and specific information that Ofcom intends to publish in the Register of Licences.

**Table 2: Register of Licences**

<b>Data field</b>	<b>Description</b>
Name of licensee	Name of the individual or enterprise holding the licence (as notified to Ofcom)
Contact details	Contact postal address, Email addresses, or Telephone numbers or Agent's contact details
Licence Class	Description of the licence class in use by the licensee
Frequency boundaries of right	The radiofrequency range of the assignment specified either in terms of a central frequency with channel width, e.g. 415.25MHz, 100kHz, or a frequency range, e.g. 415.15 to 415.35MHz
Geographical Information	Specification of the geographical characteristics of the right, for example the authorised operational area (e.g. UK national)

- 7.50 For the point to point fixed links class, a number of security concerns have been raised. In order to deal with these concerns the information on geographic locations which will be published on the register will be at a high level and will not detail precise geographical links. Ofcom expects that potential traders will contact the licence holder for additional information in relation to specific links.

- 7.51 The Register will not change the current position with regard to who holds a licence. Ofcom have and will take reasonable steps to ensure that the Register is accurate and is kept up-to-date. However, there is a balance to be struck between creating a register quickly to facilitate trading and undertaking extensive checks on the accuracy of the information currently held by Ofcom. This is particularly the case in relation to those classes of licences where there are numerous licensees and Ofcom exercise a light regulatory touch. Those considering trades should use the Register as a guide to basic information but should not rely on the Register without undertaking further checks. Ofcom will work with licensees and, with the consent of relevant licensees, will aim to provide confirmations in response to standard due diligence questions about particular licences to those contemplating a specific trade. Ofcom recognises the importance of being able to ask and receive responses to these due diligence questions at an early stage.



## **Publication of trading information**

- 7.52 Ofcom will publish (on its web site) information about proposed transfers that have been notified to Ofcom for approval. 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 on the web page. If however, the transfer is not completed the entry will be amended to reflect the fact that the trade did not complete. In such circumstances, Ofcom will not publish any information as to why the trade did not proceed, which could be the result of refusal by Ofcom or the parties deciding between themselves not to go ahead.
- 7.53 It is hoped that the 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 trading web site will include:
- details of the licence being traded (licence class, licence number (or link to register), possible description of the licence area);
  - 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.
- 7.54 Once a transfer has been completed the information will remain on the web site for one year. After this time the information will be archived and available upon request. Ofcom may from time to time publish reports concerning trading trends.

## **Assisting with due diligence**

- 7.55 When revoking licences Ofcom does not ordinarily consult (and is not legally obliged to consult) anyone other than the licensee. For example, where Ofcom has issued a statutory notice proposing revocation for non payment of licence fees or for breach of a licence condition, this will not be a matter of public record<sup>20</sup>. Ofcom has decided not to change this position and revocation notices will therefore not be included on the Register of Licences.
- 7.56 Similarly, Ofcom will not include on public registers any information about whether licensees are acting in breach of licence terms or have paid all licence fees at the time when they were due.
- 7.57 Purchasers must therefore undertake a due diligence exercise and obtain the necessary assurances or contractual warranties from the seller in relation these matters. In particular firms purchasing spectrum may wish to seek comfort that Ofcom has not served notice on the seller of its intention to revoke or vary the licence in question. Under the draft Trading Regulations,

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<sup>20</sup> Such notices permit the licensee to remedy the non payment or licence breach within a certain time period.

where Ofcom has served a statutory notice to vary or revoke a licence (under section 1E of the Wireless Telegraphy Act 1949), licences may not be transferred. Such a notice is usually served around a month and a half before actual revocation. In the case of a licence variation, the notice under section 1E need not be an obstacle to transfer. This is because it is open to the holder of the licence to consent to the variation being made, and if that happened, the licence amendment would be implemented quickly.

- 7.58 Where notice of Ofcom’s intention to revoke a licence for spectrum management reasons has been served under the licence (this is different from the statutory notice), then licences may be transferred but the transfer will be subject to the existing notice (since the transferor cannot transfer greater rights under the licence than he himself holds).
- 7.59 Ofcom intends to develop a checklist of matters which it can advise licensees on. This might include matters such as revocation notices and licence fee payments. Where a licensee requests Ofcom to disclose the matters on the list to a potential purchaser Ofcom will do so, after first obtaining the agreement of the licensee as to the veracity of matters which are about to be disclosed.

### UK Plan for Frequency Authorisation (PFA)

- 7.60 Ofcom will provide additional contextual information by further developing the UK Plan for Frequency Authorisation (PFA). Section 153 of the Communications Act requires the production of a Plan to make it clear which frequencies and licence classes are available for assignment and for what purposes different frequencies have been allocated. Ofcom proposes to widen and enhance this facility by the provision of links for each class to provide more information to aid trading.
- 7.61 The UK PFA will include general information about licence classes, their terms and conditions and application procedures. It will also provide an additional source of information for parties carrying out due diligence on particular licences.
- 7.62 Table 3 provides an indication of the type of information that will be included in the UK Plan for Frequency Authorisation.

**Table 3: UK Plan for Frequency Authorisation**

Licence Class	Licence Product	Availability	Frequency Range	Fees information	Licence terms and conditions	Additional information
Name of licence class	Name of product	Details of availability	Description of frequency ranges	Information on fees	Details on licence conditions	Contextual information

- 7.63 The UK PFA will be searchable by frequency range or licence product. Additional information will include contextual information, typically including the following data:

1. The Radio Interface requirement relevant to that particular licence class.
2. Details of the Technical Frequency Assignment Criteria used to assign frequencies, and consider licence variation, used within that class.
3. Details of other licence products which use the same frequencies
4. Licence application guidance notes issued for each licence product
5. International co-ordination arrangements (where appropriate) and agenda (e.g. EU harmonisation measures)
6. Access to published spectrum strategy statements and Ofcom future plans for spectrum management

### **Monitoring of the market**

- 7.64 Ofcom intends that information published on the trading and licensing registers, as described above, will form the main sources for public monitoring of the market. They will also form the core sources for Ofcom's own monitoring of the market.
- 7.65 Additionally, at the time of notification of proposed transfers Ofcom will ask for voluntary disclosure of certain further information. This may include a brief description of the nature of the contractual arrangements between the trading parties, including information on the price attributable to the rights and obligations under the licence which are being transferred. Ofcom will retain all such information which is disclosed voluntarily on a confidential basis. Ofcom considers that such information will be valuable in order to monitor the development of the trading market and consider whether any improvements can be made.
- 7.66 Ofcom may from time to time publish trend data on the trading market, based on this voluntary data, provided that individual anonymity and confidentiality can be preserved. This might, for example, involve publication of aggregated figures which hide individual transaction values and details.
- 7.67 Ofcom considers that this approach will provide a basic set of information to facilitate the development of spectrum trading markets. Ofcom also considers that it will leave scope for the private sector to potentially develop value added spectrum trading information services, including market monitoring services.
- 7.68 In addition to information about trading, Ofcom is considering whether to collect information on spectrum hires in order to monitor the impact of the spectrum hiring arrangements described earlier in this section.

### **Regulatory Impact Assessment (RIA)**

- 7.69 Annex B of the November consultation document presented a regulatory impact assessment (RIA) for the introduction of spectrum trading and liberalisation, comprising a risk assessment and an evaluation of the net benefits.
- 7.70 After reviewing the option of not introducing trading and liberalisation, the document concluded that there was a significant risk that potential gains in economic efficiency could be lost if they were not introduced, on the basis

that an effective spectrum market would be better at promoting economic efficiency than other regulatory mechanisms.

- 7.71 The risks from introducing trading and liberalisation were also reviewed and though some of these risks could potentially be significant, it was concluded that Ofcom could take specific actions to minimise or mitigate these risks. Chief amongst these potential risks were:
- potentially inefficient use of spectrum - notwithstanding the fact that effective markets should deliver more efficient outcomes than regulation, this risk could be mitigated by Ofcom negotiating with licensees and, ultimately, by giving notice of revocation to facilitate re-planning of a band;
  - increased interference - robust procedures for resolving interference problems are in place; in addition requests for licence variation would continue to be subject to rigorous checks as they are now;
  - risks to safety of life services - protection of safety of life services would be paramount in Ofcom granting approval to trading in these sectors and in any interference investigations.
- 7.72 The evaluation of the net benefits of introducing spectrum trading and liberalisation found that the expected benefits were considerably higher than the predicted costs. The net present value of the benefits to the UK economy, having subtracted the costs, was estimated to lie between £164 million and £228 million, based on a similar level of trading as that observed in other countries.
- 7.73 The main uncertainty in the evaluation lay in the potential volume of and type of activity (i.e. transfers of all rights and obligations, or change of use). Several scenarios were estimated assuming an equal proportion of trading across nearly all spectrum bands, but varying the annual percentage of licences traded and the type of activity. The finding that the benefits considerably outweighed the costs was confirmed across all the scenarios.
- 7.74 A small number of comments to the consultation document were received on both the risk assessment and evaluation of the net benefits, mostly from the mobile network operators.
- 7.75 Some suggested that, in evaluating the net benefits, it would be more accurate to assess the annual percentage of spectrum traded on a class by class basis, rather than assume an equal proportion across all classes. One respondent went further in suggesting that a separate RIA should be carried out on a sector by sector basis.
- 7.76 Some also suggested that a more detailed assessment of the risks of spectrum trading and liberalisation was needed, particularly the risks from interference. It was also suggested that the risks should be quantified and that their impact on the estimated costs of introducing spectrum trading should also be taken into account.
- 7.77 Finally, an issue was raised that the cost calculation did not take into account competition checks. This issue, however, will no longer be relevant if Ofcom's proposal to rely on existing competition law, rather than introduce new ex

ante regulation, as set out in the recent consultation document on the subject, is adopted.

- 7.78 Ofcom has noted the comments made by the respondents. We will examine ways in which the suggestions could be taken into account and will produce an amended RIA for both the Trading Regulations and the Register Regulation to be published later in the year.
- 7.79 In this regard, Ofcom has noted the recent study on spectrum trading carried out for the European Commission by Analysys, DotEcon and Hogan & Hartson<sup>21</sup>. This study found that the introduction of trading and liberalisation across the European Union could release potential benefits of up to 8 billion euro per year. Their analysis also concluded that the introduction of trading alone (with liberalisation as an option) could result in benefits of up to approximately 900 million euro per year. Some of the identified risks, including interference management, were included in this quantitative analysis.

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[http://europa.eu.int/information\\_society/topics/radio\\_spectrum/useful\\_info/studies/secondtrad\\_study/index\\_en.htm](http://europa.eu.int/information_society/topics/radio_spectrum/useful_info/studies/secondtrad_study/index_en.htm)

## Section 8

# Next steps

- 8.1 Alongside this statement, Ofcom has, or will be, issuing consultation documents and other documentation on certain key aspects connected with the introduction of spectrum trading. A consultation document on ensuring effective competition following the introduction of spectrum trading was issued on 10 June, with comments required by 16 July. Another, on spectrum liberalisation, will be issued shortly. Ofcom also intends to publish a revised Regulatory Impact Assessment and further detailed information, as necessary, on the processes and procedures Ofcom will follow to support trading.
- 8.2 In the autumn, Ofcom will publish further draft Trading Regulations and draft Register Regulations for one month statutory consultation. It is expected that both sets of regulations will be made by Ofcom in November in order that they can come into force and permit spectrum trading from December 2004.
- 8.3 Prior to this, it is Ofcom's intention to amend WT Act licences, which fall within the spectrum classes identified for trading in 2004, along the lines set out in this statement. It is anticipated that these amendments, including necessary consultation with licensees, will be carried out during autumn 2004.
- 8.4 Further amendment to licences planned for trading in 2005 and beyond, and future amendment of the Trading Regulations, will be carried out as necessary at the appropriate time. Ofcom will consult as required in the course of making such changes.

**Annex A**

# Draft Spectrum Trading Regulations

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STATUTORY INSTRUMENTS

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**2004 No. XXXX**

## **ELECTRONIC COMMUNICATIONS**

### **The Wireless Telegraphy (Spectrum Trading) Regulations 2004**

<i>Made</i>	- - - -	<i>2004</i>
<i>Coming into force</i>	- -	<i>2004</i>

Whereas the Office of Communications (“OFCOM”) have given notice of their proposal to make these Regulations in accordance with section 403(4)(a) of the Communications Act 2003<sup>(22)</sup> (“the 2003 Act”) and published notice of their proposal in accordance with section 403(4)(b) of the 2003 Act and have considered the representations made to them before the time specified in the notice:

Now, therefore, OFCOM, in exercise of the powers conferred upon them by section 168(1) and (3) of the 2003 Act and section 403(7) of the 2003 Act hereby make the following Regulations:

#### **Citation, commencement and extent**

1. These Regulations may be cited as the Wireless Telegraphy (Spectrum Trading) Regulations 2004 and shall come into force on [ ] 2004.
2. These Regulations shall not extend to Bailiwick of Guernsey.

#### **Interpretation**

3. In these Regulations “concurrent holders” means persons who concurrently hold the rights and obligations under a wireless telegraphy licence by virtue of a transfer authorised by these regulations which has that effect.

#### **Transfer of all of the rights and obligations arising by virtue of a wireless telegraphy licence**

4.— (1) A transfer by the holder of a wireless telegraphy licence to which this regulation applies of all of the rights and obligations arising by virtue of that wireless telegraphy licence is authorised if it satisfies one of the two conditions set out in paragraph (2).

(2) Those conditions are —

- (a) that the rights and obligations of the person making the transfer become rights and obligations of the transferee to the exclusion of the person making the transfer; and

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<sup>(22)</sup> 2003 c. 21

- (b) that the transferred rights and obligations become rights and obligations of the transferee while continuing, concurrently, to be rights and obligations of the person making the transfer.

5. Subject to regulation 6, regulation 4 shall apply to wireless telegraphy licences within the licence classes specified in Column 1 of each Part of the Schedule which apply to a station or apparatus operating within any of the frequency bands specified in Column 2 of the same Part.

6. Regulations 4 and 7 shall not apply to wireless telegraphy licences which have been granted for use by emergency services. [*Note: will apply to certain public sector licensees. Exact scope to be clarified.*]

#### **Partial transfer of rights and obligations arising by virtue of a wireless telegraphy licence**

7. Subject to regulation 6, transfers satisfying the conditions in regulation 4(2) are also authorised where the transfer is of —

- (a) all of the rights arising by virtue of a wireless telegraphy licence which relate to —
  - (i) whole frequency channels under one of the licences of a class specified in Column 1 of Part 1 or Column 1 of Part 6 of the Schedule which apply to a station or apparatus operating within any of the frequency bands specified in Column 2 of the same Part;
  - (ii) part frequency channels which have in each case a bandwidth of 12.5 KHz or a multiple thereof with the same start or end frequency limit as a frequency channel under one of the licences of a class specified in Column 1 Part 1 or Column 1 of Part 6 of the Schedule which apply to a station or apparatus operating within any of the frequency bands specified in Column 2 of the same Part;
  - (iii) whole wireless telegraphy links designed for use between two fixed points under one of the licences of a class specified in Column 1 of Part 5 of the Schedule which apply to a station or apparatus operating within any of the frequency bands specified in Column 2 that Part;
  - (iv) a part of the range of frequencies under one of the licences of a class specified in Column 1 of Part 2 or Column 1 of Part 4 of the Schedule which apply to a station or apparatus operating within any of the frequency bands specified in Column 2 of the same Part;
  - (v) a geographical area being part of the total geographical area in which the holder is authorised to establish, install and use radio transmitting and receiving stations or apparatus under one of the licences specified in Column 1 of Part 2 or Column 1 of Part 4 of the Schedule which apply to a station or apparatus operating within any of the frequency bands specified in Column 2 of the same Part; or
  - (vi) both of the situations set out in sub-paragraphs (a)(iv) and (v) of this regulation; and
- (b) the corresponding part of each of the obligations under the licence.

#### **Circumstances in which a transfer shall not be made**

8. A transfer under regulation 4 or regulation 7 of rights and obligations under a wireless telegraphy licence shall not be made where —

- (a) the licence holder, or all of the concurrent licence holders, and the transferee have not consented to the transfer;
- (b) any sum payable under the Wireless Telegraphy (Licence Charges) Regulations 2002<sup>(23)</sup> in respect of that licence is owing to OFCOM because it has not been paid by the time it became due; [*Note: would not include cases where sums were previously owing if they were subsequently paid.*]

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<sup>(23)</sup> S.I. 2002/1700, amended by S.I. 2003/2983 and S.I 2003/2984



- (c) any instalment payment is to be paid to OFCOM under regulation 4(8)(b) of the Wireless Telegraphy (Licence Charges) Regulations 2002 in respect of that licence;
- (d) OFCOM has served notice under section 1E of the Wireless Telegraphy Act 1949<sup>(24)</sup> on the holder, or the concurrent holders, of that licence of a proposal to revoke or vary that licence but that revocation or variation has not yet been made; and [*Note: notices under section 1E are generally sent around 1-2 months before revocation or variation. In the case of a licence variation, the notice under section 1E need not be an obstacle to transfer. That is because the holder can consent to the variation being made and, if that happened, the licence amendment would be implemented quickly.*]
- (e) the holder has, or the concurrent holders have, requested Ofcom to revoke or vary the licence or have consented to a revocation or variation proposed by Ofcom but that revocation or variation has not yet been made.

### **Consent of OFCOM required for transfer**

9. (1) A proposed transfer under regulation 4 or regulation 7 shall not be put into effect in accordance with regulation 11(5) until after OFCOM have given their consent.

(2) In determining whether or not to consent to a proposed transfer OFCOM shall take into account whether –

- (a) the holder is, or the concurrent holders are, in breach of the terms of the wireless telegraphy licence under which the rights and obligations are to be transferred;
- (b) the transferee is able to meet the terms, provisions and limitations of the wireless telegraphy licence which is to be granted as a result of the transfer;
- (c) in the case of a partial transfer under regulation 7 the transferor is able to meet the terms, provisions and limitations of the wireless telegraphy licence which is to be granted as a result of the transfer;
- (d) the transferee is able to meet any criteria relating to the persons to whom a wireless telegraphy licence of the class under which rights and obligations are to be transferred may be granted; and
- (e) it is requisite or expedient to refuse consent to the transfer –
  - (i) in the interests of national security;
  - (ii) for the purposes of complying with a Community obligation of the United Kingdom or with any international agreement or arrangements to which the United Kingdom is party; or
  - (iii) for the purposes of complying with a direction by the Secretary of State given to OFCOM under section 5 or section 156 of the Communications Act 2003.

### **Directions by OFCOM**

10. (1) If OFCOM consents to a transfer they may also direct that a transfer shall only be put into effect in accordance with regulation 11(5) after compliance with conditions which may relate to any matter mentioned in any of the sub-paragraphs of regulation 9(2).

(2) A proposed transfer may not be put into effect in accordance with regulation 11(5) until after compliance with the conditions of any such direction.

### **Transfer notification and procedure**

11. (1) The holder, or concurrent holders, of a wireless telegraphy licence who wishes, or who wish, to make a transfer under regulation 4 or 7 must provide to OFCOM –

- (a) the reference number of the wireless telegraphy licence under which rights and obligations are to be transferred;

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<sup>(24)</sup> 1949 c. 54

- (b) the name and address of the holder or concurrent holders of the wireless telegraphy licence;
  - (c) the name and address of proposed transferee;
  - (d) a description of which type of transfer under regulation 4 or regulation 7 is proposed;
  - (e) a document signed by or on behalf of the holder or each concurrent holder of the licence and signed by or on behalf of the transferee, which warrants to OFCOM that each of those persons have consented to the proposed transfer;
  - (f) all information necessary for OFCOM to determine whether or not they shall consent to the trade; and [*Note: not all of this information needs to be provided on the first day of notification. This provision is included so that Ofcom has the power to require the production of all of the information it needs to consider consent issues.*]
  - (g) in the case of a partial transfer, a description of which rights and obligations under the licence are to be transferred.
- (2) OFCOM shall, after determining that the requirements of paragraph (1) of this regulation have been met, publish a notice stating:
- (a) the name of the wireless telegraphy licence holder or concurrent holders and the transferee to whom it is proposed that the rights and obligations arising under the licence shall be transferred;
  - (b) the date when Ofcom determined that the requirements paragraph (1) of this regulation was met;
  - (c) the licence class and licence reference number; and
  - (d) in the case of a partial transfer, a description of which rights under the licence are proposed to be transferred.
- (3) After publishing a notice under paragraph (2) of this regulation OFCOM shall decide –
- (a) if they consent to the transfer in accordance with regulation 9; and
  - (b) if they shall give any directions under regulation 10.
- (4) OFCOM shall notify the parties to the proposed transfer of their decision under paragraph (3) of this regulation.
- (5) A transfer shall be effected by the holder or concurrent holders of the wireless telegraphy licence under which rights and obligations are to be transferred surrendering that licence and by Ofcom granting a new one to the transferee and, in the case of a concurrent or partial transfer, also to the holder or concurrent holders who made the transfer.
- (6) OFCOM shall publish the information specified in paragraph (2) of this regulation in relation to transfers that have been effected pursuant to paragraph (5) of this regulation.

*Name*

Date

For and by authority of the Office of Communications

**SCHEDULE** Regulations 4 and 7  
**LICENCE CLASSES AND FREQUENCY BANDS**

**PART 1**

<i>Column 1</i>	<i>Column 2</i>
(See regulations 5 and 7 for explanation of columns)	(See regulations 5 and 7 for explanation of columns)
<b>Licence classes</b>	<b>Frequency bands</b>
Public Mobile Operator for Public Wide-Area Paging	55.75 – 87.50 MHz
Public Mobile Operator for Public Mobile Data, Non-Voice Only Operation	136 – 208 MHz
Public Mobile Operator for Public Access Mobile Radio	450 – 470 MHz
Public Mobile Operator for CDMA Spread Spectrum Data/Asset Tracking Systems	133 – 134 KHz
National and Regional Private Business Radio	146 – 147 KHz
Common Base Station Operator	

**PART 2**

<i>Column 1</i>	<i>Column 2</i>
<b>Licence classes</b>	<b>Frequency bands</b>
Fixed Wireless Access (including point-to-multipoint systems)	3480 – 3600 MHz

**PART 3**

<i>Column 1</i>	<i>Column 2</i>
<b>Licence class</b>	<b>Frequency bands</b>
Fixed Wireless Access (including point-to-multipoint systems)	3605 - 4009 MHz

## PART 4

<i>Column 1</i>	<i>Column 2</i>
<b>Licence class</b>	<b>Frequency</b>
Broadband Fixed Wireless Access	28.0525 – 28.4445 GHz 29.0605 – 29.4525 GHz

## PART 5

<i>Column 1</i>	<i>Column 2</i>
<b>Licence class</b>	<b>Frequency</b>
Point to Point Fixed Links	1350 – 1530 MHz 1672 – 1690 MHz 3600 – 4200 MHz 5925 – 6425 MHz 6425 – 7125 MHz 7425 – 7900 MHz 10.7 – 11.7 GHz 12.75 – 13.25 GHz 14.25 – 14.5 GHz 14.5 – 15.35 GHz 17.3 – 17.7 GHz 17.7 – 19.7 GHz 21.2 – 22 GHz 22 – 23.6 GHz 24.5 – 26.5 GHz 32.319 – 33.383 GHz 37 – 39.5 GHz 49.2 – 50.2 GHz 51.4 – 52.6 GHz 55.78 – 57 GHz

## PART 6

<i>Column 1</i>	<i>Column 2</i>
<b>Licence class</b>	<b>Frequency bands</b>
Scanning Telemetry	457.5 – 464 MHz

**EXPLANATORY NOTE**

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

These Regulations are made under [            ]

These Regulations provide for [            ]

A full regulatory impact assessment and report of the effect that these Regulations would have on the costs to business is available to the public from the Office of Communications Library at Riverside House, 2a Southwark Bridge Road, London SE1 9HA (Tel: 020 7981 3000) or on the Office of Communications Internet web site at [www.ofcom.org.uk](http://www.ofcom.org.uk). Copies of the report have also been placed in the libraries of both Houses of Parliament.

**Annex B**

# Draft Wireless Telegraphy Register Regulations

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STATUTORY INSTRUMENTS

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## 2004 No. XXXX

### ELECTRONIC COMMUNICATIONS

#### The Wireless Telegraphy Register Regulations 2004

*Made* - - - - 2004

*Coming into force* - - 2004

Whereas the Office of Communications (“OFCOM”) have given notice of their proposal to make these Regulations in accordance with section 403(4)(a) of the Communications Act 2003<sup>(25)</sup> (“the 2003 Act”) and published notice of their proposal in accordance with section 403(4)(b) of the 2003 Act and have considered the representations made to them before the time specified in the notice:

Now, therefore, OFCOM, in exercise of the powers conferred upon them by section 170(1), (2) and (4) of the 2003 Act and section 403(7) of the 2003 Act hereby make the following Regulations:

#### **Citation, commencement and extent**

1. These Regulations may be cited as the Wireless Telegraphy Register Regulations 2004 and shall come into force on [ ] 2004.

2. These Regulations shall not extend to the Channel Islands or to the Isle of Man.

#### **Public register of information**

3. OFCOM shall establish and maintain a public register of relevant information to which these Regulations apply.

4. (1) The description of relevant information prescribed for the purposes of section 170(2) of the Communications Act 2003 is information which relates to the issue, renewal or variation of wireless telegraphy licences within the licence classes specified in Column 1 of each Part of the Schedule which apply to a station or apparatus operating within any of the frequency bands specified in Column 2 of the same Part and which relates to the matters set out in paragraph (2).

(2) The matters are —

- (a) the identity of the holder or concurrent holders of a wireless telegraphy licence and a contact address;

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<sup>(25)</sup> 2003 c.21.

- (b) the licence class and licence reference number of a wireless telegraphy licence; and
- (c) the terms, provisions or limitations of a wireless telegraphy licence which concern the following —
  - (i) the frequencies assigned; and
  - (ii) geographical restrictions on transmission.

**Inspection of the register**

- 5. There shall be no charge for inspection of the register by the public.

*Name*

Date

For and by authority of the Office of Communications

## SCHEDULE

### LICENCE CLASSES AND FREQUENCY BANDS

#### PART 1

<i>Column 1</i> (See regulation 4 for explanation of columns)	<i>Column 2</i> (See regulation 4 for explanation of columns)
<b>Licence classes</b>	<b>Frequency bands</b>
Public Mobile Operator for Public Wide-Area Paging	55.75 – 87.50 MHz
Public Mobile Operator for Public Mobile Data, Non-Voice Only Operation	136 – 208 MHz
Public Mobile Operator for Public Access Mobile Radio	450 – 470 MHz
Public Mobile Operator for CDMA Spread Spectrum Data/Asset Tracking Systems	133 – 134 kHz
National and Regional Private Business Radio	146 – 147 kHz
Common Base Station Operator	

#### PART 2

<i>Column 1</i>	<i>Column 2</i>
<b>Licence classes</b>	<b>Frequency bands</b>
Fixed Wireless Access (including point-to-multipoint systems)	3480 – 3600 MHz

#### PART 3

<i>Column 1</i>	<i>Column 2</i>
<b>Licence class</b>	<b>Frequency bands</b>
Fixed Wireless Access (including point-to-multipoint systems)	3605 - 4009 MHz



## PART 4

<i>Column 1</i>	<i>Column 2</i>
<b>Licence class</b>	<b>Frequency</b>
Broadband Fixed Wireless Access	28.0525 – 28.4445 GHz 29.0605 – 29.4525 GHz

## PART 5

<i>Column 1</i>	<i>Column 2</i>
<b>Licence class</b>	<b>Frequency</b>
Point to Point Fixed Links	1350 – 1530 MHz 1672 – 1690 MHz 3600 – 4200 MHz 5925 – 6425 MHz 6425 – 7125 MHz 7425 – 7900 MHz 10.7 – 11.7 GHz 12.75 – 13.25 GHz 14.25 – 14.5 GHz 14.5 – 15.35 GHz 17.3 – 17.7 GHz 17.7 – 19.7 GHz 21.2 – 22 GHz 22 – 23.6 GHz 24.5 – 26.5 GHz 32.319 – 33.383 GHz 37 – 39.5 GHz 49.2 – 50.2 GHz 51.4 – 52.6 GHz 55.78 – 57 GHz

## PART 6

<i>Column 1</i>	<i>Column 2</i>
<b>Licence class</b>	<b>Frequency bands</b>
Scanning Telemetry	457.5 – 464 MHz

## **EXPLANATORY NOTE**

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

These Regulations are made under section 170(1) of the Communications Act 2003 (“the Act”). Under section 170(1) OFCOM may, by regulations, make provision for the establishment and maintenance of a register of information which relates to the issue, renewal, transfer, variation or revocation of wireless telegraphy licences or the making, renewal, transfer, modification or revocation of grants of recognised spectrum access.

These Regulations provide for [        ]

A full regulatory impact assessment and report of the effect that these Regulations would have on the costs to business is available to the public from the Office of Communications Library at Riverside House, 2a Southwark Bridge Road, London SE1 9HA (Tel: 020 7981 3000) or on the Office of Communications Internet web site at [www.ofcom.org.uk](http://www.ofcom.org.uk). Copies of the report have also been placed in the libraries of both Houses of Parliament.

## Annex C

# Summary of trading proposals

## Introduction of trading in 2004

<i>Licence sector</i>	<i>Licence Class</i>	<i>Types of Transfer</i>
Public Mobile Operator	Analogue PAMR	<ul style="list-style-type: none"> <li>• Transfers of all rights and obligations and spectrum partitioning to a minimum channel spacing of 12.5 kHz.</li> <li>• Geographical partitioning and more flexible frequency partitioning planned for 2005.</li> </ul>
Public Mobile Operator	Public Wide Area Paging (National Paging)	<ul style="list-style-type: none"> <li>• Transfers of all rights and obligations and spectrum partitioning to a minimum channel spacing of 12.5 kHz in the 153 MHz and 450-470 MHz bands.</li> <li>• Geographical partitioning and more flexible frequency partitioning planned for 2005</li> <li>• 420-450 MHz band excluded from proposals due to sharing requirements.</li> <li>• All ERMES paging licences returned to Ofcom. Decision on future of band awaiting European harmonisation developments.</li> </ul>
Public Mobile Operator	Public Mobile Data, Non-voice only Operations	<ul style="list-style-type: none"> <li>• Transfers of all rights and obligations and spectrum partitioning to a minimum channel spacing of 12.5 kHz in all bands except 420-450 MHz and 866-868 MHz.</li> <li>• Geographical partitioning and more flexible frequency partitioning planned for 2005.</li> <li>• 420-450 MHz band excluded from proposals due to sharing requirements.</li> <li>• Consultation planned on deregulation of 866-868 MHz band.</li> </ul>
Public Mobile Operator	Common Base Station Operator	<ul style="list-style-type: none"> <li>• Transfers of all rights and obligations and spectrum partitioning to a minimum channel spacing of 12.5 kHz in all bands except 420-450 MHz.</li> </ul>

<i>Licence sector</i>	<i>Licence Class</i>	<i>Types of Transfer</i>
		<ul style="list-style-type: none"> <li>• 420-450 MHz band excluded from proposals due to sharing requirements.</li> </ul>
Private Business Radio	National & Regional Private Business Radio (PBR)	<ul style="list-style-type: none"> <li>• Transfers of all rights and obligations and spectrum partitioning to a minimum channel spacing of 12.5 kHz all bands except 420-450 MHz.</li> <li>• Geographical partitioning and more flexible frequency partitioning planned for 2005.</li> <li>• 420-450 MHz band excluded from proposals due to sharing requirements.</li> <li>• Ofcom will give further consideration to the possibility of permitting trading of licences in this class held by the Emergency Services, and will review options for the introduction of trading in 2006.</li> </ul>
Fixed Wireless Access	3.4 GHz	<ul style="list-style-type: none"> <li>• Transfers of all rights and obligations and ability to partition licence geographically and/or spectrally.</li> </ul>
	3.6 GHz	<ul style="list-style-type: none"> <li>• Transfers of all rights and obligations</li> </ul>
Broadband Fixed Wireless Access	28 GHz	<ul style="list-style-type: none"> <li>• Transfers of all rights and obligations and ability to partition licence geographically and/or spectrally.</li> </ul>
Fixed Services	Scanning Telemetry	<ul style="list-style-type: none"> <li>• Transfers of all rights and obligations and spectrum partitioning to a minimum channel spacing of 12.5 kHz.</li> </ul>
Fixed Services	Point to Point Fixed Links	<ul style="list-style-type: none"> <li>• Transfers of all rights and obligations under licences and individual links under a licence.</li> </ul>
Fixed Services	32 GHz	<ul style="list-style-type: none"> <li>• One third of 32 GHz band currently used for point-to-point fixed links will be made tradable under the same conditions as other fixed terrestrial link spectrum.</li> </ul>

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<i>Licence sector</i>	<i>Licence Class</i>	<i>Types of Transfer</i>
		<ul style="list-style-type: none"><li>• Two thirds of 32 GHz band is currently vacant and Ofcom is considering appropriate award process for this spectrum.</li></ul>

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## Introduction of trading from 2005 onwards

Year	Licence Class	Comment
2005	Wide area PBR	<ul style="list-style-type: none"> <li>Introduction of MASTS will facilitate trading in this class.</li> </ul>
	On-Site PBR	<ul style="list-style-type: none"> <li>Completion of review of on-site services will enable spectrum not identified for deregulation or lighter licensing to be made tradable.</li> </ul>
	Digital PAMR	<ul style="list-style-type: none"> <li>Completion of realignment exercise with MOD will enable introduction of trading.</li> </ul>
	10 GHz	<ul style="list-style-type: none"> <li>Ofcom is exploring the future use of this band and does not propose to introduce trading before 2005.</li> </ul>
	31 GHz	<ul style="list-style-type: none"> <li>Ofcom is reviewing spectrum use of this band prior to developing plans for trading.</li> </ul>
	32 GHz	<ul style="list-style-type: none"> <li>Portion of band currently vacant. Expected that tradability will be permissible on issue.</li> </ul>
	40 GHz	<ul style="list-style-type: none"> <li>Currently vacant spectrum. Expected that tradability will be permissible on issue.</li> </ul>
2006	Emergency Services	<ul style="list-style-type: none"> <li>Delayed until questions regarding the future organisation and assignment of spectrum for the emergency services have been resolved.</li> </ul>
2007	PMSE	<ul style="list-style-type: none"> <li>Ofcom proposes to introduce trading in 2007 though this date will be subject to review nearer the time.</li> </ul>
	2G and 3G mobile spectrum	<ul style="list-style-type: none"> <li>Still under review alongside issues associated with the future of 2G spectrum and release of 3G expansion spectrum.</li> </ul>
	Aviation and maritime communications	<ul style="list-style-type: none"> <li>Ofcom, CAA and MCA will work together to decide on the feasibility of trading for ground-based aviation and maritime coastal communication rights of use. A decision will be made by 2007</li> </ul>

Year	Licence Class	Comment
		<ul style="list-style-type: none"> <li>Trading will be within the constraints of international harmonisation agreements, safety of life considerations, and within principles agreed with sector regulators CAA and MCA.</li> </ul>
	Radionavigation (radar)	<ul style="list-style-type: none"> <li>Decision by Ofcom and CAA on the feasibility of trading of radio navigation rights between 2007 and 2009</li> <li>Trading will be within the constraints of international harmonisation agreements, safety of life considerations, and within principles agreed with sector regulators CAA and MCA.</li> </ul>
	5.8 GHz Band C	<ul style="list-style-type: none"> <li>Further analysis has suggested that trading may not be appropriate for this band. Ofcom intends to review this situation in 2007.</li> </ul>
Other	Radio Broadcasting	<ul style="list-style-type: none"> <li>Current arrangements for licensing radio broadcasting effectively permit the transfer of WT Act licences. This position will be kept under review (see para 4.44).</li> </ul>
	Television Broadcasting	<ul style="list-style-type: none"> <li>Ofcom will review options for the introduction of trading, once plans for digital switchover are clearer (see paras 4.51-4.52).</li> </ul>
	Mobile Satellite	<ul style="list-style-type: none"> <li>Tradability subject to introduction of Recognised Spectrum Access.</li> </ul>
	Remote Meter Reading	<ul style="list-style-type: none"> <li>Tradability subject to introduction of Recognised Spectrum Access.</li> </ul>
	Satellite shared with terrestrial services	<ul style="list-style-type: none"> <li>Tradability subject to introduction of Recognised Spectrum Access.</li> </ul>

## **Annex D**

# **List of respondents to the consultation**

Responses to the consultation document were received from large organisations, small medium-sized enterprises (SMEs), individuals, advisory committees, trade and similar associations and government departments.

**Aerial Facilities Limited**  
**AirRadio Ltd**  
**AMS (RSD & CSD Divisions)**  
**Arup Communications**  
**Audio Ltd**  
**Autograph Sound Recording Ltd**  
**BAA plc**  
**Barclay Associates Ltd**  
**BBC**  
**Better Sound Limited**  
**British Microlight Aircraft Association**  
**BT Group Plc**  
**Cable & Wireless**  
**CACFOA**  
**Capital Radio plc**  
**CDMA Development Group (CDG)**  
**Chrysalis Radio**  
**Civil Aviation Authority**  
**CLRC-Rutherford Appleton Laboratory**  
**Cogent**  
**Colin Bowman**  
**Commercial Radio Companies Association**  
**Communications Management Association**  
**Crown Castle UK Ltd**  
**David Hall Systems Ltd**  
**DETI (Northern Ireland)**  
**Digital 3 and 4 Limited**  
**DJ Consulting Services Limited**  
**Dr. David Rudd**  
**Dr. Stewart Bryant**  
**Emap Performance**  
**Energis Communications Ltd**  
**Ericsson Limited**  
**European Satellite Operators Association (ESOA)**  
**Eutelsat S.A.**  
**FCS Ltd**  
**Five**  
**FuturePace Solutions, Australia**  
**Gould Electronics Twoway Radio Limited**



**GWR Group plc**  
**Hand Held Audio Ltd**  
**Hospital Broadcasting Association (HBA)**  
**Hutchison 3G Limited**  
**Independent Televisions News Limited (ITN)**  
**Inmarsat**  
**Institute of Broadcast Sound**  
**Institute of Electrical Engineers (IEE)**  
**Intellect UK**  
**ITIS Holdings Plc**  
**ITV Network**  
**JFMG**  
**John Turnock**  
**Joint Radio Company Limited**  
**Kingston Communications (Hull) plc**  
**London Underground**  
**Lucent Technologies**  
**Maritime and Coastguard Agency (MCA)**  
**Mason Communications Ltd**  
**Members of the Spectrum Management Advisory Group (SMAG)**  
**Ministry of Defence**  
**MLL Telecom Ltd**  
**Mr. & Mrs. Eldridge**  
**National Air Traffic Services Ltd**  
**National Radiological Protection Board**  
**Nigel Hitchman**  
**Nokia UK Ltd**  
**O2 UK Limited**  
**Olswang**  
**Orange**  
**Peter Helm**  
**PIPEX Communications**  
**Pro Consulting Services Ltd**  
**Procom Communication Services**  
**QVC**  
**Radio Research Advisory Committee (RRAC)**  
**Radio Society**  
**Satellite Action Plan Regulatory Group (SAP REG)**  
**Satellite and Cable Broadcasters Group**  
**Scope Communications UK Limited**  
**Scottish Executive (Energy & Telccoms Division)**  
**Sennheiser UK Ltd**  
**SES ASTRA**  
**SIBC**  
**Siemens AG**  
**SMG plc**  
**St Helens College**  
**Telecommunications Advisory Committee (TAC)**

**The On Site Communications Association (OSCA)**

**T-Mobile (UK) Ltd**

**Transfinite Systems Ltd**

**Transplan UK**

**UK Broadband Limited**

**UK-UWB Association**

**UMTS Forum**

**Visions Ltd**

**Vodafone Ltd**

**Welsh Assembly Government**

**Wireless Messaging Association**

**plus 16 confidential responses**

## Annex E

# Summary of responses to the consultation

Summary of issues raised by stakeholders in response to the spectrum trading consultation and Ofcom's responses to those issues	
Issues raised	Ofcom's response
<p><b>Q1: (a) Do you believe that spectrum trading will be beneficial to consumers, businesses and radio users?</b></p> <p><b>(b) What could Ofcom do to increase the benefits and mitigate the disadvantages of spectrum trading?</b></p> <p>Generally the economic benefits of trading are recognised.</p> <p>Some proposals that trading would be most beneficially introduced with maximum flexibility.</p> <p>Others proposed that clear rules and processes need to be established in particular to prevent distortions of competition and protect against interference.</p> <p>A few proposals for less flexibility and more caution. Start with a simple trading environment and liberalise later.</p> <p>Avoid overly complex arrangements.</p> <p>The introduction of trading should be phased to give Ofcom the opportunity to learn from experience.</p> <p>Interference should be avoided through technical studies and properly developed guidelines.</p> <p>Ofcom should take the needs of small companies into account.</p>	<p>Ofcom believes that spectrum trading has the potential to generate significant benefit and should be introduced with maximum flexibility, while at the same time ensuring adequate protection for all spectrum users.</p> <p>Ofcom is introducing spectrum trading through a phased and deliberately structured programme to balance speed with the opportunity to learn from experience. It is believed this is the best combination to maximize benefits and limit potential disadvantages.</p> <p>Every effort is being made to reduce potential for trading to cause interference. Ofcom recognises the importance of monitoring spectrum use and resolving interference and will continue to have a strong enforcement role. Interference issues will be dealt with in more detail in the forthcoming consultation on spectrum liberalisation to be published later in the summer.</p>
<p>Particular sectors such as emergency services have special characteristics and trading should not be applicable to them.</p>	<p>A final decision has not yet been made concerning emergency services spectrum. However, trading in Emergency Services spectrum will not be introduced before 2006.</p>
<p><b>Q2: How could Ofcom's proposals for spectrum trading be amended to reflect the potential benefits of emerging</b></p>	

<p><b><i>transmission technologies?</i></b></p> <p>Ofcom should apply regulatory pressure to licensees to adopt new technologies.</p> <p>Old technology should be cleared out and spectrum set aside for new technology.</p> <p>There should be greater emphasis on licence exemption with no trading or property rights.</p> <p>Ofcom should give licensees as much flexibility as possible.</p> <p>Concern expressed that emphasis on the new implied the tried and tested not favoured; new is not necessarily better.</p>	<p>Spectrum trading will help to enable spectrum to be used in a way that provides greatest benefit. This does not necessarily mean a new use or technology and licensees will be under no obligation to trade. Ofcom does however want to encourage innovation.</p> <p>Ofcom continues to explore opportunities for licence exemption and has postponed the introduction of trading in certain classes where licence exemption is being considered.</p> <p>Ofcom will generally aim to leave decisions between the new and the known, tried and tested, to the market.</p>
<p><b><i>Q3: a) Should tradability be universal within licence classes, and not an option, as proposed?</i></b></p> <p>There was broad agreement that trading should be universal within licence classes and existing licensees permitted to trade (with a few exceptions).</p>	<p>A class by class approach to the introduction of trading seems to have relatively wide support. There was no significant disagreement with Ofcom's proposals to introduce tradability universally within licence classes, except that some exceptions were suggested e.g. emergency services.</p>
<p><b><i>b) Do you agree that liberalisation of spectrum use should be implemented through issuing guidance rather than through precise definition of licence terms?</i></b></p> <p>Guidelines may not carry sufficient weight and the certainty of rules is preferred to deal with competition and interference concerns.</p> <p>Guidelines should be introduced as opposed to strict rules to allow as much flexibility as possible.</p>	<p>Spectrum trading will be introduced through Trading Regulations, a draft of which is attached at Annex A. Ofcom's proposals for spectrum liberalisation will be set out in the forthcoming consultation on the topic.</p>
<p><b><i>Q4 Are there any reasons why existing licence holders should not be authorised to participate in the trading process? If so, please provide details of which types of licence holders you consider should be excluded from the new trading process and why.</i></b></p> <p>Existing licence holders should be authorised to participate in trading, provided that all licence holders in the</p>	<p>Ofcom will aim to provide trading opportunities for all licensees with as few exceptions as possible.</p>

<p>bands in question have equitable access to the market and equivalent licence terms.</p>	
<p>Agreement that the new policy should apply as widely as possible.</p> <p>Existing licensees should be permitted to trade with a small number of exceptions.</p> <p>Reservations regarding trading of some licence products but agreement that Ofcom should not discriminate within licence classes.</p> <p>All existing PMR licensees should be allowed to trade, unless there is the potential for market dominance or distortion.</p>	<p>Ofcom will aim to implement tradability as widely as possible.</p>
<p>As custodian of the national spectrum, Ofcom should ensure that the public interest is upheld and that emergency services, transportation services, public service broadcasting, defence and recreational services are not placed in jeopardy through any trade or permitted change of use.</p>	<p>It is clearly essential that services, such as the emergency services and MoD, continue to have adequate access to spectrum.</p>
<p>Reservations about trading in satellite bands.</p>	<p>Potential for trading in satellite bands will be reviewed once experience has been gained from the introduction of trading in other areas.</p>
<p>Support for initial application of change of ownership, without change of licence characteristics, across the board.</p> <p>Liberalisation for existing licence holders should be addressed separately.</p> <p>Earliest and fullest possible liberalisation is needed, independent of trading.</p>	<p>Ofcom intends to permit trading in the form of transfers of rights and associated obligations from December 2004.</p> <p>Liberalisation policy will be further developed in response to the forthcoming consultation on the topic.</p>
<p><b>Q5: Should RSA be tradable?</b></p> <p>RSA is a management tool and not an asset so how can it become tradable?</p> <p>RSA should become tradable but more details are needed about RSA, where it will apply and how it will become tradable.</p> <p>How could RSA be traded when several operators sharing frequency from different orbital positions might have equivalent or overlapping RSA?</p> <p>Ofcom should consult in detail on RSA proposals.</p>	<p>Ofcom recognises that grants of RSA will have their own characteristics and issues, however it believes that the rights granted for RSA should in principle be tradable and inter-convertible with licences.</p> <p>Ofcom plans to consult on RSA for radio astronomy in autumn 2004 including a timetable for other uses (principally satellite). This consultation will address tradability.</p>
<p><b>Q6: Do you think trading should be introduced more or less rapidly than</b></p>	

<p><b>suggested above?</b></p> <p>Trading should be introduced more rapidly with maximum flexibility in a possibly wider range of licence classes than suggested.</p> <p>Trading should be introduced less rapidly than suggested.</p> <p>Trading should be introduced as soon as possible and with full liberalisation.</p> <p>Trading should be introduced in a cautious way with a longer timescale.</p>	<p>Ofcom has decided to proceed with a phased roll out, with trading being extended to new licence classes as the timetable proceeds and in the light of experience gained. Ofcom will consider any requests for increased flexibility as to the types of trade permitted by the Regulations.</p>
<p>Fixed links should not become tradable, because it is unlikely that another party would require a licence for exactly the same radio link as an existing link.</p> <p>Fixed links should become tradable as soon as practicable.</p>	<p>Ofcom is including fixed links in the first implementation phase. This will allow the market to decide what is and what is not traded. The market is better placed than a central regulator to take these decisions.</p>
<p><b>Q7: a) Do you anticipate problems in defining the right to transmit in terms of transmitted power or equivalent isotropically radiated power and a 'spectrum mask', and if so what?</b></p> <p>Various detailed suggestions for augmenting a power and spectrum mask were received for the reason that these were not considered to be sufficient by themselves.</p> <p>Several respondents suggested further study, research and consultation.</p> <p>Ofcom should proceed carefully before removing restrictions on spectrum use and should base technical restrictions on co-existence and compatibility studies at European level before relaxing constraints.</p> <p>Change of use is likely to change technical interference criteria.</p>	<p>Ofcom understands concerns about interference and confirms it has no intention of allowing an interference free-for-all. It intends to adopt a phased approach with safeguards to prevent interference arising as a result of change of licence characteristics. Further details will be given in the forthcoming consultation on spectrum liberalisation.</p> <p>There will be further consideration and consultation before Ofcom makes a decision on whether or not to proceed with a programme of licence variation which may replace existing licence terms and conditions by spectrum masks and radiated power limits.</p>
<p><b>b) What alternative approaches (such as standardised frequency trading units) would you prefer?</b></p> <p>Responses to the consultation did not support STUs.</p>	<p>Ofcom agrees that STUs are too inflexible and complex and does not propose to adopt them.</p>
<p><b>Q8: a) How important is it to provide guidelines on levels of interference for each licence class?</b></p> <p>There was broad agreement that interference is a fundamental issue as</p>	<p>Ofcom proposes that, where</p>

<p>radio systems are increasingly operating under interference-limited conditions and that change of use will be technically challenging. Some respondents said that interference levels should be specified by enforceable rules, not guidelines, with new licensees being responsible for resolving any interference they cause.</p> <p>Other respondents said that regulatory certainty should be combined with flexibility. Guidelines should be indicative rather than mandatory, with scope for variation by agreement between potentially affected partners, in order to ensure that developments in equipment and interference avoidance techniques can rapidly and efficiently be assimilated. Thus decisions would be taken by the parties with the best knowledge of their own equipment and requirements.</p>	<p>appropriate, licensees will be able to negotiate commercially to vary boundary conditions. Further details about such arrangements (and other interference issues) will be covered in the forthcoming consultation on spectrum liberalisation.</p>
<p><b>b) Do you anticipate any problems in doing this, and if so what?</b></p> <p>Some respondents expressed concern about the feasibility of controlling interference in a spectrum market and warned of a risk of large numbers of interference disputes.</p>	<p>This issue will be dealt with in the forthcoming consultation on spectrum liberalisation.</p>
<p><b>c) What alternative approaches might Ofcom adopt?</b></p> <p>In the early days of trading, complaints of actual or potential interference should be based on empirical evidence.</p>	<p>This issue will be dealt with in the forthcoming consultation on spectrum liberalisation.</p>
<p><b>Q9: (a) Do you agree that on the introduction of trading, current licences should have a rolling term with a defined notice period for termination?</b></p> <p>There should be a defined notice period on a rolling term which would be much better than the current uncertain position.</p> <p>Perpetual licences would be inefficient and lead to problems.</p>	<p>Ofcom intends to introduce a rolling term for tradable licences that have not been auctioned. Ofcom will set out the circumstances under which such licences will be revocable by Ofcom. These will include the power to revoke a licence on 5 years minimum notice for spectrum management reasons. This is believed to give the best balance between the factors involved.</p>
<p>A defined notice period is necessary to promote investment and is an essential</p>	<p>Ofcom considers that a five year minimum notice period will give</p>

<p>prerequisite for introducing trading.</p>	<p>spectrum users sufficient certainty on which to base investment decisions.</p>
<p>For licences issued by competition the predefined periods specified on award should still remain appropriate and should move onto a rolling term at the end of the set term.</p>	<p>Predefined licence periods specified on award will not be changed. Ofcom will review how to proceed with such licences nearer the end of the pre-defined period.</p>
<p><b>(b) What notice period do you think would be appropriate?</b></p> <p>Division among respondents concerning the length of notice period for revocation for spectrum management reasons. Suggestions ranged from several weeks to 20 years.</p> <p>Concerns were expressed that a longer period for revocation could encourage spectrum hoarding.</p> <p>Suggestion of higher up- front fees for applicants wanting longer notice periods.</p> <p>Ofcom could consider case by case extensions, with stricter reasons for revocation for failure to use spectrum.</p> <p>The length of notice period needs to reflect the type of use and investment. Ofcom should consider different notice periods for different licence classes. In particular, longer notice periods should apply where substantial infrastructure investment is required, or to encourage new technology to be implemented.</p> <p>A 5 year period best reflects international practice.</p>	<p>Ofcom considers that a five year minimum notice period for spectrum management reasons is appropriate and will provide adequate security to licensees, encourage efficient use of spectrum and promote investment and innovation.</p> <p>Ofcom believes that linking notice periods to licence class would restrict flexibility for future re-arrangements of licence classes as technology develops and applications change.</p> <p>Ofcom will consider at the time the appropriate notice period and circumstances of revocation for licences issued through future competitions.</p>
<p>Some respondents suggested that Broadcasting Act licences and WT Act licences need to be co-terminus.</p>	<p>Ofcom intends that WT Act licences should be varied accordingly.</p>
<p><b>Q10: a) In what circumstances do you believe it would be appropriate for Ofcom to revoke or serve notice on licences?</b></p> <p>The criteria suggested for revoking licences strike a fair balance but there should not be intervention because of market fragmentation or failure.</p> <p>Opinions varied about how far re-farming spectrum should be a driver, although there was general agreement that it is important to ensure spectrum is used as</p>	<p>The circumstances for revocation take account of comments received from respondents, including views that Ofcom must have sufficient flexibility to carry out its spectrum management functions.</p>



<p>efficiently as possible.</p>	
<p>General consensus that international agreements for spectrum reallocation are a key driver for revocation, but there should be long lead times leading up to such changes.</p> <p>Some suggested consultation prior to the UK signing up to such agreements.</p>	<p>International harmonisation and coordination agreements are reasons for which licences could be revoked or amended. Ofcom will aim to keep licensees informed of any possible changes and will consult licensees as appropriate.</p>
<p><b><i>b) Would the proposed guidelines provide sufficient certainty to licensees and potential purchasers and sufficient flexibility for the necessary management of the spectrum by Ofcom</i></b></p> <p>Many felt it was essential for Ofcom to produce clear guidelines and transparent revocation processes backed by the necessary enforcement powers.</p>	<p>Ofcom has set out clear grounds for revocation in this statement.</p>
<p><b><i>c) Are there circumstances in which it might be appropriate for Ofcom to have a power to terminate licences on shorter notice, with compensation?</i></b></p> <p>Compensation should be paid, particularly if periods of use were shortened below the times agreed as notice periods.</p> <p>Compensation criteria need to be clear and impartially administered.</p>	<p>Ofcom does not rule out that, in exceptional circumstances, it may be appropriate to consider compensating a licensee.</p>
<p><b>Q11: What problems do you anticipate in separating non-spectrum licence conditions (such as rollout obligations) from spectrum licence conditions, and allowing licensees to pass on their obligations as part of the trade if they wish?</b></p> <p>Spectrum related license conditions such as interference and emission levels should remain in place.</p>	<p>In the case of a trade, such conditions would remain in place.</p>
<p>Certain obligations that were issued with the original licenses may have become obsolete or unnecessary, Ofcom should review these requirements.</p> <p>Non-spectrum related conditions should be continued because of a need to safeguard the range and coverage of service.</p>	<p>Non-spectrum license conditions will remain in place unless Ofcom considers that they are no longer objectively justifiable or proportionate in which case they will be removed.</p>
<p>Requests to transfer license obligations should be looked at on a case by case basis.</p>	<p>Ofcom intends to review license obligations upon transfer to prevent trades which would result in license terms and conditions not being met.</p>

<p><b>Q12: What intermediaries do you expect to emerge and what sort of regulation may be necessary?</b></p> <p>Expectation that SMOs would emerge to at least some degree. Expectation that their emergence should bring benefits.</p> <p>Only very few intermediaries are likely to emerge. Any benefits of intermediaries would likely be outweighed by an additional cost burden, therefore intermediaries should not be encouraged.</p> <p>Advantages to intermediaries becoming involved in short-term hires.</p>	<p>Ofcom believes that intermediaries could bring benefits to trading markets but will leave the nature and development of intermediaries to the market.</p>
<p>Major objections from PMSE sector who have concerns that the emergence of competing SMOs in PMSE spectrum would result in inefficient use of spectrum and raise costs.</p>	<p>A decision on the introduction of trading to the PMSE sector will be postponed until 2007.</p>
<p>Competition rules should equally apply to SMOs, to allay fears held by some that SMOs would be able to control markets and distort competition by hoarding spectrum. Others felt that intermediaries should be allowed to operate with the minimum necessary regulations.</p> <p>Specific regulation of intermediaries was called for if trading developed in such a way as to involve financial instruments.</p>	<p>A consultation document proposing how Ofcom will prevent distortions of competition was published on 10<sup>th</sup> June 2004.</p> <p>In cases involving financial instruments the FSA may become involved.</p>
<p><b>Q13: Do you agree with Ofcom's proposed arrangements for the spectrum currently managed by JFMG, JRC, CSS and the CAA?</b></p> <p>New SMOs should be allowed to emerge if commercial opportunities develop as greater competition and flexibility are likely to be beneficial.</p> <p>Broad support for Ofcom's proposals from existing SMOs in the utilities sector and the CAA, leaving the basic structure largely unchanged but introducing trading.</p> <p>Resistance from the PMSE sector to the proposal that the present single-SMO arrangement might be changed in 2005 to allow additional SMOs to emerge. Concern that this might lead to spectrum inefficiency and higher costs.</p>	<p>Ofcom has taken account of these comments in developing its plans for the introduction of spectrum trading. A decision on the introduction of trading to the PMSE sector will be postponed until 2007.</p>
<p><b>Q14: Do you agree with the extent of information that Ofcom is proposing to make available to the market?</b></p>	

<p>General agreement that there is a need to publish information.</p> <p>Requests for more information, including contextual information about the use of a specific band to allow a full assessment of the interference environment. A few respondents wanted specific information about trading deals struck, including price (although others opposed disclosure of price information);</p> <p>Calls for less information to be published due to security or commercial concerns.</p> <p>Concerns on security and public safety grounds about the absence of specific safeguards for emergency and public safety assignments within the proposals for publication of a national register giving details of UK spectrum use.</p>	<p>Ofcom has taken account of these comments in developing its approach, which aims to balance the security concerns of existing licence holders with the need to provide adequate information to those wishing to trade.</p> <p>Ofcom will aim to assist potential parties to a trade to obtain answers to standard due diligence questions, but only with the consent of the relevant licensee.</p>
<p><b>Question 15: a) What problems do you anticipate in the process for administering spectrum trading?</b></p> <p>Problems identified included; lack of resources to administer spectrum trading, time-consuming, costly and bureaucratic procedure, uncertainty, lack of transparency.</p>	<p>Ofcom has sought to introduce a simple, quick and predictable process to support spectrum trades.</p>
<p><b>b) Do you agree with Ofcom's outline procedure?</b></p> <p>General agreement with Ofcom's outline procedure.</p> <p>Procedure could be enhanced by e-based rather than paper-based system of approving trades.</p> <p>Concern expressed about the amount of resource needed to assist the industry and manage the spectrum trading procedure.</p>	<p>Ofcom has sought to introduce a simple trading process. Ofcom intends to look at implementing an e-based system once trading is up and running.</p>
<p>Lack of transparency in procedure. Procedure unnecessarily complex especially where there is no change of use.</p>	<p>Ofcom has developed the procedure to be as transparent and simple as possible. The procedure may be amended in due course to take account of the experience gained from the introduction of trading.</p>
<p>Ofcom should make public the details of an intended trade with an appropriate period to comment so 3<sup>rd</sup> parties are given the opportunity to express their views on technical/competition grounds.</p>	<p>Ofcom does not believe it is necessary to allow third parties to comment in relation to an intended transfer of rights and obligations and believes that such an approach would unnecessarily raise uncertainty.</p>
<p>Requests for clarification of the charging</p>	<p>Ofcom has decided that there will be no</p>

<p>principles by which Ofcom intends to recover its costs for the administration of spectrum trading.</p>	<p>charge for spectrum trades at the present time. The cost of administering spectrum trading will be included within the grant received from the government for spectrum management.</p>
<p>Given that the licence fee is transferable, how will Ofcom deal with apportionments in the case of partial trades?</p>	<p>Annual licence fees will need to be paid in full before a trade is approved. For future years new fees will be calculated for each of the partitioned licences.</p>
<p>Concerns raised about accuracy of licensing information held by Ofcom and whether it would support the new spectrum management processes.</p>	<p>Ofcom will take reasonable steps to ensure that its information sources are accurate and up-to-date. Ofcom will also work with licensees to aim to provide answers to standard due diligence questions where possible.</p>
<p>Ofcom and the government should have the least interventionist role in the whole process and Ofcom should not be involved in enforcing the terms of transfer agreements to the extent they relate to commercial issues.</p> <p>Ofcom should not require trading parties to disclose their commercial terms but should only be concerned with those terms that have an impact on Ofcom's ability to discharge its statutory duties and functions and on the parties' ability to fulfil their statutory/licence obligations.</p>	<p>Ofcom has sought to develop a simple and transparent process for trading, offering flexibility and sufficient regulatory certainty, and requiring minimum intervention from Ofcom.</p>
<p>Ofcom should consider how to deal with cases where operators bought up licences and never used them - specific regulations should be put in place in order to prevent this.</p>	<p>Issues relating to anti-competitive hoarding are considered as part of the consultation on ensuring effective competition.</p>
<p>Concern if non competent licensees lease spectrum to 3<sup>rd</sup> parties. Management and assessment of technically competent reference bodies would be possible concerns as well.</p>	<p>Ofcom does not intend that it will be possible for a party to obtain a licence through trading that would be prevented from obtaining one by other means. The provision of false information in the application for a trade may in some cases provide grounds for revocation of the licence because it would be a breach of the Trading Regulations.</p>
<p>Concerns that there could be increased cases of interference and disputes arising from interference and competition issues (e.g. if interference guidelines could not be met without change of use or were exceeded due to the aggregation effect of large numbers of services across multiple</p>	<p>Ofcom will set out its approach to dispute resolution and interference regulations in the forthcoming consultation document on spectrum liberalisation. Ofcom's proposals for preventing distortions of competition were set out in the competition</p>

<p>licensed or unlicensed bands).</p>	<p>consultation published on 10<sup>th</sup> June 2004.</p>
<p>The outlined procedure does not adequately protect the rights of existing spectrum users. A process in line with the European merger controls process suggested. Service level agreements (SLA) for processing in order to balance the ability to process and the commercial imperatives of the trading parties.</p>	<p>Ofcom has sought to provide a balance protecting the rights of existing users while encouraging innovation and lowering barriers to entry for new users.</p>
<p>Taxation issues were not adequately covered. Ofcom asked to provide further clarification.</p>	<p>Trading parties who have tax-related queries should refer either to Inland Revenue or to Customs and Excise in the first instance.</p>
<p>Ofcom should make sure that primary and secondary licensing are on equitable basis (i.e. Ofcom should consider the kind of obligations/conditions/processes it would put in place in relation to the status of the transferee and make sure that processes were not less/more onerous than the ones applicable to primary licensing).  Primary assignments should remain as fixed terms in order to maximise the benefit for the UK economy.</p>	<p>Licence conditions will be carried over as part of the trade unless Ofcom considers that they are no longer objectively justifiable or proportionate.  Auctioned licences will continue to be valid for the fixed period set out in the licence. Other licences will be varied and will include a 5 year minimum notice period for revocation for spectrum management reasons.</p>
<p><b>Q16 a) What kind of leasing and hiring arrangements do you envisage arising?</b>  Support for concurrent rights and obligations for lessor and lessee  Calls for few restrictions, but protection for lessor if lessee actions could lead to licence revocation.  Ofcom should allow maximum flexibility to see what emerges.</p>	<p>Ofcom has sought to develop a flexible approach.</p>
<p><b>b) Do you agree with Ofcom's proposed arrangements for approval and registration of spectrum leases and hires?</b>  Some specific concerns about details were raised. A rogue lessee must not be able to cause a lessor's licence to be revoked.  Leasing seen as key, as it can unlock markets with new business models.  Change of use associated with leasing or hiring should be strictly controlled to avoid unacceptable interference.  In principle, "pre-nuptial" agreements</p>	<p>Ofcom aims to make a range of options available.  Ofcom has sought to develop a process which provides for necessary certainty for both the lessor and the lessee.  Ofcom does not envisage becoming involved in contractual arrangements</p>

<p>(ahead of licence acquisition) are seen as highly desirable.</p> <p>Proposed framework doesn't facilitate real time trading or commoditisation of spectrum</p> <p>Support for lessor to retain original licence and lessee to be issued with separate limited licence.</p>	<p>that exist between lessor and lessee.</p>
<p><b>Q17 a) Do you think liberalisation of spectrum use as proposed should be pursued as well as trading?</b></p> <p><b>b) Do you agree with the constraints on liberalisation outlined above?</b></p> <p>Points raised will be considered as part of the forthcoming consultation on spectrum liberalisation.</p>	<p>These issues will be dealt with in the forthcoming consultation on spectrum liberalisation.</p>
<p><b>Q18: a) Do you agree with the proposed process for approval of licence reconfigurations or changes of use?</b></p> <p><b>b) Are there any other factors which Ofcom should take into account in whether or not to approve an application for change of use?</b></p> <p><b>c) Should Ofcom make commitments to performance targets for assessing change of use?</b></p> <p>Points raised will be considered as part of the forthcoming consultation on spectrum liberalisation.</p>	<p>These issues will be dealt with in the forthcoming consultation on spectrum liberalisation.</p>
<p><b>Q19: (a) What types of dispute do you envisage arising and how should Ofcom become involved?</b></p> <p><b>(b) Beyond its statutory duties on disputes, how far should Ofcom become involved?</b></p> <p>The introduction of trading could lead to an increase in the number of disputes, particularly interference issues.</p> <p>A range of views were expressed as to the extent of Ofcom's involvement including:</p> <ul style="list-style-type: none"> <li>• Ofcom should not get involved in disputes beyond its statutory duties;</li> <li>• Ofcom should have an advisory role in relation to dispute resolution;</li> <li>• Ofcom should have a major role in dispute resolution.</li> </ul>	<p>Ofcom envisages that it will continue to play an active role in resolving any disputes that may arise, whether they arise in relation to interference or a spectrum trade.</p> <p>Further details on Ofcom's role in protecting licensees from unacceptable levels of interference will be set out in the forthcoming consultation document on spectrum liberalisation.</p>

<p>Support for groups of licensees to be allowed to determine to their mutual satisfaction acceptable levels of interference.</p>	<p>Ofcom intends that licensees will be able to negotiate commercially to vary boundary conditions.</p>
<p>Concern was expressed that the dispute resolution process may take too long and that a 10 day consultation period could be insufficient.</p> <p>Ofcom should be prepared to offer particular assistance to smaller companies and potentially offer support through the courts.</p>	<p>Ofcom aims to offer adequate protection for all users. Ofcom aims to assist small users by keeping administrative burdens to a minimum and providing administrative support as necessary (e.g. with form filling). Ofcom however would not envisage providing support through the courts.</p>
<p><b>Q20: (a) Do you agree that an assessment of whether a spectrum trade can be expected to result in a substantial lessening of competition is appropriate?</b></p> <p><b>(b) How should such a test be applied in practice?</b></p> <p>Some respondents emphasised the importance of having a light-touch, market based regulatory approach.</p> <p>There was concern about the potential for anti-competitive behaviour resulting from the introduction of spectrum trading, particularly in relation to spectrum hoarding and denying access. Competition controls alone may not give Ofcom sufficient powers to prevent distortions of competition.</p> <p>Suggestion that Ofcom should impose some safeguards to protect access to spectrum for certain types of users/services.</p>	<p>Ofcom published on 10 June a consultation which describes in detail the various mechanisms available to prevent distortions of competition and makes proposals as to how Ofcom should move forward.</p>
<p><b>Q21: In what ways do you anticipate that administrative incentive pricing will need to be changed to take account of spectrum trading?</b></p> <p>Some respondents suggested that there was no rationale for retaining pricing as a spectrum management tool after the commencement of trading.</p> <p>Some were of the view that pricing should either end at the outset or be phased out as trading was taken up.</p> <p>Others saw a continuing role for pricing to deter hoarding and to reflect the value of</p>	<p>Having considered the responses, Ofcom is of the view that AIP should continue to apply to both tradable and non-tradable spectrum after the introduction of trading later this year.</p> <p>Ofcom is concerned that spectrum trading alone may not be fully effective at promoting efficiency.</p> <p>Ofcom will undertake a consultation on AIP later this year which will outline the</p>

<p>spectrum.</p> <p>The price level needed to be carefully judged so as to not deter trades. Present levels should be kept until trading was well under way then the impact reviewed.</p> <p>AIP will influence traded values, but will not deter trades provided the level was not set too high and provided there was long term stability.</p> <p>Many respondents agreed with Ofcom's idea of having 5 year reviews of pricing.</p>	<p>economic fundamentals of the approach, the policy issues involved in setting AIP and initial estimates of the marginal valuation of spectrum by band.</p> <p>Review periods for pricing will be considered as part of the forthcoming consultation on AIP.</p>
<p><b>Q22: Do you agree with the proposals for application of spectrum trading to television and radio broadcasting spectrum?</b></p> <p>Some agreement, in principle, on the purposes of, and rationale for, spectrum trading in this area.</p> <p>Clarification requested as to how and when trading could be applied in this sector within current spectrum rigidities. How will wider complexities concerning pricing, digital switchover, PSB obligations, re-negotiation of licences and financial terms be dealt with?</p> <p>It was highlighted that caution was required in the sector (especially given the amount of prime spectrum used), whilst some respondents were of the view that the sector should be brought as fully as possible within a wide ranging trading regime across the radio spectrum as a whole.</p> <p>Concerns were raised in relation to the benefits that trading is going to deliver for viewers and listeners.</p>	<p>Ofcom had proposed to introduce trading in TV broadcasting spectrum in 2007. Ofcom still believes that this proposal is realistic, but will keep the situation under review and will re-assess the 2007 date nearer the time, in the light of future events.</p> <p>Current arrangements for the licensing of Radio Broadcasting effectively permit the transfer of WT Act licences which are associated with the transfer of corresponding Broadcasting Act licences. Consequently, the absence of a WT Act licence trading facility is, in practice, not an impediment to transfers of rights to use spectrum in this sector. However, Ofcom intends to keep this situation under review.</p>
<p><b>Q23: Do you agree with the proposals for programme-making and special events spectrum?</b></p> <p>A number of concerns were raised by the programme making community in relation to the complex radio environment in which PMSE activity takes place. Some respondents suggested that the timetable for introducing trading in broadcasting spectrum should be linked to the timetable for digital switchover.</p>	<p>Ofcom will delay the introduction of trading to the PMSE class until 2007. Ofcom also intends to carry out an assessment, including consultation in due course, of alternative approaches to managing PMSE spectrum.</p>
<p><b>Q24: Do you agree with the proposals for the application of spectrum trading</b></p>	



<p><b>to public wireless networks?</b></p> <p><b>Specifically do you agree with;</b></p> <ul style="list-style-type: none"> <li><b>a) the proposed timetable of its introduction;</b></li> <li><b>b) the proposals for the extent of licence reconfiguration and change of use that would be permissible; and</b></li> <li><b>c) the proposals for amendment to licence conditions?</b></li> </ul> <p>Some respondents suggested that trading of 2G and 3G mobile spectrum should be introduced earlier, whilst others thought that Ofcom's proposed timetable was practical and acceptable.</p> <p>Most respondents agreed that there were a number of key issues that needed to be resolved before the introduction of trading to public wireless networks.</p>	<p>Ofcom intends to allow trading in 2004 in the following classes of licence (amongst others): Analogue PAMR, national paging, data networks.</p> <p>As far as digital PAMR is concerned, trading has been delayed in this class until completion of a reassignment exercise in conjunction with the MoD.</p> <p>For 2G and 3G mobile spectrum, Ofcom is still considering the appropriate timing for the introduction of spectrum trading and expects to confirm its proposals later this year.</p>
<p><b>Q25: Do you agree with the proposals for application of spectrum trading to private business systems?</b></p> <p><b>Specifically, do you agree with:</b></p> <ul style="list-style-type: none"> <li><b>a) the proposed timing of its introduction;</b></li> <li><b>b) the proposals for the extent of licence reconfiguration and change of use that would in principle be permissible; and</b></li> <li><b>c) the proposals for amendment to licence conditions?</b></li> </ul> <p>There was broad support for the proposal but insistence that future versions of MASTS should be configured to ensure that serious complications relating to co-ordination and interference were avoided if change of use was permitted for wide-area PBR licences and that Ofcom should conduct intensive tests prior to making the system available for public use.</p> <p>Some respondents did not support trading in the 5.8GHz Band C since the light licensing approach in this band relates solely to the need to protect exclusion</p>	<p>Ofcom appreciates the concerns expressed and will seek to introduce trading to minimise possibilities for interference and not to prejudice any band realignment. For those licence classes for which MASTS will be an important assignment tool, the introduction of trading will take place after MASTS has been brought into service.</p> <p>Ofcom will introduce trading in 2004 in national and regional PBR and</p>

<p>zones and other adjacent services and not to any implied property right or level of protection.</p> <p>It was suggested that different user groups should be treated differently and on different time scales and it was proposed that 2005 would be a more realistic goal for trading and reconfiguration of non-exclusive licences.</p> <p>The PBR community pointed out that the PBR sector could benefit from flexible trading, for example the ability to deploy larger, shared (digital) systems through the aggregation of spectrum for smaller systems. However, they suggested that practical difficulties due to the limited size and expertise of most small PBR users should be overcome first. This could be a role for band managers or other third parties.</p> <p>The PBR community expressed concerns regarding the change of application in business use within the PBR categories. Such a change may be acceptable, yet it may open the way for a change from private to public use, which could disadvantage existing PBR users. In a free-for-all, large companies might squeeze out the smaller players with no spectrum efficiency or social value gain and consumers would have less choice. Therefore, some suggested that change of use from private to public services should not be permitted in any of the six PMR bands.</p> <p>In addition, it was suggested that the notice period for private systems should be 7-10 years as opposed to the 5 year notice period Ofcom put forward in the consultation document.</p>	<p>common base stations.</p> <p>Ofcom will launch a consultation later this year in order to explore how on-site services might be managed in future. Ofcom does not intend to introduce trading into any on-site licence class until this review is complete.</p> <p>As far as the 5.8 GHz Band C is concerned, it is necessary for Ofcom to licence activity in this band as there are a number of exclusion zones and the proximity of other users makes it essential for Ofcom to know the location of each terminal. However, there is no limit on the number of terminals that can be registered and consequently no scarcity – making the benefits of trading minimal. Ofcom also believes the sharing environment may change in coming years and it is planned that current authorisation arrangements will be reviewed in 2007.</p> <p>Finally, assignments in the wide-area PBR are shared, so trading will require recourse to MASTS. Therefore it is proposed that trading be introduced from 2005 once the MASTS tool is in place. Ofcom also intends to introduce a more generic approach to business radio licensing in this licence class.</p> <p>As described previously, Ofcom has decided that a 5 year minimum notice period is appropriate.</p>
<p><b>Q26: Do you agree with the proposals for application of spectrum trading to fixed terrestrial and satellite links? Specifically, do you agree with:</b></p> <p><b>(a) the proposed timing of its introduction;</b></p> <p><b>(b) the proposals for the extent of licence reconfiguration and change of use that would in principle be permissible; and</b></p>	

<p><b>(c) the proposals for amendment to licence conditions?</b></p> <p>As far as fixed terrestrial services are concerned, some respondents requested that no trading be permitted in this spectrum, as they considered it unlikely that another party would require a licence for exactly the same radio link as an existing link. On the other hand, others requested that the timescales for the introduction of trading should be flexible.</p> <p>It was suggested that any fixed terrestrial links associated with non-profit making functions should be subject to administrative incentive pricing rather than trading. However, links associated with profit making should be made tradable.</p> <p>It was highlighted that care must be taken to ensure the integrity of safety of life services operating at L band.</p> <p>Certain respondents sought clarification as to the impact of recognised spectrum access (RSA).</p> <p>As far as trading in satellite bands is concerned, it was suggested that it would likely be complicated because of existing international regulatory arrangements and the sensitivity of satellite uplinks to interference.</p>	<p>Ofcom does not believe it would be appropriate to refrain from introducing trading just because of doubts about trading activity. For example, it may be that particular links on busy routes may be of interest for trading and further options may emerge as more spectrum efficient equipment becomes available. Therefore, Ofcom has decided to provide scope for licensees in the fixed terrestrial links class to trade.</p> <p>Trading will be introduced in 2004 for point-to-point fixed links, scanning telemetry and one third of 32GHz currently used for point-to-point fixed links. Trading is scheduled to be introduced in 31GHz in 2005 subject to further review.</p> <p>Ofcom's plans to introduce trading for satellite services are contingent on the introduction of RSA. As space-to-earth transmissions are unlicensed, RSA is necessary to provide the pre-requisite tradable 'right'. Ofcom intends to indicate the timetable later this year for introducing RSA for satellite services.</p>
<p><b>Q27: Do you agree with the proposals for application of spectrum trading to maritime and aviation spectrum?</b></p> <p><b>Specifically, do you agree with:</b></p> <ul style="list-style-type: none"> <li><b>a) the proposed timing of its introduction;</b></li> <li><b>b) the proposals for the extent of licence reconfiguration and change of use that would in principle be permissible; and</b></li> <li><b>c) the proposals for amendment to licence conditions?</b></li> </ul> <p>Certain respondents pointed out that attention should be given to international and other constraints on trading, including</p>	<p>Ofcom acknowledges the concerns raised by respondents. Ofcom, CAA</p>

<p>the paramount need to protect safety of life services.</p> <p>A few respondents did not support Ofcom's proposals at all, while some argued that trading should not be introduced too early in this sector. Others considered that the principles of trading should be extended to these classes of licences as far as is practicable.</p> <p>Aviation depends on the availability of spectrum to meet the communication, navigation and surveillance requirements that are necessary to support the safe and expeditious flow of commercial and recreational air traffic, including military operations.</p> <p>Amendments to licence conditions will be problematic as aviation standards are generally tighter than the relevant ITU requirements.</p> <p>Radar manufacturers pointed out that MoD had significant interest in both aeronautical and maritime spectrum use and should be involved in the assessment of any trades.</p>	<p>and MCA will work together to decide on the feasibility of trading for ground-based aviation and maritime coastal communication rights of use. A decision will be made by 2007.</p> <p>In the Radio-navigation (radar) licence class, it is expected that tradability of radio navigation rights of use will be introduced between 2007 and 2009. In all cases, tradability will be permitted within the constraints of international harmonisation and agreements, safety of life considerations, and with the agreement of sector regulators, the CAA and MCA.</p> <p>In the case of on-board use, Ofcom is exploring with CAA and MCA whether certain types of use in this category might lend themselves to deregulation in the form of exemption from individual licensing.</p>
<p><b>Q28: Do you agree with the proposals for application of trading to science and technology spectrum, and that trading is inappropriate for license exempt spectrum?</b></p> <p>It was suggested that licence exempt (LE) spectrum should not be included in the spectrum trading project and further LE spectrum should be made available.</p> <p>Respondents argued that flexible and easy access to a wide range of bands should be sought in order to facilitate research, growth and innovation.</p> <p>Further consultation requested on space research licences, Test &amp; Development (T&amp;D) licences and clarification as to which bands were licence exempt.</p>	<p>Ofcom is in the process of initiating a review of all Non-Operational Development and Non-Operational Temporary Use Licences (formerly known as T&amp;D licences). Until this review is completed, Ofcom will continue with current practice.</p>
<p><b>Q29: Do you agree with proposals for the application of spectrum trading to the emergency services and the Ministry of Defence?</b></p> <p>Some respondents expressed support for proposals to make emergency services spectrum tradable. However stress was</p>	<p>Ofcom will not introduce trading for spectrum used by emergency services before 2006 to allow questions</p>

<p>placed on the importance of international and other constraints on trading, including the paramount need to protect emergency service spectrum.</p> <p>Others considered that emergency service spectrum is unsuited to trading because of the requirement for the highest levels of inter-operability and reliability. Another said that trading should not be introduced in this sector until the trading system is fully established and secure.</p> <p>Prospects for emergency and commercial services to co-exist in the same spectrum will be improved by enhancements in technology.</p>	<p>regarding future organisation and assignment to be resolved.</p>
<p>Calls for visibility of MoD's future plans for spectrum release.</p> <p>Safeguards should be put in place to make sure there is no future MoD or emergency service use for spectrum before disposing of it as it may be difficult to reacquire.</p> <p>MoD should release spectrum to Ofcom to be released by open competition.</p> <p>Sharing arrangements between the MoD and private users need to be reviewed and revised before trading by other parties could be considered. Change of use is unlikely to be possible.</p> <p>The proposed timescale for trading MoD spectrum looks too short.</p>	<p>Ofcom works with MoD to explore and identify spectrum that can be used for civil use. Some spectrum may from time to time be released to Ofcom by MoD to make primary assignments and these may in turn be traded.</p> <p>If the spectrum is still used for military purposes, the MoD may impose restrictions or co-ordination requirements which may affect the potential for trading.</p> <p>Change of use will be considered in the forthcoming consultation on spectrum liberalisation.</p>

## Annex F

# Glossary

### 2G

Second generation of mobile telephony systems using digital encoding. GSM (Global System for Mobile communications) is the 2G standard used in Europe.

### 3G

Third generation of mobile telephony. Provides higher-speed data transmissions to support multimedia applications such as broadcast-standard video.

### 5.8 GHz Band C

Frequencies in the range 5725 to 5875 MHz, which have recently opened for use by broadband fixed wireless access services, including Mesh Radio.

### AIP

Administrative Incentive Pricing or spectrum pricing: fees charged for access to spectrum to reflect its value. AIP applies in bands for which significant demand exists for that spectrum either in its current use, or for an alternative radio service, and acts as an incentive to users to use their spectrum as efficiently as possible. AIP is currently set at a level which reflects the value of the spectrum to the user using a methodology reviewed by NERA and Smith System in July 1998, available at:

[www.radio.gov.uk/topics/spectrum-price/documents/spec\\_rev/review.htm](http://www.radio.gov.uk/topics/spectrum-price/documents/spec_rev/review.htm).

A further study to review spectrum pricing, undertaken by Indepen, Aegis, and Warwick Business School, was published in February 2004. It can be found at:

[http://www.ofcom.org.uk/research/industry\\_market\\_research/m\\_i\\_index/spectrum\\_research/independent\\_review/spectrum\\_pricing.pdf](http://www.ofcom.org.uk/research/industry_market_research/m_i_index/spectrum_research/independent_review/spectrum_pricing.pdf)

### Allocation

a) The process of identifying specific frequency ranges for specific applications; or  
b) a frequency band entered in a table of frequency allocations, for use by a particular category of services.

### Analogue switch-off

Process of moving all TV households from analogue to digital terrestrial television

reception and so releasing spectrum used for analogue television transmission for other uses.

### Antenna

A passive device designed to radiate and receive electromagnetic energy.

### Apparatus

Any equipment designed to radiate and receive electromagnetic energy.

### Assignment

Authorisation given by a licensing authority for a radio station to use a specific radio frequency or channel under specified conditions.

### Authorisation Directive

Directive 2000/20/EC of the European Parliament and of the Council of 7 March 2002 on the authorisation of electronic communications networks and services.

### AVL

Automatic Vehicle Location: integration of wireless communications and location tracking devices into automobiles to allow fleet tracking, remote diagnostics, roadside assistance, etc.

### Band

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

### Band 3

Former TV broadcast band between 174 and 208 MHz, now used mainly for mobile communications.

### Base station

A radio transmitter and receiver installed by an operator to provide a communications service, typically used in mobile telecommunications.

### Bluetooth

Wireless standard for short-range radio communications between a variety of devices such as PCs, headsets, printers, mobile phones and PDAs.

### Broadcasting Acts

The Broadcasting Act 1990 and the Broadcasting Act 1996. These Acts will be further amended by the Communications Act

2003. These Acts govern the licensing and operation of the broadcasting industry (including the provision of cable TV services, but excluding the BBC) in the UK.

### **CAA Civil Aviation Authority**

A public corporation established by Parliament in 1972 as an independent specialist aviation regulator and provider of air traffic services.

### **Cave Review**

Review of Radio Spectrum Management, by Professor Martin Cave, published March 2002.

### **CDMA**

Code Division Multiple Access.

### **Change of use**

Change of technology, change of application, change in nature of business.

### **Common Base Stations**

a) A single channel base station for PBR shared by users (also known as a community repeater); or  
b) a PBR installation giving wide area coverage under the control of one or more operators offering mobile communications on a commercial basis to a number of independent (usually business) users.

### **Communications Act**

The Communications Act 2003.

### **Competition Act (CA)**

The Competition Act 1998.

### **Co-ordination Agreements**

Arrangements between the UK and neighbouring countries designed to avoid harmful interference between users in different countries. Also, arrangements within the UK to limit interference between domestic spectrum users.

### **CPE**

Customer Premises Equipment.

### **CRCA**

Commercial Radio Companies Association.

### **CSS**

C.S.S. Spectrum Management Services Ltd.

### **DAB**

Digital Audio Broadcast: radio broadcasting using digital modulation and digital source coding techniques.

### **Data Networks**

A network established and operated for the specific purpose of providing data transmission services for the public.

### **DCMS**

Department for Culture Media and Sport.

### **DTT**

Digital Terrestrial Television.

### **Earth station**

Centre for communicating by radio with a space satellite.

### **eirp**

The product of power supplied to the antenna and the antenna gain in a given direction relative to an isotropic antenna.

### **EMC**

Electro-Magnetic Compatibility: the ability of equipment or systems to be used within designated environments without causing or receiving electromagnetic interference.

### **Emissions**

Radiation produced, or the production of radiation, by a radio transmitting station.

### **EMRP**

Effective Monopole Radiated Power

### **Enterprise Act**

Enterprise Act 2002, which among other things, restates the current UK merger control framework with certain significant amendments.

### **EPFD**

Equivalent Power Flux Density. The equivalent power flux-density is defined as the sum of the power flux-densities produced at a point on the Earth's surface by all space stations within a non-geostationary satellite system, taking into account the off-axis discrimination of a reference receiving antenna assumed to be pointing towards the geostationary-satellite orbit.

### **ERP**

Effective Radiated Power.

**e-Trading systems**

An electronic mechanism designed to facilitate spectrum trading.

**ETSI**

European Telecommunications Standards Institute.

**Eureka 147**

A standard for DAB, digital audio broadcasting.

**Ex-ante**

Before an event, e.g. a trade, takes place.

**Ex-post**

After an event.

**FDMA**

Frequency Division Multiple Access.

**Field Monitoring**

Monitoring spectrum use in real-world situations.

**Fixed Links**

Communications links between fixed points. Such links may be unidirectional or bidirectional, and may be point-to-point or point-to-multipoint.

**Foreclosure**

Markets are foreclosed when undertakings are unable to enter the market either completely or partially. Markets may be foreclosed by a range of anti-competitive agreements or conduct by undertakings with market power. For example, where a company acquires a significant proportion of an essential supply to a market, this may effectively block access to that market for a competitor.

**Framework Directive**

Directive 2002/21/EC of the European Parliament and of the Council of 7 March 2002 on a common regulatory framework for electronic communications networks and services.

**Frequency Boundaries**

The extremities of the radio frequency range of an assignment, specified either in terms of a central frequency with channel width, or a frequency range.

**Frequency Re-Use**

Re-using the same frequencies at different spatial locations, in such a manner that the frequencies are arranged so that they do not cause undue interference to one another.

**Frequency Trading Units**

Standard blocks of spectrum defined by frequency, time and geography to act as a common unit for trading.

**FSA**

Financial Services Authority.

**FWA**

Fixed Wireless Access: radio link to the home or the office from a cell site or base station, replacing the traditional local loop.

**GHz**

GigaHertz, a frequency of one thousand million Hertz (cycles per second).

**GSM**

Global System for Mobile communications. The international operating standard for the second generation of digital cellular mobile communications.

**Guard band**

Frequency range between assignments to protect users on either side from out-of-band interference.

**Harmonisation**

Allocation of frequencies on an international basis, e.g. within Europe or globally, for particular radio services. Such frequency ranges are known as harmonised bands, or harmonised spectrum.

**HF**

High Frequency: portion of the electromagnetic spectrum typically used in short-wave radio applications, normally in the 3MHz to 30 MHz range.

**Interface requirements**

High level descriptions of how the spectrum should be used, typically consisting of the spectrum allocation table, together with requirements related to international transmissions in allocated frequency bands. All interface requirements are published at [http://www.ofcom.org.uk/licensing\\_numbering/radiocomms/fix\\_ed\\_ter\\_p2p\\_licensing/?a=87101](http://www.ofcom.org.uk/licensing_numbering/radiocomms/fix_ed_ter_p2p_licensing/?a=87101) and are quoted in Exemption Regulations and in licence conditions.



**Interference**

The effect of unwanted signals upon the reception of the 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.

**IR 2008**

Standard which permits data insertion into one of eight timeslots in the two or four second cycle used by TDMA PBR services.

**ITC**

Independent Television Commission.

**ITU**

International Telecommunication Union. The United Nations agency that co-ordinates and manages radio use worldwide through the international Radio Regulations that it promulgates. These have the status of an international treaty and are binding on member states.

**JFMG**

JFMG Ltd undertakes licensing of programme-making and special events spectrum on behalf of the RA, administering licences and collecting licence fees. JFMG Ltd, the successor to the Joint Frequency Management Group, is jointly owned by the ITV companies and the CRCA.

**JRC**

Joint Radio Company Ltd, which undertakes management of the scanning telemetry spectrum licensed to the gas and electricity utilities.

**Land Mobile**

A mobile service between base stations and land mobile stations, or between land mobile stations.

**L-Band**

A band of frequencies in the 0.5 to 2GHz range. Ofcom are currently undertaking a consultation on the future use of VHF frequencies and L-band, exploring possible applications which may include mobile services and digital sound broadcasting services.

**Liberalisation**

Relaxation of constraints on use of spectrum (e.g. technology employed or service provided) including variation to geographical coverage, power or frequency bandwidth occupied.

**Licence class**

Type of licence issued by Ofcom, for example PAMR or Wide area PBR. Volume classes refer to those licence classes for which there are significant numbers of licensees, for example on site PBR with 26,000 licensees and on-board maritime with 64,500.

**Licence exempt**

Under regulations made by Ofcom, some types of radio equipment are exempted from the requirement for a licence. The installation of such equipment is not a criminal offence, provided that the terms of the regulations are complied with. The current regulations are the Wireless Telegraphy (Exemption) Regulations 2003 (SI 2003 No. 74), available at:

<http://www.legislation.hmsso.gov.uk/si/si2003/20030074.htm>

**LMDS**

Local Multipoint Distribution Service.

**Marginal Spectrum**

Spectrum that may be surplus to the requirements of a given licensee, owing to reasons of it being on the margins of frequency or geography, or being unused overnight.

**MASTS**

Mobile technical Assignment Tool, an electronic assignment system currently under development for Ofcom.

**MCA**

Maritime and Coastguard Agency, also MCGA. Regulator of maritime and coastguard agency services.

**Mesh radio**

Broadband Fixed Wireless Access architecture that avoids the limitations of point-to-multi-point systems.

**MMDS**

Multichannel Multipoint Distribution Services: means of distributing television signals, through microwave from a single

transmission point to multiple receiving points, often used as an alternative to cable-based television.

**Mobile Satellite**

A service between mobile earth stations and one or more space stations, possibly including feeder links in operation.

**MoD**

Ministry of Defence

**MPT**

The prefix for the numbering sequence for UK national type approval specifications.

**Multiplexing**

Transmitting two or more signals over a single channel.

**NATO**

North Atlantic Treaty Organisation.

**Neighbouring Licensees**

Two or more adjacent licensees in terms of geography or frequency or both.

**NODL**

Non-Operational Development Licences (formerly known as Test and Development Licenses)

**NPV**

Net Present Value, the sum of a series of future discounted cashflows.

**Ofcom**

Office of Communications. Ofcom took over the RA's responsibility for spectrum management in the UK in December 2003.

**OFT**

Office of Fair Trading, which is the main UK competition authority and has certain responsibilities under the Enterprise Act in relation to merger control.

**Oftel**

Office of Telecommunications – the office of the Director General of Telecommunications – the previous telecommunications regulator whose functions transferred to Ofcom on 29<sup>th</sup> December 2003.

**Opportunity cost**

The potential value of an asset in the next best alternative that is foregone by virtue of its actual use.

**PAMR**

Public Access Mobile Radio.

**PBR**

Private Business Radio (previously known as Private Mobile Radio (PMR)) A private radio service installed and operated by businesses and public sector organisations to provide mobile communications for their own workforces. A base station is installed by each organisation on a suitable site providing local coverage, and used to send or receive short messages concerning the business of the organisation to, from or between, mobile units.

**PFD**

Power Flux Density.

**PMR**

Private Mobile Radio (PMR), see PBR.

**Point-to-multipoint**

Fixed link having at one end a multi-directional antenna for communication with multiple users over or relatively small area.

**Polite technologies**

Radio transmission techniques that are designed to minimise the impact of transmissions on other users of the radio spectrum. Examples of such technologies include Dynamic Frequency Selection (DFS) and Transmitter Power Control (TPC).

**Pooled frequencies**

Frequencies used by multiple users, on a non-exclusive, shared basis (for example, maritime on-board communications frequencies). Users of on-board communications equipment can use a range of pooled frequencies, or channels, to communicate. The user will choose a channel on which to communicate and will switch to an alternative channel if that one is busy.

**PPARC**

Particle Physics and Astronomy Research Council.

**Primary Assignment**

The initial allocation of spectrum by the regulator to the market.

### **Propagation**

The transmission of radio waves. Propagation characteristics depend on frequency and are affected by the environmental conditions, such as terrain and atmospheric conditions, encountered on the path.

### **PSB**

Public Service Broadcasting/Broadcaster.

### **PSD**

Power Spectral Density

### **RA**

The Radiocommunications Agency: former executive agency of the Department of Trade and Industry, previously responsible for the management of most non-military spectrum in the UK. The RA's functions transferred to Ofcom on 29<sup>th</sup> December 2003.

### **Radio Authority**

The regulatory body that oversaw and licensed radio broadcasting in the UK, whose functions transferred to Ofcom on 29<sup>th</sup> December 2003.

### **Radio-microphones**

Equipment used by programme-makers and organisers of special events.

### **Reconfiguration**

The redefinition of a right to use spectrum, for example, by separating one licence into two, or amalgamating two licences which are adjacent in terms of geography or frequency.

### **Refarming**

Migration from an outgoing to an incoming service on a particular range of spectrum.

### **Remote meter reading**

The reading of meters from a distance using radio.

### **Rolling Term Licences**

Licences whose term of validity continues until notice is given a defined period in advance.

### **Roll-out requirements**

Specific requirements relating to build or operation of radio networks.

### **RSA**

Recognises Spectrum Access.

### **Safety of life services**

Services provided by organisations who use radio spectrum to protect the lives of individuals, such as the emergency services.

### **Scanning Telemetry**

National channels that are licensed to the water, electricity and gas companies.

### **Secondary Market**

The market is created once the initial allocation of spectrum has been made by the regulator.

### **Site Clearance**

Permission to install or operate a radio transmitter at a particular site.

### **SME**

Small or Medium Sized Enterprise.

### **SMO**

Spectrum Management Organisation. An organisation that undertakes the administrative and technical management of part of the radio spectrum, usually limited to the identification of suitable assignments, record keeping, calculation of interference risks etc, and also the distribution of licences

### **Software Radio**

A type of technology that provides mechanisms to help deal with spectrum scarcity.

### **Spectrum Mask**

A mechanism designed to define the right to transmit with a tradable licence.

### **Spectrum Registry**

A central record of all licensees and all conditions associated with each licence established by Ofcom under section 170 of the Communications Act.

### **Spectrum tariff unit**

An average tariff per MHz of spectrum used. This average tariff is set at 50 per cent of the marginal values on which it was based, therefore the licence fees were multiplied by a factor of two in the calculation.

**Spectrum**

A continuous range of frequencies of electromagnetic radiation (for example, radio waves).

**T&D**

Test and development.

**TDMA**

Time Division Multiple Access.

**Telemetry**

The transmission of radio signals and coded data.

**TETRA**

Trans European Trunked Radio Access: A European Telecommunications Standards Institute (ETSI) standard for mobile radio, utilised by fleets of vehicles such as taxi cabs and emergency services e.g. police, fire services.

**TETRA2**

Trans European Trunked Radio Access Data Upgrade: An upgrade to the TETRA standard that provides additional functionality for data communications.

**Trading Regulations**

Regulations made under section 168 of the Communications Act to enact spectrum trading.

**Trunked radio**

A system in which users share or pool a number of radio channels. Frequencies are distributed by the system according to demand and traffic levels. Trunking can enhance spectrum efficiency in some circumstances.

**UK Plan for Frequency Authorisation**

A plan published by Ofcom setting out (a) the frequencies that in relation to the UK have been allocated for particular purposes and are available for assignment and (b) the purpose for which the different frequencies have been allocated.

**UMTS**

Universal Mobile Telecommunications System – a third generation mobile standard.

**Undue interference**

Interference with any wireless telegraphy that is harmful, as provided by section 183 Communications Act 2003. This includes interference that creates dangers or risks of dangers to the functioning of any radiocommunications service designed for the purposes of navigation or safety services, or if the interference degrades, obstructs or repeatedly interrupts authorised broadcasting or other wireless telegraphy.

**Use it or lose it**

A specification by the regulator that licensees should either effectively use their designated spectrum or face having their licence revoked.

**UWB**

Ultra Wide Band. A technology that spreads a signal thinly over a wide range of frequencies.

**VHF**

Very High Frequency (30 – 300 MHz).

**VSAT**

Very Small Aperture Terminal.

**Wireless LAN**

Wireless Local Area Network.

**WT Acts**

Wireless Telegraphy Act 1949 (as amended by the Wireless Telegraphy Act 1967) and Wireless Telegraphy Act 1998. These Acts are further amended by the Communications Act 2003. These Acts regulate the use of civil radio spectrum in the UK.

**WT Act licences**

Licences issued under the Wireless Telegraphy Act 1949 (as amended).