OFFICE OF COMMUNICATIONS

Business Radio Trading & Liberalisation

A statement on measures to liberalise and simplify Business Radio licensing (including measures to extend trading)

Statement

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Contents

Section 1

Executive Summary

1.1 This statement presents Ofcom's conclusions on taking forward reforms in the Business Radio (BR) sector following a public consultation published on 6 July 2006 and available at http://www.ofcom.org.uk/consult/condocs/brtrading/.

1.2 Ofcom is setting out its conclusions on changes to wireless telegraphy licence fees for a range of sectors, including BR, in a separate statement available at: http://www.ofcom.org.uk/consult/condocs/pricing06/statement/.

1.3 The main features of the proposals were a simplification of the BR licensing structure based on 5 licence products in place of the current 21 and an extension of spectrum trading.

1.4 At present, there are 21 different BR licence products for different types of business. For example, there are different licences for paging or for data. Consequently, a firm wishing to change the nature of its business or to diversify may well have to apply to Ofcom for a new licence or a variation of its existing licence. This can hold back desirable changes in spectrum use to the detriment of consumers and businesses and constitutes a regulatory burden on businesses. The changes described in this Statement will streamline the product range into just 5 separate licence products, which will give licensees greater flexibility to use radio for a wide range of business activities without the need to seek Ofcom's permission for change of use and will also bring about improvements in the efficiency with which spectrum is utilised.

1.5 In addition, more BR licences will be made tradable and the permitted ways of trading will be widened making it easier to transfer spectrum rights to those who can make use of them to generate greater value. This will also make it easier and simpler for businesses to re-structure without having to apply for a new licence in the name of a new corporate entity.

1.6 Liberalisation and trading are at the heart of Ofcom's drive to secure optimal use of the radio spectrum and promote innovation and competition by giving users greater freedom to decide how best to use the spectrum to generate higher benefits for consumers. The rationale for this approach has been set out in Ofcom's Spectrum Framework Review (http://www.ofcom.org.uk/consult/condocs/sfr/) and numerous other publications. Ofcom has already begun to apply these principles in the BR sector; the planned introduction of new spectrum assignment tools will make possible a significant further advance as described in this Statement.

1.7 The consultation sought views on the following proposals.

- *Simplifying current BR licensing arrangements.* It was proposed to replace the current 21 licence classes with just 5 licence products in 3 generic licence classes according to the degree of technical planning and coordination involved in making assignments. The proposed licence products were Area Defined, Technically Assigned and 3 Light Licensing products. This will remove much of the current usage-based segmentation of Business Radio spectrum and allow users far greater choice as to the purpose to which they use spectrum without the need to seek permission from Ofcom.

- *Making more licences tradable.* It was proposed to make a wider range of licence classes in the Business Radio sector tradable.

- *Publication of information.* In order to support the extension of spectrum trading, it was proposed to publish similar information in the register of licences about the BR licences that Ofcom intends to make tradable as is currently published about licences that are already tradable.

- *Introducing greater security of tenure for licensees.* It was proposed to extend the notice period for licence revocation for spectrum management reasons to 5 years for all BR licences. At present, there is no formal notice period.

1.8 Ofcom received 13 responses, 2 of which were confidential. Respondents are listed in Annex 1 and the non-confidential responses are published on Ofcom's website at http://www.ofcom.org.uk/consult/condocs/brtrading/responses/. Ofcom is grateful for these responses and has carefully considered them in reaching the conclusions set out in this Statement.

1.9 The majority of respondents broadly supported Ofcom's proposals. However, several stakeholders felt that the technical nature of the proposals and their complexity made it difficult to assess the implications for spectrum users. In response to these comments, we held a number of bilateral meetings with industry representatives and organised two further workshops to clarify the proposals and discuss the issues raised. The presentations given at these workshops are available at: http://www.ofcom.org.uk/consult/condocs/brtrading/.

1.10 In light of the responses to the consultation and the further dialogue with stakeholders, Ofcom has modified its original proposals. This Statement describes the modifications, clarifies various aspects of Ofcom's proposals and discusses issues raised in the responses.

1.11 Ofcom has decided to modify its proposals in two respects.

- Firstly, some respondents pointed out that holders of Technically Assigned licences for multi-site systems with overlapping coverage will be charged higher fees because Technically Assigned licence fees depend on the number of base stations. Such systems can be more spectrally efficient than systems that do not have overlapping coverage and it would be contrary to the aims of AIP to charge them more. Ofcom has therefore decided to modify its proposals to allow users to convert, subject to certain conditions, from Technically Assigned to Area Defined licences, fees for which do not depend on the number of base stations deployed.

- Secondly, some respondents raised concerns that allowing spectrum segmentation for Technically Assigned licences through a partial trade could lead to interference between assignments with different channel spacings. To protect against this, Ofcom will assess the interference potential of all such proposals by using the new Mobile Assignment Technical System (MASTS) modelling tool before deciding whether to allow them to proceed.

Next steps and timetable

1.12 To implement the measures described in this Statement, Ofcom will need to make various regulations to introduce the new licence products, to extend spectrum trading, to provide for publication about assignments and to introduce the new

licence fees. Ofcom plans to consult on all these regulations during the course of 2007.

1.13 There are three key milestones in the implementation of the measures described in this Statement:

- The **implementation date**, at which the regulations on BR licensing and trading will enter into effect. After this date, new applicants will be able to apply for one of the new licence products. Until that date, new licences that are issued will continue to be in one of the existing 21 licence classes.

- The **conversion date**, from which licences that have already been issued will be converted to new licence products. This date will be in the months following the implementation date, on which the new regulations take effect. A notice will be sent to each individual licensee affected.

- The **fee change date**, at which the new fees come into effect for existing licensees. This date might not be until some time after the conversion date.

1.14 Ofcom will be making available further information on the dates and timeline for implementing the BR reforms throughout 2007. Because of the dependence of the reforms on the development and implementation of major new IT systems, the implementation date, when the regulations take effect, is not expected to be before early 2008.

Summary of changes to Business Radio licensing products

1.15 As described in the consultation document and elsewhere in this Statement, the new BR licence products will substantially streamline the BR licensing product range and give users considerable added flexibility as to the type of business they can carry out or the use they can make of the spectrum without having to apply to Ofcom for licence variations. The changes are summarised in the following tables.

- Table 1.1 summarises the main characteristics of the radio systems covered by each of the new licence products.

- Table 1.2 summarises the changes in terms of the increased flexibility from this liberalisation, the extent to which licence rights and obligations may be traded and the application process.

- Table 1.3 maps how existing licences will migrate to the new types.

- Table 1.4 summarises the effects of the changes.

Table 1.1: Summary of characteristics of new licence products

Licence class and product		Description of licence
BR Area Defined		• Covers whole of UK, one or more Nations (ie England, Scotland, Wales or Northern Ireland) or a region down to 50 km grid squares. • Spectrum mask, boundary conditions, exclusive use of frequencies in the licensed geographical area, no technical assignment by Ofcom of individual base stations. • No limit on base station deployments or mobile numbers within the licence area.
BR Technically Assigned		• On-site to wide area coverage but less than a Nation. • Shared or exclusive spectrum within the geographical area with technical assignment and coordination undertaken by Ofcom. • Application-neutral, technical specification of base station defines coverage. • Base station position(s) specified, no limit on number of mobiles.
Light Licensing	BR Simple UK	• Set of frequencies available for mobile to mobile use only, anywhere in UK, no technical coordination by Ofcom. • Standard technical conditions. • No limit on number of mobiles.
	BR Simple Site	• Set of frequencies available for on-site, shared spectrum, fixed location, no technical coordination by Ofcom. • Standard technical conditions. • No limit on number of mobiles.
	BR Suppliers	• Set of frequencies for on-site to wide area coverage, shared spectrum, no technical coordination by Ofcom. • Standard technical conditions. • No limit on number of mobiles.

Table 1.2: Summary of liberalisation, trading and application process

Licence class and product	Liberalisation	Trading	Application process
Area Defined	• Wider flexibility to change use and application without reference to Ofcom. • Single set of flexible application-neutral technical requirements.	Full transfers • Outright transfers of all rights and obligations. • Extension of trading to UHF1 (420-450 MHz). Partial transfers • Geographical segmentation possible down to a minimum trading unit (50 km grid square). • Spectrum segmentation to a minimum channel width of 6.25 kHz.	• On-line • Annual fee payments
Technically Assigned	• Introduction of MASTS tool to make assignments allowing wider flexibility to change use, application and number of mobiles without reference to Ofcom. • Technical parameter changes are allowed through licence variation. • Changing Technically Assigned licence to Area Defined licence allowed through licence variation. • Single set of flexible application-neutral technical requirements.	Full transfers • Outright transfers of all rights and obligations. • Extension of trading to UHF1 (420-450 MHz). Partial transfers • Spectrum segmentation to a minimum channel width of 6.25 kHz (subject to clearance by Ofcom and prior licence variation). • Transfers of individual assignments where licence covers more than one assignment.	• On-line • Annual fee payments
Light Licensing comprising Simple UK Simple Site Suppliers	Single set of application-neutral equipment requirements.	Not applicable. These licence products are not being made tradable as there is no limit on how many can be granted and tradability would confer no advantage.	• On-line application • Fee payment every 5 years

Table 1.3: Mapping of conversion from current to new liberalised licence products

Current licence products	Liberalised licence products
Business Radio (Public Wide Area Paging) Business Radio (Public Mobile Data, Non-Voice) Business Radio (National and Regional) Business Radio (Tetra Digital PAMR) Business Radio (CDMA Asset Tracker) Business Radio (Remote Meter Reading Operator) - Exclusive channel	BR Area Defined
Business Radio (Analogue PAMR) Business Radio (Common Base Stations) Business Radio (Remote Meter Reading Operator) - Shared channels Business Radio (Wide Area Speech and Data Systems) Business Radio (Wide Area One-Way Paging and Speech Systems) Business Radio (Wide Area Distress Alarms) Business Radio (Band 1 and Band III CBS) Business Radio (IR2008 Data) Business Radio (On-Site Speech and Data Systems) Business Radio (On Site Hospital Paging and Emergencies Speech Systems	BR Technically Assigned
	Light Licensing comprising
Business Radio (UK General)	BR Simple UK
Business Radio (On-Site Local Communications) Business Radio (On-Site One-Way Paging and Speech) Business Radio (Self-Select)	BR Simple Site
Business Radio (Suppliers)	BR Suppliers

The Business Radio (Standard) licence product is to be withdrawn from July 2007. Licensees in that class have been given the opportunity to transfer to a corresponding licence product.

Table 1.4: Summary of Business Radio changes

Benefits of trading and liberalisation measures	• Simplification and rationalisation of licence classes from 21 different licence types to 5:
	  o Technically Assigned
	  o Area Defined
	  o 3 Light Licensing products (Simple UK, Simple Site, Suppliers)
	• New, consistent and more transparent technical assignment process with:
	  o more efficient use of spectrum than is possible with our current approach (in many cases, a greater number of assignments will be possible within a given area while maintaining spectrum quality benchmarks);
	  o automated and faster assignment process for Technically Assigned licences;
	  o extended on-line application and management of licences.
	• Greater flexibility to change the application or use of spectrum (eg change of business from taxi to haulier or from paging to data) within technical parameters of the licence.
	• Enhanced opportunities to buy and sell spectrum
	  o Rights to trade extended to all BR licences (except Light Licensing classes for which trading is not relevant);
	  o Greater flexibility in ways spectrum can be traded.

Implications for licence holders	• New licences to replace existing licence with benefits outlined above. • Enhanced security: licences of indefinite duration with 5 year minimum notice period in most cases. • Re-balancing of fees with same or lower fees for about 90% of licences. Those facing fee increases will have opportunities to mitigate them in most cases. • Licence technical parameters and conditions remain broadly similar to current licences with no changes to existing technical assignments. • Interference management and enforcement unaffected.

Section 2

Introduction

2.1 On 6 July 2006, Ofcom published a consultation document on proposals to liberalise and simplify BR licensing and to extend spectrum trading. The consultation received 13 responses, of which two were confidential. The majority of the responses broadly supported Ofcom's approach to spectrum trading and liberalisation in the BR sector although they raised a number of detailed questions.

2.2 Spectrum liberalisation and trading[1] are at the heart of Ofcom's drive to give spectrum users greater freedom to use spectrum to generate higher benefits for consumers through innovation and competition. The rationale for this approach has been set out in Ofcom's Spectrum Framework Review (SFR)[2] and numerous other publications. Ofcom believes that market mechanisms are, generally speaking, more likely than the alternatives to secure optimal use of the radio spectrum as required by its duties under section 3 of the Communications Act 2003. This is because decisions on how best to use the spectrum can then be taken by those directly involved in the market instead of being dictated by the regulator.

2.3 Ofcom began to apply these principles in the BR sector in phase 1 of its spectrum trading and liberalisation policies in 2003 and early 2004 when, because of the limitations of Ofcom's assignment tools, it was necessary to restrict spectrum trading and liberalisation in the BR sector[3]. Consequently, opportunities to trade were limited and licences were narrowly specified as to the services that could be provided so that businesses had to apply to Ofcom for a licence variation if they wished to change their use of the spectrum. There are different licence classes for different types of business so it is currently necessary, for example, for a firm wishing to switch between paging and data transmission to obtain permission from Ofcom to use radio systems for its new business. This is a source of delay and regulatory uncertainty, risks holding back desirable changes in spectrum use to the detriment of consumers and businesses and constitutes a regulatory burden on businesses.

2.4 Ofcom said in its statement on liberalisation4 that it intended to extend trading and liberalisation in the BR sector once it had introduced MASTS, Ofcom's new assignment tool. MASTS is now expected to enter service later this year or early in 2008, which will make it possible to progress to phase 2 of BR trading and liberalisation during the course of 2008. The measures proposed in the consultation and described in this Statement will extend trading within the Business Radio sector from about 8,500 assignments at present to over 50,000 and make licences more generically flexible by streamlining the product range from 21 to just 5 separate licence types. The latter change will give licensees greater flexibility to use radio for a wide range of business activities without having to apply to Ofcom for individual licence variations on each occasion.

[1] *Liberalisation* is the removal from WT licences of restrictions on how the spectrum is used. *Trading* is the transfer of rights and obligations arising from a WT licence.
[2] http://www.ofcom.org.uk/consult/condocs/sfr/
[3] In Phase 1, liberalisation was limited to analogue PAMR, data networks, national paging and national and regional PBR; trading was restricted to those classes plus CBS; and geographical segmentation was not permitted.
[4] http://www.ofcom.org.uk/consult/condocs/liberalisation/statement.pdf

Overview of responses to the consultation

2.5 The responses to the July 2006 consultation broadly supported the extension of liberalisation and trading in the BR sector but made a number of comments on the proposals. Ofcom accordingly intends to proceed to implement its proposals as modified in the light of stakeholders' comments. Ofcom believes that these changes will bring about the following benefits:

- significant additional liberalisation in the sector through adoption of generically more flexible licences and spectrum management techniques;
- extended opportunities to trade spectrum to a significantly increased range of licence classes and licensees;
- simplified and rationalised licensing arrangements with a more deregulatory approach in line with Ofcom's duty to avoid unnecessary regulatory burdens.

2.6 Ofcom is issuing a separate Statement on changes to wireless telegraphy licence fees for a range of sectors, including BR. This can be found at: http://www.ofcom.org.uk/consult/condocs/pricing06/statement/.

2.7 This Statement refers in various places to the legislation governing the management and use of the radio spectrum. From 8 February 2007, provisions on radio spectrum from a number of statutes, including the Wireless Telegraphy Act 1949, the Wireless Telegraphy Act 1998 and the Communications Act 2003, are being consolidated without substantive change in the Wireless Telegraphy Act 2006. After that date, this Statement should be read as referring to the corresponding provisions of the new Act. For further details about the Wireless Telegraphy Act 2006, see the notice at: http://www.ofcom.org.uk/radiocomms/ifi/wtact2006/.

Structure of document

2.8 The structure of the rest of this document is as follows.

- Section 3 summarises the proposals and main issues arising from the consultation and sets out Ofcom's conclusions.
- Section 4 sets out next steps following the publication of this statement.
- Annex 1 lists respondents to the consultation.
- Annex 2 gives an overview of the Business Radio reforms.
- Annex 3 provides a detailed summary of the main issues raised by respondents and Ofcom's response.
- Annex 4 summarises the WT licence fee proposals.
- Annex 5 contains an Impact Assessment.
- Annex 6 is a glossary.

Section 3

Main issues raised in the consultation and Ofcom's conclusions

Introduction

3.1 Ofcom consulted in July 2006 on proposals to simplify and liberalise licensing in the Business Radio sector by removing restrictions from licences and to extend spectrum trading in the sector. This formed part of Ofcom's ongoing policies on spectrum liberalisation[5] (ie the reduction or removal of restrictions on the use that can be made of spectrum) and trading[6].

3.2 The consultation and the non-confidential responses are available at: http://www.ofcom.org.uk/consult/condocs/brtrading/ . This section outlines Ofcom's proposals, summarises the main issues arising from the consultation and gives Ofcom's conclusions on these. There is a more detailed account of the proposals, the responses to the consultation and Ofcom's response to these in annexes 2 and 3.

3.3 At the same time, Ofcom consulted separately on proposals to revise licence fees, including in the BR sector. This Statement refers to these proposals and summarises them in annex 4. Ofcom's conclusions on licence fees are set out in a separate Statement being published at the same time as this document. The consultation, responses and accompanying Statement on licence fees are available at: http://www.ofcom.org.uk/consult/condocs/pricing06/

Overview of proposals

3.4 Ofcom's proposals on BR liberalisation and trading had three main aspects.

- First, removing limitations on the type of business or radio traffic carried and simplifying the licence structure would enable a radical reduction in the number of separate licence classes from 21 to 5. The proposed new licence classes were broader than the previous narrow segmentation and would give licensees greater flexibility and freedom to change the purposes for which, and the ways in which, they use their radio systems while also enabling gains in spectrum efficiency to be realised.

- Second, they would extend spectrum trading to BR licence classes that are not currently tradable and allow assignments to be subdivided and partially transferred in ways that are not currently permitted.

- Third, they would give licensees greater certainty by making licences perpetual with a 5-year notice period in most circumstances and introduce administrative improvements that will reduce the regulatory burden on licensees, for example through simplified and e-enabled assignment processes.

[5] http://www.ofcom.org.uk/consult/condocs/liberalisation/
[6] http://www.ofcom.org.uk/consult/condocs/spec_trad/

Liberalisation

3.5 The new simplified and more flexible licensing structure in the BR sector will consist of just 5 licence products in place of the existing 21 separate licence types. The new licence products correspond to the 3 assignment processes depending on the extent to which Ofcom carries out technical planning and coordination:

- **Area Defined** licences that are assigned by Ofcom subject to boundary conditions within which the licensee plans system deployment;
- **Technically Assigned** licences that are planned by Ofcom as part of the assignment process;
- Three Light Licensing products with no technical coordination:
    - **Simple UK**
    - **Simple Site**
    - **Suppliers**

3.6 The introduction into service of Ofcom's new technical assignment system, MASTS, means that it will no longer be necessary or proportionate to maintain many of the distinctions between BR services that are currently contained in BR licence conditions.

3.7 In parallel the licence application process will be simplified and the assignment process will become automated, and hence quicker, for a larger proportion of licence applications. The use of longer intervals between fee payments for Light Licensing products will mean that there is a less frequent requirement for licence renewal.

3.8 There will also be benefits in terms of spectrum efficiency. Collapsing the existing 21 licence products into 5 will mean that new licence applications will be able to access a larger proportion of the BR channel plan for their particular type of use instead of being restricted to one of the current 21 groups of channels earmarked for the each of the existing licence categories; and the introduction of the new assignment tool, MASTS, will allow more assignments to be made for Technically Assigned licences within the same amount of spectrum while preserving margins of safety to avoid excessive interference.

3.9 The new licence products are described in the following paragraphs.

Area Defined licences

3.10 The **Area Defined** class will replace 6 existing licence classes[7], each of which is for a different use. Area Defined licences offer:

- more flexibility from removal of current licence restrictions on type of use;
- enhanced flexibility to trade licences with geographical segmentation down to 50 km grid squares (see below);
- a single fee structure to support these flexibilities.

[7] See table 1.3 for details.

3.11 They are suitable for networks that are run on a national or wide area regional basis and need exclusive access to spectrum. Such networks are often of strategic or national importance – for instance for rail networks, utilities major distribution networks and some other types of transport – and tend to be professionally installed and run. Ofcom's new approach is to define the extent of the area by reference to the aggregate total number of 50 km national grid squares covered (unless it is the whole UK) and to define boundary conditions for the transmission limits.

3.12 Some existing licence products that will be mapped across to the new Area Defined products are already tradable with the exception of licences within in UHF1 band. However, under Ofcom's proposals, all the Area Defined licences, including those in UHF1 will become tradable.

3.13 Ofcom will proceed to make licences of indefinite duration subject to payment of an annual fee. Ofcom would give 5 years' notice which will bring the licences into line with BR licences that are already tradable. As discussed in the Statement on spectrum trading[8], the 5 year period strikes a balance between certainty for licensees and flexibility for Ofcom to manage the spectrum. There may be circumstances in which a shorter notice period is necessary, for example breach of licence terms or spectrum regulations or non-payment of the licence fee or if the revocation or variation is on the grounds of national security, compliance with an international obligation, breach of spectrum regulations or a requirement to comply with a direction from the Secretary of State.

3.14 Licence fees are discussed in detail in the Statement on spectrum pricing that is being published in parallel with this document. Some 40% of Area Defined licensees will be faced with fee increases but these are not solely or primarily attributable to the licence restructuring covered by this Statement. As discussed in annex 5, licensees will be able to take steps to mitigate their fees.

Technically Assigned licences

3.15 The **Technically Assigned** class will replace ten separate licence classes[9], each of which is for a different use. Technically Assigned licences offer:

- greater flexibility from the removal of current licence segmentation by type of use or traffic;
- increased spectrum efficiency from use of the new MASTS tool, which is capable of making assignments from a single pool of channels without spectrum fragmentation;
- tradability;
- a new fee structure.

3.16 Technically Assigned licences are designed for users at one or more business sites who require a network that is tailored to their individual needs. Such systems normally involve a base station and a number of mobiles operating within a set coverage area, although more sophisticated networks may involve more than one base station. Such use will typically include local delivery services, local government

[8] http://www.ofcom.org.uk/consult/condocs/spec_trad/
[9] See table 1.3 for details.

and transport services, taxis and couriers, bigger industrial sites and many other private uses.

3.17 Ofcom will proceed to make licences be of indefinite duration subject to payment of an annual fee. Ofcom would give 5 years' notice save in exceptional circumstances if the licence was to be revoked for spectrum management reasons but may give a shorter period of notice if directed by the Secretary of State or in order to comply with an international obligation.

3.18 A new feature not currently available for many licences that will be converted to the Technically Assigned class is that assignments will be transferable in accordance with trading regulations made by Ofcom.

3.19 Licence fees are discussed in detail in the Statement on spectrum pricing that is being published in parallel with this document. Ofcom estimates that 72% of Technically Assigned licensees will experience a fee reduction or no increase. Some licensees will be faced with fee increases but these are not solely or primarily attributable to the BR licence reforms but result instead from a general review of the fee structure. As discussed in annex 5, licensees will be able to take steps to mitigate their fees.

Light Licensing

3.20 Light Licensing (ie a simple licensing process without technical assignment) will apply to 3 products: **Simple UK**, **Simple Site** and **Suppliers** licences. These replace 5 different licence products[10] and will share a simple licensing process and low fees at £75 to cover a 5 year period, which represents an average 60% reduction compared to present fees.

3.21 Light Licensing is intended for users who are willing to use the same radio frequencies as other users using limited power over restricted areas. This means that frequencies can be extensively shared on a geographical basis without causing harmful interference and assignments are not coordinated. Typically, a block of frequencies is available for short-range operation. This is suitable for users of their own paging systems or short-range voice communications (eg for a single store or site). These systems can consist of a group of mobiles that can be used together anywhere in the UK or a single base station with linked mobiles.

3.22 There are three key differences between the Technically Assigned and Light Licensing classes. Technically Assigned licences provide greater geographical coverage, are subject to technical coordination by Ofcom in the assignment process and attract a higher fee. Light Licensing provides lower coverage without technical coordination but attracts a lower fee. Technically Assigned licences are suitable for users who need greater coverage than can be achieved under Light Licensing and also for those whose coverage requirements are less but who, nonetheless, which to avail themselves of the additional assurance on spectrum quality that is provided by technical coordination.

3.23 The **Simple UK** licence is for systems without base stations and the **Simple Site** licence is for systems with base stations. The **Suppliers licence** is a specialist product for businesses that supply short-range communications systems and services to others and incorporates a higher power limit and maximum antenna height as described in annex 2.

[10] See table 1.3 for details.

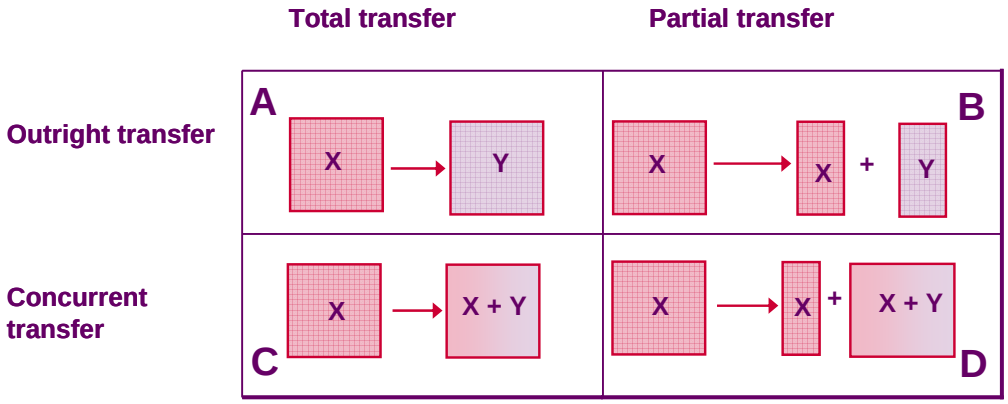
Spectrum trading

3.24 The responses confirm Ofcom's view that it would be beneficial to make Area Defined and Technically Assigned licences tradable. Ofcom envisages that the trading procedure will be the same as for licences that are already tradable. This involves notification to Ofcom and, provided that Ofcom consents to the transaction, the issue of a new licence or licences to the parties. The trading regulations on which Ofcom will be consulting in due course (see section 4 below) will specify the circumstances in which consent may be refused.

3.25 Ofcom intends to provide considerable flexibility in the ways (or 'modes') in which trading will be allowed. For example, a transfer may be *total* or *partial* (depending on whether the totality of the rights and obligations are transferred or only some of them) and *outright* or *concurrent* (depending on whether the transferred rights and obligations vest in the purchaser and are relinquished by the vendor or are exercised simultaneously by the vendor and the purchaser). The possible modes of trade are illustrated in the following figure 3.1.

3.26 This marks a considerable extension of trading compared to the present situation, in which only the licences that currently make up the Area Defined class and Common Base Station and Analogue PAMR licence classes are tradable and geographical segmentation is not permitted.

Figure 3.1: Possible modes of trade



3.27 Ofcom does not intend to make the Light Licensing products tradable. Because the spectrum is so heavily shared on a geographical basis, there is effectively no scarcity in the bands set aside for these systems and therefore no real advantage in making licences transferable.

Responses to Ofcom proposals

3.28 Ofcom received 13 responses as listed in annex 1. These broadly supported the proposals but made a number of comments that are addressed in this Statement and Ofcom has modified its proposals in the light of these. Several respondents felt that the complexity and technical nature of the proposals made it difficult to understand them and their implications for spectrum users. To address this concern, we held a number of meetings with stakeholders and their representatives and organised two further workshops with respondents to explain the proposals and discuss the issues raised.

3.29 Respondents supported Ofcom's proposals to simplify its current licensing process for Technically Assigned licences and the use of the new modelling tool (MASTS). However there were concerns in relation to trunked system and several comments about the MASTS process.

3.30 All respondents supported Ofcom's proposals for the Business Radio Area Defined Licence class, although several asked about the granularity of trading units and availability of spectrum. All respondents agreed with Ofcom's simplification proposals for the Business Radio Light Licence class.

3.31 Most respondents supported Ofcom's proposals for trading, including the proposal to extend trading to the UHF 1 band. However, some expressed concerns that trading could lead to a reduction in spectrum available to BR users and that the proposal to allow spectrum segmentation through partial trading in the Technically Assigned licence class could lead to interference.

3.32 All respondents supported Ofcom's proposals to make changes to BR licence terms and conditions.

3.33 The following paragraphs discuss Ofcom's conclusions on particular issues that attracted comment. These are the effect of liberalisation on licence fees, the geographical sub-divisibility of Area Defined licences, spectrum quality, spectrum segmentation, publication of information and the technical parameters of licences. They are relevant in differing degrees to all 5 licence products but mainly relate to Technically Assigned licences. The following paragraphs also explain how Ofcom has decided to modify its proposals. Annex 3 provides a more comprehensive and detailed analysis in tabular form of the comments received in response to the consultation.

Effect of liberalisation on licence fees

3.34 The majority of BR licensees will experience no change in fees or fee reductions as a result of the liberalisation measures themselves. Some will face increases but, as described in the impact assessment at annex 5, will be able to take steps to mitigate these, for example by electing to share spectrum instead of having exclusive coverage.

3.35 The position on fees is complicated because fees are also changing as a result of the general rebalancing in the application of administered incentive pricing (AIP) fee levels that Ofcom is conducting at the same time. That review of fee levels to apply AIP more consistently is the subject of a separate Statement[11] being published in parallel with this Statement and will result in fee increases for some Area Defined and Technically Assigned licences but, as noted above, the majority will pay less or the same. The total of the fees paid by those in the BR sector for their spectrum licences will remain unchanged.

3.36 The primary reason behind the increases where these occur is the introduction of an intermediate geographical pricing tier in new licences (based on population density as a proxy for congestion on the more popular bands). For some existing licence classes, current fees are high in central London, but all other cities and urban areas are currently treated as if they were uncongested. For some other current licence classes, there is no congestion charging by location and current fees are artificially low for historic reasons in some cases. The new intermediate tier will reflect

[11] http://www.ofcom.org.uk/consult/condocs/pricing06/

population densities in most metropolitan and urban areas, where there is greater pressure for assignments.

3.37 These changes do not result solely or primarily from the liberalisation of BR licences and would have occurred regardless of whether BR licences were restructured. Ofcom's reasons for revising AIP are explained in the Statement on spectrum pricing and are not discussed in depth in this Statement, which focuses as far as fees are concerned, on changes that result directly from BR liberalisation.

3.38 Nonetheless, there is one particular respect in which the liberalisation proposals discussed in this Statement will affect licence fees separately from the general rebalancing, namely the setting of fees for Technically Assigned licences according to the number of base stations and how this would work in practice. This is discussed below.

Trunked systems

3.39 Several respondents commented that the proposals for Technically Assigned licence fees did not take into account spectrally efficient trunked systems used by the utilities and transportation industries. The fee proposals are based on a single-site coverage model in which a fee is attached to each base station frequency assignment. It is important to note that this is the same model that is used for the majority of the current licence classes which will fall in the new Technically Assigned licence class. Ofcom accepts, however, that, although this model is appropriate for the vast majority of licences and is simple to understand and administer, it might not be ideal for large multi-site trunked systems.

3.40 Ofcom recognises that such systems use spectrum efficiently and has worked with the respondents concerned to consider whether to modify its proposals so as to allow them to benefit from pursuing other licensing options.

3.41 The aim of AIP is to promote more efficient use of spectrum. Spectrum efficiency is affected by a number of variables. However, incorporating too many of these or having too many pricing bands will make fee structure more complicated. Although this might in theory be more precise than a simpler alternative, the theoretical advantages can be outweighed by practical drawbacks if the fees structure becomes too unwieldy or so complicated that it is obscures how users' decisions will affect their fees. Ofcom's objective is a fee structure that is effective and transparent without being disproportionately complicated or impracticable to implement.

3.42 After careful consideration, we believe that the best option, bearing in mind the considerations outlined above, is to proceed with the proposal to set fees for Technically Assigned licences according to the number of base stations but to modify it to allow licensees to convert Technically Assigned licences into an Area Defined licences through licence variation where:

- all the Technically Assigned assignments within the area to be converted to one Area Defined licence are held by the same licensee or by concurrent licensees;
- the boundary power density at the geographical boundaries and beyond does not exceed the limit of -116dBm/12.5 kHz contained in Area Defined licences.

3.43 The area covered by the new Area Defined licence following conversion will be defined by reference to 50 km grid squares with the smallest area representing one grid square.

3.44 These conditions reflect the limit on the extent to which Area Defined licences may be sub-divided geographically, the exclusive nature of Area Defined assignments and the need to avoid excessive interference. Geographical sub-divisibility of Area Defined licences is discussed further below.

3.45 Some licensees affected might prefer to convert to Light Licensing products if their required coverage area is sufficiently small and they do not require technical coordination. This will reduce their fees compared to what they would have paid for a Technically Assigned or Area Defined licence.

3.46 This modification of the original proposals will enable licensees with trunked systems to mitigate the effect of fee increases, subject to meeting the above conditions, while maintaining incentives to adopt spectrally efficient trunked systems. Ofcom will keep the situation under review and assess whether any further modifications are needed in relation to trunked systems.

Geographical sub-divisibility of Area Defined licences

3.47 Under Ofcom's proposals, the coverage of an Area Defined licence is defined in terms of minimum units of 50 km grid squares. Several respondents felt that 50 km grid squares would not provide sufficient flexibility, especially in London. Larger grid squares make for a simpler fee structure but mean that a licensee with a base station near the edge of a square could need an assignment covering two or more squares with a combined area in excess of the area in which the licensee wishes to provide a service. This edge effect is inevitable with any system based on grid squares but is less pronounced with smaller squares since these allow desired coverage areas to be mapped more precisely. On the other hand, the fee structure then becomes more complicated to implement.

3.48 Currently, geographical segmentation is not permitted at all for national licences. So the introduction under the new regime of 50 km grid squares to create Area Defined licences at sub-national level will add considerable flexibility for users to trade spectrum compared to the present situation. However, Ofcom acknowledges that it is relevant to monitor whether flexibility might need to be further enhanced by reducing the size of the minimum tradable unit of area below a 50 km square. Ofcom will monitor how the proposed reform works in practice to assess whether the limitation on divisibility of geographical coverage has material adverse consequences in practice for licensees and whether it needs to be revised and, if relevant, will work with the BRIG (Business Radio Interest Group) to explore the scope for enhancing flexibility further by reducing the grid square size.

3.49 We note that in area such as London, it will be possible under the proposals for more than one user to access the spectrum through the use of concurrent trading of an Area Defined licence for a single 50 km grid square.

Spectrum quality and interference

3.50 Some respondents expressed concern about a risk of increase in harmful interference if licensees availing themselves of the additional flexibility were to operate outside their licence terms and conditions.

3.51 Ofcom agrees that this is an important issue and has carefully designed the proposals for BR liberalisation and the more flexible licences to incorporate processes, terms and conditions to avoid excessive interference. As outlined in annex 7 to the consultation document, Ofcom will use its technical assignment tool,

MASTS, to continue to plan assignments of Technically Assigned licences in detail and manage the risk of interference. Ofcom plans to publish an information sheet giving further details of the MASTS process and algorithm in mid-2007.

3.52 As mentioned above, the introduction of MASTS has the potential to allow more assignments to be made for Technically Assigned licences within the same amount of spectrum by comparison with the current assignment process. This is because the current process is not supported by analytical tools and so results in the use of conservative assumptions about separations between adjacent assignments in order to avoid unacceptable levels of interference. MASTS will enable assignments to be planned more precisely so that more users can be accommodated in a given frequency band while maintaining the existing spectrum quality benchmarks. However, we do plan to adopt a relatively cautious approach initially to increasing the density of assignments and will monitor the effects before further reducing separations.

3.53 Moreover, Ofcom will continue its active role in investigating and resolving interference problems, including any that arise following licence variation. Nothing in the proposals changes this position. Further detail of Ofcom's enforcement policies in this regard can be found in the Ofcom's statement on spectrum liberalisation published on 26 January 2005 and available at: http://www.ofcom.org.uk/consult/condocs/liberalisation/statement.pdf.

Spectrum segmentation

3.54 Ofcom proposed to make the new BR licences tradable, including provision for partial transfers (ie transactions in which only some of the rights and obligations under a licence are transferred). Some respondents expressed concern that allowing spectrum segmentation for a Technically Assigned licence through partial transfers could lead to a risk of interference between assignments with different channel spacings. Clarification was also sought on the process for partial transfers of Technically Assigned licences.

3.55 Ofcom appreciates the reasons for this concern. For example, 2 x 6.25 kHz channels created from a 1 x 12.5 kHz channel could cause interference problems if assignments were made on both rasters in the same geographical area on a shared basis. Accordingly, Ofcom has decided to modify its proposals by introducing a further stage in the process of spectrum segmentation. The original proposal was to allow this to proceed through spectrum trading by way of partial transfer. Ofcom accepts that this would not give it sufficient opportunity to check the risk of increased interference. Accordingly, we will require spectrum segmentation through partial transfer to be effected through a licence variation. This will involve the licensee in submitting proposals to Ofcom so that we can first check any risk of increased interference and manage coexistence between different channel spacings using the MASTS modelling tool before consenting to the partitioning. It might be necessary to refuse the variation request or to make a completely new assignment in order to facilitate the partitioning if the proposed segmentation would cause interference to other licensees.

3.56 This can be illustrated by an example. In the case of a Technically Assigned licence with a 1 x 12.5 kHz channel assignment, a licensee wishing to undertake a partial transfer would first apply through the licence variation process to segment the assignment into 2 x 6.25 kHz channel assignments. Ofcom will then assess the interference risk and, if satisfied, grant the licensee a revised licence with two 6.25

kHz assignments. The licensee could then trade these via the partial transfer procedure.

3.57 This procedure will be more burdensome for those wishing to trade by a partial transfer of spectrum but Ofcom believes that it is an effective and proportionate response to the concerns expressed in the consultation.

Publication of information by Ofcom to facilitate trading

3.58 Respondents had different views on the publication of licence information and on the amount of information that should be published in the Wireless Telegraphy Register (the "WT Register")[12]. Some respondents expressed concern that publication of information about BR licences or trades would reveal information that was sensitive from a commercial or security point of view while others suggested that, for trading to be successful, it was essential that the register contained as much information as possible.

3.59 The establishment of a successful secondary market for spectrum, as for any other market, depends crucially on the provision of information so that prospective purchasers are aware of assignments that are potentially available. Similar issues about confidentiality arose in relation to the existing WT Register regulations, which provide for the WT Register to contain the identity and contact address of the licensee, the reference number of the licence, the frequencies assigned and the geographical area of transmission.

3.60 Ofcom accepts that it is necessary to strike a careful balance between these concerns and the dependence of trading on availability of information. Ofcom is not aware of any evidence that disclosure of the above information in the WT Register has caused difficulties in practice for spectrum users in terms of revealing commercially sensitive information or that it would be justified or necessary to publish any less information about the BR licences that will be made tradable in accordance with this Statement than is published already about other licence types. Ofcom therefore intends to proceed to make similar information available about the new BR licences as is already available in the WT Register in respect of licences that are currently tradable.

3.61 As in the case of licences that are already tradable, Ofcom will be willing to provide additional information to prospective purchasers in order to facilitate due diligence but would do so only with the agreement of the current licensee.

Technical parameters of licences

3.62 Various respondents queried the way in which we proposed to define the designated service area (DSA) and the propagation model that will be used by MASTS for interference calculation. Some also commented that they should be consulted on the documents relating to the assignment process that Ofcom is developing to support BR liberalisation.

3.63 Ofcom acknowledges the importance of these questions and the significance of the MASTS propagation model, interference calculations and associated technical

[12] The Wireless Telegraphy (Register) Regulations 2004, made under section 170 of the Communications Act 2003, enable Ofcom to establish a register of relevant information about spectrum licensing. The WT Register is available at: http://www.ofcom.org.uk/radiocomms/isu/ukpfa/intro.

documentation. Ofcom will work with stakeholders through the Business Radio Industry Group (BRIG) to develop documents such as the TFAC and the Interface Requirements (IRs) and will consult on the revised IR through the European Commission (EC).

Related issues

3.64 Two other related issues are worthy of note. These relate to digital PMR and Band III.

Digital PMR 446 (446.1 – 446.2 MHz)

3.65 Two respondents questioned the proposed band plan, which features two channel rasters, on the basis that this would cause an increased risk of interference.

3.66 Ofcom has responded to this issue in detail in section 2.35 of the Notice of Ofcom's Proposal to Amend the Wireless Telegraphy (Exemption) Regulations 2003. This can be found at http://www.ofcom.org.uk/consult/condocs/exemption/exemption.pdf.

Band III (174 – 207.5 MHz) trading and liberalisation

3.67 Business Radio also uses VHF Band III at 174 – 205 MHz. The long-term future of the use of VHF Band III was reviewed at the International Telecommunication Union (ITU) Radio Regulatory Committee conference (GE-06) held in May and June 2006. Ofcom has assessed the outcome of the conference, which is a legally binding international treaty, and will need to introduce a programme of changes to the existing incoming and outgoing UK interference protection arrangements. These changes will have implications for the potential to introduce trading and liberalisation for users in this band.

3.68 The two main deadlines for these changes are April 2009 for spectrum at 174.0 to 177.5 MHz (eg within T-DAB channels CH5A/B) and April 2012 for vacating the affected assignments at 193.2 to 207.5 MHz (ie sub-band 2). Time-limited extensions may be considered on a case-by-case basis (eg if the system is being used for the Olympic games). The final deadline is 31 December 2012.

3.69 Ofcom is currently working on a transition plan for the band and intends to communicate it early in 2007.

Consultation process

3.70 Some respondents did not consider that they were given sufficient time to consider the proposals prior to the deadline of 15 September 2006. They objected for two main reasons: firstly the sector had to consider two consultation documents in a relatively short period of time; and secondly, the consultation period included the summer holidays.

3.71 Ofcom held roadshows during the consultation to further explain its proposals and, in the light of concerns about the time allowed for the consultation, arranged additional meetings with stakeholders at the beginning of October to explain the proposals further and discuss issues raised in the responses. It also discussed issues raised in the responses at the BRIG and held meetings with individual organisations as part of its regular contacts with industry. Going forward, Ofcom plans to communicate further with stakeholders during 2007 in order to explain fully the changes and their implementation.

Conclusion

3.72 In view of the overall support from stakeholders, Ofcom has decided to proceed with the further trading and liberalisation measures as proposed in the consultation and as modified in the light of the feedback from respondents in two important aspects. First, we will allow conversion of Technically Assigned licences to Area Defined licences under certain conditions so as better to accommodate spectrally efficient trunked systems. Second, we will require spectrum segmentation through partial trading to be effected through a licence variation of Technically Assigned licence so that Ofcom can check the implications on interference. Ofcom will monitor the progress of the simplification and flexibilities introduced and work with stakeholders to develop any further flexibility that is required once experience of the new licence regime has been gained.

3.73 In order to introduce these measures and the new fee approach, Ofcom will need to introduce a new IT system and update the relevant WT Act regulations as discussed in the next section.

Section 4

Next steps and timetable

4.1 This section describes the indicative timetable and next steps for bringing the changes into effect. As explained below, the indicative nature of this timetable derives from the interdependency with a much larger IT project being undertaken by Ofcom. The key determinant of timing will be the implementation of IT systems that are required to support the changes. To give the changes legal effect we will need to make new regulations; the timetable for these regulations needs to take account of the delivery dates for the new systems. Accordingly, this section gives an overview of:

- the indicative timetable for the delivery of the new IT systems and the implications for bringing the new BR licensing arrangements into effect;
- the implications for Business Radio users in terms of when they can expect the changes to be introduced;
- the variation process to migrate assignments from the existing licences to the new licences;
- the regulations required to bring the changes into effect;
- other documents that we need to publish;
- next steps.

Indicative timetable for IT system implementation

4.2 New IT systems will be required to support:

- the licensing of new Business Radio assignments under one of the 5 new licence product classes described in this Statement (Area Defined, Technically Assigned and 3 Light Licensing products);
- the process for converting existing BR licences to one of the 5 new licence product classes, which, because of its scale, will need to be automated.

4.3 Once up and running, the new systems and processes will:

- enable simplified and automated licensing application and assignment processes;
- provide the MASTS functionality to underpin the issue of licences in the Technically Assigned class and manage the interference environment resulting from other assignments within the same coverage area that share the same spectrum;
- support the trading flexibilities outlined in this Statement, including geographical segmentation of Area Defined licences.

4.4 The IT systems functionality required to support these changes for Business Radio forms part of a much larger IT programme, called Unify, in which Ofcom is consolidating and modernising the IT systems inherited from its predecessor

organisations. The timetable for delivery of the BR licensing components is dictated by the needs of the overall Unify programme. Now that Ofcom has decided to go ahead with the BR reforms with the modifications described in this Statement, the design specifications to support BR reforms within the IT systems can be finalised.

4.5 The detailed implementation planning work for these reforms is still in progress. The indicative timing for delivery of the relevant functionality is late 2007 or early 2008.

Changes for the Business Radio community

4.6 From the perspective of the BR user there are three key milestones.

- The **implementation date** of the new regime when the regulations on BR licensing and trading enter into effect. After this date, new applicants will be able to apply for one of the new licence products and will pay fees at the revised rates. Until that date, new licences that are issued will be in one of the existing 21 licence classes.

- The **conversion date**, which is the date from which licences that have already been issued to existing licensees (ie persons granted their licences before the implementation date) are converted to new licence products. This date will be in the months following the date on which the new regulations take effect. A notice will be sent to each individual licensee affected. For most users, this will be an administrative process with no immediate practical consequences except that, following the variation, the user will be able to take advantage of the new flexibilities of the licence as described in this Statement.

- The **fee change date** at which the new fees become payable by existing licensees, subject to the making of the necessary regulations, following conversion. Ofcom is still examining the options on how to introduce the new fees. However, the fee change date for an individual licence is likely to relate to the annual renewal date of the existing licence. It might not be for some time after the conversion date. The new fee rate will not become payable for all licencees on the conversion date itself as this would create very substantial extra processing work and is not necessary.

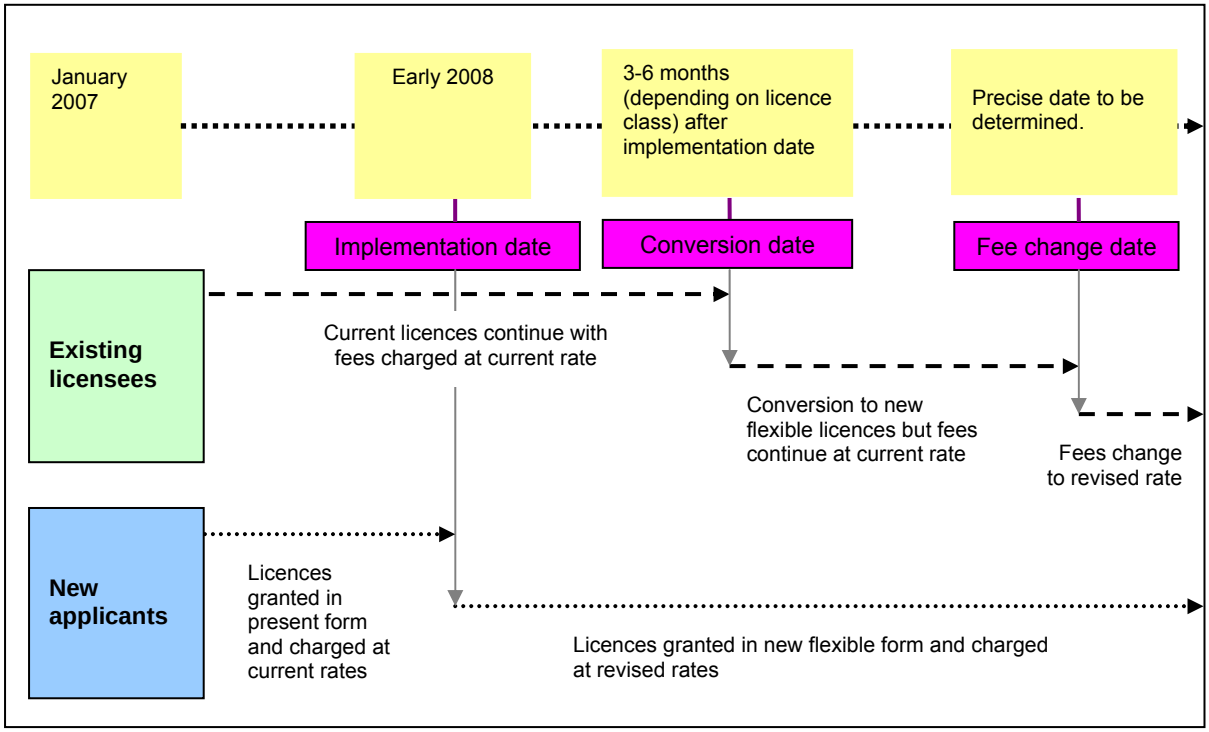
4.7 The precise timing of these events for each of the new licence classes is still being planned, but our current expectation is as follows.

- The licensing regime for new applications is expected to come into force in early 2008. We are currently planning for all new licence classes to be activated on the same date. However, we are examining whether the implementation date for the Technically Assigned licence class should be staggered so as to come into force a few months after the Light Licensing and Area Defined licence categories.

- The variation process is described further below. The interval between the implementation date and conversion date for existing licensees will depend on the licence class and is expected to between 3 and 6 months depending on licence type. The exact date of conversion will be specific to each licensee because of the need for Ofcom to correspond with each individual licensee and because the size of the task means that the workload will need to be spread.

4.8 This is illustrated in the following diagram.

Indicative timeline for existing licensees and new applicants



4.9 Between the implementation date of the new licence regime and completion of the variation process, the BR sector will be operating under a mix of the existing 21 licence types and the 5 new licence products.

4.10 A number of other detailed implementation questions are being examined, for example relating to renewals and user-requested variations to existing licences (ie variations unrelated to the BR reforms) between the date of the new regime coming into force and the variation date.

4.11 Ofcom will make available further information on the dates and timeline for implementing the BR reforms throughout 2007.

Variation of licences

4.12 The variation process will be required to vary all licences on issue to the 5 new licence products and to introduce the new 5 year notice period. To do this, Ofcom will give written notice to each licensee setting out the terms and conditions of their proposed new wireless telegraphy licence. Licensees will be given a minimum of one month to make any representations about the changes, which Ofcom will consider before deciding whether to issue the replacement licences. Licensees will also be asked to advise Ofcom if their licence is no longer required. One month is the minimum period of notice required to be given for WT licence variations[13].

4.13 At the variation date, each existing licence will be revoked and a new licence issued with the same technical information included. Fees might not be payable at the new rate until some time after the conversion date. The precise timing of the transition will be determined in consultation with stakeholders as discussed above.

[13] Section 1E of the Wireless Telegraphy Act 1949, inserted by section 169 of the Communications Act 2003 or paragraph 7 of schedule 1 to the Wireless Telegraphy Act 2006 from 8 February 2007.

Regulations

4.14 Ofcom will need to make new regulations to give legal effect to the arrangements outlined in this Statement. In particular, we will need to introduce:

- WT trading regulations to extend trading, specify the permitted modes of trading and the procedure to be followed, including the information to be published about transactions;
- WT register regulations to extend the coverage of the WT register so as to the publication of information on all tradable licences;
- WT licence charges regulations to give effect to the new fee rates for the new licence products. These will include transitional arrangements for existing licensees to move to the revised fees.

4.15 The Communications Act 2003 requires Ofcom to publish Statutory Notices to consult on these regulations before making them. In line with Ofcom's usual practice, we will consult on each of them for one month. This will take place in the course of 2007. The timing of these consultations will be driven, in part, by the implementation planning for the overall Unify programme since this will determine the date on which the new regime will enter into force and it will be necessary to specify this date in the draft regulations. We will publish more details of the consultation timetable in early 2007.

4.16 In order to reflect the changes made by the above regulations, Ofcom will also need in due course to adjust other regulations concerning licensing procedures and limitations on numbers of licences granted.

Other Documents

4.17 Ofcom will need to revise the current interface requirement IR 2044 (to include 6.25 kHz channel width and IR 2008 TDMA) and develop the Technical Frequency Assignment Criteria (TFAC) for Technically Assigned business radio, including the MASTS algorithms. We expect to publish these in the middle of 2007.

4.18 At an appropriate time Ofcom will also update the Trading and Liberalisation Guidelines[14] to reflect the new arrangements.

Next steps

4.19 Following this statement, Ofcom will:

- complete its planning work around the sequencing and timing of the changes described above and communicate details to BR stakeholders;
- consult during 2007 on the regulations to enable the new regime to come into effect in 2008;
- update its communications plan to keep stakeholders informed about developments during the course of 2007 in order to spread awareness and understanding of the changes. We expect to issue an update in spring 2007.

[14] http://www.ofcom.org.uk/radiocomms/ifi/trading/

Annex 1

List of respondents

- BAA plc
- Federation of Communication Services (FCS)
- Intellect
- Joint Radio Company Ltd (JRC)
- London Bus Services Ltd
- Motorola Ltd
- Network Rail
- Scottish and Southern Energy plc
- St John Ambulance
- TAUWI
- Western Power Distribution

Two respondents asked not to be identified

Annex 2

Business Radio reform

A2.1 This annex gives an overview of the reforms that Ofcom plans to introduce to the Business Radio sector in the first half of 2008.

A2.2 The main features of the reforms are as follows:

- **Simplification:** the licensing regime will be simplified, moving to an approach based around 5 distinct licence products in 3 licence classes – Technically Assigned, Area Defined and 3 Light Licensing products –in place of the 21 current licence classes.

- **Liberalisation:** licences will give users greater freedom to vary their use of spectrum within the technical parameters set in their licence.

- **Trading:** all Technically Assigned and Area Defined licences will be tradable and there will be flexibility to subdivide assignments by frequency and geography, subject to certain safeguards, in order to facilitate more effective use of spectrum through trading.

- **Greater security:** licensees will be given 5 years notice in most circumstances if revocation of their licence becomes necessary.

- **Spectrum efficiency:** the reduction in fragmentation of the channel plan will increase the availability of spectrum for each individual type of use. The introduction of the new MASTS tool for technical analysis of applications for Technically Assigned licences will also allow more assignments to be made within the same amount of spectrum while preserving margins of safety to avoid excessive interference.

- **Improved licensing processes:** the application process will be simplified and the assignment process will be automated and faster. Longer intervals between fee payments for Light Licensing products will mean less frequent licence renewals.

- **Pricing:** the fees for all licences will be brought onto a common basis so as to meet the objective of greater consistency and transparency and so as to send more appropriate price signals to encourage efficient use of spectrum. The changes will not alter the overall amount of the fee payments made by business radio users (to within a few percentage points); but fees for some users will go up and for others they will go down. As explained elsewhere in this Statement, these changes are not totally attributable to liberalisation.

A2.3 The new approach is structured around the 5 new licence products that reflect the 3 fundamentally different approaches to how assignments are made. The remainder of this annex gives an overview of each new licence product and assignment process.

A2.4 Fee rates for the new products are provided in annex 4 and more substantive details, including a discussion of the responses to Ofcom's consultation on new fees, are set out on a separate Statement available at: http://www.ofcom.org.uk/consult/condocs/pricing06/statement/. This includes examples of fee calculations for some typical users under the new approach.

A2.5 This annex now summarises the main aspects of the new licensing regime for the Business Radio sector which Ofcom plans to bring into effect in the course of 2008.

Area Defined licences

A2.6 **Area Defined** licences are suitable for networks that are run on a national or wide area regional basis and have exclusive spectrum needs. Such networks are often of strategic or national importance – for instance for rail networks, utilities major distribution networks and some other types of transport. These are mostly for professionally installed and run systems.

Area Defined licence simplification

A2.7 Ofcom will merge a range of current Business Radio licence classes, which are designed for users operating exclusively in larger geographical areas, into a single flexible BR Area Defined licence class. The table below identifies the affected licence classes.

Current licence product	New licence product
Business Radio (Public Wide Area Paging)	BR Area Defined
Business Radio (Public Mobile Data, Non voice)	
Business Radio (National and Regional)	
Business Radio (Tetra Digital PAMR)	
Business Radio (CDMA Asset Tracker)	
Business Radio (Remote Meter Reading Operator) - Exclusive channels)	

Area Defined licence design

A2.8 Licences that will be migrated to Area Defined licence give licensees the right to deploy anywhere in a defined area (for example the UK or a Nation[15]) and make choices as to the level of interference they will tolerate between base stations in their own network. So, although current procedures allow a certain amount of freedom to licensees about how they deploy their network, licences are currently specified in a way that restricts flexibility and requires Ofcom intervention to permit changes. As illustrated in the following figure, the following will constitute the basic elements of the licence.

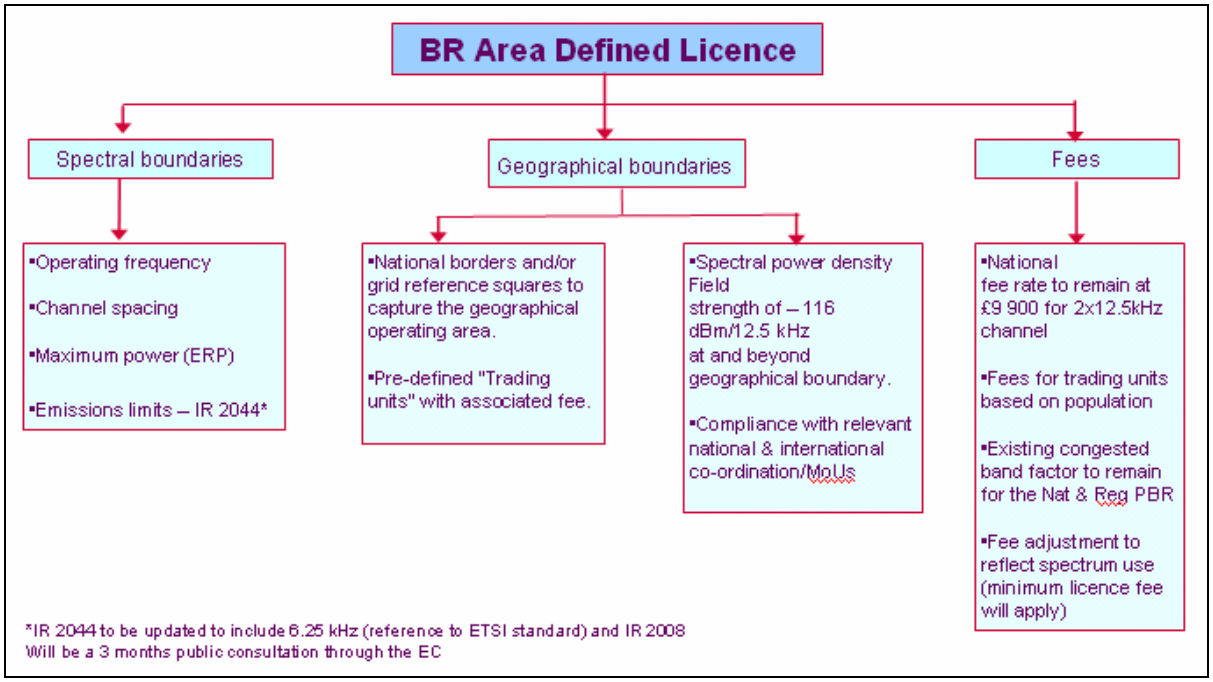
- Spectral boundaries: This will specify the frequencies on which the licensee can operate, the channel spacing, maximum operating power and the emission limits should meet those specified in the revised Interface Requirement (IR 2044).

- Geographical boundary: This will specify the area in which the licensee can operate, using the national grid reference system combined with national borders, and the level of field strength density (-116 dBm/12.5 kHz) that should not be exceeded at and beyond adjacent geographical assignments.

[15] England, Scotland, Wales or Northern Ireland

- Fee: The licence fee for an Area Defined licence is derived from current national rate (£9,900 per 2 x 12.5 kHz channel) taking into account the operating frequency and the channels bandwidth and weighted by population density.

Figure A2.1: Elements of the Area Defined Licence



A2.9 As stated in the consultation, Ofcom is also keen to ensure that licensees are able to use the spectrum as effectively as possible near geographical boundaries. To do this, neighbouring licensees might agree to receive more interference from their neighbour than permitted by the defined boundary condition. Ofcom is currently considering the role it should play in approving and facilitating such arrangements and we will work with stakeholders on how they may be developed.

Trading for Area Defined licences

A2.10 Those licences on issue that will be migrated to the Area Defined licence class are currently tradable and support concurrent trading and the partial transfer of frequencies under a licence (with certain limitations). It is our intention to maintain current trading options for licensees within these classes, but also to use the flexibilities offered by the new Area Defined licence approach to:

- introduce trading to UHF 1 band while complying with the coordination obligations with RAF Fylingdales;
- extend the range of transfer options to allow the transfer of geographical elements of a licence to a minimum trading unit (50 km grid squares);
- extend options for spectrum segmentation to a minimum channel width of 6.25 kHz. We will be making slight amendments to IR 2044, based on ETSI standards (EN 300 166 – 2), to support this narrower channel width.

Technically Assigned Licences

A2.11 **Technically Assigned** licences are designed for users at one or more business sites who require a network that is tailored to their individual needs. Such systems normally involve a base station and a number of mobiles operating within a set coverage area, although more sophisticated networks may involve more than one base station. Typically such use may include local delivery services, local government and transport services, taxis and couriers, bigger industrial sites and many other private uses.

Technically Assigned licence simplification

A2.12 Licence classes that will be replaced by the Technically Assigned licence class are shown in the table below.

Current licence product	New licence product
Business Radio (Analogue PAMR)	BR Technically Assigned
Business Radio (Remote Meter Reading Operator) - Shared spectrum	
Business Radio (Wide Area Speech and Data Systems)	
Business Radio (Wide Area One-Way Paging and Speech Systems)	
Business Radio (Wide Area Distress Alarms)	
Business Radio (Common Base Stations)	
Business Radio (Band I and Band III CBS)	
Business Radio (IR2008 Data)	
Business Radio (On-Site Speech and Data Systems)	
Business Radio (On Site Hospital Paging and Emergencies Speech Systems)	

A2.13 The new Technically Assigned licence will be designated as either “exclusive” or “shared”. An exclusive licence will be charged at a higher rate than a shared licence, but will enjoy the sole use of its channel(s) for its location. The mapping of current licence products onto either “exclusive” or “shared” designation is shown in table A4.6 in Annex 4.

Technically Assigned licence design

A2.14 The fundamental change for this new licence class is that assignments will be made using the new MASTS tool. Indeed, it is the introduction of this tool that will allow us to collapse the existing ten licence products into the one new Technically Assigned licence product and remove the restrictions on type of technology and use. However, the new Technically Assigned licence will continue to be defined in terms of the right to transmit signals and the transmission characteristics will be specified in fundamentally the same way (ie a transmitter power from a specified location).

A2.15 A significant change for the new Technically Assigned licence product is that the licensee will receive more information on spectrum quality:

- The licence will specify whether the assignment is exclusive or shared. In the latter case, the availability factor (ie. % of time that the licensee can expect to

have access to the channels) can be less than 100% where Ofcom makes additional assignments within the same spectrum and geographical boundaries. However, the MASTS tool will not allow new assignments where the effect would be to reduce the availability below 50%. The licensee will be able to obtain information on the extent of sharing effecting their assignment.

- The MASTS tool will allow a licensee to see the Designated Service Area over which their assignment will be protected. Moreover, during the application process the applicant will be able to use the MASTS tool themselves, if they wish, to optimise the DSA using a graphical user interface.

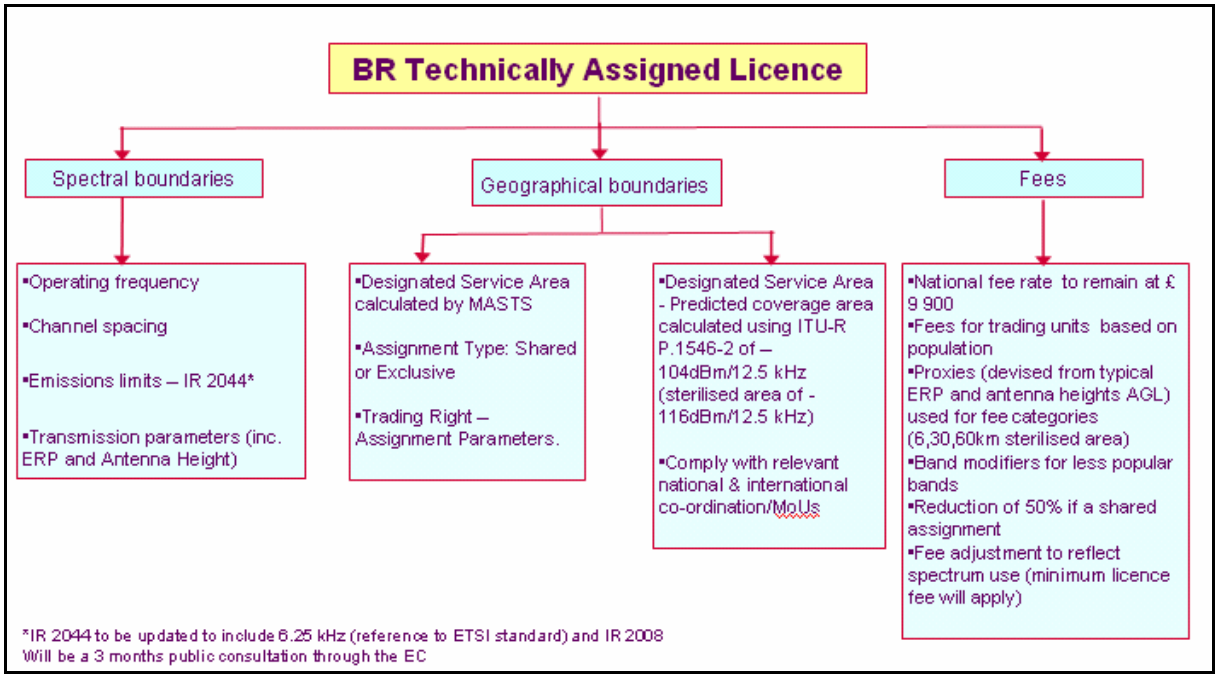
A2.16 Accordingly, the following are the basic constituents of the specification of the transmission rights.

- Spectral boundaries: these represent the transmission characteristics and will be the same as those currently on the existing licence. This will specify the transmitter location, antenna characteristics, antenna height, maximum power and channel bandwidth for both base and mobile frequencies and that the equipment must comply with the Interface Requirement (IR 2044).

- Geographical boundaries: this is additional information that we intend to introduce using our new assignment tool, MASTS, which will provide an indication of the quality of the assignment. We will specify the assignment type (either exclusive or shared) within the licence operation area defined by a geographical area and the interference and blocking levels that we will protect from other assignments.

A2.17 The following figure (A2.2) summarises the basic elements that will constitute Technically Assigned licences.

Figure A2.2: Elements of the Technically Assigned Licence



A2.18 Full details of the process by which the designated service area is determined can be found in the forthcoming publication of the MASTS algorithm and technical frequency assignment criteria (TFAC). Further, the MASTS algorithm will give details of the way in which Ofcom will indicate the amount of sharing that should be

expected. Licensees will be able to use the TFAC to reproduce their Designated Service Area (DSA). Ofcom proposes to make copies available on request until the necessary tools are e-enabled. Once this is in place, licensees will have the ability to view the DSA of their assignment on-line.

A2.19 There is one exception to the description above that the new Technically Assigned licence will be defined with reference to antenna height and transmitter power from a specified location. This is where a mobile to mobile system is deployed without a base station. Often, such systems will be licensed under the BR Simple UK Light Licence product. But where the user wants to have exclusive access to its spectrum then they will need to go through coordination using the MASTS tool to obtain an Operational Area version of the Technically Defined Licence product. In this case, the licence will define the area within which the mobiles can be used and this will be similar to the Designated Service Area which MASTS will protect when making other assignments.

Trading for Technically Assigned licences

A2.20 Ofcom intends to extend the current trading framework to the Technically Assigned licence class.

A2.21 In addition to the outright transfer of the rights and obligations of a Technically Assigned licence, Ofcom intends to provide a range of trading options, which will include:

- the ability to transfer the rights and obligations under a licence such that the transferred rights and obligations become rights and obligations of the transferee while continuing to be rights and obligations of the person making the transfer (known as 'concurrent transfers'); this will allow a licensee to benefit from sharing its assignment with other users where they can accommodate this alongside their own use;

- the ability to transfer individual assignments authorised under a licence through a partial trade, subject to checking by Ofcom that the segmentation will not cause excessive interference.

Light Licensing

A2.22 Light Licensing applies to 3 licence products: **Simple UK** for systems without a base station; **Simple Site** for systems with a base station; and **Suppliers** for firms that provide on-site communications systems and services for others. The light licence products are designed for users who need highly localised coverage and are willing to use the same radio frequencies as other light users. Typically a block of frequencies is available to low power radio equipment and are suitable for users of their own paging systems or short range voice communications (eg for a store or single site). These systems can either be a group of mobiles that can be used together anywhere in the UK or be a base station with linked mobiles.

Simplification for Light Licensing

A2.23 The three new Light Licensing products will replace five BR licence classes that, for historical reasons, have different application procedures, fee payment periods (annually or every three years) and fees. These arrangements will be rationalised as summarised in the table below so that all the new Light Licensing products have:

- a common application electronic application process;

- a common set of technical restrictions to minimise the risk of interference;
- a common payment interval of five years, which will allow us to minimise regulatory intervention while maintaining a clear picture of the level of activity in the available channels;
- a common fee that reflects Ofcom's direct costs in managing these licences.

A2.24 Licence products in the Light Licensing category will not be tradable.

Current licence product	New licence product	Technical parameters
Business Radio (UK General)	BR Simple UK	• Single set of application-neutral equipment requirements – must comply with the revised IR 2044. • Maximum ERP power: 5 Watts.
Business Radio (On-Site Local Communications)	BR Simple Site	• Single set of application-neutral equipment requirements – must comply with the revised IR 2044 • Maximum ERP power: 5 Watts for mobile and 2 watts for base station • Maximum antenna height above ground of 10 metres.
Business Radio (On-Site One-Way Paging and Speech Systems)		
Business Radio (Self-Select)		
Business Radio (Suppliers)	BR Suppliers	• Single set of application-neutral equipment requirements – must comply with the revised IR 2044. • Maximum ERP power: 25 Watts for mobile and 10 watts for base station • Maximum antenna height above ground of 20 metres.

A simpler licensing process

A2.25 New applicants and existing licensees will be able to seek advice from Ofcom on the appropriate BR licence class that will best suit them. The application form can then be downloaded from the Ofcom website and submitted electronically.

- For **Area Defined** licences, Ofcom will issue a licence if spectrum is available within the geographical area requested. The licensee will have the freedom of deployment as long as the licence conditions are met and comply with any national and international coordination through the post issue process.
- For **Technically Assigned** licences, Ofcom will use its new technical assignment tool to process the request. In most cases a suitable assignment will be granted.
- For **Light Licensing** products, Ofcom will automatically issue a licence with a set of frequencies that can be used.

A2.26 Ofcom is in the process of developing licence application forms for the new products and will also update its licensing process manual which will be communicated to stakeholders through the BRIG.

Annex 3

Summary of issues raised by respondents to the consultation and Ofcom response

Issues raised	Ofcom's response
Question 1: Ofcom would welcome comment on its proposals for the Business Radio Technically Assigned Licence class ***Response: All respondents supported the licensing simplification approach although there were concerns in relation to trunked systems and several comments about the MASTS process.***	
Some respondents expressed concerns that the Technically Assigned licence class proposals, particularly in relation to the fee proposals, produce a negative impact on spectrum efficient multi-site trunked radio systems, thereby discouraging customers from choosing spectrum efficient solutions.	MASTS has the capability of accommodating these types of use but the pricing algorithm does not utilise the resultant MASTS data. Our pricing approach for Technically Assigned licences charges for each base station. In light of the concerns raised by respondents, Ofcom intends to allow additional flexibility for Technically Assigned licences to move to the Area Defined licence class through the licence variation process. See details in section 3.
One respondent was unclear which of the new licensing classes (Area Defined or Technically Assigned) would be used to license a trunked PMR network	Existing radio systems or networks will be mapped across to the new licence classes based on the licence product under which they are currently licensed, rather than the type of system used. For example, if a trunked network is currently licensed under a Wide Area Speech and Data licence, it will be mapped across to the new Technically Assigned licence class. If a trunked network is currently licensed under a National and Regional licence class, it will be mapped across to the Area Defined licence class. However, as detailed in section 3, licensees might be able to convert their licence to a different licence class.
Trunked systems could be licensed as a "virtual" base station with a protection area equivalent to that occupied by a number of smaller trunked radio transmitters installed within the Designated Service Area (DSA) all sharing the same frequency.	Ofcom has considered the suggestion that a virtual base station could be used to accommodate this specific issue. However, Ofcom cannot licence a virtual base station per se and so would, instead, have to issue a licence that defined a Designated Service Area that corresponds to the virtual base station. But this is very much what the Area Defined licence product does, albeit for geographic service areas which are limited to the 50km grid squares. The problem with creating a DSA as the proxy for licensing a virtual base station is that it would require a bespoke DSA to be created in the licence for each assignment and this cannot be managed sensibly within

Issues raised	Ofcom's response
	the licensing tool. Ofcom believes that allowing users to change from a Technically Defined licence product to an Area Defined licence product through licence variation would be a better way to meet the requirements of users with multi-site radio systems (see section 3 for more details).
Trunked and non-trunked systems should not be allowed to share the same spectrum.	Existing trunked radio system assignments that will be migrated to the Technically Assigned licence type will receive an exclusive assignment for the coverage area of their base station. Although non-trunked systems may potentially be assigned on the same channel, they will not be assigned in the same geographical area, which effectively means that they will not be sharing spectrum with non-trunked systems.
Ofcom should consult on Technical Frequency Assignment Criteria (TFAC) and the updated Interface Requirement (IR).	Ofcom would welcome stakeholder involvement in the production of the new TFAC and IR. This will be achieved through the Business Radio Interest Group (BRIG). In addition, any changes to the IR Ofcom will have a three months public consultation under the EU procedure. We plan to publish these documents during the second half of 2007.
Derivation of the designated Service Area (DSA) is carried out with reference to technology specific C/I ratio but should be more generic.	The definition of the Designated Service Area (DSA) boundary has been derived from the current receiver sensitivity level of -104dBm/12.5kHz and a C/I (significant blocking) of 12dB which is for analogue FM technology. Current digital systems are able to meet or surpass these levels and will therefore result in adequate protection. Ofcom believes that this threshold will provide adequate protection for existing users and flexibility to support future innovation.
The propagation model used by Ofcom, P1546-2 is not appropriate for interference calculation for mobile to mobile.	Ofcom believes that the propagation model, P1546 – 2 is as good as any of the currently available general prediction models. Ofcom is funding a project aimed at reviewing the model. This will conclude this financial year and, depending on the outcome of the study and subsequent discussion in the ITU, Ofcom will reconsider its choice of propagation model.
Stakeholders should be more involved in the development of MASTS.	Ofcom and its predecessor, the RA, have involved stakeholders in the development of MASTS through the Technical Advisory Group, Roadshows and the Spectrum User Panel and have presented at various events held jointly with the FCS. Ofcom will be arranging a MASTS workshop early in 2007, which will give stakeholders an opportunity to ask

Issues raised	Ofcom's response
	questions and explore various scenarios.
Propagation model standard deviation should be added to the boundary field strength.	Ofcom is of the opinion that the enhanced version of P.1546-2 is the most suitable model for general use. Ofcom acknowledges that no propagation model is perfect and that there will be differences between field strengths predicted and those that occur in practice. Ofcom does not rule out the use of measurements in supporting interference management activities and further refinement of the current model. The use of a propagation model and a defined boundary in the form of the Designated Service Area (DSA) will enhance the certainty about spectrum quality provided by the current assignment process.
Some respondents believe that the proposals for Technically Assigned licence class will have considerable benefits, but only for new licence applications.	The introduction of MASTS will bring substantial benefits for new users as it will enable greater use of the available spectrum. Existing users will also benefit as the MASTS process will be run on all existing assignments with the same parameters as for new applications. This can be expected to result in enhanced spectrum quality for those licensees whose assignments currently have relatively low spectrum quality benchmarks (SQBs) and Ofcom (as part of the new assignment process using MASTS) will ensure that SQBs for other existing licensees are not reduced. All existing licensees will also benefit from the flexibilities being introduced on change of use and trading and the 5 year notice period for revocation or variation for spectrum management reasons.
Protection should be provided to Critical National Infrastructure (CNI). It was suggested that this could be done by limiting the access for certain spectrum to a defined user group.	The utilities are considered in exactly the same way as any other civil users using the same type of licence. The licensee chooses between exclusive or shared spectrum depending on their needs. By choosing exclusive assignments, the utilities industry (or other provider of Critical National Infrastructure) can avoid having to share their assigned spectrum.
Technically Assigned licence proposals do not address spectrum availability for future system expansion.	Ofcom provides assignments for BR on a first-come, first-served basis. It is not Ofcom's policy to reserve, or hold back, spectrum for possible future use by particular licensees (or group of licensees). Spectrum trading will provide flexibility to acquire spectrum through the market for expansion in cases where spectrum is not available from Ofcom directly.
Removing current restrictions on use may increase the risk of interference.	The technical restrictions for the new licence classes are designed to avoid harmful interference. We will use the MASTS tool to continue to plan new assignments in a way that manages interference.

Issues raised	Ofcom's response
Question 2: Ofcom would welcome comment on its proposals for the Business Radio Area Defined Licence class ***Response: All respondents supported Ofcom's proposals for simplification and licence design. However, many asked about the granularity of trading units and availability of spectrum.***	
Will Ofcom make spectrum available for Area Defined licence applicants to purchase additional 50 km grid squares?	Ofcom will do so subject to availability of spectrum (and subject to a minimum fee of £75 for the transaction cost). Licensees wishing to acquire additional coverage will also have the opportunity to do so through spectrum trading.
What is the availability of unused spectrum and what will Ofcom do with it?	There is some spectrum in PMR bands that is currently unused; the majority of this is in bands which are not popular with PMR users, such as VHF Band 1 and VHF Low Band. There is also a very limited amount of unused spectrum available in other more popular bands. This spectrum continues to be available for licensing on a first-come, first-served basis. With regard to VHF Band 1, a recent consultation requested views from interested parties as to what use could be made of this spectrum and how it could be released to the market. Please see the following link for more details: Band 1 summary Ofcom is considering how to publish information about where spectrum is available on a frequency band basis.
Proposed design for Area Defined is aimed at facilitating trading but the national licence fee is too high to encourage trading.	Ofcom considers that AIP and trading are complementary. The fee for Area Defined licences is directly linked to the AIP rate that has now been in place for 8 years. Ofcom will reassess the rate of AIP within the next few years.
Will Ofcom permit trading of an overlapping trading unit between two nations?	Ofcom will allow geographical trading for an Area Defined licence in units of 50 km grid squares. A licensee will be able to trade a grid square that straddles a national border provided that it holds the licence on both sides of the border.
Several respondents felt that a 50 km grid square trading unit would not provide sufficient flexibility, especially in London.	Currently, geographical segmentation is not permitted for national licences. So the introduction of 50 km grid square trading units to create Area Defined licences at less than national level will add very considerable flexibility that is not currently permitted. As we gain experience of the new arrangements in operation we will explore and work with the BRIG (Business Radio Interest Group) to see if more flexibility should be introduced in due course. The introduction of concurrent trading will add a degree of flexibility to make use of a given trading unit area such as London.

Issues raised	Ofcom's response
Area Defined licence proposals do not address spectrum availability for future system expansion.	Ofcom provides assignments for Business Radio on a first-come, first-served basis. It is not Ofcom's policy to reserve, or hold back, spectrum for possible future use by particular licensees (or group of licensees).Spectrum trading will provide flexibility to acquire spectrum through the market for expansion.
Question 3: Ofcom would welcome comment on its proposals for the Business Radio Light Licence class ***Response: All respondents agreed with Ofcom's simplification proposals but concerns were raised over possible increase of interference cases that may result from licensees not operating within their technical parameters.***	
One respondent requested confirmation that the pool of channels set aside for the new Light Licensing class should include at least all of those that are currently set aside for the licence classes that will become 'lightly managed' so that no user of existing equipment is required to modify his frequency assignment.	Ofcom confirms that this is the case.
Proposals come during Ofcom review of maximum power level for licence exempt devices.	The Light Licensing products are not licence exempt and are for different applications. Hence there is no overlap between the review of the maximum power level for licence exempt devices and the current proposals for Business Radio trading and liberalisation.
Need enforcement of technical licence restrictions.	Ofcom will maintain its interference investigation and enforcement role with a view to upholding SQBs. If a complaint of interference is received, Ofcom will act to enforce licence conditions.
Question 4: Do you agree with Ofcom proposals to extend trading in the Business Radio sector? ***Response:Most respondents supported Ofcom's proposals for trading although some expressed concerns over a possible reduction of spectrum available to BR users if spectrum is transferred to non-BR users.***	
Trading and liberalisation will allow non-BR users into BR spectrum, therefore reducing spectrum available for BR.	As set out in various documents, Ofcom's general policy to secure optimal use of the radio spectrum is to remove unnecessary restrictions on spectrum use and to maximise flexibility. Although Ofcom notes the concern expressed, it would be contrary to this policy to introduce a restriction that embedded a reservation of spectrum for particular sectors such as BR in the absence of evidence of a market failure. That said, Ofcom has no policy actively to promote a change in use of spectrum currently used by BR. There seems little imminent likelihood that a major shift in spectrum use would occur that would threaten the viability

Issues raised	Ofcom's response
	of business radio services, particularly given the significant economic value created by business radio services. Moreover, there is no obligation on BR licensees to sell their assignments to other types of user.
No proposals should be introduced that reduce the available spectrum below the level needed to support critical operations.	The BR reforms do not include any proposals to reduce the spectrum available to support critical operations (or any other BR uses). Licensees will be responsible for securing spectrum by direct licensing from Ofcom or through the market. The response to the Independent Audit of Spectrum Holdings (www.spectrumaudit.org.uk) made clear the Government's view that public sector users should, wherever possible, access spectrum through the market rather than by administrative assignment, although the latter might need to be resorted to in exceptional circumstances.
Question 5: Do you agree with Ofcom proposals to extend trading flexibilities? ***Response: Most respondent agreed with the proposals. However, a minority raised concerns over the proposal to allow spectrum segmentation through partial trading in the Technically Assigned licence class.***	
Interference issue – Spectrum segmentation to a 6.25 kHz channel will not coexist with 12.5 KHz for a shared Technically Assigned assignment. Unclear how partial trading could be operated in shared channels.	Ofcom has reviewed its original proposal, to allow spectrum segmentation to a 6.25 kHz for a Technically Assigned licence through partial trading and intends to require this to proceed only through the licence variation process. This will enable Ofcom to assess requests using MASTS and check that it would not cause an unacceptable increase in interference to existing assignments. See section 3 of this document for further details.
Question 6: Do you agree with Ofcom proposals to extend trading to the UHF 1 band ***Response: Respondents generally agreed with the proposals and no issues were raised***	
Question 7: Do you agree with Ofcom's proposals to extend information currently available about tradable licence classes to those licences made tradable as a result of the proposals set out in this document? ***Response: Some respondents supported Ofcom's proposals while other raised concerns over sensitivity of information***	
Licence information should be kept in confidence for reasons of security and commercial sensitivity.	We understand the sensitivity of some information. However, some information on assignments has to be published in order to facilitate trading. For the reasons set out in section 3, Ofcom considers that publication of certain information is desirable and will not prejudice

Issues raised	Ofcom's response
	commercial confidentiality or security. Ofcom will consult further through the register regulations on the detailed content of the information to be published.
Some respondents requested that agents' details appear in the spectrum register.	This is already permitted.
Question 8: Do you agree with Ofcom proposal to extend licence term to 5 years notice period ***Response: All respondents agreed with the proposal and no issues were raised.***	

General comments	
Not clear what the SQBs are for Technically Assigned and Area Defined licence classes.	The SQBs for Area Defined licences will be defined by boundary conditions: • a geographical boundary defined by either national borders or 50 km grid squares and; • a spectral power density of -116 dBm/12.5 kHz) at and beyond geographical boundary. For Technically Assigned licences where the licence will be based on transmission characteristics (eg its location, power, frequency etc) more information on the quality of the assignment will be provided in terms of: • a Designated Service Area which will be defined by a spectral power density of: -104dBm/12.5kHz for the service level and -116dBm/12.5 kHz for the blocking (significant interference) level at and beyond the geographical boundary; • type of assignment – Shared (50% activity factor) or Exclusive (100% activity factor).
Ofcom should clarify paragraph 2.6 of the consultation document where it refers to Ofcom's statutory duty to "secure optimal use of spectrum" and "use it to generate greatest economic benefit". There is no reference to business, only consumers. Can Ofcom explain how the "greatest economic benefit" is measured?	Estimates of economic benefit take account of the contributions of businesses. Economic benefit may be measured as the sum of producer surplus* and consumer surplus or as the contribution to gross domestic product (GDP) and employment made by firms that are direct users of spectrum. This is illustrated in the recent report *Economic Impact of the Use of Radio in the UK* commissioned by Ofcom and published at: http://www.ofcom.org.uk/research/radiocomms/reports/economic_spectrum_use/. *Producer surplus relates to benefit to businesses that use spectrum to provide services and represents the difference between a business's revenue from providing a radio service and the economic costs to it from doing so.

Ofcom should publish the "range of trading options" in more detailed in Ofcom's "Trading Guidance Notes".	Ofcom agrees. We will update current trading and liberalisation guidance notes to include the Business Radio trading and liberalisation measures set out in this document. These will be published during 2007 at the same time as the final trading regulations.
Ofcom should set out how it will monitor the transition period from current to new licences, setting out detailed objectives and milestones.	As stated in section 4 (next steps and timetable) Ofcom intends to set out further details during the course of 2007 on the timing and processes for licence variation.
Insufficient length of consultation period.	See section 3.
Issues raised but not related to the proposals within the consultation	
There is no indication of the level of the trading fees that Ofcom will charge.	Ofcom is not proposing to charge for trading.
New technologies should not change the operational purpose of existing licence holders.	The proposals are technology and application neutral. It is for the licensee to determine the best use of the spectrum within the licence conditions.
DMR 446 – Licence exempt A Couple of respondents questioned the proposed band plan which features two channel rasters on the basis that this would cause an increased risk of interference.	Ofcom has responded to this issue in detail in section 2.35 of the Notice of Ofcom's Proposal to Amend the Wireless Telegraphy (Exemption) Regulations 2003 consultation document. This can be found at: http://www.ofcom.org.uk/consult/condocs/exemption/exemption.pdf.

Annex 4

Business Radio fee charging

A4.1 Ofcom has published in conjunction with this document a separate Statement available at: http://www.ofcom.org.uk/consult/condocs/pricing06/statement/ on changes to wireless telegraphy licence fees for a range of sectors, including BR, following a public consultation published on 6 July 2006 and available at: http://www.ofcom.org.uk/consult/condocs/pricing06/.

A4.2 The following tables provide Ofcom fee charges for licences in the new licence categories.

Area Defined licence fee charging

A4.3 Table A4.1 shows the annual fee for Area Defined licences for a 2 x 12.5 kHz channel for different population and frequency band categorisations. Details of the categorisations follow in tables A4.4-A4.7.

Table A4.1: Area Defined licence fee for a 2 x 12.5 kHz channel

Area	Fee (£) for Highly Popular bands	Fee (£) for Medium Popular bands	Fee (£) for Less Popular bands
UK	9900	8250	3300
England	8275	6895	2758
Wales	490	410	163
Scotland	855	710	285
Northern Ireland	280	235	93
GB (England, Wales and Scotland)	9620	8015	3206
Trading unit within high population category (A)	1185	990	395
Trading unit within medium population category (B)	150	125	50
Trading unit within low population category (C)	14*	12*	5*

* Minimum licence fee of £75 applies

Technically Assigned licence fee charging

A4.4 The licence fee for Technically Assigned licences will be derived from current national rate (£9,900 per 2 x 12.5 kHz channel) and will take into account the following factors:

- The operating frequency: the charge will be higher if the service uses more popular channels and lower if the service uses less popular channels.

- Size of geographical area covered: in the case of systems using a base station, a combination of power and antenna height above ground level will be used as a proxy for a typical coverage area of each radio channel, ranging from 6km (suitable for a site or building), 30km (suitable for local services) to 60 km (suitable for a bigger town or region).

- The location of the site; the charges will more in areas of higher population density (defined to three levels by the published UK population of each 50 km National Grid square as published by the Ordnance Survey).

- The designation of the assignment as either "exclusive" or "shared": users have a choice over whether to pay the full charge to have exclusive use of a channel at their location. Many users are currently willing to share with another service, so will benefit from a reduced rate.

- The channel bandwidth.

A4.5 The separate fees Statement referred to above includes some worked examples to help licensees understand how to calculate what their licence fee will be under the new approach.

A4.6 Tables A4.2.1 to A4.2.3 show the new annual fee for Technically Assigned licences for a 2 x 12.5 kHz channel for different coverage area, population, frequency band and assignment type categorisations. Details of the categorisations follow in tables A4.4-A4.7.

Table A4.2.1: Technically Assigned licence class fee for 2 x 12.5 kHz channel in Highly Popular Bands

Coverage area	Category 1		Category 2		Category 3	
Assignment Type	**Exclusive**	**Shared**	**Exclusive**	**Shared**	**Exclusive**	**Shared**
Population category A	£200	£100	£740	£370	£1480	£740
Population category B	£100	£75	£200	£100	£300	£150
Population category C	£75	£75	£95	£75	£110	£75

Table A4.2.2: Technically Assigned licence class fee for 2 x 12.5 kHz channel in Medium Popular Bands

Coverage area	Category 1		Category 2		Category 3	
Assignment Type	**Exclusive**	**Shared**	**Exclusive**	**Shared**	**Exclusive**	**Shared**
Population category A	£100	£75	£370	£185	£740	£370
Population category B	£85	£75	£170	£85	£250	£125
Population category C	£75	£75	£80	£75	£90	£75

Table A4.2.3: Technically Assigned licence class fee for 2 x 12.5 kHz channel in Less Popular Bands

Coverage area	Category 1	Category 2	Category 3
Assignment Type	**Exclusive or Shared**		
Population category A	£ 75		
Population category B			
Population category C			

Light licensing fee charging

A4.7 Table A4.3 shows the fees for the three Light Licensing products.

Table A4.3 - Light Licensing fees

Light Licensing product	Licence fee
BR Simple UK licence	£75 per 5 years
BR Suppliers licence	
BR Simple Site licence	£75 per site per 5 years

Categorisations used for Business Radio fee charging (Technically Assigned and Area Defined licence classes)

A4.8 The following tables show the frequency band, coverage area, operational area, geographical area (population) and sharing categorisations used to determine the assignment licence fee.

Table A4.4 - Band categorisation for Technically Assigned and Area Defined licences

Band categorisations	Bands	Frequency range (MHz)	Description
Highly Popular bands (HPB)	High Band	165.04375 – 173.09375	These bands are classified as being highly popular due to high demand and are heavily congested.
	UHF 1	425.00625 – 449.49375	
	UHF 2	453.00625 – 466.0875	
Medium Popular bands (MPB)	Mid Band	137.9625 – 165.04375	These bands are classified as Medium Popular as demand is less than for highly Popular bands.
	Band III	177.20625 – 207.49375	
Less Popular bands (LPB)	Paging	26.225 – 49.49375	These bands are considered less popular. Demand is low because of the propagation characteristics (not suitable in urban area) and equipment size (longer antenna not suitable for hand portable operations).
	Band 1	55.75 – 68.0	
	Low Band	68.08125 – 87.49375	

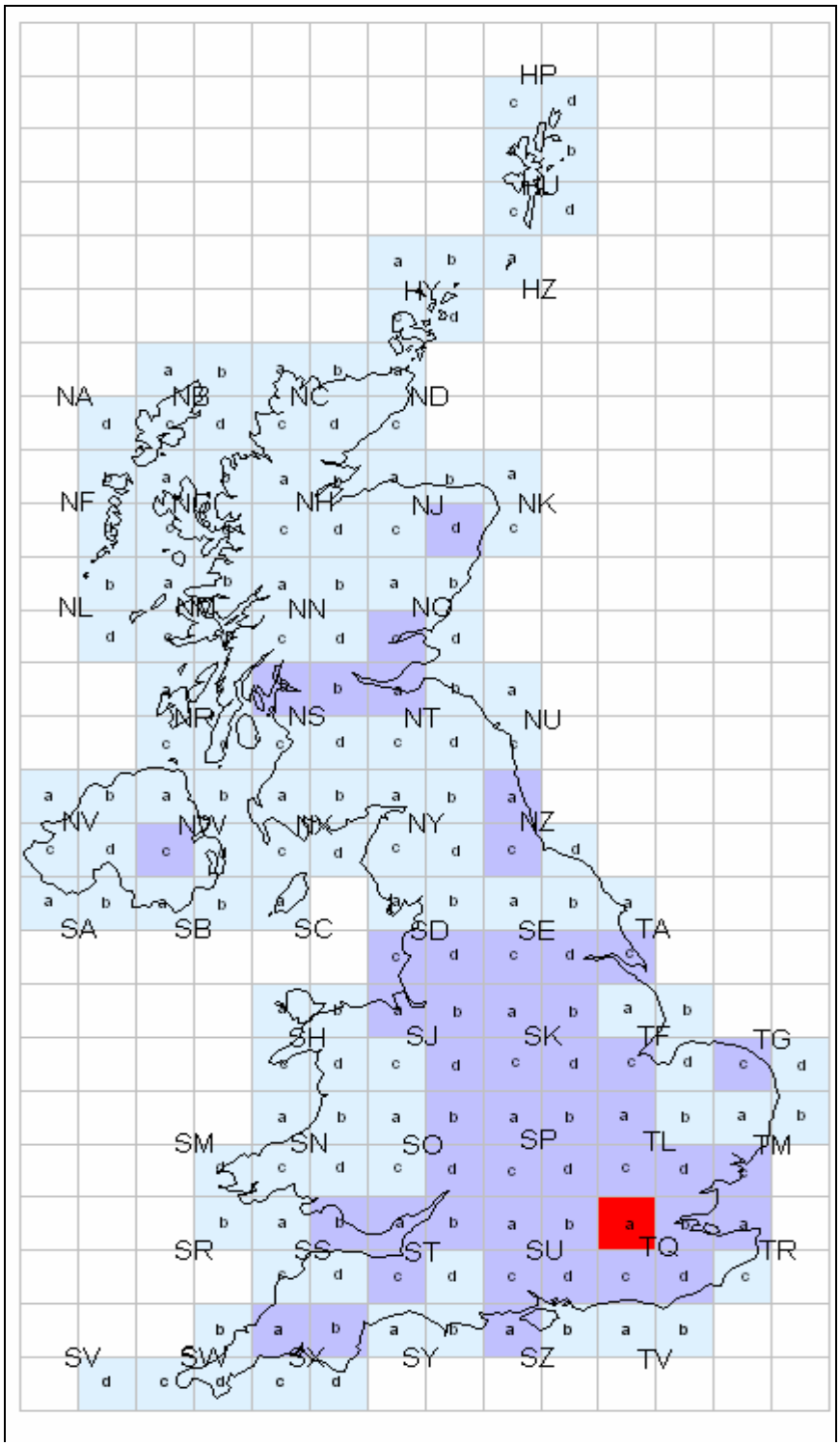
Table A4.5 – Coverage categorisation for Technically Assigned licences

Coverage categorisations	Combinations of ERP Power (P) in Watts, and antenna height above ground level (A_h) in metres – for base station	Operational area radius (R) in km for mobile to mobile systems
Category 1	$P \leq 5$ W and $A_h \leq 10$m	$0 < R \leq 3$
Category 2	$P \leq 5$ W and $10m < A_h \leq 30m$	$3 < R \leq 15$
	$P > 5$W and $A_h \leq 10$m	
Category 3	$P > 5$W and $A_h > 10$m	$15 < R \leq 30$
	$P \leq 5$ W and $A_h > 30$m	

A4.9 If the antenna is used indoor or underground or is a downfire or leaky feeder type, it will come within category 1.

Population categorisation for Area Defined and Technically Assigned licences

A4.10 The following map shows the trading units* and division of population between these units (see table below) – Note that Technically Assigned licence assignments that are outside the UK main land will be categorised in the low population category. Note: for operational areas this relates to the centre of the area and for base stations these will be the location of the antenna.



*Smallest subdivisions of geographical coverage, based on Ordnance Survey national grid

Table A4.6 - Table showing the trading units population categorisation

Designation of area	Trading units – 50 km grid squares									
High population (Red colour on map)	TQ-a									
Medium population (Violet colour on the map)	NJ-d	NO-c	NS-a	NS-b	NT-a	NW-c	NZ-a	NZ-c	SD-c	SD-d
	SE-c	SE-d	SJ-a	SJ-b	SJ-d	SK-a	SK-b	SK-c	SK-d	SO-b
	SO-d	SP-a	SP-b	SP-c	SP-d	SS-b	ST-a	ST-b	ST-c	SU-a
	SU-b	SU-c	SU-d	SX-a	SX-b	SZ-a	TA-c	TF-c	TG-c	TL-b
	TL-c	TL-d	TM-c	TQ-b	TQ-c	TQ-d	TR-a			
Low population (Light blue colour on the map)	HP-d	HU-a	HU-b	HU-c	HY-a	HY-b	HY-c	HY-d	HZ-a	NB-a
	NB-b	NB-c	NB-d	NC-a	NC-b	NC-c	NC-d	ND-a	ND-c	NF-b
	NF-d	NG-a	NG-b	NG-c	NG-d	NH-a	NH-b	NH-c	NH-d	NJ-a
	NJ-b	NJ-c	NK-a	NK-c	NL-b	NL-d	NM-a	NM-b	NM-c	NM-d
	NN-a	NN-b	NN-c	NN-d	NO-a	NO-b	NO-d	NR-a	NR-b	NR-c
	NR-d	NS-c	NS-d	NT-b	NT-c	NT-d	NU-a	NU-c	NV-a	NV-b
	NV-c	NV-d	NW-a	NW-b	NW-d	NX-a	NX-b	NX-c	NX-d	NY-a
	NY-b	NY-c	NY-d	NZ-d	SA-a	SA-b	SB-a	SB-b	SD-a	SD-b
	SE-a	SE-b	SH-a	SH-b	SH-c	SH-d	SJ-c	SM-d	SN-a	SN-b
	SN-c	SN-d	SO-a	SO-c	SR-b	SS-a	SS-c	SS-d	ST-d	SV-d
	SW-b	SW-c	SW-d	SX-c	SX-d	SY-a	SY-b	SZ-b	TA-a	TF-a
	TF-b	TF-d	TG-d	TL-a	TM-a	TM-b	TR-c	TV-a	TV-b	

Table A4.7: Shared and exclusive assignment categorisation for current products that will be converted to Technically Assigned licences.

Current Products	Exclusive or shared assignment category
Business Radio (Analogue PAMR)	Exclusive
Business Radio (Common Base Stations)	
Business Radio (Band 1 and Band III CBS)	
Business Radio (IR2008 Data)	
Business Radio (Wide Area One-Way Paging and Speech Systems)	Shared
Business Radio (Remote Meter Reading Operator) - Shared channels	
Business Radio (Wide Area Distress Alarms)	
Business Radio (On Site Hospital Paging and Emergency Speech Systems)	
Business Radio (Wide Area Speech and Data Systems)	Shared*
Business Radio (On-Site Speech and Data Systems)	

*The majority of assignments within this class will be considered as shared, except:

1. licensees that have users with safety critical activities;
Ofcom will contact these to discuss their future spectrum and exclusivity requirements.

2. assignments with special technical requirements that have an overall impact on how the radio system is used (eg trunked radio and TETRA systems).

Annex 5

Impact Assessment

Policy Objective

A5.1 Impact assessments (IAs) provide a valuable method of assessing different options for regulation and illustrating why the proposed method was chosen. They form part of best practice policy-making and are commonly used by other regulators. Section 7 of the Communications Act also places a responsibility on Ofcom to carry out IAs where the proposals are likely to have a significant impact on businesses or the general public, or where there is a major change in Ofcom's activities.

A5.2 This document presents Ofcom's conclusions to Business Radio trading and liberalisation following a public consultation. This annex constitutes the IA for the proposals on both liberalisation and trading. It assesses the costs and benefits of the proposed introduction of the proposals and how risks might be managed and mitigated.

A5.3 The Business Radio sector encompasses a wide range of land mobile applications used for wireless voice and data communications, including PMR, Paging, Common Base Stations, PAMR, etc. Stakeholders include local and central government, spectrum management organisations, radio suppliers and dealers, emergency services, fleet operators, public transport systems, construction projects, utilities companies, medical facilities etc. The sector uses a range of frequency bands between 30 MHz and 1GHz although most of the use is in the VHF (130-200 MHz) and UHF (425-465 MHz) ranges. Approximately 90 MHz is available. The majority of stakeholders tend to have access to limited amounts of spectrum (a few 2 ×12.5 kHz channels) for small geographical areas (normally from 3 km – 50 km) normally sharing with other users.

A5.4 There are currently 21 licence types in the Business Radio sector, allied to more than 50 types of user classification, a range of different approaches to Administered Incentive Pricing (AIP) and a range of different technical restrictions. This complex set of technical and administrative rules introduces process inefficiency and is a barrier to liberalisation and trading.

Proposal, purpose and intended effect

A5.5 Ofcom intends to rationalise the licence classifications to allow more flexible use and extend trading and, more specifically, to:

- liberalise licensing arrangements and technical restrictions in the Business Radio sector to make them more flexible while improving spectrum quality benchmarks;
- extend spectrum trading to identified licence classes within the Business Radio sector;
- provide enhanced security of tenure for licensees and introduce improvements to licensing processes.

A5.6 Ofcom's objectives are to maximise the value created by the use of radio spectrum by extending opportunities to trade within a more liberalised spectrum environment

while at the same time protecting existing users from excessive interference. Value will be maximised by encouraging innovation, by removing barriers to entry for new technologies and by minimising the time that spectrum lies unused.

Benefits of the proposals

A5.7 Ofcom's SFR concluded that spectrum is managed most effectively if the market is allowed greater influence over how spectrum is used. In other words, trading and liberalisation will together ensure greater benefits are generated from the spectrum. Trading will allow licences to be transferred to users who can make better use of them. Liberalisation will allow spectrum to migrate to higher value uses. Together, they will lower barriers to accessing spectrum, promoting competition and innovation. Consumers will benefit through lower prices and increased choice with new services and technologies being introduced more quickly. Businesses will benefit from being able to take advantage of the resulting opportunities to provide radio-based services and from the greater competitiveness that new technologies can enable. There will also be a reduction in regulatory burden as users will have greater scope to change use without applying to Ofcom for a licence variation and less risk of regulatory failure as Ofcom will be less involved in deciding in as much detail how spectrum is used.

A5.8 This is a difficult area in which to quantify benefits because it is up to licence holders, not Ofcom, to decide how to make the most of the additional flexibility that the proposals will provide. The decisions that they make, which we cannot predict, will have a major impact on the costs and benefits. In the SFR Statement, we set out an approach to determining the costs and benefits of our market-based approach based on a study produced for the European Commission.

A5.9 That report, produced by Analysys, DotEcon and Hogan & Hartson on conditions and options in introducing secondary trading of radio spectrum in the European Community, concluded that there are powerful synergies between trading and liberalisation and estimated that benefits from both are over 9 times the benefits from trading alone. The study also estimated that the costs, mainly from additional interference management, amount to less than 1% of the benefits relative to the status quo. Overall benefits for the EU as a whole were estimated at €9bn a year.

A5.10 The responses to the SFR IA were mixed. Some acknowledged that estimating benefits in this area is extraordinarily difficult and that we had done as much as was possible and sensible. Others felt that a more detailed estimate of the benefits was needed but did not provide any views on how this might be achieved. Our assessment is that, given the difficulties in estimating the benefits and the fact that the benefits are highly likely to significantly outweigh the costs, it is not appropriate to expend substantial time and effort attempting more detailed quantification. Hence, what follows is based on the material presented in the SFR.

A5.11 As stated above, it is difficult to quantify the benefits of liberalisation or trading because they will depend on the uses to which the spectrum is put and subsequent technical developments. Based on the Analysys et al report and assuming that the benefits to the UK equate to approximately 1/6th of the benefits to all of Europe and that the ratio of costs and benefits in the UK is similar to that in Europe as a whole, it can be estimated that the benefits across all of the economy including licence holders, consumers, etc, from the introduction of liberalisation and trading in all licence classes might be in the region of £0.9bn per year. This estimate is highly speculative, however, and relates to all spectrum users whereas the proposals in this document are confined to Business Radio. Nonetheless, Business Radio contributes

around £1bn-£2bn to GDP, which indicates the size of the potential gains.

A5.12 Some of the benefits will result from the existing policies and some will only be realised with the introduction of the proposed extension of trading and liberalisation. Estimating the split is highly problematic. However, insofar as the proposals facilitate liberalisation, they can be expected materially to enhance the gains.

A5.13 The proposals will also reduce the regulatory burden. The potential costs of making a change of use without the proposals include:

- costs to business of going through the Ofcom process;
- costs incurred by Ofcom in considering each request;
- lost opportunities (or much lower probability) of beneficial change of use or ownership of licences since the two parties would have to negotiate a conditional agreement and then both submit change of use requests to Ofcom.

A5.14 Insofar as the proposals enable more changes of use to occur without reference to Ofcom, there will be a reduction in regulatory burden although it is difficult to quantify this.

A5.15 The new proposals would reduce the regulatory and administrative burden on Ofcom as it would no longer have to manage many complex licence classes with different characteristics. This would reduce its administrative costs, which are currently running at about £400,000 a year for PBR, PAMR and national paging licences.

Costs of the proposals

A5.16 The liberalisation and trading proposals do not in themselves impose any additional burden on licensees as it is up to them to decide whether and to what extent to take advantage of them. Any licence holder is free to choose not to change use and to continue the use of spectrum unchanged or not to trade. If licence holders wish to change their use or to trade, then there may be costs associated with this. However, it is unlikely that they would elect to incur these costs unless they expected the benefits to be greater. Hence it may plausibly be concluded that introduction of the proposals would lead to an overall net benefit.

A5.17 The introduction of trading might increase costs to licensees in managing their own spectrum and also to interested parties who may have to depend on the market to obtain information on technical characteristics of the licence. However, to a large extent this cost can be minimised by the use of the MASTS tool and electronic notification to Ofcom.

A5.18 Licensees will be required to notify Ofcom before a transfer is made and on completion of the trade. However, Ofcom is proposing to minimise the costs by the use of electronic notification and is not currently proposing to charge an administration fee for whole or partial transfers under spectrum trading.

A5.19 Ofcom would have to incur some costs in developing the MASTS algorithm, but these costs are likely to be outweighed by the potential benefits of the algorithm facilitating trading and the more efficient use of spectrum.

Impact on licence fees

A5.20 The total fees paid by licensees in both the Area Defined and Technically Assigned classes will remain very similar to current overall fee levels; however, there will be some rebalancing of fee charges between the different assignments within each class. All users of systems in the Light Licensing products will benefit from fee reductions of between 10% and 90% as a result of the move to a 5 year fee payment interval.

A5.21 Ofcom estimates that, for Area Defined licences, 60% of assignments will see fee reductions or no change, 23 % of assignments will see fee increases by up to 8%, and 17 % of assignments will see fee increases by up to 25 %.

A5.22 Fees for Technically Assigned licences will depend on operating frequency, transmitter power, location and height of the antenna and channel width. Ofcom estimates that for about 72% of Technically Assigned assignments fee will remain the same or reduce, for a further 21.5% fees will increase by no more than £150 a year and for 6.5% of assignments fees could increase by more than this, in some cases by more than 100%. Some BR spectrum users may have more than one assignment and, in these cases, it is possible that fee increases for some of their assignments will be offset by fee reductions for others.

A5.23 These changes in fee levels do not relate solely to the liberalisation measures; in fact, they result mainly from the general review of the application of AIP to BR that has been conducted that would have applied regardless of liberalisation. The new fee rates will not become payable until some time after the grant of the new licence which itself will not happen before early 2008. Until then, the existing fees will be payable.

A5.24 There are various steps that Area Defined and Technically Assigned licensees may be able to take to mitigate any fees increases. These include the following.

- Re-engineer to a smaller sterilised area by reducing transmitter power and antenna height.
- Trade or relinquish unwanted coverage or bandwidth.
- Elect to share spectrum instead of having exclusive assignments.
- Move to less congested frequency bands.
- In the case of trunked systems with overlapping base station coverage, convert from a Technically Assigned licence to an Area Defined licence.
- Use a ‘downfire’ antenna.
- Convert to a Light Licensing product.
- Switch to a licence-exempt alternative (eg PMR 446, wi-fi or CB radio) if usage is light or if instant messaging or discrete networks are not essential, a public network system, eg GSM-PRO, or an alternative option from a local dealer.

A5.25 For example, some licensees will face fee increases for Technically Assigned licences if they elect to have exclusive access to the spectrum they are assigned. For those categories of assignments where we have estimated fee increases in

excess of 100% we have based the calculations on the assumption of exclusive access under the new licence. But licensees will be able to mitigate this by paying a lower fee for sharing access and this would, in most cases, cut their new fee in half. Most users are currently willing to share with another service and so may be content to opt for shared status and qualify for the reduced rate.

A5.26 Ofcom plans to communicate directly with those categories of licensee that are likely to face the largest % fee increase so as to alert them to the changes and give them an opportunity to plan any mitigating measures they may wish to take following the conversion of their existing licence in 2008.

Options

A5.27 Ofcom has identified four main options for future trading and liberalisation in the BR sector.

- *Option 1*: no change from present liberalisation and trading. All change of use requests beyond the scope of existing licences have to be notified to Ofcom to decide whether they should be allowed (current phase 1 liberalisation) and trading is limited to certain licence classes and types of trade.
- *Option 2*: extend spectrum trading to the specified licence classes without liberalising further. Ofcom would continue to require all changes of use to be notified to Ofcom to decide whether they should be allowed (current phase 1 liberalisation).
- *Option 3*: the trading and liberalisation measures described in this document.
- *Option 4*: maintain the present position as at option 1 and move direct to technology and application neutral Spectrum Usage Rights (SURs) in due course.

Comparison of the options

A5.28 The potential opportunity cost to businesses and consumers of doing nothing (option 1) is substantial. It will forego the additional benefits of the extension of liberalisation and trading discussed above.

A5.29 The potential opportunity cost of extending trading without liberalisation (option 2) is less but still potentially significant. The study for the European Commission mentioned above shows that far greater benefits are realised by trading and liberalisation combined than from trading alone. Trading without liberalisation was estimated to realise only about 10% of the benefits of trading and liberalisation combined (option 3). Hence option 2 would sacrifice about 90% of the potential gains of option 3.

A5.30 Option 4, waiting to introduce SURs directly, would delay the benefits of liberalisation and trading until such time as Ofcom had formulated and consulted on SURs in the BR sector. Ofcom is currently consulting on applying SURs to specific awards at 2500-2690 MHz, 2010-2025 MHz and 2290-2300 MHz[16] but it would take some time to complete the necessary technical analysis for the BR sector. Further, based on work carried out so far, it is possible that the benefits from implementing SURs for Technically Assigned and Light Licensing types might not justify the regulatory

[16] http://www.ofcom.org.uk/consult/condocs/2ghzawards/

overhead arising from the complex patterns of shared access. This issue was discussed in the consultation document on SURs[17]. Equally, implementation of option 3 does not prevent, or complicate, the introduction of SURs in due course should that appear appropriate. Hence, it is preferable to adopt option 3 at this stage, and review later whether a move to SURs would be appropriate.

Risk Assessment

A5.31 Based on the foregoing analysis, the measures described in this document, which correspond to option 3, offer significant advantages over the alternatives. However, they are not risk-free.

A5.32 Both trading and liberalisation involve risks that have been analysed and reviewed in depth in the consultations and statements on trading and liberalisation. It was concluded in those documents that, although some of the risks could potentially be significant, Ofcom could take specific actions to manage or mitigate them. The analysis is not repeated in detail here but the main risks with management and mitigation measures are summarised in the following table.

Area of risk	Possible effects	Management and mitigation
Licences incorrectly specified to avoid harmful interference	Increased interference to licence holders. Flexibility not as great as might be achieved. Neighbouring licence holders transmit within their rights but suffer interference.	Careful introduction of liberalisation to allow the interference risk to be assessed and use of modeling. Licence redesign and use of new computer based planning tools. Continued Ofcom involvement in investigating and resolving interference.
Inefficient use of spectrum	Fragmentation: trading results in incumbents occupying small assignments scattered throughout bands and high transaction costs prevent acquisition of larger blocks.	Although effective markets should deliver more effective outcomes, Ofcom could negotiate with licensees and, ultimately, take regulatory action to facilitate re-planning.
Market failures	Abuse of market power (eg hold-outs). Transaction costs (eg search costs relating to trading).	Use competition powers. Ofcom is looking at a number of ways to mitigate these costs. As examples: • making information available on tradable licences; • making its assignment tool (MASTS) and the Generic Radio Modeling Tool (GRMT) available on-line to enable technical impact on current users to be assessed. More information on the GRMT, which is currently under development, can be found at: http://www.ofcom.org.uk/research/technology.
Disruption to customers	As use is changed, some services may be withdrawn with subsequent disruption.	Limited action from Ofcom – this is part of a standard market and would not normally require intervention.

[17] http://www.ofcom.org.uk/consult/condocs/sur/

Summary and recommendations

A5.33 The benefits of the measures described in the Statement, which correspond to option 3 in this IA, are difficult to quantify but are likely to be significant. These are highly likely to exceed by a considerable margin the costs, which are expected to be relatively slight. Some licensees will face sizable increases in fees as a result of revised AIP but these increases are not primarily attributable to the liberalisation measures and licensees will be able to take steps to mitigate them.

A5.34 In summary, the proposals in this document can be expected to generate significant benefits for consumers and businesses, including equipment manufacturers and communications service providers, and offer significant advantages over the alternatives. There are risks involved but Ofcom believes that these can be managed and effectively mitigated. Ofcom has accordingly decided to proceed with option 3.

Annex 6

Glossary

AIP

Administered 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:

http://www.ofcom.org.uk/static/archive/ra/topics/spectrum-price/documents/spec_rev/ha129.doc

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/radiocomms/reports/independent_review/

Ofcom consulted last year on revisions to update AIP and a Statement is being published on its conclusions in parallel with this Statement.

Antenna

A passive device 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.

Band

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

Base station

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

CDMA

Code Division Multiple Access.

Common Base Stations

A single channel base station for BR shared by users (also known as a community repeater); or 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

Communications Act 2003, which confers powers, duties and functions on Ofcom and came into force in December 2003.

Data Networks

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

DSA - Designated Service Area:

This is the geographical area resultant from applying the CRSA and the associated technical characteristics required (from the transmitter) to the MASTS algorithm. It is formed by the intersection of the CRSA and the predicted coverage area, and is the area over which the activity factor is to be maintained.

dBm

dBm is a measure of absolute power values. Zero dBm equals one milliwatt.

eirp

Equivalent Isotropically Radiated Power. The product of power supplied to an antenna and the antenna gain in a given direction relative to an isotropic antenna, ie one that radiates equally in all directions.

ERP

Effective Radiated Power.

ETSI

European Telecommunications Standards Institute.

GHz

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

GSM – PRO:

Is an implementation of GSM that allows a telephone number to connect to a whole work group rather than one to one calls. Some implementations allow push to talk functionality with the handset having a loudspeaker so that the radio can be used more like a PMR handset than a telephone.

IR: Interface requirements

In accordance with Articles 4.1 and 7.2 of the R&TTE Directive, UK Radio Interface Requirements (RIRs or IRs) set out the relevant high-level assignment, frequency occupation rules and planning assumptions for licensed equipment. They are referenced in Exemption Regulations and licences.

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.

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.

kHz

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

Land Mobile

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

Liberalisation

Removal of restriction on use of spectrum (eg technology employed or service provided) including change of geographical coverage, power or frequency bandwidth occupied.

Licence class

Type of licence, for example PAMR or Wide area. Volume classes refer to those licence classes for which there are significant numbers of licensees, for example On Site BR with 26,000 licensees.

Licence exempt

Under regulations made previously by the Secretary of State and now by Ofcom, some types of radio equipment are exempted from the requirement for a licence. The current regulations, the Wireless Telegraphy (Exemption) Regulations 2003 (SI 2003 No. 74), are available at:

http://www.legislation.hmso.gov.uk/si/si2003/20030074.htm

MASTS

Mobile Assignment Technical System, an electronic assignment system currently under development for Ofcom and planned to enter service in 2007.

MHz

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

Ofcom

Office of Communications, responsible for spectrum management in the UK and international representation since 29 December 2003.

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.

PMR

Private Mobile Radio (PMR), see PBR.

Propagation

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

PSD

Power Spectral Density. A measure of the intensity of a radio signal, averaged over a specified frequency range.

Remote meter reading

The reading of meters from a distance using radio.

Safety of life services

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

SFR

Ofcom's Spectrum Framework Review, published 23 November 2004, that sets out Ofcom's vision for spectrum management.

SFR: IP

The Spectrum Framework Review: Implementation Plan that sets out Ofcom's plans for releasing spectrum in 2005-08 and extending liberalisation and trading to mobile services.

Spectrum

A continuous range of frequencies of electromagnetic radiation (eg radio waves).

Spectrum Licensing Portal

This System provides a range of information about spectrum licences and authorisations that is useful to spectrum users and in particular those interested in Spectrum Trading and Ofcom's other initiatives for liberalising the use of the radio spectrum, available at:

http://www.ofcom.org.uk/radiocomms/isu/ukpfa/intro

SQB

Spectrum Quality Benchmark – used to define the standard of spectrum quality that licensees can expect to experience. Based on TFAC.

SUR

Spectrum Usage Rights

Telemetry

Transmission of data by radio for remotely indicating or recording measurements.

TFAC

Technical Frequency Assignment Criteria used by Ofcom in planning and granting assignments.

Trading Regulations

Regulations made under section 168 of the Communications Act to introduce and regulate 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.

Undue interference

Interference that is harmful, defined by section 183 Communications Act 2003 to include interference that creates dangers or risks to the functioning of any radio communications service used for navigation or safety, or that degrades, obstructs or repeatedly interrupts broadcasting or other radio communications.

VHF

Very High Frequency; the portion of the electromagnetic spectrum between 30 and 300 MHz.

WT Acts

Wireless Telegraphy Acts 1949, 1967 and 1998 as amended by the Communications Act and due to be replaced on 8 February 2007 by the Wireless Telegraphy Act 2006. They regulate use of UK radio spectrum.

WT Act licences

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

WT Register

Part of the licensing system portal system which provide basic information about individual licences such as contact names and address details, class of licence, band(s) of frequencies and where relevant geographic area of operation. At present information is limited to the classes that became tradable in December 2004, available at:

http://www.ofcom.org.uk/radiocomms/isu/ukpfa/intro