



'Implementing Spectrum Trading'

**Response to the Consultation Document of the
Radiocommunications Agency**

October 2002

Introduction and Executive Summary

This document is the response of the Radio Authority's staff to the Radiocommunications Agency's consultation document "Implementing Spectrum Trading" (July 2002).

The response is in two parts. Firstly, a general commentary is given both on a general level, and specifically, to explain the framework under which sound broadcasting operates and the relevance this may or may not have to spectrum trading. The second and larger part of the response is addressed to the specific questions raised in the consultation document.

The most important points the Authority wishes to make are in four areas:

- (paragraphs 8, question 6, and 23) The use of spectrum for sound broadcasting is centrally planned for their respective sectors by the Radio Authority and BBC in cooperation. This is to secure public policy objectives; notably where radio services are and how extensive their coverage should be, principles which are consolidated in the draft Communications Bill. The trading of this basic right of spectrum use could generally not be in the gift of the Authority's licensees, or the BBC, if these public policy objectives are to be upheld effectively and fairly.
- (para.7, Q.7/8 and 23) Spectrum trading could helpfully be applied to sound broadcasting in the specific and defined context of analogue to digital transition. It could be used to assist the entry to digital and exit from analogue wavebands where the services concerned fall outside the use of spectrum allocated and planned for public policy purposes, namely:
 - early entry to frequencies already earmarked for digital radio for future public policy purposes;
 - access to frequencies available for a variety of applications including but not exclusively for sound broadcasting ('general' multiplexes, anticipated in the Communications Bill);
 - allowing a commercially-driven rather than (later) an administratively-dictated withdrawal from analogue broadcast frequencies, when the relevant public policy requirements are fulfilled instead by digital radio.
- (para.6, Q. 25) Radiocommunications sectors which have developed under the management of a benign regulator, typically characterised by small independent users, will find spectrum trading a major culture shock for which they will be ill-equipped. The emergence of a mature commercial service in market engagement may eventually serve these sectors as well or

better, but there is a significant risk that until that market reaches an equilibrium, damage may be done.

- (Q.19) Spectrum pricing as a tool of spectrum management is for many sectors only convincing in an environment of auctions (or similar) and trading, where pricing is:
 - genuinely market tested;
 - part of a completed circle in the direct exercise of choice and behaviour in spectrum use by the parties involved.

The question of payment (e.g. administrative pricing) for access to public good is related, but different.

General Commentary

Opportunities for Improved Spectrum Management

1. The underlying principle of spectrum trading, that market mechanisms are an effective way to distribute resource, is intuitively and historically appealing. The Radio Authority therefore warmly welcomes the opportunities for improved spectrum management that are presented by the proposed facilitation of spectrum trading.

Sound Broadcasting and Market Mechanisms

2. However, the Authority endorses the clear recognition in the Radiocommunications Agency's consultation document that market mechanisms will on their own not in all circumstances deliver outcomes which best serve the public interest. The basic premise of the regulation of sound broadcasting, both now and as anticipated in the Communications Bill, is that the best results for consumers are achieved by firstly setting a particular framework in the various areas which impact on the service delivered to them. Market mechanisms are then a key component, but not the only one, in the toolkit for achieving these best outcomes. They extend particularly to the relationship between providers (radio stations) and consumers (the public).

Definition of Licensee Rights and Obligations

3. The Authority welcomes the move anticipated in the Agency's document towards a more thorough definition of licensee rights and obligations. This is helpful whether or not the licences are tradable, and essential if they are. These definitions need not be inflexible and absolute in nature, but the more clarity attaching to a spectrum licence the better. The concept of such licences as a 'good' is philosophically and practically the most appropriate, whatever the context of its establishment and operation.

Smaller Spectrum Users

4. The Authority believes that it will be important for Ofcom to consider its overall strategy for the range of parties which use spectrum. The world of spectrum trading would appear to be no place for direct participation by amateurs or smaller businesses, for whom communications is not their core activity.

5. A supposition of spectrum trading is the efficacy of the market to deliver spectrum access to such smaller users via more expert intermediaries either as advisors or brokers. It will probably take some time before the natural

operation of a market in such service provision has reached an equilibrium. It may be that the equilibrium delivers a different profile and dynamic of user from the present. On the one hand, the precepts of market supremacy might be better for all concerned. On the other, the increased overheads or costs for small users may squeeze them from spectrum use, not because they are intrinsically inefficient spectrum users (though they may be), but because they are too small to count in a 'bulk brokering' game.

6. In some sectors there is a history of dependence on an essentially benign regulator, which is keen to foster and sponsor it, e.g. the Authority itself with smaller commercial radio services (not to mention its 'restricted services'), and the Radiocommunications Agency (with Private Business Radio - PBR). Spectrum trading changes the game for the sectors affected, for better or worse, and Ofcom will need to approach this change in an appropriately holistic and pragmatic way.

Sound Broadcasting and Spectrum Trading

7. The Authority is pleased that the consultative document recognises the importance of public policy criteria in deciding whether or not, and how to apply spectrum trading to broadcasting. It is therefore consistent, and appropriate, to defer its possible introduction to 'Wave 2', rather than 'Wave 1'. This would also allow consideration and preparation of any relevant scheme at a more relevant time in sound broadcasting's development. Two considerations come to mind in this regard.

i) A large proportion of current analogue licences, whose terms and basis of establishment preclude all but 'Mode 1' trading (which already is practised de facto, by virtue of trading in the associated Broadcasting Act licences), expire over the period 2007 to 2008 although the Communications Bill anticipates an extension of this by four years. Digital licences have in effect twenty or more years to run.

ii). The Authority believes that the most appropriate significant use of trading for sound broadcasting licences would be in providing a more flexible mechanism for effecting spectrum reallocation associated with analogue to digital transition. There is much more detail to consider, but the principle is interesting. However, the appropriate time to consider this is when the longer-term strategic view is clearer with respect to:

- (a) spectrum allocations as a whole in the relevant bands;
- (b) the extent to which the totality of sound broadcasting would in future be comprised of services operating, as now, under a regulator-initiated public policy remit (however lightly regulated), i.e. all, some, or even none.

- (c) the take-up of digital radio enabling some or all of the public policy commitments carried out on analogue transmission to be ceased.

Sound Broadcasting: Applying Public Policy Requirements; Devolving Responsibility

8. The present regulation of sound broadcasting includes that the basic attribution of a common pool of spectral resource is centrally planned by the regulator (currently the Radio Authority, in co-operation with the BBC, under the arm's length supervision of the Radiocommunications Agency). This is necessary because the regulator has a statutory duty to determine:

- (a) where local radio licences should be, and for what size of area coverage should be enabled,
- (b) secure as broad a range of local services as the available spectrum will allow, and
- (c) secure that the licensee covers as much of its permitted area as reasonably possible.

These factors require to be balanced, since when pursued in isolation they are typically conflicting. Further practical considerations also apply, notably that most licences use very few transmitters, and that competitive licence awards need to be made against a background of security of spectrum availability and the ability to use it.

9. However although all this requires a central and active rôle for the regulator, the Authority does seek to minimise it as far as possible, and looks to the commercial judgement of its licensees to work in the public interest, notably in securing effective coverage beyond a minimum acceptable level.

10. On the whole, digital radio has enabled a greater devolution of responsibility from regulator to licensee, although the Authority has needed to plan *a priori*:

- the basic pattern of frequency use (for reasons given above);
- a helpful but not excessive level of detail to define the freedoms and constraints for licensees to decide for themselves on the details of implementation, without interfering with other licensees.

11. This has of necessity involved the Authority in setting out basic network designs in some cases, in order to retain the ability for competitors to use,

rather than sterilise, adjacent frequencies. This promotes competition, delivers better services to the consumers, and uses frequencies more efficiently. However, the regulatory framework has retained flexibility for licensees to come to additional agreements where they perceive mutual benefit. Also, the Authority's policy on coverage and protection specifies criteria for accepting some small interference to one service to allow for the major improvement of another.

Response to Specific Questions

Question 1 Do you have any comments on the proposed modes of trade? Are there others that should be considered?

The proposed modes of trade appear logically categorised. Their applicability would depend on the detailed rules made for the frequency bands and sectors concerned.

Question 2 How should interference disputes be resolved? How far should Ofcom become involved and what should its rôle be in relation to interference?

The Authority believes it would be more efficient for interference disputes to be resolved, if not between the parties concerned, by an expert regulator:

- (a) whose vested interest is to minimise the complexity and duration of dispute resolution;
- (b) whose establishment of precedent would be made with the overall health of the system in mind for the longer term.

Ofcom should at the very least establish in its trading rules and interference standards the extent to which protection from interference should be expected. It is unrealistic to expect protection to be absolute in most cases. Protection is generally expressed in statistical terms, which do not lend themselves to incontrovertibly measurable proof. For example, the Authority's own planning and protection activities, whilst stated in quantitative and objective terms, can include a significant contextual element in the interest of spectrum efficiency. Albeit that this is explained as far as possible in its published guidance notes, it is not exclusively quantitative. The benefits of reasoned judgement cannot be overstated, especially where efficient use of spectrum is required.

A further point is that where disputes are resolved between parties without recourse to Ofcom this should not by default after the defined rights and constraints of the licences concerned. In other words, Ofcom should approve the resolution.

Question 3 It is proposed to give scope for trades with as wide as possible a variety of time periods and opportunities for reversion. Which combinations do you think will deliver greatest benefits?

The scope for trades should certainly be as wide as possible, as circumstance will vary widely between the frequency bands, user sectors and technology. Time periods should typically be shorter for 'outgoing' licensees whose tradable licences would be likely to be bought by exponents of different

services/newer technologies. Time periods for 'overlay' licences (as defined in the Agency's consultation document) might be longer term. Obviously a balance has to be struck between, on the one hand, allowing enough time for investment in new techniques and technologies and in associated spectrum licences to give adequate returns; and on the other, not to have spectrum blocked for a long time by partially successful technologies. Users of unsuccessful technologies will of course jump at the chance to sell on spectrum anyway. In general, the arguments tend to favour longer rather than shorter licence terms. Early unforeseen reversion, even for public policy purposes, could then require licence holders to be bought out (akin to or indeed constituting a compulsory purchase order for an infrastructure project).

Question 4 It is proposed to give scope for trades where the extent of transfer of rights and obligation is complete or concurrent. What is your view on this proposal?

Again, scope for both complete or concurrent rights should be provided for, but the concept of concurrent rights is unconvincing. Sub-assignment of responsibilities with leasing is, however, realistic and appropriate.

Question 5 Licence classes from the following sectors are proposed for a first wave of introduction of spectrum trading: public wireless networks; broadband fixed wireless access, private business systems and terrestrial fixed links. Additionally for the first wave the simplest mode of trading (change of ownership only) is proposed for all other licence sectors and licence classes (with a few exceptions). a) What is your view of these proposals? b) What is your view on the appropriate timing of the introduction of trading for particular licence classes within sectors, and in particular for Third Generation Mobile (3G) licences?

The Authority would look to the representative bodies for the sectors concerned for inclusion in the 'first wave' to make a more detailed assessment of the proposals. However the choice of these sectors appears appropriate. Public wireless networks and broadband fixed wireless operate on a regional or national multi-transmitter, block-spectrum basis. In some cases this is with basic public policy requirements on coverage, but the majority of their spectrum activity (notably where there is spectrum scarcity) is to satisfy commercial requirements which are also consistent with public interest in a competitive environment. In these sectors therefore, spectrum requirements are required to be flexible according to market conditions. These licences were established by selection (including auction in some cases) and so the additional flexibility to trade spectrum (in and out) appears logical and to be potentially very beneficial. The requirements of coverage would be maintained through Ofcom's other instruments of regulatory leverage. The maintenance of adequate competition in a particular sector would, as suggested, be one of the

criteria for regulating trades, if not regulated by other provisions in Ofcom's remit.

PBR and terrestrial fixed links also appear appropriate for trades as the functions they fulfil tend to be ancillary (albeit of high importance) to the businesses and organisations which use them, rather than intrinsic in the way that broadcasting or public wireless might be. These users also tend to have more alternative means of service provision at their disposal (including changes of their PBR and fixed link use) and stand to gain as sellers and purchasers of the associated rights.

Question 6 Licence classes from the following sectors are proposed for a second wave of spectrum trading; sound broadcasting (analogue and digital), television broadcasting (analogue and digital), programme making and special events, and aeronautical and maritime. What is your view of these proposals?

All these sectors (perhaps less so for programme making and special events) incorporate strong elements of public policy in their construction. They are also characterised, largely for this very reason, by constraining but necessary international harmonisation and, generally a split of responsibility for equipment ownership between service provider and consumer. This cannot be addressed without significant, if 'arms length', regulatory guidance or planning.

Also, a subtle distinction exists between broadcasting on the one hand, and the other three sectors on the other. Broadcasting is more intrinsically a function of its spectrum use (arguably less so for fixed reception modes than for mobile), whereas the other three sectors are using their spectrum as support operations, albeit that these are vital functions for which there are not necessarily full or obvious alternatives.

The extent of applicability of trading to these 'Wave 2' sectors will need to be more carefully considered, as, of course will be the preparations for any (probably selective) implementation. The nature of trades may be different, e.g. with respect to scope and preemption. Leasing or pre-emptable short-term arrangements may be beneficial, where more fundamental levels of trading may not.

Certainly the whole structure of the sound broadcast licensing system(s) as reinforced by the Communications Bill, is not consistent at all with the general application of spectrum trading.

Questions 7 and 8 In your view, what is the best approach for introducing the more complex forms of trading? What is your view on the overall timing of the introduction of spectrum trading?

We are not inclined to make recommendations for the approach and timing of spectrum trading in other sectors. We also think it is important that Ofcom should be able to form its own strategic and policy approaches to the sectors affected by spectrum trading, as well as to the trading itself. In respect of those aspects of sound broadcasting which are relevant, the approach should accrue from Ofcom policy for interpreting its explicit statutory duties with respect to sound broadcasting, and also for the other sectors which compete for the same spectrum or with which trades may occur. Due account will also be taken of the other means by which sound broadcasting services may be brought about, notably the “general multiplex” (Communications Bill, Section 132 (10) refers), as well as channels offering only fixed reception such as ‘additional services’ on TV multiplexes.

We would expect the timing to relate to the relevance of applicability, as well as the lead-time necessary to prepare properly-conceived and agreed arrangements. For sound broadcasting, we believe this could relate particularly to the possibility of:

- i) licensing local digital radio multiplex services in the ‘L-Band’ (or in VHF bands if a relevant allocation decision were to be made) effective from a specified future date on an ‘overlay’ basis; the ‘public policy’ requirements and promises would relate to the time from which incumbent fixed-link users would be required to move from the band, but licensees could gain earlier access by buying the fixed link users’ tenure at an early stage;
- ii) deciding at a future stage that some sound broadcasting services’ public policy requirements were fulfilled on digital radio, and so enabling holders of relevant analogue licences to sell their rights; (to whatever range of allowable purposes Ofcom may determine).

It could also be possible in theory to purchase very localised interference rights. The best (and perhaps only) example would be where a digital radio multiplex licensee would secure the agreement of a licensee using the adjacent frequency in the same area to site a transmitter which would cause a small zone of interference. However, the Authority already allows limited zones of interference, and to allow the creation of slightly larger areas in recognition of money having changed hands would soon start to weigh against the public interest requirement of securing extensive coverage of broadcast services. It sounds more complex than it’s worth.

Question 9 In planning for the introduction of spectrum trading, it would be helpful to have an estimate of the likely volume of trading. For each licence sector and licence class on which you can express a view, what volume of trades would you expect? Would you expect a different volume depending on the available modes of trade?

The reality of current arrangements for licensing sound broadcasting is that what the consultation defines as 'Mode 1' trading has been permitted since 1990. The relevant WT Act licences are issued by the Radiocommunications Agency at its discretion, but in practice linked directly or indirectly, but always exactly, to the holding of a sound broadcast licence issued by the Radio Authority. The volume of 'Mode 1' trading would therefore continue, as now, dependent on movements in the industry as a whole, with greater bursts of activity surrounding any discrete shifts in industry ownership rules.

The more substantive issue of trades which alter the actual use of spectrum for sound broadcasting services in the specific context of our answer to question 7 and 8 is harder to predict; it would depend on circumstances. In fact one of the main advantages of spectrum trading is that market forces apply directly, rather than being substituted by administrative anticipation, analysis and attempts to quantify them.

The possibility of trades between existing fixed link licensees and digital radio overlay licences on L-Band frequencies (led by existing public policy criteria) would become significant if:

- incumbent users of analogue fixed link services were prepared to migrate to the new alternative digital bands in principle, but would otherwise defer investment until it was necessary (i.e. to move in March 2007); and,
- holders of overlay licences had a strong enough commercial incentive to get on air sooner rather than later.

The commercial advantages of transmitting on digital radio (T-DAB) on this trading-accelerated timescale would be different from those which currently apply to digital licences being awarded by the Authority on its existing VHF allocation. The business model for the latter is to a significant extent supported by the automatic renewal of analogue licences for services which secure carriage on a digital multiplex – hence providing one or two ready customers for multiplex licensees in an embryonic market. The timescale on which many of the remaining licences fall for renewal may render this incentive of less relevance. However, the other principal driver remains, namely the longer-term prospects for digital radio, and the desire to secure an early position as 'gatekeeper'. The incentive for the 'overlay' licensees to start transmissions, as opposed to 'merely' winning a licence for future use, would come from (i) an (unexpectedly) early move into intrinsic profitability for digital radio (all the

way along the value chain, including perhaps analogue broadcasters wishing to position themselves into a digital landscape), or (ii) a strategic push by the industry to continue the introduction of new services to fuel the momentum of public take-up of digital radio, especially receiver sales.

Clearer advice than this on possible extent and timescales of trading would require more detailed analysis and forecasting; it would in any case be somewhat speculative. The Radio Authority has identified some twelve local radio areas which are (a) small enough to be technically feasible for L-Band service delivery (b) populous enough such that, had frequencies been available, they would have been included in its current round of licensing (which includes the analogue renewal incentive).

These licences would be the ones most likely to feature in trades. About another eight to twelve larger areas could also feature if advertised despite the more restricted coverage potential of L-Band frequencies (this would deliver somewhat 'cherry-picked' coverage). The Authority believes that beyond this there is likely to be a case for further spectrum to be allocated in L-Band for public policy broadcasting purposes, notably for smaller-scale radio services. However, given the current rate of uptake of digital radio services, and the financial constraints on smaller radio stations, the technique of 'overlay' licences is probably not of relevance to these smaller scale services on the timescale of interest (i.e. before 2007).

The same 'overlay' principles could apply to 'general multiplexes' (Communications Bill Section 132 (10)). These could also be awarded as 'overlay licences', e.g. by auction with the possibility of sound programme services being permitted to be carried *inter alia*, but without all of the public policy provisions of location, extent, maintenance and character of service applying. Equally, they could simply be introduced by the permitted purchase of incumbent fixed link licensee rights, within those parts of the spectrum not earmarked for public policy-driven broadcast multiplexes. As the commercial drivers include but go beyond simply those of digital radio, the timescale of relevance could be shorter than those of the public policy overlay DAB multiplex licences described above. They could, for example, develop in conjunction with and as a complement to, certain 3G services/platforms.

Question 10 For the proposed licence sectors from which licence classes will be selected for the first wave of the introduction of spectrum trading with more complex trading modes (i.e. for the sectors: public wireless networks, broadband fixed wireless access, private business systems and terrestrial fixed links) do you have any views on how extensively change of use or reconfiguration should be permitted?

The opportunities and threats or constraints presented by change of use or configuration in first wave sectors will be best identified by the actors within those sectors. However, certain points of principle are more general; some philosophical and practical considerations can be identified.

The philosophy of the spectrum trading concept would, in those sectors where it is fully applicable suggest that:

- reconfiguration should be unrestricted, save where competition concerns came into play, e.g. number of 3G licences (to the extent this is not regulated elsewhere);
- significant change of use could at least be permitted within certain broad categories (e.g. 'public wireless networks' would have wide discretion with respect to standards, public and private business radio would be interchangeable, broadcast fixed wireless access could be interchangeable with fixed links).

The various recognised safeguards set out in the consultation document would apply, of course, e.g. international radio regulation and harmonisation issues, anti-competitive behaviour/ hoarding, etc. The most significant concern beyond this, as opposed to 'a reason not to do it', is the spectral opportunity cost of commercial misjudgments pending a part of a market reaching an equilibrium state (after the major discontinuity of introducing spectrum trading).

Cable television illustrates this point. The enormous financial difficulties encountered by this industry in the UK, over some 20 years, suggest that the profile of investment made in infrastructure was not well matched to the profile of returns. However, in terms of infrastructure opportunity cost for other potential users of spectrum, there is, at least on a superficial analysis, no harm done. This would not have been the case with a radio-based technology. Not, of course, that traditional administratively-determined allocation is immune from this difficulty; indeed spectrum trading does at least offer a facilitative remedy, if the operator concerned is prepared to cut its losses.

Question 11 For the proposed licence sectors from which licence classes will be selected for the second wave of spectrum trading, do you have any views on how extensively change of use or reconfiguration should be permitted?

For the second wave of trading, the extent of change of use or configuration would be significantly more restricted. The arguments and detail are rehearsed in answers to previous questions, notably to draw attention to the more direct singular public policy remit of individual users (as opposed to the overall achievement of public policy aims by market forces for first wave users).

However, the particular examples of trading which we give as being potentially applicable to sound broadcasting, by definition require change of use (as well as reconfiguration).

Question 12 Would having different trading rules for different licence sectors and licence classes have any undesirable impact?

Consistent with our above discussion, and with our general commentary, we believe it will not be possible to apply identical (or even particularly similar) trading rules across all licence sectors and classes. It will be necessary to take account of the relevant circumstances, for example whether:

- there are any public policy considerations;
- tenure/responsibility is full or sub-let;
- a sub-band of spectrum over a wide geographical area is traded, or one or more individual transmitter assignments (with defined protection rights);
- the spectrum concerned is viewed strategically by Ofcom as (i) there to be colonised on a 'first-come-first-served' basis (with trading used just to negotiate away interference incompatibilities with existing users), or (ii) to be paid for by incoming/ 'colonising' users to reflect the whole opportunity cost of the spectrum used (as opposed simply to that relating to incumbents' existing specific rights);
- the licences are 'overlay' licences or not (although this does not of itself necessarily require fundamentally different rules).

As for any undesirability of those differences, perhaps the most obvious is the greater difficulty in establishing what would be a reasonable price for trades; the like-for-like comparison of alternative options becomes more difficult. This will require Ofcom to make its rules very clear up front, to enable accurate, fair and fluent participation in trading. This will in turn present a separate challenge, to develop the trading schemes in response to experience without moving the trading goalposts in an unfair way.

Question 13 In what circumstances do you consider it would be appropriate for Ofcom to (a) require prior clearance or consent (ex ante) for competition purposes for a proposed trade and (b) withhold consent for a trade on competition grounds?

As the consultation document suggests, the presumption in favour of 'ex post' scrutiny of trades on competition grounds (as opposed to 'ex ante' for, say, technical grounds) is logical, as it is consistent with normal practice in this field. It is right that the definition of a relevant market would be made with reference to the end user(s) concerned. However, a truly like-for-like comparison of a use of spectrum with a use of other communications media is not easy, for all that it is achievable. (As an example, a PBR on VHF could

instead use a 'virtual' private network overlaid on a public mobile network; to what extent is the spectrum use of the public network included directly in the spectrum balance, or alternatively, regarded as a conceptual 'pipe', whose own network's use of spectrum is the subject of a different comparison?).

Without prejudice to the need to assess competition issues (a) with respect to end-use and (b) with a presumption in favour of 'ex post' scrutiny (deterministically or by complaint), the underlying utility and unique characteristics of spectrum as a public good should not be overlooked. If civil spectrum is to be divided broadly into 'that reserved for specific public policy reasons' (e.g. most sound broadcasting) and that general resource of spectrum available to be traded, then undue dominance of the latter by a single owner would surely be anti-competitive. The different characteristics and uses of different frequency ranges also requires those markets to be defined distinctively, e.g. perhaps 'VHF', 'UHF', etc.

Following on from this, we believe there is a case for 'ex ante' approval of trades on grounds of overall competition in the market for broadly comparable spectrum, perhaps only in response to complaint rather than deterministically. This should not preclude 'ex post' complaints being brought by parties, especially some users against their 'spectral landlords' (in the FMO scenario).

This policy need not necessarily apply indefinitely. A review could be made after the initial few years of operation, to consider moving to 'ex post' scrutiny. The intermediate 'ex ante' stage would at least enable the trading regime to bed in, without the disruption to the spectrum market which would accrue from unraveling, ex post, a done deal.

Question 14 How should tradable licences be structured? Views on all aspects of structuring the licences would be appreciated including on the technical construction of boundary conditions.

Question 15 Are there licence classes, or licence sectors, for which division of spectrum into predefined frequency trading units with fixed boundary conditions would facilitate trading?

Question 16 Are there licence classes, or licence sectors, for which user-negotiable boundaries would facilitate trading?

These three questions are taken together, given the close inter-relationship between them.

Ideally, consistency would be sought in the structuring and packaging of licences. However, strategic and practical differences between the nature of

different services and frequency bands will lead to some corresponding differences of structure of licences.

As a general principle, it would be desirable to define the 'good' of spectrum use by the specification of boundary conditions, in order to maximise the opportunity for commercial concerns to plan and optimise their use of spectrum. It may be useful, as an example, to explain how the Authority has tried to follow this principle to the (rather limited) extent feasible.

The degrees of freedom within which an Authority licensee operates are a mix of the general (related to the general coverage, overspill and opportunity cost considerations of the licence), albeit articulated by exact technical criteria, and the specific (related to protecting existing services' coverage areas from interference). Digital Radio has been better suited than analogue to this approach of trying to maximise licensee freedom. Yet even here it is necessary to apply some regulatory pre-planning and management of the transmitter sites which are used, in order that adjacent-channel frequency blocks can be used in the same area by different operators.

The general boundary conditions applied for digital radio are:

- i) limits to the (predicted) interference field strengths from the digital radio transmitter networks to prescribed (detailed) co-channel areas, and at other particular defined test points (where relevant);
- ii) the definition of surrounding zones into which wanted signals should not overspill: i.e. to define the local area to which the licence relates
- iii) definition of an area (the 'primary protected area') within which the Authority will take measures in its planning to protect the service concerned from interference;
- iv) a statement of which parts of the area (if any) will have services operating on the adjacent-frequency channel, and within that area, at what transmitter sites operation is allowed irrespective of interference to or from those other services.

It should be noted that for (i) and (iii), general limits are supplemented by more specific advice about the indicative acceptable levels of power which could be radiated into and out of the area concerned by specific representative transmitter assignments. To some extent, this reflects the particular nature of broadcast transmitter network topology. However, it serves to exemplify a general principle, which the Authority believes applies more widely, namely that:

the effective application of boundary conditions requires the application of regulatory scrutiny of implementation proposals. Setting these conditions in 'absolute' terms militates strongly against spectrum efficiency.

The alternative approach to spectrum trading, in which traded units are of large granularity, is far simpler to operate where applicable. However, the use of general purpose 'spectrum trading units' may be too crude, and not optimised to the different circumstances required. They may though have applicability if optimised to different bands. This is the area where the dynamics of market operation can yield the greatest benefit (which is not to overlook the potential of trading at the less macroscopic level and especially where overlay licences are concerned). It lends itself to sectors where national networks would require the exclusive use of a frequency band of width related to demand, and in which competitors are of a similar type. Public wireless networks may be a good example.

It is important that the rules and structure of trading in any event deal effectively and clearly with technical interactions between bands which are otherwise planned and managed separately. This is particularly due to (i) 'intermodulation products' generated at transmitters and within receivers, and (ii) unintended but predictable receiver responses related to 'intermediate' and 'image' frequencies.

Other sectors have more limited potential. Trading assignments (e.g. in PBR) would be more appropriate, with reconfiguration being (a) necessary (b) governed by a clear policy for the frequency band concerned in relation to the extent of that reconfiguration. In the case of 'assignment' trading, the trade may be between licensees or, in the case of 'leased' spectrum, between 'tenant' and 'private landlord', in the latter case the 'landlord' would hold umbrella rights. The 'landlord' (or Spectrum Management Organisation, SMO) system has the attraction that it would not be necessary for Ofcom to set out 'general degrees of freedom' to define the 'good' of an individual licence assignment. On the other hand, the SMO should ideally do so and indeed should be required to do so by Ofcom; the need does not go away.

At the assignment level, 'traded entities' may be entire assignments (preferably with defined degrees of freedom), or 'rights to interfere', i.e. to interfere with another service to a greater extent than a regulator (or SMO as a proxy regulator) would allow by its published criteria (however flexible). The extent of that interference right may be explicitly associated with the trade, and registered by Ofcom, or it may be implicit in the allowance of otherwise incompatible frequency assignment characteristics permitted by Ofcom with the expressed agreement of the interference victim, who is paid in the trade for its troubles. These two options amount to the same mechanic, however, as best

practice by Ofcom would include a self-imposed requirement to record the rationale for its decisions.

Question 17 Are there licence classes, or licence sectors, for which spectrum reconfiguration on demand would facilitate trading?

Spectrum reconfiguration is the central dynamic of spectrum trading. 'Mode 1' trading and the fairly limited-impact facility of buying interference rights are relatively peripheral.

Reconfiguration is most obviously applicable to the 'macroscopic' examples of large area/national licences of significant bandwidth segments. Reconfiguration can and should also occur *de facto* by the aggregation of individual assignments by a new owner and then their replacement, rather akin to a property developer buying up small houses (or large gardens) for a redevelopment scheme. It is rather academic as to whether that 'developer' is the owner of one large plot of land, or multiple but contiguous smaller ones.

Question 18 What changes, if any, do you consider are needed to licence term and security of tenure to promote the successful introduction of spectrum trading? Please be as specific as possible about the licence sector(s) and licence class(es) to which you are referring.

The sound broadcasting licences issued by the Radio Authority have a finite duration of several years with an associated security of tenure, and with a balance of freedoms and obligations. The actual durations of spectrum licences should in principle vary between sectors, but the basic principle remains one of striking the balance between on one hand giving enough time to enable a recouping of associated non-spectrum investments, and on the other, the need (if any) perceived by the regulator at some point to be able to 'claw back' spectrum for public policy/new technology/international obligations purposes. In the sound broadcasting field, to illustrate the principle, analogue licences are of eight years duration (to be extended to twelve in the new Communications Bill) and digital, in effect, twenty four (renewal at twelve years need only satisfy a low threshold of requirements).

As for security of tenure, knowledge of duration must be supplemented by clarity of the procedures and criteria of interference protection (for reasons stated earlier, these should be open, and detailed, but for the sake of spectrum efficiency, not absolutist in character). Also, the circumstances and framework terms of any 'compulsory purchase' scheme to which the licence could be susceptible, should be spelt out.

Some difference of treatment is to be expected for licences which are established by auction or other valuation-based fee payment. These will tend to

be associated with longer periods of tenure. By contrast, where trading is established to enable holders of 'overlay' licences (who pay for long-term tenure by auction, other payment, public-service obligation or a combination of these) to buy out incumbent users, security of tenure would be shorter, and consistent with that implicit under the relevant current arrangements.

Question 19 What are your views on continuation of annual licence fees for traded licences?

Annual licence fees should continue to be paid for traded licences, to cover administrative costs (overheads), rather than the element of 'spectrum rights', which is the more complex issue at the heart of this question. (In passing, it should be mentioned that Ofcom's fee structure may also or alternatively be on a 'per trade' basis). The 'fee' for spectrum rights is in effect established by the processes by which those (long-term) rights are granted in the first place. However, it should be noted that the fee determination may include a formula with a continuing element: for example the Authority's national analogue licences' 'value of good' fees include a cash bid, together with a 'percentage of qualifying revenue' component, both payable annually to the Treasury.

Much of this consultation response distinguishes between sectors (particularly sound broadcasting), where the actual spectrum management component is public-policy led, and those where for structural reasons a dynamic, traded approach delivers the best outcomes. However, the Authority does recognise that many services may not be characterised as solely 'public-policy'. On the one extreme, access to spectrum is reserved and guaranteed, but also free to access in return for very specific delivery objectives. But where the purity of mission is diluted, as opposed to eliminated, then the case is stronger for making some charge for access to the public good. Analogue national sound broadcast licences are already in this category; the payments made by the licensee do not relate directly to spectrum management.

Returning to the issue of spectrum trading in the fullest sense (with reconfiguration), one of its principal attractions is that it can replace administratively-based assessments of spectrum value with the genuine mechanism of the market. Indeed, the case for spectrum pricing as a tool of spectrum management is really only convincing in the environment of auctions/cash-bids and trading.

Question 20 a) Ofcom could provide only a minimum level of information of spectrum trading (identification and some description of licensed spectrum, and ability to send a message to the licensee) and leave further information provision to the market, or Ofcom could provide higher levels of information. What is your view on the optimum level for spectrum trading of information by Ofcom?

b) What type of information would assist or encourage you to trade?

c) Should Ofcom have power to compel disclosure of market information?

Ofcom's regulation of spectrum trading would, as foreseen in the Communications Bill, apply in the domains of technical requirements and competition. Its holding and dissemination/availability of technical information should be as complete as possible.

Ofcom will need to publish:

- its policy, and detail, of interference management criteria and techniques;
- any policy related to management of general spectral opportunity costs for future use upon reconfiguration of assignments (where this is the basis of trades);
- full allocation and assignment details (as up to date as possible, but realistically the information will lag approvals by a finite time period).

One practical challenge will be how to deal with approved reconfigurations associated with trades (especially at the assignment level), which are subsequently abandoned or subject to prevarication over implementation. Although not associated with trades, this is an all-too-common feature of transmission changes for sound broadcasting. It can be unavoidable, but it is not helpful to the publication of relevant information. Procedures for approval of trades and publication of information will need to be mutually compatible. The right balance will be needed between recognising the externalities applying to spectrum use (especially transmitter site access), and the imperative of avoiding an unduly 'scattergun' or nugatory component to reconfiguration proposals. A trade must at some defined point be regarded as non-reversible by Ofcom (i.e. needing a separate trade to restore the status quo, if that is what the parties want).

In the competition domain, normal practice should be applied to the regulation of commercial activity, but with regard to 'spectrum' as the market of relevance; Ofcom would apply any sector-specific considerations separately as appropriate.

Question 21 Should Ofcom publish details of potential trades before they take place?

On balance, the Authority believes that these details should be published. The publication of potential trades would make the process more transparent, and by alerting the market more proactively ensures that a greater number of players participate, and hence that a more tested market price is secured.

A clear procedure including publication would be helpful to allow a stage for the provision of information, comment and representation. It would also be necessary if 'ex-ante' scrutiny triggered by complaint were part of the process of competition regulation (see our response to Q.13). The process should be complete before Ofcom manages, scrutinises and publishes the details of the trade. Responsibility for due diligence on compliance issues should rest with the contracting parties. Ofcom should not be bogged down with endless permutations and combinations of possible trades, especially if they have not been properly thought through beforehand.

We recognise that there is also a good case not to publish details of proposed trades, other than where there is a policy benefit in including a public consultation element (e.g. major change of use). Most markets operate without such rigidity of procedure, and negotiations enjoy privileges of confidentiality to balance the obligations of disclosure. It also places a possibly excessive burden on the generality of spectrum users (many of which are small organisations) to have to scan a large volume of (largely irrelevant) proposals, particularly if this were an integral component of Ofcom's overall process of scrutiny.

Question 22 Are there topics other than those listed in Table two paragraph 17.1 that will need to be considered before Trading Regulations are finalised and trading is introduced for particular licence sectors and classes?

The Authority currently has no suggestions for further topics for consideration.

Question 23 For licence sectors and licence classes in which you have an interest how would you like to see trading start?

Our response to this question reiterates certain points made earlier. We believe that spectrum trading (other than the existing de facto 'Mode 1' facility) would not be appropriate for:

- the current analogue sound broadcasting environment
- the current digital sound broadcasting environment

Trading should be considered for sound broadcasting in the first instance as a possible means of smoothing the transition of some frequencies within the L-Band range (1452 –1479.5 MHz) from their present allocation (to private fixed links) to what we hope would be (from March 2007 onwards), their allocation to sound broadcasting (and potentially more general use as well: the Agency's Spectrum Strategy Document for 2002 provides more background). The trading would be allowed only by sale of fixed link licences (or interference rights thereto), to holders of 'overlay' digital radio multiplex licences. Some twelve

or more such licences could realistically be awarded as a logical extension to the Authority's current programme, and there are various options which Ofcom will wish to consider for development beyond that point. The initial batch of overlay licences could be advertised as early as possible within the years 2004 to 2006 (to be (a) feasible, and (b) worth doing).

Question 24 What steps, if any, should the Government take to recoup capital gains realised as a consequence of the introduction of spectrum trading?

The recouping of capital gains should depend on the terms under which tradable rights were assumed or acquired on introduction of trading. We have no further comment on this issue.

Question 25

a) What steps, if any, should Ofcom take to facilitate the start of spectrum trading markets?

b) How can Ofcom assist the development of successful spectrum trading markets?

c) Do you consider that intermediaries are likely to emerge through the market if there is demand, or will Ofcom need to assist and if so how?

a) b) By definition, a market will develop if it is profitable for the parties involved to participate, and if the regulations for its operation are facilitative as opposed to inhibiting. Therefore Ofcom's rôle should be in the facilitative components of market creation, rather than the overly proactive ones.

The principal contributions which Ofcom can make to this facilitation are:

- strong technical competence and fluency of assessment of the impact of (proposed) trades;
- clear and up-to-date published statements concerning
 - the scope of eligibility for trading (to sell, to buy)
 - the scope for reconfiguration/change of use for licences susceptible to trade (whether actually traded or not);
 - interference management policy, practice and procedures in detail for each frequency band and licence sector;
 - allocation and assignment details
 - procedures and criteria for acceptable trades,

c) It will probably take some time for fluently-operating trading intermediaries to emerge and become established. The move to spectrum trading heralds a significant cultural shift for many spectrum users, especially smaller ones, in how they engage with their access to spectrum. It will take

time for the changes to be fully understood, even if Ofcom's guidance is very clear.

Ofcom will be trusted as impartial, although it is definitely the place of an intermediary, not a regulator, to advise the users, who will want to know how to play this new game, and who may approach it with trepidation. The challenge for the effective operation of spectrum trading will be the establishment of advisors who are both competent and impartial; the regulator should not become bogged down in implicit or explicit accreditation. It is perhaps worth considering whether some code of practice, (based on the principles of co-regulation) could be drawn up to govern dealings between intermediaries and their clients, directed towards the objectives of impartiality and best practice.

Question 26 Do you agree with the analysis in the draft Regulatory Impact Assessment? Is there additional information or data you can provide to help assess either costs or benefits?

The Authority is not offering a review of this analysis.