



**Digital Dividend Review:
geographic interleaved awards for
frequency bands 542 to 550 MHz
and 758 to 766 MHz covering
Cardiff and Manchester**
Statement following consultation

The information memorandum for the awards is
published separately

Statement

Publication date: 29 October 2008

Contents

Section		Page
1	Executive summary	1
2	Introduction	5
3	Uses of the geographic interleaved spectrum	8
4	Coverage and impact of new services	9
5	Spectrum packaging	11
6	Auction design and rules	13
7	Technical licence conditions	18
8	Non-technical licence conditions	21
9	Promoting competition and efficiency	25
10	Next steps	31
Annex		Page
1	Summary of responses to the 12 June 2008 consultation	32
2	Impact assessment	37
3	Protection options for DTT multiplexes	44

Section 1

Executive summary

Introduction

- 1.1 This document sets out our decisions on the award on a geographic basis of part of the spectrum that is being freed up for new uses by the switchover to digital transmission of television. It focuses on the first phase of awards, for spectrum lots covering Cardiff and Manchester.
- 1.2 By switching from analogue to digital transmissions (i.e. digital switchover – ‘DSO’) more television channels can be broadcast using less spectrum. The spectrum that is no longer needed for television can be released to the market for other services. All TV transmissions in the UK will have switched to digital in 2012. We call the released spectrum the digital dividend.
- 1.3 There are two distinct categories of spectrum in the digital dividend: the spectrum that by 2012 will be totally cleared of television transmissions (‘cleared spectrum’); and, capacity available within the spectrum that will be used after DSO to carry the six existing digital terrestrial television (‘DTT’) multiplexes. We are concerned in this document with the second type, which we call the geographic interleaved spectrum. It is so called because for each channel within this spectrum there are geographic areas where it will not be used for DTT. In those areas the unused channels may be used for other services.
- 1.4 The digital dividend comprises a significant amount of spectrum. It is spectrum that can be used for many different applications, including more digital television, mobile telephony, broadband delivery and programme production. It is our duty to secure the optimal use of the spectrum, taking into account a range of criteria set out in the Communications Act 2003. Our principal duties are to further the interests of citizens in relation to communications matters, and to further the interests of consumers in relevant markets, where appropriate by promoting competition. We have conducted an extensive review of how to make available the digital dividend in a way that will maximise the total value to society generated by its use over time. We consulted on this digital dividend review (‘DDR’) in December 2006, and published a statement in December 2007 (the ‘December 2007 DDR statement’¹).
- 1.5 In the December 2007 DDR statement, we set out our conclusions on how we proposed to make available the digital dividend. Our main decisions were:
 - to package the digital dividend in a way that enables the widest possible range of uses, including additional DTT multiplexes as well as new mobile services, and not to reserve any of the digital dividend for specific services, with one important exception (see below);
 - to award geographic packages of interleaved spectrum suitable for local television, but not to restrict their use to this service;

¹ *Digital Dividend Review. A statement on our approach to awarding the digital dividend*, Ofcom, 13 December 2007, <http://www.ofcom.org.uk/consult/condocs/ddr/statement/>

- to reserve most of the available interleaved spectrum to meet the needs of programme making and special events ('PMSE') users, and for channel 69 to continue to be available on a licensed basis for PMSE;
- to propose allowing licence exempt use of interleaved spectrum for cognitive devices;
- to auction the cleared spectrum, including channels 36 and 38 and the interleaved capacity available in channels 60 and 61;
- to auction the packages of interleaved spectrum suitable, but not reserved, for local television;
- to award by beauty contest the package of interleaved spectrum and channel 69 to a band manager with obligations to programme making and special events (PMSE) users; and
- to award the digital dividend as soon as possible.

1.6 In summer 2008, we published three separate consultations on the spectrum awards for the digital dividend:

- the consultation on the award of the cleared spectrum was published on 6 June and closed on 15 August 2008²;
- the consultation on the award of geographic interleaved spectrum awards was published on 12 June and closed on 21 August³ (we call this the 'June consultation' in this document); and
- the consultation on the award of spectrum to a band manager with obligations toward PMSE was published on 31 July and closed on 16 October 2008⁴.

1.7 In the June consultation we proposed a phased approach to the award of the geographic interleaved spectrum:

- In the first phase we would award spectrum lots for areas where DSO is before spring 2010 and where there are existing local TV stations, operating under restricted television service licences (RTSLs), i.e. Carlisle, Cardiff and Manchester. These awards would take place in late 2008 or early 2009.
- This would be followed by the combined award of spectrum lots at about 25 transmission sites that cover population areas likely to be large enough to support a broadcasting station, or where there are existing RTSLs and that may be suitable for aggregation. The indicative list in the June consultation included lots that could cover areas including Manchester or Cardiff.
- The final phase would involve individual awards of spectrum lots in other areas for which we receive convincing expressions of interest and/or there was an existing RTSL.

² <http://www.ofcom.org.uk/consult/condocs/clearedaward/>

³ <http://www.ofcom.org.uk/consult/condocs/ddrinterleaved/>

⁴ <http://www.ofcom.org.uk/consult/condocs/bandmgr/>

- 1.8 This statement covers only those issues raised in the June consultation that relate directly to the first phase awards. We are currently considering how to proceed with the remaining awards, in the light of responses to all three digital dividend consultations, and plan to make a further announcement later this year.
- 1.9 We received 40 responses to the June consultation, 12 of which were confidential responses. We have placed the non-confidential responses on our website⁵.
- 1.10 This statement sets out our decisions for the first phase of awards, taking account of matters raised in the June consultation and responses to the proposals we made in it. Our main decisions are:
- To award licences for frequency channels to cover Manchester (from the Winter Hill transmission site) and Cardiff (from the Wenvoe transmission site) early in 2009, but at this stage not to award a licence for a frequency channel to cover Carlisle (from the Caldbeck transmission site) (see paragraph 5.4).
 - To hold the two awards as soon as practicable, probably in the first quarter of 2009, using single unit ascending bid auctions and to hold those auctions concurrently.
 - The reserve price will be £10,000 for each licence and bidders will be required to submit a deposit for the same amount to take part in the auction.
 - At the end of each bidding round of the auction we will inform bidders how many valid bids were made in the round.
 - The level of protection of existing DTT multiplexes will be specific to the two licences being awarded.
 - Licences will include a block edge mask and technical parameters suitable for DTT. Licensees wishing to provide services other than DTT may ask for the technical licence conditions to be varied.
 - Licences will include restrictions on those who may provide a DTT multiplex service, and minimum requirements for interoperability with existing DTT multiplexes.
 - Licences will be of indefinite duration with an initial term lasting until 2026.
 - Licences will be tradable.
- 1.11 We are publishing, at the same time as this statement, the following documents that relate to the first phase awards:
- an information memorandum, which sets out relevant information that interested parties should take into account, on the basis set out in that memorandum, when considering their possible participation in the awards; and
 - a notice of our proposal to make statutory instruments in relation to the awards in accordance with section 122 of the Wireless Telegraphy Act 2006 (the 'WT Act'). For each of the first phase awards there will be the following statutory instruments: (i) the auction regulations, (ii) regulations extending spectrum

⁵ <http://www.ofcom.org.uk/consult/condocs/ddrinterleaved/responses/>

trading to the relevant frequency bands, (iii) regulations to provide for publication of the identity of the licence holder and some specified licence details and (iv) an order relating to the limitation of the number of licences to be awarded in the bands.

- 1.12 Interested parties are advised to familiarise themselves with the auction regulations, in particular the rules relating to disclosure of confidential information, and those that prevent association and collusion between bidders.

Section 2

Introduction

- 2.1 This statement sets out our decisions on various matters relating to the first phase awards of wireless telegraphy licences for the use of frequency channels within the spectrum bands 470 MHz to 550 MHz and 630 MHz to 790 MHz. It sets out our conclusions on issues raised in the June consultation that related to these awards. We have reached these conclusions following careful consideration of the responses to that consultation. This statement also takes into account the feedback received from stakeholders at meetings we have held since publication of the June consultation.
- 2.2 This statement does not address matters relating to other digital dividend awards in the geographic interleaved spectrum discussed in the June consultation. We are considering how to proceed with the other digital dividend awards in the light of responses to the three consultations and international developments. We discuss this further, in the context of future availability of the spectrum to be awarded, in section 2 of the Information Memorandum published with this Statement. We expect to make a statement to confirm the next steps later this year.

Proposals for phased awards

- 2.3 In the June consultation we proposed a phased approach to the award of the geographic interleaved spectrum:
- In the first phase we would award spectrum lots in the areas where DSO was before spring 2010 and where there were existing local TV operators (holders of restricted television service licences, or RTSLs), i.e. Carlisle, Cardiff and Manchester. These awards would take place in late 2008 or early 2009.
 - This would be followed by the combined award of spectrum lots at about 25 transmission sites that cover population areas likely to be large enough to support a broadcasting station or where there were existing RTSLs and that would be suitable for aggregation.
 - The final phase would involve individual awards of spectrum lots in other areas for which we received convincing expressions of interest and/or in which there was an existing RTSL.

The first phase awards

- 2.4 We have decided to include licences for lots at Winter Hill (for Manchester) and Wenvoe (for Cardiff) in the first phase of awards, but not at Caldbeck (for Carlisle) (see paragraph 5.4). In documents published alongside this statement, specifically in the information memorandum and the proposed auction regulations, we give further details in relation to the first phase awards, including application instructions.
- 2.5 In the case of conflict or ambiguity between this statement, the information memorandum and the proposed auction regulations precedence shall be given to each in the order set out below:
- first, the provisions of the auction regulations;

- second, the information memorandum; and
 - third, this statement.
- 2.6 Subject to the consultation on the draft regulations, we intend to start the award process in early 2009.

Overview of responses to the proposals in the June consultation

- 2.7 We received 40 responses to the June consultation, 12 of which were confidential. We have placed the non-confidential responses on our website⁶. Annex 1 summarises the comments made in responses.
- 2.8 We consider all the main points made in responses that are relevant to the first phase awards in sections 3 to 10 and Annex 1 of this document.

Associated documents

- 2.9 We are publishing alongside this statement the following documents that relate to the first phase awards:
- an information memorandum, which sets out relevant information that interested parties should take into account when considering their possible participation in the awards; and
 - a notice of our proposal to make statutory instruments in relation to the award process in accordance with section 122 of the Wireless Telegraphy Act 2006. These statutory instruments include the auction regulations, regulations extending spectrum trading to the frequency channels to be licensed, regulations to allow for publication of the identity and terms of the licences and an order limiting the number of licences.

Document structure

- 2.10 In addition to the executive summary (Section 1) and this introduction (Section 2), this statement comprises:
- Section 3 – possible uses of the available spectrum.
 - Section 4 – issues relating to coverage and impact of new services on existing DTT services.
 - Section 5 – timing of the awards.
 - Section 6 – auction design and rules.
 - Section 7 – technical conditions to be included in the wireless telegraphy licences.
 - Section 8 – non-technical conditions to be included in the wireless telegraphy licences.
 - Section 9 – issues relating to promotion of competition and efficiency.

⁶ <http://www.ofcom.org.uk/consult/condocs/ddrinterleaved/responses/>

- Section 10 – next steps for the awards.
- Annex 1 – summarises the main points made in the responses to the June consultation.
- Annex 2 – impact assessment.
- Annex 3 – protection options for existing DTT multiplexes

Section 3

Uses of the geographic interleaved spectrum

Most likely uses of the geographic interleaved spectrum

- 3.1 In the June consultation we identified additional DTT services, including local television, and PMSE as likely uses of the geographic interleaved spectrum. We thought that those interested in providing mobile TV would probably focus on the cleared spectrum, and the feasibility of using the interleaved spectrum for mobile broadband was still being investigated. Our most recent stakeholder research supported our view that DTT, aimed at UK national, regional or local markets, was the most likely use of the interleaved spectrum.
- 3.2 Most responses to the consultation agreed that DTT was the most likely use and some of them also identified PMSE. One respondent said that the spectrum could be used for emergency services. BT, Vodafone and JFMG considered that we had not demonstrated a willingness to facilitate uses other than DTT, given the technical specification and thrust of the consultation. We remain of the view that the most likely initial use of the spectrum to be awarded in the first phase awards is DTT, and we have specified technical conditions on this basis. However, it will be possible for the licences to be varied to allow other uses.

Cognitive devices and protection of other uses

- 3.3 We also considered what uses should be protected if licence exempt use of cognitive devices were permitted in the spectrum. We proposed that DVB-T transmissions and PMSE use should be protected. Protecting mobile TV would effectively prevent the use of cognitive devices as they could not coexist in the same spectrum unless the existing out-of-band performance of mobile TV handsets substantially improved. Almost all of those responding on these issues expressed concern about the potential impact of cognitive devices on other users. We are planning a consultation later this year or early next year on licence exempt use of cognitive devices and in its preparation we will take into account the responses to the three DDR award consultations held in 2008.

Section 4

Coverage and impact of new services

Coverage of new DTT services

- 4.1 As we considered DTT to be the most likely use of the geographic interleaved spectrum in the June consultation, we looked at the potential coverage such services could achieve. We identified three categories of geographic coverage for which we might auction lots:
- large lots – frequencies at main transmission sites that offer widespread geographical and/or high population coverage;
 - medium lots – frequencies at main transmission sites and relay transmission sites that offer more targeted, significant population coverage; and
 - small lots – frequencies at relay transmission sites that offer localised geographical and population coverage.
- 4.2 For the first phase awards, we intend to award medium lots at Winter Hill (for Manchester) and Wenvoe (for Cardiff).
- 4.3 We have noted respondents' interest in lots covering other areas. We are currently considering how to proceed with the remaining awards, in the light of responses to all three digital dividend consultations and will make further announcements in due course.

Impact of new services on existing DTT multiplexes

- 4.4 Introducing new services into the interleaved spectrum could impact on the coverage of the existing DTT multiplexes following DSO. In the June consultation, we considered what protection from new services the existing DTT multiplexes should have. This was complicated by the existence of coverage overlaps from DTT multiplexes. This means that in any particular location some households may be able to receive the existing DTT multiplexes from more than one transmission site.
- 4.5 We considered that there were three feasible generic options for protecting reception of existing DTT services:
- Protecting signals received only from the 'best' (in technical terms) DTT transmission site, i.e. the site offering services from at least the three PSB multiplexes plus the greatest number of the three commercial multiplexes. This option is called the digital preferred service area ('DPSA') option.
 - Protecting a total of three overlap coverages (the technically 'best', the 'correct' national service and the best analogue service relay), with a small fixed increase of 0.5 dB in allowable interference to DTT. This option is called the JPP option as the DSO Joint Planning Project ('JPP') proposed it.
 - The JPP option, with a variable increase of more than 1 dB in allowable interference to DTT. We have called this the median option.
- 4.6 On balance, we favoured the median option.

- 4.7 Responses were divided on the choice of option. Guardian Media Group pointed out that, compared with DPSA, the median option resulted in significant reduction in coverage for Manchester, and said that this made the frequency unviable for additional DTT services.
- 4.8 A confidential respondent to the consultation on the cleared award expressed concerns about Ofcom's approach to assessing the options, arguing that, because existing broadcasters and viewers had made investments based on current signal coverage, it was unfair to give equal weighting in a cost-benefit analysis to the loss of reception by some viewers of existing signals and the potential for new services.
- 4.9 Our assessment of the options took into account a wide set of considerations, including the interests of existing viewers. The illustrative cost benefit analysis in the June consultation for example marginally favoured the protection of technically best coverage areas only ('DPSA only'), with this based on a conservative estimate of the benefit of new services and the preservation of a service for all viewers. Nevertheless our wider assessment, taking into account other factors such as the desire to include protection of relay sites and correct national services, led us to favour the median option.
- 4.10 We still believe that, in general, the median approach offers the right balance between providing opportunities for new services and protecting the interests of viewers and existing broadcasters. However, respondents to the June consultation raised concerns about the actual coverage that could be achieved by real antennas and the way this was affected by the level of protection afforded to existing multiplexes. We have carried out further work for the first phase awards to determine actual coverage and the appropriate level of protection.
- 4.11 We have established where there is space on masts at Winter Hill and Wenvoe and carried out coverage planning based on a real antenna design. This detailed analysis has shown that median protection can in some circumstances protect overlap coverage from transmission sites that viewers are unlikely to be making use of (i.e. it is overprotective). Therefore, we decided to assess the appropriate level of protection for existing DTT services on a case-by-case basis, subject to a minimum protection of DPSA. Examples of circumstances when we would consider varying protection from the median level is where a target area would be poorly served, making the frequency unviable, or where restrictions make it impossible to build a practical antenna.
- 4.12 For the first phase awards we will relax the median level of protection. This will afford material increases in coverage for new DTT services with very limited impacts on the reception of the six existing DTT multiplexes after DSO, based on the actual antenna locations proposed.
- 4.13 We provide details of the proposed arrangements for Wenvoe and Winter Hill in Annex 3 together with an assessment of the impact of each upon the national services. This includes a description of the transitional arrangements which will apply to the spectrum we are awarding during the period when DSO is taking place.

Section 5

Spectrum packaging

Candidate transmission sites and channels for award

- 5.1 In the June consultation we set out a list of 81 transmission sites each with either one or two frequency channels for which we might award licences. Each site and channel would comprise a lot to be awarded by auction. The sites included:
- the 25 sites for which we anticipated auctioning spectrum in the December 2007 DDR statement;
 - 46 other main sites identified in a NGW coverage study⁷;
 - eight sites that we added following our local TV stakeholder event in January 2008; and
 - two sites in respect of the Isle of Man and the Channel Islands.
- 5.2 We proposed a phased approach as follows:
- In the first phase we would award medium lots in the areas where DSO is before spring 2010 and where there were existing RTSLs, i.e. Cardiff, Carlisle and Manchester. These awards would take place in late 2008 or early 2009.
 - The combined award would take place in 2009 shortly after the cleared award and would award in a simultaneous process the large lots most suitable for aggregation (i.e. it would include the 25 indicative sites, plus any additional sites suitable for aggregation).
 - The final phase would involve individual awards of medium and small lots in those areas not already included in the first phase, where they were supported by a convincing expression of interest and/or there was an existing RTSL. Channels in those localities where DSO occurs in 2011 would be the subject of an award in early 2010, with an award in early 2011 for those localities where DSO occurs in 2012.
- 5.3 Numerous responses agreed with the packaging and timing and sequencing of awards, and some had additional comments. In relation to the first phase of awards, Freeview suggested the auctions should be held as early as possible in 2009. BT also believed the awards should be held as early as possible. Guardian Media Group proposed that auctions are held about nine months before DSO in each area.
- 5.4 We have decided to hold awards for lots at Wenvoe (for Cardiff) and Winter Hill (for Manchester) in early 2009, where there are operational local TV channels. Due to the lack of interest from any local operator, and noting that the RTSL for Carlisle has expired, we will not at this stage award a lot for Caldbeck to cover Carlisle. However a lot at Caldbeck could be included in a later award.

⁷ *Interleaved Spectrum Planning Study Final Report*, NGW, 30 November 2007, <http://www.ofcom.org.uk/consult/condocs/ddr/statement/NGW1.pdf>

- 5.5 We have noted the interest expressed by respondents in lots covering other areas. We are currently considering how to proceed with the remaining awards, in the light of responses to all three digital dividend consultations, and we hope to indicate our next steps by the end of this year.

Section 6

Auction design and rules

6.1 In the June consultation we considered the factors that can affect the efficient outcome of an auction and described the auction designs we had considered for the proposed awards.

A market led approach

6.2 A number of responses opposed the use of auctions to award spectrum. They considered that a market led approach would not further the interests of the consumer, some sections of society or community media. These respondents included The Royal National Institute of Blind People (RNIB), The Royal National Institute for Deaf People (RNID), Public Voice and the Institute for Local Television. A number of Scottish organisations made similar points with specific reference to the needs of local television in Scotland and some suggested that the social value of local television would justify reserving spectrum for this use. BECTU questioned the absence of any public value test in assessing bids.

6.3 A fundamental strategic choice that we faced in relation to the digital dividend was what level of control to impose on the future use of this spectrum. There were two broad alternatives:

- A market led approach, which would give spectrum users as much flexibility as possible to determine how to use the spectrum, with constraints being the minimum necessary to prevent harmful interference and to meet the UK's international obligations.
- An interventionist approach, which would see Ofcom imposing constraints in order to control the future use of the spectrum, restricting spectrum use to particular services, technologies and/or categories of user. This approach would be consistent with allocating spectrum to particular uses in order to promote public policy goals.

6.4 We discussed these choices in the December 2006 consultation and set out our conclusions in the December 2007 DDR statement. In the December 2006 consultation, we did not think that an approach that was fundamentally interventionist was right or sustainable in the digital age. It was increasingly inappropriate to use spectrum as a policy instrument when the variety of uses was so great and there were many options for securing value for society. In particular we considered that if we picked preferred uses or users of the spectrum we would:

- distort incentives to use the spectrum efficiently;
- reduce the scope for responding flexibly to developments that called for changed use of the spectrum;
- risk distorting competition and reducing innovation by denying access to the spectrum to other than preferred users; and
- risk picking a use or user that did not get the most value out of the spectrum.

For these reasons we preferred a market led approach.

- 6.5 We noted nevertheless that markets and market outcomes can under certain circumstances become subject to failure, meaning that market outcomes may fail to maximise total value to society. In such cases, it would be appropriate to consider remedies to any such failures in order to maximise the value of the digital dividend to citizens and consumers. We set out an analytical framework for considering market failures, possible remedies, and the costs of possible remedies.
- 6.6 In preparing the December 2007 DDR statement in light of responses to the consultation we re-examined the choices and our analytical framework for assessing them. We concluded that the market led approach remained valid and that it was right to maintain a presumption against intervening to limit or specify the use of spectrum.
- 6.7 In the December 2007 DDR statement we considered arguments for intervention from local television operators and media organisations who suggested reserving spectrum exclusively for local television and awarding it by beauty contest. We concluded that, for a number of reasons, such intervention was not justified.
- It would displace other potential users who could also generate higher value for society.
 - It would not ensure that local television was economically viable.
 - It would undermine incentives to use the spectrum efficiently.
 - Other delivery mechanisms, such as broadband, might be an attractive alternative for delivering content to meet social goals.
- 6.8 We considered that a better approach to creating opportunities for local television was to award packages of spectrum suitable for this use in as many areas as appropriate. This approach underpinned our proposals in the June consultation and is the basis of the decisions set out in this statement.
- 6.9 In awarding spectrum the use of auctions is a key aspect of the market led approach. In the case of the first phase awards we consider that an auction offers the most open, transparent and non-discriminatory method out of those available for determining who should be granted the licences concerned. This is because in auctions, a bidding process is used to award licences to those bidders prepared to pay most for them. Auctions are therefore likely to lead to the spectrum rights being assigned to users that value them most highly, which will generally be those who are likely to use the spectrum most efficiently. Alternative mechanisms, such as beauty contests (also known as comparative selection), carry the risk of subjective judgements on the part of the regulator and not awarding spectrum to the user best able to maximise value to society. A well designed auction, with appropriate licence conditions and packaging, should give the market maximum flexibility to determine who uses spectrum, for what and how. This further reduces the risk of regulatory failure and unnecessary intervention inherent in other approaches.

Auction design for the first phase of awards

- 6.10 The auction design that we proposed for the phased geographic interleaved awards was a single unit ascending bid auction. The main factor in considering the auction design for these awards was that demand for the lots to be awarded was most likely to come from those wishing to develop local services, due to the specific characteristics of the spectrum on offer. For the first phase of awards some bidders

could be interested in just one of the three lots we proposed to award. There might be a larger number of lots available in the final phase awards, but we considered that interest was still likely to be for individual lots.

- 6.11 There were some comments on our proposals for the auction design for phased awards. Arqiva, BT and a confidential response said they agreed with them. Guardian Media Group agreed, as the proposal favoured simplicity and speed, and suggested auctions should be held nine months prior to switchover. Two confidential responses agreed with the use of ascending bid auctions with a second price rule. A confidential response said there was no need to have a more complex auction design for these awards.
- 6.12 None of the responses queried using single unit ascending bid auctions for the phased awards and we therefore intend to use this auction design for the first phase awards.

Sequencing of the first phase awards

- 6.13 For the three proposed awards in the first phase we considered whether they should run in sequence or in parallel and if in sequence what the order should be. We sought stakeholders' views on these questions. A confidential response, for the first awards, favoured either a sequence of awards in a particular order or parallel awards of all three licences. Guardian Media Group and a confidential response preferred parallel awards.
- 6.14 As we said in the June consultation, our main consideration in the timing of the first awards is to provide existing local television operators in Manchester and Cardiff the opportunity to obtain clarity on their future spectrum holding in advance of early DSO. (We explained in the previous section that we will not include a lot for Carlisle in the first awards, see paragraph 5.4.) We should be able to complete parallel awards more quickly than a sequence of awards and, in that case, the existing operators would know earlier whether they had won a licence. Given the absence of any strong arguments in favour of sequential awards, we will hold the awards of channels at Winter Hill (for Manchester) and Wenvoe (for Cardiff) concurrently.

Reserve prices

- 6.15 We set out in summary the process and main rules we were minded to adopt for the single unit ascending bid auctions in the first phase. This included a description of each stage in the process and an illustration of how such an auction would work. The auction rules would cover such matters as collusion and release of bidding information during the auction. Under the rules we proposed a reserve price of £25,000 for each lot. We also proposed a deposit of 50 per cent of the reserve price to be submitted with applications. This would be increased to equal the reserve price before bidding started. Deposits would be returned to applicants who did not qualify to bid and to unsuccessful bidders, less any sums forfeited for breach of the auction rules.
- 6.16 Comments on the rules focussed on the reserve price and deposit level. Arqiva suggested a reserve price of £10,000 would be more appropriate for lots of relatively low economic value. A confidential response considered the deposit and reserve price should be calculated on a sliding scale proportional to the likely number of viewers. It also considered that increments in the auction process should be a matter for the bidders, not pre-set by the auctioneer. BECTU considered that high deposits would deter community and not-for-profit bidders. IBS said that a deposit of £25,000

helped to make it unlikely that the PMSE community would enter an auction. Public Voice considered that the reserve price was too high and would preclude not-for-profit organisations from bidding.

- 6.17 Our aim in setting the reserve price is to discourage frivolous bidders while encouraging participation from credible service providers. Responses suggest that £25,000 could discourage such participation in both awards. It is a matter of judgement what reserve price would strike a reasonable balance between encouraging serious bids for viable services and discouraging frivolous bidding. The figure of £10,000 seems a reasonable figure to meet our aims. We do not consider that a figure of £10,000 would discourage genuine bidders. A lower figure might not discourage frivolous participation in the auction. We therefore intend to set the reserve price for each of the lots in the first awards at £10,000. For similar reasons we also consider that the initial deposit, to be submitted with applications, should be £10,000.
- 6.18 We considered whether reserve prices should be set on a sliding scale to reflect the potential coverage of a frequency channel. We do not think this is appropriate given that our purpose in setting a reserve price is to deter frivolous bidders, not to reflect any valuation of the spectrum. It leaves the problem of what would be an appropriate reserve price for a given coverage. It also presents the problem of what an appropriate sliding scale would be. There is the danger that we would have prices at the lower end that encouraged frivolous entrants and prices at the upper end that discouraged credible bidders. In any case, we consider that a reserve price of £10,000 weakens the need for a sliding scale.
- 6.19 Bid increments between rounds are used to manage the pace of the auction. Larger bid increments can speed up an auction, but if they are too large they may not allow bidders sufficient flexibility in refining their valuations as the auction proceeds, which may distort the auction's efficiency. However, given the opportunity for discretionary bids, this is a small risk in this case. We consider that it is a key function of the auctioneer to set bid increments. In each round we will set the minimum and maximum bid prices and this will allow bidders some discretion in the amount they may bid. In the first round we propose a round price of £15,000, and a minimum valid bid of £10,000. In subsequent rounds the minimum valid bid will be no less than the previous round price and the maximum will be the round price we set for the current round. Round prices may not be more than double the round price in the previous round.

Information policy

- 6.20 An important feature of the auction rules is the release of information to bidders on other bidders and their bids. In the June consultation we considered that full transparency would make for an efficient auction. In its response Guardian Media Group suggested that bidders should be anonymous during the bid process to prevent businesses learning about competitors' economics.
- 6.21 Bidders need information on others' bids to help their decision making in the auction. There is a range of options for releasing information. It is arguable that bidders need to know only how many other bidders have bid in a round. However, full transparency, with bidders being informed of the identity of other bidders after each round might make for a more efficient auction, as bidders would be better placed to assess others' bidding behaviour. One risk in releasing full information on bids is that it can assist collusion between bidders or give bidders the opportunity to indulge in strategic tactics designed to undermine or harm other bidders.

- 6.22 For the first phase awards we consider that there would be no significant loss in efficiency if after each round we released to bidders only the number of bidders that made bids, but not the names of the bidders. At the same time this would reduce any risk there might be of collusive or strategic behaviour.

Section 7

Technical licence conditions

- 7.1 In the June consultation we proposed technical conditions to be included in the licences in order to manage interference between services. The conditions were designed to protect the existing DTT multiplexes from harmful interference from new services after DSO.
- 7.2 Our view, which our most recent stakeholder research supported, was that DTT, aimed at UK national, regional or local markets, was the most likely use of the interleaved spectrum. We therefore proposed to include technical conditions appropriate to DTT as basic technical conditions in the licences in the first phase of awards. These would define a number of technical parameters for a given channel at a particular transmission site, including:
- the frequency;
 - the maximum radiated power that may be used;
 - the transmit antenna template (modified as required by any international coordination restraints that apply);
 - the polarisation (horizontal or vertical); and
 - the height of the transmit antenna on the mast.

The licence conditions would also include a block edge mask based on the appropriate DVB-T transmitter mask specified in Ofcom Interface Requirement 2022⁸.

- 7.3 We recognised that these technical conditions would be less suitable for other new non-DTT services. Where the spectrum was not used for DTT it was likely that multiple transmitters would be deployed to form a network. In that case we would favour including as technical conditions spectrum usage rights (SURs), which are specified in terms of the interference that neighbouring users experience. If, after a licence award, the licensee wished to provide other services we would consider any request for variation of the technical conditions.
- 7.4 There were a number of comments on these proposed technical conditions. Organisations associated with broadcasting were generally content with them, although some felt that the conditions should provide maximum protection to existing DTT services. They supported the inclusion of a protection clause in licences along with conditions requiring co-operation with Digital UK and DMOL to ensure any impact on DSO was minimised.
- 7.5 A number of responses commented on the applicability of the technical conditions to non-DTT use. Arqiva agreed that for non-DTT services an SUR approach would be more appropriate. BT considered the conditions were a barrier to the introduction of other services; there was no guarantee that a variation would be granted, or what it would entail, and therefore a risk in buying the spectrum. JFMG considered that basing the conditions on DTT-only use could exclude and deter other potential

⁸ http://www.ofcom.org.uk/radiocomms/ifi/tech/interface_req/ir2022.pdf

bidders; PMSE was the most likely other use, but no licence provision has been made for this use. Vodafone considered the conditions should be defined so as not to discriminate between potential bidders; it was inappropriate to define in-band technical licence conditions using the block edge mask approach. Guardian Media Group asked that Ofcom clarify what signal modes licensees would be permitted to use and questioned whether viewers' receivers would be able to decode QPSK signals. They also asked whether it would be permissible to use alternative transmission sites to those specified in the awards.

- 7.6 We have had strong interest from potential operators of DTT services in geographic interleaved spectrum. We have therefore tailored the award towards single transmitters at fixed existing sites and based technical licence conditions on a single transmitter.
- 7.7 Developing an alternative approach to technical licence conditions based on SURs or spectrum masks would take some time to implement. As DSO is due to take place fairly soon at Wenvoe and Winter Hill, there is a tight timescale for the first phase awards. There is also no clear demand from alternative uses, and we have decided to proceed on the basis of defining technical licence conditions suitable for DTT use at single sites. However, as we said in the June consultation, if the holder of a licence obtained in the first phase awards wished to provide a non-DTT service we would consider a request for variation of the technical conditions. In advance of a formal request we would be willing to discuss its feasibility and explain what information we would require to progress it. Proposed variations may call for detailed technical analysis and consultation with third parties in order to establish what the appropriate technical conditions would be for the new service.
- 7.8 Work on a suitable protection clause is ongoing as part of the DDR cleared award. The process involves close engagement with stakeholders and is likely to take some time. A protection clause is not needed in the first phase award licences as the technical licence conditions have been defined by single fixed transmitters co-located with other DTT services. As we said in the June consultation, if a protection clause is implemented for the cleared award, we would consider including such a clause in the licences we are awarding where there was a change to technical parameters.
- 7.9 One situation where a protection clause could be of particular use is where a successful bidder wishes to use an alternative transmission site. If this alternative site is not used by the other DTT multiplexes there is a possibility that the new transmitter could affect reception of the other multiplexes for a limited radius around the site (so-called 'hole-punching'). If one of the first phase award licensees wishes to use an alternative transmission site we will follow the licence variation process described briefly in paragraph 7.7. If our analysis indicates that there will be any material loss of service to viewers we would expect the licensee requesting the change to seek to agree, if possible, appropriate remedial action with the providers of the affected services and provide us with evidence of that agreement before we permit use of the alternative site.
- 7.10 We note the concerns raised over the ability of consumers' set-top boxes to decode QPSK signals. QPSK is a valid signal mode that has always been included in equipment specifications, and our discussions with industry indicate that many boxes should be able to operate satisfactorily with QPSK signals. We have however commissioned some further research in this area which we aim to publish in November 2008.

International coordination

- 7.11 DTT transmitters are subject to international coordination where they exceed agreed field strengths at neighbouring borders or coastlines. In order to avoid coordination we proposed not to allow new DTT services to exceed the agreed threshold.
- 7.12 There were some comments and reservations on this proposal. BT agreed with this proposal, though it might reduce the utility of the spectrum in more populated areas. A confidential response suggested that it could result in large restrictions on licensees and we should consider on a case by case basis whether an attempt to coordinate relaxed restrictions could impact on existing multiplexes. Arqiva believed we should consider improving the default levels by negotiating with neighbouring countries. A confidential response said that ex post it would be useful to have the flexibility to discuss with international parties, particularly for high coverage stations.
- 7.13 We are proceeding on the basis that the licences in the first phase awards will not allow for the co-ordination threshold to be exceeded. However, we will consider renegotiation of international agreements on a case-by-case basis at the licensee's request.

Section 8

Non-technical licence conditions

8.1 In the June consultation we proposed to include a number of non-technical conditions in the licences to be awarded. In particular we proposed:

- DTT multiplex issues – to include certain restrictions on ownership in relation to use of geographic interleaved spectrum to operate new DTT multiplexes. These would reflect the similar regime under the Broadcasting Act (for example preventing religious or political bodies from holding licences for this purpose).
- DTT multiplex issues - to facilitate technical interoperability between any new DTT services in geographic interleaved spectrum and existing DTT services
- Spectrum trading - licences would be tradable. All types of trade - partial or total; concurrent or outright - would be permitted.
- Licence duration - the licences would be of indefinite duration with an initial term ending in 2026. The licence fee for the initial term would be set through the award process, but we expected to charge further fees after the initial term. Ofcom's power to revoke the licences on spectrum management grounds would be limited during the initial term.
- Non-technical restrictions - the licences would not contain any restrictions on the use to which the spectrum could be put, subject to complying with technical licence conditions.
- Provision of information - licensees would be required to provide certain information regarding their use of the spectrum, which we might publish in order to facilitate spectrum trading.

Ownership restrictions

8.2 BT, Public Voice and a confidential response agreed with our proposals. Guardian Media Group said it was important to restrict ownership to fit and proper persons. Both Guardian Media Group and Freeview were concerned that opening up the spectrum to advertising agencies could result in anti-competitive behaviour. BECTU agreed with the exclusion of political and religious groups but believed more rigorous ownership rules were needed to take account of cross-platform and cross-media concentration of ownership. Arqiva did not believe there should be any unnecessary restrictions placed on use of the spectrum. Scottish Borders Council commented that public sector assistance might be needed to support local television but it would not seek to unduly influence editorial content. A confidential response noted that there was a process set out in legislation for reviewing the ownership rules and suggested that was the appropriate way of making such changes.

8.3 Our reason for not excluding broadcasting bodies (i.e. the BBC and S4C) was that we had already issued wireless telegraphy licences to companies owned by broadcasting bodies for existing DTT multiplexes. We did not think that an advertising agency operating a multiplex was likely to act against the public interest given that commercial broadcasters were competing against both other broadcasters and other platforms for advertising revenue.

- 8.4 We recognise that there is a process in the Communications Act for reviewing the media ownership rules that apply to licences issued under the Broadcasting Act. The most recent review was carried out by Ofcom in 2006. We considered that it was appropriate to consider ownership restrictions in relation to DTT multiplexes operating under wireless telegraphy licences specifically in relation to the DDR awards, and consulted on them in this context in the June consultation, rather than hold off the awards until the next review of media ownership rules had been completed.
- 8.5 In relation to advertising agencies, we expect that the opportunities for advertising on TV channels carried on new multiplexes would be part of a wider market, or series of markets, including existing UK national and regional television, UK national, regional and local press, as well as online. If a new multiplex operator sought to abuse any position of market power, such behaviour could be appropriately dealt with under relevant competition rules.
- 8.6 We have not received new evidence from respondents which has caused us to change our reasoning, and we have therefore decided to include ownership restrictions in the licences for multiplex operators as proposed in the consultation.

Interoperability

- 8.7 Public Voice, Freeview and BECTU and a confidential response agreed with our proposals. Freeview also said we should have a strong facilitation role.
- 8.8 Digital UK and DMOL said that interoperability should be mandatory for new multiplex operators. A confidential response also favoured a mandatory approach above facilitation. Digital UK and a confidential response suggested including a further condition for new licensees to cooperate with DUK and DMOL to ensure any impact on DSO by the launch of new multiplexes was minimised.
- 8.9 Arqiva and a confidential response said that interoperability should be left to commercial agreement.
- 8.10 We are committed to intervention only in areas where it is necessary. We believe that there are strong commercial incentives for new entrants to interoperate with the existing multiplex operators and to provide services that are compatible with viewers' receivers. We remain of the view that it would not be appropriate to require new entrants to comply with the terms of the Reference Parameters. We also recognise the concerns of the organisations that are already involved in operating the DTT platform and the considerable voluntary actions they have undertaken to ensure consistency.
- 8.11 We will therefore include conditions in the WT Act licences that will require licensees to cooperate with the operators of other compatible services (such as the six existing multiplexes) only on matters that are critical to the stability of the DTT platform such as allocation of Logical Channel Numbers and the labelling of key transport stream components. We will not intervene in relation to interoperability in other areas.

Spectrum trading

- 8.12 BECTU opposed spectrum trading in an environment where the regulator had no regard to the technology or applications used. If trading was permitted transactions should be subjected to a public value test to ensure that Ofcom's non-monetary obligations were fulfilled if licences changed hands.

- 8.13 Spectrum trading is a key mechanism in our approach to spectrum management. We have explained above (paragraphs 6.3 to 6.4) why we are taking a market led approach to awarding the digital dividend. We aim to give spectrum users as much flexibility as possible to determine how to use the spectrum, with constraints being the minimum necessary to prevent harmful interference and to meet the UK's international obligations. This applies to transactions in the secondary trading market as much as it does to primary spectrum assignments through an award.
- 8.14 The Spectrum Trading Regulations⁹ set out the matters we must take into account in deciding whether to consent to a trade; they include such matters as whether the transferee is able to meet the licence terms and whether refusal of consent is required in order to comply with international obligations. The Regulations do not provide for a public value test, nor do we think that introducing one is appropriate as we have concluded that this spectrum should be released in a way that allows the market flexibility to decide how spectrum is used.

Provision of information

- 8.15 There were a variety of comments on the proposed inclusion of a condition in the licence for provision of information. Public Voice and a confidential response agreed with the idea. BT said the assumption should be based on the minimum necessary rather than totally open access. A confidential response said that information requested should not be overly onerous or commercially sensitive. The Scottish Government would like a licence condition that encouraged secondary trading. Vodafone had no objection to a public register of ownership but were not convinced it would do much to facilitate secondary trading. Guardian Media Group could not see spectrum trading developing and so there was no need for an information provision. Scottish Screen welcomed the collection and sharing of information, but did not think it would address concerns about speculative hoarding.
- 8.16 We proposed including a provision in the licence which would allow us to ask licensees for information relating to the use of the radio equipment for the purpose of ensuring that we could perform our spectrum management functions. We recognise the concerns expressed in responses that our information requests should not be overly onerous and that we should not publish commercially sensitive information. Minimising burdens on industry is a principle of best regulatory practice that we have regard to in performing our duties. It will be an important consideration in any request we make for information.
- 8.17 Under the licence we will award the licensee will be required to keep records of certain information relating to the technical parameters of the equipment and the use of the spectrum. We can request those records from the licensee and may publish the information, including in aggregated form. The type of information licensees will have to keep includes records of the location of the radio equipment, the licensed frequencies, the estimated number of receivers (or subscribers, depending on the service provided) of the service, and the extent to which the spectrum is being used. For the licences awarded as a result of this auction, we expect most of this information to be in the public domain at the time of award as the technical parameters, for example, are set out in the Licences themselves. We may request some or all of this information from time to time, but would not generally expect to do so more than once a year.

⁹ The Wireless Telegraphy (Spectrum Trading) Regulations 2004 (SI 3154)
<http://www.opsi.gov.uk/si/si2004/20043154.htm>

- 8.18 We are considering more generally the provision of spectrum information and issues of data disclosure and are planning to publish a consultation later this year. The outcome of this consultation process may lead to proposals for changes to the licence condition dealing with records and the provision of information or to a different policy on the provision and publication of information. It may in this way affect the information we publish on licensees' use of spectrum and associated radio equipment.
- 8.19 We discuss further in the following section (paragraphs 9.22 to 9.28) how the provision and publication of spectrum information may encourage spectrum trading.

Section 9

Promoting competition and efficiency

- 9.1 This section sets out our updated views on the promotion of competition and efficiency in respect of the first phase awards. We briefly recap our approach and proposals from the June consultation, set out relevant consultation responses, and set out our preferred approach in the light of these. In considering responses and our preferred approach, we confine attention to issues raised by respondents which relate to the first phase awards.
- 9.2 In our June consultation documents for both the cleared and the geographic interleaved awards, we set out the importance of the promotion of competition in downstream markets that might depend on spectrum as an input, and of efficient use of spectrum. We noted for example that geographic interleaved spectrum can be a building block for a number of services including, but not limited to, local and regional broadcasting. We also noted the link between competition and efficiency considerations and our statutory duties.

Our three step approach and views from the June consultation

- 9.3 In approaching the issue, we used a three step approach aimed at promoting competition and efficient spectrum use.
- 9.4 Step one was to approach the packaging and auction design in ways aimed at fostering competition and efficiency. Overall, we considered that our proposals here would go a long way towards fostering competition and efficiency.
- 9.5 Step two was to consider whether there may be a case to go beyond the packaging and auction design and promote competition and efficiency by putting in place general safeguards. We looked at:
- use it or lose it requirements;
 - rollout obligations;
 - information provisions;
 - access requirements; and
 - spectrum caps.

We concluded that the only general remedy that might be appropriate was the inclusion of an information provision condition in licences to facilitate spectrum trading.

- 9.6 Step three involved identifying whether there are potential uses to which spectrum could be put which might raise specific market failure risks, and identifying whether targeting intervention designed to help to ensure that the award brings about a more competitive market structure would be an appropriate regulatory response to such risks. We identified two issues for the awards concerned where we considered there was sufficient potential for spectrum purchase outcomes to result in a downstream market structure that might be less competitive than it might otherwise have been.

- 9.7 The first concerned Sky and its possible purchase of geographic interleaved spectrum for aggregation into a sub UK multiplex for pay TV services. We saw the question of access to premium content as the central issue here. This was not primarily linked to the potential for Sky to acquire geographic interleaved spectrum, or to the impact this might have on market structure. We noted that any competition concerns would be best pursued through our existing reviews concerning Sky's 'Picnic' proposal and our wider review of the Pay TV market, where we published further consultations on both in September 2008^{10, 11}.
- 9.8 The second concerned NGW/Arqiva and its possible acquisition and aggregation of geographic interleaved spectrum for additional multiplexes on DTT. It was uncertain whether a competition concern would arise and if it did there were significant risks involved in seeking to remedy it in the geographic interleaved award.
- 9.9 We took the view at this stage that we should not intervene in the award to remedy any potential impact on competition resulting from the either Sky's or NGW/Arqiva's acquisition of geographic interleaved spectrum.
- 9.10 The rest of this chapter summarises respondents' views on issues which relate to the first phase awards together with our consideration of these and our conclusions for the first phase awards. We have grouped issues considered under the following headings:
- use it or lose it and rollout requirements
 - information provisions
 - Sky on DTT, NGW/Arqiva, and other broadcasting issues

Use it or lose it and roll out requirements

- 9.11 The June consultation noted that use it or lose it requirements would require a spectrum holder to give up spectrum or otherwise take action where the holder does not use it. This could in principle address risks of spectrum holders speculatively hoarding or otherwise inefficiently using spectrum. We nevertheless noted a number of drawbacks of the approach, including the difficulty of defining and detecting inefficient use, and the risks that such conditions could foster rather than correct inefficient use and constitute a barrier to efficient trading.
- 9.12 We also discussed the use of rollout obligations. These aim at obliging a licensee to use its spectrum to rollout a network and service in order to cover a defined territory or proportion of the population of a given area. We noted that since such an obligation imposes costs on the licence holder, it should only be considered where expected social benefits exceed expected costs.
- 9.13 Overall we concluded that it would not be appropriate to introduce use it or lose it or rollout requirements into the licences to be made available in the geographic interleaved awards.
- 9.14 While a number of respondents either expressed broad agreement with this approach, for example agreeing with our view that we should not apply any general

¹⁰ See http://www.ofcom.org.uk/consult/condocs/second_paytv/

¹¹ See <http://www.ofcom.org.uk/consult/condocs/picnic/>

remedies other than for information provision, or remaining silent on the issue, the majority raised concerns with this approach.

- 9.15 These concerns centred on the prospect of geographic interleaved spectrum being either hoarded for speculative reasons or that spectrum will for other reasons be purchased and not used. Under either circumstance respondents expressed concerns that the spectrum would then not be available to provide citizen or consumer value, and so argued for the inclusion of use it or lose it or rollout obligations in licences. Some of these respondents suggested that Ofcom had the ability to determine whether or not spectrum is being used effectively, for example through a five year review, so addressing one of the perceived drawbacks of this approach. Guardian Media Group in addition said that its perception of one of our given drawbacks of a use it or lose condition was that it could be an impediment to the development of a fluid secondary market. Based on this, the respondent argued that use it or lose it conditions need not hinder the development of a fluid secondary market and trading, on the grounds that such a fluid secondary market is unlikely to emerge in any case. Scottish Screen expressed concerns that our view of rollout conditions would marginalise the concept of a 'socially desirable level of rollout'.
- 9.16 In the context of the first phase awards, we do not see compelling reasons or evidence to alter our conclusions from the June consultation. We have reached this conclusion for the following four reasons, which address the points made by respondents.
- 9.17 First, we have not seen new evidence concerning these awards that spectrum is likely to be purchased and hoarded, either for anti-competitive or inefficient reasons, or that it will be inefficiently rolled out. We continue to believe that there is a commercial interest in this spectrum which would tend to preclude its being held idle for inefficient reasons. We would expect that where spectrum has value, it will generally be used or traded. However we also note in this context that it may be efficient to purchase and hold spectrum for a period in order to realise a fuller overall value at a later date.
- 9.18 Second, regarding the question of the extent of rollout to be provided on the basis of acquired spectrum, we note that in the context of the first phase awards existing RTSL operators have both the opportunity and incentive to maximise coverage and viewers reached, should spectrum be obtained. Hence we do not think there is evidence to suggest that a socially sub optimal level of coverage will be achieved. Therefore, given that rollout conditions are not costless, we do not believe that they should be applied for these awards.
- 9.19 Third, we believe that it is both likely and desirable that some form of spectrum trading will emerge. The imposition of use it or lose it conditions risks impeding efficient trading, where trading is predicated for example on a use which requires the spectrum to be unused for a period. This is the case even when trading involves relatively infrequent bilateral trades, hence this potential inefficiency is not dependent on the formation of fluid secondary markets.
- 9.20 Fourth, the imposition of use it or lose it or rollout conditions carries a number of potential costs. Requiring use of spectrum for example risks impeding secondary trading, or undermining any longer term use or value the spectrum holder may anticipate. Such conditions could reduce interest in, and hence the efficiency of, the award process. Given our belief that likelihood of spectrum hoarding or inefficient rollout is small, we retain our view that the costs of any conditions are likely to outweigh any benefits.

- 9.21 We conclude therefore that we do not intend to introduce use it or lose it or rollout conditions for the first phase awards.

Information provisions

- 9.22 The June consultation noted that the public availability of information regarding spectrum and the uses to which it is put can facilitate more informed valuation of spectrum. Hence it can facilitate efficient secondary trading and spectrum use, including minimising periods of underutilisation. We have included an information provision licence condition in the award of spectrum in the 2.6 GHz band which requires licensees to provide us, on request, with general information regarding their equipment and use of frequencies, or the rollout of their network. We concluded that such an approach might have significant benefits and hence general merit in respect of the geographic interleaved award. We note however that it would be necessary to recognise any commercial confidentiality concerns.
- 9.23 Many respondents to the June consultation who mentioned this issue were content in principle with the benefits of greater information provision in terms of value formation and spectrum trading and use. Some of these respondents however emphasised that any information provision obligations would need to be framed carefully in order to protect commercial confidentiality and to minimise the burden on licence holders of collecting and providing information, with some respondents requesting further dialogue or consultation. BT for example suggested that we should consult in more detail once assignments and thus uses are known.
- 9.24 One confidential respondent commented that spectrum trading has yet to be demonstrated as an effective mechanism and so requested that Ofcom undertakes a regular review of trading in order to assess its efficacy and if appropriate propose alternative measures.
- 9.25 Some respondents expressed scepticism about the benefits and so saw less or no need for information provision requirements. The Guardian Media Group for example said it saw little prospect of a fluid secondary market developing, and suggested that it was likely that trades would occur on a more infrequent and bilateral basis. This respondent therefore considered that any information provision would be a matter for the two trading parties. Scottish Screen argued that information provision would do little to address any spectrum hoarding or underutilisation, in the absence of other specific sanctions. Other respondents said that they thought it would be difficult to place detailed information into the public domain without compromising commercial confidentiality.
- 9.26 Regarding the development of efficient secondary trade of spectrum, we continue to believe that providing relevant information to the market as a whole will be an important element to the further development of this. Experience from other markets, such as commodities, equities, electricity and gas, suggests that efficient trade is greatly promoted where information pertinent to value formation is made available to the market in a timely and transparent manner. Enabling provision of information to the market concerning spectrum should therefore enable valuation of spectrum to be formed more quickly and in a more informed environment and so encourage trade and earlier and more efficient spectrum utilisation overall. We acknowledge that it will be important to continue to monitor relevant developments in spectrum trading.
- 9.27 Overall therefore, we continue to see general merit in an information provision licence condition. We recognise concerns around the need to recognise and respect

commercial confidentiality and, all other things being equal, the need to minimise any regulatory burden on licence holders such conditions may impose.

- 9.28 We propose therefore to include information provision licence conditions in the licences to be awarded under the first phase awards. The form of these conditions is discussed in paragraphs 8.15 to 8.19 above, taking into account respondents' views concerning the need to maintain commercial confidentiality and to minimise regulatory burdens on spectrum holders while providing sufficient information to the market.

Sky on DTT, NGW Arqiva, and other broadcasting issues

- 9.29 A number of respondents to the June consultation raised concerns regarding our analysis and conclusions concerning Sky and NGW/Arqiva potential purchase of spectrum. Some respondents also raised points regarding other competition issues associated with the geographic interleaved awards and broadcasting applications.
- 9.30 Many of these comments were concerned with potential effects on competition that might result from the award of the full set of geographic interleaved spectrum. Many of the concerns were based on the idea that one party or another could obtain a substantial portion of geographic interleaved spectrum, for example aggregating holdings to form a sub-UK multiplex. Concerns around Sky and NGW/Arqiva were particularly linked to this possibility. We acknowledge concerns here but note that we are primarily concerned in this Statement with the award of two local lots. We therefore confine attention to concerns that may have a particular bearing there. We intend to return to the issues associated with wider holdings of geographic interleaved spectrum during our consideration of the next phase awards.
- 9.31 The competition issues raised by respondents with a potential significant bearing on these awards were:
- One respondent requested that Ofcom should confirm an intention to issue a written notice to NGW/Arqiva in relation to the first phase awards obliging NGW/Arqiva to produce reference offers for access to relevant broadcasting services. This obligation stems from undertakings obtained by the Competition Commission in relation to the recent NGW/Arqiva merger¹².
 - GMG expressed its opinion that ITV has a strong position in within regional television advertising and that consequently ITV may have an incentive to bid for spectrum in order to prevent its use by newly emerging local TV businesses;
 - A confidential respondent argued that Ofcom should endeavour to include sufficient competition conditions in all WTA licences. This, the respondent argued, should allow Ofcom to intervene quickly and effectively should downstream competition concerns arise via spectrum holding, and so avoid reliance on ex post competition powers which tend to be slow in correcting competition issues.
- 9.32 Regarding our intention to issue a written notice to NGW/Arqiva, we confirm our intention to do this. This process is explained further in the Information Memorandum published alongside this Statement (see section 5 of the Information Memorandum).

¹² See http://www.competition-commission.org.uk/inquiries/ref2007/macquarie/pdf/notice_undertakings.pdf

- 9.33 Regarding the potential acquisition of spectrum by ITV in order to impede the emergence of local TV, we have not seen evidence that there is a significant risk of such an outcome. Moreover, our proposal to introduce an information provision condition would, all other things being equal, tend to reduce any incentive for such a strategy since it would be more likely to be revealed. We would in such circumstances also have recourse to general competition law.
- 9.34 We note in addition that ITV advertising revenue on the ITV1 channel is currently subject to the Contract Rights Renewal remedy. This would include ITV's TV advertising at the regional level. To the extent that ITV retains market power in the TV advertising market, the remedy ameliorates the ability and incentive of ITV to exercise any such power and hence any incentives to extend the scope of any such power.
- 9.35 We also need to consider the issue in terms of available remedies and their relative benefits and costs. An available remedy in this case would be to exclude ITV from the award. Given that the likelihood of competition issues arising appears to be small, such a remedy would be unlikely to bring large benefits. Conversely it could carry significant costs in terms of an efficient award outcome and spectrum use both in the short and long term.
- 9.36 Regarding the question of including competition conditions in all WTA licences, we begin by noting that our three step approach to promoting competition aims at identifying, evaluating and where necessary proposing measures to address competition concerns that are both significant and likely. When applying this process to the geographic interleaved awards we did not identify issues or remedies other than the information provision licence condition that would need to be addressed through WTA licences. We also noted that we retain ex post competition powers to deal with any concerns that may arise after the awards. It is not therefore clear that the introduction of competition conditions into WTA licences delivers benefits over and above those achieved by our proposed approach.
- 9.37 Moreover, such an introduction risks potentially significant drawbacks. Competition conditions in the WTA licence would tend to be most effective where the nature of any potential competition problem is clear and hence where the conditions can be appropriately framed to address it. It is unlikely however that the nature of the competition problem would be clear before the event, with the consequence that any conditions included in the WTA licence are unlikely to be sufficiently targeted to be effective. Drafting the conditions in a more general manner risks creating uncertainty for the licensee and Ofcom. Ex post competition law on the other hand has the advantage of a well established analytical framework and precedent in EU and UK law that offers some clarity concerning the scope, investigation and remedy of competition issues.
- 9.38 Given the relatively small likelihood of benefits compared to potential drawbacks, we will not include competition conditions within the WTA licences for the first phase awards. We nevertheless intend to return to the issue when considering our next phase of awards, including setting the issue against the wider question of the relative merits and appropriate use of ex post competition law.

Section 10

Next steps

The first phase awards

- 10.1 We have decided to hold the first phase award of lots for Winter Hill (for Manchester) and Wenvoe (for Cardiff) as soon as possible. The key next step in the award process is for us to make the statutory instrument that sets out the auction rules and the related statutory instruments. A Notice and draft statutory instruments are published alongside this statement; it is subject to a statutory consultation period of at least one month. After the closing date for responses to this statutory consultation, we will consider responses and assess whether we should amend the proposed regulations. We will then make the regulations and they will come into force on the date specified in them, which is likely to be about one month after the date they are made.
- 10.2 The rules for the awards cannot be finalised before the statutory consultations have closed and we have considered responses. Subject to this, we expect the auction regulations to be in force by a date that would allow the auction process to start in early 2009. Section 4 of the Information Memorandum describes the various stages in the process.
- 10.3 We are planning to hold a number of events that will allow interested parties to familiarise themselves with the auction design and procedures. These will include a seminar, to be held before the Regulations are made to explain the auction rules. We will also hold bidder training for applicants who qualify as bidders in the auction.

Annex 1

Summary of responses to the 12 June 2008 consultation

Issue raised	Comments	Ofcom's response
Policy objectives and uses of the geographic interleaved spectrum	A number of responses considered that a market led approach would not further the interests of the consumer, some sections of society or community media. Some also argued that the spectrum should be reserved for specific uses/services.	Our approach to the awards was guided by our primary duty to further the interests of citizens and consumers. The overarching policy objective of the DDR geographic interleaved award is to maximise the total value to society generated by the use of this spectrum over time. We consider that a market led approach is more likely to achieve this objective than an interventionist approach that allocated spectrum to particular uses in order to promote public policy goals.
Timing of the geographic interleaved awards	A number of responses commented on the timing of the awards and for a variety of reasons suggested that the awards should be delayed.	Our main consideration in the timing of the first awards is to provide existing local television operators in Manchester and Cardiff the opportunity to obtain clarity on their future spectrum holding in advance of early DSO. We are currently considering how to proceed with the remaining awards, in the light of responses to all three digital dividend consultations, and we plan to make a further announcement later this year.
PMSE use	A number of respondents expressed concern that there would be insufficient spectrum available for present and future PMSE use.	We published a consultation titled 'Digital Dividend Review: band manager award' on 31 July 2008. The consultation closed on 16 October 2008. The responses concerning spectrum availability for PMSE will be taken into account as part of that consultation.
Cognitive devices	<p>A number of respondents expressed concern that cognitive devices would constrain use of the spectrum.</p> <p>Vodafone considered the UK should not be prevented from taking advantage of future developments in DTT technology by constraints imposed by cognitive devices.</p>	We are planning to publish a consultation later in 2008 or in early 2009 on licence exempt use of cognitive devices and in its preparation we will take into account these responses.
Coverage and protection of existing DTT services	<p>Several respondents said it was important that existing DTT services are given a high level of protection.</p> <p>Guardian Media Group suggested that the median option resulted in a dramatic reduction in coverage for</p>	<p>We remain convinced that median offers a good balance between protecting the interests of existing operators and providing opportunities for new entrants.</p> <p>For the first phase awards we will relax the median level of protection. This will afford material increases in coverage for new DTT services with very limited impacts on the</p>

	Manchester, compared to DPSA.	reception of the six existing DTT multiplexes after DSO, based on the actual antenna locations proposed.
Coverage in Scotland	A number of responses commented on the coverage for Scotland, in particular, on the scope for revising the DSO plan to optimise coverage in Scotland and Northern Ireland.	We have noted the interest expressed by respondents in lots covering other areas. We are currently considering how to proceed with the remaining awards, in the light of responses to all three digital dividend consultations, and we plan to make a further announcement later this year.
Spectrum to be awarded	A confidential respondent asked for clearer definitions of large, medium and small lots. It suggested that medium and large lots should be included in a single award.	We are currently considering how to proceed with the remaining awards, in the light of responses to all three digital dividend consultations, and we shall cover points such as these in our further considerations.
Parking channels	Digital UK and a confidential respondent asked Ofcom to ensure that time of the awards did not prevent access to parking channels.	We are currently considering how to proceed with the remaining awards, in the light of responses to all three digital dividend consultations, and we shall cover points such as these in our further considerations.
Single frequency networks (SFNs)	EADS Atrium suggested that it would be possible to clear more spectrum by replanning the broadcast networks to use single frequency networks employing many low-power transmitters i.e. a cellular model.	The decision to proceed with a multi-frequency network was made by Government some years ago. Prior to that decision, several options, including one involving SFNs, were considered taking into account factors including the cost and disruption to viewers of changing receive aerials and the likelihood of being able to secure international agreement.
Spectrum packaging	The Scottish Government said the efforts must be made to ensure that any party wishing aggregate spectrum to provide a wider service must be given priority.	We are currently considering how to proceed with the remaining awards, in the light of responses to all three digital dividend consultations, and we shall cover points such as these in our further considerations.
	Scottish Borders Council said that spectrum should be packaged to allow coverage across south of Scotland and that Selkirk should be should be available at the same time as Caldbeck.	Due to the lack of interest in a lot covering Carlisle, and noting that the RTSL for Carlisle has expired, we will not at this stage award a lot for Caldbeck to cover Carlisle. However a lot at Caldbeck could be included in a later award.
	Scottish Screen considered that the timetable needed to allow for issues specific to Scotland such as the need for a PSB provision within Scotland or issues arising from the conclusions of the SBC.	We have noted the interest expressed by respondents in lots covering other areas. We are currently considering how to proceed with the remaining awards, in the light of responses to all three digital dividend consultations, and we plan to make a further announcement later this year.
Assignment of spectrum by auction	A number of respondents opposed the use of auctions for awarding spectrum and felt that a market based approach would not further the interests of consumers and some sections of	In the case of the first phase awards we consider that an auction offers the most open, transparent and non-discriminatory method out of those available for determining who should be granted the licences concerned. This is because in auctions, a bidding process is used to award

	society.	licences to those bidders prepared to pay most for them. Auctions are therefore likely to lead to the spectrum rights being assigned to users that value them most highly, which will generally be those who are likely to use the spectrum most efficiently.
Rules for the first phase auctions	<p>Arqiva and BECTU felt that the proposed level of deposits/reserve prices was too high and could deter potential bidders.</p> <p>A confidential respondent suggested that the deposit and reserve price be calculated on a sliding scale proportional to the likely number of viewers.</p>	<p>We have set the reserve price at £10,000, having proposed £25,000 in the June consultation. Our aim in setting the reserve price is to discourage frivolous bidders while encouraging participation from credible service providers. The figure of £10,000 seems a reasonable figure to meet our aim. For similar reasons we also consider that the initial deposit, to be submitted with applications, should be £10,000.</p> <p>We consider that a reserve price of £10,000 removes the need for a sliding scale.</p>
	A confidential respondent suggested that bid increments in the auction should be a matter for bidders and not pre-set by the auctioneer.	Bid increments between rounds are used to manage the pace of the auction. We consider that it is a key function of the auctioneer to have the discretion to set bid increments. In each round we will set the minimum and maximum bid prices and this will allow bidders some discretion in the amount they may bid.
	Guardian Media Group suggested that bidders should be anonymous during the bid process.	For the first phase awards we consider that there would be no significant loss in efficiency if after each round we released to bidders only the number of bidders that made bids, but not the names of the bidders. At the same time this would reduce any risk there might be of collusive or strategic behaviour.
Unsold spectrum	A confidential respondent suggested that Ofcom should clarify what it intends to do with any unsold spectrum prior to the auction. Public Voice said that that unsold spectrum should be gifted to public service uses.	We retain the discretion to award any unsold lots through a separate award process.
Technical licence conditions	<p>BT considered that the licence conditions were a barrier to the introduction of other services as there was no guarantee that a variation would be granted or what it would entail.</p> <p>JFMG considered that PMSE was the most likely use of the spectrum but no licence provision had been made for its use.</p>	If the holder of a licence obtained in the first phase awards wished to provide a non-DTT service we would consider a request for variation of the technical conditions.
	Vodafone suggested that it was inappropriate to define in-band technical licence conditions using the block edge mask approach.	We have had strong interest from potential operators of DTT services in geographic interleaved spectrum. We have therefore tailored the award towards single transmitters at fixed existing sites and based

		technical licence conditions on a single transmitter. Developing an alternative approach to technical licence conditions based on SURs would take some time to implement. Given the tight timescales for the first phase awards and the absence of clear demand from alternative uses, we are proceeding on the basis of a block edge mask.
International co-ordination	<p>Arqiva believed that Ofcom should consider improving the default levels by negotiating with neighbouring countries.</p> <p>A confidential response suggested that the proposals could result in large restrictions on licensees and Ofcom should consider on a case by case basis whether an attempt to coordinate relaxed restrictions could impact on existing multiplexes.</p> <p>Another confidential response said that ex post it may be useful to have the flexibility to discuss with international parties, particularly for high coverage stations.</p>	We are proceeding on the basis that the licences in the first phase awards will not allow for the co-ordination threshold to be exceeded. However, we will consider renegotiation of international agreements on a case-by-case basis at the licensee's request.
Non technical licence conditions	Guardian Media Group considered that advertising agencies should be precluded from holding WT Act licences as this could result in anti-competitive behaviour.	We expect that the opportunities for advertising on TV channels carried on new multiplexes would be part of a wider market, including existing UK national and regional television, UK national, regional and local press, as well as online. If a new multiplex operator sought to abuse any position of market power, such behaviour could be appropriately dealt with under relevant competition rules.
	<p>Several responders believed that interoperability needed to be underpinned by mandatory licence conditions.</p> <p>Digital UK and a confidential responder suggested a further condition for new licensees to cooperate with DUK and DMOL to ensure that impact on DSO was minimised.</p>	We will include conditions in the WT Act licences that will require licensees to cooperate with the operators of other compatible services (such as the six existing multiplexes) on matters that are critical to the stability of the DTT platform such as allocation of Logical Channel Numbers and the labelling of key transport stream components.
Spectrum trading	BECTU opposed trading in an environment where the regulator had no regard to the technology or	Spectrum trading is a key mechanism in our approach to spectrum management. We aim to give spectrum users as much flexibility as possible to determine how to use the

	applications used and considered that trades should be subject to a public value test.	spectrum, with constraints being the minimum necessary to prevent harmful interference and to meet the UK's international obligations. The Spectrum Trading Regulations do not permit us take into account a public value test.
Licence duration	BECTU believed that WT Act licences should have a finite duration.	We consider that licences with an indefinite term are likely to promote optimal use of the radio spectrum and other relevant objectives, including the promotion of competition. It removes the requirement for return to the regulator, removes the risk of discouraging investment and creates additional opportunities for the market to secure the efficient use of the spectrum, particularly in the presence of spectrum trading.
Provision of information	Guardian Media Group did not consider that spectrum trading would develop and therefore did not see a need for an information provision.	We consider that providing relevant information to the market as a whole will be an important element in the further development of secondary trading of spectrum. Enabling provision of information to the market should enable valuation of spectrum to be formed more quickly and in a more informed environment and so encourage trade and earlier and more efficient spectrum utilisation overall.
Use it or lose it requirements	Some responses were concerned that the absence of a 'use it or lose it' clause in the WT Act licence might encourage spectrum hoarding or acquisition of spectrum for the purposes of denying it to competitors.	In the context of the first phase awards, we do not see compelling reasons or evidence to alter our conclusions in the June consultation that it would not be appropriate to introduce use it or lose it or rollout requirements into the licences. We set out our reasons in section 9 of this document.

Annex 2

Impact assessment

Introduction

- A2.1 This This annex represents an impact assessment (IA) of the options we have considered and the modifications we have made to the proposals in the June consultation relating to the first phase awards.
- A2.2 The IA in the June consultation explained how our approach to the awards was guided by our primary duty to further the interests of citizens and consumers. The overarching policy objective of the DDR Geographic Interleaved award was to maximise the total value to society generated by the use of this spectrum over time. The IA set out and evaluated the options that we had considered for this award. It focused on the key decisions concerning:
- technical licence conditions;
 - non-technical licence conditions;
 - spectrum packaging;
 - auction design and rules; and
 - promoting competition and efficiency.
- A2.3 We set out our approach to impact assessments in guidelines *Better Policy Making: Ofcom's approach to Impact Assessments*¹³. In paragraph 3.9 of that document we said that, following a consultation, in the statement setting out our decisions a separate section or annex would show how the comments made about the consultation IA had affected our assessment of the impact of the options considered. We would also set out the option we had chosen and why. We cover these points in this annex.
- A2.4 Alongside this statement, we have published a notice setting out our proposed intention to make regulations in connection with the first phase of DDR geographic interleaved awards. It includes a regulatory impact assessment on each of the draft regulations. We are consulting on these documents and the closing date for responses is 25 November 2008.

Comments on the impact assessment and our further assessment of the options

- A2.5 We received a range of comments on the proposals in the June consultation. While not directly addressing the IA they had a bearing on the analysis in it. We summarise in the body of this statement and in annex 1 the comments made and our response to them. In the light of these comments we have modified our proposals and we set out below an impact assessment of each of the modifications we have decided to make.

¹³ http://www.ofcom.org.uk/consult/policy_making/guidelines.pdf

Technical licence conditions - coverage and impact of new services

A2.6 We considered it most likely that the lots included in the first phase of awards would be used for DTT, and planned the coverage of these lots with this in mind. We considered that there were three feasible generic options for protecting reception of existing DTT services. They are described in the following table below. We expressed a preference for the median option.

A2.7 Responses were divided on the choice of option. Of particular note was the Guardian Media Group comment that, compared with DPSA, the median option resulted in significant reduction in coverage for Manchester and this made the frequency unusable for DTT services.

A2.8 We have carried out further detailed planning work for each of the lots, and found that the median option overprotected overlap coverage in some areas. Having considered the responses to the consultation, and carried out further detailed technical work, we have decided to relax the median level of protection for lots included in the first phase of awards. This will afford material increases in coverage for new DTT services with very limited impacts on the reception of the six existing DTT multiplexes after DSO, based on the actual antenna locations proposed.

A2.9 The following table summarises our assessment.

Option	Advantage	Disadvantage
Use the DPSA option – protecting only the (technically) best DTT coverage	Allows the maximum use of the interleaved spectrum, and the best coverage for a new multiplex using lots at Winter Hill or Wenvoe	Does not always protect the correct national or regional service, and can result in disruption for viewers
Use the JPP (Joint Planning Project) option – protecting three layers of overlap coverage	Provides the maximum protection for existing DTT services, and no disruption to viewers	Severely restricts the amount of interleaved spectrum available. Unlikely to allow coverage of the relevant areas of population in Manchester and Cardiff
Use the median option – protecting the best coverage as well as the best analogue service	Provides a good compromise between protecting existing services and allowing use of more interleaved spectrum in most areas	Detailed planning shows that for Manchester, and to a lesser degree for Cardiff, this option unnecessarily over-protects transmissions from some relays
Revised plan - use median option as a starting point, and DPSA as a backstop, but allow manual intervention	Allows more flexibility and enables better coverage for the potential new services, without detrimental impact on viewers of existing services	Requires detailed technical examination of each spectrum lot

Non-technical licence conditions - interoperability

- A2.10 We proposed to facilitate technical interoperability between any new DTT services in geographic interleaved spectrum and existing DTT services.
- A2.11 Most respondents agreed that it was important that new multiplex operators could interoperate effectively with the existing platform, and suggested this should be mandated or facilitated, to varying degrees. Two respondents said interoperability should be left to commercial agreement between the parties.
- A2.12 We have considered further the essential features of interoperability. We have found that if a new multiplex operator were to use the same logical channel numbers, network and service identification or other identifiers for transport stream components, there is a high risk of disruption to viewers. We have noted that existing multiplex operators are already under a range of obligations through their licences which ensure that they interoperate. We do not consider that it is necessary to add further conditions for existing DTT multiplexes.
- A2.13 We have decided therefore to mandate cooperation by new operators only on those limited features which are essential to ensuring that new operators will not disrupt existing services. This allows new operators to interoperate, but places no obligation on them to do so.
- A2.14 The following table summarises our assessment.

Option	Advantages	Disadvantages
Do nothing – leave interoperability to the operators	Non-interventionist; no regulatory burden on licensees	Risk of disruption of existing services and viewers Risk that new operators are not able to join the DTT platform
Facilitate – require existing multiplex operators to interoperate at the request of the new operators. New operators would not be obliged to do so.	Preserves flexibility for new operators	Potential burden on existing operators Risk that new operators may disrupt existing services if they choose to not interoperate
Mandate – require new and existing operators to interoperate by means of licence conditions.	Ensures no disruption for viewers	Potentially a regulatory burden on both existing and new operators Does not allow new operators to use different standards
Revised approach following further work on the essential features of interoperability – to include a condition in the licences for new operators	Ensures no disruption for viewers Allows new operators to use	Potential burden on new operators

obliging them to ensure they do not duplicate identifiers for transport stream components.	different standards	
--	---------------------	--

Spectrum packaging - the spectrum lots we will award

- A2.15 We proposed to include in the first phase awards lots for Manchester, Cardiff and Carlisle, where there were licensed local TV operators and DSO is imminent.
- A2.16 Most respondents who commented on the question agreed with our rationale for holding an award for Winter Hill (for Manchester), Wenvoe (for Cardiff) and Caldbeck (for Carlisle) in late 2008 or early 2009. There was clear interest in obtaining lots to provide services covering Manchester and Cardiff but no interest expressed in covering Carlisle.
- A2.17 In the light of responses we have decided to offer two rather than three lots for auction in the initial phased awards. These will be for Cardiff (from Wenvoe) and Manchester (from Winter Hill). We will not include a lot for Carlisle (from Caldbeck) in the first phase of awards This is because the RTSL in Carlisle has expired and we had no indication of interest from local operators for a service covering Carlisle. We will consider including Caldbeck in a later award. This could also allow it to be awarded at the same time as Selkirk.
- A2.18 The impact assessment published with the June consultation noted that we had already stated that we planned to award lots in respect of locations for three existing RTSL holders (Carlisle, Cardiff and Manchester). Hence the assessment there was primarily concerned with the extent to which further lots might be auctioned, beyond the initial phased award. The following table is specific to the proposals for the initial phase awards.

Option	Advantages	Disadvantages
Original option: include lots for Cardiff, Manchester and Carlisle in first phase of awards	Meets our commitments as set out in our December 2007 Statement to meet needs of RTSLs facing first DSO	Would in present circumstances increase risk of unsold lots
Revised plan: include lots for Cardiff and Manchester in initial phase of awards Not include a lot for Carlisle	Continues to meet stated needs of RTSL holders Reduces risk of unsold lots	

Auction design - sequencing and timing of first phase awards

- A2.19 We proposed in our June consultation that we would hold the first phase awards in late 2008 or early 2009. We also noted that we would need to consider whether to run the auctions sequentially or in parallel, and set out some considerations for each approach, noting that both approaches should produce a similarly efficient auction outcome and spectrum allocation. We did not express a preference.

A2.20 A number of respondents requested that the first phase awards be held as early as possible, with one respondent requesting that the relevant lots be awarded at least nine months before DSO. A confidential respondent said it favoured either a sequence of awards or parallel awards of all three lots. Other respondents who mentioned the issue noted that they preferred parallel awards.

A2.21 Some respondents suggested that the award timetable needed to be delayed slightly in order to address a number of issues, including the expected report from the Scottish Broadcasting Commission and the provision of local TV services in Scotland. We have noted the interest expressed by respondents in lots covering other areas. We are currently considering how to proceed with the remaining awards, in the light of responses to all three digital dividend consultations, and we plan to make a further announcement later this year.

A2.22 Following responses and our decision not to include a lot for Carlisle (from Caldbeck) in the first phase awards, we have decided to hold parallel awards for Wenvoe (for Cardiff) and Winter Hill (for Manchester) in early 2009. Our main consideration in the timing of the first phase awards is to provide existing local television operators in Manchester and Cardiff the opportunity to obtain clarity on their future spectrum holding in advance of early DSO. We should be able to complete parallel awards more quickly than a sequence of awards and, in that case, the existing operators would know earlier whether they had won a licence. Given the absence of any strong arguments in favour of sequential awards, we will hold the awards of channels at Winter Hill and Wenvoe concurrently.

A2.23 The following table sets out our assessment of this approach.

Option	Advantages	Disadvantages
Timing		
Original option stands: Hold initial phased awards in early 2009	Meets requirements of RTSL holders and Ofcom commitments in this regard Releases some spectrum onto market as soon as possible	For bidders interested in local lots, may be too early to secure public funding
Sequential versus parallel		
Sequential	May be more practicable for bidders where they wish to participate in more than one award	Extends period taken to complete awards and so may increase uncertainty
Parallel	Expedites completion of awards and so reduces uncertainty	As number of awards increase, becomes increasingly impracticable for bidders wishing to participate in more than one award

Auction rules for first phase awards

- A2.24 We proposed to award these lots using a single unit ascending bid auction, in late 2008 or early 2009 and proposed specific rules for the auction, including a minimum price of £25,000 with a 50% deposit on application and full transparency in the auction process.
- A2.25 A number of respondents argued that the levels of the reserve price and deposit were set too high; suggesting that the levels outlined in the consultation might deter certain types of bidders such as community or not for profit organisations, or that levels should be set with reference to the likely number of viewers that a spectrum lot might allow for. Also, one respondent said that bidders should be anonymous during the award process.
- A2.26 We have decided that the reserve price will be £10,000 for each lot and bidders will be required to submit a deposit for the same amount on application to take part in the auction. We consider that these amounts strike a reasonable balance between encouraging applications and bids from those with viable business cases and discouraging frivolous applications and bidding.
- A2.27 At the end of each bidding round we will provide bidders with information on the number of bidders that have submitted bids in the round, but not the names of bidders. We will give the number that submitted valid bids at the round price and the number that submitted valid bids at less than the round price. For the first phase awards we consider that there would be no significant loss in efficiency if after each round we released to bidders only the number of bidders that made bids, but not the names of the bidders. At the same time this would reduce any risk there might be of collusive or aggressive behaviour.
- A2.28 The following table summarises our assessment.

Option	Advantages	Disadvantages
Reserve price of £25,000	Would discourage bidders who did not have the resources to make effective use of the spectrum.	Might over estimate the value of the spectrum and discourage smaller organisations from bidding.
Reserve price of £10,000	Would encourage bidding by smaller organisations with viable business cases.	Might under estimate the value of the spectrum and encourage applications from those with no intention of submitting serious bids.
Initial deposit of 50% of the reserve price	Depending on level of the reserve price may encourage applications from applicants with viable business cases.	Where reserve price is relatively low, at £10,000, might encourage applications from those with no intention of submitting serious bids.
Initial deposit of £10,000	Would encourage applications from smaller organisations with viable business cases.	Might encourage applications from those with no intention of submitting serious bids.

<p>Release full information on those bidding in each round</p>	<p>Allows bidders to assess bidding behaviour of competitors. Can help secure an efficient auction outcome.</p>	<p>Can assist collusion between bidders or give strong bidders the opportunity to indulge in aggressive tactics designed to undermine weaker bidders.</p>
<p>Release information only on the number bidding in each round</p>	<p>Allows bidders to assess bidding behaviour of competitors.</p> <p>Helps avoid risk of collusion and aggressive behaviour by strong bidders.</p>	<p>May be less efficient than full disclosure.</p>

Annex 3

Protection options for DTT multiplexes

Introduction

A3.1 Section 7 of this statement sets out our decisions on the technical licence conditions that will apply to Licensees, including the level of protection for existing DTT multiplexes. This Annex sets out in more detail how we reached our decisions on protection for existing DTT multiplexes from new services, both in relation to the transitional arrangements that will apply while DSO is taking place, and the final arrangements for each frequency.

The need for transitional arrangements

A3.2 Channel 30 at Wenvoe (Lot 1 for Cardiff) is subject to a transitional arrangement. During DSO, it is planned that some transmitters will operate on temporary frequencies to avoid interference occurring to viewers in other parts of the UK where analogue services have not yet been switched off. The Wenvoe transmitter is due to switch between January and March 2010. However, it is anticipated that channel 30 will be occupied by a national DTT multiplex until mid-2011 and will therefore be unavailable until after that time.

A3.3 A temporary frequency (channel 55) will therefore be made available to the Winning Bidder during the transition period from DSO at Wenvoe in early 2010 until the time when channel 30 becomes available after mid-2011.

A3.4 Use of channel 57 at Winter Hill (Lot 2 for Manchester) will introduce a new frequency interaction between Winter Hill and the existing pre-DSO Multiplex D service from The Wrekin transmission site in the ITV Central region. This interaction disappears when DSO occurs at The Wrekin and Multiplex D moves to another channel.

A3.5 It will be necessary to put in place a restriction on the use of channel 57 from Winter Hill to protect Multiplex D viewers during the period between DSO at Winter Hill and DSO at The Wrekin. DSO is due to happen at Winter Hill in the fourth quarter of 2009 and at The Wrekin in 2011.

A3.6 Two technical arrangements are detailed below – one for the transitional period between DSO at Winter Hill and DSO at The Wrekin, the other for the final arrangement that can be adopted when DSO has completed at The Wrekin.

Wenvoe

Theoretical templates – Wenvoe channel 30 final arrangement

A3.7 The templates contained in Figure A3.1 show the results of Arqiva's analysis using both the Median and DPSA methods. The Median template shows some restrictions towards Cardiff (approximately 0°-70° ETN). These restrictions are set by transmitters at Bromsgrove and The Wrekin in locations where Arqiva does not believe there will be viewers post DSO. Their analysis is set out in Table A3.1.

Figure A3.1 – Median, DPSA and continental templates for Wenvoe channel 30

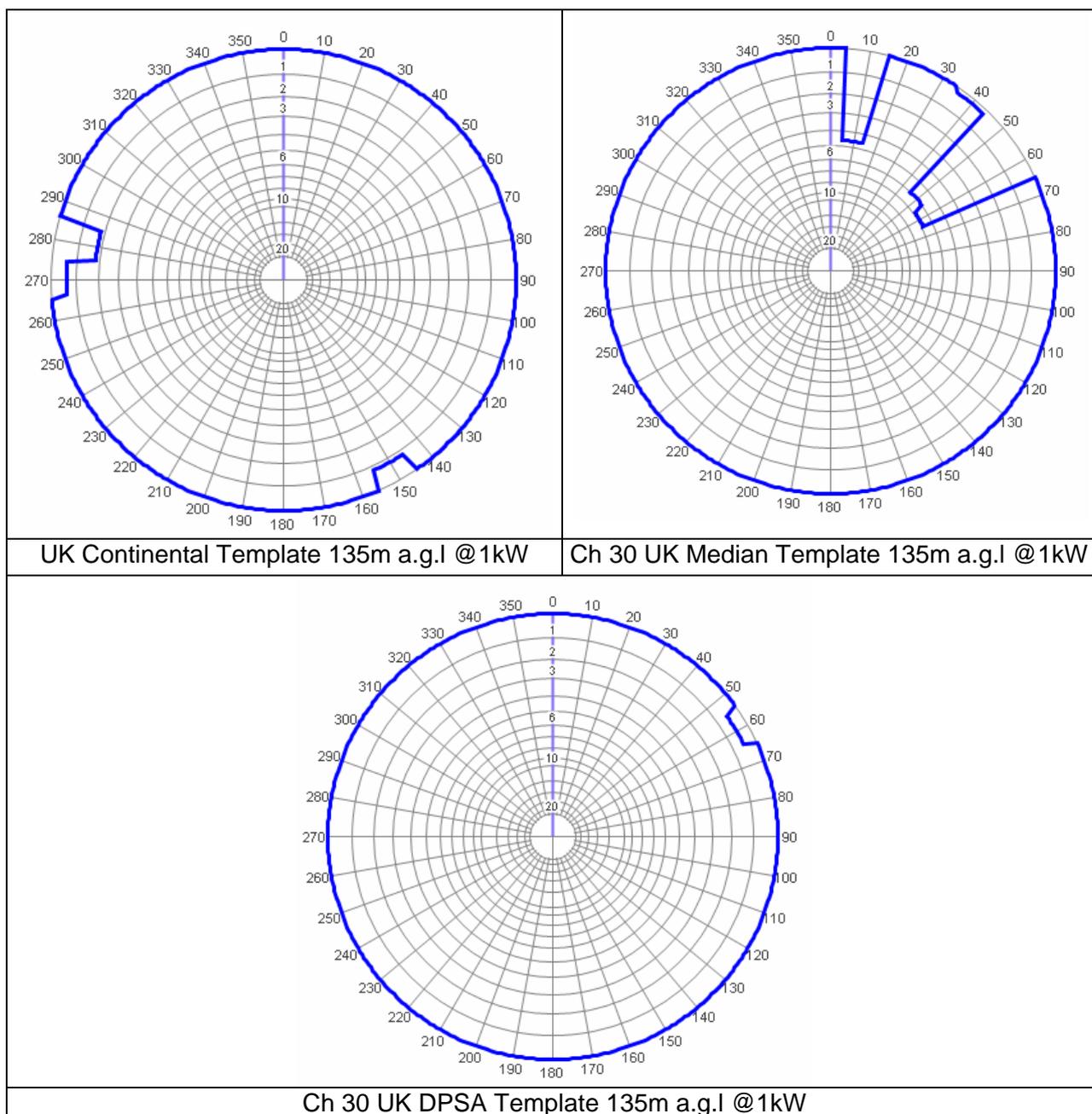


Table A3.1 Restriction analysis – Median method

Azimuth	Restriction/s (dB) Median Method	Comment
50	Bromsgrove 6.0 NGR SP 0485 5885	On the edge of the PSA, Digital UK postcode checker shows most likely transmitter as Ridge Hill.
60	The Wrekin 6.8 NGR SO 9755 2175	Within PSA, Digital UK postcode checker shows most likely transmitter as Ridge Hill.

Practical antenna proposal and impact – channel 30 final arrangement

A3.8 In order to serve Cardiff and surrounding areas, it is proposed to use an array of 4 stacked log-periodic antennas to achieve a 5 degrees beam tilt which is used to provide protection towards Bromsgrove and The Wrekin. The effect of this would be to provide a 4 dB power reduction on the horizon and thereby minimise consequential impact. The Horizontal Radiation Pattern (HRP) of the proposed antenna compared to the theoretical templates is shown in Figure A3.2 below. The impact on the coverage of the national services is summarised in Table A3.2.

Figure A3.2 Comparison of practical antenna pattern with templates

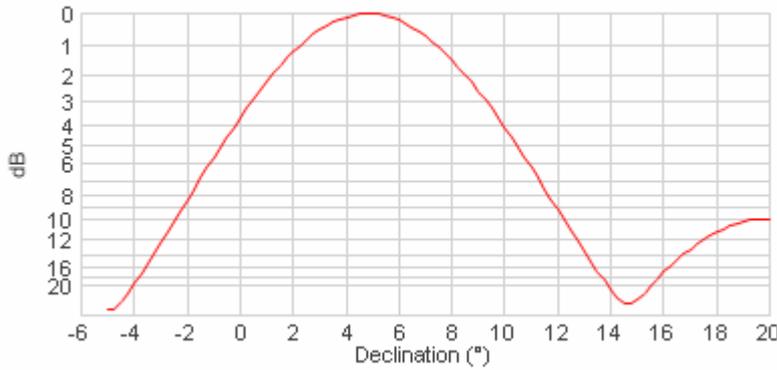
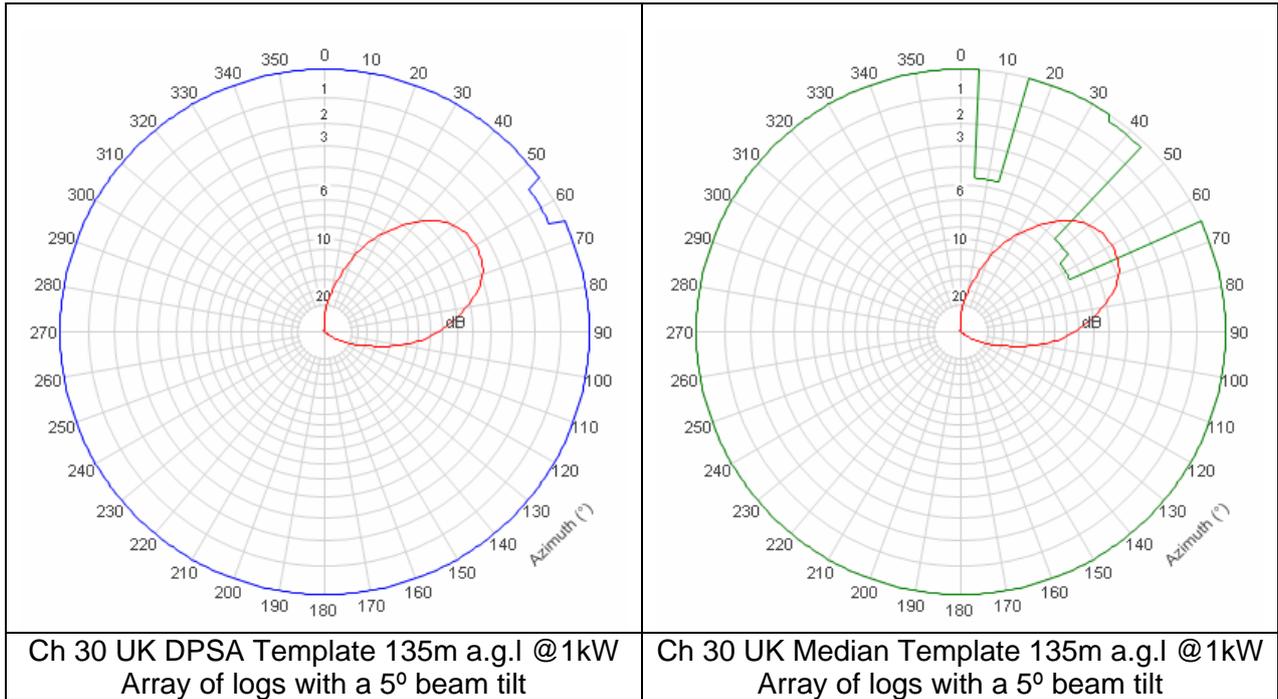


Table A3.2 Impact on coverage of national multiplexes

Transmitter and service affected	Gross loss		Loss within analogue preferred service area	
	Households	% of gross pop	Households	% of pop in APSA

Bromsgrove multiplex D	107	0.1	0	0.0
The Wrekin multiplex D	800	0.1	2	0.0

Theoretical templates – Wenvoe channel 55 transitional arrangement

A3.9 The templates contained in Figure A3.3 below show the results of Arqiva’s analysis using the Median method. The Median template shows some restrictions towards Cardiff (approximately 0°-70° ETN). These restrictions are to transmitters at Monmouth, Andoversford and Portishead in locations where Arqiva judges that there will not be viewers post DSO. Their analysis is set out in Table A3.3. At 70° ETN the restriction is due to Oxford DSO which will not occur until mid 2011.

Figure A3.3 – Median and continental templates for Wenvoe channel 55

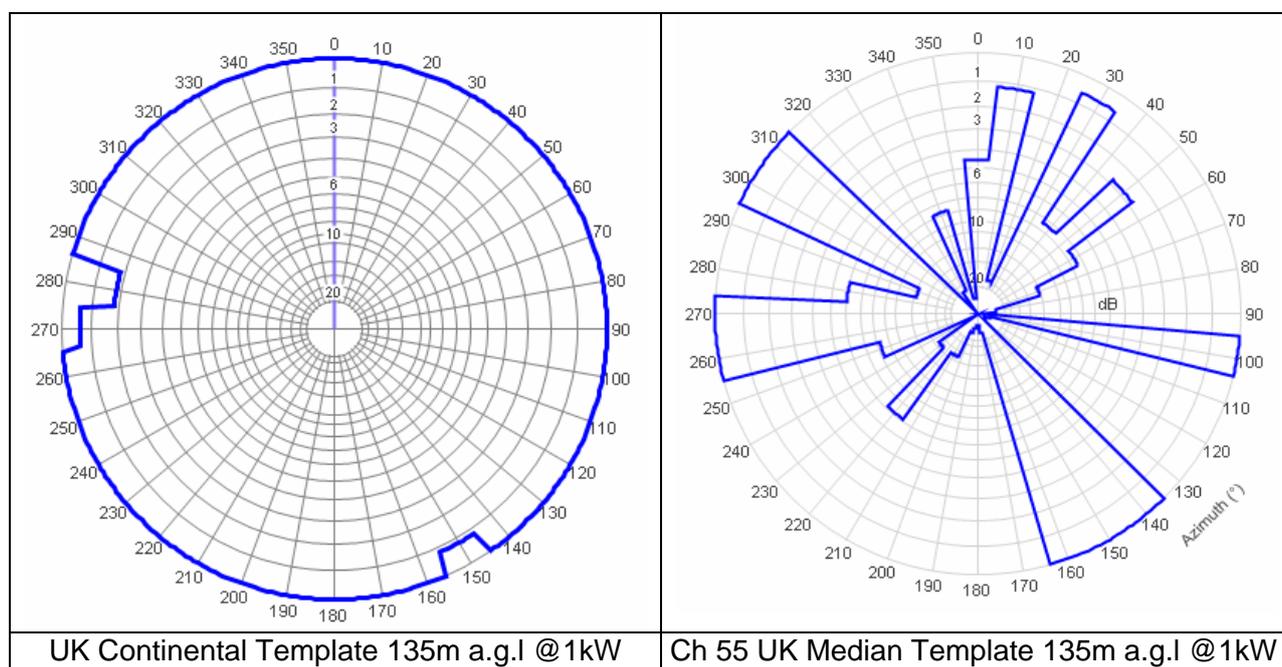


Table A3.3 Restriction analysis – Median method

Azimuth	Restriction/s (dB) Median Method	Comment
30-50	Monmouth 2.8 NGR SO 5515 1560	Digital UK postcode checker shows most likely transmitter as Wenvoe.
60	Andoversford 5.5 NGR SP 0045 22650	Digital UK postcode checker shows most likely transmitter as Mendip.
80	Portishead 23.0 NGR ST 4685 7735	Digital UK postcode checker shows most likely transmitter as Mendip.

Practical antenna proposal and impact – Wenvoe channel 55 transitional arrangement

- A3.10 A two bay of four stacked log-periodic antennas separated horizontally with 5 degrees of beam tilt oriented at 50° ETN would provide coverage towards Cardiff, Newport and surrounding areas. A comparison of the pattern of such an antenna to the theoretical templates given in Figure A3.4. The impact on the coverage of the national services is summarised in Table A3.4
- A3.11 The bayed log-periodic arrangement is designed to put a null towards Hutton (100° ETN) which is expected to have switched in early 2010. The beam tilt is used to provide protection towards Monmouth, Portishead, Clearwell, Machen Upper, Taffs Well, Tonyrefail, and Andoversford

Figure A3.4 Comparison of practical antenna pattern with median template

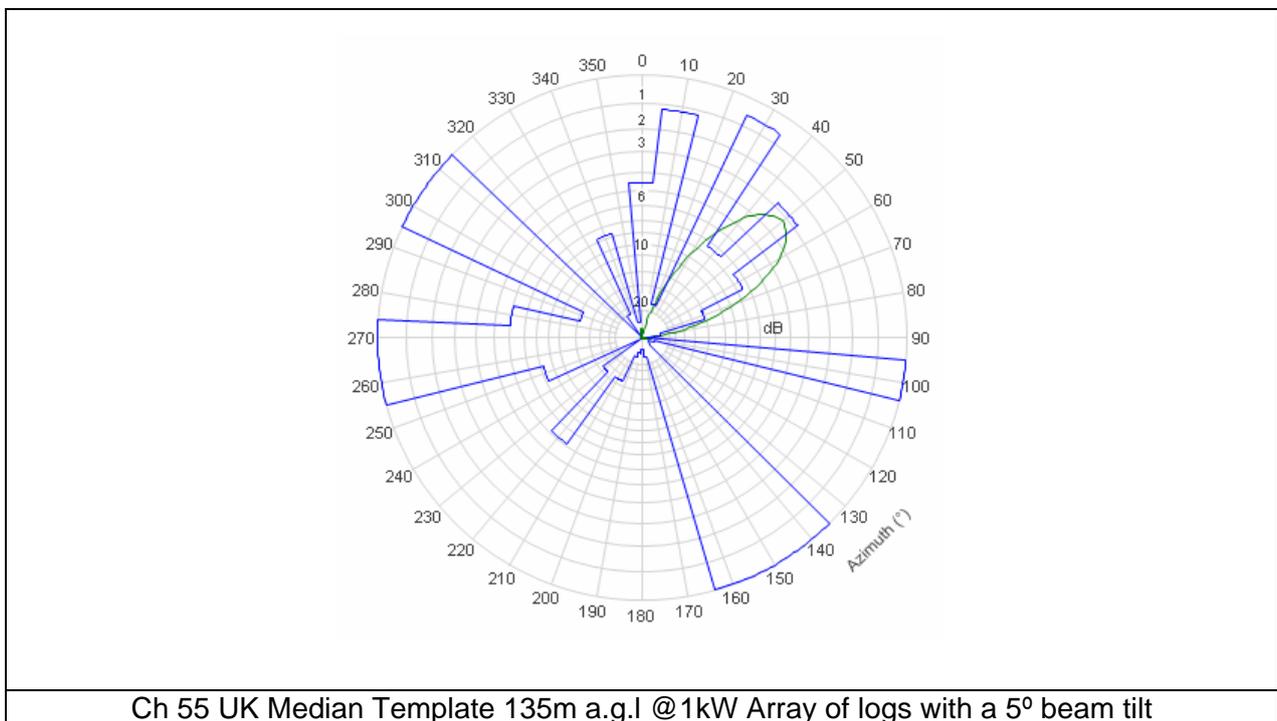


Table A3.4 Impact on coverage of national multiplexes

Transmitter and service	Gross loss	Loss within analogue
-------------------------	------------	----------------------

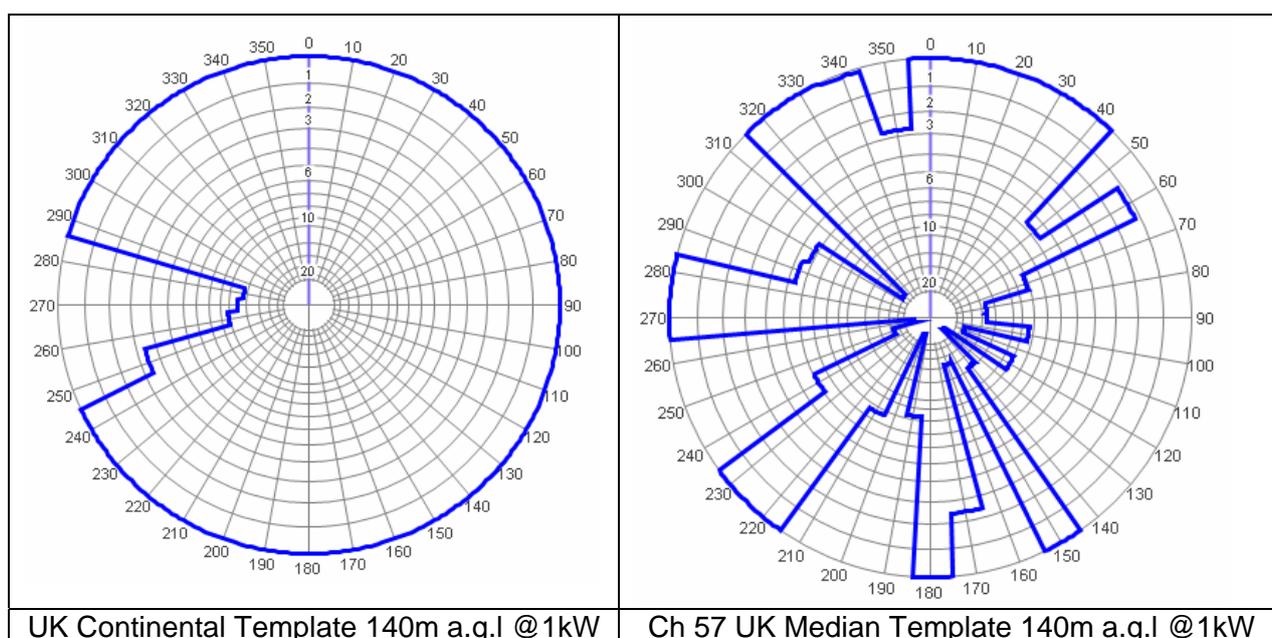
affected			preferred service area	
	Households	% of gross pop	Households	% of pop in APSA
Monmouth	56	0.8	0	0.0
Clearwell	98	8.8	0	0.0
Machen Upper	71	5.1	0	0
Taffs Well	724	4.5	0	0
Portishead	2,217	20.6	2	0.1
Hutton	394	1.3	0	0
Andoversford			0	0

Winter Hill

Theoretical templates – Winter Hill channel 57

A3.12 The templates contained in Figure A3.5 below show the results of Arqiva’s analysis using both the DPSA and Median method. The median method shows a number of onerous restrictions towards greater Manchester (approximately 70°-170°). Most of these restrictions are set by Winter Hill relays in locations where it is expected that viewers will watch Winter Hill post DSO. Arqiva’s analysis of the restrictions is given in Table A3.5.

Figure A3.5 – Median, DPSA and continental templates for Winter Hill ch 57



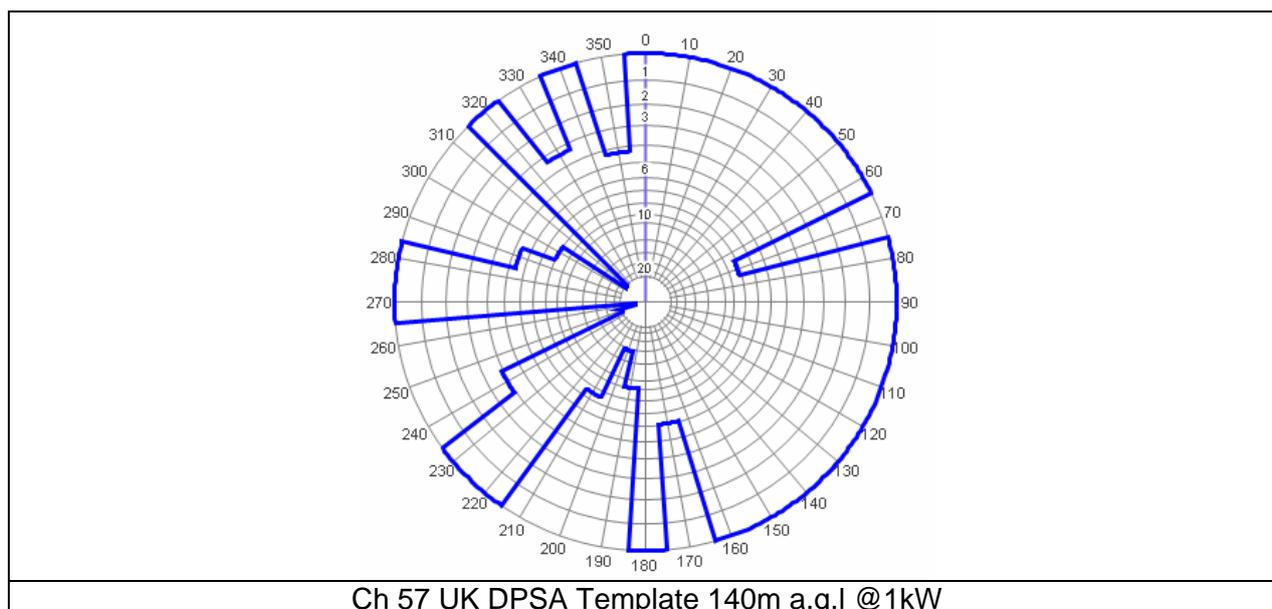


Table A3.5 Restriction analysis – Median method

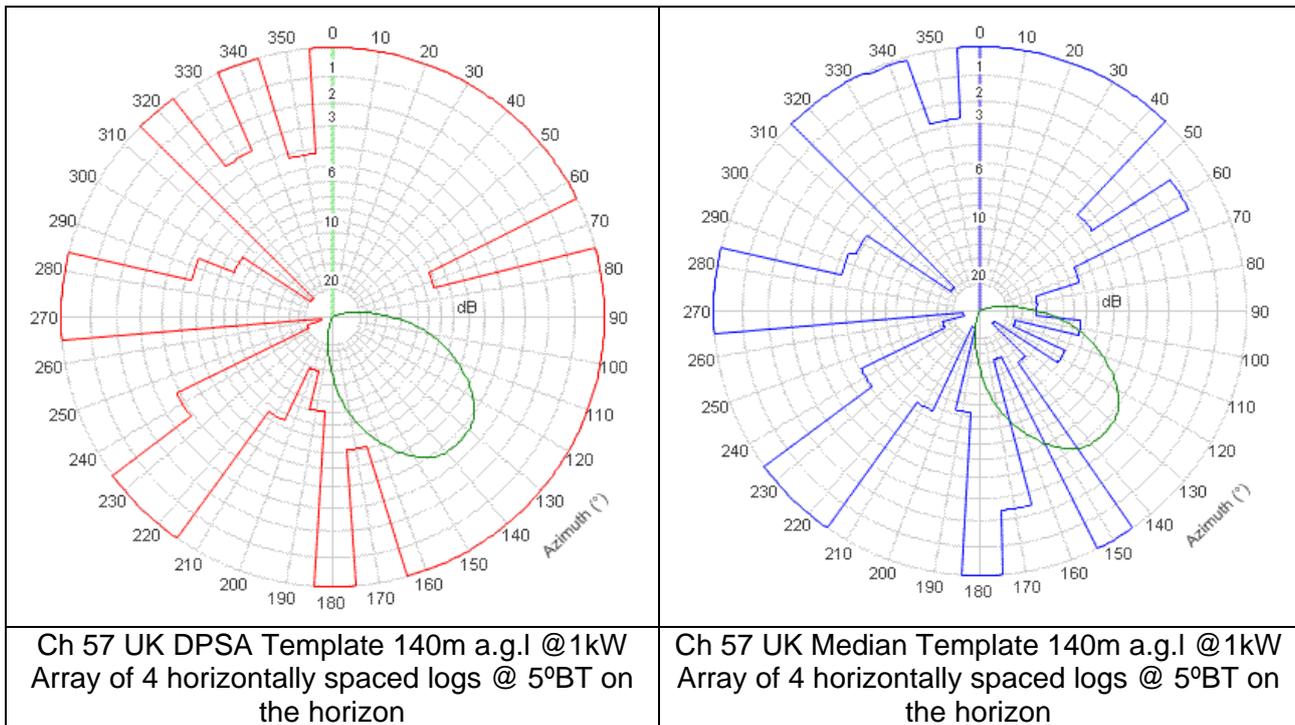
Azimuth	Restriction/s (dB) Median Method	Comment
90	Ramsbottom 11.9 NGR SD 7785 1495 Norden 13.9 NGR SD 8855 1425	Ramsbottom – edge of PSA, Digital UK postcode checker shows most likely transmitter as Ramsbottom but high signal level from all six Winter Hill multiplexes. Norden – Isolated PSA pixel in Rochdale, Digital UK postcode checker shows most likely transmitter as Winter Hill.
100	Ramsbottom 8.4 NGR SD 7715 1155	Within PSA, DUK postcode checker shows most likely transmitter as Ramsbottom but high signal level from all six WRH multiplexes.
110	Brook Bottom 17.2 NGR SJ 9825 9945	High ground on edge of PSA, DUK postcode checker shows most likely transmitter as Brook Bottom but high signal level from all six WRH multiplexes.
120	Brook Bottom 9.1 NGR SJ 9765 9925	Within PSA, DUK postcode checker shows most likely transmitter as Brook Bottom but high signal level from all six WRH multiplexes.
130	Chinley 23.5 NGR SK 0505 8085	High ground on edge of PSA (Lower Crossings), unlikely to be watching relay.
140	Ramsbottom 12.4 NGR SD 7515 0525	Ramsbottom – One isolated pixel allocated to PSA, well away from coverage area. DUK postcode checker shows WRH as most likely transmitter.
150	-	
160	Over Biddulph 14.4 NGR SJ 8925 5685	High ground on edge of PSA, 62km from WRH, DUK postcode checker shows most likely transmitter as Over Biddulph but high signal level from all six WRH multiplexes.
170	Oxford 6.1 NGR SO 9425 1535	High ground 200km away from WRH near Gloucester (due to an isolated pixel in DPSA)
180	-	

190	Long Mountain 8.3 NGR SO 3575 9945	Within PSA, DUK postcode checker shows most likely transmitter as Winter Hill
200	Long Mountain 23.7 NGR SJ 2305 1065 Cefn Mawr 20.8 NGR SJ 3555 4105	Long Mountain- Within PSA, DUK postcode checker shows most likely transmitter as Winter Hill, high signal level from all six WRH multiplexes. Cefn Mawr- Within PSA, DUK postcode checker shows most likely transmitter as Moel-Y-Parc

Practical antenna proposal and impact – Winter Hill channel 57 final arrangement

A3.13 A possible option would be to use an array of 4 stacked log periodic antennas with a 5 degree beam tilt, which would provide a 4 dB power reduction on the horizon to provide protection towards Ramsbottom, Norden, Brook Bottom, Chinley, Over Biddulph, Long Mountain and Cefn Mawr. The HRP of such an antenna compared to theoretical templates is shown in Figure A3.6. The impact on national services is summarised in Table A3.6.

Figure A3.6 Comparison of practical antenna pattern with median template



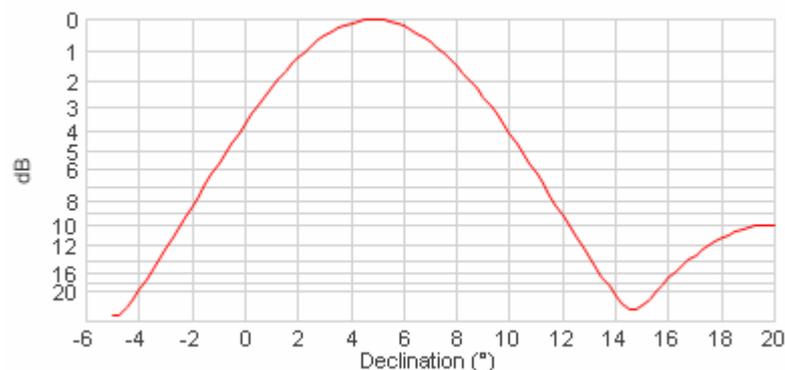


Table A3.6 Impact on coverage of national multiplexes

Transmitter and service affected	Gross loss		Loss within analogue preferred service area	
	Households	% of gross population	Households	% of population in APSA
Ramsbottom	20,024	48.2	7	0.1
Norden	835	12.5	0	0
Brook Bottom	405	6.1	32	0.7
Chinley	66	2.7	50	2.7
Over Biddulph	610	9.8	3	0.1

Practical antenna proposal and impact – Winter Hill channel 55 transitional arrangement

A3.14 In the period between DSO at Winter Hill in Q3 2009 and COM DSO at The Wrekin in 2011, any service from Winter Hill on channel 57 will need to protect the existing multiplex D service at The Wrekin. During this period it is proposed that a restricted antenna pattern is used, the antenna consisting of 3 horizontally spaced log-periodic antennas on 135° ETN. Such an antenna, similar in design to that used by the analogue RSL would provide coverage towards Manchester, Bolton and the surrounding areas. The HRP of the proposed antenna compared to the theoretical templates is shown in Figure A3.7. The impact on national services is summarised in Table A3.7.

Figure A3.7 Comparison of practical antenna pattern with median template

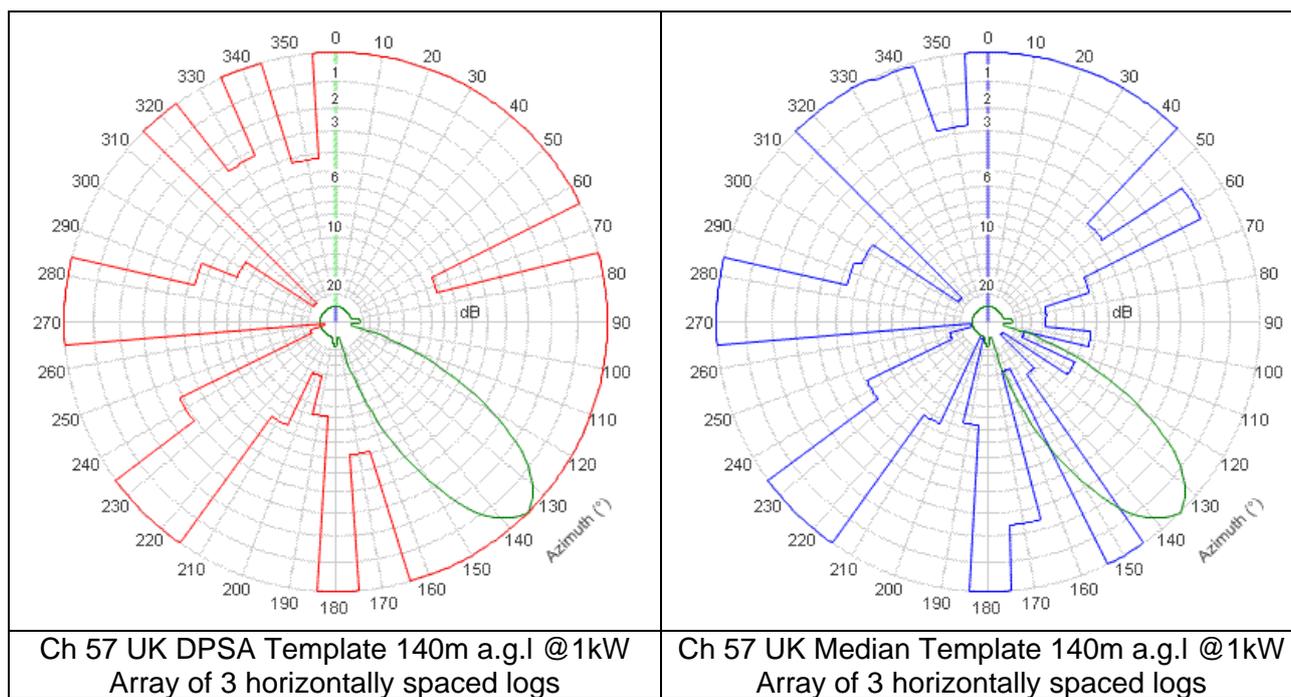


Table A3.7 Impact on coverage of national multiplexes

Transmitter and service affected	Gross loss		Loss within analogue preferred service area	
	Households	% of gross population	Households	% of population in APSA
Ramsbottom	16,338	39.2	7	0.1
Norden	373	5.6	0	0
Brook Bottom	288	4.4	1	0.0
Chinley	67	2.7	50	2.3
Over Biddulph	200	3.2	0	0
Cefn Mawr	36	0.7	0	0
The Wrekin	2164	0.7	245	0.1