Programme-making and special events

Future spectrum management, access and availability

Interim statement

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Section 1

Executive summary

1.1 This interim statement sets out decisions we have taken about future spectrum management, access and availability for programme-making and special events (PMSE).

Future spectrum management

1.2 In December 2007, we concluded PMSE users' long-term interests were best served by moving to a market-based approach to spectrum. To enable this, we decided to appoint a band manager with obligations to meet their reasonable demand but incentives to find other uses of the spectrum awarded to it. We published consultations on the design of the award in July 2008 and June 2009. Separately, we consulted in May 2009 on making spectrum available for the London 2012 Olympic Games and Paralympic Games. Respondents noted the need for effective cooperation between us and the band manager and queried the relationship between our timetable for that award and the licensing arrangements for the Olympics.

1.3 In the light of our consultations and the responses we received, we have decided to defer the band-manager award until after the Olympics. This is in part because of the outstanding complexities of the award itself. But it is particularly because we consider there would be insufficient time to develop, test and implement the necessary arrangements between us and the band manager to coordinate spectrum use in London without an unacceptable risk of disruption to the Olympics.

1.4 We continue to believe band management is the best long-term approach to PMSE spectrum access and expect the delay will give us the time we need to deal with these complexities. We anticipate returning to it after the Olympics in 2012.

1.5 We are currently assessing the options for PMSE spectrum management in the interim period before we restart the band-manager award. We see a choice between continuing to outsource the granting of licences, as is currently the case, or carrying out this function ourselves—both options we are confident can deliver the service PMSE users have come to expect. At the forefront of our considerations are the twin objectives of minimising disruption for PMSE users and risks for the Olympics.

Future spectrum access

1.6 Some of our proposals concerned the terms of PMSE spectrum access rather than the institutional arrangements for managing it. Where relevant, we will take these forward as they contribute to meeting our key objectives for the PMSE sector in their own right. Specifically, we will:

- confirm the spectrum that will be available for PMSE use;
- decide when and how we will introduce fees for PMSE spectrum use based on administered incentive pricing (AIP) to reflect its opportunity cost;
- confirm the block-edge masks (BEMs) that will serve as technical licence conditions (TLCs) for use of this spectrum; and

- determine the process by which we would permit non-PMSE use.

1.7 In particular, we have identified security of tenure as critical to a functioning market for PMSE spectrum access. PMSE users also consider this to be a key issue, which has been brought into sharp relief by our decision to clear them from channel 69. We had indicated the band manager's obligations to PMSE users would last until 2018, but many stakeholders argued this was unsatisfactory because equipment lifecycles often exceed 10 years and a fixed cut-off date would act as a cliff-edge. We accept both these arguments, and our final decisions on this issue will set out arrangements to provide greater security of tenure for PMSE users than we have indicated to date.

Future spectrum availability

1.8 On 30 June 2009, we published a statement setting out our decision to clear the 800 MHz band and release it for new services. This means PMSE users of channel 69 must move to alternative spectrum. We committed to putting in place arrangements to move these users with the minimum of disruption, confirming channel 38 as the replacement for channel 69 and maintaining PMSE access to channel 69 until at least 1 January 2012.

1.9 With regard to the timing of clearing channel 69, we have decided:

- PMSE users will retain primary access to channel 69 until at least 1 July 2012 in all of the UK and at least 1 October 2012 in London, Northern Ireland and the northeast of England (the Tyne Tees television region);

- we will determine in 2011 the date for completing clearing channel 69 as more information will be available on the likely timing of new services being rolled out in the 800 MHz band; and

- the final date for clearance will remain no later than 31 December 2012.

1.10 Recognising the different types of PMSE use of channel 69, the availability of channel 38 and the suitability of other spectrum available for PMSE, we:

- set out the options for moving to replacement spectrum and when users might make the move; and

- explain the shared-licensing arrangements we introduced for channel 38 in January 2010 to allow similar utility as channel 69.

1.11 Addressing the broader picture of PMSE spectrum availability, we confirm we plan to publish information on the availability of interleaved spectrum for PMSE after digital switchover (DSO) later this year following the conclusion of international negotiations to clear the 800 MHz band. Based on a provisional technical assessment, we expect there to be more than sufficient spectrum to meet historic peak demand.

1.12 This interim statement does not address the issue of funding. Final decisions on the nature and level of this are a matter for the Government. We await these decisions.

Next steps

1.13 We expect to take and publish decisions about future PMSE spectrum management and access by July 2010 at the latest (but not necessarily at the same time).

Section 2

Future spectrum management

Introduction

2.1 On 13 December 2007,[1] we published a statement on our approach to awarding the digital dividend (the digital-dividend statement)—the spectrum in UHF Bands IV and V (470-862 MHz) being freed up for new uses as a result of DSO. A key element of that statement was our approach to future spectrum access for PMSE. Informed by a consultation we published on 20 June 2007 (the PMSE consultation),[2] we concluded the long-term interests of the PMSE sector would best be served if it moved to a market-based approach to spectrum access. This contrasts with the current situation in which we have outsourced the granting of licences to JFMG but continue to decide the spectrum PMSE users can access, the technical characteristics of the equipment they can use and the conditions (including price) of their access.

2.2 To help the sector move to a market-based approach, we decided we would award a single package of interleaved spectrum and channel 69 via a beauty contest to a band manager with obligations toward PMSE users. We would use criteria designed to ensure the band manager's interests were aligned with those of PMSE users. The band manager would pay a charge for its spectrum, set by us on the basis of AIP, to reflect the opportunity cost of that use and would be able to earn revenue by charging its customers for access. Regulation would ensure it had to meet reasonable demand from PMSE users, but as long as these obligations were met, the band manager could allow its spectrum to be used by other services.

2.3 Underpinning this approach were four key objectives for the PMSE sector:

- avoiding disruption to PMSE users that adversely affects their ability to provide a wide range of services to citizens, consumers and business customers;
- facilitating the participation of the PMSE sector in a market-based approach to spectrum;
- promoting the optimal use of spectrum in relation to all potential uses and users over time; and
- avoiding the risks of regulatory and market failure.

Consultations on the band-manager award and the Olympics

2.4 We published two consultations on the detailed design of the band-manager award, the first on 31 July 2008 (the first band-manager consultation),[3] the second on 22 June 2009 (the second band-manager consultation).[4] These considered all the issues related to appointing the band manager, consistent with our key objectives for the PMSE sector. Our main proposals were as follows:

[1] www.ofcom.org.uk/consult/condocs/ddr/statement/statement.pdf.
[2] www.ofcom.org.uk/consult/condocs/pmse/pmse.pdf.
[3] www.ofcom.org.uk/consult/condocs/bandmngr/condoc.pdf.
[4] www.ofcom.org.uk/consult/condocs/bandmanager09/bandmanager09.pdf.

- most of the spectrum currently allocated to PMSE should be awarded to the band manager;
- the selection criteria for the beauty contest should address—
  - the extent to which each applicant would secure efficient use of the spectrum to be awarded for both PMSE and other uses;
  - the extent to which each applicant demonstrated an understanding of, and a commitment to, the needs of PMSE users; and
  - the financial, managerial and technical ability of each applicant to establish and maintain efficient systems and procedures to secure efficient use of the spectrum to be awarded for both PMSE and other uses;
- the band manager's licence should be indefinite with no initial period and notice periods of one year for bands currently used for PMSE and five years for bands currently unused for PMSE;
- AIP levels should be calculated conservatively on a band-by-band basis, with phasing-in periods to allow PMSE users to respond to any significant rises compared to current fee levels;
- the band manager would have a licence obligation to meet demand from PMSE users on fair, reasonable and non-discriminatory (FRND) terms ahead of other, competing non-PMSE use; and
- TLCs for the spectrum to be awarded should be service and technology neutral, albeit based in the first instance on existing PMSE use.

2.5 Separately, we published a consultation of 27 May 2009 with our proposals for making spectrum available for wireless communications at the Olympics (the Olympics consultation).[5] It also noted the Olympics present a special challenge to our normal authorisation arrangements due to the volume and variety of requests for spectrum we will receive. As a result, we believed it would be necessary for us to establish special licensing arrangements.

2.6 Respondents to the Olympics consultation made important observations about the need for proper provision of licensing arrangements for both members of the Olympic Family and other stakeholders. They also noted such arrangements should avoid the inconvenience and confusion that could arise from requiring stakeholders to seek spectrum authorisation from a number of different sources. Dealing with these issues would require effective cooperation between us and the band manager. Respondents to the second band-manager consultation also questioned the relationship between our timetable for that award and the licensing arrangements for the Olympics.

Implications for the band-manager award

2.7 The proposals on which we have consulted and the responses we have received lead us to three conclusions:

- our key objectives for the PMSE sector require us to strike a difficult balance between sometimes-competing interests, particularly PMSE users' desire for

[5] www.ofcom.org.uk/consult/condocs/london2012/london2012.pdf.

continuity of spectrum access on one hand and the band manager's and non-PMSE users' ability to access that spectrum to provide new wireless services on the other;

- enshrining that balance as legally enforceable conditions in the band manager's licence would represent a challenge for the existing framework for spectrum management; and most significantly

- there would be insufficient time to develop, test and implement the necessary arrangements between us and the band manager to coordinate Olympic and business-as-usual spectrum use in London. This is because the timing of the band-manager award has slipped significantly since the digital-dividend statement. At that time, we envisaged its taking place in late 2008 after a single consultation on award design. But we could not now conclude the award until early 2011, with the possibility of the successful applicant not beginning operation until the second half of that year. With the Opening Ceremony of the Olympics starting on 27 July 2012, the risk of disruption from changes in processes as a consequence of moving from a management contract to a band manager, as well as from a possible change in the identity of the PMSE spectrum manager from JFMG to a successful competing applicant, is now, in our view, unacceptable.

2.8 As a consequence, we have decided to defer the band-manager award until after the Olympics. We continue to believe band management is the best long-term approach to PMSE spectrum access and expect the delay will give us the time we need to deal with the issues raised through consultation. We therefore anticipate revisiting these aspects of our proposals after the conclusion of the Olympics in 2012. Other aspects, concerning the terms of PMSE spectrum access rather than the institutional arrangements for managing it, are addressed in section 3.

Interim arrangements

2.9 We are currently assessing the options for PMSE spectrum management in the interim period before we restart the band-manager award. Fundamentally, we see a choice between two approaches:

- continue to outsource the granting of licences, as is currently the case; or

- carry out this function ourselves. Our analysis to date suggests insourcing is technically viable and might be less expensive. This could reduce our costs and some PMSE users' fees, the latter as spectrum-management costs are a factor in the fees we have proposed they pay for access.

2.10 At the forefront of our considerations are the twin objectives of minimising disruption for PMSE users and risks for the Olympics.

2.11 We expect to take and publish decisions about PMSE spectrum management in the interim period by July 2010 at the latest.

Section 3

Future spectrum access

Introduction

3.1 Our first and second band-manager consultations addressed all aspects of how we expected the PMSE sector to move toward a market-based approach to spectrum. Some of our proposals related directly to the selection process for the band manager, to the licence that would be awarded to the band manager or to how we expected the band manager to meet its obligations to PMSE users. As a consequence of our decision to defer the band-manager award, there is no need to take these forward at this time. We anticipate revisiting them after the conclusion of the Olympics in 2012.

3.2 However, as mentioned in section 2, other proposals concerned the terms of PMSE spectrum access rather than the institutional arrangements for managing it. We will continue to take these forward as they contribute to meeting our key objectives for the PMSE sector in their own right. They address:

- the spectrum that will be available for PMSE use;
- security of tenure for PMSE use of this spectrum;
- the process by which we would permit non-PMSE use of this spectrum;
- the introduction of AIP-based fees for PMSE use of this spectrum; and
- TLCs for use of this spectrum.

3.3 The rest of this section summarises how we intend to take these proposals forward. We expect to take and publish decisions by July 2010 at the latest.

Spectrum availability for PMSE

3.4 Our first band-manager consultation proposed most of the spectrum currently allocated to PMSE should be included in the award. The exceptions (some determined subsequently) were the spectrum in UHF Bands IV and V being cleared for new uses as part of the UK's digital dividend, the 2.6 GHz band also subject to award and four discrete bands at 11.7-12 GHz likely to face an increased risk of harmful interference as a result of heavier use for direct-to-home satellite television. At the same time, we proposed adding 2290-2300 MHz, currently available for wireless-camera use on a temporary basis, to the award.

3.5 PMSE users will still need clarity about the spectrum allocated for their use in the future. We will therefore confirm this in the light of our proposals and the responses we have received.

Security of tenure for PMSE

3.6 Our PMSE consultation identified the lack of enduring rights to spectrum as one of the barriers to the formation of a well-functioning market for PMSE spectrum access. We are fully aware PMSE users themselves consider this to be a key issue, and it has been brought into sharp relief by our decision to clear channel 69 and the

implications for investment in new equipment using alternative spectrum (see section 4).

3.7 The digital-dividend statement indicated the band manager's obligations to PMSE users would last until 2018. We considered this best balanced the lifecycle of equipment with the opportunity cost of precluding alternative uses of the spectrum. We were also mindful of giving users sufficient time to prepare for any changes that a band manager felt compelled to introduce. We reiterated this in our first and second band-manager consultations.

3.8 Many stakeholders argued ending the band manager's obligations to PMSE users in 2018 was unsatisfactory on two counts:

- equipment lifecycles often exceed 10 years, particularly where new technologies require additional time to be developed and achieve sufficient market penetration. Compounding this, changes to spectrum availability in UHF Bands IV and V would not be complete until DSO ended in 2012, giving at best six years' certainty of being able to use new equipment there; and

- a fixed cut-off date would act as a cliff-edge, creating increased uncertainty as it approached.

3.9 We acknowledge both these arguments, which now need to be considered in the context of decisions we may take about PMSE spectrum availability rather than the band manager's FRND obligations. Our final decisions on this issue will provide greater security of tenure for PMSE users than we have indicated to date.

Non-PMSE spectrum use

3.10 Our second band-manager consultation set out high-level principles for how we would approve non-PMSE use of the spectrum to be awarded. We envisaged PMSE users would have first refusal, ahead of competing non-PMSE users, as long as they were prepared to pay FRND prices for spectrum access. But we wanted the band manager to be able to allow non-PMSE use if it could demonstrate it was otherwise meeting its obligations to PMSE users.

3.11 The scope for non-PMSE use of this spectrum is a fundamental factor in PMSE users' security of tenure. We will discuss with stakeholders the process we might follow when considering requests for non-PMSE use before confirming our final position.

AIP-based fees for PMSE

3.12 AIP-based fees are crucial in facilitating the participation of the PMSE sector in a market-based approach to spectrum. Our second band-manager consultation set out our proposed objectives for, and approach to, their introduction as well as specific estimates of the opportunity cost of the bands to be awarded and how AIP should be phased in to allow PMSE users to efficiently respond to any significant rises compared to current fee levels.

3.13 The band manager would have set fees for PMSE users within the limits of its FRND obligations, covering both AIP and its management costs. How our opportunity-cost estimates and relevant management costs will translate into fees will now be a decision for us in the interim period, whether we insource or continue to outsource PMSE spectrum management, in the light of our proposals and the responses we

have received. We will be guided by the principles set out in our second band-manager consultation, which are consistent with the general principles in our current consultation on spectrum pricing,[6] and take full account of our key objectives for the PMSE sector.

TLCs

3.14 Our second band-manager consultation proposed TLCs for the spectrum to be awarded defined in the form of BEMs. Although service and technology neutral, they were based, in the first instance, on existing PMSE use of the spectrum. However, we indicated the band manager could seek to have these changed to facilitate alternative uses with our approval.

3.15 PMSE—and potentially other—users will still need clarity about the TLCs governing use of this spectrum in the future. We will therefore confirm these in the light of our proposals and the responses we have received.

[6] www.ofcom.org.uk/consult/condocs/srsp/srsp_condoc.pdf.

Section 4

Future spectrum availability

Introduction

4.1 On 30 June 2009, we published a statement setting out our decision to clear the 800 MHz band—comprising channels 61-69 in UHF Band V—and release it for new services (the 800 MHz statement).[7] This means PMSE users of channel 69 (854-862 MHz) must move to alternative spectrum. We took this decision because our analysis indicated clearing channels 61, 62 and 69 to release the whole 800 MHz band would bring significant net benefits (conservatively estimated at £2-3 billion) for UK citizens and consumers. But we recognised moving existing PMSE users out of channel 69—and digital terrestrial television (DTT) out of channels 61-62—would be a complicated and costly exercise with risks of disruption to users and the citizens and consumers who rely on their services. As such, we committed to putting in place arrangements to move these users with the minimum of disruption.

4.2 We made two commitments to PMSE users affected by our decision:

- to provide replacement spectrum and maintain PMSE access to channel 69 during the transition period. We confirmed channel 38 (606-614 MHz) as the replacement for channel 69 and said PMSE access to channel 69 would be maintained until at least 1 January 2012, when channel 38 would become available UK-wide; and

- to provide funding for the move from channel 69 subject to meeting eligibility criteria. We indicated funding for the residual value of equipment (or the cost of modification) would be made available so eligible PMSE users would be left in an equivalent position as if we had not decided to clear channel 69 in 2012.

4.3 We see these commitments to minimising disruption as crucial to making it possible for PMSE users to continue providing important services. Channel 69 is particularly important for PMSE users as it allows them to use the same equipment across the UK. Estimates suggest 95% of new wireless microphones sold and 50% of professional users' equipment are for use in channel 69.[8] Users operate wireless microphones, in-ear monitors and other devices using frequencies in this channel to deliver a multitude of different services across the UK including sound recording for film and television productions, staging live theatre and concerts and projecting voices in churches and community centres.

4.4 This interim statement does not address the second commitment, to provide funding. In its Digital Britain final report of 16 June 2009, the Government stated it supported the proposal to clear the 800 MHz band and was prepared in principle to meet the cost.[9] We published a consultation on the detailed arrangements for providing funding on 14 August 2009 (the funding consultation).[10] The majority of respondents said funding should cover the full cost of replacing affected equipment. They said that funding based on the residual value of existing equipment, as we had proposed, was insufficient because providing anything less than the full replacement cost would

[7] www.ofcom.org.uk/consult/condocs/800mhz/statement/clearing.pdf.
[8] www.ofcom.org.uk/consult/condocs/ddr/reports/report_sagentia.pdf.
[9] www.culture.gov.uk/what_we_do/broadcasting/6216.aspx.
[10] www.ofcom.org.uk/consult/condocs/pmse_funding/pmse_funding.pdf.

mean some users would find it difficult to invest in new equipment. We acknowledge these arguments but note our powers extend only to making grants to promote the efficient use of spectrum. Additionally, given the Government is meeting the cost of grants and the consent of HM Treasury is specifically required under our legislative powers, final decisions on the nature and level of funding are a matter for them. We await these decisions.

4.5 This section sets out our decisions on issues from the funding consultation other than funding itself. It outlines our plans for clearing channel 69 and facilitating the move to channel 38 and other spectrum suitable for different types of PMSE use. It also refers to the broader picture of PMSE spectrum availability following DSO and the issue of those PMSE users currently operating in interleaved spectrum (i.e. the capacity available within the spectrum that will be used after DSO to carry the six existing DTT multiplexes and able to be used at a local level on a shared—or interleaved—basis).

4.6 With regard to the timing of clearing channel 69, we have decided:

- PMSE users will retain primary access to channel 69 until at least 1 July 2012 in all of the UK and at least 1 October 2012 in London, Northern Ireland and northeast England (the Tyne Tees television region);
- we will determine in 2011 the final date for clearing channel 69 when more information will be available on the likely timing of new services being rolled out in the 800 MHz band; and
- the final date for clearance will remain no later than 31 December 2012.

4.7 Recognising the different types of PMSE use of channel 69, the availability of channel 38 and the suitability of other spectrum available for PMSE, this section:

- sets out the options for moving to replacement spectrum and when users might make the move; and
- explains the shared-licensing arrangements we introduced for channel 38 in January 2010 to allow similar utility as channel 69.

4.8 Addressing the broader picture of PMSE spectrum availability after DSO, we confirm we plan to publish information on the availability of interleaved spectrum for PMSE after DSO later this year following the conclusion of international negotiations to clear the 800 MHz band. We expect there to be more than sufficient spectrum to meet historic peak demand.

Timing of clearing channel 69 and overlap with channel 38

4.9 In the 800 MHz statement, we confirmed channel 69 (and the rest of the 800 MHz band) would remain available for PMSE until at least 1 January 2012, when protection for radioastronomy use of channel 38 would end. We said the timing would depend on the outcome of the Government-expedited work to resolve the key questions outlined in the Independent Spectrum Broker's report of 12 May 2009 for Digital Britain.[11] We said it might be possible for PMSE access to some or all the 800 MHz band to extend beyond 1 January 2012, up to the end of DSO late that year.

[11] www.culture.gov.uk/reference_library/publications/6147.aspx.

4.10 To inform the decision on timing of clearing channel 69, we asked the following question in our funding consultation:

Question 15: How would a decision to clear PMSE from channel 69 on 1 January 2012 affect you? What could we and the Government do to provide for an orderly migration in these circumstances?

Summary of responses

4.11 Around half of the 305 respondents to the funding consultation responded to this question. Most said clearing channel 69 on 1 January 2012 would not be feasible without significant adverse impact on PMSE users, for two main reasons:

- there would not be sufficient overlap of UK-wide spectrum for PMSE. Channel 38 would not be fully available until DSO had been completed, so removing access to channel 69 on 1 January 2012 would leave PMSE users with no UK-wide channel. Respondents' suggestions for the timescale for overlap varied from one to three years, but most respondents who addressed this point said the overlap had to extend at least until the end of the Olympics; and

- users needed time to re-equip. Respondents said the timescales involved in developing, producing and distributing sufficient equipment to re-equip the vast majority of the PMSE sector meant clearing by 1 January 2012 would not be feasible. Many stated they would need to bring forward the purchase of new equipment as existing equipment could no longer be used. There would be a rush to purchase new equipment, which would push prices up, and there would be pressure on the number of technicians available to modify equipment.

4.12 A small number of respondents said a decision to clear channel 69 on 1 January 2012 would directly result in their going out of business. Many respondents said it would be an additional cost for them.

4.13 In contrast, T-Mobile said we should move PMSE users out of the 800 MHz band across the whole of the UK as quickly as possible, and by January 2012 at the latest, to release the band for new services. It acknowledged the 800 MHz band would be used for the Olympics, which would preclude its UK-wide availability for new services until late 2012. However, it stated there were areas of the UK that would not be affected by the Olympics and where the 800 MHz band would be cleared by the end of 2011 as a result of DSO. It said the top 2 $\times$ 10 MHz would be available by the end of 2011 and the full band (2 $\times$ 30 MHz) could be available in some regions by the end of 2012. It noted continued use of channel 69 for PMSE in 2012 would sterilise 2 $\times$ 10 MHz (852-862 MHz and the corresponding downlink) across the UK and prevent earlier access by new services. It said any delay in clearing PMSE from channel 69 would have a great cost impact.

Our response

4.14 We note PMSE users have told us the timing of clearing channel 69 and, in particular, the period of overlap when channels 38 and 69 are both fully available across the UK are crucial to enable a smooth and orderly migration.

4.15 However, we also appreciate clearing channel 69 is key to the availability of the top 2 $\times$ 10 MHz in the 800 MHz band. The earlier channel 69 is cleared, the sooner this could allow rollout of new mobile services to citizens and consumers ahead of clearing the full 800 MHz band. The availability of those services earlier than would

otherwise be the case could bring significant benefits. We have to take this into account when deciding when in 2012 channel 69 should be cleared.

Channel 38 (with channels 39 and 40) will be fully available from 1 January 2012

4.16 We accept clearing channel 69 on 1 January 2012 could cause disruption to some PMSE users as there would be no overlap period when both channel 38 and channel 69 were fully available across the UK.

4.17 To consider the timing of any overlap, we have assessed the availability of channel 38 for PMSE. Channel 38 has been available for PMSE use on a coordinated basis for some time. As set out in paragraphs 4.87 onward, the new licensing arrangements for channel 38, with the temporary inclusion of channels 39 and 40 in the new shared licence, mean equipment that tunes to channels 38-40 can now be used across the UK as flexibly as equipment for channel 69, with limitations to outdoor use in some areas because of continued protection for radioastronomy and terrestrial television. Channels 39 and 40 will continue to be available on a shared basis in areas where use of channel 38 is restricted until DSO has been completed in late 2012. Thereafter, channels 39 and 40 will be available on the same basis as other interleaved spectrum.

4.18 Although protection of radioastronomy ends on 1 January 2012, some PMSE users have noted some outdoor restrictions on channel 38 to protect terrestrial television will remain in certain areas until the end of DSO. They have said channel 38 will not provide equivalent utility to channel 69 until the end of DSO.

4.19 We have carried out further technical work on this point. High-power use of channels 37 and 39 for analogue terrestrial television does affect outdoor (but not indoor) use of channel 38 for PMSE. These constraints will be removed as DSO progresses, ceasing in the London area in the second quarter of 2012 and northeast England (the Tyne Tees television region) and Northern Ireland in the fourth quarter of 2012.

4.20 However, channel 39 will be used for DTT in some areas after DSO. We have considered whether this could impact on outdoor use of channel 38 for PMSE. We have concluded there may be some marginal impact near higher-power DTT sites, where a small guard band may be required for PMSE use of channel 38. We have yet to define the band-edge requirements for DTT in channels 39 and 60, but it is likely DTT will be required to comply with very similar out-of-band emission limits as were set out for channels 41 and 62 when it was envisaged these would be the band-edge channels.[12]

4.21 Historically, high-power terrestrial-television use of channel 68 has had little noticeable impact on PMSE use of channel 69. Provided suitable band-edge requirements are defined, we have no reason to expect there would be any significant impact from DTT use of channel 39 on PMSE use of channel 38.

4.22 Some marginal restrictions on PMSE use of channel 38 will remain in specific locations until mid-2012. But we have established channels 39 and/or 40 are available on an interleaved basis in most of these locations. JFMG has carried out a provisional technical analysis of potential PMSE use of channels 38-40 in 2012, illustrated in annex 1. (This makes assumptions about future DTT transmissions in channels 39 and 40 that are still subject to confirmation.) Based on this further work, we have concluded channel 38 (with channels 39 and 40) will closely replicate the

[12] See www.ofcom.org.uk/radiocomms/ifi/tech/interface_reg/ir2022.pdf.

key characteristics of channel 69 from 1 January 2012. Availability of replacement spectrum is discussed in more detail in paragraphs 4.30 onward.

It is uncertain when new services using channel 69 could be available

4.23 As set out above, channel 38 will be fully available for PMSE across the UK from 1 January 2012. This date therefore becomes the starting point for any overlap period when channels 69 and 38 would both be available for PMSE across the UK.

4.24 To determine the duration of any such overlap, we need to assess the impact not only on PMSE users but also on potential new users of the spectrum. There are a number of factors to take into account in doing so, including the timing of the award of the 800 MHz band and the availability of the other frequencies needed to launch a service in the top 2 × 10 MHz of the 800 MHz band. Other important considerations are the timing of subsequent rollout of services, technical and commercial testing and availability of consumer equipment. Many of these factors are currently unknown or difficult to predict with any certainty.

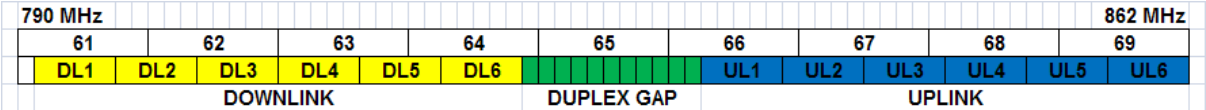
4.25 The timing of the award of the 800 MHz band for new uses is linked to the Government's implementation of the proposals in its Digital Britain final report. Since we published the funding consultation, BIS has continued with its plans to direct us to implement aspects of the Digital Britain Wireless Radio Spectrum Modernisation Programme. The direction was laid before Parliament in March 2010 and will, if made, be the basis for our award of the 800 MHz band.[13] However, it was not voted on before the end of the last Parliament. We understand the direction will therefore remain laid before Parliament until after the general election, when it will be up to the new Government to decide what to do with the direction. Accordingly, the timing of the award of the 800 MHz band now depends on the decisions the new Government makes in this regard. We will implement any direction that is made.

4.26 In its response to the consultation on the draft direction,[14] the Government noted PMSE users had expressed their wish to retain the use of the 800 MHz band until the end of 2012. It said the availability of this spectrum was subject to how DSO progressed and to the requirements of the Olympics but PMSE users would have access well into 2012.

4.27 Another key factor is the availability of the other parts of the top 2 × 10 MHz of the 800 MHz band—requiring access to channels 63, 64 and 68—and any technical constraints on the use of that spectrum during 2012. Figure 1 shows the preferred band plan for frequency-division duplexing (FDD) use the 800 MHz band agreed by the European Conference of Postal and Telecommunications Administrations (CEPT) on 30 October 2009,[15] then by the Radio Spectrum Committee of the European Union (EU) on 18 March 2010.[16] It illustrates channels 63, 64, 68 and 69 all need to be available to use one "pair" of frequency blocks—downlink (DL) 5 and 6 plus uplink (UL) 5 and 6—for FDD mobile services.

[13] www.opsi.gov.uk/si/si2010/draft/pdf/ukdsi_9780111495650_en.pdf.
[14] www.bis.gov.uk/assets/biscore/corporate/docs/g/10-737-govt-response-wireless-spectrum-consultation.pdf.
[15] www.erodocdb.dk/Docs/doc98/official/Word/ECCDEC0903.DOC.
[16] http://ec.europa.eu/information_society/policy/ecomm/radio_spectrum/_document_storage/rsc/rsc31_public_docs/rscom10_05.pdf.

Figure 1. FDD 800 MHz band plan



4.28 We have carried out an initial assessment of the availability of channels 63, 64 and 68 at different dates in 2012—1 January, 1 April, 1 July and 1 October—to help inform our decision on the timing of clearing channel 69. We found one or more of channels 63, 64 and 68 will remain in use until the second quarter of 2012 in London and southeast England (the London and Meridian television regions) and until the fourth quarter of 2012 in Northern Ireland and northeast England (the Ulster and Tyne Tees television regions). In other parts of the UK, these channels will be available, in principle, for new uses from the beginning of 2012, although restrictions may remain due to continued use of neighbouring channels for terrestrial television.

4.29 Separately, we have committed to making available channels 38 and 69 as well as almost all the cleared digital-dividend spectrum (including the rest of the 800 MHz band) in London to meet the needs of the Olympics.[17] As a consequence, channel 69 cannot be cleared in London until mid-September 2012 at the earliest.

PMSE users will have UK-wide access to channel 69 until at least 1 July 2012 and in London, northeast England and Northern Ireland until at least 1 October 2012

4.30 We have decided PMSE users should retain access to channel 69 until at least 1 July 2012 in all of the UK and at least 1 October 2012 in London, Northern Ireland and northeast England (the Tyne Tees television region). PMSE users will remain the primary users of channel 69 during this period, although this should not preclude new licensees carrying out some technical testing where that is possible.

4.31 This decision takes account of the importance to PMSE users of having a reasonable period of overlap when channels 38 and 69 are both available across the UK. Considering the likely timing of the 800 MHz award as well as the other technical constraints on the use of the band, we note it is unlikely it would be possible to launch new services much before mid-2012 in any case notwithstanding the possible benefits of early availability of channel 69 for new services.

4.32 We do not want to clear PMSE users from channel 69 unless it is to allow its use for new services. Many uncertainties remain around the launch of new services in the 800 MHz band, and we will therefore review in 2011, before its award, whether PMSE access to channel 69 can be extended beyond the 1 July and 1 October 2012 dates. Any such extension would be up to 31 December 2012 at the latest.

Moving from channel 69 to replacement spectrum

Channel 69 is used for PMSE in a variety of ways

4.33 PMSE users of channel 69 have different purposes and therefore varying spectrum requirements. While channel 38 will be the clear choice for some, others may wish to move to alternative spectrum due to their particular needs. We set out the different options for migration below.

[17] www.ofcom.org.uk/consult/condocs/london2012/statement/statement.pdf.

4.34 In particular, we address the possibility of using alternatives to channel 69 other than channel 38, including the options for users who need UK-wide access to a single channel, high-power coordinated users and users who may be able to accept an elevated risk of harmful interference.

4.35 We briefly address the options for users who currently operate in other channels being cleared for award: channels 31-37 (550-606 MHz) and channels 61-68 (790-854 MHz). We also look at the options for users who operate on an interleaved basis in channels being retained for DTT—channels 21-30 (470-550 MHz) and channels 39-60 (614-790 MHz)—but whose changing configuration of availability for PMSE as a result of DSO and international negotiations to clear the 800 MHz band could mean users will also have to use new frequencies.

4.36 PMSE users ultimately hold responsibility for planning their future spectrum use, taking into account their own circumstances and requirements. The possible options and guidance set out below may assist them in that decision-making process.

Moving to channel 38

4.37 In our consultation of 2 February 2009 on clearing the 800 MHz band (the 800 MHz consultation),[18] we set out our assessment of the six identified plausible options for replacing channel 69 for PMSE use: channel 38, interleaved spectrum, the 800 MHz duplex gap, channel 70, the 872-876/917-921 MHz bands and 1785-1800 MHz. We indentified channel 38 as the best option as it most closely replicated the key characteristics of channel 69 that made it so valuable for PMSE users, namely:

- it is the closest alternative in technical terms, both in its own right (especially its ability to support the deployment of up to eight wireless microphones) and because it is adjacent to interleaved spectrum;
- it is already used for PMSE and will be available on a UK-wide basis (with some minor restrictions) from 1 January 2012; and
- it has a relatively low opportunity cost, which is likely to translate into a low fee for PMSE users for the foreseeable future.

4.38 Because channel 38 is at significantly lower frequencies than channel 69, it has subsequently been pointed out PMSE users are also likely to gain some benefit from:

- increased equipment battery life; and/or
- an increased workable range from transmitter to receiver.

4.39 Responses to the 800 MHz consultation broadly supported our assessment, albeit with the caveats channel 38 would only become available on a UK-wide basis in 2012 (when protection for radioastronomy ended) and a flexible licensing structure similar to that for channel 69 should be established.

4.40 Since that consultation, we have taken measures that have gone some way to meeting the concerns of PMSE users. On 16 December 2009, we announced flexible

[18] www.ofcom.org.uk/consult/condocs/800mhz/800mhz.pdf.

shared licences would be available for low-power (10 mW handheld) wireless-microphone use of channel 38 from 4 January 2010.[19]

4.41 We decided:

- licences should be available for channel 38 on a fully shared basis with no facility for coordinated use;
- where channel 38 was not fully available (i.e. where there was not enough bandwidth to support eight wireless microphones), channels 39 and/or 40 should also be made available on a shared basis where possible; and
- licences should otherwise be subject to the same terms and conditions (including price) to current channel 69 licences.

4.42 We set out the rationale for these decisions and summarise the responses to the relevant questions in the funding consultation in paragraphs 4.87 onward.

4.43 The measures set out above were designed to facilitate the migration from channel 69 as soon as possible. Including channels 39 and 40 in the shared licence goes some way to addressing channel 38's not currently being available UK-wide. But there are still some small areas of the UK where there is no outdoor availability yet. However, on an indoor basis, a channel 38-40 tuning range currently offers at least 8 MHz of spectrum in all UK locations and either 16 MHz or 24 MHz in most areas.

4.44 We have also sought to avoid further disruption to PMSE users by maintaining the same price for the new shared licence and including ongoing access to channel 69.

4.45 At present, eight wireless microphones can typically be used in channel 69 without the risk of harmful interference. It is our hope the new flexible licensing arrangements will enable manufacturers to identify additional frequencies within channel 38—perhaps as many as 10 or 12—where PMSE users will be able to operate without harmful interference to or from others.

4.46 Additionally, we understand from subsequent discussions with PMSE stakeholders all equipment now being built to use channel 38 will include channels 39 and 40 in its tuning range. This will give PMSE users access to near-UK-wide spectrum.

Timing

4.47 We expect one of the key benefits of our announcement on new licensing arrangements is a significant number of wireless-microphone users who currently operate using a shared channel 69 licence will be able to move to channel 38 as soon as possible.

4.48 This clearly also depends on the availability of channel 38 equipment in the market. We have noted the concerns some respondents have raised about the availability of equipment for channel 38. Existing channel 38 equipment has tended to be at the higher end of the market and not manufactured in large quantities. We have, however, received anecdotal evidence channel 38 equipment is being manufactured in increasing numbers as PMSE users begin to place orders for it.

[19] www.ofcom.org.uk/consumer/2009/12/new-licensing-arrangements-for-wireless-microphone-users/.

4.49 We consider the introduction of new shared licensing arrangements removes one of the key regulatory obstacles preventing existing shared channel 69 PMSE users from moving to channel 38.

Some shared PMSE users will need to continue using channel 69 until 2012

4.50 It is likely channel 38 is not yet a suitable replacement for a number of existing PMSE users with shared channel 69 licences if they operate outdoors in areas where:

- there is no spectrum available before 1 January 2012 in channels 38-40;[20] and/or
- there is spectrum available before 1 January 2012 but it does not meet their peak demand for frequencies because of restrictions caused by the need to protect terrestrial television in channels 37 and/or 39.

4.51 These users are likely to continue using channel 69 until it becomes viable for them to move to channel 38.

Timing

4.52 We expect a number of these users will continue to use their channel 69 equipment until 1 July 2012, the earliest date it will cease to be available for PMSE use UK-wide (see paragraphs 4.30-4.32). However, while some users may continue using channel 69 until the point it ceases being available for PMSE use, we expect a significant number will switch to channel 38 on or soon after 1 January 2012, when radioastronomy protection ceases. At this point, there will be nowhere in the UK where wireless microphones cannot be used outdoors in channel 38. The availability of channels 38, 39 and 40 as of 1 January 2012 is illustrated in the map in annex 1.

Moving to 863-865 MHz (channel 70)

4.53 PMSE users have asked us about the future of the licence-exempt spectrum at 863-865 MHz. For the purposes of this document, we refer to 863-865 MHz as channel 70. References to channel 70 in this document do not include 865-870 MHz, which is used for short-range devices including key fobs and low-power radio-frequency identification devices such as security tags used in shops.

4.54 Channel 70 is available for wireless-microphone use UK-wide and can support up to three microphones in each location. It is free to use without the need for a licence so long as the conditions of use are met. There is an obligation not to cause harmful interference to other users and no right to protection from harmful interference.

4.55 There may be significant benefits to some PMSE users of making greater use of channel 70. It will continue to be available for PMSE use on a licence-exempt basis. Some existing wireless-microphone equipment that tunes to channel 69 can also use channel 70. PMSE users may wish to consult the manufacturers of their equipment to confirm whether this is possible. Modifying channel 69 equipment to tune to channel 70 may also be possible.

4.56 We are currently assessing whether there is any further increased risk of harmful interference to wireless microphones using channel 70 from likely new mobile services in the 800 MHz band. We will publish further information after we have completed this work.

[20] Details of affected areas can be found on the JFMG website at www.jfmg.co.uk.

4.57 There may be the potential to extend licence-exempt wireless-microphone use to 865-870 MHz in the future, but we would need to find out more about how this spectrum is used, the likely impact on existing services and the views of relevant stakeholders before considering the scope for allowing this. Ongoing work in CEPT working group FM22 is identifying how services in the 865-870 MHz band are currently being used.

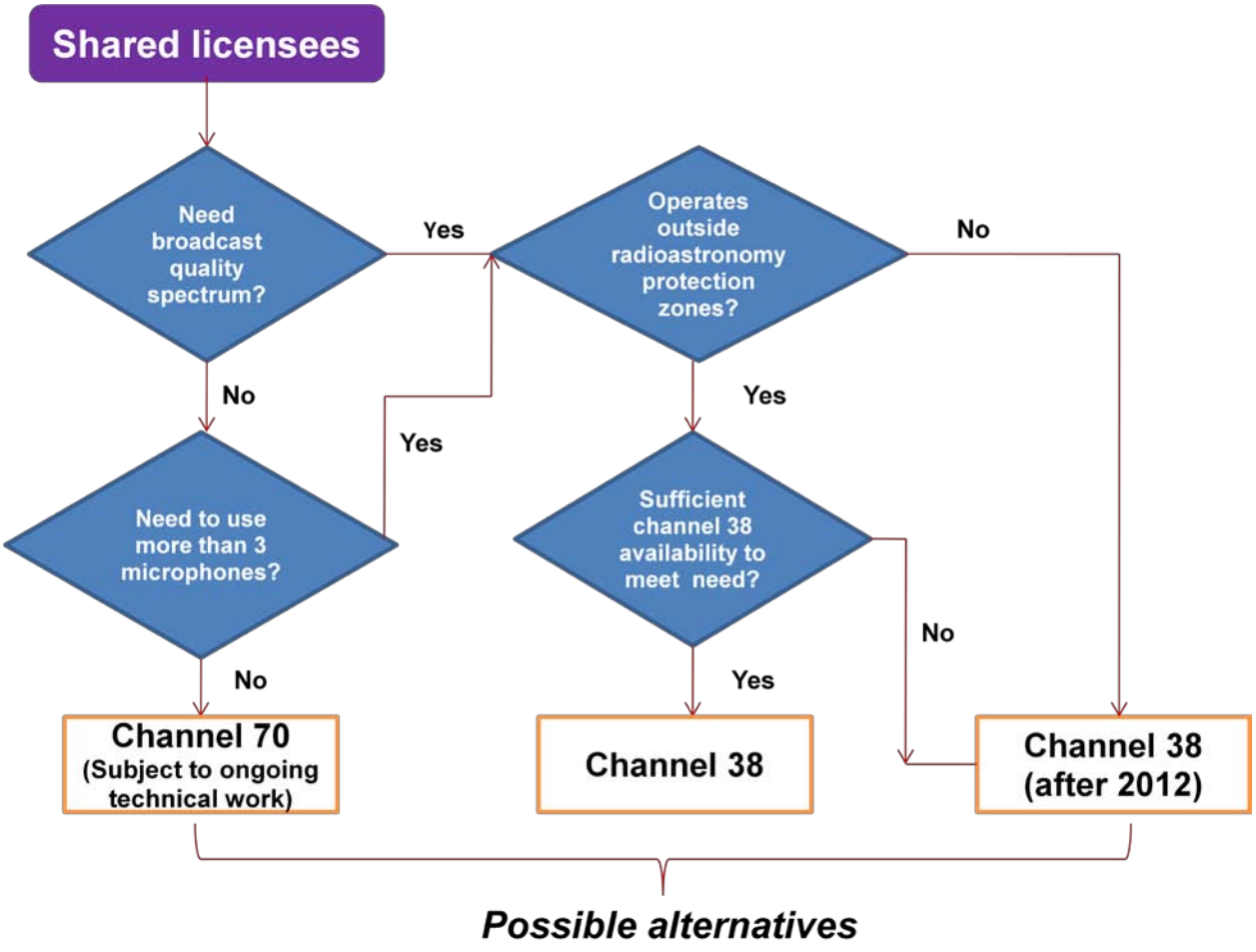
Timing

4.58 Channel 70 is available now for PMSE use. If PMSE users think this will be appropriate for them, they can move from channel 69 to channel 70 immediately or as soon as they have made any necessary adjustments to their equipment.

Summary of options for shared channel 69 PMSE users

4.59 Figure 2 illustrates some possible options shared channel 69 PMSE users may consider when planning their migration to new frequencies.

Figure 2. Migration options for shared channel 69 PMSE users



Moving to interleaved spectrum

4.60 A minority of low-power (10 mW handheld) wireless-microphone users of channel 69 operate on a coordinated basis to reserve exclusive use of certain frequencies in particular locations. This enables them to effectively avoid harmful interference from shared channel 69 PMSE users. However, because we have decided the new

licensing arrangements for channel 38 will not contain coordinated frequencies, these users will have to decide whether they are willing to move to channel 38 and accept an elevated risk of harmful interference from other PMSE users.

4.61 In the funding consultation, we indicated those users who wished to maintain access to site-specific coordinated frequencies could be accommodated by using interleaved spectrum. PMSE use of interleaved spectrum is on an entirely coordinated basis.

4.62 PMSE users will continue to have access to all remaining 32 channels of interleaved spectrum after DSO. We expect lower-power coordinated users of channel 69 will be able to relocate to available interleaved spectrum in each relevant location.

4.63 Interleaved spectrum is used on a coordinated basis by PMSE users who require protection from harmful interference. Interleaved spectrum is currently available in channels 21-68 (470-854 MHz), but availability after DSO will be in channels 21-30 (470-550 MHz) and channels 39-60 (614-790 MHz). Users of the channels cleared for award will need to move to new frequencies. Some users of the spectrum retained for DTT will also need to move where the configuration of available frequencies changes as a result of DSO and the international negotiations to clear the 800 MHz band.

Timing

4.64 A number of stakeholders have raised concerns over the lack of information about the interleaved frequencies that will be available in each location after DSO. This is because they want to make decisions about equipment investment in sufficient time before DSO is completed.

4.65 We recognise these concerns and are aware the PMSE sector will need time to prepare for the changes caused by DSO. However, the need for international negotiations to clear the 800 MHz band in the UK and in neighbouring countries means we will not know the new configuration of interleaved spectrum until these negotiations are complete. We expect this information will be available later in 2010 and will confirm the interleaved frequencies available for PMSE use at that time.

4.66 This will leave some 18-24 months for affected users to replace or modify their equipment where necessary. This is a challenging timescale, although we believe it should be achievable because:

- this shorter timescale applies to a low proportion of the total stock of wireless microphones in the UK since most tune to channel 69; and
- it is also likely much of the wireless-microphone equipment currently deployed in interleaved spectrum will still be able to operate in the new configuration after DSO with little or no modification.

Will there be enough interleaved spectrum to meet the needs of the PMSE sector?

4.67 Another concern raised by representatives of the PMSE sector is whether there will be enough interleaved spectrum to meet the needs of wireless-microphone users after DSO has taken place. These concerns have been raised in light of two factors:

- the reduction of total available interleaved spectrum from 48 channels to 32 as a direct result of DSO and releasing the cleared spectrum for new uses; and

- the expected continuing increase in demand for spectrum for wireless microphones in coming years.

4.68 Given our key objectives for the PMSE sector include avoiding disruption, we published a first assessment of the likely quantity of interleaved spectrum available for PMSE use after DSO on 16 January 2008.[21] That assessment, while confirming there would be broadly sufficient spectrum to meet historic PMSE demand, also identified a small number of venues where spectrum supply appeared to be exceeded by demand.

4.69 However, the technical assumptions we made in coming to our assessment were deliberately conservative and tended to underestimate the availability of interleaved spectrum for PMSE. We have since carried out further work that suggests actual availability is significantly higher than we indicated in January 2008 and will be sufficient to more than satisfy historic peak demand.

4.70 We will update and publish this information when there is sufficient clarity over the outcome of the international negotiations to clear the 800 MHz band later this year.

Moving to 1517-1525 MHz

4.71 A small number of PMSE users operate audio-link devices in channel 69 at powers that range from 100 mW to 25 W. Channel 38 will not be available for such higher-power use because of our obligations to protect radioastronomy in the Netherlands.

4.72 In our 800 MHz consultation, we suggested these users might consider moving to interleaved spectrum like other site-specific channel 69 users. Subsequent informal discussions with a small number of these licensees have indicated this could pose some significant technical difficulties, in particular because audio links are typically used over long distances, with some requiring UK-wide access. Because the equipment has a limited tuning range, this would create difficulties in using the fragmented configuration of interleaved spectrum.

4.73 In light of this, we have identified a possible solution for these higher-power users. There is spectrum currently allocated for PMSE use, though currently little used, at 1517-1525 MHz. This spectrum is available UK-wide and may offer suitable propagation characteristics for this type of use.

4.74 Users may wish to discuss the option of moving to 1517-1525 MHz with the manufacturers of their equipment. In the meantime, this spectrum remains available for PMSE use with no known plans for other PMSE or non-PMSE services to use it.

Timing

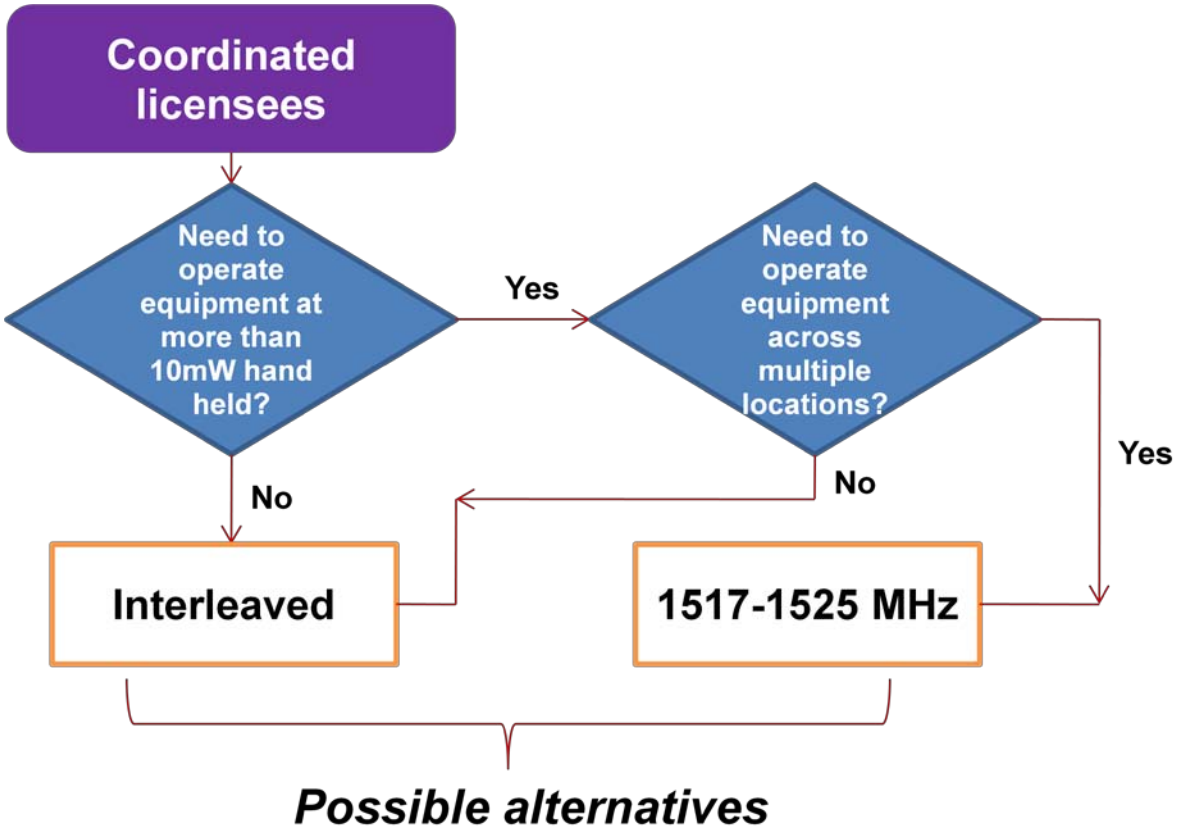
4.75 This spectrum is available now on a UK-wide basis and relatively free from harmful interference. Where there are any technical obstacles to using these frequencies for these technologies, we are open to discuss users' needs further.

Summary of options for coordinated channel 69 users

4.76 Figure 3 below out some options for channel 69 users of coordinated frequencies.

[21] www.ofcom.org.uk/consult/condocs/ddr/statement/statement2/statement.pdf.

Figure 3. Migration options for coordinated channel 69 PMSE users



Ongoing PMSE use of 821-832 MHz

4.77 The preferred FDD band plan for the 800 MHz band includes an 11 MHz guard band at 821-832 MHz. This duplex gap lies between the uplink and downlink segments of the band plan. CEPT has suggested part of the duplex gap—823-832 MHz—may be suitable for use by low-power devices such as lower-power wireless microphones without causing harmful interference to new wireless-broadband services.

4.78 The Government has not included the duplex gap in its proposed direction to us on awarding the 800 MHz band. If the duplex gap is not included in the award, it will not need to be cleared for the purposes of this award. Some PMSE users may decide this spectrum could provide a suitable alternative to channel 69, particularly as:

- technical studies indicate low-power (10 mW handheld) wireless microphones will be able to operate at 823-831 MHz without suffering significant harmful interference from users of the adjacent spectrum;[22] and
- it is likely to be available in a large number of EU Member States and could offer economies of scale for manufacturers as well as flexible international spectrum access for PMSE users.

Timing

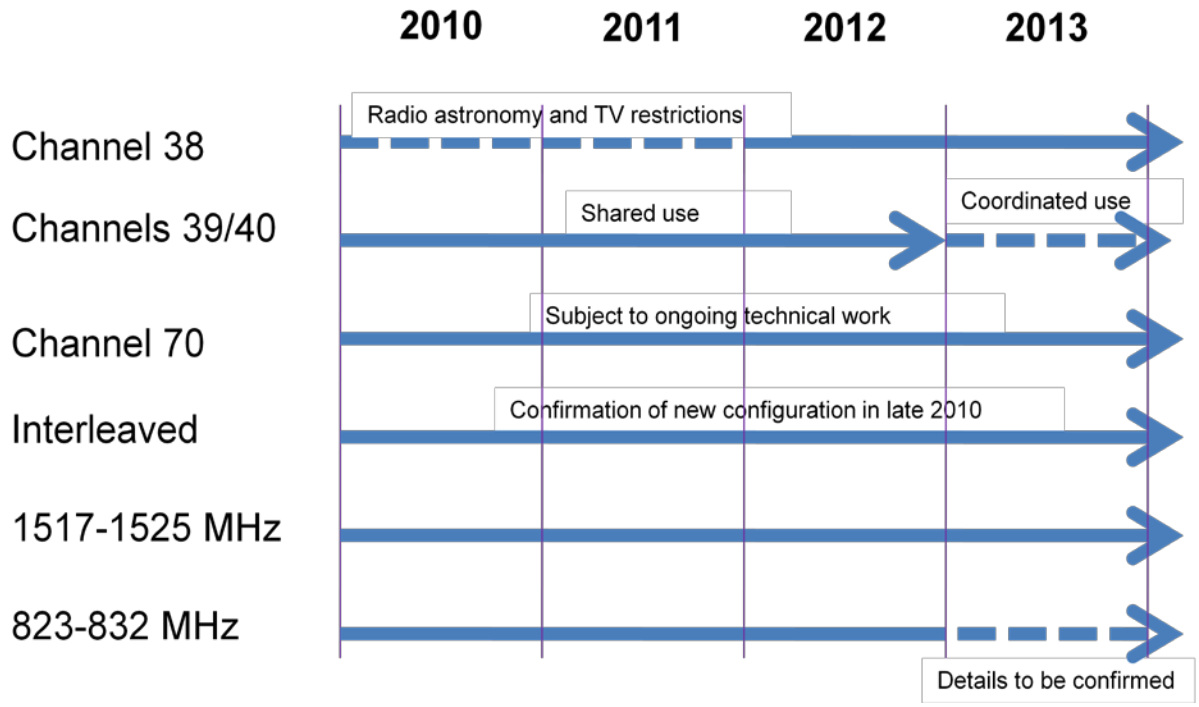
4.79 We will give further details of our plans for the duplex gap later this year.

[22] www.erodocdb.dk/Docs/doc98/official/pdf/CEPTREP030.PDF.

Summary of timing for moving from channel 69

4.80 Figure 4 shows the timing of availability of spectrum to which PMSE users could move from channel 69.

Figure 4. Timing of availability of alternative spectrum to channel 69



Audio induction loop feedback systems

4.81 We received representations moving from channel 69 to replacement spectrum may have a particularly adverse impact on people with hearing loss and others who benefit from using audio induction-loop feedback systems.

4.82 In response to the 800 MHz consultation, RNID and the BBC said the impact on people with hearing loss who benefit from the use of audio induction-loop feedback systems needed to be considered when assessing any replacement spectrum for PMSE. RNID was concerned the wider implications for induction-loop systems, and the resulting barriers for people with hearing loss who relied on them, had not been considered with due care or suitable and equivalent solutions proposed. RNID said the proposals could potentially cause significant difficulty to existing deployments and the availability and cost of new equipment might also pose problems.

4.83 Similar concerns were raised by the Faculty of Health, Liverpool John Moores University in response to the funding consultation. It questioned the impact of the decision on its ability to comply with the Disability Discrimination Act through providing induction-loop systems and services for students absent on long-term sick or who were not native English speakers. It said it was concerned about finding funding to purchase replacement equipment and whether suitable replacements would be available.

4.84 We discussed this issue with RNID and took account of its arguments when reaching decisions on clearing the 800 MHz band. We understand the successful operation of induction-loop systems is not dependent on any specific frequency at which wireless

microphones—a key input—operate. We also understand it is likely a significant amount of equipment currently used for this purpose may be able to retune to and use frequencies in channel 70 (863-865 MHz) on a licence-exempt basis. Where existing equipment cannot retune to available frequencies, the replacement spectrum we have identified should ensure the service for these stakeholders continues. Only the wireless microphones would need to be replaced in these circumstances; the existing induction loops would still operate with the new equipment.

4.85 We also consider Liverpool John Moores University and other similar institutions will be able to make alternative arrangements to maintain their services using the replacement spectrum. We do not think they are affected to a greater extent than other PMSE users.

4.86 We are keen to work with RNID and other affected organisations to ensure users of wireless microphones as an input to induction-loop systems are aware of the scope to retune equipment to channel 70 or purchase appropriate replacement equipment.

Licensing arrangements for channel 38

4.87 A number of responses to the 800 MHz consultation stated the flexible licensing arrangements provided by existing channel 69 shared licences would need to be replicated for the replacement spectrum to be considered viable. These licences include a set number of frequencies available for licensed use without the need for prior frequency coordination with JFMG.

4.88 PMSE users told us the absence of a shared licence product was inhibiting the emergence of channel 38 equipment in the market. This was because there was no demand from users for the new frequencies while coordinated licences were the only means by which to operate legally in channel 38. Coordinated licences, in comparison to shared licences, were considered an expensive and inflexible option for those PMSE users who need to use their equipment in different locations and often at short notice.

4.89 Based on these representations, the 800 MHz statement acknowledged the shared licensing arrangements enjoyed by channel 69 should be replicated in some form for new users of channel 38.

We consulted on three shared licensing options put forward by JFMG

4.90 JFMG, in its position as our contracted spectrum manager for PMSE, examined options for introducing shared licences for channel 38. In the funding consultation, we reproduced the details of the three options JFMG put forward:

- option 1—a licence with specific frequencies only, comparable with the current arrangements for channel 69;
- option 2—a blanket licence for use of any frequencies within a defined band with no frequency plan defined; and
- option 3—a blanket licence for use of any frequency within a defined band but with guidance for users through recommended frequency plans.

4.91 We then invited comments with the following question:

Question 18: What are your views on the three options for new licensing arrangements for channel 38 identified by JFMG? Do you prefer any different approaches?

Summary of responses

4.92 The majority of respondents who expressed an opinion, including representative bodies the Association of Motion Picture Sound (AMPS) and the British Entertainment Industry Radio Group (BEIRG), supported option 3 because they said it offered the highest degree of flexibility.

4.93 BEIRG said users would no doubt welcome the increased flexibility and be happy to be guided by manufacturers and to work with them to provide a frequency plan that best suited their needs. AMPS made a similar point and suggested option 3 would offer superior arrangements to those currently offered for channel 69 once channel 38 became available UK-wide.

4.94 The BBC preferred option 1 because it gave the most certainty of minimising (mutual) harmful interference between broadcast, entertainment and community PMSE users. Similarly, other respondents, such as the Sound and Light Partnership, said a standardised set of frequencies was crucial in an environment where other channel 69 shared-licence holders were working and coordination was needed to avoid harmful interference such as at press conferences and festivals. Oldham Coliseum Theatre and Venue Cymru were among a small number of respondents who also preferred option 1.

Our response

4.95 On balance, we considered PMSE users and manufacturers were better placed to determine the best way of using the frequencies within channel 38 than either we or JFMG through regulatory intervention. We were mindful this was consistent with the majority of respondents who expressed a view on this matter.

4.96 However, we also acknowledged the reasons some respondents preferred to keep a standard set of frequencies, as set out in option 1. While the existence of standard coordinated frequencies gives additional comfort for users requiring interference-free spectrum use, we said we thought these concerns could be overcome because:

- PMSE users generally have an ability to manage use of channel 69 shared frequencies “on the ground,” communicating with each other to ensure they can operate free from harmful interference. There is no reason why this should not apply to channel 38 use; and

- there will still be the option of using interleaved spectrum where users consider they need additional protection from harmful interference.

4.97 We accepted the points made on the potential impact on existing coordinated channel 38 users. We assessed the potential impact of option 3 on users with JFMG. This included consulting existing channel 38 coordinated users on how they would respond to the elevated risk of harmful interference if we adopted this option.

4.98 10 of the 12 users licensed to use channel 38 on a coordinated basis responded to JFMG’s enquiries. Four said they would incur a cost as a result of the plans. One suggested hire companies would be severely affected. However, we considered this

last point unlikely as hire companies would be able to hire out channel 38 equipment in future to other PMSE users.

Our decision

4.99 We decided to adopt option 3. This not only met the wishes of the majority of PMSE respondents to the funding consultation but also had the advantage of allowing a more flexible use of the spectrum. While a small number of users would incur some costs from the change in licensing arrangements, we considered the wider benefits to future shared-licence holders made option 3 best.

We proposed channels 39 and 40 should be temporarily included in the new shared licence

4.100 In the 800 MHz statement, we explained how channel 38 would not be fully available UK-wide until 2012, when radioastronomy protection ceased and restrictions as a result of adjacent analogue-television transmissions were removed. A number of respondents to the funding consultation explained they would consequently face significant difficulties in using channel 38 before 2012 because they could face demand for their services within affected areas, in particular inside the radioastronomy-protection zones in Cambridgeshire and northwest England.

4.101 In response to these representations, we examined ways of using the existing spectrum available within the UK to improve coverage for these users. Mindful of the ability of many wireless microphones to tune across at least three channels (24 MHz), we found there was some merit in allowing shared-licence access to channels 39 and 40 in areas where channel 38 was not yet fully available.

4.102 We set out this assessment in the funding consultation and published maps showing available spectrum in channels 38-40. The maps showed the scale of restrictions on outdoor PMSE use before 2012 would be much reduced. Indoor use would become fully UK-wide with channels 39 and 40 available on shared-licence terms. As a result, we considered there would be more incentive for some users to start using channel 38 in advance of the removal of radioastronomy protection or the end of DSO.

4.103 We also acknowledged implementing this plan would require some minor coordination between PMSE users and JFMG to ensure users were using the correct available frequencies in the channel 38-40 range. At that time, we suggested this might be done by checking an online tool on the JFMG website before tuning to the relevant frequencies as set out in their shared licence.

4.104 Having set out our approach to channels 39 and 40, we invited views by asking the following question:

Question 19: Do you agree with our proposal to include frequencies from channel 39 and 40 in the shared licence arrangements for channel 38?

Summary of responses

4.105 More than half of those who responded to this question agreed we should include frequencies from channels 39 and 40 in the shared licences for channel 38. Only a very small number disagreed with our proposal. Overall, there was clear support for increasing the number of frequencies covered in the shared licence.

4.106 BEIRG and a large number of other respondents agreed in principle with including channels 39 and 40 in the shared-licensing arrangements. However, BEIRG added it was likely to result in a failure on the part of many users to coordinate use across the three channels. This could lead to an increased risk of harmful interference. It added it would be especially challenging for community and non-commercial PMSE users, who might not know about the new licensing arrangements. BEIRG also said it was unlikely many users would purchase and use equipment that operated in these channels until channel 38 was available on the same basis as channel 69.

4.107 AMPS and others noted the maps of coverage of channels 38-40 still showed many restrictions on indoor use and the outdoor map showed large areas where there was no available frequency. It said it did not therefore seem possible this plan could successfully mirror the utility of channel 69 prior to 2012 and there was no viable alternative for channel 69 for film and television production until these issues were resolved. A number of respondents supported AMPS's response to the consultation.

4.108 A respondent said users should have at least three channels available after 2012 as users could fairly easily have four channels around channel 69 (i.e. including channel 70 on a licence-exempt basis and channels 67 and 68). It added users could use the same equipment within this range to run more channels together and be flexible.

4.109 Other respondents who agreed channels 39 and 40 should be included in the shared licence for channel 38 raised the importance of manufacturing equipment with the capability to tune to channels 38-40.

4.110 Others suggested site-specific licences for channels 39 and 40 should be considered to supplement channel 38.

Our response

4.111 We noted BEIRG's argument checking the availability of any of the three channels with JFMG in advance of their use would create an extra burden on users. On the other hand, we would expect any user who considered such prior coordination to be unduly onerous would probably continue using channel 69 until the restrictions on channel 38 availability fell away in 2012. In the meantime, we expected other PMSE users who wanted to take advantage of the new shared-licence arrangements to comply with the terms of those licence conditions.

4.112 We further noted BEIRG's point equipment would not be produced until channel 38 was fully available in the same way as channel 69 because of the lack of demand from users. However, we would expect channel 38 equipment to be made if there was sufficient demand for it and in light of the following developments:

- we had provided certainty channel 38 was the replacement for channel 69;
- shared-licensing arrangements for channel 38 were now in place;
- funding was being made available to assist the migration from channel 69;
- there was full UK-wide indoor access in a channel 38-40 tuning range;
- there was near-UK-wide outdoor access in a channel 38-40 tuning range; and

- many users were not affected by the radioastronomy or terrestrial-television restrictions and were therefore more likely to be in a position to buy channel 38 equipment as soon as possible.

4.113 AMPS's point on the needs of users who wanted to use spectrum within areas where spectrum access was restricted is relevant to users who operate outdoors and move around the UK. For those users, there may be no option other than to continue using channel 69 equipment until channel 38 becomes sufficiently available. However, we repeat the point this will not apply to a significant number of users because they do not need to operate outdoors in northwest England or Cambridgeshire and/or the spectrum otherwise available in channels 38-40 will fulfil their requirements.

Our decision

4.114 PMSE users stressed the urgency of including frequencies from channels 39 and 40 in the shared licences for channel 38 for users who move around the UK and said it was crucial in order for these users to move to channel 38. We therefore decided to introduce the new licensing regime in advance of addressing the other issues raised in the funding consultation and announced the new shared licensing arrangements on 16 December 2009, with the new licences available from 4 January 2010.

4.115 To mitigate the continuing constraints imposed by terrestrial television in adjacent channels 37 and 39, we decided channels 39 and 40 should remain in the shared licence until the end of DSO. This would enable us to more closely mirror available channel 69 bandwidth throughout the UK.

4.116 We further decided existing coordinated use of channels 39 and 40 should be protected so relevant users should not suffer disruption for the temporary period channels 39 and 40 were included in the shared licence. However, additional coordinated use of these channels would not be available while channels 39 and 40 were included on the shared licence.

We have implemented shared licensing in channel 38

4.117 The new UHF UK Wireless Microphone licence available from 4 January 2010 allows use of shared frequencies in channel 69 as well as channels 38-40, where available. Licensees must check availability of channels 38-40 in each location before using their equipment in those channels.

4.118 JFMG has developed a web tool that allows users to quickly and easily check frequencies available for use in any location.[23] Users must check the web tool (or contact JFMG by telephone) before a licence is obtained and any shared use of channels 38-40 takes place. Users should be aware this is important as it avoids the risk of unlawful use of spectrum, which may in turn lead to enforcement action.

[23] www.jfmg.co.uk/JfmgEcom/Wireless/Public/MicrophoneSh600.aspx.

Section 5

Next steps

5.1 We expect to take and publish decisions about PMSE spectrum management in the interim period before we restart the band-manager award and about the terms of future PMSE spectrum access by July 2010 at the latest (but not necessarily at the same time). We will discuss relevant aspects with stakeholders as appropriate. We will be guided by our key objectives for the PMSE sector and the need to minimise risks for the Olympics.

5.2 Later this year, we plan to publish further information on:

- the availability of interleaved spectrum for PMSE after DSO following the conclusion of international negotiations to clear the 800 MHz band;
- any increased risk of harmful interference to wireless microphones using channel 70 from likely new mobile services in the 800 MHz band; and
- our plans for the 800 MHz duplex gap.

5.3 We await a Government decision on funding for PMSE users affected by clearing channel 69. We will announce plans for the funding scheme in light of that decision.

5.4 Stakeholders may wish to note we have also published today an interim statement setting out our intention to streamline the spectrum trading process to make secondary markets more dynamic and efficient.[24] This affirms our continuing view band management can be an important instrument in securing efficient use of spectrum. We plan to make the necessary changes by May 2011, well before we revisit the band-manager award.

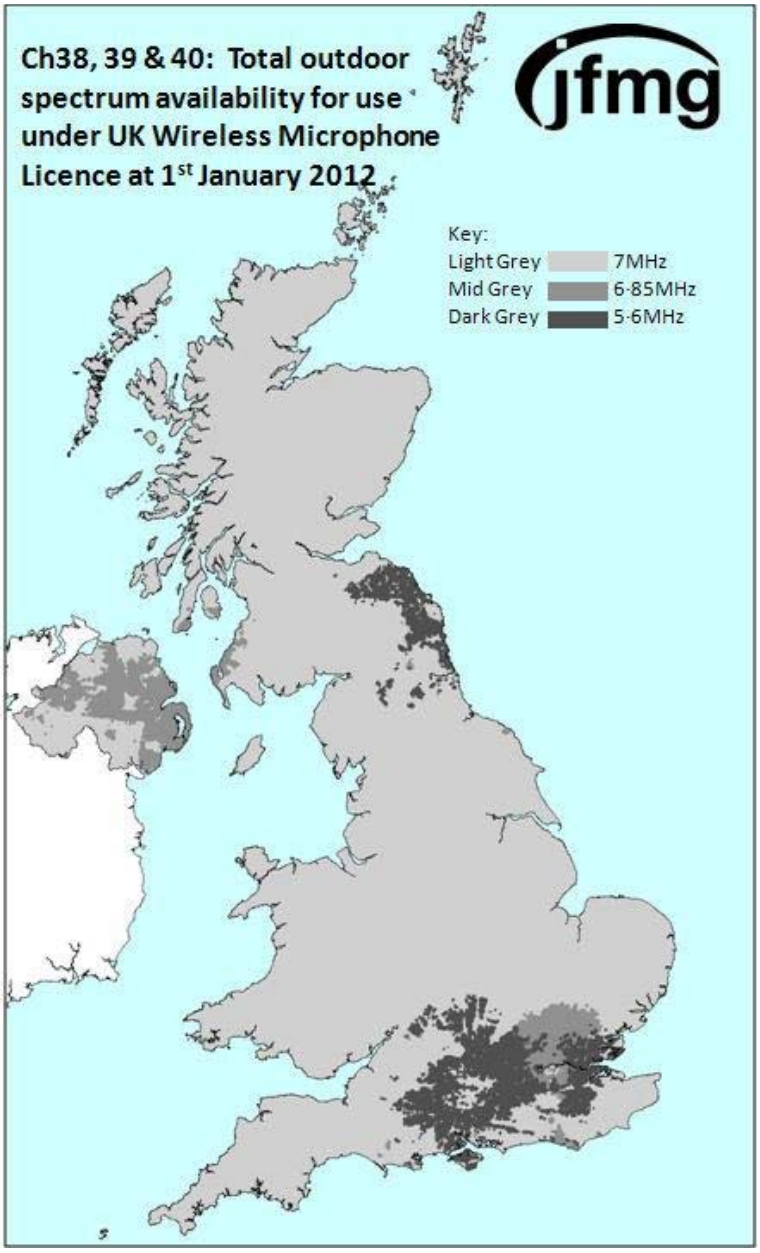
[24] www.ofcom.org.uk/consult/condocs/simplify/statement/statement.pdf.

Annex 1

Outdoor availability of channels 38-40 on 1 January 2012

A1.1 The map below is a provisional illustration of the quantity of spectrum available for low-power wireless-microphone use on 1 January 2012. This reflects the cessation of protection for radioastronomy use of channel 38.

A1.2 Some minor restrictions will remain as a result of adjacent-channel terrestrial-television transmissions. These will progressively reduce during 2012 as the final phases of DSO take place. However, the map shows the minimum quantity of spectrum available for PMSE use on 1 January 2012 will still be 5.6 MHz (where only channel 38 is available). We understand this bandwidth could facilitate the use of up to seven wireless microphones.



Annex 2

Abbreviations

AIP	Administered incentive pricing
AMPS	Association of Motion Picture Sound
BEIRG	British Entertainment Industry Radio Group
BEM	Block-edge mask
CEPT	European Conference of Postal and Telecommunications Administrations
DL	Downlink
DSO	Digital switchover
DTT	Digital terrestrial television
EU	European Union
FDD	Frequency-division duplexing
FRND	Fair, reasonable and non-discriminatory
GHz	Gigahertz
MHz	Megahertz
mW	Milliwatt
PMSE	Programme-making and special events
TLC	Technical licence condition
UHF	Ultra-high frequency
UL	Uplink
W	Watt