Question 1: This executive summary sets out our proposals for the Digital Dividend Cleared Award. Do you agree with these proposals?

I suggest.

- Channel 61, 62 and 69 should be fully included in the cleared spectrum, but channel 38.39 and 40 should not. (attached is an exercise in removing c61-62 from DTT use)
-
- Channel 38 should after the Olympic replace channel 69 as the UK-wide PMSE allocation.
- Channel 39 and 40 should be used at DTT substitutes for channel 61 and 62.
-
- The upper sub-band should use a 5 MHz raster with a variable start frequency.
- The upper sub-band should have a preferred allocation FDDd g TDD g FDDu.
- All upper lots should be generic and remain virtual/generic for the license
- Attribute lots that covers restrictions or advantages should be auctioned and attached to generic lots.
- FDD and TDD lots should not be in lower sub-band or the prices for broadband spectrum in the lower sub-band should be at least as high as the price in the upper sub-band.
-
- DTT should not used channels above channel 60.
- The aerial groups should be simplified into 3 groups, A (21-37), H(35-60) and W60(21-60).
-
- There should be a 'Use it or lease it' requirement for longer periods of idle spectrum.
- There should be incentives to provide rural broadband coverage.
-
- AIP should be phased in from 2017 starting with 10% in 2017 and 100% in 2027
-
- The GE06 plan cannot be changed anytime soon, but it is based on assumptions that are known not to be relevant going forward. The GE06 plan will likely have a limited lifetime. Ofcom should plan for a possible GE12-GE15 plan before any DD auction.
-

Question 2: Do you agree with our proposal to include the interleaved spectrum in channels 61 and 62 in the cleared award?

I will propose that all of channel 61 and 62 is included in the cleared award from 2012 and that channel 39 and 40 are not included in the cleared spectrum, but included in the DTT spectrum.

New developments since the Ofcom DDR statement will allow this with only small changes to the GE06 plan and no major changes to the aerial groups in the DSO 81plan.

Question 3: Do you agree with our proposal not to allow licence-exempt use of channels 61 and 62 by cognitive devices?

Yes. Cognitive devices should not be used in any channels.

Question 4: Do you have any comments on our assessment of the most likely uses of the cleared spectrum and the amount of spectrum required for these services? Are there any other potential uses that we should consider?

DTT SD+HD 40 - 64 MHz,

MMS. Likely 0 MHz. The UHF band may not be the right place for MMS services

FDD/TDD 60 MHz seems enough for basic UK wide coverage and for competition.
Refarming of the GSM spectrum could in time free spectrum for more providers.
Additional bandwidth should be allocated in higher bands.
Ofcom should ensure that rural areas are broadband covered as this will be important for the UK society to be able to assume that broadband is universally available.
The DD spectrum may be the only viable option for this.
Low cap levels - hard or soft – should be part of the licenses.

Question 5: Do you agree that we should proceed with our current timetable, with a view to holding the cleared award in summer 2009?

Reading this consultation, the DDR statement and other recent consultations and comparing the arguments and decisions with recent events, developments and information on product timings, I think Ofcom likely should delay the auction or part of it for 12-18 month.

The exception is the interleaved award in areas where **existing local analogue TV channels** are operating. These few areas could be granted with AIP or indeed for free in a period of 4-7 years.

Question 6: Do you have any views on the appropriate notice period for temporary PMSE access to channels 63-68, and/or on whether or not extend temporary access to channels 31-40?

It is important, that PMSE users understand that protecting there investments is not unlimited in time, that the PMSE license is for professional use so business economics must apply and finally that all future PMSE equipment must be able to work spectrum efficient across all channels in the band, in this case band IV/V.

A very large amount of PMSE equipment can be expected to be available after the Olympics in late 2012. This seems the optimum time for a final phase-out of inefficient legacy PMSE equipment.

It is suggested to move the 'PMSE UK-wide' 8 MHz allocation (currently channel 69) to channel 38 just before the Olympics and clearing channel 69 from PMSE use at the time the London award can be used ref. Q7 below.

Question 7: What are your views on deferring the start date for rights to use cleared spectrum in London to help meet the need for wireless microphones and other audio links for the London 2012 Olympic Games and Paralympic Games?

What else can you do?

Question 8: Do you agree with the use of SURs as the approach for defining consistent TLCs for this award?

Anything else would be impossible to handle politically.

If DTT interference was the result of "Ofcom selling off 'most of our' frequencies and destroying the 'few' remaining channels used by Freeview" - that could bring down ministers.

But every effort should be made to minimise possible conflicts by separating conflicting use of spectrum. The separation of DTT and FDD/TDD between channel 60 and 61 will help here.

Question 9: Do you have any comments on the SUR parameters listed in Tables 5.1 to 5.5 and the assumptions used to derive them?

Question 10: Do you agree with our proposals for managing interference between new services in the DDR cleared spectrum?

?

Question 11: Do you agree that the most efficient and effective means of preventing interference to the existing DTT services is by the addition of a protection clause to licences in the cleared spectrum? If not, what alternative approach would you suggest?

Yes – except for new DTT services, that should operate like the current DTT services.

Question 12: Do you agree that the best way to finalise the protection clause approach and to address the practical implementation issues is through direct engagement with interested stakeholders? With which stakeholders should we engage?

Yes, including DTT broadcasters.

Question 13: What do you believe would be the implications of protecting indoor/settop antennas? Should a distinction be drawn between set-top antennas and larger antennas designed for external reception of TV signals that are loft-mounted?

Even though the use of settop antennas should not be recommended – they are used by many households. There is much more to be said in favour of loft-mounted aerials. At many households installation of an outdoor aerial is not possible or sometimes not allowed. In such cases larger antennas - loft or otherwise indoor-mounted - may be the only solution. There may at some locations be the choice between two loft-mounted antennas with a ‘diversity’ receiver or one large rooftop antenna.

Question 14: Do you agree with our proposals for managing interference between new and existing users?

The risk of sterilising a lot of spectrum seems very significant.

Question 15: Do you agree with the proposed propagation models and databases to be used for compliance assessment?

-

Question 16: Do you have any comments on the transmit masks set out in paras 5.128 to 5.130?

-

Question 17: Do you agree that where the cleared spectrum is used for the operation of a DTT multiplex, we should replicate the ownership restrictions from the Broadcasting Act regime relating

to (a) local authorities, (b) political bodies, (c) religious bodies and (d) bodies exerting undue influence but not replicate restrictions relating to (e) broadcasting bodies and (f) advertising agencies?

Yes – except for (f). The pool of advertising funds is limited and the possible implications for advertising financed Freeview channels should be considered. Internet advertising is already removing needed revenue from TV channels.

Question 18: Do you agree that we should facilitate interoperability between existing DTT multiplex operators and new operators using cleared spectrum?

I understand the Ofcom position. But I think all DTT must be required to interoperate even across free- / pay-tv operators.

Question 19: We welcome views on the relative merits of such an approach to information provision; in particular concerning the type of information that may be helpful and any impacts that publication of information might have both on licence holders and the wider spectrum market.

Question 20: Do you agree that the cleared award should include both 8 MHz lots for DVB-T and MMS TLCs and 5 MHz lots for FDD and TDD TLCs across the band?

The upper sub-band
- this band should be the preferred band for broadband services FDD and/or TDD
- channel 61, 62 and 69 should be added to this band from 2012/13 – 2026.
- should use a 5 MHz raster with no predetermined start frequency.
- should not include any DTT lots.
- MMS lots in this band should be 5 MHz, or there should be no MMS in this band.
- should be pre-structured ‘FDD down’ ‘g 5MHz’ ‘TDD’ ‘g 5MHz’ ‘FDD up’

The lower sub-band
- should not include channel 38. Channel 38 should replace for channel 69 for PMSE from 2012.
- should not include channel 39 and 40, as they should replace channel 61 and 62 for DTT.
- FDD and TDD spectrum price including needed guard-bands not lower than in upper sub-band.

With the more efficient DVB-T2 SFN technology one or two DTT multiplexes with good coverage should be possible using channel 31-35 + 37 and maybe with some added interleaved spectrum. Use of SFN operation for the PSB-3 relays should be able to ease directional restrictions for some of the interleaved spectrum.

Question 21: Do you agree that the cleared award requires a mixture of frequencyspecific and frequency-generic lots to be offered in the auction?

Except DTT lots that need high-tower/power and depends more heavily on the GE06, the other lot types should be frequency-generic and the licenses should remain frequency-generic.

Some needs additional restriction attributes e.g. in the upper sub-band it should not be “FDD down ch63 restricted” , but rather “FDD down ‘DTT within 5 MHz below’ restricted”.
Another attribute could be ‘early available’ – an attribute that will last until late 2012.

Question 22: Do you agree with the proposed outline definition of lots suitable for MMS, DVB-T, TDD and FDD applications?

Question 23: Should the flexibility to bid for lots defined on both fixed and variablefrequency rasters be preserved in the auction? If not, which are preferred?

The variable raster is preferred, but for DTT lots.
The exact frequency should not be part of the license, but remain at technical parameter that can be adjusted by Ofcom during the (unlimited) license period – i.e. the spectrum should remain virtual/generic with restriction attributes attached if needed.

All future equipment will be digitally tuned, even if analogue transmission is used. Changing the exact frequency used should be possible more than once in the 15-18 years of the initial period. When longer license terms are used, it is important that only the part of the license that has significant money value is fixed.

Question 24: Do you agree with the proposed basis for awarding Channel 38 as a distinct lot in the auction?

The uncertainty about the future use of channel 38 makes it the ideal for PMSE use from the Olympics going forward. The large amount of PMSE equipment available 'second hand' just after the Olympics makes September 2012 the optimum time to clear channel 69 and require newer PMSE equipment to be universally used.
Channel 70 may be used by old equipment that is spectrum efficient, but cannot tune to channel 38.
The PMSE band-manager should be granted a license for the generic 'UK wide 8 MHz virtual UHF channel' and Ofcom should map it onto channel 69 now and onto channel 38 from 2012 – maybe until RAS restrictions are lifted, maybe longer.

Question 25: Do you agree with the proposed structure of frequency rules for allocating different licence types in the auction? Are there any amendments that would improve the efficiency of spectrum allocation via an auction?

See Q20 and

Question 26: Do you agree with our proposal to proceed on the basis of UK-wide lots?

The policy for spectrum allocation in the island of Ireland should be reviewed by the governments in London, Dublin and the local government in NI. An island-wide spectrum plan should be presented and the benefits of such a plan should be made clear to ministers and the general public.

Allocation different frequencies in two countries, just because there is a borderline and then selling the spectrum off to – possible different – private companies, doesn't make much sense – if any sense at all.
The WRC-07 channels (Ch60-69) seem to be the obvious place to start. Providing broadband to rural areas in NI and RoI may well depend heavily on optimising the cost structure of providing LTE and/or WiMAX.
Note that while most DTT and MMS are for private consumption and entertainment, broadband is increasingly a 'must–have' for almost everybody. Business, work from home mums, school children, pacemaker-checks, you name it, they all need it.

Access to the Internet at some minimum MHz bit-rate is also the basis for much of the expected future service improvement and productivity gain that are hoped for in our public sectors.

The present GE06 plan should of course be used to facilitate the DSO/ASO process in all parts of the UK and in the RoI, but the DD should not be included in the DD auction unless this review has ended before the auction.

Although major changes to the GE06 plan are not possible towards the European continent anytime soon, the geography makes all changes to the GE06 plan in the western parts of the UK and in the RoI transparent to all other GE06 participating countries.

Question 27: Do you favour including the available cleared spectrum in (a) Guernsey and (b) Jersey in the geographic coverage of the licences to be awarded? If not, what approach do you favour instead?

No. The limited spectrum allocation on these islands should not just be included in any lot, but be used for what is most needed on the islands. There seems to be a high risk of ending up in a winning bid for a service not much needed or with a service provider that do not want to work on the islands.

Question 28: Do you agree that the combinatorial clock auction is the most suitable auction design for the cleared DDR award?

Question 29: What potential simplifications, if any, could be made to the proposed lot structure for DVB-T, MMS, TDD and FDD lot categories which would still reflect the most important differences in value between lots?

In the upper sub-band channel 61-69 (790-862 Mhz) 5 MHz lots only

- generic FDD up (paired) 6 at 2x5 MHz
- genetic FDD down 14 at 5 MHz
- generic TDD 12 at 5 MHz
- generic MMS 12 at 5 MHz (or none)

attribute lots
- 1 ‘DTT 5 MHz lower restriction’ attribute for FDD, this has the use from DSO attribute, too. This attribute may have positive or negative value.
- 6 additional use ‘at DSO’ attributes (channel 63-68 is cleared at DSO)

As channel 61 and 62 may be cleared in Scotland at DSO and Scotland is RF isolated, all lots may have the ‘at DSO’ attribute by default in Scotland.

A bid could be for 2 FDD up (2 x 10 Mhz) + 2 ‘at DSO’ + 1 ‘DTT restriction’

If this bid is winning 2 x 5 MHz can be used from DSO with the lower FDD down license being DTT restricted. The price would be for 1 ‘at DSO’ attribute, as the ‘DTT restricted’ license would include the other needed ‘at DSO’ attribute.

After the Olympics all the lots can be used, still with the DTT restriction on 5 MHz of the FDD down license.

The Ofcom virtual to real mapping could be – before and after the Olympics.
* DTT 5 MHz restriction attribute

Ch61	Ch62	FDD dwn*	2/3 others	→	G 10 MHz	FDD up	2 others	Ch69
FDD dwn*	FDD dwn	4 others	→	G 10 MHz	FDD up	FDD up	4 others	→

Question 30: Do you have any comments on our proposals for the Application and Qualification Stages of the combinatorial clock auction for the cleared DDR award, including our proposals for initial deposits?

Question 31: Do you consider that it is important to distinguish relative weightings in advance between the eligibility points of the different 1 MHz blocks available in this award? If so should this be restricted to channels 36, 38, 61 and 62 and what do you consider these relative weightings should be?

Channel 61 and 62 should be included in the generic FDD/TDD lots, without the 'available at DSO' attribute.

Question 32: Do you have any views on whether an ex ante eligibility points activity rule or a revealed preference activity rule should be used in this award?

Question 33: Do you have any views on whether there should be restrictions on bidders' ability to bid on multiple technical licence types within single package bids or between different rounds of the auction and whether bidder association rules should potentially be adjusted to cater for any such restrictions being imposed?

Question 34: Do you have any further comments on any aspect of our proposals for the Principal Stage of the combinatorial clock auction for the cleared DDR award?

Question 35: Do you have any comments on any aspect of our proposals for the Assignment Stage or the Grant Stage of the combinatorial clock auction for the cleared DDR award?

Question 36: Do you agree with our approach to assessing whether the award of cleared spectrum fully promotes competition and efficiency?

Question 37: Do you have particular concerns about possibilities for award outcomes to fail to fully promote competition in downstream markets or to result in inefficient use of spectrum? If so, please explain what these are and provide supporting evidence.

Question 38: Do you agree with our view that we should introduce a general safeguard cap aimed at promoting diversity of spectrum holdings? Do you have views concerning the level of such a cap?

To promote competition, I think, a cap of 30 Mhz for FDD /TDD services would be better.
In a 72 MHz cleared upper sub-band 60 MHz will be available for use allowing only two 'capped' lots. There could well be a case for a hard cap of 20-25 MHz.
The max download speed may be somewhat limited, but the remedy should be to acquire additional spectrum in a higher band (1.8 GHz and up).

For the FDD and TDD lots the softcap level may depend on the concurrent holding and using other- above 1GHz - spectrum for broadband services by the same licensee.

Likewise it may lower the softcap level it the < 1GHz spectrum is not used in rural areas.

For the UK society universal access to broadband may be as important as the postal service used to be. E.g. access to health-services via the net, may not be of economic interest to an individual, but may save the NHS a lot of money.

Question 39: Do you agree with our proposals to include an information provision licence condition to help facilitate efficient secondary trading?

Question 40: Do you agree with our view that we should not apply any other general remedies in the cleared award?

Question 41: Do you agree with our identification of the three areas requiring further attention?

MMS may well be more useful at lower frequencies – like DVB-T2 (H2) in 1.7 MHz T-DAB channels – where losses are lower or in higher frequency bands - like DVB-SH – where antenna gain is better and diversity receivers are practical for HH devices.

However I do believe that this area requires further attention as others may think differently.

Pay-TV - I think that for DTT the unit to license should be 'One multiplex'.

NGW/Arqiva - No comment.

Question 42: Do you agree with our assessment that the limitations on the amount of cleared spectrum available for mobile broadband applications, and the particular advantages of sub 1GHz spectrum, could result in an outcome where there are limits on the level of competition possible in the provision of these services?

Yes - ref Q 38

Question 43: Do you think that a soft spectrum cap on either (a) the cleared spectrum suitable for mobile broadband applications alone, or (b) the holding of any sub 1GHz spectrum suitable for mobile broadband applications, which would trigger action if a significant competition concern emerges in relation to the market structure in the future mobile broadband market, could be an appropriate approach to these concerns?

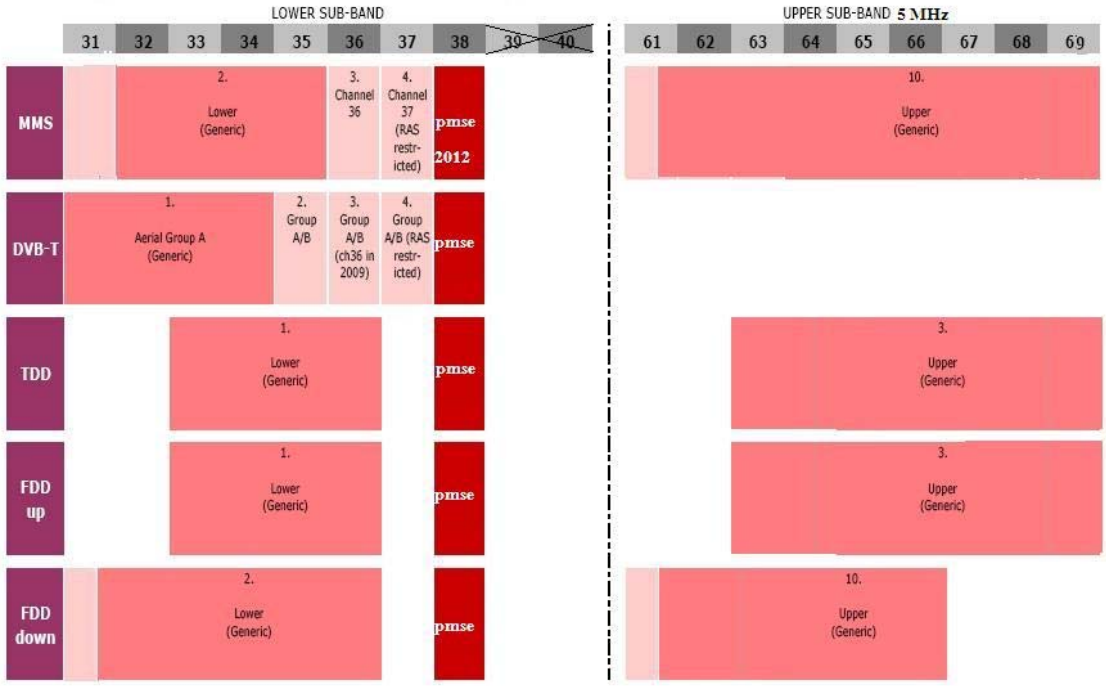
b) all sub 1GHz holdings allocated to mobile broadband.

Question 44: Do you agree with our assessment that issues in the pay TV market are not at this stage primarily an issue for the cleared award?

I think, pay TV should be licensed within a multiplex or for one multiplex. Pay TV should not own spectrum. (Local TV may be an exception).

Question 45: Do you agree with our initial assessment that we should not intervene further in the cleared award to remedy any potential impact on competition resulting from the holding of cleared spectrum by NGW/Arqiva?

No comments.



The actual frequency location of some of the restricted lot categories would not be fixed in practice; the figure shows possible outcomes.

Channel 39 and 40 is not part of the cleared award
Channel 38 is the new UK-wide PMSE frequency mapping.

Eliminate the use of channel 61 and 62 for DTT in the UK .

Since the DDR statement there has been two important developments that significantly can ease the removal of channel 61 and 62 for DTT use in the UK – not including NI.

- DVB-T2 has been released. It has much improved SFN capabilities and much less overhead.
- DVB-T2 will be used UK-wide from late 2009 on the PSB-3 multiplex.

DVB-T2 SFN's will make a new DTT multiplex possible, I think, with only channels from the lower sub-band – channel 31-37 and some interleaved spectrum.

This consultation shows the difficulties and high 'gap-cost' of allocating mixed services. The use of channel 39 and 40 for broadband FDD/TDD services are severely limited.

By moving channel 39 and 40 from the cleared spectrum to the DTT spectrum and creating 8 or 9 DVB-T2 medium sized SFN's for the new PSB-3 multiplex, I believe DTT usage of channel 61 and 62 will no longer be needed in the UK.
None of these SFN's crosses nation borders and they will not interfere with the known planned program streams (ITV1 and C4/S4C).

There will be no major changes to the GE06 plan, but a few channels will have to be coordinated from nearby transmitters and/or at a changed ERP.

I expect the only major problem will be a new channel for Dover at 46 dB to replace channel 62. The suggested Sudbury-Tacolneston PSB-3 SFN will have several channels to choose from and Tacolneston is almost 200 km from the European continent.

This exercise is not trying to make an optimal new DTT allocation, but is only one possible way of eliminating channel 61/62 DTT use. It operates (almost) within the GE06 plan and is only using '2010 available' DTT technology.
It will however be easy to convert PSB-3 relays to SFN gap-fillers and thus eliminate use of the current PSB-3 relay channel UK-wide.

The DVB-T2 parameters are for a 80 km SFN with a bit-rate just under 33 Mbps. This is 2-2.5 Mbps less bit-rate than the bit-rate of a MFN multiplex with the same code-rate and modulation.

Move channel 39 or 40 to nearby locations.

- Channel 40 from Keelylang Hill to Rumster Forest replacing channel 62
- Replace one channel at Chatton with channel 39 (GE06) and move replaced channel to Pontop Pike (49 in-group, 47 one off group) to replace channel 62. Coordination at +7dB (450 km HOL)
- Replace one channel at Wenvoe with channel 40 (GE06) and move replaced channel to Mendip (49 in group, 47 one off group) to replace channel 61.
- Move channel 39 (GE06) to Huntshaw Cross, same ERP, but out of group.
- Move channel 51 or 52 from Emley Moore to Winter Hill (in SFN description)
-

PSB-3 SFN's (single frequency network) in order to eliminate DTT use of channel 61 and 62

Colour code: **Bold black: change, Green: SFN**, Blue: Ch 39 or 40 used, Red**: Channel moved to nearby location**, **Brown: to be removed**

Black Hill, Rosnearth PSB-3 SFN GI 19/256 (80km) 32.9 Mbps.

81-Sites	PSB-1	PSB-2	PSB-3	COM-1	COM-2	COM-3	Group
Black Hill	43	46	50	41	44	47	BH
Rosnearth	54	58	**61**	53	57	60	C/DH

PSB-3 SFN	PSB-1	PSB-2	PSB-3	COM-1	COM-2	COM-3	Group
Black Hill	43	46	**50**	41	44	47	BH
Rosnearth	54	58	**50**	53	57	60	C/DH (+V)

SFN Ch 50 50 dB Black Hill, 33 dB Rosenearth (no change RoI)

Channel 39 or 40 could have been used, but Roasnearth remains in group with this SFN.

Channel 61 removed at Rosnearth.


Mainland
Keelylang Hill
Hoy
South Ronaldsay
Stroma
Rumster Forest
Scotland
Lismore
Rosneath
Black Hill
Image NASA

Emley Moor, Kieghley, Winter Hill, Saddleworth PSB-3 SFN GI 19/256 (80km) 32.9 Mbps.

81-Sites	PSB-1	PSB-2	PSB-3	COM-1	COM-2	COM-3	Group
Emley Moor	41	44	**47**	48	51	**52**	BH
Keighley	54	58	**61**	53	57	60	C/DV
Winter Hill	54	59	**62**	55	58	**61**	C/DH
Saddleworth	42	45	**49**	48	**51**	52	BV

PSB-3 SFN	PSB-1	PSB-2	PSB-3	COM-1	COM-2	COM-3	Group
Emley Moor	41	44	**52**	48	**39**	**47**	BH
Keighley	54	58	**52**	53	57	60	C/DV
Winter Hill	54	59	**52**	55	58	**51**	C/DH
Saddleworth	42	45	**52**	48	**39**	49	BV

SFN Ch 52 Emley Moor, Kieghley, Winter Hill and Saddleworth

New Ch 39 GE06 at Emley Moor 52.4 dB

Channel 52 <+2 dB higher total ERP, Winter Hill 53 km closer Truskmore, RoI (GE06 52 dB)

Moved Ch 51 from Emley Moor to Winter Hill - 2.4 dB 53 km closer Cairn Hill, RoI (GE06 52 dB)

Channel 39 used to remove Ch 51 from Saddleworth 26 dB

This Channel allocation requires changes at Moel-y-Parc, see below.

Channel 61 removed at Winter Hill and Keighley and channel 62 removed at Winter Hill.

Llanddona, Moel-y-parc, Long Mountain PSB-3 SFN GI 19/256 (80km) 32.9 Mbps.

81-Sites	PSB-1	PSB-2	PSB-3	COM-1	COM-2	COM-3	Group
Llanddona	**53**	57	60	43	46	50	EH
Moel-y-parc	42	45	49	**51**	**52**	48	BH
Storeton W	**57**	**53**	60				C/DH
Long Mnt.	**53**	**60**	57				C/DV

PSB-3 SFN	PSB-1	PSB-2	PSB-3	COM-1	COM-2	COM-3	Group
Llanddona	60	57	**53**	43	46	50	EH
Moel-y-parc	42	45	**53**	**40**	49	48	BH
Storeton W	57	60	**53**				C/DH
Long Mnt.	60	57	**53**				C/DV

SFN Ch 53 Llanddona, Moel-y-parc, Storeton Wales and Long Mountain.

Storeton-Wales and Long Mountain included as Channel 53 is presently used in the 81-Sites plan.

New Ch 40 GE06 at Moel-y-parc . Channel 51 and 52 moved to Winter Hill.

Sutton Coldfield, Waltham PSB-3 SFN GI 19/256 (80km) 32.9 Mbps.

81-Sites	PSB-1	PSB-2	PSB-3	COM-1	COM-2	COM-3	Group
Sutton C	43	46	**50**	42	45	**49**	BH
Waltham	54	58	**61**	29	56	57	WH

SFN	PSB-1	PSB-2	PSB-3	COM-1	COM-2	COM-3	Group
Sutton C	43	46	**49**	42	45	**50**	BH
Waltham	54	58	**49**	29	56	57	WH

SFN Ch 49 53 dB Sutton Coldfield, 47 dB Waltham (< +1dB France)

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Optionally Ch 43, 46, 42 or 45 may be used for the PSB-3 SFN

Ch 40 GE06 at Sutton Coldfield (53 dB), can likely be moved to Waltham (47 dB) to replace Ch 61.

Channel 61 removed at Waltham.

Hannington, Salisbury, Midhust PSB-3 SFN GI 19/256 (80km) 32.9 Mbps.

81-Sites	PSB-1	PSB-2	PSB-3	COM-1	COM-2	COM-3	Group
Hannington	42	45	**51**	41	44	**47**	BH
Midhurst	55	58	**61**	50	59	**62**	C/DH
Salisbury	53	57	60	55	59	**62**	C/DV
(Whitehawk)	53	57	60	48	**51**	56	C/DV

PSB-3 SFN	PSB-1	PSB-2	PSB-3	COM-1	COM-2	COM-3	Group
Hannington	42	45	**51**	41	44	**39**	BH
Midhurst	55	58	**51**	50	59	**47**	C/DH -1
Salisbury	53	57	**51**	55	59	60	C/DV
(Whitehawk)	53	57	**51**	48	60	56	C/DV

SFN Ch 51 Hannington, Salisburry, Midhurst and maybe Whitehawk Hill

New Ch 39 GE06 at Hannington

Moved Ch 47 from Hannington to Midhust - 4 dB 1 below group

Channel 61 removed at Midhurst

Channel 62 removed at Midhurst and Salisbury

Sudbury, Tacolneston PSB-3 SFN GI 19/256 (80km) 32.9 Mbps.

81-Sites	PSB-1	PSB-2	PSB-3	COM-1	COM-2	COM-3	Group
Sudbury	41	44	**47**	56	58	60	EH
Tacolneston	55	59	**62**	42	45	50	EH

PSB-3 SFN	PSB-1	PSB-2	PSB-3	COM-1	COM-2	COM-3	Group
Sudbury	41	44	**47**	56	58	60	EH
Tacolneston	55	59	**47**	42	45	50	EH

SFN Ch 47 50 dB Sudbury and Tacolneston (< +3 dB France, >= +3 dB north of Flushing, distance 200 km)

All Sudbary channels are in-group at Tacolneston and can replace Ch 47.

Dover, Bluebell Hill PSB-3 SFN GI 19/256 (80km) 32.9 Mbps.

81-Sites	PSB-1	PSB-2	PSB-3	COM-1	COM-2	COM-3	Group
Bluebell Hill	43	46	**54**	45	48	**61**	EH
Dover	50	51	**53**	55	59	**62**	C/DH

PSB-3 SFN	PSB-1	PSB-2	PSB-3	COM-1	COM-2	COM-3	Group
Bluebell Hill	43	46	**53**	45	48	**40**	EH
Dover	50	51	**53**	55	59	**54 + 3db**	C/DH

SFN Ch 53 49 dB Dover, 43 dB Bluebell Hill (< +1dB France)

Ch 53 used at Reigate 33 dB V and Whitehawk Hill 36 dB V.

Guildford, Heathfield and Tunbridge Wells may need to broadcast PSB-3 using a DVB-T2 SFN with Reigate on channel 52

New Ch 40 GE06 at Bluebell Hill

Moved Ch 54 from Bluebell Hill to Dover? (+3 dB and 55 km closer France)

Or move Ch 48 / Ch 43, 45, 46 (out of group) to Dover?

Channel 61 removed at Bluebell Hill

Channel 62 removed at Dover.

The Pontop Pike – Bilsdale SFN is not specified in the text.