

*Championing  
excellence and diversity  
in broadcasting*

Founded in 1983 by Jocelyn Hay CBE



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**RESPONSE BY THE VOICE OF THE LISTENER & VIEWER  
TO OFCOM'S CONSULTATION ON COEXISTENCE OF NEW SERVICES IN THE 700  
MHZ BAND WITH DIGITAL TERRESTRIAL TELEVISION**

**July 2017**

# **Response by the Voice of the Listener & Viewer to Ofcom's consultation on Coexistence of new services in the 700 MHz band with Digital Terrestrial Television, May 2017.**

## **INFORMATION ABOUT THE VLV**

The Voice of the Listener & Viewer Limited (VLV) represents the citizen and consumer interests in broadcasting and speaks for listeners and viewers on the full range of broadcasting issues. It uses its independent expertise to champion quality and diversity in public service broadcasting, to respond to consultations, to produce policy briefings and to conduct research. For over 30 years VLV has played a unique role within Britain in keeping a citizen's eye on major legislative proposals and action taken by British regulators and broadcasters, enabling the voice of viewers to be heard, independent of the interests of political parties, industry players and other pressure groups. VLV also has an interest and participation in European groups concerned with Public Service Broadcasting. VLV is a charitable company limited by guarantee (registered in England No 4407712 - Charity No 1152136).

## **EXECUTIVE SUMMARY**

1. VLV is committed to the preservation of Public Service Broadcasting (PSB) freely available over the airwaves and strives to protect its place in the communications market and to represent the interests of viewers during times of change.
2. VLV is fully aware of the impact of Mobile Data Services (MDS) on spectrum resources and the consequent challenge to broadcasters and viewers using the UHF bands. It is a *de facto* decision across Europe and elsewhere that the 700 MHz band of spectrum is to be given to MDS with a consequent and costly requirement for broadcasters and, more importantly, for some viewers, to adjust to the practical effects on Digital Terrestrial Television (DTT) services.
3. The evidence, both theoretical and practical, presented in this consultation makes a good case for believing that the remedies for interference caused by MDS to DTT reception have, so far, largely been effective for MDS networks operating in the 800 MHz band. It is argued that these same remedies will be effective in protecting new broadcast transmissions in the lower frequencies as television reception is now moved further downwards and out of the 700 MHz band where it is currently located.
4. However, viewers using set-top aerials will be more vulnerable and available remedies in this case may not be as effective.
5. Whilst MDS networks in the 700 MHz band will not become fully operational until 2020 the clearance programme to move DTT transmissions out of the 700 MHz band will have some early and adverse effect, unconnected with interference, on some viewers' experience. This will be caused by the engineering work required to move DTT transmissions and thus require viewers to retune receivers and possibly replace aerials. Viewer support will be essential during this process in addition to that needed later when interference may be expected.
6. NO element of cost placed upon viewers to resolve reception problems, including the mitigation of any interference problems, should be borne by those viewers, including users of set-top aerials. ALL changes affecting viewers have been and will be caused by the reallocation of the 700 MHz bands to MDS use. It follows that all costs of restoring viewers' experiences of DTT should be

paid by the MDS operators. We appreciate that this is a matter for government and not something that it is within the power of Ofcom to grant. This consultation suggests that the impact on viewers – and therefore also the cost of putting things right - will not be as great as for the 800 MHz case.

## GENERAL COMMENTS

7. The VLV welcomes the opportunity to respond to this consultation on *Coexistence of new services in the 700 MHz band with Digital Terrestrial Television (DTT)*. We have responded in the past to consultations on the altered use of the UHF spectrum formerly allocated to analogue and digital TV services, in particular the reallocation of both 800 MHz and 700 MHz bands to Mobile Data Services (MDS).

8. In these responses we have been primarily concerned that DTT viewers' interests are taken fully into account during the planning and implementation of the change of use in the two bands. **Specifically we expect full measures of support where interference is likely and where mitigation is required.**

9. Whilst MDS networks in the 700 MHz band will not become fully operational until 2020 the clearance programme to move DTT transmissions out of the 700 MHz band will have some early and adverse effect, unconnected with interference, on some viewers' experience. This will be caused by the engineering work required to move DTT transmissions and thus require viewers to retune receivers and possibly replace aerials. Viewer support will be essential during this process in addition to that needed later when interference may be expected.

10. We understand that any compensation or financial assistance arising from those measures is a matter for government rather than Ofcom. The measures in place for the 800 MHz clearance and consequential use for MDS seem to be working, which gives rise to some comfort that they will also be extended to cover the 700 MHz clearance.

11. We note that Clause 6.1 gives July 14th for the closure date for responses whereas the front page states July 18th.

## COMMENTS ON SECTION 1: EXECUTIVE SUMMARY

12. We note the similarities between the case of 700 MHz and that of the 800 MHz clearances. We agree that it is valid, with appropriate adjustments, to extend experience of the latter to the former.

13. We welcome the prioritisation of practical investigations over theoretical assessment given the similarities between the two cases. We also welcome the use of field tests and measurements and practical experience gained since the original assessment prior to the launch of 800 MHz MDS. This adds confidence that predictions for the 700 MHz band will be sound.

14. There are, however, some differences in the band plan arrangements that require specific attention when extending that experience to the 700 MHz case. This has been addressed in the consultation through close attention to handset transmissions which will be closest in frequency to the revised DTT band.

15. There is also the fact that both 800 MHz and 700 MHz MDS transmissions will be present once the latter services are operational and so some increase in interference levels might be

expected. It is comforting to note that this has been addressed and that there are good theoretical and practical reasons to believe that there will be no significant additional adverse effect on DTT reception.

16. We note that the primary remedy for mitigating interference risks will be the same as that for the 800 MHz case, ie a suitable filter in the aerial lead and, in extreme cases, a replacement aerial. We note that the number of locations in which all the adverse conditions of reception all occur is expected to be very small (about 4,000, see also below at Clause 59 and also Clauses 1.7 and 8.8 of the supplementary report). Though these adverse conditions will clearly be a big issue, and require remedy, for the 4,000 adversely affected, the consultation does not address what those remedies might be in sufficient detail.

17. We note the comments in relation to set-top aerials. This has always been a difficult issue and we welcome its discussion in this consultation. We have comments on this issue in our response to Question 3 (see comments on Section 4, our paragraphs 42-43 below).

## COMMENTS ON SECTION 2: INTRODUCTION

18. We note Clause 2.4 and appreciate that the delivery of remedy or mitigation solutions is a matter for government, acting under advice from Ofcom, **but we expect that those solutions in place for the 800 MHz case will be retained and extended to cover 700 MHz.**

19. We note from Clauses 2.7 to 2.12 that the UK will be using harmonised standards in planning MDS networks and in dealing with interference issues between such networks and DTT. This extends to revised specifications for DTT sets manufactured in the future. We comment further on the impact of this revision in our response to Section 3 below (Clauses 23 *et seq*).

20. We note the comments in Clauses 2.13 to 2.16 concerning similarities between the 800 and 700 MHz cases. We broadly agree that experience from the planning and implementation of 800 MHz MDS networks and their impact on DTT services will also be appropriate in the 700 MHz case.

21. We specifically note Clause 2.16 and its reference to the different band plan which changes the roles of handsets and base stations in generating interference to DTT. We welcome the close attention that this factor has been given in the consultation documents.

22. We note the Impact Assessment reported in Clauses 2.17 to 2.27. Whilst we note the comment in 2.27 that interference is a technical and environmental issue we consider that this interference also raises issues for equality or social equity. VLV considers that the ability of some vulnerable members of the viewing community to understand and afford remedies to the same extent as others is limited. For elderly viewers DTT is the most affordable service available and is valued greatly as a source of social contact and entertainment. It has been reported that 4 out of 5 elderly people have only DTT services as their only contact with the world outside. **We would expect that such viewers will be given due attention e.g. through liaison with support groups and that current experience with the 800 MHz case will provide guidance.**

## COMMENTS ON SECTION 3: ASSESSMENT OF COEXISTENCE RISKS FROM HANDSETS AND BASE STATIONS IN THE 700 MHz BAND

23. VLV welcomes this section in particular because the 700 MHz band plan places the handset transmissions much closer in frequency to the DTT band than is the case for 800MHz. Given the greater numbers and mobility of handsets and the prospects for very close proximity of them to TV

reception systems it is highly appropriate that a special study is made of the consequences for interference. We welcome the separate document reporting tests relating to handset interference to DTT reception installations.

24. We note that the different band plan implies that interference caused by base stations is diminished, compared to that for the 800 MHz case, but not eradicated. The moving of the DTT transmissions further from the 800 MHz band, the changed band plan for 700 MHz, the prospect that some base stations will not necessarily be co-sited in both networks as well as the fact that the 700 MHz network will generate additional interferers are all reasons why base stations' performance needs to be evaluated. Good reasons are given in the consultation that overall the various effects will broadly compensate each other.

25. We note and welcome the use of practical experience gained during the implementation of MDS services in the 800 MHz band in planning the 700 MHz band. We also note from Clause 3.9 that practical data have been given preference over predictions where possible and appropriate.

26. Theoretical predictions made before the 800 MHz networks were built have proved to be largely correct and appear to have erred on the cautious side. It seems that in practice both interference and invasive remedial action for viewers have been less prevalent than expected. The pro-active step of supplying aerial lead filters to many more viewers than would be expected to experience interference has probably had a beneficial effect.

27. We note that the conditions under which signal strength predictions have been less accurate have been investigated and identified and that changes to the UK Planning Model used to support network planning studies, eg in the light of actual receiver and aerial performance, have been implemented. We note (Clauses 3.14 and 3.16) that High Definition (HD) TV signals are more robust than Standard Definition (SD), presumably because the DVB-T2 system is more robust than DVB-T1.

28. We note and appreciate the detailed and extensive evaluation work reported in this section, in Annexe 4 of the consultation document and in the separate report on tests of handset interference to DTT. The latter seems the most important source of interference and so it is commendable that special measures to assess it have been taken. The report includes a valuable assessment of the level of interference when the new 700 MHz MDS systems are fully operational and fully loaded with traffic.

29. The evaluation work appears thorough and has the benefit of practical experience as well as theoretical predictions. This gives confidence that the planning methodology for the 700 MHz band will be sound and perhaps more accurate than was possible during the early stages of the 800 MHz planning process. We note specifically Clauses 3.35 to 3.37 which summarise experience from the 800 MHz project and point to particular areas of vulnerability to interference.

30. Better planning does not remove all risks of interference but perhaps will better predict where such interference might occur and where mitigation methods will be effective. Whilst we note the similarities between them we also note that Clauses 3.38 to 3.50 discuss the key technical differences between the 800 and 700 MHz cases. These have been used to guide the investigations of conditions under which interference to DTT might be expected. We welcome this initiative as well as the study of experience in other countries where change of use of the 700 band is already being implemented.

31. One of the measures taken to reduce the risks of interference in the future is to revise the specifications of DTT receivers (Clauses 3.51 to 3.53). It is known that the susceptibility of current TV sets to interference is variable (see Annexe 1 to the supplementary report) thus prompting the

revision of specifications. Whilst this revision clearly will only be effective when new TV sets enter the market, it does not address the very many receivers already in place, some of them having been purchased before switchover and still perfectly functional and have further lifetime expectation on the part of the owners.

32. 7-8 years is given as the average set renewal period so that by 2020 it is likely that some of the older sets will have been removed from the market – perhaps still being functional but then possibly adding to the landfill burden – and it is likely that these are sets without any internal filtering. Sets sold more recently will hopefully have some 800 MHz filtering included but still be properly receptive to DTT transmissions in the 700 MHz band. A substantial but incomplete flushing may not occur before 2025 or even later.

33. The statistical distribution of the renewal period around the average is not given but it would be expected to be non-symmetrical around the mean and skewed towards a longer period rather than a shorter one. Television receivers do last a long time. The key at risk groups when changes are made to terrestrial broadcasting are the elderly and disabled. These are the very groups unlikely to change equipment that is still in working order. They are the viewers who are most dependent on TV at a cost they can afford. It is estimated that two fifths of all older people in the UK say that TV is their main form of company. Therefore there could be a significant portion of installed receivers whose renewal period extends beyond the average. **For the elderly and less wealthy viewer a new set is a significant cost and so advice to government should be mindful of this.**

34. Recent experience (see Reference below) with the proposed changes to the BBC iPlayer service, where some TV sets not yet 5 years old have already ceased to function properly, will not build viewer confidence in service providers or regulators. The iPlayer availability on some sets will not be supported by BBC transmissions and/or receivers from this coming August. This is unacceptable from a public service operator funded by the licence fee. It is wholly wrong, for whatever reason, that a public body should cease to support people who have bought such sets in good faith with the full expectation that they will have a long and useful life well beyond 5 years. This experience does not create confidence among viewers and consumers, especially the less wealthy, that the other public services they value and have invested in will remain available. Whilst not directly relevant to this consultation it is wholly indicative of the growing attitude of service providers to their public and the failure of regulators to protect the public interest.

35. This is also of concern in the light of the Lamy report (Ref 1) which suggested that the UHF in Europe should protect the sub-700MHz DTT bands until 2030 but that the situation should be reviewed again in 2025 in order to evaluate at that time how the demand for MDS will have progressed and whether more spectrum in the sub-700MHz band might be demanded. In the light of this possibility **DTT could be at risk from 2030 or even earlier so that a new DTT set could be obsolete within only a few years of purchase.** Any doubts about the future of the sub-700 band for DTT arising around 2025 will affect viewer confidence and could dampen demand for new receivers before 2030.

36. Another measure which experience has revealed to be of value is attention paid to the performance of aerials and viewer installation quality, especially where interference is mainly from handsets. Planning rules assume a rooftop aerial pointing to a local DTT transmitter and selected to be appropriate for that transmitter. A marginal aerial performance eg as a result of natural degradation due to age or of wideband reception bandwidth can contribute to interference risk. Insofar that the existing viewer support regime introduced for the 800 MHz project can and has dealt with these issues it is to be expected that its extension to the 700 MHz case will also be valuable but perhaps less in extent.

37. Clauses 3.29 to 3.34 summarise some experience of the organisational aspects of the 800 MHz project. Statistical information is provided that gives some idea of the extent of measures taken to identify and suppress interference to DTT. Whilst this is a useful indicator, a more detailed breakdown would have been valuable to better understand the nature of the issues and how they were resolved. As it stands, this information is limited.

38. It is implied in Clause 3.30 that almost two out of three households visited by installers had problems unrelated to MDS which implies that some future visits will also reveal that the reported interference is not caused by MDS. This experience could be extended to the 700 MHz case. It is also implied that only a few households needed a second visit.

39. The table presented in Clause 3.34 (Table 3.2) suggests that the number of filters expected to be sent to viewers on completion of the 800 MHz project will be more than 3 times the actual confirmed cases of interference. Similarly the number of installer visits will also be about 3 times that number. For the 700 MHz project all those filters will need to be replaced but it is clear that there is scope for reducing the numbers of filters needed to be sent out, provided the data exists to reveal how many households actually solved their own problems without the intervention of an installer visit and how many were not needed at all. In the absence of suitable data and depending on the cost of the 700/800 MHz replacement filters it may simply be appropriate to repeat the 800 MHz process.

40. This section of the consultation has provided good theoretical and practical reasons to believe that there will be no significant additional adverse effect on DTT reception from MDS in the 700 MHz band. We note that the primary remedy for mitigating any interference risks that do remain will be the same as that for the 800 MHz case, ie a suitable filter in the aerial lead and, in specific cases, a replacement aerial. It is not clear what remedies will be available for the 4,000 homes where there is no easy remedy.

## **COMMENTS ON SECTION 4: OTHER POTENTIAL COEXISTENCE RISKS**

41. We note these additional risks, recognising their role as a result of experience with the 800 MHz planning process.

42. Given the extensive evidence presented in the consultation documents, there are good grounds for believing that risks from interference from 700 MHz band handsets to DTT receivers will be low especially if those handsets are operated a reasonable distance (more than 50cm, see Clause 4.10) away from the set and its cabling. We note that HDTV signals are more robust than SD.

43. The case of set-top aerials has been traditionally somewhat ambivalent insofar that the DTT service is planned for rooftop aerials. The reduced and highly variable signal strength achievable with a set-top compared to an external one is significant and leads to reception difficulties and greater risk of interference especially from MDS handsets. This particular case has been examined and reported in Clauses 4.2 to 4.6.

44. Whilst advice to viewers is to avoid set-top aerials there are some viewers, albeit a small number probably concentrated in urban areas, who cannot install an external rooftop aerial e.g. tenants in flats with unco-operative landlords or in listed buildings. These may be licence paying viewers and so some attention must be paid to their situation. It is gratifying to note that this has been recognised and tests have been made and reported in the consultation documents. The results suggest that set-top aerials do lead to greater risk of interference and there are very limited means of mitigation. Advice to avoid them is confirmed leaving these viewers with a potentially reduced quality of service. We believe that more robust action is required to assist these viewers

## **COMMENTS ON SECTION 5: TECHNICAL SOLUTIONS FOR MITIGATING COEXISTENCE RISKS**

45. We welcome this summary of solutions available and the additional confidence that filters will be the primary remedy for any harmful interference. It is clear that the technical design for the new filters is somewhat easier than was the case for 800 MHz. We note the options for beginning installation of these filters before and after 2020.

46. Additional measures to improve the interference background at a DTT receiver installation include a change of aerial to a new one with lower bandwidth and without the degradations of age. We note the options for beginning installation of these aerials before and after 2020 and note particularly the effect on a change of aerial would have on reception of the Interim Multiplexes. For as long as these multiplexes are transmitting no steps should be taken to reduce the ability of viewers to receive them.

47. There is also the possibility that improving the quality of household cabling will provide additional protection in some cases.

## **NEXT STEPS**

48. We welcome the approach to government in relation to policy decisions that could lead to an extension of existing viewer support schemes beyond the 800 MHz case.

## **CONSULTATION QUESTIONS**

**Question 1: Do you agree with our conclusions that:**

**a) the risk of interference from mobile handsets to DTT will be minimal**

49. Given the extensive evidence presented in the consultation documents there are good grounds for believing that risks from interference from 700 MHz band handsets to DTT receivers will be low especially if those handsets are operated a reasonable distance (more than 50cm, see Clause 4.10) away from the set and its cabling. We note that High Definition [HD] TV signals carried using the more advanced DVB-T2 transmission standard are more robust than Standard Definition [SD] using the older DVB-T1 system.

**b) the risk of interference from mobile base stations in 700 MHz to DTT will be broadly similar to the risk for 800 MHz, with some tens of thousands of households potentially affected?**

50. The evidence presented suggests that this is the case.

**Question 2: Do you have any comments on our analysis of coexistence risks related to set-top aerials, direct signal ingress to receivers, impact of DTT on mobile services and interference to cable TV?**

51. Set-top aerials have always been outside the planning process despite their use for second sets and in premises where rooftop aerials cannot for various reasons be used. We agree with the consultation analysis that the mitigating options for this case are limited and that viewers should be

encouraged to avoid their use. We note that there may be some viewers who cannot deploy a rooftop aerial.

52. In marginal cases attention to cabling quality in the home could aid in improving performance.

53. The consultation analysis makes a good case for believing that interference caused by DTT to MDS and to Cable TV systems will not be harmful.

**Question 3: Do you agree with our conclusions that DTT receiver filters will be the most effective mitigation technique for the 700 MHz band and that group K aerials will also help to mitigate against 700 MHz coexistence issues?**

54. Yes. A good case has been made from both theoretical and practical evidence that using suitable new filters will be the primary solution to potential and some real interference problems. We also concur that changes to aerials with more appropriate performance will be helpful in some cases. This will lead to expense for viewers and we believe that the affected viewers should not bear the cost of this because it is caused directly by the reallocation of spectrum to MDS.

## **ANNEXES**

### **Annexe 1: Responding to this consultation:**

55. No comment.

### **Annexe 2: OfCom's consultation principles:**

56. No comment.

### **Annexe 3: Consultation Questions:**

57. See Clauses 47-53 above.

### **Annexe 4: DTT reception performance in the presence of 700 and 800 MHz base station signals.**

### **Supplementary document: Study of mobile uplink interference effects upon DTT reception:**

58. We welcome the supplementary document reporting details of tests on MDS handset interference to DTT in domestic premises. Given the 700 MHz band plan arrangements which place handset transmission in the lower 700 MHz band, adjacent to the upper part of the DTT band, this is an essential piece of work. The report is comprehensive and its analysis explores well the important technical aspects that affect the quality and reliability of any predictions for the 700 MHz case that may be made from it.

59. The interference regime generated by handsets is more complex than that of base stations and can be highly dynamic with location and with time. There are several identifiable instances of potential interference and quality conditions of reception environments but not all adverse situations will occur at all times and in all locations. It is possible to identify broadly the conditions in those few "hot spots" where the worst case interference susceptibility may be found and this may help identify specific locations at greatest risk.

60. The conclusions of the study are comforting in predicting that the risks from handsets, even with fully mature networks fully loaded with traffic, will affect relatively few households (about 4,000, see Clauses 1.7 and 8.8 of this report) and are containable within the measures already identified from experience with the 800 MHz case. The performance of filters required to reduce handset interference is modest (see this report Clause 1.6 and consultation document Clause 5.12 and Figure 5.2) compared with the current filters needed for protection from the 800 MHz band.

61. We note that the tests were focussed on interference to rooftop aerial systems. This is appropriate to the planning assumptions for DTT services. Set-top aerials (see also comments above in our Clauses 43 and 44 and in the answer to Question 2) are in use by some viewers but are not recommended where a complete, reliable DTT service is required. Whilst these aerials might perform adequately in high signal strength areas close to main transmitters there is no public service guarantee anywhere in a given service area. If interference is present in addition to a weak DTT signal then set-top aerials are unlikely to supply the receiver with an adequate signal. Filters may help improve reception in some cases but this cannot be assured. We suggest that the status of set top aerials needs to be reconsidered in the light of practical limitations placed on some viewers who cannot control their reception environment.

62. We have commented above (see above Clauses 31 *et seq.*) on the impact of improved specifications for DTT receivers likely to be in place by or after 2020.

## REFERENCES

Report of the High Level Group on the future use of the UHF band in Europe chaired by Pascal Lamy: [http://www.google.co.uk/url?sa=t&rct=j&q=&esrc=s&source=web&cd=3&ved=0ahUKEwiuqZT4\\_dPUAhViLMAKHTZWBDMQFggyMAI&url=http%3A%2F%2Fec.europa.eu%2Finformation\\_society%2Fnewsroom%2Fcf%2Fdae%2Fdocument.cfm%3Fdoc\\_id%3D6721&usg=AFQjCNFljLHjGT3dSNAIrZYO4PXk6vrfZw](http://www.google.co.uk/url?sa=t&rct=j&q=&esrc=s&source=web&cd=3&ved=0ahUKEwiuqZT4_dPUAhViLMAKHTZWBDMQFggyMAI&url=http%3A%2F%2Fec.europa.eu%2Finformation_society%2Fnewsroom%2Fcf%2Fdae%2Fdocument.cfm%3Fdoc_id%3D6721&usg=AFQjCNFljLHjGT3dSNAIrZYO4PXk6vrfZw)

This link provides a brief summary of the report: [http://europa.eu/rapid/press-release\\_IP-14-957\\_en.htm](http://europa.eu/rapid/press-release_IP-14-957_en.htm)

*Which Magazine*, May 2017, pp29-31