

Ofcom Consultation

British Entertainment Industry Radio Group (BEIRG)

Managing the effects of 700 MHz clearance on PMSE and DTT viewers

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Executive Summary

- Any funding scheme should be guided by the principle that PMSE users must be left “no worse off” by the 700MHz band clearance. PMSE users will gain no benefit from the clearance of the 700MHz band, so it is imperative that they are not financially penalised in any way by their enforced relocation. It is BEIRG’s hope that Ofcom and DCMS will support this principle and that all three parties can work together towards the design of a suitable funding scheme.
- It is BEIRG’s position that PMSE users should be able to replace equipment that is any way affected by the 700MHz spectrum clearance. This equipment should be funded for the full cost of a suitable operational replacement.
- BEIRG broadly supports the categories of equipment that may need replacing listed in section 4.3 of the call for inputs, and particularly welcomes the recognition that some equipment that operates in the sub-694MHz spectrum, for example sub-694MHz equipment operating in fixed locations, may need to be replaced as a

consequence of the eventual DTT re-pack. BEIRG believes that a significant quantity of equipment will be affected below 694MHz. However, due to the current unavailability of finalised post 700MHz band clearance white space maps for spectrum below 694 MHz, a true assessment of all affected equipment is not possible at present.

- BEIRG believes that Ofcom has overlooked the possibility that ancillary equipment, such as antenna systems, lavalier microphones etc. will also need to be replaced and should, therefore, also be eligible for funding.
- BEIRG reiterates its challenge to the assumption that no new 700MHz equipment has been purchased since 2014.¹ It has taken two years for new spectrum to be allocated and equipment does not yet exist in this band, meaning that users have had no choice but to replace essential 700MHz equipment with new equipment in the same band. This point has previously been acknowledged and accepted by Ofcom.²
- BEIRG believes that any new equipment operating in the 960-1164MHz band will prove to be more expensive; it will need to be more sophisticated than existing UHF equipment in order to operate in the new band; the market for equipment is likely to be limited in size; and the use of safeguards against unlicensed use of PMSE equipment, to protect safety-of-life services, will add complexity to any new systems if and when such equipment becomes available and is ultimately accepted by the audio PMSE community. At present it is impossible to predict how long this process might take.
- BEIRG understands that Ofcom have modelled for a figure of 5% to cover additional decommissioning and inventorying costs.³ This figure is based on the experience of rental companies. We do not believe that Ofcom has accounted for the additional cost burden placed on other categories of PMSE user, which in some cases will exceed the 5% figure.

Introduction – The principles of a funding scheme

BEIRG appreciates the work that Ofcom has undertaken in modelling the costs of a funding scheme to mitigate the loss of the 700MHz band.

Any funding scheme should be guided by the principle that PMSE users must be left “no worse off” by the clearance. PMSE users will gain no benefit from the clearance of the 700 MHz band, so it is imperative that they are not financially penalised in any way by their relocation. It is BEIRG’s hope that Ofcom and DCMS will support this principle and allow it to guide them in the design of the funding scheme.

In light of this, we are wary that Ofcom does not set out the circumstances under which equipment will be included in the scheme, particularly with regards to affected equipment that operates partially in the 700MHz or entirely in the spectrum below 694MHz. This level of detail is essential to assessing whether the scheme is fair and proportionate.

It is BEIRG’s position that PMSE users should be able to replace equipment that is any way affected by the 700MHz spectrum clearance. This equipment should be funded at the full cost of a suitable replacement. The administering of a scheme based on the asset life of equipment does not reflect the disparate range of users and usages in the PMSE sector. Frequency of use, type of use and frequency of transportation are just a few of the factors that will affect the average lifespan of a given piece of equipment. Basing funding on an average lifespan disadvantages those users who are able to extend the lifespan of their equipment, and therefore budget to

¹ <http://stakeholders.ofcom.org.uk/binaries/consultations/700MHz/summary/main.pdf> Section A12.27

² <http://stakeholders.ofcom.org.uk/binaries/consultations/700MHz/statement/700-mhz-statement.pdf> Section 7.11

³ http://stakeholders.ofcom.org.uk/binaries/consultations/700-clearance-cfi/summary/700_MHz_Implementation.pdf Section 4.8

replace equipment much further in the future than a nominal lifespan. It would be unacceptable to have a situation in which a user was unable to claim any funding because they had been able to extend the life of their equipment beyond the lifespan arbitrarily chosen by Ofcom. In addition, BEIRG does not believe there is sufficient evidence that Ofcom's use of straight line depreciation adequately reflects how many businesses budget for new equipment.

Therefore, it is BEIRG's belief that the following should be included in any funding scheme:

- Any equipment that is tuneable to the frequencies within the 700MHz band, and will therefore lose functionality as a result of the clearance. It is BEIRG's belief - in line with the findings of the Lamy Report⁴ - that, as no PMSE user should be disadvantaged by the clearance of the 700MHz band, even a small reduction in functionality is unacceptable and should make that equipment eligible for funding
- Any equipment that operates in the spectrum below 694MHz, for instance in a fixed location that will no longer be able to operate on those frequencies in a given location due to the re-planning of DTT broadcasts
- Any modular equipment that has been superseded by later models that cannot operate alongside replacement equipment (further details given in answer to question 14)
- Any equipment that, whilst not directly affected by the 700 MHz band clearance, is paired with now obsolete equipment that is affected. For example paired communications systems, racks, antennas, and ancillary equipment such as lavalier microphones (further details given in answer to question 14)
- Additional costs associated with replacing or otherwise altering equipment affected by the 700MHz clearance (further detail given in answer to question 19)

Answers to Questions

Q14: Have there been any developments since 2014 which would affect our estimate of the amount of equipment that PMSE users will need to replace as a result of 700 MHz clearance?

BEIRG broadly supports the categories of equipment that may need replacing listed in section 4.3 of the call for inputs, and particularly welcomes the recognition that some equipment operating in a fixed location in sub-694MHz spectrum may need to be replaced. We do however believe that Ofcom has overlooked the possibility that whole rack-mounted systems may need to be replaced because it is no longer possible to buy like-for-like replacements that are compatible with the older systems.

Following the channel 69 clearance, most users were able to switch out rack-mounted equipment operating in the cleared spectrum for identical modules operating in the spectrum below 790MHz. Technological innovation since then has meant that older modular systems have been superseded by smaller, more efficient systems. Although many of the older systems are still in operation (and still earning 100% rental value), they are no longer in production. This means that if some of the modules in a given audio PMSE system need to be replaced as a result of the 700MHz clearance, users will have to buy new equipment that will not be compatible with the older systems, resulting in the need to replace the entire system including, in many cases, the racks and antenna systems. This issue will be particularly prevalent among higher end professional users who will require equipment that operates across the whole range of new spectrum.

There are several reasons why mixing and matching equipment is unacceptable for professional sound designers. Clearly, transporting and setting up two separate rack-mounted systems instead of one is a major burden in the

⁴ http://ec.europa.eu/newsroom/dae/document.cfm?doc_id=8423 Point 3, page 12

context of a touring production, with associated additional costs including that of transporting much more audio PMSE equipment. But more importantly, professional sound designers invariably require all the equipment used on their production to sound and perform uniformly. The already complicated task of producing a professional live sound production would be made even more difficult if sound designers have to compensate for the difference between old and new equipment – if that even proves possible. If analogue equipment is replaced with a digital equivalent for example, it will be impossible to run the two systems alongside each other without a serious impact on the spectral efficiency of the production.

At the very least, existing wide-band antenna systems that are not replaced in their entirety will require filters to screen out future LTE signals. BEIRG urges Ofcom and DCMS to also consider including the purchase and installation costs of these filters in any future funding package.

In addition to modular systems, there are other systems that may be rendered wholly obsolete as a result of the clearance affecting a portion of the system. An example of this would be duplexed communications systems where one half of the system is in the 700MHz band. A belt pack that transmits in the 700MHz band is clearly affected, but the base station that receives in 700MHz but transmits below 700MHz would also be rendered obsolete by the clearance as they are not tuneable. Therefore the whole system will need replacing.

BEIRG therefore reiterates that, in addition to the wireless equipment already identified in section 4.3, replacement racks, antenna systems, and ancillary equipment such as lavalier microphones whose old connectors are incompatible with replacement body pack transmitters, should also be eligible for funding where necessary. Additionally Ofcom should recognise all the categories of sub-694MHz equipment that will be affected, including equipment that is part of a system alongside 700MHz equipment if like-for-like replacements are no longer available on the market, and sub-694MHz equipment that is paired with 700MHz equipment.

Q15: Are you aware of any developments since the 2014 Statement that would affect our cost estimates?

BEIRG challenges the assumption made in the 2014 statement that no new 700MHz equipment has been purchased since 2014.⁵ PMSE users will have continued to purchase 700MHz equipment for the same reason that they always have: to supplement access to the sub 694MHz UHF where that spectrum is insufficient to cater for a production's needs. In 2014, Ofcom suggested that PMSE users should avoid purchasing new 700MHz equipment because new spectrum would become available.⁶ However, this new spectrum was not confirmed as available until March 2016 and, consequently, equipment does not yet exist in this band, meaning that users have had no choice but to replace essential 700MHz equipment with new equipment in the same 700MHz band.

We recognise that the number of instances of this occurring is likely to be relatively low and will not impact significantly on Ofcom's overall cost estimates, but it is essential that Ofcom recommends to DCMS that this equipment is included in any funding package. PMSE users should not be penalised because of the length of time between the announcement of the clearing of the 700MHz band and the announcement of alternative spectrum.

Q16: Do you have any information or evidence of the likely unit cost of new equipment which operates in the 960-1164 MHz band?

Because the statement confirming the intention to make the 960-1164MHz band available for PMSE use was only released on 10 March 2016, it is far too early to have a firm indication of the cost of any new equipment that may be developed to operate in this new band. There are however three factors that suggest equipment in the new band will be more expensive.

⁵ <http://stakeholders.ofcom.org.uk/binaries/consultations/700MHz/summary/main.pdf> Section A12.27

⁶ <http://stakeholders.ofcom.org.uk/binaries/consultations/700MHz/statement/700-mhz-statement.pdf> Section 7.10

Firstly, it is highly likely that equipment will need to be much more sophisticated than current UHF equipment in order to operate successfully in the band. The 960-1164MHz band presents a harsher and more challenging spectrum environment than the current UHF bands, and will require more advanced filtering techniques which will entail greater costs.

In addition to this, the indicative maps of spectrum availability in the 960-1164MHz band presented to us by Ofcom suggest that equipment will need to cover the entire 200MHz spectrum range in order to be usable in different parts of the country. This is also broadly consistent with the direction of travel for professional PMSE equipment; growing production requirements mean that new technology is expected to be more flexible, allowing it to operate in a variety of different situations including indoor and outdoor operation. This means that buying equipment in the new band may represent a significant upgrade on any previously owned 700MHz equipment.

BEIRG understands that the 2013 equipment survey found that there was no significant price premium on tuning ranges wider than 200MHz, and in fact found a slight decrease in price which it attributed to “noise in the data”.⁷ We believe that this noise in the data can be attributed to the range of equipment owners surveyed. Cheap wide-band radio microphones do exist, but these are not appropriate for professional use. The wide-band equipment that will be used in the new spectrum will have to be of a significantly higher quality than this equipment and so will represent a price premium.

Secondly, Ofcom has already conceded that the market for equipment is likely to be limited in size: “Following clearance, the remaining interleaved spectrum in the 470-694MHz band is likely to be sufficient to serve the needs of the majority of events. We would therefore expect most users to replace their equipment with radio microphones which function in this band.”⁸ From what we understand of the 960-1164MHz band so far and the likely price of equipment capable of operating in it, BEIRG anticipates that the band will be used almost exclusively by higher end professional users such as major broadcasters, further demonstrating the limited size of the market. In order for manufacturers to achieve a return on R&D investment high enough to make a business case to build equipment for the band, the new equipment may have to be sold, at least initially, at a higher price.

Finally, manufacturers do not yet know how equipment will be configured in order to coexist with DME and other services already in the band. It is clearly essential that safety-of-life services operating in the band are protected from harmful interference, which may necessitate the use of safeguards against unlicensed use of PMSE equipment. Depending on the complexity of any such systems, the price of equipment may increase further.

BEIRG believes that Ofcom should recommend to DCMS that there should be additional funding available for PMSE users purchasing equipment in the 960-1164MHz band beyond the 20-40% mark-up already modelled for to account for more frequency agile equipment. This is important firstly because users must not be left materially worse off because they have been forced to purchase more expensive new equipment as a result of the 700MHz clearance, but also because users need to be willing to buy equipment in the new band in order for it to offer a viable business case.

In conclusion, it is very likely that any new equipment will be more expensive to produce than traditional UHF equipment and that this additional cost will, by necessity, be passed on to consumers.

Q17: Have we correctly identified the main categories of PMSE user that 700 MHz clearance will affect? If not, please provide examples of stakeholders which do not fit broadly into any of the groups mentioned.

BEIRG is not aware of any additional type of PMSE user that the 700MHz clearance will affect. BEIRG does however recommend breaking down the user types into further categories in order to facilitate the eventual

⁷ <http://stakeholders.ofcom.org.uk/binaries/consultations/700MHz/summary/main.pdf> Section A12.26

⁸ <http://stakeholders.ofcom.org.uk/binaries/consultations/maximising-benefits-700-MHz-clearance/summary/maximising-benefits-of-700MHz-clearance.pdf> Section 3.17

communication of a funding scheme to all the different audio PMSE user groups. For example, churches, schools and colleges all make extensive use of PMSE equipment but clearly would need to be contacted in different ways to professional PMSE users.

Q18: Do you have any comments on our assessment of the proportion of equipment the different user types account for?

Due to the distribution model for audio PMSE equipment, it is almost impossible to judge the proportion of equipment by user type. With direct sales from manufacturer/distributor to end users, the user type is obvious. For example, broadcasters and larger rental companies tend to 'buy direct'. However, as we descend the supply chain, the picture becomes more blurred. Manufacturers' distribution operations also sell to wholesalers and equipment re-sellers, who, in turn, will service the smaller audio PMSE user base. In some cases there are as many as three transactions before a piece of audio PMSE equipment reaches the end user. For example, a typical chain might be; manufacturer's distributor to wholesaler, wholesaler to small re-seller, re-seller to end user. The figure will vary by manufacturer, but for some the eventual destination of up to 80% of the audio PMSE equipment is ultimately unknown. Given this fact, BEIRG has no way of assessing whether or not Ofcom's assessment of the proportion of equipment by user type is correct.

Q19: In addition to any information provided in response to the survey, do you have any other evidence as to how clearance may financially affect each of the different categories of PMSE equipment owner identified above?

BEIRG understands that Ofcom have modelled for a figure of 5% to cover additional decommissioning and inventorying costs.⁹ This figure is based on the experience of rental companies. We do not believe that Ofcom has accounted for the additional cost burden placed on other categories of PMSE user, which in some cases will exceed the 5% figure.

For instance, due to the amount of equipment being replaced, end users of wireless audio equipment, such as in theatres, will have to call additional cast rehearsals so that the sound designer can test the new equipment. This entails additional costs to cover actors and engineers for at least one additional rehearsal. Full cast calls and orchestra rehearsals can represent a significant cost to some users, especially when considered as a percentage of the value of wireless equipment that they actually own. An orchestra rehearsal can cost between £2,500 and £3,500 depending on the size of the orchestra, and a full cast rehearsal will likely cost around £2,500.

Additionally, Ofcom should consider the burden on small businesses in particular of bringing forward the purchase of a large quantity of equipment. To ease this financial pressure, Ofcom should recommend that DCMS emulate the 2010 funding scheme which allowed these businesses to phase the processing of claims.¹⁰ In addition to this, it may also be necessary in some cases to provide the first funding scheme payment up front, before the affected equipment is traded in. This is because rental companies need to have the new equipment set up and ready before they can swap out the old equipment. It was our experience in the last funding scheme that some smaller users had difficulty clearing this initial hurdle as they lacked sufficient resources to cover the first batch of equipment before receiving funding.

Given that the audio PMSE user base is so fragmented, as demonstrated in our answer to Q18, BEIRG has concerns that the financial survey may result in unrealistic and unrepresentative figures. This is because of the short deadline for the questionnaire; it has been difficult to reach all PMSE user groups in the timeframe while those that have been reached may not have had time to respond. While BEIRG understands that there are time

⁹ <http://stakeholders.ofcom.org.uk/binaries/consultations/700MHz/statement/700-mhz-statement.pdf> Sections 7.16-7.18

¹⁰ http://stakeholders.ofcom.org.uk/binaries/consultations/pmse_funding/statement/statement.pdf Section 4.37

pressures involved, if the numbers generated by the questionnaire are unrepresentative, there is a risk that some elements of the audio PMSE sector will be excluded from the results.

Conclusion

BEIRG extends its gratitude for the vast amount of work being undertaken by both Ofcom and DCMS to ensure that PMSE users are properly compensated for the disruption, cost and risk of being moved out of the 700MHz band.

It is of vital importance that Ofcom and DCMS commit to the principle that PMSE users should be left “no worse off” and, in light of this, include in a funding scheme all equipment that is any way affected by the 700MHz spectrum clearance along with the costs associated with the physical replacement of any equipment or systems as well as retraining costs. The equipment should be funded for the full cost of a suitable replacement.

British Entertainment Industry Radio Group

The British Entertainment Industry Radio Group (BEIRG) is an independent, not-for-profit organisation that works for the benefit of all those who produce, distribute and ultimately consume content made using radio spectrum in the UK. Venues and productions that depend on radio spectrum include TV, film, sport, theatre, churches, schools, live music, newsgathering, political and corporate events, and many others. BEIRG campaigns for the maintenance of ‘Programme Making and Special Events’ (PMSE) access to sufficient quantity of interference-free spectrum for use by wireless production tools such as wireless microphones and wireless in-ear monitor (IEM) systems.

As well as being vital in producing live content, wireless PMSE technologies play a key role in helping to improve security and safety levels within the entertainment industry and other sectors. Their benefits include improving the management of electrical safety, the reduction of noise levels, the development of safety in communications and reducing trip hazards as well as providing an essential tool for the security orientated services. Wireless equipment and the spectrum it operates in are now crucial to the British entertainment industry.

BEIRG is a member of the Association of Professional Wireless Production Technologies (APWPT)¹¹, which promotes on an international level the efficient and demand-driven provision and use of production frequencies for professional event productions, as well as safeguarding such production frequencies for the users on the long run.

¹¹ <http://www.apwpt.org/>