Your response

Question	Your response
Section 3 –Spectrum use by the PMSE sector in the UK **Question 1**: What are your views on how our processes work - for example our online booking system, turna-round times, and event coordination. Do you think the current approach works well? How could we improve it?	Confidential? – No I think the current system works well. Although filming schedules change daily, so locations change, and it is not always practical to know or book or amend bookings ahead of time to have licences in place. There is low awareness among film and TV production staff and studios of the need for wireless licensing. The sound engineers who use the equipment may have more knowledge but are reluctant to raise an additional cost to producers who could view it as the engineer costing them more money. If the last freelance engineer didn't incur that cost, next time they might choose to employ the engineer who costs the production less money. With the current system it's good to be able to talk to an experienced coordinator on the phone when required. In Film/ TV/ Events, sometimes our production staff who are booking frequencies are not experienced with wire-less and need to be able to get advice from Ofcom PMSE. It would be good if the pricing was more clear regarding individual frequencies vs complete TV channels and time caps i.e. does it cost more for 3 x 24 hour periods or 1 whole week/ month/ year etc.
Section 4 – PMSE historic trends **Question 2**: Do you have any com-ments on how we have analysed and characterised wireless microphone and IEM demand, or suggestions for alternative ways of characterising this demand?	Confidential? – No In my opinion, it would take a very wide survey to get a true picture of demand. There is a lot more use of wire-less equipment than is declared and licenced. Many us-ers who buy or rent equipment are not even aware of li-censing laws. In summary, I suspect the demand is more than is regis-tered.
Question 3: Do you have any com-ments on how we have analysed and characterised wireless video demand, or suggestions for alternative ways of characterising wireless video demand?	Confidential? – No

Question	Your response
## Section 5 – Future trends and opportunities ## Wireless audio ### Drivers of demand **Question 4:** What factors have driven changes in the demand for audio PMSE applications, specifically for: a) the increased use of coordinated wireless microphones and IEMs, particularly the peak number of simultaneous assignments used at the largest events? b) the slight decline in the number of national wireless microphone licences (UHF channel 38 and VHF)? Has the extent of use of these licences changed, and if so why? c) the declines in talkback, fixed audio links and ADS licences?	Confidential? – No a) There has been increased demand in Film and TV production due to changes in technology and working practices. It is now normal for every actor with a speaking part, to wear a wireless microphone. This has only become practical since the adoption and development of truly portable multitrack recorders, allowing a track for each microphone. Post production editing systems are now, more than ever, able to cope with many more tracks, so more microphones are deployed on set, most of them wireless, to record dialogue, effects and ambiance. There is also more demand for IEM channels because directors, creatives and producers are more demanding in wanting to hear different things. People are used to wireless being reliable these days, so wireless feeds/ speakers/ earpieces are used as solutions for creative and practical problems on set. I think you see more demand for coordination at large events because it wouldn't be technically possible to stage these events without coordination. Where it is technically possible to run smaller events without coordination, I suspect not all frequencies are licensed. It is normally down to the freelance Sound Engineer to coordinate frequencies in Film and TV production. So it is down to the freelance engineer if they want to raise the issue of paying for licences and filling in unfamiliar forms with their employer or not. b) I think the use of VHF equipment has declined in favour of UHF, so this may explain decline in VHF licences. c) don't know
Question 5: What factors could drive further changes in the demand for audio PMSE applications in the future, and what will this mean for future demand, specifically for: a) coordinated wireless microphones and IEMs, particularly	Confidential? – Y / N

Question	Your response
the peak number of simultaneous assignments used at the largest events? b) national wireless microphone licences (UHF channel 38 and VHF)? c) talkback, fixed audio links and ADS licences?	
Question 6: Do you agree that, given the trends, we are right to focus on wireless microphones/IEMs?	Confidential? – N
Changes in the take-up of bands already available **Question 7:** What factors have driven the take-up of different bands for wireless audio? What are the barriers to greater use of the DME band?	Confidential? – N DME take up barriers: Cost of new transmitters and receivers, new RF distribution units, new amplifiers, Cost of new antennas, Cost of new cabling. With UHF, new components can be added to an existing system, DME requires replacing all components through the chain, which is a big investment. UHF can be used worldwide. DME is limited to UK. DME requires a licence for each location and each 24 hours of use. This is a cost and a hassle. If it was included in Chan 38 shared licence it would be easier and the cost would be a known item.
Question 8: What actions could enable greater take-up of the DME, DECT and licence exempt bands in the future?	Confidential? – N If DME was included in Chan 38 shared licence it would be easier and the cost would be a known item. Licence exempt bands are already congested so unreliable. If, for example, the channel 70 allocation, or 2.4GHz was larger, it could be more viable. I wouldn't use equipment in licence exempt bands because when I arrive at a location it is already full.

Question	Your response
Changes in spectrum availability **Question 9:** Which potential additional bands might be suitable for wireless audio applications, particularly microphones and IEMs at the largest events and venues?	Confidential? – N The best approach is to keep and protect the bands we currently use. We have built our careers, investments and cultural assets on these frequency bands. We make them work and should not be disadvantaged by a hostile takeover.
Question 10: To what extent do the characteristics of different audio applications drive their requirements for spectrum – for example particular requirements for latency, resilience or capacity?	Confidential? – N Latency is a big issue when considering changes in wireless technology for Film, TV, Events and Music. All my wireless microphones and IEMs need to have zero latency. Microphones can't be mixed together if they have different latency. Singers can't sing with an IEM if it has latency. But comms systems can use packet data and tolerate a bit of latency. Resilience is essential in high-end Film and TV work.
Changes in efficiency of spectrum use **Question 11:** What changes in spectrum use (technology, working practices, different bands, etc) have enabled audio wireless growth to be accommodated to date, particularly the increased use of wireless microphones and IEMs at the largest events and venues in the context of reduced UHF spectrum availability?	Confidential? – N Engineers have had to learn coordination skills. Scanning equipment and Coordination software has developed and is helping to make robust frequency plans. If someone is equipped with DME, they can work alongside another production using UHF. New equipment uses spectrum more efficiently to fit more channels into the same amount of spectrum. New equipment has developed which is less susceptible to intermods and interference.
Question 12: What technologies are currently available or are being developed which can improve audio spectrum efficiency in the future, particularly in the use of wireless microphones and IEMs at the largest events and venues?	Confidential? – N Scanners, spectrum analysers, Receivers with built-in scanners, coordination software and apps, are all helping to improve audio spectrum efficiency.

Question	Your response
Question 13: Are there any barriers to adopting more efficient technologies for audio applications, particularly for wireless microphones and IEMs at the largest events and venues? What could industry do and what could Ofcom do to facilitate greater use of those technologies?	Confidential? – N Cost of re-equipping. Incompatibility with existing equipment. The current model for freelancers is they don't get paid enough for labour costs to make a living, so they rely on hiring out equipment they own as well. It is not affordable to buy all new equipment and if current equipment became redundant it would be tragic. Industry and Ofcom can make the case for protection of the UHF spectrum we rely on.
Question 14: What changes to working practices and spectrum planning could improve audio spectrum efficiency in the future, particularly in the use of wireless microphones and IEMs at the largest events and venues?	Confidential? – Y / N
Question 15: Are there any barriers to adopting working practices that could enable more efficient use of spectrum by audio applications, particularly for wireless microphones and IEMs at the largest events and venues? What could industry do and what could Ofcom do to facilitate those efficiencies?	Confidential? – Y / N

Question	Your response
## Wireless video ### Drivers of demand **Question 16:** What factors (such as more complex events and use of higher resolution equipment) have driven the demand for wireless video bandwidth, in particular for: a) the increased bandwidth required for the largest sporting events such as Formula 1 at Silverstone and The Open Championship? b) the bandwidth required for nationally important state events such as The Coronation? c) the slow growth or decline in bandwidth used at horse racing fixtures?	Confidential? – Y / N
Question 17: What factors could drive further changes in the demand for wireless video bandwidth in the future, and what will this mean for future demand, in particular for: a) the bandwidth required for the largest sporting events like Formula 1 at Silverstone and The Open Championship? b) the bandwidth required for nationally important state events such as The Coronation? c) the bandwidth used at horse racing fixtures and other major sporting events?	Confidential? – Y / N

Question	Your response
Potential news bands **Question 18:** What factors have influenced the degree of take-up of existing bands used by wireless video applications, particularly the growth in take-up of the 7 GHz band?	Confidential? – Y / N
Question 19: Which potential additional bands might be suitable for video PMSE applications, particularly at the largest events and venues?	Confidential? – Y / N
Question 20: To what extent do the characteristics of different video applications drive their requirements for spectrum – for example particular requirements for resilience or capacity?	Confidential? – Y / N
Changes in efficiency of spectrum use **Question 21:** What technologies are currently available or are being developed which can improve wireless video spectrum efficiency in the future?	Confidential? – Y / N
Question 22: Are there any barriers to adopting more efficient technologies for wireless video? What could industry do and what could Ofcom do to facilitate greater use of those technologies?	Confidential? – Y / N
Question 23: What types of video demand could realistically be supported by private (for example 5G) networks?	Confidential? – Y / N
Question 24: What changes to working practices and spectrum planning could improve video spectrum efficiency in the future, particularly in the	Confidential? – Y / N

Question	Your response
use of wireless microphones and IEMs at the largest events and venues?	
Question 25: Are there any barriers to adopting working practices that could enable more efficient use of spectrum by wireless video? What could industry do and what could Ofcom do to facilitate those efficiencies?	Confidential? – Y / N
Other comments **Question 26:** Do you have any other comments or views on the issues raised in this document?	Confidential? – N Ofcom and Industry should be working to protect Spectrum for PMSE use. This is a Cultural Asset and important for UK society. Those who would want to make a hostile takeover of the PMSE spectrum have more resources than we do to find alternative technologies and spectrum efficiencies. I believe our industry has already done a lot and is close to peak technology with regards to the latency free RF equipment we need to make Film and TV. I think less effort should go into looking for other places to go for PMSE, and more into ring-fencing what we have. Our industry should have a long-term future.

Please tell us how you came across about this consultation.

- [X] Email from Ofcom
- [ ] Saw it on social media
- [ ] Found it on Ofcom's website
- [ ] Found it on another website
- [ ] Heard about it on TV or radio
- [ ] Read about it in a newspaper or magazine
- [ ] Heard about it at an event
- [ ] Somebody told me or shared it with me
- [ ] Other (please specify)

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