

## Your response

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<p><b>Section 3 –Spectrum use by the PMSE sector in the UK</b></p> <p><b>Question 1:</b> What are your views on how our processes work - for example our online booking system, turn-around times, and event coordination. Do you think the current approach works well? How could we improve it?</p>	<p>Confidential? – N</p> <p>I work in location sound and a lot of jobs can happen at short notice, so the on-line booking system is useful. Sometimes it does not have spectrum availability displayed, although in reality it is possible with some diligent co-ordination, so a quicker response time to enquiries would be helpful in those cases.</p>
<p><b>Section 4 – PMSE historic trends</b></p> <p><b>Question 2:</b> Do you have any comments on how we have analysed and characterised wireless microphone and IEM demand, or suggestions for alternative ways of characterising this demand?</p>	<p>Confidential? – N</p> <p>I'm not sure that your analysis captures the multitude of small scale operations that take place every day across the UK, which rely on using Ch 38 in the first instance.</p>
<p><b>Question 3:</b> Do you have any comments on how we have analysed and characterised wireless video demand, or suggestions for alternative ways of characterising wireless video demand?</p>	<p>Confidential? – Y / N</p>

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<p><b>Section 5 – Future trends and opportunities</b></p> <p><b>Wireless audio</b></p> <p><b>Drivers of demand</b></p> <p><b>Question 4:</b> What factors have driven changes in the demand for audio PMSE applications, specifically for:</p> <ul style="list-style-type: none"> <li>a) the increased use of coordinated wireless microphones and IEMs, particularly the peak number of simultaneous assignments used at the largest events?</li> <li>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?</li> <li>c) the declines in talkback, fixed audio links and ADS licences?</li> </ul>	<p>Confidential? – N</p> <p>A) In factual and non-scripted television production it has become the norm to have multiple contributors on radio mics. Technological advances in recent years, mean that it is now possible to have a portable field mixer with up to a dozen or so inputs, whereas we used to be limited to four, and productions have now come to expect multiple radio mics.</p>
<p><b>Question 5:</b> 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:</p> <ul style="list-style-type: none"> <li>a) coordinated wireless microphones and IEMs, particularly the peak number of simultaneous assignments used at the largest events?</li> <li>b) national wireless microphone licences (UHF channel 38 and VHF)?</li> </ul>	<p>Confidential? – Y / N</p>

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c) talkback, fixed audio links and ADS licences?	
<b>Question 6:</b> Do you agree that, given the trends, we are right to focus on wireless microphones/IEMs?	Confidential? – Y / N
<p><b>Changes in the take-up of bands already available</b></p> <p><b>Question 7:</b> What factors have driven the take-up of different bands for wireless audio? What are the barriers to greater use of the DME band?</p>	Confidential? – Y / N
<b>Question 8:</b> What actions could enable greater take-up of the DME, DECT and licence exempt bands in the future?	Confidential? – Y / N
<p><b>Changes in spectrum availability</b></p> <p><b>Question 9:</b> Which potential additional bands might be suitable for wireless audio applications, particularly microphones and IEMs at the largest events and venues?</p>	Confidential? – Y / N
<b>Question 10:</b> To what extent do the characteristics of different audio applications drive their requirements for spectrum – for example particular requirements for latency, resilience or capacity?	<p>Confidential? – N</p> <p>For broadcast television and video production, both low latency and high quality audio, requiring decent bandwidth, are of utmost importance. This puts a practical limit on how many radio mics can be operated simultaneously in one 8 MHz channel band, even with the advantages of digital systems. With the increasing mic counts of modern productions, we increasingly see the need to spread radio mics across more than one channel band.</p>

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<p><b>Changes in efficiency of spectrum use</b></p> <p><b>Question 11:</b> 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?</p>	<p>Confidential? – Y / N</p>
<p><b>Question 12:</b> 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?</p>	<p>Confidential? – Y / N</p>
<p><b>Question 13:</b> 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?</p>	<p>Confidential? – Y / N</p>
<p><b>Question 14:</b> 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?</p>	<p>Confidential? – Y / N</p>
<p><b>Question 15:</b> 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</p>	<p>Confidential? – Y / N</p>

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Ofcom do to facilitate those efficiencies?	
<p><b>Wireless video</b></p> <p><b>Drivers of demand</b></p> <p><b>Question 16:</b> What factors (such as more complex events and use of higher resolution equipment) have driven the demand for wireless video bandwidth, in particular for:</p> <ul style="list-style-type: none"> <li>a) the increased bandwidth required for the largest sporting events such as Formula 1 at Silverstone and The Open Championship?</li> <li>b) the bandwidth required for nationally important state events such as The Coronation?</li> <li>c) the slow growth or decline in bandwidth used at horse racing fixtures?</li> </ul>	Confidential? – Y / N
<p><b>Question 17:</b> 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:</p> <ul style="list-style-type: none"> <li>a) the bandwidth required for the largest sporting events like Formula 1 at Silverstone and The Open Championship?</li> <li>b) the bandwidth required for nationally important state events such as The Coronation?</li> </ul>	Confidential? – Y / N

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c) the bandwidth used at horse racing fixtures and other major sporting events?	
<p><b>Potential news bands</b></p> <p><b>Question 18:</b> 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?</p>	Confidential? – Y / N
<p><b>Question 19:</b> Which potential additional bands might be suitable for video PMSE applications, particularly at the largest events and venues?</p>	Confidential? – Y / N
<p><b>Question 20:</b> To what extent do the characteristics of different video applications drive their requirements for spectrum – for example particular requirements for resilience or capacity?</p>	Confidential? – Y / N
<p><b>Changes in efficiency of spectrum use</b></p> <p><b>Question 21:</b> What technologies are currently available or are being developed which can improve wireless video spectrum efficiency in the future?</p>	Confidential? – Y / N
<p><b>Question 22:</b> 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?</p>	Confidential? – Y / N
<p><b>Question 23:</b> What types of video demand could realistically be supported by private (for example 5G) networks?</p>	Confidential? – Y / N

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<p><b>Question 24:</b> What changes to working practices and spectrum planning could improve video spectrum efficiency in the future, particularly in the use of wireless microphones and IEMs at the largest events and venues?</p>	<p>Confidential? – Y / N</p>
<p><b>Question 25:</b> 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?</p>	<p>Confidential? – Y / N</p>
<p><b>Other comments</b></p> <p><b>Question 26:</b> Do you have any other comments or views on the issues raised in this document?</p>	<p>Confidential? – N</p> <p>I work as a location sound recordist in factual television and video production. I own 10 UHF radio mics – 2 of which are wide-band (470 – 694), 3 of which are wide-band (600 – 694) and 5 of which are limited to a 30 MHz range, centred around Ch 38. I also own 4 x IEM transmitters and 8 x IEM receivers, which I operate in Ch 65 &amp; Ch 70.</p> <p>Having access to Ch 38 in the UK is vital to be able to operate on any given day and at any location, especially as the nature of my work is usually very short notice with minimal planning time.</p> <p>If I had to replace this equipment because of loss of access to the UHF spectrum, this would incur considerable cost, which with the current state of the industry I would not be able to afford.</p>

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