



Submissions to Consultation 10/37

**Responses received on Consultation 10/37 -
Future Spectrum Availability for Programme
Making & Special Events**

Submissions received from respondents

Document No:	10/68s
Date:	1st September 2010

Consultation:	10/37
Date:	27th April 2010

Contents

1	Mr. Amir Carmel (sole trader, PMSE sector)	2
2	Broadcast RF Ltd	3
3	Eircom/Meteor.....	4
4	Orbital Sound Ltd	5
5	Mr. Paul Hope (cameraman, PMSE sector)	8
6	Safety & Communications Ltd.....	10
7	TV Mobiles Ltd.....	11
8	Vodafone Ltd.....	13

1 Mr. Amir Carmel (sole trader, PMSE sector)

Q1 - Access to band 2 is useful. (821-832Mhz)
Band 3 & 4 will depend on equipment availability.

Q2 – Ch. 38 Should be made available to PMSE. It would be very practical to allocate PMSE channels same as in the UK.

Q3 - Ch 38 alone is not enough to satisfy demand.

Q4 – Any access in the 470-862 range will be useful to us, for as long as possible. This is very valuable in terms of using equipment already available and spread future investment in new equipment.

Q5 – 863-865 have limited use to us.

2 Broadcast RF Ltd

Q1 – N/A to BRF

Q2 – N/A to BRF

Q3 – N/A to BRF

Q4 – N/A to BRF

Q5 – N/A to BRF

Q6 – We of course would like to maintain as much of the spectrum as possible, however in the UK we only have 2395Mhz available in the 2.3GHz – 2.4Ghz band, and that works ok. As long as we had all spectrum in the 2.2Ghz-2.3Ghz band, we can work with that.

Q7 – Yes, exclusive use would be great. Although we still occasionally need to put fixed pt to pt links in this band (2.2Ghz to 2.3Ghz).

Q8 – There is a low demand as no manufacturers seem to be able to offer a working system at these frequencies. Performance generally is quite bad and not good enough for the work we do.

Q9 – No – you will need to talk to the manufacturers of the kit – Major players – Link & Gigawave.

Q10 – U6 not so much although some of our equipment goes below 7125MHz, but not much. Never really use this band. U7 band is most certainly the future when it comes to 7GHz wireless camera systems. We currently own 4 x 7GHz wireless cameras and 2 x 7Ghz fixed pt to pt links. These are very useful bands to occupy when the 2GHz bands are very full. For example if the Ryder Cup came to Ireland again, we would most certainly be wanting 7Ghz wireless camera frequencies. It's the future.

Q11 – No as long as the band is managed properly, there will be no problems.

Q12 – no other bands are required. Maybe the upper 2.5-2.7GHz band?

3 Eircom/Meteor



eircom Group
comprising of eircom Ltd and Meteor Mobile Communications

Response to ComReg Doc. 10/37

***Consultation on
Future Spectrum Availability For Programme Making &
Special Events***

Wireless Microphones/IEMs & Wireless Cameras

10 June 2010

DOCUMENT CONTROL

Document name	eircom Group response to consult on Future Spectrum Availability 1037.pdf
Document Owner	eircom
Last updated	10/06/10
Status	

Please note that for the purposes of the Freedom of Information Acts, 1997 and 2003, and indeed generally, information supplied by eircom to you may contain commercially sensitive information consisting of financial, commercial, technical or other information whose disclosure to a third party could result in financial loss to eircom, or could prejudice the competitive position of eircom in the conduct of its business, or could otherwise prejudice the conduct or outcome of contractual or other negotiations to which eircom is a party.

Accordingly, you are requested to contact a member of eircom's Regulatory Operations where there is a request by any party to have access to records which may contain any of the information herein, and not to furnish any information before eircom has had an opportunity to consider the matter.

TABLE OF CONTENTS

EXECUTIVE SUMMARY	4
RESPONSE TO CONSULTATION QUESTIONS.....	5
Q. 1. Which (if any) of bands 1-4 listed above should ComReg consider for wireless microphone/IEM applications in the future? Please set out the reasons for your answer. Is the necessary equipment currently available or about to become available?.....	5
Q. 2. In your view, should ComReg allocate Channel 38 exclusively to PMSE (as in the UK)? Please give reasons for your answer.....	5
Q. 3. Would this Channel be sufficient to satisfy demand? Please give reasons for your answer.....	5
Q. 4. In your opinion, would access to the interleaved spectrum in the DTT band plan on a non-interference, non-protected basis be useful for Wireless Microphone/IEM applications? If so, why?.....	5
Q. 5. Is the sub-band 863 – 865 MHz suitable for PMSE? Are there any difficulties or issues with this band, such as interference or lack of available equipment?.....	5
Q. 6. In your view, is it important to maintain some spectrum in WiCam Band C (2.3 – 2.4 GHz) for future Wireless Camera applications? How much might be reasonably required? Please give reasons for your answer	5
Q. 7. In your view, should ComReg consider making WiCam Bands A and B available exclusively for Wireless Cameras in the greater Dublin area? Please give reasons for your answer. (The bands could possibly continue to be available on a secondary, non-interference, non-protected basis for Wireless Camera assignments elsewhere in Ireland.).....	6
Q. 8. What, in your opinion, are the reasons for the low demand for Wireless Camera frequency assignments in WiCam Band D? Are there (for example) interference, propagation characteristic or equipment availability problems which affect this band?.....	6
Q. 9. Is there anything that could be done to increase the usage of this band?.....	6
Q. 10. Is there equipment available for use in the U6 and L7 bands for Wireless Camera applications? If so, should ComReg open these bands for such applications on a secondary, non-interference non-protected basis?	6
Q. 11. Apart from equipment availability concerns, do you foresee any other issues which may affect the operation of Wireless Cameras in interleaved spectrum within the U6 or L7 bands?	6
Q. 12. In your opinion apart from those listed above, are there any other bands which ComReg should consider for Wireless Camera applications in future? If so, please indicate what bands should be considered giving reasons for your answer.....	7

EXECUTIVE SUMMARY

eircom Group welcomes the opportunity to respond to this consultation. As ComReg has identified, PMSE has both cultural and social importance in Ireland. The temporary and secondary use nature of PMSE makes it difficult to identify or to warrant spectrum specific to its use. However, it is important that the PMSE industry is supported, particularly as some of the traditional bands used for PMSE are evolving to support next generation mobile broadband, such as the Digital Dividend (790 - 862 MHz) and the 2.3 GHz band. ComReg has clearly outlined the current use of spectrum by PMSE (Wireless Microphones) and it would seem that the best opportunity is to make further use of interleaved spectrum in the UHF band (470 - 790 MHz). In addition, as the UK is planning to make channel 38 available for PMSE, there should be sufficient economies of scale to make this channel attractive for PMSE use in Ireland also.

Similarly, ComReg has given a very good analysis of spectrum currently used for PMSE (Wireless Cameras) and alternative options. ComReg has consulted on the 2.3 GHz band and has rightly identified up to 70 MHz of this as potential spectrum for national use on a technology and service neutral basis. In practice, as indicated at the ComReg briefing on the future of the 2.3 GHz band earlier in 2010, less than 70 MHz will be available, due to the requirement for guard bands with the 2.4 GHz ISM band. 70 MHz is only equivalent in size to the current 900 MHz GSM band and will be barely enough to support 3 to 4 operators deploying next generation mobile broadband technologies such as WiMAX or LTE. In addition, it is important that existing services such as eircom's RurTel solution are protected from interference. For these reasons, it is recommended that Wireless cameras are restricted to the 2025 -2110 and 2200 - 2300 MHz bands, as well as the 10.3 to 10.5 GHz band.

It is important that PMSE does not impact on other licensed users of spectrum and for this reason, it is strongly recommended that PMSE is not deployed in the U6 and L7 Microwave bands. eircom, Meteor and other operators use these bands for high capacity point to point Microwave links, designed for very high levels of availability (99.999). It would be extremely hard to ensure that PMSE would not interfere with these Microwave links if they were located in the same region.

RESPONSE TO CONSULTATION QUESTIONS

Q. 1. Which (if any) of bands 1-4 listed above should ComReg consider for wireless microphone/IEM applications in the future? Please set out the reasons for your answer. Is the necessary equipment currently available or about to become available?

It would seem that the best opportunity is to make further use of interleaved spectrum in the UHF band (470 - 790 MHz). In addition, as the UK is planning to make channel 38 available for PMSE, there should be sufficient economies of scale to make this channel attractive for PMSE use in Ireland also.

Q. 2. In your view, should ComReg allocate Channel 38 exclusively to PMSE (as in the UK)? Please give reasons for your answer.

As the UK is planning to make channel 38 available for PMSE, there should be sufficient economies of scale to make this channel attractive for PMSE use in Ireland also. In terms of a secondary Digital Dividend block, it is unlikely that it would encompass as low as channel 38, and hence that the possibility of a secondary Digital Dividend block should not stop the allocation of channel 38 exclusively to PMSE.

Q. 3. Would this Channel be sufficient to satisfy demand? Please give reasons for your answer.

No comment

Q. 4. In your opinion, would access to the interleaved spectrum in the DTT band plan on a non-interference, non-protected basis be useful for Wireless Microphone/IEM applications? If so, why?

This would seem to be a logical continuation of the existing practice and as the Digital Dividend using 790 - 862 MHz will take place across all of Europe; it is likely that focus will be placed on making equipment available for these frequencies.

Q. 5. Is the sub-band 863 – 865 MHz suitable for PMSE? Are there any difficulties or issues with this band, such as interference or lack of available equipment?

No comment

Q. 6. In your view, is it important to maintain some spectrum in WiCam Band C (2.3 – 2.4 GHz) for future Wireless Camera applications? How much might be reasonably required? Please give reasons for your answer

ComReg has consulted on the 2.3 GHz band and has rightly identified up to 70 MHz of this as potential spectrum for national use on a technology and service neutral basis. In practice, as indicated at the ComReg briefing on the future of the 2.3 GHz band earlier in 2010, less than 70 MHz will be available, due to the requirement for guard bands with the 2.4 GHz ISM band. 70 MHz is only equivalent in size to the current 900 MHz GSM band and will be barely enough to support 3 to 4 operators deploying next generation mobile broadband technologies such as WiMAX or LTE.

In addition, it is important that existing services such as eircom's RurTel solution are protected from interference. For these reasons, it is recommended that Wireless cameras are restricted to the 2025 -2110 and 2200 - 2300 MHz bands, as well as the 10.3 to 10.5 GHz band.

Q. 7. In your view, should ComReg consider making WiCam Bands A and B available exclusively for Wireless Cameras in the greater Dublin area? Please give reasons for your answer. (The bands could possibly continue to be available on a secondary, non-interference, non-protected basis for Wireless Camera assignments elsewhere in Ireland.)

No comment

Q. 8. What, in your opinion, are the reasons for the low demand for Wireless Camera frequency assignments in WiCam Band D? Are there (for example) interference, propagation characteristic or equipment availability problems which affect this band?

No comment

Q. 9. Is there anything that could be done to increase the usage of this band?

No comment

Q. 10. Is there equipment available for use in the U6 and L7 bands for Wireless Camera applications? If so, should ComReg open these bands for such applications on a secondary, non-interference non-protected basis?

It is important that PMSE does not impact on other licensed users of spectrum and for this reason; it is strongly recommended that PMSE is not deployed in the U6 and L7 Microwave bands. eircom, Meteor and other operators use these bands for high capacity point to point Microwave links, designed for very high levels of availability (99.999). It would be extremely hard to ensure that PMSE would not interfere with these Microwave links if they were located in the same region.

Q. 11. Apart from equipment availability concerns, do you foresee any other issues which may affect the operation of Wireless Cameras in interleaved spectrum within the U6 or L7 bands?

See answer to question 10

Q. 12. In your opinion apart from those listed above, are there any other bands which ComReg should consider for Wireless Camera applications in future? If so, please indicate what bands should be considered giving reasons for your answer.

No comment

4 Orbital Sound Ltd

Orbital Sound Ltd. Consultation Response for “Future Spectrum Availability for Programme Making & Special Events

Reference: Submission re ComReg 10/37

Orbital Sound Limited is one of the largest suppliers of sound and communications equipment to the theatrical and event sectors in the United Kingdom. We own around £1.5 million of equipment working in the band 470 – 862 MHz, and will be coordinating the use of up to a thousand ways of radio equipment in the West End, and on national and international tours at any given time.

Question 1

None of these options should be considered; option 1 is too small and remote, and requires overly long antennae, option 2 is also small, and liable to be very noisy. Options 3 and 4 are too high frequency for usable propagation characteristics – for example, for transmitter packs to work reliably beneath clothes. Modern equipment is not available in any of these bands, and, as they are not under serious consideration in other markets to the best of my knowledge, equipment is unlikely to be produced. There are wireless microphones available in the 2.4GHz band, but they are, in our opinion (an opinion that is also borne out by the behaviour of our competitors and clients) unsuitable for professional use.

Question 2

Yes; it is well positioned to be used alongside interleaved spectrum. Furthermore, a channel licensed in this way (like channel 69 is now) is a proven asset to all scales of use. The loss of shared PMSE frequencies would be the one thing in the digital switchover that could have the largest negative impact on the entertainment sector in Ireland. Whilst channel 38 is not under consideration in this way in mainland Europe, the nature of touring theatre in the UK and Ireland has made the availability of channel 69 or an alternative an essential part of frequency planning for these shows.

Question 3

Absolutely not; the analysis of spectrum use for wireless microphones on page 12 of the consultation document is fatally flawed. Although the channel bandwidth of this equipment is nominally 200kHz, up to 400kHz separation is required between channels. Furthermore, vastly increased spacing is always required in non-trivial systems to avoid intermodulation products. A large touring musical can often require in excess of 40MHz of clear spectrum for radio microphones alone. It should also be borne in mind that, even in the absence of radio microphones, the safe running of most large shows and events is heavily dependent on radio communications equipment, much of which works in this band.

Question 4

For the reason explained above, this is absolutely essential. Furthermore, adopting a similar regime to the UK will maintain the positive synergy that exists between the entertainment markets in the two countries.

Question 5

No; this block of spectrum is too small and too remote from other usable spectrum (post-2012) to warrant consideration. There is no guard band between it and the proposed wireless data uplink, and it is heavily used by non-licensed devices such as cordless telephones, baby monitors, and non-professional wireless microphones.

Question 6

Not applicable

Question 7

Not applicable

Question 8

Submissions Received-Future Spectrum Availability for PMSE

Not applicable

Question 9

Not applicable

Question 10

Not applicable

Question 11

Not applicable

Question 12

Not applicable

*Theo Holloway 9/6/2010
Senior Technical Support, Orbital Sound Ltd*

5 Mr. Paul Hope (cameraman, PMSE sector)

**Response to
COMREG Document 10/37
From
Paul Hope, Cameraman: 087-2536222**

Q1 to 5 are not applicable to me, as I've no knowledge of those applications or no response.

Q6: As the sort of RF technology (COFDM) used in this range is only commonly available for hire or purchase in the recent few years, many people in the industry have purchased hardware, or ancillary equipment, to work in these frequency ranges. This equipment is actively in use as most TV production is acquired, and/or broadcast, in standard definition (SD) and will remain so for the coming 5 years or more. RTE currently has no high-definition (HD) production studios and it looks like at least 5 years before there is full HD production here, as UK broadcasters are still acquiring in and broadcasting SD. The 2012 switchover in the UK is primarily to facilitate more channels in SD rather than specifically allow HD channels. With the advent of full HD broadcasting, new hardware will need to be purchased for wireless camera systems as bandwidth used is more than 8mhz.....until now. In the next few months, HD COFDM systems are becoming available using only 8mhz bandwidth which would utilise channels in this range and negate the need for wider bandwidth transmitters.

Q7/8/9/11: Whilst the EIRP output of most on-camera transmitters is usually between 200mw-400mw, frequencies and transmitters used in higher frequencies can more than double this EIRP for reasons of propagation. COMREG might find it useful to know that most, if not all requests, for wireless camera channels listed in Q8 would be for cameras using the transmitter as a point to point link, cabled to, and not on board the camera. When the camera is hand-held or shoulder mounted. It is necessary to keep EIRP to a minimum at the operators head. The flexibility afforded by using frequencies in the 2Ghz range means the transmitter can remain on the camera and allow the camera operator the freedom of movement. In my opinion, it would be interesting to see radiation patterns of cameras/transmitters using higher frequencies, especially one mentioned in Q8. I think this may answer Q9 & Q11 aswell with regard to wireless camera channels in these spectra.

Q10/12: I think it is too early to tell what way manufacturers are going. As outlined Earlier, HD units are soon to be available in 8mhz bandwidth which would mean manufacturers or users, being easily able to modify existing equipment, or produce more cheaply, new units which would operate in existing channels.

6 Safety & Communications Ltd

Safety & Communications Ltd

150 Season Park, Newtownmountkennedy, Co. Wicklow.

Phone/Fax: +353 1 2810028. Mobile: +353 86 350 6699. E,mail: stephen@safetycomms.ie

Ms Sinead Devey
Commission for Communications Regulation
Irish Life Centre
Abbey Street
Dublin 1.

10-6-2010

Re: Future Spectrum Availability for Programme Making & Special Events.

Dear Sinead

Many thanks for the opportunity to have some input on this issue. The following are my opinions in relation to the questions posed.

I am very glad that the 470-790 MHz is still going to be available as even though it has not been overly used previously there is a ready supply of equipment capable of operating on these frequencies (or at least tested and certified whether or not manufactured)

Q1. I would see band 2 as being the most appropriate. There are already units being manufactured that can operate in these areas and as such it minimises the potential for manufacturers having to re-design and re-certify equipment for other bands and at other outputs.

Q2. I feel that Channel 38 should be allocated for PMSE as in the UK as most of the rental equipment brought into Ireland does come from UK and as such it makes user and hirer's life much easier. It also means that there is a common frequency listing and any intermod discovered can be managed more easily.

Q3. Without knowing how large the demand can be it would be impossible to say. If you take Oxegen for example there could be up to 40+ units in use at any one time so the risk of trying to keep everything in a 8 MHz slot is not really workable.

Q4. Yes. If this was allowed the benefits are that people that have units bought already can stay on these frequencies on an ongoing basis (obviously subject to licensing conditions) and companies do not have to get rid of their current stocks of equipment. Thus minimising the financial strain incurred in changing frequency band.

Safety & Communications Ltd

150 Season Park, Newtownmountkennedy, Co. Wicklow.

Phone/Fax: +353 1 2810028. Mobile: +353 86 350 6699. E,mail: stephen@safetycomms.ie

Q5. Yes the sub group is suitable and has been used by many for years. There have been minimal difficulties and the equipment has become cheaper and easier for schools etc to replace rather than try to repair. As these units are generally used indoors the risk of interference is minimal and provides a simple solution for those wishing to buy and not worry about licensing.

As I have little to no operations at this time that rely on wireless cameras I will leave those better suited to comment on them to do so.

I look forward to Comreg's final decisions in relation to the Radio Mic/IEM frequency provision.

Regards

Stephen Dempsey

Stephen Dempsey

7 TV Mobiles Ltd

Reference: Submission re ComReg 10/37

Q. 1. The TV VHF band 216-223 could become a viable band for radio mics and IEM's. Equipment manufacturers already have been active with radio mics in the 174-216 band.

The availability of equipment is limited at present.

The second band listed, 821-832Mhz, is certainly within a usable switching range for the modern radio mic kits. Particularly equipment that is already designed to work in the 863-865Mhz band.

Q 2: I think using the Ch 38 exclusively for PMSE is the right way to go. It makes sense for travelling companies coming over here from the UK, having compatibility.

Q 3: This channel on its own would not be able to cater for large scale International events, particularly LE shows which could also have a LIVE TV element involved.

Q 5: Yes the sub-band 863-865Mhz is suitable for PMSE. There are quite a number of manufacturers producing equipment in this band.

Q 6: Some spectrum in Wicam Band C (2.3 – 2.4 Ghz) should be kept available for wireless camera operations as there is still equipment being used on a regular basis in this frequency. Such equipment is not upgradeable to operate in other frequency ranges and would therefore be of no use to its owners. Currently broadcasts which are still happening in Standard Definition would be using equipment which will only operate in Wicam A,B and C. Until such time as broadcasters upgrade to High Definition productions, current wireless camera systems would be required to maintain our current contracts. As the migration to High Definition happens, new equipment will be required to be purchased and this can be in the U6 and L7 bands.

Example of equipment: Gigawave DCam systems which operate in the 1.9Ghz to 2.5Ghz range. These systems have a required bandwidth of 8Mhz.

Q 7: Any spectrum which could be made available in Wicam Band A (2025 – 2110 MHz) and WiCam Band B (2200 – 2300 MHz) would help. Again for the reasons that equipment currently in use on Standard Definition productions would typically operate in the frequency band of 1.9 – 2.5GHz. Many of the main sporting events happen in the greater Dublin area and these events would generally require the use of at least 1 wireless camera system.

Q 8: The reasons for the low demand for Wireless Camera frequency assignments in WiCam Band D (10.3 – 10.5 Ghz) are mainly due to the lack of equipment available which use this frequency range. The equipment available is generally point to point links. Line of sight to the receiver is essential and accuracy of TX to RX alignment

needs to be good. There are virtually no Wireless Camera systems available in the market in this frequency range.

Q 10: There is equipment available for use in the U6 (6.425 GHz – 7.125 GHz) & L7 (7.125 – 7.425 GHz) bands for Wireless Camera applications. Link Research and Gigawave both have Wireless Camera systems available in the 6.8 – 7.5 Ghz range. We have done successful tests in Thomond Park, Limerick using a demo system in this frequency range. These bands should definitely be opened up for wireless camera applications and we would focus our future Wireless Camera purchases in this band if it were available.

8 Vodafone Ltd



**Vodafone Response to the Consultation on Future Spectrum Availability
For Programme Making & Special Events**

Introduction

Vodafone welcomes the opportunity to respond to this ComReg consultation on future spectrum availability for Programme Making and Special Events (PMSE) purposes. We consider that the spectrum needs of the PMSE sector should be taken into account, subject to ensuring that measures to facilitate access to spectrum for wireless microphones, wireless cameras and related equipment do not in any way inhibit the assignment of spectrum for the provision of wireless or mobile broadband services in frequencies that have been, or may potentially be, identified for harmonised delivery of these services on a pan European or international basis.

In addition we consider that particular care must be taken to ensure that technical conditions imposed in relation to use of spectrum by wireless microphones and wireless cameras are sufficient to avoid interference being caused to other uses of spectrum such as the provision of electronic communications services.

Vodafone's views in relation to the issues raised in the consultation are set out fully in response to the consultation questions below.

Response to Consultation Questions

Q1. Which (if any) of bands 1-4 listed above should ComReg consider for wireless microphone/IEM applications in the future? Please set out the reasons for your answer. Is the necessary equipment currently available or about to become available?

Vodafone considers that the second band listed by ComReg in section 5.3 of the consultation (the MFCN (FDD) 11 MHz Duplex Gap proposed at 821-832 MHz) would be appropriate for use by wireless microphone/IEM applications following analogue switch-off. This would provide long term security to PMSE use.

The technical conditions set out in ECC Decision (09) 03 and the attached Annexes should provide sufficient protection against interference. Vodafone considers in particular that a small guard band adjacent to the mobile uplink band is necessary to ensure that basestations are not affected by the out-of-band emissions from microphones. It would be preferable to limit the use of higher power audio links to the centre of the duplex gap.

In relation to the first band listed in section 5.3 of the consultation, the TV VHF Band (216-223 MHz), while the number of white spaces available for PMSE is likely to be reduced by the introduction of digital systems, the much increased robustness of DVB-T to interference relative to analogue broadcasting could also allow interleaved spectrum to be utilised more intensively for PMSE. The potential of the TV VHF band for PMSE use may therefore warrant further investigation.

For the other bands identified, the "L" band and the 1800-1805 MHz in conjunction with 1785-1805 MHz band, any decision by ComReg on the use of these bands for PMSE should await the completion of the ongoing studies into their suitability for this purpose. In addition to technical suitability, the availability of equipment that can use frequencies in these bands would be an

important consideration in any decision by ComReg to designate any part of these two bands for PMSE use.

Q2. In your view, should ComReg allocate Channel 38 exclusively to PMSE (as in the UK)? Please give reasons for your answer.

Yes. Vodafone considers that there is considerable merit in allocating Channel 38 exclusively to PMSE as its use in Ireland would be harmonised with that in the U.K. As the decision of Ofcom should secure the commercial availability of wireless microphone equipment compatible with use of this channel this would be an effective solution to replace Channel 69 for wireless microphone/IEM assignments.

Q3. Would this Channel be sufficient to satisfy demand? Please give reasons for your answer.

Vodafone considers that Channel 38, together with options to make spectrum available for PMSE in other bands as outlined in the response to question 1, should be sufficient to satisfy demand.

Q4. In your opinion, would access to the interleaved spectrum in the DTT band plan on a non-interference, non-protected basis be useful for Wireless Microphone/IEM applications? If so, why?

Vodafone considers that access to interleaved spectrum in the DTT band plan on a secondary non-interference, non-protected basis for wireless microphone/IEM applications could be accommodated given the likely increased robustness of DVB-T to interference compared to analogue TV broadcasting.

Q5. Is the sub-band 863-865 MHz suitable for PMSE? Are there any difficulties or issues with this band, such as interference or lack of available equipment?

Yes. It is Vodafone's understanding that almost all recent types of radio microphones used in Channel 69 can also operate in the 863-865 MHz band. They could therefore be used in the 863-865 MHz band when Channel 69 is no longer available for PMSE purposes. However any use of the 863-865 MHz band by wireless microphone/IEM applications should be subject to appropriate technical conditions to protect against interference being caused to mobile/fixed communication network services provision in the 790-862 MHz band in the future, following digital switchover.

Q6. In your view, is it important to maintain some spectrum in WiCam Band C (2.3-2.4 GHz) for future Wireless Camera applications? How much might be reasonably required? Please give reasons for your answer.

Q7. In your view, should ComReg consider making WiCam Bands A and B available exclusively for Wireless Cameras in the greater Dublin area? Please give reasons for your answer. (The bands could possibly continue to be available on a secondary, non-interference, non-protected basis for Wireless Camera assignments elsewhere in Ireland.)

Vodafone considers that it would be appropriate for ComReg to make WiCam bands A and B available exclusively for Wireless Cameras in the greater Dublin area if it can be clearly demonstrated that this is required to satisfy expected future demand for wireless camera applications in this region. The continued availability of Wireless Camera assignments on a secondary, non-interference basis in these bands, at least in other areas of the country, should be facilitated.

Q8. What, in your opinion, are the reasons for the low demand for Wireless Camera frequency assignments in WiCam Band D? Are there (for example) interference, propagation characteristic or equipment availability problems which affect this band?

Q9. Is there anything that could be done to increase the usage of this band?

Q10. Is there equipment available for use in the U6 and L7 bands for Wireless Camera applications? If so, should ComReg open these bands for such applications on a secondary, non-interference non-protected basis?

If wireless camera applications were to be permitted to operate, interleaved with fixed links, in the U6 and L7 bands then it would be imperative, as ComReg has acknowledged, that strict technical constraints be imposed to avoid the risk of interference being caused to fixed links.

Q11. Apart from equipment availability concerns, do you foresee any other issues which may affect the operation of Wireless Cameras in interleaved spectrum within the U6 or L7 bands?

Q12. In your opinion apart from those listed above, are there any other bands which ComReg should consider for Wireless Camera applications in future? If so, please indicate what bands should be considered giving reasons for your answer.