LOCOG's Response to London 2012 Olympic Games and Paralympic Games Draft Spectrum Plan

Approach

Question 1: Do you have any comments on the three approaches we have taken to spectrum planning for the London Games?

LOCOG concur with Ofcom's approach to planning for the Games and acknowledge the excellent work done by Ofcom to find spectrum in such a congested environment. We acknowledge the difficulty in defining the overall number of channels required for the Games. It may be helpful to Ofcom if each organisation could declare what they were using in Beijing.

We anticipate that the spectrum will require changes over time.

Question 2: Do you have any comments on the scope for reducing demand by using fibre-wireless networks within venues?

We understand that broadcasters would generally opt to use wired technology as it is more reliable however there is an increase demand for wireless cameras to increase the production quality.

Question 3: Do you have any comments on the scope for reducing demand by deploying a London-wide cellular receive system?

As it halves the spectrum requirement for camera it is therefore worthwhile considering.

This approach is proven as it has been used successfully at previous events.
There may be tighter restrictions on air space access so this approach may offer a viable alternative.

This option has an interesting legacy value so local broadcasting organisations and manufacturers may be able to find long term benefits.
Due to the equipment compatibility issues, it may be difficult to cater for all types of systems onto this network

Question 4: Do you have any other comments on the scope for reducing demand by relying more heavily on wired communications?

The reduction of wireless technology is very much focused on the broadcasters. We would like to see other users/applications considering using wired solutions where possible.

Question 5: Do you have any comments on the scope for maximising supply by using spectrum more efficiently?

Optimising spectrum use by calculating the best frequencies which will not suffer from inter-modulations product interferences etc is clearly likely to increase spectrum efficiency however equipment constrains could restrict user's ability to tune to the optimal frequencies.

When defining offsets and centre frequency Ofcom must take into consideration equipment restrictions and typical channel plans. Some applications/equipments are more flexible than others.

Question 6: Do you have any comments on the scope for maximising supply by reusing spectrum efficiently?

Spectrum is a finite resource and must be used wisely.
Applicants should investigate where they can reuse their own frequencies by coordinating all their teams to reduce demand (time and/or location sharing within a company).

When planning frequency reuse Ofcom should take into consideration operational requirements.

For example reusing the same frequency at every venue for low power devices like wireless microphone is possible however operationally users will be required to retune before entering and leaving a venue. The risk of a user forgetting to retune is very high and may means that to cover the Olympic park he will need more than one device to cover all the attributed frequencies.

Increase frequency reuse may also increase the interference cases.

The balance between spectrum reuse, operational requirement and risks of interference will be a complex equation to balance.

Question 7: Do you have any comments on the scope for maximising supply by using higher-frequency spectrum?

With pressure around the world on wireless camera moving out of the 2/3GHz band, we anticipate that more and more users will migrate up the frequency range. We do however foresee a very high demand for wireless camera at 2/3GHz for the 2012 Games. NHK do already use higher frequencies and we welcome that Ofcom is making these available.

Question 8: Would you consider using free-space optics technologies?

At this stage we have not yet identifed an application to use this technology. Our preference remains to provide wired solution for point to point links where possible,

Assumptions and summary conclusions

Question 9: Do you have any comments on our assumptions?

I. Some 20,000 accredited media staff will cover the London Games

Agree.

II. Wired rather than wireless technology will be used where practicable

This is true for competition venues.

Our approach is to favour wired over wireless solutions which we are applying for our LAN network. Wifi will still be required in certain areas.

III. Spectrum will be required for partners and venue setup from January 2012, for broadcasters from May 2012 and for teams from June 2012

Spectrum will also be required for test events. Some applications will need to have access to the same channels during the Games as for the test events, others will be able to retune within a band.

Spectrum demand will increase as we get closer to the Games as more concurrent test events will occur as clusters and venues begin their early operations.

IV. All spectrum requirements covered by the Government's spectrum guarantees will cease by the end of September 2012

Spectrum requirement will reduce greatly after the Games, especially on the broadcasting side. However there is a requirement for spectrum to decommission the venues and maintain security until formal handover. The demand will decrease as we progress the decommissioning but this no doubt run beyond September 2012. a detail plan will need to be developed to ensure critical services are maintained during this period.

V. Wireless equipment is likely to be imported from participating nations

We agree. However this equipment will need to be approved for use by Ofcom.

VI. Wireless equipment will be re-tuneable to some extent

We agree. Older equipment or specialised applications may not be able to retune.

VII. Radiated power for all wireless equipment will be limited to the minimum necessary to obtain required coverage

Some guidelines to that effect would be useful as part of the communication materials.

VIII. The bandwidth for wireless equipment will not increase

There is a possibility that some HD wireless camera will need more bandwidth.

IX. All wireless equipment will comply with the relevant ETSI standards defined in UK Interface Requirements (IRs) even when using spectrum not normally available in the UK

For spectrum/channel planning purposes this assumption is acceptable. However not all wireless equipment will comply with the ETSI standards as some devices will be brought in from other countries which have other standards such as IEEE. Not all devices will be CE marked either.

X. OBS will capture live video feeds of all sporting events and make them available at the IBC to RHBs

Agree. This will be done via a fibre contribution network.

XI. RHBs will contract with the IOC to broadcast those feeds

Agree

XII. Those feeds will be mainly in HD

Agree

XIII. Wireless cameras used by OBS will not move between venues (with the exception of those used for wide-area sports)

Wireless camera will be mostly allocated to a venue however some will be redeployed especially as venues transition between sports and from the Olympic to Paralympic Games.

XIV. Lower-frequency spectrum is preferable for wireless cameras

Agree

XV. Adjacent-channel use by wireless cameras is possible

XVI. OBS will coordinate all spectrum requirements for broadcasting within venues

OBS has an excellent knowledge of the broadcasting spectrum requirement sporting events and will provide comments on the spectrum plan. While OBS represents all the rights holders, individual rights holders will apply directly for their own spectrum needs therefore OBS may not be aware of all spectrum use. Non accredited media will also apply directly.

XVII. Wireless-camera links can be engineered so that more than one receive point is deployed

XVIII. RHBs will transport their own feeds back to the IBC in some cases

RHB may also setup temporary studios outside the IBC such as hotels and would therefore also need to carry their feeds to other non competition venues.

XIX. Optical fibre will be used at and link all competition venues within the Olympic Park

Agree.

XX. During the Games, PMR will be used by NOCs, LOCOG, broadcasters, marketing partners, LOCOG's partners and E&PSS

We agree. The LOCOG tetra network is available to all accredited organisations via the rate card.

XXI. LOCOG will use a PMR trunked network

This is correct. Airwave will deliver a digital secured Tetra Network.

XXII. All PMR will use CTCSS tones/DCS codes to set the squelch automatically

Please note that in some case PMR devices could be used to carry data. This is often the case for telemetry applications which do not use license exempt spectrum.

XXIII. RHBs will deploy a satellite-dish farm at a fixed location adjacent to the IBC

Agree but this will be coordinated by OBS.

XXIV. RHBs might also use satellites to link competition venues back to their facilities in the IBC or at other locations

Expectation is that the OBS fibre network (geographically diverse) will connect all venues to IBC and satellite links will be limited to the satellite dish farm or courses routes which are temporary in nature.

XXV. ENG organisations will also use satellites

We anticipate that outside broadcast and news gathering trucks could be at all venues. We therefore highly recommend that areas where satellite uplink would fail the coordination process are identified as early as possible. News gathering organisation will be deploying at short notice anywhere in the country – this needs to be kept in mind with regards to the coordination process.

XXVI. Test events will have comparable spectrum requirements to Games events, though there will be additional demand if several Games events take place at the same time

As Ofcom is proposing to use bands which may not have been used previously for broadcasting purposes, it will be extremely useful that these bands are made available before the Games to allow for testing and familiarisation. Some of the test events will be suitable for that, but Ofcom should also consider allowing the broadcasters to have access to these bands for their day to day activity allowing a wider range of testing. Ideally, local broadcasters could do testing as part of their day to day activities and share their experience with visiting broadcasters via world broadcasting meetings or broadcasting shows. Test events will vary dramatically in demand for spectrum.

XXVII. New technologies will need to be proven by the time of LOCOG's technology freeze in 2010 if they are to be relied on at the London Games

This technology freeze does not necessarily apply to other Olympic family members.

XXVIII. Spectrum use can be licensed for periods as short as – or even shorter than – one day, maximising the opportunities for frequency reuse

This approach supports efficient spectrum use but will need very clear communications to spectrum users to avoid misunderstanding. It may also require heavier operational support in validating the users.

XXIX. The spectrum plan will be subject to change in the run-up to the London Games

We support this approach to refine the spectrum plan to reflect key learning from test events and new technologies. The most difficult area is believed to be defining the actual number of channels required. Requirement for sponsors has not been defined.

Private mobile radio

Question 10: Would you be willing to use LOCOG's land-radio network?

We will be encouraging all the Olympic Family and associated partners/contractors to use this network. This is enable good spectrum usage, operation efficiency, reduce the risk of interference and interoperability issues. This service will be available via the rate card.

Question 11: If not, how would you prefer to receive land-radio services?

Question 12: Would you be willing to use CTCSS tones/DCS codes to allow the same channel to be used for land radio in both the Olympic Park and the River Zone?

We believe CTSS/DCS codes will reduce interference complains.
As most of telemetry channels are using license exempt spectrum, thus at high risk, it is very likely that some telemetry systems will require PMR licensed channels instead. In that case the channel will be carrying data and could be constantly transmitting.

Question 13: Do you have any other comments on our assessment and proposals for land radio?

We anticipate the demand for PMR spectrum to be high around 450-470MHz

Question 14: Do you have any comments on our assessment and proposals for maritime radio?

We would prefer the use of the Airwave Tetra network for the running of the sailing event however communications with boats/cost guards and other support services may require maritime analogue channels; we therefore concur with Ofcom's proposals at this stage.

Audio links

Question 15: Do you have any comments on our assessment and proposals for wireless microphones and IEMs?

Ofcom will need to specify the test event spectrum plan as the Digital Switch Over is due to take place during test events as a results wireless microphone spectrum will change.

Question 16: Do you have any comments on our assessment and proposals for talkback?

Question 17: Do you have any comments on ADS?

ADS allocation will not suffice as it is currently only limited to 4 channels namely 61.2, 61.7, 62.3 and 62.7MHz at 1W output maximum.

Video links

Question 18: Which bands would you prefer to use for wireless cameras?

We anticipate that demand for the 2-3GHz will be really high. We anticipate that 6-10GHz will be used by the Japanese broadcasters.

Question 19: Which bands would you be willing to use for wireless cameras if you cannot use your preferred bands?

Question 20: Do you have any other comments on our assessment and proposals for wireless cameras?

We would welcome the opportunity for the broadcasting community to be able to start using the frequencies around 2.7 – 3.1GHz and 4-5GHz to validate their usability and built confidence. Test events would be useful but may not suffice.

Question 21: Which bands would you prefer to use for point-to-point links?

Question 22: Which bands would you be willing to use for point-to-point links if you cannot use your preferred bands?

Question 23: Do you have any other comments on our assessment and proposals for point-to-point links?

Other guaranteed services

Question 24: Do you have any comments on our assessment and proposals for FSS?

We anticipate the need for broadcasters to use transportable Earth Stations in C band.

Question 25: Do you have any comments on our assessment for MSS?

Question 26: Do you have any comments on our assessment for RNSS?

The Ministry of Defence conducts occasional tests on military systems which may result in some loss of service to civilian users of the Global Positioning System (GPS) including in-car navigation devices and networks which rely on GPS signals.
We anticipate heavy use of GPS technologies for timing purposes. We would therefore request that no GPS jamming exercises which could interfere with our applications are carried out during the Games.

Question 27: Do you have any comments on our assessment and proposals for telemetry and telecommand?

IR2030 does offer a wide range of bands which will meet some of our requirements assuming there are enough channels available. Will Ofcom allow use of higher power?

Question 28: Do you have any comments on our assessment and proposals for

WLANs?

We agree with Ofcom‘s assessment of the WLAN applications. We are minded to offer good quality wireless internet services to our customers. We will be providing services to press and media in specific areas for work purposes via our rate card system. Over the coming months, we will be finalising our strategy for members of the Olympic family and general public.

Football venues

Question 29: Do you have any comments on our assessment or proposals for spectrum at the six football venues?

The assessment is based on spectrum demand per venue at only one time. In reality, the Olympic family would expect to have to be able to use the same channels every time they visit the venue. As a result the aggregated demand is higher than stated.

Cultural events
Question 30: Do you have any comments on our assessment and proposals for cultural events?

We believe the Torch relay could be more complex.
The roadshow will include local broadcasting team, accredited rights holders, non-accredited rights holders & non rights holders. With the current proposal to license some of these groups via a different process could cause confusion and increase the risk of radio interferences.

Non-guaranteed services

Question 31: Do any non-guaranteed public services have spectrum requirements that cannot be met through existing allocation and assignment processes?
Question 32: Do any non-guaranteed private services have spectrum requirements that cannot be met through the market and existing assignment processes? Should we make alternative arrangements for handling such requests?

Innovation and legacy

Question 33: Do you have any comments on our approach to innovation and legacy?

Operational issues

Question 34: Do you agree we should establish special licensing arrangements for users covered by the Government’s spectrum guarantees? To what extent is your response based on what has worked well at past Games and comparable events?

Due to the large amount of applications and their density of use special licensing arrangements should be put in place. However, it may be complex to separate guaranteed and non guaranteed users outside the main competition venues.

Ofcom is proposing in another consultation (Digital dividend: band manager award: Second consultation on detailed award design) to award PMSE spectrum to a band manager with strong expertise in special events. Separating the processes will increase complexity as exiting PMSE license users will still expect to be able to use their equipment for the Games and therefore reduce the demand for additional channels. The PMSE band manager may be able to bring some useful knowledge to this work assuming the timing of the award allows this to happen, else JFMG, the current Ofcom contractor, may be able to help.

Question 35: Do you agree that an online application process using the LOCOG rate-card ordering system is the best way for guaranteed users to apply for spectrum licences? How could the licence-application process be made optimal?
Question 36: How can efficient sharing and coordination between Games and non-Games spectrum use best be achieved?

Ofcom is planning to use a combination of the following:

- identifying particular channels that are set aside for Games use and not otherwise available for their duration;

This is the ideal solution. However, please note that adjacent channel protection is a issue a band edges and the only way to ensure quality channels is to either coordinate adjacent channel use or to use guard band which are not spectrally efficient.

- establishing geographic coordination zones where we will perform the necessary technical checks to ensure proper coordination between Games and non-Games use; and

- establishing geographic exclusion zones around Games venues where any spectrum use will require specific additional authorisation from us.

It is important to remember that the Games are not only within the 35 fixed competitions venues but along competition courses and at non competition venues. We estimate that we will have just fewer than 100 different venues, where guaranteed users will be operating from. The exclusion/coordination zone will need to cover an area wide enough to cover all the venues (competitions venues (inside and outside of London), Outdoor events such as cycling and sailing, non competitions venues and possibly training areas).
We are concern that it will be difficult for spectrum user (guaranteed or not) to know whether they are in one or the other zone. Clarity and simplicity are important when defining these.

For the torch relay we expect accredited and non-accredited media to be covering the event. They may only cover specific legs or areas. Coordination of both requirements does not fit into the proposals above and applications for spectrum could be very confusing (rate card vs Business As Usual).

Licensing the events will be complex due to high and diverse spectrum demand. To avoid any illegal spectrum use and reduce the risk of interference, we believe the licensing process must be simple and clear. Having definitions of specific areas should be very obvious and leave no doubts to spectrum users especially if this is done per application/band as suggested in chapter 13.12. It will be unacceptable for

a broadcasting team moving around London with a wireless camera, an OB truck, wireless microphones/in ear monitors to have to apply via a different system for each device at each spot they require to operate from.

Question 37: How can the use of licence-exempt equipment best be managed?

Generally, Ofcom does not intervene where interferences are taking place in the license exempt bands if both devices meet the relevant interface requirement. However we may need Ofcom to intervene should the LOCOG WLAN applications suffer from interference.

Question 38: Do you have any other comments on how best to license spectrum use for the London Games?

Question 39: How can interference management be most effective in ensuring the successful running of the London Games? Are there other measures we should consider implementing? To what extent is your response based on previous experience of similar events?

We strongly recommend that spectrum identified for the Games is monitored to get information about its usability/quality.
We also recommend that licensed radio devices are tested prior to being used in a venue to validate that the correct frequencies have been implemented and remove all illegal/unlicensed users.
A tag on approved radio devices will help identify illegal users entering venues. Spectrum users will often challenge users without the approved tag.
We understand this has reduced the risk of interference at previous Games and other sporting events such as the Tour de France. The European Radiocommunications Office has produced provides useful guidance for radio usage at special events (report 44 - http://www.erodocdb.dk/Docs/doc98/official/pdf/ECCREP044.PDF).

Test events

Question 40: Do you have any comments on our approach to test events?

We would like to see spectrum not currently used for broadcasting purposes to be made available prior to the Games allowing sufficient time for users to become familiar with the bands or equipment.
We would like to see the spectrum plan for test events being the same as for the Games especially where there is little/no impact to existing user.
The Draft spectrum plan covered by this consultation is mainly for Games time, Ofcom will need to publish the test event spectrum which we hope will be very similar apart maybe from the UHF band IV and V which will be affected by DSO.