Introduction

XXX welcomes Ofcom's consultation on Spectrum provision for the 2012 Olympic games. We recognize that the 2012 Olympic games represent an unprecedented challenge in spectrum and technology management and consider this consultation to be an excellent first step in exploring potential solutions.

XXX is a new technology company with expertise in providing remote, robust real time spectrum monitoring equipment and spectrum analysis software. The response below reflects this expertise.

Approach and assumptions

Question 1. Do you have any comments on our approach?

The approach Ofcom has proposed is broken down into top down, bottom up, and theoretical analysis. We believe that the mechanism for awarding, monitoring and enforcing the spectrum should also be an important consideration at this stage. This could be thought of as a practical analysis which is considered later on in the consultation. However, little weight is placed on how spectrum is actually used, discovery of interference from legal and illegal transmitters and how the spectrum will be monitored and managed – something that might greatly increase spectral efficiency.

Question 2. Do you have any comments on our assumptions?

See answer to Q1.

Requirements for PMR and broadcasting

Question 3,5,8,10,11,12,13,14,16 **a**. What is your assessment of the requirements for *X* systems?

We feel that demand for the systems outlined in your consultation will be high as you have indicated. We would like to see a greater consideration of what the spectrum requirement for each of these systems will be and what might be the potential substitutes (i.e. opportunity cost).

The opportunity cost in provision of these services (in terms of spectrum) is clearly an extremely complicated exercise, and obviously is a clear case for charging AIP in order to discriminate against the most cost-productive uses of spectrum. We are concerned that the general benefits of AIP (incentives for different allocation) may not be gained if the government/LOCOG is charged directly or if Ofcom manages the allocation directly.

Question 3,5,8,10,11,12,13,14,16 b. How can they be met most efficiently?

We believe that AIP or spectrum trading would be the best way of achieving an efficient outcome however this may not be practically possible. With this in mind, we would explore potential demand by creating a register of interested parties or services which may use the spectrum for 2012. This could then be used to evaluate different mechanisms of allocation.

Question 4. Would you want to use capacity on LOCOG's trunk network through a rate card?

We would be concerned about the implications this may have for the development or emergence of new technologies. A list as such may create a regulatory lag and potentially prevent some technologies which may emerge at a later date. Potential uses would need to be updated on a regular basis up to the games.

We consider this to be similar in application to a license exempt approach to spectrum, and wonder if there is any benefit to this as opposed to freeing up a large swathe of spectrum for license exempt use instead of or alongside a rate card.

Question 7. Do you think that digital wireless microphones will be widely used by the time of the London Games?

Yes, absolutely.

Question 9. How do you think developments in audio technology will affect spectrum requirements?

They will have two opposing effects: Firstly digital audio equipment will decrease the requirement for spectrum; Secondly increase in demand for higher audio quality and greater diversity of content/coverage means that there will be more, higher quality audio devices in use, which will increase the requirement for spectrum.

Question 15. How do you think the use of HD will affect spectrum requirements?

HD will become the dominant TV standard in many developed and developing countries by 2012 regardless of adoption in the UK. This means that HD will be a new and key component in coverage of the Olympics, and one for which the scale of spectrum requirements is clearly very large.

Question 17. How do you think spectrum could be used more efficiently?

Efficient re-use, detailed planning, monitoring and enforcement, AIP and careful consideration of the opportunity cost of fixed-line technologies or different frequencies (an extremely complex problem) can all increase the efficiency in spectrum use. Investment in monitoring and enforcement technologies now around London may provide a solid backdrop for more the better use of spectrum during the games.

Question 18a,b,c

We look forward to the Sagentia report to inform our opinion.

Question 18d. Are there any other considerations that will affect the feasibility of using higher-frequency spectrum for wireless cameras?

We would assume that factors such as availability of spectrum after the games and on spectrum availability on an international scale will seriously influence the economies in provision of higher frequency cameras.

Question 19. Do you think that using optical-fibre cameras will reduce spectrum requirements?

Yes; these cameras will use optical fibres as opposed to the radio spectrum. Though the extent of the spectrum saving depends on the range of the wireless cameras and consequently spectrum re-use: If the camera has a very short range, then it has little impact on the available spectrum, conversely if it has a longer range meaning that cameras using the same frequency must be spaced far apart, then would be a large reduction in spectrum requirements.

Question 20. Do you think that using short, wireless video links to fixed, cabled access points will reduce spectrum requirements?

Assuming this is opposed to using lengthy wireless links, then yes (see q.19).

Question 21. Do you think that using optical fibre within and between competition venues will reduce the requirement for fixed point-to-point links?

Potentially yes, but point-to-point links don't prevent other spectrum services (assuming narrow beam width antennae). It is likely that there are many other considerations such as the cost of installing fibre, access considerations (allowing different providers access to infrastructure), or flexibility/adaptability of the network.

Requirements for support services

Question 22. Do any public support services have spectrum requirements that cannot be met through existing allocation and assignment processes?

It looks like the demand for spectrum will exceed the current available spectrum, how existing and new public support services will interact in a constrained spectrum environment is difficult to answer.

Requirements for cultural events

Question 23a. What is your assessment of the requirements for cultural events?

Large; our impression that events round the country will be on a par with existing sporting events. It is possible that the temporary resources required to provide for the games may restrict the ability of existing agencies (e.g. JFMG) to deal effectively with the demand for spectrum planning services. This may be exacerbated by the reduction in spectrum available to PMSE users by 2012.

Question 23b. How can they be met most efficiently?

Automated management, monitoring and enforcement of the radio spectrum.

Other requirements

Question 24a. What is your assessment of other requirements?

Requirements may include commercial services – consumers as the direct use of the spectrum, mobile TV etc. The use of UWB or other emerging technologies has not been discussed in this document.

Question 24b. How can they be met most efficiently?

The market or mechanisms which best approximate the operation of an efficient and competitive market.

Operational issues

Question 25a. Do you have you any views on previous or possible licensing systems?

Without spectrum pricing directly being paid by the users it will be difficult to make appropriate allocation decisions. Users will attempt to 'grab' as much as possible. A licensing system may as a result have to take into account as much information about the technologies, their use, and substitutes as possible.

Question 25b. When should the licensing system start to accept applications?

Not now. But we think that a preliminary exercise could be to get potential users to write in with ideas to get an indication of the potential scale and diversity of use.

Question 26. Do you have any views on enforcement?

The demand for spectrum for the 2012 Olympics will be immense, and the level of congestion in the spectrum will be unprecedented. It will be essential for Ofcom, LOCOG, OBS or appropriate body to be able to monitor the use of spectrum and enforce their allocations to protect consumer and safety of life services.

Unknowns:

- LE congestion
- Re-tuned or faulty equipment
- Misuse of licenses
- Real spectrum propagation across London
- UWB
- Security threats
- Land grab through allocation

In such a spectrum environment we think that a spectrum monitoring system is needed to ensure the protection of safety of life systems, security services, and commercial services. Such a system would have huge benefits to the organisation of spectrum for the games:

- Enforcement
 - o Live or active spectrum monitoring with location detection
 - Ensure use is as licensed
 - o Protect all spectrum services
 - o Instant enforcement a possibility
- Efficiency
 - o Real spectrum interference feeds into planning
 - More efficient packing of licenses, in temporal, frequency and spatial dimensions.
 - o Underused spectrum can be located
 - o User 'Frequency hopping' is reduced

- Flexibility

 - Dynamic spectrum allocation would be simple
 Spectrum can be allocated at a much later date than with a fixed spectrum plan
 - In emergencies spectrum use can be reorganised rapidly