Guide To Radio Spectrum
FOR THE LONDON 2012 OLYMPIC AND PARALYMPIC GAMES
Radio Spectrum and London 2012

The London 2012 Olympic Games and Paralympic Games will take place between 27 July and 9 September 2012. They will be staged at various locations around the UK, concentrating on the Olympic Park in East London, and form the focus of a summer of major cultural events and celebrations in the UK.

Wireless services and radio spectrum will play an important role in facilitating these events and keeping participants and spectators safe. Many thousands of wireless applications will be needed by the media and other users of spectrum; from walkie-talkies used by event organisers to TV cameras broadcasting to a global audience of five billion viewers, the demand on radio spectrum – a scarce resource – will be unprecedented.

Using Radio in 2012

Planning and co-ordination of wireless use is essential if users are to be able to operate effectively at and around the 2012 Olympic and Paralympic Games.

Special arrangements have been put in place to cope with the extremely high demand for spectrum, including a dedicated licensing service for the Games Family, rights-holding media and broadcasters. This service is operated by The London Organising Committee of the Olympic and Paralympic Games (LOCOG). Even if a Games Family spectrum user has an existing UK licence, they must also apply for a Games licence to operate at London 2012 venues. The deadline for Games licence requests closed on 31 December 2011. If you did not apply for your Games licence before this date, please contact LOCOG using the details found on page 7.

Contact the relevant parties set out in this booklet if you have not already done so.

This Booklet

The purpose of this booklet is to tell you what you need to know if you, or your contractor, plan to operate radio communication equipment during the 2012 Games (regardless of whether you are operating inside or outside a London 2012 venue).

Licensing and operating arrangements differ for Games Family members and Non-Games Family members. This booklet features information for both:

- Games Family - page 4
- Non-Games Family - page 8

Make sure you read the following:

- Operational checks - page 12
- LOCOG terms and conditions - page 14
Am I in the Games Family?

The term Games Family refers to the broad group of accredited personnel who help deliver or work at the Games.

They are:

- Olympic and Paralympic Family
- Athletes and team officials
- Technical officials
- Press
- Broadcasters
- Marketing partners
- Workforce

The Olympic and Paralympic Family – as referenced in the Games Family – is:

**The Olympic Family** is a diverse group mostly consisting of senior executives and VIPs. It includes the IOC (and its constituents), chairmen and CEOs (or equivalent) of sponsors and broadcast rights holders, international and domestic dignitaries, Presidents and Secretary-Generals of National Olympic Committees, International Federations, future Organising Committees, Candidate Cities, the World Anti-Doping Agency, the Court of Arbitration for Sport and other eligible guests.

**The Paralympic Family** mostly consists of senior executives and VIPs from the equivalent Paralympic organisations, along with international and domestic dignitaries.

If you are still unsure about whether you are part of the Games Family please contact spectrum@london2012.com
GAMES FAMILY MEMBERS

You will require a special licence to operate at the London 2012 Games venues, even if you have an existing UK licence or your equipment would normally operate on a licence-exempt basis. (A London 2012 Games venue is defined as any area that requires LOCOG accreditation to access it).

You must obtain this licence should you wish to use any wireless radio equipment, including: wireless microphones, in-ear monitors (IFB), wireless cameras, Satellite News Gathering (SNG) uplinks, mobile microwave or fixed links, and talkback (intercom) radio. Please note this is not an exhaustive list so please check with the Spectrum Team if you have any queries. Failure to obtain a licence is also a criminal offence in the UK and risks causing interference to other spectrum users. Your equipment must then also be tested and ‘tagged’ before operating in a London 2012 venue, or prior to setting up at broadcast locations. Without the correct licence and ‘tag’ (see below) you will not be able to bring your wireless equipment into the venues.

If you have already applied for a licence
You will receive a letter shortly with an indication of your allocated frequencies. Every effort will be made to ensure that you receive the frequencies that you requested, but you will have 21 days from the receipt of this letter to contact the spectrum team if you feel that the offer doesn’t meet your requirements. Following this period you will receive your licence documentation.

Licences will be issued from April 2012 for orders received before the 31 December 2011 deadline. Late orders will be processed once the pre-deadline orders have been assigned. You will receive your licence by email with your assigned radio frequency or frequencies. It is essential to keep this document with you when at the Games. You must program this frequency into your equipment prior to arriving at venues. You will be sent instructions with your licence on how to arrange testing and collect your validation tags.
If you haven’t yet applied for a licence

There is extremely high demand for spectrum in London and if you haven’t already applied for your licence please get in touch with the Spectrum Team promptly.

Games licences can only be obtained from LOCOG. If you or your suppliers, partners or contractors identify a need for wireless communications, please submit your requirements to the LOCOG Spectrum Team at spectrum@london2012.com, or if you are a LOCOG Rate Card user, access the spectrum order portal https://ratecard.london2012.com/. Please note; the spectrum order portal will not accept orders after 30 April 2012.

Late applications for licences will only be processed once the pre-deadline orders have been assigned.

LOCOG also offers a radio solution for land mobile radio (walkie-talkies) at Games venues. This may be a better option than bringing your own equipment. If you want to enquire about this product please contact the Spectrum Team by emailing spectrum@london2012.com.

I already have a WT Act licence issued to me by Ofcom. Can I use this at the Games?

All existing licensees must apply for a London 2012 Games-time-specific licence as your normal licence will not be authorised for use inside of London 2012 venues. If you have any questions about this process please contact the Spectrum Team by emailing spectrum@london2012.com
Out and about with radio microphones and cameras

If you plan to use wireless microphones or wireless cameras around London over the duration of the 2012 Games (for example, as part of an Electronic News Gathering), we recommend that in addition to obtaining the correct radio licence, you should:

- take practical measures to deal with the likely high levels of spectrum congestion in popular locations by, for example, ensuring that you have a wired microphone alternative; and
- obtain the correct permission to film. Information on this can be found at www.londonandpartners.com

How much does this cost?
There is no fee.

What about Wi-Fi applications?
If you intend to set up a Wi-Fi private network at the Games you must apply using the spectrum order portal https://ratecard.london2012.com/ and create a new spectrum request by selecting ‘Private Wi-Fi Co-ordination’ as the equipment type.

What do I do when I get to London?
Once you have a Games licence you must arrange to get your equipment tested and tagged by making an appointment with the Spectrum Team at spectrum@london2012.com. This process involves a set of tests to ensure the equipment won’t cause problems to other spectrum users. Once testing is complete your equipment will be issued with a tag that indicates to LOCOG staff that the equipment is OK to operate inside a venue. It is in your best interests to arrange an appointment at your earliest convenience. If you have a fixed installation we may also need to arrange a site visit. If you do not have the correct tag you will not be permitted to use your radio equipment at the Games.
What do I need to do before I switch on my radio equipment for use during the Games?
To avoid interference, your radio equipment/installation needs to be of a high engineering standard and operate correctly. Important information is included in this booklet which relates to operating your radio equipment within London 2012 venues and an operational checklist (see page 12 of this booklet) that you should read carefully prior to switching on your equipment.

What do I do if I have a problem?
If you have any questions about your radio spectrum allocation or any general spectrum issue please contact the Spectrum Team by emailing spectrum@london2012.com. If you receive radio interference once you are at a London 2012 venue please contact the LOCOG Technology Helpdesk on 0203 2012 888. It will be important to note the location, the type of interference (noise, audible voice, and language type if known) and whether it is intermittent or constant interference.

Useful Contacts
LOCOG Technology Helpdesk    +44 (0)203 2012 888
Spectrum Team                   spectrum@london2012.com
LOCOG Press Office             pressoffice@london2012.com or +44 (0)203 2012 100
NON-GAMES FAMILY MEMBERS

You will need a licence to operate. All broadcasters and media using wireless equipment require a licence to operate their equipment in the UK.

Broadcasters and members of the media must ensure they obtain an appropriate licence for all wireless operation prior to setting up at broadcast locations or operating any equipment. This includes any wireless microphones, in-ear monitors, wireless cameras, talkback radio (intercom), microwave links and SNG uplinks. Failure to do so is a criminal offence and also risks causing interference to other spectrum users.

The only exceptions are either devices using public networks such as mobile phones and portable computers, or approved devices for short-range applications, (see ‘When do I not need a licence?’ on page 9). You can find details of UK frequency ranges on the JFMG website at: http://www.jfmg.co.uk/pages/freq/freq.htm

Who are JFMG?

JFMG (Joint Frequency Management Group) is a privately owned spectrum management company. JFMG provides spectrum co-ordination and licensing services for wireless frequencies that have been especially allocated for Programme Making and Special Events (PMSE) use by Ofcom (the Office of Communications). (With exception to rights-holding broadcasters and media for the London 2012 Games).

Due to the extremely high demand for spectrum around the London 2012 Games some broadcasters and members of the media may be required to retune or reprogram their equipment. JFMG will provide information as to the availability of your required frequencies.

How do I obtain a licence?

Rights-holding media and accredited non rights-holding media for the London 2012 Games should contact the Spectrum Team using the contact details set out on page 7. All other users should contact JFMG.

You can apply via the office by downloading an application form from the JFMG website http://www.jfmg.co.uk/pages/apply/eventapps.htm and sending it by fax, email or post using the details on page 10.
When do I not need a licence?
You don’t need a licence to use some types of approved short-range devices in the UK, provided they operate in specific frequency bands and below specified power levels. Examples of typical licence-exempt wireless devices include: Bluetooth headsets, Wi-Fi enabled smart phones, tablets and computers, remote alarm and key fobs, and wireless headphones.

For more information please refer to the JFMG website:
http://www.jfmg.co.uk/pages/equip/Radiomics/exempt.htm

How much will a licence cost?
Fees vary according to equipment type, frequency, power and duration of use.
You can find full details of fees at: http://www.jfmg.co.uk/pages/fees/fees.htm

• Typical fee for Wireless Microphones and In-Ear Monitors - £34 per frequency per week (£38 approx)
• Typical fee for Wireless Camera - £224 per week (£249 approx)
• Typical fee for Duplex Talk Back - £68 per frequency per week (£76 approx)
• Licences issued through JFMG’s office are subject to a minimum charge of £28 (£32 approx)

NB: Euros prices based on currency rate at time of publishing.

What do I do if I have a problem?
Licence-exempt and shared frequency devices may be subject to interference from other users on the same frequency.

This should not happen with co-ordinated frequencies as these are carefully managed by JFMG. If you have a licence with JFMG and you do receive interference to your radio equipment on co-ordinated frequencies, please contact JFMG on the details on page 10.

What do I need to do before I switch my radio equipment on for use?
To avoid interference your radio equipment/installation needs to be of a high engineering standard and operate correctly. Important information is included in this booklet which relates to operating your radio equipment and an operational checklist on pages 12 and 13 that you should read carefully prior to switching on your equipment.
Useful Contacts

Media visiting London during the Games may also wish to contact the below organisations to discuss other requirements and facilities available (such as arrangements for obtaining permission to film).

**JFMG**
UK House 4th Floor
2 Great Titchfield Street
London W1D 1NN

Email: admin@jfmg.co.uk
Tel: +44 (0)20 7299 8660
Fax: +44 (0)20 7299 8661
Out of hours: +44 (0)7866 423 619
www.jfmg.co.uk

**London Media Centre**

Email: info@londonmediacentre.co.uk
Fax: +44 (0)20 7234 5753
Tel: +44 (0)20 7234 5710
OPERATIONAL CHECKLIST

Best practice in the use of wireless systems to avoid interference

This checklist aims to help users to get best use of the available spectrum for the London 2012 Games and for other day-to-day programme making and special event purposes.

More detailed information on accepted best practice for radio installation can be found at http://stakeholders.ofcom.org.uk/spectrum/olympics

Please read this section carefully before operating your radio equipment.

- Obtain the correct licence and tag
  You must have obtained the correct licence to operate.
  NB: A special licence is required to operate in London 2012 venues.

- Ensure equipment is correctly set to the exact frequencies as licensed
  Use of the wrong or offset frequencies is a common cause of interference reports. It is important that users check that the correct frequencies are being used.

- Ensure paired frequencies are correctly configured
  For duplex operation it is especially important that any base station equipment is configured as specified in the licence documentation. Use of the frequencies in reverse can cause widespread interference. It is important that users check that the correct frequencies are being used for base and mobile units, as some bands in the UK are in reverse.

- Operate within power limits
  Use of a higher power than has been licensed is likely to cause interference.

- Ensure that your equipment does not exceed your licensed power
  UK radio licences are specified in terms of radiated, not terminal, power. So please ensure that you take into account any gain from devices such as antennas, and please only use the transmit power you need as this allows more people to share spectrum more effectively.
Use antenna isolators fitted to transmitters for talkback, cue, IFB and camera control

Base transmitters are required to suppress the generation of unwanted spurious emissions in the harsh environment of a congested PMSE venue. Typically, each transmitter will need to be fitted with an antenna isolator (or ‘circulator’) to meet this performance requirement.

Use antenna head-amps only where passive antennas are not suitable

The use of additional wide-bandwidth amplification raises the receiver’s vulnerability to other signals such as TV broadcasts and other nearby users. In many cases, performance of a typical wireless microphone system is likely to be better without additional amplification.

Use high quality screened cable between head units and receiver

Some wireless camera systems are known to be vulnerable to interference from talkback and other non-PMSE UHF systems that break through into the cable link. High quality screened cables can prevent this from occurring.

Use filters

The use of filters on the receiver side will help with reducing and sometimes removing unwanted noise. Please ensure that you are filtering the received signals on wireless cameras and wireless microphones.

Use CTCSS/DCS codes

The use of CTCSS and DCS codes on your voice communication will help greatly in reducing the unwanted audio noise on your handheld radio/walkie talkie and will therefore increase the quality of the audio communication.

Check connectors and batteries

It is important to ensure that the antenna is correctly affixed to the equipment and that it has no loose connections. Failure to do this may result in poor or ineffective operation. It is also important to ensure that your equipment is fully charged prior to operation.

Ensure receiver antennas are spaced away from transmitter antennas

Close location of transmitter and receiver antennas increases the receiver’s vulnerability to interference. Vertical separation is preferable, but horizontal separation of antennas helps where this is not practical.
LOCOG terms and conditions for use of wireless equipment at London 2012 venues

In addition to a legal requirement to operate within the Terms and Conditions of your WT Act Licence (issued by Ofcom), LOCOG requires that you comply with the following set of conditions to operate Radio Equipment within London 2012 venues.

**Condition 1** – All users of wireless Radio Equipment must comply with the WT Act conditions set out in Schedule 1 of your licence, and the LOCOG terms and conditions (this document). Breach of these conditions will invalidate the permission to use the Radio Equipment within LOCOG venues.

**Condition 2** – All wireless devices must have successfully passed a two-part process before being used at the Games:

2.1 You must obtain a WT Act licence from the Spectrum Team. It is important to keep this document with you when at the Games. The operator of the Radio Equipment may be required to produce the licence as part of the compliance checking process.

2.2 Your Radio Equipment is tested and tagged by the Spectrum Team prior to use. If either of these conditions are not met, you will not be permitted to use the relevant Radio Equipment at the Games.

**Condition 3** – A London 2012 spectrum licence tag (the ‘tag’) will be provided by the Spectrum Team for wireless devices that have successfully passed the two-part process as set out in Condition 2. The tag must remain visible on the device throughout the licence period but should be removed thereafter. It is a LOCOG requirement that, unless an exception has been expressly agreed between your organisation and LOCOG, your device(s) are clean of commercial branding. A tag may be used to cover or obscure branding on a device, provided the tag is applied neatly. The tag should never be applied alongside any branding.

**Condition 4** – If your Radio Equipment operates on licence-exempt frequencies you must comply with condition 2 to use your Radio Equipment within London 2012 venues.

**Condition 5** – The deployment of private hubs/access points and private Wi-Fi services are subject to condition 2.2 of this document. LOCOG, through mandatory frequency co-ordination, may grant use of these devices and specify the channel to operate on. Its use will be co-ordinated on a non-interference, non-protected basis.
Condition 6 – Mobile phones, smart phones, electronic key fobs, DECT cordless phones, tablet computers, or wireless Bluetooth headsets are not subject to these terms and conditions.

Condition 7 – Deployment of fixed antennas for high power systems (above 1 W radiated) must be inspected by the Spectrum Team. Please contact the Spectrum Team at spectrum@london2012.com to book a site installation validation appointment.

Condition 8 – Failure to programme your equipment to the correct frequency as detailed in the licence will prevent it from being authorised for use.

Condition 9 – All Radio Equipment entering a venue must be presented for inspection during the security screening process. Any Radio Equipment that does not carry the correct tag will not be allowed to enter the venue. Security will report the accreditation and contact details of the persons with the equipment to the Spectrum Team.

Condition 10 – Compliance checks on equipment will be carried out. If requested by the Spectrum Team, you must present the Radio Equipment and licence to the Spectrum Team for inspection.

Condition 11 – You are requested to report other users’ untagged Radio Equipment to the Spectrum Team because there is a risk that these devices may cause interference to your equipment or the equipment of other users.

Condition 12 – Enforcement actions will be taken if unlicensed or untagged Radio Equipment is used in London 2012 venues or if Radio Equipment is used which breaches the licence conditions, and/or the LOCOG terms and conditions, and/or any instructions of the Spectrum Team.

Condition 13 – Users of Radio Equipment must comply with the decisions made by the Spectrum Team. Failure to do so may result in your equipment being banned from the venue.