World Radiocommunication Conference 2012 (WRC-12)

Contents

Section 1

Executive Summary

1.1   The International Telecommunication Union (ITU) Radio Regulations are an international treaty defining the rights and obligations for use of the radio spectrum. Changes to the Radio Regulations can only be made at World Radiocommunication Conferences (WRCs) which are held approximately every four years.

1.2   Ofcom leads UK preparations for WRCs and represents the UK there. In so doing, we act in accordance with a direction from the government, which formally has the final say on the positions to be adopted going into the conference. We already have a close working relationship with many stakeholders with an interest in the issues on the agenda for WRC-12. The purpose of this consultation is to seek views on our developing thinking on those issues and on the process for conducting this work. WRC outcomes can have a significant impact on how spectrum is used and on the development of wireless services and we are particularly interested in engaging with those not already involved in the WRC preparatory process.

1.3   The next WRC will be held early 2012 and the agenda for the conference contains a diverse range of topics falling under more than 25 agenda items. For the purpose of this consultation the issues have been grouped as follows:

- Electronic communications services;

- Transport, including radiodetermination;

- Scientific and amateur use of spectrum;

- International regulatory framework;

- Standing agenda items.

1.4   The Radio Regulations contain a table of frequency allocations in which frequency bands are allocated to one or more radiocommunication services such as fixed, mobile, broadcasting and various space services. Several of the agenda items are seeking new allocations to allow the introduction of new, or the development of existing services. In many cases, it is necessary to do this at international level to achieve the necessary degree of harmonisation for economies of scale or because of the international nature of the service. Aeronautical, maritime and satellite are examples of services where the nature of some applications requires spectrum to be available seamlessly across national boundaries.

1.5   The Radio Regulations also contain procedures for a range of international spectrum management functions. An example of the need for such procedures to be defined by international treaty is in the field of satellite communications. The rights to operate frequencies on a satellite cannot be defined simply on a basis of operation from the territory of one country and a complex set of procedures is in place for notification and co-ordination of frequency assignments to ensure equitable access to this valuable spectrum/orbital resource.

1.6   Ofcom supports introducing greater flexibility in the Radio Regulations. This is in line with our policies to facilitate a more liberal and market based approach to spectrum management. The need for evolution of the Radio Regulations to ensure they remain

fit for purpose in the future has been included in the agenda of the next WRC and Ofcom is treating this as one of the high priority issues.

1.7   Other high priority topics include technical arrangements for the exploitation of the digital dividend, specifically mobile services in the band 790- 862 MHz, and spectrum for the operation of unmanned aircraft.

1.8   The closing date for responses is 5 February 2010, see Annex 1 for details of how to respond to this consultation.

Section 2

Introduction

2.1   The international framework for the management of the radio frequency spectrum is laid down in the International Radio Regulations. The Radio Regulations have the status of an international treaty and determine the rights and obligations for spectrum use in one country relative to spectrum use in all other countries. Although the Radio Regulations, in the United Kingdom at least, do not formally restrict the use to which the spectrum is put, they can constrain spectrum usage to a considerable extent. In practice, they have for many years determined the pattern of spectrum use for almost the entire radio spectrum and almost all radio services. There are a number of reasons for this, including:

- keeping cross-border interference to a minimum;

- enabling international roaming, benefiting from international markets for equipment with resulting economies of scale for operators and users; and

- the international nature of some radio services (the most obvious examples being international short-wave broadcasting and satellite communications).

2.2   The Radio Regulations are probably best known for the International Table of Frequency Allocations, which subdivides the radio spectrum from 9 kHz to 275 GHz into a large number of frequency bands, each being allocated to one or more defined radiocommunication services (such as broadcasting, mobile, fixed-satellite etc). A detailed description of the various radiocommunication services and how they relate together is set out in Annex 9.

2.3   The frequency table also divides the world into three broad geographical Regions: Region 1 covers Africa and Europe (including Armenia, Azerbaijan, the Russian Federation, Georgia, Kazakhstan, Mongolia, Uzbekistan, Kyrgyzstan, Tajikistan, Turkmenistan, Turkey and Ukraine); Region 2 covers the Americas; and Region 3 covers the Asia-Pacific countries. The Islamic Republic of Iran is split between Region 1 and 3. Although there is a good degree of alignment between the Regions, there are also distinct differences in many important parts of the spectrum.

2.4   The bulk of the Radio Regulations contains regulatory procedures for the use of the radio spectrum. These include general procedures for coordinating frequency use between countries at the level of individual assignments, i.e. individual stations or networks. Such procedures establish rights and obligations, giving the regulatory certainty necessary for investment in radiocommunications systems. Other provisions may be specific to certain radio services, including pre-determined frequency assignment plans in some cases, and detailed operational procedures (particularly for maritime and aeronautical services).

2.5   The Radio Regulations are produced and updated by a World Radiocommunication Conference (WRC) of the International Telecommunication Union (ITU), a specialised agency of the United Nations. In order to keep pace with the rapidly changing world of radiocommunications, WRCs are held about every four years. The last was in 2007 (WRC-07) and the next will be held from 23 January to 17 February 2012 (WRC-12). Ofcom formally represents the United Kingdom at each WRC.

2.6   There has not been a comprehensive revision of the Radio Regulations since 1979. All subsequent WRCs have undertaken a partial revision of the Regulations on the basis of a fixed, pre-determined agenda. The agenda of a WRC is prepared by the previous WRC, before being formally endorsed by the Council of the ITU.

2.7   The agenda for WRC-12 contains over 25 agenda items covering a wide variety of frequency bands and radio services and several "standing" agenda items covering more general regulatory and procedural matters. Some items are very specific and tightly defined while others have the potential to embrace a wide range of issues. All have the potential to create new opportunities for the use of the radio spectrum but also may, at the same time, present a possible threat to existing users. In this consultation document the WRC-12 agenda is explained in general terms together with the issues raised by each item, insofar as they can be determined this far before the WRC. For this purpose the main WRC-12 agenda items have been grouped into broad subject categories for convenience:

Subject	Agenda items
Electronic Communications Services	1.5, 1.8, 1.13, 1.17, 1.20, 1.25
Transport, including radiodetermination	1.3, 1.4, 1.7, 1.9, 1.10, 1.14, 1.18, 1.21
Scientific and amateur use of spectrum	1.6, 1.11, 1.12, 1.15, 1.16, 1.23, 1.24
International regulatory framework	1.2, 1.19, 1.22
Standing agenda items	1.1, 2, 3, 4, 5, 6, 7, 8.1, 8.2,

NB: These categories do not have any formal international recognition.

2.8   This consultation addresses each of the broad subject categories, providing an overview of the individual agenda items. The document aims to provide a summary of each issue in a format suitable for those who are not already familiar with the WRC process. It also tries to identify any linkages between issues which may not be immediately obvious from the WRC Agenda itself.

2.9   The objectives for specific agenda items, or issues, are described. These are based on existing Ofcom policies and discussions with involved stakeholders. There is a continuous process of reviewing these objectives as the work progresses to take account of developments. Ofcom sees this consultation as an important step in this process and will review our objectives against the responses and other relevant factors. It may be necessary to issue one or more further consultations, possibly focusing on specific agenda Items. This may be appropriate for the most controversial topics at the point of deciding the final UK positions, as was the case for WRC-07.

2.10   The consultation also identifies what we consider to be the relative priorities of the various agenda items. These priorities have been developed in collaboration with government departments and other stakeholders and we would welcome views as to whether we have identified the priorities correctly. A list of all the agenda items and the priority we have provisionally assigned to them is set out in Annex 6, along with a description of how the priorities have been determined. We will take account of responses to this consultation in prioritising the work going forward.

UK preparation for WRCs

2.11   The preparation for each WRC begins at the previous conference with the agreement of the agenda. The preliminary conference agenda is developed two conferences before, i.e. the agenda for WRC-12 was drafted at WRC-03 and confirmed at WRC-07 after necessary changes as a result of having been drafted so early. The organisation of the studies and attribution of the work to the ITU-R Study Groups is decided at the first Conference Preparatory Meeting (CPM) held during the week following the previous WRC.

2.12   Proposals to WRCs are usually co-ordinated by countries through regional groups, in the case of the UK this is within the Conference of European Postal and Telecommunications Administrations (CEPT). CEPT, which currently has 48 member countries, then submits European Common Proposals (ECPs) to the WRC. Each CEPT member is free to formally sign each ECP and, unless there was good reason not to do so, Ofcom would usually expect to support all the ECPs developed through this process[1]. In this way we expect that by adding our support on issues where we may not have as strong a view as other countries, we should gain support for the matters which are important to us on a reciprocal basis. We see this as one of the key strengths of CEPT and a benefit of membership.

2.13   As well as participating in CEPT, Ofcom also monitors developments at the global level and, where justified, participates as an observer in relevant meetings outside Europe including CITEL (Americas); APG (Asia-Pacific); ASMG (Arab group); RCC (former Soviet countries) and ATU (Africa).

2.14   UK preparation for WRCs is led by Ofcom and formal responsibility for the development of UK positions rests with the UK Spectrum Strategy Committee (UKSSC – a Cabinet Office committee). The Ofcom chaired International Frequency Policy Group (IFPG) has delegated responsibility to conduct the detailed work and in practice the UK SSC is only expected to need to actively consider the most controversial issues.

2.15   A co-ordinator is assigned to manage each agenda item, reporting to the IFPG. These co-ordinators are currently Ofcom staff with responsibility for the relevant subject area, although there is nothing preventing this role being outside Ofcom. Co-ordination of UK views at working level is primarily the responsibility of these co-ordinators through a combination of face to face meetings and correspondence with relevant stakeholders. The co-ordinator for each agenda item is identified in the relevant section of this Consultation Document where the agenda item is discussed.

2.16   Draft European proposals for WRC-12 will be developed during the course of 2010 and 2011 and Ofcom is already engaged in the discussions that will lead to these proposals. UK input to these European proposals will be co-ordinated through the IFPG as has been done in the past and this Consultation Document is not intended to replace any of this process.

2.17   The purpose of this Consultation Document is, at this relatively early stage of the preparations, to inform users of the radio spectrum and the radio industry of the issues that will be discussed. We invite interested parties, especially (but not only)

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[1] Note that although the UK has a track record of signing most ECPs, it did not do so for one major item at WRC-07. This was on spectrum for future generations of mobile radio which was subject to an Ofcom consultation in 2007: "WRC 07 Agenda item 1.4 - Consultation on candidate bands under consideration at WRC-07 for IMT".

those with whom we are not already engaged, to identify themselves and to raise any opportunities or threats that they consider may arise. As explained above, we also invite views on the relative priorities that we have tentatively assigned to each agenda item.

2.18   Ofcom is commited to furthering the interests of citizens and consumers – regardless of their background or identity. Based on an initial screening, Ofcom considers that WRC-12 has no direct implications for equality or diversity. Ofcom invites comments on this issue, in particular the identification of any specific WRC issue which could have an impact in this area.

> *Question 1: Are there any opportunities or threats associated with WRC-12 in addition to those already identified in this consultation? Do you agree with the prioritisation of the agenda items, and if you have identified any opportunities or threats, does this have an impact on these priorities?*

> *Question 2: Do you have any comments on the mechanism for UK preparation for WRCs and the role of Ofcom in this process?*

> *Question 3: Do you agree with Ofcom's view that WRC-12 does not have direct implications for equality or diversity of UK citizens?*

Section 3

Electronic Communication Services

3.1   The agenda items described in this section in general deal with requests for access to spectrum for new services or to more spectrum for existing services. This can be on the basis of either an allocation of new spectrum on an exclusive basis or on a shared basis with other services.

3.2   This section addresses the following WRC-12 agenda items:

1.5	Harmonisation of spectrum for Electronic News Gathering (ENG);
1.8	Fixed service in the bands between 71 and 238 GHz;
1.13	Usage of 21.4 – 22 GHz for the Broadcasting Satellite Service (BSS);
1.17	Sharing between mobile and other services in the band 790 – 862 MHz;
1.20	High Altitude Platform Stations (HAPS) in the range 5850 – 7075 MHz;
1.25	Additional allocations to the Mobile Satellite Service (MSS).

Agenda Item 1.5 - Harmonisation of spectrum for ENG

3.3   Agenda item 1.5 covers possible harmonisation of bands used for Electronic News Gathering (ENG) – usually described as programme-making and special events (PMSE) in the UK. ENG covers a range of activities associated with the production of television and radio programmes, for example wireless cameras used to cover sporting events and video/audio links to provide a live feed from a major news event to the studio. ENG typically operates in bands shared with other services. This agenda item offers a possibility to identify harmonised bands to increase economies of scale and facilitate circulation of equipment.

3.4   Identification of spectrum for ENG will be on a non-exclusive basis. Such identification may be used, for example, to provide a tuning range for ENG equipment within which different sub-bands are likely to be available in different countries. This approach has benefits for major international events where a smaller amount of harmonised spectrum may not provide sufficient capacity.

3.5   Ofcom's view is to support market-led, non-mandatory harmonisation of spectrum. We support this agenda item insofar as it promotes cooperation between ENG users and manufacturers to realise and take advantage of any equipment economies of scale where they are identified.

3.6   If you would like to discuss this agenda item in more detail, John Canavan is co-ordinating the UK views and can be contacted by e-mail: John.Canavan@ofcom.org.uk

> *Question 4: Do you agree with Ofcom's view that it is beneficial to identify spectrum for ENG use on a non-exclusive basis in order to support market-led, non-mandatory harmonisation?*

Agenda Items 1.8 - Fixed service in the bands between 71 and 238 GHz

3.7   Agenda item 1.8 addresses future developments in the fixed service in the bands between 71 and 238 GHz, whilst protecting scientific use. These bands are becoming increasingly attractive for high capacity short distance links which can be used, for example, to provide very high data rate links without the need for detailed planning allowing for far quicker and more flexible deployment than wired or fibre networks.

3.8   Ofcom is seeking to ensure that an appropriate regulatory framework is in place to facilitate this development with the objective of creating sufficient certainty for industry to invest in the development of equipment.

3.9   If you would like to discuss this agenda item in more detail, Alex Dixon is co-ordinating the UK views and can be contacted by e-mail: Alex.Dixon@ofcom.org.uk

Question 5: Do you agree with Ofcom's aim to seek an appropriate regulatory framework to facilitate the development of fixed service in the bands above 71 GHz?

Agenda Item 1.13 - Usage of the 21.4 – 22 GHz band for the BSS

3.10   Agenda item 1.13 concerns the usage of the band 21.4 – 22 GHz for the BSS and associated feeder links[2] in Regions 1 and 3. These allocations were originally made in 1992, although not coming into force until 2007, and were made in anticipation of high definition satellite TV delivery.

3.11   It is necessary to develop procedures for notification and co-ordination of satellite systems to be able to implement satellite networks. This has led to a number of ITU studies being undertaken including in relation to technical and regulatory aspects of harmonisation of the usage of the band, planning methodologies, coordination or other procedures, and BSS technologies.

3.12   Interim procedures were agreed in 1992 to allow High Definition Television (HDTV) systems to be introduced on a first come first served basis. In 2007 it was recognised that developing a rigid plan for the use of the band (*a priori* planning in ITU terminology) should be avoided as it would freeze access according to the technology and demand for spectrum assumed at the time that the plan was developed. The task of WRC-12 is to review results of the latest studies and take a decision on the framework for usage of the band.

3.13   Ofcom supports flexible use of the band, thus promoting the availability of services by satellite, such as HDTV. Ofcom is opposed to *a priori* planning for the reasons recognised above and taking account of experience in other bands which shows that this restricts access to spectrum and prevents technological developments.

3.14   Ofcom is not convinced of a real need for additional BSS feeder link spectrum, noting that the existing bands between 17.3 – 18.4 GHz are available for this purpose and it may also be possible to use the 47.2 - 49.2 GHz band. We will seek to ensure that any proposal submitted requesting additional spectrum allocations is accompanied

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[2] A feeder link is necessary to uplink the programme material to be broadcast from the satellite.

with a full justification, evidence and an assessment setting out the implications for other applications and services.

3.15   If you would like to discuss this agenda item in more detail, James Richardson is co-ordinating the UK views and can be contacted by e-mail: James.Richardson@ofcom.org.uk

Question 6: Do you agree with Ofcom's intended approach to use of the band 21.4 – 22 GHz?

Agenda Item 1.17 - Sharing between mobile and other services in 790–862 MHz

3.16   The digital dividend is of particular importance in the UK and has been addressed in a number of previous Ofcom consultation documents and statements[3]. Agenda item 1.17 addresses technical and regulatory issues resulting from the allocations[4] made under WRC-07 Agenda item 1.4 for mobile services in the band 790 – 862 MHz (also known as the 800 MHz band).

3.17   The introduction of mobile services in the 800 MHz band creates a potential for interference to the services currently using the band, including terrestrial television reception, services connected with broadcasting such as radiomicrophones, and other services, in particular aeronautical radionavigation. This situation is due to the fact that mobile services are not expected to start using the band in all countries in the same timeframe, in the same way, or in some cases at all.

3.18   The agenda item is primarily concerned with cross border interference scenarios. In general, where there is similar spectrum use in different countries, border co-ordination can normally be achieved in an equitable manner. However, in the case of this agenda item there are significant issues to be solved for cases where one country has a service which is particularly sensitive to interference, e.g. Aeronautical Radionavigation, and the introduction of mobile services is sought in its neighbour.

3.19   The purpose of agenda item 1.17 is to consider the sharing studies which are underway between the mobile service and other services in this band for Regions 1 and 3 (the allocation situation is different in Region 2 and there are no significant cross border issues between Region 2 and Region 1 or 3 countries). Based on the studies, WRC-12 needs to take appropriate regulatory action to protect the existing services. The UK is fully engaged in the studies which are being undertaken for this agenda item. Our objective is to ensure that decisions taken at WRC-12 do not limit the possibility to deploy mobile networks in this band.

3.20   Ofcom's view is that the provisions agreed at the Regional Radiocommunication Conference in Geneva 2006 for the planning of digital terrestrial broadcasting in Europe (GE-06) are fit for purpose and no specific further action is required to meet UK needs. The agenda item is high priority for the UK due to the need to ensure that there is no unwanted impact to the award of the 800 MHz band domestically or elsewhere in Europe. In particular, we want to ensure that the outcome of WRC-12

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[3] See: http://www.ofcom.org.uk/radiocomms/ddr/documents/

[4] The UK is included in an existing co-primary mobile allocation from Radio Regulations Footnote No. 5.316, this was expanded by No. 5.316A to certain other countries on 1 January 2009 and will be further expanded to become a table allocation for the whole of Region 1 on 17 June 2015.

does not provide any obstacle to work being undertaken within the European Union in relation to the 800 MHz band.

3.21   If you would like to discuss this agenda item in more detail, Steve Green is co-ordinating the UK views and can be contacted by e-mail: Steve.Green@ofcom.org.uk

Question 7: Do you agree with Ofcom's approach to the sharing issues in the band 790 – 862 MHz?

Agenda Item 1.20 - HAPS in the range 5850 – 7075 MHz

3.22   Agenda item 1.20 is related to the identification of spectrum for feeder links to High Altitude Platform Stations (HAPS). HAPS are high altitude, i.e. around 20 km, balloons which can be used as a platform for telecommunications infrastructure, e.g. broadband internet access. The main interest to deploy HAPS has come from outside Europe, particularly when factors such as very low population density and lack of existing infrastructure make this an attractive alternative to terrestrial infrastructure. There has been some UK interest in developing the technology for HAPS balloons, however our primary interest under this agenda item is protection of the existing services, including conventional fixed services which operate in this frequency range.

3.23   If you would like to discuss this agenda item in more detail, Nasarat Ali is co-ordinating the UK views and can be contacted by e-mail: Nasarat.Ali@ofcom.org.uk

Question 8: Do you agree with Ofcom's objective to protect the existing services from deployment of HAPS?

Agenda Item 1.25 - Additional allocations to the MSS

3.24   Agenda item 1.25 is concerned with new allocations to the Mobile Satellite Service (MSS) and is focussed on the frequency range 4 – 16 GHz. Future developments in the MSS may lead to a requirement for additional spectrum to facilitate innovative new space services, for example two-way communications and broadband data services for remote areas. A key issue is that spectrum for MSS needs to be harmonised, preferably globally but at least at regional level, due to the large satellite footprint of the service.

3.25   There is a potential link between this agenda item and agenda item 1.7 (see paragraphs 4.13 – 4.18). There may be a requirement for additional MSS spectrum caused by the displacement of non-aviation communication MSS services from the bands around 1.6 GHz due to aeronautical mobile satellite service communications taking priority in those bands. It is also possible that if the aeronautical requirements cannot be met from the 1.6 GHz bands, there could be a need for additional MSS allocations for specific aeronautical use, although Ofcom does not believe this scenario is likely to be justified based on the current ITU-R studies.

3.26   There are significant challenges with this agenda item. Within the frequency range under study there are very limited possibilities to introduce new MSS allocations, without placing additional constraints on existing services. Below 4 GHz, the situation becomes even more difficult because the spectrum is highly congested, and above

16 GHz the technical limitations and the mobile nature of MSS make the introduction of these services difficult. Ofcom has taken a strong position on the need for a robust business case for the need for additional MSS spectrum. In the case of displacement of existing services around 1.6 GHz, the spectrum requirement is self-evident since the band is heavily used. In the case of spectrum for new services more detailed consideration is necessary.

3.27   Because of the link to agenda item 1.7 and the fact that there may be a future requirement for MSS spectrum due to displacement from existing bands by aeronautical use, it is likely to be necessary to seek to keep this issue open by including it on the agenda of a future WRC.

3.28   If you would like to discuss this agenda item in more detail, Steve Harding is co-ordinating the UK views and can be contacted by e-mail: Steve.Harding@ofcom.org.uk

Question 9: What is your view on the need for additional spectrum to be allocated for mobile satellite services?

Section 4

Transport, including Radiodetermination

4.1   The agenda items addressed in this section cover a range of transport related applications. Many of the transport based agenda items are of particular interest to the relevant aviation and maritime regulatory authorities in the UK. This is because there are likely to be additional regulatory and implementation measures that these bodies will need to consider, outside of purely spectrum matters, following the results of WRC-12. Additionally these UK authorities are active in European[5] and International[6] bodies that have wider regulatory responsibility for aviation and maritime measures. This linkage plays an important part in the formulation of the UK position on these particular agenda items.

4.2   This section addresses the following agenda items:

1.3	Unmanned Aircraft Systems (UAS);
1.4	Aeronautical systems in 112 – 117.975, 960 – 1164 and 5000 – 5030 MHz;
1.7	Aeronautical satellite in the bands 1525 – 1559 and 1626.5 – 1660.5 MHz;
1.9	Frequencies and channel arrangements of Appendix 17 (Maritime);
1.10	Safety systems for ships and ports;
1.14	Radiolocation service in 30 – 300 MHz;
1.18	Radiodetermination satellite service in the band 2483.5 – 2500 MHz;
1.21	Radiolocation service in the band 15.4 – 15.7 GHz.

Agenda Item 1.3 - Unmanned Aircraft Systems (UAS)

4.3   The objective of this agenda item is to develop the technical characteristics, spectrum requirements and associated radio regulatory measures required for the safe implementation of unmanned aircraft systems (UAS). Unmanned aircraft systems are of increasing interest with aerospace companies and operators. The system would see the main piloting functions of the aircraft automated and the pilot located on the ground. This would require various radio links, so that plane control can be effectively managed. Whilst we already have the use of relatively small UASs within some countries, the work under this agenda item additionally encompasses aircraft that would fly in commercial airspace. There has been significant activity around UAS in industry groups and aviation regulatory bodies, before the involvement of relevant radio regulatory groups such as CEPT and ITU. Finally it is understood that the scope of this agenda item is addressing the safe operation of the UAS only. Therefore additional spectrum requirements, not directly related to this safety function, are not being considered under this agenda item, i.e. requirements for applications carried by the UAS but not used to control it.

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[5] The European Organisation for the Safety of Air Navigation (EUROCONTROL) whose objective is the development of a seamless, pan-European Air Traffic Management (ATM) system.
[6] International Civil Aviation Organization (ICAO) and the International Maritime Organization (IMO), which are specialised agencies of the United Nations.

4.4   The UK supported the establishment of this agenda item at the previous World Radio Conference in 2007, noting interest from some UK stakeholders. Much of the initial work has been focused around the technical description of the platform and calculating its bandwidth requirements. A number of European countries and US/Canada are particularly active on this agenda item.

4.5   Until recently there has only been limited discussion of the spectrum bands from where the bandwidth requirements are expected to be drawn. This is because the technical description would need to have a reasonable level of detail before spectrum requirements could be effectively addressed. We are now beginning to reach that stage in the debate. Whilst the agenda item scope does not limit the range of frequency bands that could be considered for UAS, the spectrum bands that have recently been proposed are those that already have an aeronautical allocation, and we would see this as a sensible development.

4.6   There is a potential link in this agenda item with agenda item 1.7, (see paragraphs 4.13 to 4.18). Agenda item 1.3 covers the separate two way link from the individual UAS to its remote pilot and this may include satellite AMS(R)S communications. The spectrum requirements for this may need to be considered separately by WRC-12. It may be necessary to adopt regulations which exclude this specific spectrum requirement from impacting the bands under agenda item 1.7, where specific radio regulations apply.

4.7   Ofcom's position on this agenda item is to support the on-going work around the technical description. Also where alternative, non aeronautical frequency bands are selected that the operation of UAS should not place undue constraints on other, recognised services.

4.8   If you would like to discuss this agenda item in more detail, Stephen Talbot is co-ordinating the UK views and can be contacted by e-mail: Stephen.Talbot@ofcom.org.uk

Question 10: What are your views on the spectrum needs for the control of unmanned aircraft?

Agenda Item 1.4 - Aeronautical systems in 112–117.975, 960–1164 and 5000–5030 MHz

4.9   WRC-07 saw discussions around the development of new aeronautical services, which resulted in this agenda item. The primary purpose of this agenda item is to consider the need for any regulatory requirements to facilitate the introduction of new aeronautical systems in the 112 to 117.975, 960 to 1164 and 5000 to 5030 MHz bands.

4.10   These spectrum bands are already identified, internationally, for aeronautical use. Work related to this agenda item is currently focussed around defining the technical criteria of the systems that might make use of the bands in question. This includes, but is not necessarily limited to: Instrument Landing Systems (ILS), a system currently used to guide aircraft on final approach to the runway; VHF Omni-directional Radio Range (VOR), which is used for aircraft navigation en-route; and the Microwave Landing Systems (MLS) which is a more advanced aircraft landing system which is at the initial stages of deployment.

4.11   Ofcom's position on this agenda item is to support the technical sharing studies, which are currently being undertaken. Again, any technical or regulatory requirements should not place undue constraints on other services. We also note that some of the spectrum specifically identified under this agenda item (5000 – 5030 MHz) forms part of the spectrum that will be used by the Galileo project which will provide a service similar to GPS.

4.12   If you would like to discuss this agenda item in more detail, Stephen Talbot is co-ordinating the UK views and can be contacted by e-mail: Stephen.Talbot@ofcom.org.uk

Question 11: What are your views on the technical and regulatory issues related to new aeronautical services? Is there a current or expected future demand from other services to use the bands identified under agenda item 1.4?

Agenda Item 1.7 - Aeronautical satellite in 1525–1559 and 1626.5–1660.5 MHz

4.13   This agenda item is concerned with aeronautical mobile satellite access to the generic mobile satellite bands 1525 – 1559 MHz and 1626.5 – 1660.5 MHz. Coordination of spectrum assignments for mobile satellite service (MSS) networks in these bands is carried out through regular multilateral meetings between the MSS operators. These meetings follow a dynamic process, allowing for the assignments to each operator to be reviewed annually.

4.14   The Radio Regulations give priority to aeronautical safety communications in the frequency bands 1545 – 1555 and 1646.5 – 1656.5 MHz over other MSS traffic (i.e. generic MSS use, not limited to aviation); the current MSS operators carry a mixture of generic MSS and aviation safety traffic. The European Space Agency (ESA) are developing an aeronautical mobile satellite system to support the Single European Sky initiative. ESA plan to propose this systems standard for adoption by ICAO and it could in future claim a priority to operate in these bands.

4.15   The agenda item has been prompted by dissatisfaction with the co-ordination arrangements from new operators, e.g. MTSAT of Japan[7]. In the UK, Inmarsat has a significant interest in this issue as a major supplier of MSS services to commercial and safety service users for more than thirty years.

4.16   The UK view is that the issue of priority access for aeronautical safety communications has been well known for many years and should be respected. Therefore no action is needed under this agenda item and the requirements for AMS(R)S should be met from within the 2 x 10 MHz (1545 – 1555 MHz and 1646.5 – 1656.5 MHz). If necessary, existing MSS operators should relinquish spectrum used for non-aviation communication services to facilitate this.

4.17   However, the UK is keen to ensure that future use of these bands will be carried out in a spectrally efficient manner in the case of both safety and commercial applications. Therefore, any requirements for AMS(R)S access to the 2 x 10 MHz to which access has been prioritised will still need to be justified. Where use of the full 2 x 10 MHz for AMS(R)S is not adequately justified, access to this spectrum should continue to be available for MSS.

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[7] MTSAT is managed by the Japanese Government and supports weather and air traffic control functions.

4.18   If you would like to discuss this agenda item in more detail, Steve Harding is co-ordinating the UK views and can be contacted by e-mail: Steve.Harding@ofcom.org.uk

Question 12: What are your views on the use of the 1.6 GHz bands by MSS?

Agenda Item 1.9 - Frequencies and channel arrangements of Appendix 17 (Maritime)

4.19   The intent under this agenda item is to review the frequency arrangements of the maritime use in the HF (High Frequency) range so that new, predominately digital maritime services can make use of the band. This agenda item is of importance to the maritime community but has little impact on other services.

4.20   If you would like to discuss this agenda item in more detail, Stephen Talbot is co-ordinating the UK views and can be contacted by e-mail: Stephen.Talbot@ofcom.org.uk

Question 13: What are your views on the Appendix 17 frequency arrangements for maritime use?

Agenda Item 1.10 - Safety systems for ships and ports

4.21   This agenda item, in general terms, regularly appears on the agenda of a WRC. The main reason is that developments in maritime communications and other aspects of safety of life at sea result in a need to update relevant international standards and regulations, including the maritime parts of the Radio Regulations.

4.22   The scope of the agenda item is quite wide and we are currently seeing a number of proposals being put forward. These address the potential application of Radio Frequency Identification (RFID) tags for containers on vessels and the potential use of digital technologies in the maritime VHF[8] band. There are also proposals for the addition of a maritime mobile satellite allocation in the VHF band 156-162.025 MHz to support ship and port security and maritime safety systems.

4.23   The maritime VHF band is mainly used for simplex communication, i.e. using a single frequency with communication in one direction at a time. The majority of channels are, however, reserved for duplex communication which is a legacy of the requirement for simultaneous two way connection to the public telephone network. Recent WRCs have made provision for single frequency use of these channels albeit with some restrictions. Duplex use for public correspondence (i.e. phone calls) has largely been overtaken by mobile and satellite phones and the UK is proposing a change to the VHF maritime frequency arrangements that could see use of dual frequency channels, for single frequency use. For this to occur globally it will be necessary to remove the restrictions embedded in the Radio Regulations.

4.24   If you would like to discuss this agenda item in more detail, Stephen Talbot is co-ordinating the UK views and can be contacted by e-mail: Stephen.Talbot@ofcom.org.uk

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[8] Appendix 18 of the ITU-R Radio Regulations refers.

> *Question 14: What are your views on the need for additional allocations for maritime mobile use to enhance maritime safety and security?*

Agenda Item 1.14 - Radiolocation service in 30 – 300 MHz

4.25   Creation of this agenda item evolved from proposals put forward by the Russian Federation to WRC-07. That proposal outlined the need for a primary allocation to Radiolocation in the VHF frequency band for airport radars and systems for the remote sensing of the surface of the Moon and asteroids, as well as for defining the position of natural and artificial Earth satellites.

4.26   Whilst the agenda item covers the frequency range 30-300 MHz, discussions are currently focused around the bands 142-144 MHz and 154-156 MHz. These bands are used by the MoD in the UK and we will maintain a careful watching brief to evaluate any risk of interference to these services.

4.27   If you would like to discuss this agenda item in more detail, Stephen Talbot is co-ordinating the UK views and can be contacted by e-mail: Stephen.Talbot@ofcom.org.uk

> *Question 15: Do you agree with Ofcom seeking to protect services operating in the UK from any impact due to long range VHF radar systems?*

Agenda Item 1.18 - Radiodetermination satellite service in 2483.5 – 2500 MHz

4.28   This agenda item addresses radiodetermination satellite (RDSS) allocations in the band 2483.5 – 2500 MHz; RDSS allocations allow the operation of "SatNav" systems such as GPS and Gallileo. Some parts of the world, including China and India, have existing RDSS allocations in this band and are keen to see these allocations extended to allow global coverage. Ofcom is supportive of this initiative, subject to studies confirming that this will not create interference to existing services which, in the case of the UK, includes programme making and special event (PMSE) applications.

4.29   If you would like to discuss this agenda item in more detail, Steve Harding is co-ordinating the UK views and can be contacted by e-mail: Steve.Harding@ofcom.org.uk

> *Question 16: Do you agree with Ofcom supporting the extension of RDSS allocations in the band 2483.5 – 2500 MHz, whilst seeking to protect other services operating in the UK?*

Agenda Item 1.21 - radiolocation service in the band 15.4 – 15.7 GHz

4.30   Work on this agenda item has primarily been focused around revising supporting documentation, such as the technical recommendations that cover this frequency band and current services identified in the band. The purpose is to assist the introduction of the Radiolocation service in the band in order to facilitate advanced

radar systems with increased image resolution. This agenda item was originally proposed by the United States.

4.31   We do not have a strong view on this agenda item, other than to ensure that use does not place undue constraints on other services. In particular, aircraft landing systems which have sensitive receivers on board the aircraft.

4.32   If you would like to discuss this agenda item in more detail, Stephen Talbot is co-ordinating the UK views and can be contacted by e-mail: Stephen.Talbot@ofcom.org.uk

Question 17: Do you have any view on the introduction of radiolocation in the band 15.4 – 15.7 GHz?

Section 5

Scientific and Amateur use of spectrum

5.1   This section deals with the WRC-12 agenda items which are of scientific and amateur radio interest. The agenda covers a diverse range of scientific projects across the entire frequency range of the radio spectrum.

5.2   This section addresses the following agenda items:
- 1.6   Passive services between 275 and 3000 GHz;
- 1.11   Space Research Service (Earth to space) in the band 22.55 – 23.15 GHz;
- 1.12   Aeronautical mobile service operations in 37 – 38 GHz;
- 1.15   Oceanographic radar applications in the range 3 – 50 MHz;
- 1.16   Passive systems for lightning detection below 20 kHz;
- 1.23   Amateur Service allocation in parts of the band 415 – 526.5 kHz;
- 1.24   Meteorological Satellite Service allocation in the band 7850 – 7900 MHz.

Agenda Item 1.6 - Passive services between 275 and 3000 GHz

5.3   The main interest in the use of frequencies above 275 GHz comes from the scientific community for passive measurements, e.g. for radioastronomy and Earth exploration satellite. Agenda item 1.6 provides for a review of the spectrum use by passive services between 275 and 3000 GHz in order to update the information on spectral line observations contained in footnote 5.565 of the Radio Regulations.

5.4   Ofcom is supportive of the update of the Radio Regulations regarding passive use above 275 GHz, but would not wish to see this result in a monopolisation of the spectrum for this purpose. We believe that it is important to maintain future flexibility to encourage the development of innovative products and services, especially in less congested parts of the radio spectrum.

5.5   A second element of agenda item 1.6 is the consideration of allocations for free space optical links (i.e. point to point optical communication) above 3000 GHz. Ofcom will consider any proposals in this area carefully, but is of the view that no action is necessary with regard to satellite optical links.

5.6   If you would like to discuss this agenda item in more detail, Barry Goodyear is co-ordinating the UK views and can be contacted by e-mail: Barry.Goodyear@ofcom.org.uk

> *Question 18: Do you have any comments on the use of spectrum above 275 GHz?*

Agenda Item 1.11 - Space Research Service in the band 22.55 – 23.15 GHz

5.7   Agenda item 1.11 is seeking an allocation for the Space Research Service (Earth to space) in the band 22.55 – 23.15 GHz. The purpose of this is to support a wide range of future space research missions, including robotic missions to the Moon and Mars (i.e. for examining terrain, environment and potential landing sites).

5.8   The UK has significant interests in space research through European Space Agency (ESA) missions and is favourable to this allocation provided it does not unduly constrain existing services in the band.

5.9   If you would like to discuss this agenda item in more detail, Bharat Dudhia is co-ordinating the UK views and can be contacted by e-mail: Bharat.Dudhia@ofcom.org.uk

Question 19: Do you have any views on space research use of the band 22.55 – 23.15 GHz? Is there a current or expected future demand from other services to use this band?

Agenda Item 1.12 - Aeronautical mobile service operations in 37 – 38 GHz

5.10   This agenda item is seeking to protect the space research service operating in the band 37 – 38 GHz from aeronautical mobile service operation; these services share a co-primary allocation in this band. The space research allocations in the band could be used to support future exploration of the Moon and Mars, for example by providing video and telemetry links.

5.11   There is no current use of the band for aeronautical applications and the likely result of the agenda item will be to impose significant constraints which could prevent such use developing in the future. Ofcom can support this outcome, in the absence of any planned aeronautical use.

5.12   If you would like to discuss this agenda item in more detail, Bharat Dudhia is co-ordinating the UK views and can be contacted by e-mail: Bharat.Dudhia@ofcom.org.uk

Question 20: Do you support the protection of science services in the band 37 – 38 GHz? Do you know of any anticipated requirements for aeronautical mobile use or any other current or expected future demand in this band?

Agenda Item 1.15 - Oceanographic radar applications in the range 3 – 50 MHz

5.13   HF radar can be used in the frequency range 3 – 50 MHz for ocean wave and current measurements. This information is used for a variety of purposes, but is most important in support of search and rescue operations and for environmental work such as tracking oil spills and pollution. Experimental systems are already in operation in various locations, mainly in the US, and the purpose of agenda item 1.15 is to secure a spectrum allocation to facilitate future development.

5.14   There is UK interest in oceanographic radar applications and Ofcom is supportive of the objective of this agenda item. However, we also want to ensure continued protection of the existing services. The HF bands are used for a variety of important purposes, including international broadcasting and safety communications to ships and aircraft.

5.15   If you would like to discuss this agenda item in more detail, Bharat Dudhia is co-ordinating the UK views and can be contacted by e-mail: Bharat.Dudhia@ofcom.org.uk

Agenda Item 1.16 - Passive systems for lightning detection below 20 kHz

5.16   Detection of lightning using low frequency radio reception is well established and of great importance to the protection of life and property. Lightning strikes generate an electromagnetic discharge which propagates thousands of miles. The UK Meteorological Office manages a network of detectors to measure this effect and monitors the location and intensity of thunderstorms. The data provided by the network is used by meteorological organisations worldwide and contributes towards safety of life, both in terms of forecasting for public safety and in forecasting aviation operations, especially over the oceans, and large areas of land, where national lightning detection systems do not exist. Additionally it has the potential to give a service across Africa in support of disaster risk reduction initiatives and is used for specific purposes such as risk management in maintenance activity of the national electricity supply grid.

5.17   The propagation characteristics at these low frequencies which enable lightning detection are also suitable for some very long range communication systems, e.g. with submarines and there is a potential for interference to the lightning detectors. For this reason the UK has promoted agenda item 1.16 at WRC-12 in order to seek an allocation for such lightening detection systems which would ensure protection for their continued operation.

5.18   If you would like to discuss this agenda item in more detail, Mark Rider is co-ordinating the UK views and can be contacted by e-mail: Mark.Richard.Rider@ofcom.org.uk

Agenda Item 1.23 - Amateur Service in parts of the band 415 – 526.5 kHz

5.19   Radio amateurs use radio for experimental purposes and to provide communications in support of emergency services in some situations. Many important developments in communications technology have directly resulted from amateur activities. Agenda item 1.23 considers an allocation of around 15 kHz between 415 – 526.5 kHz for the amateur service on a secondary basis.

5.20   Ofcom's position is to support the study work in this area. On a restricted basis, and subject to obtaining a variation to the amateur licence, Ofcom already permits amateur use in a small part of this band. We will need to balance the maritime, aeronautical and amateur interests in addressing this agenda item.

5.21   If you would like to discuss this agenda item in more detail, Wesley Milton is co-ordinating the UK views and can be contacted by e-mail: Wesley.Milton@ofcom.org.uk

Agenda Item 1.24 - Meteorological Satellite in the band 7850 – 7900 MHz

5.22   Agenda item 1.24 concerns the extension of the existing meteorological satellite service allocation in the band 7750 – 7850 MHz to include the band 7850 – 7900 MHz with the same regulatory conditions. The meteorological satellite service provides the service links to download data from passive instruments which provide an essential input to the weather forecasting process. This proposed allocation would provide additional capacity to support higher resolution measurements. Ofcom is supportive of this allocation, provided it does not place undue constraints on other services.

5.23   If you would like to discuss this agenda item in more detail, Bharat Dudhia is co-ordinating the UK views and can be contacted by e-mail: Bharat.Dudhia@ofcom.org.uk

Question 24: Do you agree with Ofcom's approach to support an allocation to the meteorological satellite service, subject to not constraining other services, in the band 7850 – 7900 MHz? Is there a current or expected future demand from other new services to use this band?

Section 6

International regulatory framework

6.1   This section addresses the issues which are concerned with spectrum management at international level both in general terms and for certain applications which are not currently addressed by the Radio Regulations.

6.2   This section addresses the following agenda items:
1.2   Enhancing the international regulatory framework;
1.19   Software defined and cognitive radio systems;
1.22   Short range devices.

Agenda Item 1.2 - Enhancing the international regulatory framework

6.3   The objective of this agenda item is to develop concepts and procedures for enhancing the Radio Regulations to ensure that they will continue to be responsive to the demands of current and emerging/future radio applications. In this context, the scope of this agenda item is more wide ranging than the other agenda items which generally have a specific focus and intended outcome.

6.4   Ofcom supports introducing greater flexibility in the Radio Regulations. Convergence of technologies and services is making historical service definitions obsolete and there is a risk that desirable developments in radiocommunications will be held back if the Regulations fail to keep pace and hence prevent, or make it more difficult, for innovative services and technologies to gain access to spectrum. We therefore consider it important that WRCs should actively continue to keep under review whether it is desirable to update the Regulations in order to promote optimal use of the radio spectrum, taking account of the impact on existing users. We recognise that radical change would be unlikely to gain the required support from other countries. Hence, we believe that we should adopt a targeted, evolutionary approach.

6.5   We expect that there will be two forms of output from this agenda item:

6.5.1   Proposals that lead to direct changes in the Radio Regulations; such as changes to radio service definitions, frequency allocation table, coordination and notification procedures.

6.5.2   Proposals that do not lead to direct changes in the Radio Regulations; such as development of principles to be adopted in making changes to the Radio Regulations at future WRCs.

6.6   Ofcom would support any changes to the Radio Regulations to make them more responsive to the needs of all spectrum uses and which will help to secure optimal use of spectrum. However, our priority for WRC-12 is to seek improvement in the treatment of terrestrial fixed, mobile, and broadcasting convergence. Ofcom supports studies to alter the definition of fixed and mobile so as to be based on the network topology rather than physical mobility. We will also carefully assess the impact of other countries' emerging proposals.

6.7   If you would like to discuss this agenda item in more detail, Siew Yoon Tan is co-ordinating the UK views and can be contacted by e-mail: SiewYoon.Tan@ofcom.org.uk

Question 25: What are your views on the need to introduce greater flexibility in the international regulatory framework and on Ofcom's approach to agenda item 1.2?

Agenda Item 1.19 - Software defined and cognitive radio systems

6.8   The issue for agenda item 1.19 is whether there is a need to regulate software-defined radio (SDR) and cognitive radio systems (CRS) in the Radio Regulations. SDR and CRS are radio systems employing technologies which may offer improved efficiency to overall spectrum use and additional flexibility. CRS technologies in particular may enable coexistence/sharing in bands where it would otherwise not be feasible, for example operating in the gaps in planned terrestrial broadcasting bands known as interleaved spectrum or white space.

6.9   Ofcom is supportive of such technologies but believes that harmonisation of spectrum access for CRS should be done outside the Radio Regulations on a non mandatory basis. Where harmonisation is necessary this can best be delivered on a regional basis.

6.10   As SDR is a technology to facilitate the implementation of radio equipment, we do not believe that any change to the Radio Regulations is necessary for the introduction of SDR.

6.11   If you would like to discuss this agenda item in more detail, Siew Yoon Tan is co-ordinating the UK views and can be contacted by e-mail: SiewYoon.Tan@ofcom.org.uk

Question 26: Do you agree with Ofcom's view that no changes are needed in the Radio Regulations to implement SDR/CRS?

Agenda Item 1.22 – Short Range Devices

6.12   This agenda item studies if there is a need to regulate short range devices (SRDs) in the Radio Regulations. SRDs are applications which due to their nature, e.g. very low transmit power, are unlikely to cause interference and do not need individual licensing.

6.13   The fundamental purpose of the Radio Regulations is to provide a regulatory framework which avoids the situation that radio use in one country causes interference in another. Because of the nature of their operation, SRDs have very little potential to cause cross border interference, even if the use is not harmonised between the countries concerned. However, the possibility for this type of device to move freely across national borders is of concern to some countries.

6.14   Ofcom believes that the regulation of SRDs via the Radio Regulations is not necessary. The required action could be achieved on a regional basis or through development of non binding ITU-R Recommendation(s).

6.15   If you would like to discuss this agenda item in more detail, Barry Goodyear is co-ordinating the UK views and can be contacted by e-mail: Barry.Goodyear@ofcom.org.uk

Question 27: Do you agree with Ofcom's view that it is not necessary to regulate SRDs via the Radio Regulations?

Section 7

Standing agenda items

7.1   This section addresses the standing agenda items which cover a range of recurring, housekeeping and reporting issues, the more significant of these agenda items are addressed below. The UK view of these agenda items will be developed closer to WRC-12.

7.2   This section addresses the following agenda items:
   1.1   Deletion of, or removal of names from, country footnotes;
   7   Resolution 86 (Satellite networks);
   8.1   Report of the Director of the Radiocommunication Bureau;
   8.2   Agenda items for future WRCs.

Agenda Item 1.1 - Deletion of, or removal of names from, country footnotes

7.3   Footnotes to the table of frequency allocations in the Radio Regulations provide alternative arrangements for named countries. The removal of names from country footnotes under agenda item 1.1 presents a relatively straightforward exercise in checking the need for the various footnotes the UK appears in and as such is low priority. However, it should be noted that there is also a need to check proposals from other countries to ensure there is no adverse impact to the UK, e.g. if a country withdraws from a footnote which was giving a more favourable co-ordination situation than the table allocation. This can normally only be done relatively late in the process, and sometimes during the conference itself.

Agenda Item 7 - Resolution 86 (Satellite coordination and notification procedures)

7.4   Resolution 86 is a standing item to deal with "deficiencies and improvements" in the satellite filing procedures. There is potential for significant issues to be raised under this agenda item which may impact existing satellite users and operators, particularly due to the complexity of these procedures.

7.5   There is likely to be a relationship between this agenda item and ITU initiatives to improve implementation of the satellite filing procedures, as seen at the recent ITU Radiocommunications Bureau (BR) workshop on the efficient use of satellite resources[9].

Agenda Item 8.1 - Report of the Director of the Radiocommunication Bureau

7.6   The report of the Director can give rise to major issues, for example where the Radio Regulations Board (RRB) has been unable to resolve controversial issues, e.g. cases involving satellite filings and networks or radiocommunications use for Earth observation applications.

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[9] See: http://groups.itu.int/Default.aspx?alias=groups.itu.int/br-ssd

7.7   Similarly Resolution 80, which links certain general provisions of the ITU Constitution and the Preamble to the Radio Regulations with the coordination and notification procedures in the Radio Regulations, can prove very controversial. However, any such issues are likely to arise later in the preparatory process, and possibly only at the conference itself.

Agenda Item 8.2 - Agenda items for future WRCs

7.8   Agenda item 8.2 covers the agreement of agenda items for future conferences and is of particular significance since it provides the opportunity for future changes to the Radio Regulations to meet UK needs. It also poses a threat: although the agenda should be limited in size, the typical result of this discussion is that all regional groups get all their proposals accepted. A future agenda item with a potential negative impact to the UK may require significant resources during the study process and this highlights the importance of effective participation at an early stage when future agenda items are discussed.

Other standing Agenda items

7.9   The following standing agenda items will also be addressed later in the process:
2   ITU-R Recommendations incorporated by reference;
3   Consequential changes to the radio regulations;
4   Review of WRC Resolutions and Recommendations;
5   Report from the Radiocommunication Assembly;
6   Items requiring urgent action by the study groups;

7.10   These agenda items cover the housekeeping activities related to the Radio Regulations, for example when a recommendation which is referenced from the Radio Regulations has been updated should the reference be to the old or new version. The purpose of these agenda items is basically to cover the areas where action may be needed, but is not covered in other areas. This is important, but is not normally a controversial exercise.

7.11   If you would like to discuss the standing agenda items in more detail, the co-ordinators are:
Agenda items 1.1, 2 and 4 – Wesley Milton, Wesley.Milton@ofcom.org.uk;
Agenda items 7 and 8.1 – Stephen Limb, Stephen.Limb@ofcom.org.uk;
Other standing items – Stephen Bond, Steve.Bond@ofcom.org.uk

Question 28: Do you have any comments concerning the standing agenda items?

Question 29: Are there any items you wish to see addressed by future WRCs?

Responding to this consultation

How to respond

A1.1   Ofcom invites written views and comments on the issues raised in this document, to be made **by 5pm on 5 February 2010**.

A1.2   Ofcom strongly prefers to receive responses using the online web form at https://www.ofcom.org.uk/consult/condocs/wrc_12/howtorespond/form, as this helps us to process the responses quickly and efficiently. We would also be grateful if you could assist us by completing a response cover sheet (see Annex 3), to indicate whether or not there are confidentiality issues. This response coversheet is incorporated into the online web form questionnaire.

A1.3   For larger consultation responses - particularly those with supporting charts, tables or other data - please email WRC-12@ofcom.org.uk attaching your response in Microsoft Word format, together with a consultation response coversheet.

A1.4   Responses may alternatively be posted or faxed to the address below, marked with the title of the consultation.

Mrs Pauline Walker
3rd Floor, Ofcom
Spectrum and International Policy Team
Riverside House
2A Southwark Bridge Road
London SE1 9HA

Fax: 020 7981 3990

A1.5   Note that we do not need a hard copy in addition to an electronic version. Ofcom will acknowledge receipt of responses if they are submitted using the online web form but not otherwise.

A1.6   It would be helpful if your response could include direct answers to the questions asked in this document, which are listed together at Annex 4. It would also help if you can explain why you hold your views and how Ofcom's proposals would impact on you.

Further information

A1.7   If you want to discuss the issues and questions raised in this consultation, or need advice on the appropriate form of response, please contact Stephen Bond on 020 7783 4295.

Confidentiality

A1.8   We believe it is important for everyone interested in an issue to see the views expressed by consultation respondents. We will therefore usually publish all responses on our website, www.ofcom.org.uk, ideally on receipt. If you think your response should be kept confidential, can you please specify what part or whether

all of your response should be kept confidential, and specify why. Please also place such parts in a separate annex.

A1.9   If someone asks us to keep part or all of a response confidential, we will treat this request seriously and will try to respect this. But sometimes we will need to publish all responses, including those that are marked as confidential, in order to meet legal obligations.

A1.10   Please also note that copyright and all other intellectual property in responses will be assumed to be licensed to Ofcom to use. Ofcom's approach on intellectual property rights is explained further on its website at http://www.ofcom.org.uk/about/accoun/disclaimer/

Next steps

A1.11   Following the end of the consultation period, Ofcom intends to publish a summary of the responses received.

A1.12   Please note that you can register to receive free mail Updates alerting you to the publications of relevant Ofcom documents. For more details please see: http://www.ofcom.org.uk/static/subscribe/select_list.htm

Ofcom's consultation processes

A1.13   Ofcom seeks to ensure that responding to a consultation is easy as possible. For more information please see our consultation principles in Annex 2.

A1.14   If you have any comments or suggestions on how Ofcom conducts its consultations, please call our consultation helpdesk on 020 7981 3003 or e-mail us at consult@ofcom.org.uk . We would particularly welcome thoughts on how Ofcom could more effectively seek the views of those groups or individuals, such as small businesses or particular types of residential consumers, who are less likely to give their opinions through a formal consultation.

A1.15   If you would like to discuss these issues or Ofcom's consultation processes more generally you can alternatively contact Vicki Nash, Director Scotland, who is Ofcom's consultation champion:

Vicki Nash
Ofcom
Sutherland House
149 St. Vincent Street
Glasgow G2 5NW

Tel: 0141 229 7401
Fax: 0141 229 7433

Email vicki.nash@ofcom.org.uk

Annex 2

Ofcom's consultation principles

A2.1 Ofcom has published the following seven principles that it will follow for each public written consultation:

Before the consultation

A2.2 Where possible, we will hold informal talks with people and organisations before announcing a big consultation to find out whether we are thinking in the right direction. If we do not have enough time to do this, we will hold an open meeting to explain our proposals shortly after announcing the consultation.

During the consultation

A2.3 We will be clear about who we are consulting, why, on what questions and for how long.

A2.4 We will make the consultation document as short and simple as possible with a summary of no more than two pages. We will try to make it as easy as possible to give us a written response. If the consultation is complicated, we may provide a shortened Plain English Guide for smaller organisations or individuals who would otherwise not be able to spare the time to share their views.

A2.5 We will consult for up to 10 weeks depending on the potential impact of our proposals.

A2.6 A person within Ofcom will be in charge of making sure we follow our own guidelines and reach out to the largest number of people and organisations interested in the outcome of our decisions. Ofcom's 'Consultation Champion' will also be the main person to contact with views on the way we run our consultations.

A2.7 If we are not able to follow one of these principles, we will explain why.

After the consultation

A2.8 We think it is important for everyone interested in an issue to see the views of others during a consultation. We would usually publish all the responses we have received on our website.

Annex 3

Consultation response cover sheet

A3.1　In the interests of transparency and good regulatory practice, we will publish all consultation responses in full on our website, www.ofcom.org.uk.

A3.2　We have produced a coversheet for responses (see below) and would be very grateful if you could send one with your response (this is incorporated into the online web form if you respond in this way). This will speed up our processing of responses, and help to maintain confidentiality where appropriate.

A3.3　The quality of consultation can be enhanced by publishing responses before the consultation period closes. In particular, this can help those individuals and organisations with limited resources or familiarity with the issues to respond in a more informed way. Therefore Ofcom would encourage respondents to complete their coversheet in a way that allows Ofcom to publish their responses upon receipt, rather than waiting until the consultation period has ended.

A3.4　We strongly prefer to receive responses via the online web form which incorporates the coversheet. If you are responding via email, post or fax you can download an electronic copy of this coversheet in Word or RTF format from the 'Consultations' section of our website at www.ofcom.org.uk/consult/.

A3.5　Please put any parts of your response you consider should be kept confidential in a separate annex to your response and include your reasons why this part of your response should not be published. This can include information such as your personal background and experience. If you want your name, address, other contact details, or job title to remain confidential, please provide them in your cover sheet only, so that we don't have to edit your response.

Cover sheet for response to an Ofcom consultation

BASIC DETAILS

Consultation title:

To (Ofcom contact):

Name of respondent:

Representing (self or organisation/s):

Address (if not received by email):

CONFIDENTIALITY

Please tick below what part of your response you consider is confidential, giving your reasons why

Nothing ☐   Name/contact details/job title ☐

Whole response ☐   Organisation

☐

Part of the response ☐   If there is no separate annex, which parts?

If you want part of your response, your name or your organisation not to be published, can Ofcom still publish a reference to the contents of your response (including, for any confidential parts, a general summary that does not disclose the specific information or enable you to be identified)?

DECLARATION

I confirm that the correspondence supplied with this cover sheet is a formal consultation response that Ofcom can publish. However, in supplying this response, I understand that Ofcom may need to publish all responses, including those which are marked as confidential, in order to meet legal obligations. If I have sent my response by email, Ofcom can disregard any standard e-mail text about not disclosing email contents and attachments.

Ofcom seeks to publish responses on receipt. If your response is non-confidential (in whole or in part), and you would prefer us to publish your response only once the consultation has ended, please tick here. ☐

Name   Signed (if hard copy)

Annex 4

Consultation questions

Question 1: Are there any opportunities or threats associated with WRC-12 in addition to those already identified in this consultation? Do you agree with the prioritisation of the agenda items, and if you have identified any opportunities or threats, does this have an impact on these priorities?

Question 2: Do you have any comments on the mechanism for UK preparation for WRCs and the role of Ofcom in this process?

Question 3: Do you agree with Ofcom's view that WRC-12 does not have direct implications for equality or diversity of UK citizens?

Question 4: Do you agree with Ofcom's view that it is beneficial to identify spectrum for ENG use on a non-exclusive basis in order to support market-led, non-mandatory harmonisation?

Question 5: Do you agree with Ofcom's aim to seek an appropriate regulatory framework to facilitate the development of fixed service in the bands above 71 GHz?

Question 6: Do you agree with Ofcom's intended approach to use of the band 21.4 – 22 GHz?

Question 7: Do you agree with Ofcom's approach to the sharing issues in the band 790 – 862 MHz?

Question 8: Do you agree with Ofcom's objective to protect the existing services from deployment of HAPS?

Question 9: What is your view on the need for additional spectrum to be allocated for mobile satellite services?

Question 10: What are your views on the spectrum needs for the control of unmanned aircraft?

Question 11: What are your views on the technical and regulatory issues related to new aeronautical services? Is there a current or expected future demand from other services to use the bands identified under agenda item 1.4?

Question 12: What are your views on the use of the 1.6 GHz bands by MSS?

Question 13: What are your views on the Appendix 17 frequency arrangements for maritime use?

Question 14: What are your views on the need for additional allocations for maritime mobile use to enhance maritime safety and security?

Question 15: Do you agree with Ofcom seeking to protect services operating in the UK from any impact due to long range VHF radar systems?

Question 16: Do you agree with Ofcom supporting the extension of RDSS allocations in the band 2483.5 – 2500 MHz, whilst seeking to protect other services operating in the UK?

Question 17: Do you have any view on the introduction of radiolocation in the band 15.4 – 15.7 GHz?

Question 18: Do you have any comments on the use of spectrum above 275 GHz?

Question 19: Do you have any views on space research use of the band 22.55 – 23.15 GHz? Is there a current or expected future demand from other services to use this band?

Question 20: Do you support the protection of science services in the band 37 – 38 GHz? Do you know of any anticipated requirements for aeronautical mobile use or any other current or expected future demand in this band?

Question 21: Do you have any views on HF Oceanographic Radars operating in the range 3 – 50 MHz?

Question 22: Do you have any views on the protection of lightning detection systems from interference?

Question 23: Should Amateur radio be given an allocation in part of the band 415 – 526.5 kHz, and if so where?

Question 24: Do you agree with Ofcom's approach to support an allocation to the meteorological satellite service, subject to not constraining other services, in the band 7850 – 7900 MHz? Is there a current or expected future demand from other new services to use this band?

Question 25: What are your views on the need to introduce greater flexibility in the international regulatory framework and on Ofcom's approach to agenda item 1.2?

Question 26: Do you agree with Ofcom's view that no changes are needed in the Radio Regulations to implement SDR/CR?

Question 27: Do you agree with Ofcom's view that it is not necessary to regulate SRDs via the Radio Regulations?

Question 28: Do you have any comments concerning the standing agenda items?

Question 29: Are there any items you wish to see addressed by future WRCs?

Annex 5

Impact Assessment

A5.1   There is not sufficient information available to conduct a full impact assessment at this time. At this stage of WRC preparation the technical studies which provide the background to regulatory decisions are mostly incomplete and the views of both the UK and other countries are subject to change.

A5.2   The descriptions of individual agenda items include information on the potential impact to UK interests, where these are known.

A5.3   Impact assessment(s) may be needed at a later stage as part of consultation(s) on individual agenda items or in support of any changes to UK regulations resulting from WRC-12.

Annex 6

Agenda of WRC-12

A6.1 The full Agenda for WRC-12 is shown below. In addition we have added, in the final column, an indication of the priority that we anticipate giving to each Agenda Item. A description of how the priorities have been assessed by Ofcom, including a definition of high, medium and low, is included after the table.

WRC-12 Agenda Item	Title	Proposed UK priority
1	on the basis of proposals from administrations, taking account of the results of WRC 07 and the Report of the Conference Preparatory Meeting, and with due regard to the requirements of existing and future services in the bands under consideration, to consider and take appropriate action with respect to the following items:	
1.1	to consider and take appropriate action on requests from administrations to delete their country footnotes or to have their country name deleted from footnotes, if no longer required, taking into account Resolution 26 (Rev.WRC 07);	Low
1.2	taking into account the ITU R studies carried out in accordance with Resolution 951 (Rev.WRC 07), to take appropriate action with a view to enhancing the international regulatory framework;	High
1.3	to consider spectrum requirements and possible regulatory actions, including allocations, in order to support the safe operation of unmanned aircraft systems (UAS), based on the results of ITU R studies, in accordance with Resolution 421 (WRC 07);	High
1.4	to consider, based on the results of ITU R studies, any further regulatory measures to facilitate introduction of new aeronautical mobile (R) service (AM(R)S) systems in the bands 112-117.975 MHz, 960-1 164 MHz and 5 000-5 030 MHz in accordance with Resolutions 413 (Rev.WRC 07), 417 (WRC 07) and 420 (WRC 07);	Medium
1.5	to consider worldwide/regional harmonization of spectrum for electronic news gathering (ENG), taking into account the results of ITU R studies, in accordance with Resolution 954 (WRC 07);	Medium
1.6	to review No. 5.565 of the Radio Regulations in order to update the spectrum use by the passive services between 275 GHz and 3 000 GHz, in accordance with Resolution 950 (Rev.WRC 07), and to consider possible procedures for free-space optical-links, taking into account the results of ITU R studies, in accordance with Resolution 955 (WRC 07);	Low
1.7	to consider the results of ITU R studies in accordance with Resolution 222 (Rev.WRC 07) in order to ensure long-term spectrum availability and access to spectrum necessary to meet requirements for the aeronautical mobile-satellite (R) service, and to take appropriate action on this subject, while retaining unchanged the generic allocation to the mobile-satellite service in the bands 1 525 1 559 MHz and 1 626.5-1 660.5 MHz;	Medium
1.8	to consider the progress of ITU R studies concerning the technical and	

	regulatory issues relative to the fixed service in the bands between 71 GHz and 238 GHz, taking into account Resolutions 731 (WRC 2000) and 732 (WRC 2000);	Medium
1.9	to revise frequencies and channelling arrangements of Appendix 17 to the Radio Regulations, in accordance with Resolution 351 (Rev.WRC 07), in order to implement new digital technologies for the maritime mobile service;	Low
1.10	to examine the frequency allocation requirements with regard to operation of safety systems for ships and ports and associated regulatory provisions, in accordance with Resolution 357 (WRC 07);	Medium
1.11	to consider a primary allocation to the space research service (Earth-to-space) within the band 22.55-23.15 GHz, taking into account the results of ITU R studies, in accordance with Resolution 753 (WRC 07);	Medium
1.12	to protect the primary services in the band 37-38 GHz from interference resulting from aeronautical mobile service operations, taking into account the results of ITU R studies, in accordance with Resolution 754 (WRC 07);	Low
1.13	to consider the results of ITU R studies in accordance with Resolution 551 (WRC 07) and decide on the spectrum usage of the 21.4-22 GHz band for the broadcasting-satellite service and the associated feeder-link bands in Regions 1 and 3;	Medium
1.14	to consider requirements for new applications in the radiolocation service and review allocations or regulatory provisions for implementation of the radiolocation service in the range 30 300 MHz, in accordance with Resolution 611 (WRC 07);	Medium
1.15	to consider possible allocations in the range 3-50 MHz to the radiolocation service for oceanographic radar applications, taking into account the results of ITU R studies, in accordance with Resolution 612 (WRC 07);	Medium
1.16	to consider the needs of passive systems for lightning detection in the meteorological aids service, including the possibility of an allocation in the frequency range below 20 kHz, and to take appropriate action, in accordance with Resolution 671 (WRC 07);	High
1.17	to consider results of sharing studies between the mobile service and other services in the band 790-862 MHz in Regions 1 and 3, in accordance with Resolution 749 (WRC 07), to ensure the adequate protection of services to which this frequency band is allocated, and take appropriate action;	High
1.18	to consider extending the existing primary and secondary radiodetermination-satellite service (space-to-Earth) allocations in the band 2 483.5-2 500 MHz in order to make a global primary allocation, and to determine the necessary regulatory provisions based upon the results of ITU R studies, in accordance with Resolution 613 (WRC 07);	Medium
1.19	to consider regulatory measures and their relevance, in order to enable the introduction of software-defined radio and cognitive radio systems, based on the results of ITU R studies, in accordance with Resolution 956 (WRC 07);	Medium
1.20	to consider the results of ITU R studies and spectrum identification for gateway links for high altitude platform stations (HAPS) in the range 5 850 7 075 MHz in order to support operations in the fixed and mobile services, in accordance with Resolution 734 (Rev.WRC 07);	Medium
1.21	to consider a primary allocation to the radiolocation service in the band 15.4-15.7 GHz, taking into account the results of ITU R studies, in accordance with Resolution 614 (WRC 07);	Medium

1.22	to examine the effect of emissions from short-range devices on radiocommunication services, in accordance with Resolution 953 (WRC 07);	Medium
1.23	to consider an allocation of about 15 kHz in parts of the band 415-526.5 kHz to the amateur service on a secondary basis, taking into account the need to protect existing services;	Low
1.24	to consider the existing allocation to the meteorological-satellite service in the band 7 750 7 850 MHz with a view to extending this allocation to the band 7 850-7 900 MHz, limited to non-geostationary meteorological satellites in the space-to-Earth direction, in accordance with Resolution 672 (WRC 07);	Medium
1.25	to consider possible additional allocations to the mobile-satellite service, in accordance with Resolution 231 (WRC 07);	High
2	to examine the revised ITU R Recommendations incorporated by reference in the Radio Regulations communicated by the Radiocommunication Assembly, in accordance with Resolution 28 (Rev.WRC 03), and to decide whether or not to update the corresponding references in the Radio Regulations, in accordance with principles contained in the Annex 1 to Resolution 27 (Rev.WRC 07);	Low
3	to consider such consequential changes and amendments to the Radio Regulations as may be necessitated by the decisions of the Conference;	Low
4	in accordance with Resolution 95 (Rev.WRC 07), to review the resolutions and recommendations of previous conferences with a view to their possible revision, replacement or abrogation;	Low
5	to review, and take appropriate action on, the Report from the Radiocommunication Assembly submitted in accordance with Nos. 135 and 136 of the Convention;	Low
6	to identify those items requiring urgent action by the Radiocommunication Study Groups in preparation for the next world radiocommunication conference;	Low
7	to consider possible changes in response to Resolution 86 (Rev. Marrakesh, 2002) of the Plenipotentiary Conference: "Advance publication, coordination, notification and recording procedures for frequency assignments pertaining to satellite networks", in accordance with Resolution 86 (Rev.WRC 07);	Medium
8	in accordance with Article 7 of the Convention:	Medium
8.1	to consider and approve the Report of the Director of the Radiocommunication Bureau:	
8.1.1	on the activities of the Radiocommunication Sector since WRC 07;	
8.1.2	on any difficulties or inconsistencies encountered in the application of the Radio Regulations; and	
8.1.3	on action in response to Resolution 80 (Rev.WRC 07);	
8.2	to recommend to the Council items for inclusion in the agenda for the next WRC, and to give its views on the preliminary agenda for the subsequent conference and on possible agenda items for future conferences, taking into account Resolution 806 (WRC 07),	

High Priority

A6.2   The high Priority issues are key policy issues for the UK, either because of the importance of achieving a good outcome or because of the threat to vital interests. These issues are likely to be controversial with diverging views from other countries, even within Europe. Hence UK will need to be actively engaged at all stages, not only participating in the debate but making contributions to the development of the issues. This prioritisation will usually apply where this a major conflict between radio services or between UK interests, and especially where the agenda item is so wide-ranging that it presents potentially multiple, as yet undefined, threats (e.g. where additional spectrum is sought without any indication as to the target band).

A6.3   The WRC-12 agenda items identified as high priority are: 1.2; 1.3; 1.16; 1.17; 1.25.

Medium Priority

A6.4   The medium Priority issues are important for the UK and/or likely to present some difficulties, at least in detail, requiring UK participation in meetings. Equally however there is likely to be some degree of consensus at least in Europe, with a number of countries sharing our objectives. This prioritisation will generally apply to agenda items mainly confined to a single radio service, rather than where this is a major conflict between services.

A6.5   The WRC-12 agenda items identified as medium priority are: 1.4; 1.5; 1.7; 1.8; 1.10; 1.11; 1.13; 1.14; 1.15; 1.18; 1.19; 1.20; 1.21; 1.22; 1.24; 7; 8.

Low Priority

A6.6   The low priority issues are either relatively unimportant for the UK or sufficiently straightforward and uncontroversial that we can expect others to run with the issue at minimal risk to the UK. Hence limited effort required, mainly monitoring developments.

A6.7   The WRC-12 agenda items identified as low priority are: 1.1; 1.6; 1.9; 1.12; 1.23; 2; 3; 4; 5; 6.

Annex 7

UK Co-ordinators for WRC-12

A7.1   The following table shows the UK co-ordinators for WRC-12 agenda items

A.I.	Co-ordinator	e-mail
1.1, 1.23, 2, 4	Wesley Milton	Wesley.Milton@ofcom.org.uk
1.2, 1.19	Siew Yoon Tan	SiewYoon.Tan@ofcom.org.uk
1.3, 1.4, 1.9, 1.10, 1.14, 1.21	Stephen Talbot	Stephen.Talbot@ofcom.org.uk
1.5	John Canavan	John.Canavan@ofcom.org.uk
1.6, 1.22	Barry Goodyear	Barry.Goodyear@ofcom.org.uk
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1.11, 1.12, 1.15, 1.24	Bharat Dudhia	Bharat.Dudhia@ofcom.org.uk
1.13	James Richardson	James.Richardson@ofcom.org.uk
1.16	Mark Rider	Mark.Richard.Rider@ofcom.org.uk
1.17	Steve Green	Steve.Green@ofcom.org.uk
1.20	Alex Dixon	Alex.Dixon@ofcom.org.uk
7, 8.1	Stephen Limb	Stephen.Limb@ofcom.org.uk

Annex 8

Timeline of key events

A8.1   The following table shows the key meetings from September 2009 related to WRC-12 where Ofcom plans to participate.

Date	Event	Description
14 – 16 September 2009	African Preparation	ITU hosted meeting for African countries
14 – 16 October 2009	CPG	CEPT Preparation for WRC
10 – 13 November 2009	CITEL PCC-II	American States preparation for WRC
24 – 26 February 2010	CPG	CEPT Preparation for WRC
8 – 12 March 2010	APG	Third Asia-Pacific regional group
March 2010	ASMG	Arab Spectrum Management Group
16 July 2010	CPM Deadline	Final date for ITU studies in preparation for WRC
28 Sept. – 1 October 2010	CPG	CEPT Preparation for WRC
1 – 5 November 2010	Special Committee	ITU Group addressing regulatory and procedural issues
25 – 28 January 2011	CPG	CEPT Preparation - approval of first ECPs
14 – 25 February 2011	CPM	Agreement of conference preparatory report
Q1 2011	APG	Fourth Asia-Pacific regional group meeting
28 June – 1 July 2011	CPG	CEPT Preparation - final approval of ECPs
Q3-Q4 2011	APG	Fifth Asia-Pacific regional group meeting
Week before WRC	RA-12	Radiocommunication Assembly
27 January – 17 February 2012	WRC-12	World Radiocommunication Conference

Annex 9

Radio Services

A9.1   The table below is a guide to the radio services defined in the Radio Regulations. The centre column shows the main radio services. The entries in the left hand column may be used to limit these services to a certain type of use. For example, a MOBILE allocation covers use on land, in the air and at sea, whilst LAND MOBILE covers land based systems only. The right hand column indicates where SATELLITE may be added, e.g. MOBILE-SATELLITE (where MOBILE refers to the ground segment, not the satellite).

A9.2   The services in the table below are shown in CAPITALS, this indicates Primary status in the Radio Regulations. Services listed the Radio Regulations in normal text have secondary status and these services cannot cause interference to, or claim protection from, the Primary services.

Type of use (optional)	Radio Service *Definition*	Satellite usage (optional)
AERONAUTICAL LAND MARITIME	MOBILE *Communication between stations which may operate either while moving, or stationary at unspecified points. Includes stations not intended to be mobile, e.g. base stations.*	-SATELLITE
AERONAUTICAL MARITIME	RADIONAVIGATION *Radar used for navigation.*	
	RADIODETERMINATION *The determination of the position, speed or other characteristics of an object, i.e. Radar.*	
	RADIOLOCATION *Radar used for purposes other than navigation.*	
	FIXED *Communication between specified fixed points.*	
	BROADCASTING *Transmission intended for reception by the general public.*	

	STANDARD FREQUENCY AND TIME SIGNAL *Time signals transmitted to control clocks, industrial control, etc.*	
	AMEATEUR *Non-commercial radio for self-training and technical experiments.*	
	INTER-SATELLITE *Links between satellites*	
	SPACE-OPERATION *Operation of spacecraft.*	
	METEOROLOGICAL AIDS *Radio used for weather observations*	
	SPACE RESEARCH *Scientific research in space*	
	RADIO ASTRONOMY *Scientific observations of space. The service category includes observations made from satellites.*	
	EARTH EXPLORATION SATELLITE *Observations of the characteristics of the Earth, may use active or passive sensors.*	
	METEOROLOGICAL SATELLITE *Alternative to EES used for weather observations*	

NB: the contents of this table have been simplified and are for guidance only.

Examples of the services derived from the table:
MARITIME MOBILE-SATELLITE is a satellite service for maritime purposes.
FIXED-SATELLITE is a satellite service with Earth stations at known locations.
BROADCASTING-SATELLITE is a system for direct broadcasting from satellite to home or vehicles.